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A

SUPPLEMENT

TO

Mr. CHAMBERS's Cyclopædia:

OR,

UNIVERSAL DICTIONARY

OF

ARTS AND SCIENCES.

IN TWO VOLUMES.

VOL. II.



LONDON:

Printed for W. INNYS and J. RICHARDSON, R. WARE, J. and P. KNAPTON, T. OSBORNE, S. BIRT, T. and T. LONGMAN, D. BROWNE, C. HITCH and L. HAWES, J. HODGES, J. SHUCKBURGH, A. MILLAR, J. and J. RIVINGTON, J. WARD, M. SENEX, and the Executors of J. DARBY.

M. DCC. LIII.

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M.

MABBY, a kind of wine made from potatoes. It is ſaid to be uſed in Barbadoes. *Boyle*'s Works abridg. vol. 1. p. 71.

MABOUJAS, the *devil lizard*, a ſpecies of American lizard, ſo called from its uglineſs and diſagreeable aſpect. It grows to ſix or ſeven inches long, and to the thickneſs of a thumb, and is found in the trunks of rotten trees, and in marſhy places, where the ſun beams ſeldom reach. It is all over of a gloſſy black colour, and looks as if ſmeared over with oil. *Rochefort*'s Hiſt. Antill.

MACAM, *Indian apple*, in natural hiſtory, the name of a common Eaſt-Indian fruit; it is of a round ſhape, and about the ſize of our common wild crabs which grow in the hedges. Inſtead of the ſeveral ſmall ſeeds which our crabs and apples contain, this fruit has only one hard kernel. It is of an acid taſte, and of a raw and not very agreeable ſmell. The tree which produces this fruit, does not grow to any great height. It reſembles the quince tree in its leaves, except that they have a yelloviſh caſt. Mem. Acad. Par. 1699.

MACAQUO, in zoology, the name of a large ſpecies of monkey, called by Mr. Ray *cercopithecus angolenſis major*, the great Angola monkey. Its hair is all of the colour of that of a wolf, its noſtrils are elate, its head like a bear's, and its buttocks are bald, on theſe he frequently ſits upright. He always carries his tail bent into a ſort of arch, his length from the head to the inſertion of the tail is more than a foot; his tail equals his body in length, his legs are conſiderably long, and his body remarkably fat and bulky; his teeth are extremely white, and his penis very much reſembles that of a man. It is an extremely lively animal, and continually plays a number of antic tricks; its voice is ſhrill, and its only note hah! hah! *Ray*'s Syn. Quad. p. 155. See CERCOPITHECUS.

They have another ſpecies of this kind alſo about Angola, which may be called the black *Macaquo*. Its only colour is black, but on many parts of the back and ſides, there is a greyiſh caſt among it. This has a tail of remarkable length, being more than two foot long.

MACARON, the name of a ſort of vermicelli, a paſte made of flour and water, and formed into the ſhape of the barrel of a large quill, or the guts of ſmall fowls.

MACAW, or MACAO, in zoology, the name of a large ſpecies of parrot, diſtinguiſhed alſo by the length of its tail. There are three different ſpecies of this bird brought over into Europe, which not only differ in ſize and other particulars, but alſo in colour. The firſt is the largeſt, and is finely variegated with blue and yellow. The ſecond is ſomewhat ſmaller than this, and is principally red and yellow, and the third is red and blue. It is not uncommon alſo to ſee the *Macaw* perfectly white, and it is to that particular colour we give the name of *cockatoon*; though with ſome it is made the ſynonymous name of all the *Macaw* tribe.

MACERONE, in botany, a name given by ſome authors to the great *hippoſelinum*, or herb Alexanders. *J. Bauhine*, vol. 3. p. 126.

MACHÆRION, a word uſed by chirurgical writers as the name of an inſtrument of the nature of the inciſion knife. It is alſo ſometimes uſed to expreſs an inciſion, and by the aruſpices of old it was applied to ſome peculiar part of the liver of animals, from which they preſaged events.

MACHERA *Lapis*, in natural hiſtory, the name of a ſtone of a ferrugineous colour, frequent on mount Berecynthus in Phrygia. Plutarch, and many other grave writers, relate, that if any perſon found this ſtone, and took it up at the time of the celebration of the feaſts of Cybele, he inſtantly was ſeized with madneſs.

MACHLIS, in natural hiſtory, a name uſed by Pliny and ſome of the old authors, for the rein-deer. See the article RANGIFER.

MACKREL, the Engliſh name for the ſcombrus, or ſcomber. See the article SCOMBER.

Horſe MACKREL. See the article HORSE-*Mackrel*.

MACROCELE. See the article FULICA.

MACROCEPHALUS (*Cycl.*)—*Macroſephali*, or *Long heads*, is a name given to a certain people who, according to the accounts of authors, were famous for the unſeemly length of their heads; yet cuſtom ſo far habituated them to it, that inſtead of looking on it as a deformity, they eſteemed it a beauty, and as ſoon as the child was born, moulded and faſhioned its head in their hands to as great a length as poſſible, and afterwards uſed all ſuch rollers and bandages as might ſeem moſt likely to determine its growing long.

MACROCERCOS *Ovis*, in natural hiſtory, the name of a ſpecies of ſheep ſomewhat allied to the *ovis laticauda*, or *platycercos* in the largeneſs of its tail; but as that extends ſo wonderfully in breadth, this does ſo no leſs in length, being deſcribed to be three cubits long.

Authors who have treated of this animal obſerve, that it is wholly unable to manage this load of tail, ſo that in the

natural ſtate it trails upon the ground, and ſoon becomes ſore and ulcerated; for this reaſon the ſhepherds are obliged to contrive a ſort of ſupport for it, by which the animal is made eaſy.

MACROCOLUM, or MACROCOLLUM, among the Romans, the largeſt kind of paper then in uſe. It meaſured ſixteen inches, and frequently two feet.

MACROLOGY, Μακρολογία, in rhetoric, a redundant, or too copious ſtile; an example of which we have in Livy, lib. viii. *Legati non impetratâ pace, retro domum, unde venerant abierunt.*

The too copious is equally ſubject to obſcurity with the two conciſe ſtile, and conſequently ought to be avoided. *Voſſ.* Rhet. l. 4. c. 1. §. 12. p. 35. See the articles BRACHYLOGY and DICTION.

MACROPEDIUM, the *Long-legs*, a name given by ſome writers in natural hiſtory, to the common tipula. See the article TIPULA.

MACROPIPER, a name given by authors to the *piper longum*, or long pepper.

MACROPNUS, a word uſed by Hippocrates and other old writers in medicine, to ſignify a perſon who fetches his breath at long intervals. It is uſed in oppoſition to *brachypnus*, or ſhort-breathed. See the article BRACHYPNÆA.

MACROPTERA, in zoology, the name of a genus of birds of the hawk kind, remarkable for the length of their wings. The word is derived from the Greek μακρὸς, long, and πτερὸν, a wing.

The hawks of this genus have their wings ſo long, that when cloſed they reach to the end of the tail, or nearly ſo. Of this genus are the bald buzzard, the kite, the hen harrier, the honey buzzard, and common buzzard, the ſacre, the jerfalcon, &c. *Willughby*'s Ornitholog. p. 40.

MACRORYNCHÆ, *long-beaked*, in the Linnæan ſyſtem of zoology, the character of a large order of the bird kind.

The word is derived from the Greek μακρὸς, long, and ῥύγχος, a beak.

The birds of this order have all of them beaks many times longer than their head, with oblong noſtrils, and a furrow running from them towards the apex of the beak. *Linnæi* Syſtem. Nat. p. 45.

MACROTELOSTYLA, in natural hiſtory, the name of a genus of cryſtals, which are compoſed of two pyramids joined to the end of a column, both the pyramids, as alſo the column, being hexangular, and the whole body conſequently compoſed of eighteen planes.

The word is derived from the Greek μακρὸς, long, τέλειος, perfect, and στύλος, a column; expreſſing a perfect cryſtal with a long column. See Tab. of Foſſils, Claſs 3.

There are only three known ſpecies of this genus: 1. A very bright and colourleſs one, found in ſome few places in England, and very common in the mountains of Germany. 2. A blackiſh very bright kind, with ſhort pyramids, found ſometimes in Cornwall, but more frequent in Italy. And, 3. A dull whitiſh one, with irregular pyramids; this is ſometimes found in Yorkſhire and in Cornwall, and is very common in Germany. Either of the ſorts found with us, are called by the common name of *Corniſh diamonds*. *Hill's* Hiſt. of Foſſ.

MACROULE, in zoology, the name given by many to the largeſt ſpecies of coot. It is of a deeper black than the common kind, and has a larger bald ſpot on its head. It is alſo called by ſome *diable de mer*. *Ray*'s Ornithol. p. 289. See the article FULICA.

MACUCAQUA, in zoology, the name of a Braſilian bird of the gallinaceous kind, called alſo by ſome the *gallina ſylveſtris*, or wild hen. It is larger than our common hen, and has a black ſtrong beak ſomewhat hooked at the end; its body is thick and bulky, and it has no tail; its head and neck are variegated with black and yellow ſpots, its throat is white, its breaſt, belly, and back, are of a duſky aſh-colour; its wings are of an olive colour, and are variegated with black; the long feathers of them are all black. It is a very well-taſted fowl, and has twice as much fleſh as the European hen; its eggs are ſomewhat larger than the common hen egg, and of a bluiſh-green colour; it feeds on fruits that fall off the trees, &c. and runs well, but cannot fly high or far, and never is ſeen in the trees. *Marggrave*'s Hiſt. Braſil.

MACULA, (*Cycl.*) in the writers of medicine, is uſed to expreſs all kinds of ſpots and efflorescences on the ſkin with different epithets. Thus *Maculæ peſtilentiales* are the ſpots or efflorescences which appear upon the ſkin in peſtilential diſeaſes. *Maculæ hepaticæ* are ſpots of a browniſh red colour appearing on the ſkin in many places, from an *ichoreſcence* of the blood, attended with a ſort of coagulation. *Maculæ volaticæ*, or vaniſhing ſpots, are very common to children, appearing in ſeveral parts of their bodies, and very ſoon diſappearing again. *Maculæ maternæ* are the ſpots or blemiſhes on children called *nævi*, and marks from the mother's longing; and *maculæ albæ* are white ſpots which appear in the cornea of the eye, called by other names, albugo, leucoma, nebula, and nubecula.

MACULA *Oculi*, a word uſed by many authors to ſignify a cataract or ſuffuſion.

MAD-*Dog*. See the article MADNESS.

MAD-*Apple*. See the article MELONGENA.

MADAROSIS, a word appropriated by the Greek phyſicians to the falling off of the hair of the eye-lids. This was uſually occaſioned among them by ſmall but foul ulcers on the verge of the eyelid, and this falling off of the hair about their edges, is ſaid by Hippocrates to have been a very bad ſymptom.

MADDER (*Cycl.*)—For the botanical characters of *Madder*, See the article RUBIA.

The culture of *Madder* is an article of conſiderable advantage to the Dutch, and might be proſecuted here with equal ſucceſs. The method of cultivating it in Holland is this: In autumn they plough the land where the *Madder* is to be planted, laying it up in high ridges, that it may be mellowed by the winter's froſts. In March they plough it again, working it very deep, and laying it in ridges at eighteen inches aſunder, and about a foot deep. Then, in the beginning of April, when the *Madder* begins to ſhoot out of the ground, they open the earth about the old roots, and take off all the ſide ſhoots, which extend themſelves horizontally juſt under the ſurface of the ground, preſerving as much of the root as may be with them. Theſe they plant immediately on the tops of the new ridges, at about a foot diſtance from each other; and this they uſually do in ſhowery weather, when the plants immediately take root, and require no more water. In theſe ridges they let the plants remain two ſeaſons, keeping them clear of weeds; and at Michaelmas time, when the leaves are fallen off, they take up the roots, and dry them for the market.

In England it would not be neceſſary to lay the ground up in ridges, as our lands are not ſo ſubject to over-flowings; the plants alſo will thrive better, if at greater diſtances, and if the horizontal roots were to be deſtroyed at times, the downright root would ſucceed much the better. *Miller*'s Gardener's Dict.

MADDER-*Root*. Mr. John Belchier ſhewed to the Royal Society the bones of hogs which were become red, by their feeding on bran that had been boiled with printed calicoes, which had been ſtained with preparations of iron, alum, ſugar of lead, and had had an infuſion of *Madder-root*, to fix the colours. By feeding a cock ſixteen days on fig-duſt, with a little *Madder-root*, all his bones became alſo red. Phil. Tranſ. N° 457.

Mr. Hamel du Monceau verified Mr. Belchier's experiments, and obſerved, that except the villous coat of the ſtomach and inteſtines, the capſula of the cryſtalline and vitreous humours of the eyes, and ſome very hard bony tendons, and the bones, no other part had any tincture of the *Madder*. The moſt ſolid bones were moſt tinged, and all the red ones were larger, more ſpongy, and eaſily broken; nor did they unite ſo well, when broken, as white bones. Some young animals had their bones tinged in three days. The red colour went gradually off, when the creatures forbore to take the *Madder* for food, which proved unhealthy, for they began to languiſh ſoon, and died with it.—Vegetables did not take the red colour when they were planted in *Madder*; and none of the other dyes, with which he fed animals, had any ſuch effect of tinging their bones, as the *Madder* had. Mr. du Hamel, having mixed *Madder* with the food of a pig for ſome time, and then kept away the *madder* an equal time, found, upon ſawing the bones through, that their interior laminæ were red, while the exterior were white: And having fed another pig ſix weeks with *Madder*, then kept it out of its food as long, and then mixed it other ſix weeks; upon ſawing the bones, they were compoſed of three layers, the external and internal were red, the middle one was white. Mem. de L'Acad. des Scienc. 1739. & Phil. Tranſ. N°. 457, §. 4. Med. Eſſ. Edinb. Abr. Vol. 2. p. 477.

MADELION, in the materia medica, a word uſed by Dioſcorides for *bdellium*.

MADERAM-*Pulli*, in botany, a name uſed by ſome authors for the tree whoſe fruit is the tamarind of the ſhops. Hort. Malab. vol. 1. p. 39.

MADIC, a word uſed by ſome medical writers for buttermilk.

MADISTERIUM, a name given by the Greeks to an inſtrument intended to keep the ſkin ſmooth, by eradicating the hairs.

MADNESS, *Mania*, in medicine. See the article MANIA, *Cycl.* and *Suppl.*

MADNESS *from the bite of enraged animals*, *Rabies canina*.—The bites of enraged animals, tho' they were not *mad* at the time they inflicted them, are uſually attended with very grievous conſequences. If the wound is ſlight, the diſcharge of blood from the part is to be encouraged by preſſing it with the fingers, ſucking it in the mouth, or by the application of cupping-glaſſes, or enlarging it with a lancet. It is afterwards to be waſhed with warm ſpirit of wine, and bolſters dipped in the ſame liquor, are to be applied to it, repeating the application every three or four hours, till all danger of inflammation is gone off. If the wound be conſiderably deep, it is always neceſſary to enlarge it with the knife, unleſs it have already a very large opening; and, after applying ſpirit of wine for the firſt days, to prevent the bad ſymptoms, it may be eaſily healed with honey, or ſome digeſtive ointment, and afterwards with a vulnerary balſam, as uſual in other wounds. *Heiſter*'s Surg. 97.

To know whether the dog which has bitten a perſon be or be not *mad*, it is neceſſary to know the marks by which a dog, in that condition, is to be diſtinguiſhed from others; theſe are, that he foams at the mouth, lolls out his tongue, claps his tail between his legs, and runs up and down, without ceaſing, as if he was purſued; he makes a hoarſe noiſe when he barks, and is afraid of all animals that come in his way, ſnapping at every thing he meets, even his maſter whom he uſed to fawn upon; and other dogs are afraid of him, and avoid him.

Perſons bit by a *mad* dog are uſually afflicted with very violent diſorders, ſometimes ſooner, ſometimes later, according to the malignity of the poiſon imbibed by the wound, and other accidents. The moſt proper thing the ſurgeon can do on this occaſion, is to enlarge the wound with the knife, and promote the flowing out of the blood; then to waſh it with ſalt water, or with Venice-treacle diſſolved in vinegar; and when the texture of the part will permit, that is, when only the common integuments, or fleſhy parts are wounded, to apply the actual cautery to the wound, and afterwards dreſs it as other burns. Another method much practiſed, is to make a tight ligature above the wound, to prevent, as much as may be, the return of the blood by the veins from that part; then to enlarge the wound with a knife, and waſh it as before directed; then cauterize it if the part will admit that operation, if not, cleanſe the wound, if deep, by means of a ſyringe, and apply over it a plaſter of the mercurial kind; and if the perſon be plethoric, to open a vein. After the Venice-treacle has been uſed for a day or two in theſe caſes, the wound is to be dreſſed with honey, or with the common digeſtive ointment, mixed with the Ægyptian ointment, or with red precipitate, and be kept open by means of theſe dreſſings for ſome weeks; for wounds of this kind muſt never be healed too ſoon, eſpecially when they have not been cauterized. *Heiſter*'s Surg. 99.

Dr. de Sault argues for the *rabies canina*, depending on ſmall worms, of which, he ſays, there are a great number found in the heads of thoſe who die of this diſeaſe. From the analogy of this terrible diſeaſe with others; ſuch as the itch, lues venerea, &c. which, in his opinion, are alſo contagious, by worms communicated from one perſon to another, he was led to think that the cure of the *rabies* was only to be performed by mercury, and the ſucceſs confirmed his theory; for of four men who had all been bit at the ſame time by the ſame wolf, two were treated by the common ſpecifics of plunging in the ſea, &c. and died ſome days after of the *rabies*. The other two, having all the ſigns of an approaching *rabies*, were cured by Mr. de Sault's method, which is this: If he is conſulted immediately after the perſon is bit, he orders him to be bathed in the ſea, that the common confidence in this method may calm his mind. As ſoon as the patient returns, he puts him on the uſe of Palmarius's powder, compoſed of Fol. Rut. Verben. Salv. Plantag. Polypod. Abſinth. Vulg. Menth. Artemiſ. Meliſſ. Betonic. Hyperic. Centaur. Min. ana partes æquales, with ſome coralline. A dram of this powder is to be taken every morning, in a glaſs of white wine or warm water. This he gives for twenty or thirty days, as there is more or leſs preſumption of the poiſon having entered the blood. From the firſt day of taking the powder, he rubs a dram or two of ung. Neapolit. upon the wound, and ſkin round it, every other day. After doing this thrice, he applies the ointment every third day; and afterwards every fourth day, till he has made uſe of two or three ounces of the ointment. If the patient has delayed ſeveral days to take his advice, he uſes the mercurial friction three or four times a day, for four days, and encreaſes the doſe of Palmarius's powder; then forbears the inunction two days, leſt a ſalivation ſhould be brought on. Our author likewiſe recommends muſic as of uſe to calm the mind, and divert the fear which people, in danger of this diſeaſe, generally have. Medic. Eſſ. Edinb.

Dr. James relates the cure he made of dogs that were *mad*, and how he preſerved others from the rabies, who had been bit by *mad* dogs, by giving doſes of turbith mineral every day, or every other day. The other dogs of the pack that had been bit, died, notwithſtanding the famous pewter medicine, dipping in the ſea, and the other common ſpecifics. The Doctor likewiſe mentions three people who were bit by *mad* dogs, and eſcaped the *rabies* by the uſe of the turbith. Phil. Tranſ. N°. 441. §. 8.

Mr. Fuller relates the good effects of the pulvis antyliſſus, compoſed of lichen. ciner. terreſt. and piper. nigr. aa. in preventing the *rabies*. Phil. Tranſ. N°. 448. §. 5.

A perſon who had been bit by a *mad* dog, and began to have ſymptoms of the *rabies*, was ſaved by having one hundred and twenty ounces of blood taken in a week, and being bathed in cold water. Phil. Tranſ. ibid. §. 6.

Mr. Nourſe relates the hiſtory of a lad bit in the thumb by a *mad* dog; he took morning and evening a dram of the *pulvis antyliſſus* forty days, and bathed in the ſea ten days; he was cut for the ſtone ſoon after, and recovered very well; nineteen months after which he died, with all the ſymptoms of the hydrophobia. Phil. Tranſ. N°. 445. See the article HYDROPHOBIA.

We have an account of a man bit by one of theſe animals, who was cured by bleeding, nitre, and mithridate. See Phil. Tranſ. N°. 475. Sect. 4. The *pulvis antyliſſus*, and cold bathing, far from alleviating the ſymptoms in this patient, rather increaſed them. The cold bath was obſerved to augment the head-ach. Dr. Mortimer, the editor of the tranſactions, propoſes warm bathing.

The Tonquineſe pretend to an infallible remedy for the bite of the *mad* dog. Their method is to take about ſixteen grains of the beſt muſk; of the pureſt native cinnabar, and fineſt vermillion, each about twenty four grains; and having reduced them ſeparately to impalpable powders, they mix and adminiſter them in about a gill of arrack. This, in two or three hours, generally throws the patient into a ſound ſleep, and perſpiration: If not, they repeat the doſe, and think the cure certain. See Phil. Tranſ. N°. 474. p. 225. ſeq. Where Mr. Reid, to whom we are obliged for this receipt, obſerves, as to the vermillion, that though it be a preparation of cinnabar, yet, as the Tonquineſe ſeem to think its virtue different, it were to be wiſhed, that we knew their method of preparing it, in which they certainly excel.

This compoſition of muſk and cinnabar has been applied with ſucceſs to other diſtempers, only as Tonquin vermillion is not eaſy to be had, Mr. Reid ſubſtituted an equal quantity of factitious cinnabar in its ſtead, and ſometimes adminiſtered it in rum or brandy inſtead of arrack. See the article MUSK.

MADNING-*Money*, old Roman coins, found about Dunſtable, are ſo called by the country-people; and have their name from *magintum*, uſed by the emperor Antoninus in his Dunſtable itinerary. *Camb. Blount.*

MADON, in botany, a name by which Pliny, and ſome other authors, have called the white bryony. *Ger.* Emac. Ind. 2.

MADOR, a word uſed by ſome authors to expreſs the ſweat which ariſes under a ſyncope or fainting, whether it be cold or hot, or in larger or ſmaller quantities.

MADREPORA, in botany, the name of a genus of ſea plants, the characters of which are, that they are almoſt of a ſtony hardneſs, reſembling the corals, and are uſually divided into branches, and pervious by many holes or cavities, which are frequently of a ſtellar figure.

The ſpecies of *Madrepora*, enumerated by Mr. Tournefort, are theſe: 1. The ſtarry *Madrepora*. 2. The branched *Madrepora*. 3. The *Madrepora*, commonly called *Millepora*. 4. The common white oculated *Madrepora*, called the oculated white coral. 5. The ſmall white ſtellated and verrucoſe *Madrepora*, called the coralloide porus, and the aſtroites. 6. The much branched, and elegantly ſtellated white *Madrepora*. 7. The punctated verrucoſe *Madrepora*. 8. The abrotanum-like *Madrepora*. 9. The branched erect *Madrepora*, with numerous tubercles bending upwards. 10. The white compreſſed *Madrepora*, of a foliaceous ſtructure, and ſieve-like texture. 11. The white cypreſs-like *Madrepora*, or white porus, with hollow tubercles. 12. The great tree *Madrepora*. *Tourn.* Inſt. p. 573.

MAEL *Coronde*, in the language of the Ceyloneſe, the flowering cinnamon tree. This is a name given to a peculiar ſpecies of the cinnamon tree, which is all the year round found full of flowers. The flowers are not eaſily to be diſtinguiſhed from the very fineſt cinnamon flowers, but they produce no fruit, which the flowers of the fine cinnamon always do. The bark is much like that of the beſt cinnamon, in external appearance; but it has very little taſte or ſmell. The tree grows very large, and the inhabitants ſometimes tap it, by boring a hole into the trunk, at which it bleeds a thin watery juice, in the manner of our birch tree.

MÆMACTERION, Μαιμακτηριων, in chronology, the fourth month of the Athenian year. It contained twenty-nine days, and anſwered to the latter part of our September and beginning of October. The Bœotions called it *Alalcomenius*.

It took its name from the feſtival *Mæmacterica*, ſacred to Jupiter, kept at this time. See *Pott.* Archæol. Græc. l. 2. c. 20. Tom. I. p. 413.

MÆMACYLON, in the materia medica, a name given by Dioſcorides, and the antients in general, to the fruit of the Arbutus, or ſtrawberry-tree.

MÆNA, in zoology, the name of a ſmall fiſh, caught in vaſt abundance about the ſhores of the Mediterranean, and common in the markets of Italy, where they are accounted but a poor ſort of fiſh, and ſold at a very cheap rate. It is ſomewhat of the figure of the pearch, but broader and thinner, and is ſeldom above four or five inches in length. Its colour is a duſky pale green, and pale yellow, variegated with tranſverſe black lines, and ſome longitudinal ones of a fine blue; and on each ſide, near the middle of the body, and juſt below the line which runs from the gills to the tail, it has a large black ſpot. This fiſh changes its colour in the different ſeaſons of the year, being white in winter, and greeniſh, or yellowiſh, and ſtreaked and ſpotted in the ſummer. The eyes are large, and the tail not much forked. Its back fin has the anterior rays prickly, the reſt ſmooth. *Rondelet.* de Piſc.. l. 5. c. 13. p. 138. *Aldrovand.* de Piſc. l. 2. c. 39. p. 223. *Geſner.* de Piſc. p. 612.

MÆNA *Candida*, in ichthyology, a name given by many authors to the ſmaris. It is not very improper, for they are

both

both of the ſame genus of the ſparus, and are very nearly allied to one another; the principal difference conſiſting in the tail and belly fins of the ſmaris being red. See the articles MÆNA and SPARUS.

MAESTOSO, or MAESTUOSO, in the Italian muſic, ſignifies to play with grandeur, and conſequently ſlow, but yet with ſtrength and firmneſs.

MAFORTIUM, among the Romans, a veil, or head-dreſs, worn by the married women. *Pitiſc.* in voc.

MAGAS, in the antient muſic, is uſed to denote the bridge of any inſtrument.

MAGAURI, in zoology, the name of a Braſilian bird, a ſpecies of ſtork. It is of the ſize of the common white ſtork. Its neck is a foot long, and its beak ſtrait and pointed, and nine fingers breadth in length; its legs long and naked. Its tail is ſhort. Its head, neck, and body, are covered with ſnow-white feathers. On the throat theſe are very long, very white and valuable. Its wing and tail have their long feathers black. Its legs are red; and its fleſh eatable. *Marggrave*'s Hiſt. Braſil.

MAGBOTE, or MÆGBOTE, in our old writers, a compenſation for the ſlaying or murder of one's kinſman, in antient times, when corporal puniſhments for murder, *&c.* were ſometimes commuted into pecuniary fines, if the friends and relations of the party killed were ſo ſatisfied. Leg. Canuti, cap. 2. *Blount*, Terms of Law.

The word comes from the Saxon *Mæg*, i. e. *Cognatus*, and *Bote*, *Compenſatio*.

MAGDALEO, a word uſed by diſpenſatory writers, to expreſs any thing made up into a cylindric form. The common rolls of plaſters which the apothecaries make up, to be ready for ſpreading upon occaſion, are thus called, as alſo the rolls of ſulphur, or common brimſtone.

MAGDALIÆ, or MAGDALIDES, the ſame as *Magdaleones*, rolls of ſulphur, plaſters, *&c.* Vid. ſupra.

MAGELLANIC *Clouds*, whitiſh appearances like clouds, ſeen in the heavens towards the ſouth pole, and having the ſame apparent motion as the ſtars.

They are three in number, two of them near each other. The largeſt lies far from the ſouth pole; but the other two are not many degrees more remote from it than the neareſt conſpicuous ſtar, that is, about eleven degrees.

Mr. Boyle conjectures, that if theſe clouds were ſeen thro' a good teleſcope, they would appear to be multitudes of ſmall ſtars, like the milky way. *Boyle*'s Works abr. vol. 1. p. 295.

MAGELLANIC *Gooſe*, *Anſer Magellanicus*, in zoology. See the article GOOSE.

MAGGOT, the common name of the fly-worm, bred in fleſh, from the egg of the great blue fleſh-fly Notwithſtanding the diſtaſte for this animal, its figure, and ſtructure of parts is greatly worth attending to, and may ſerve as a general hiſtory of the claſs of worms produced from the eggs of flies.

This animal is white and fleſhy; its body is compoſed of a number of rings, like the bodies of caterpillars, and other the like inſects, and is capable, at the pleaſure of the animal, of aſſuming different figures, being, at times, more or leſs extended in length, and conſequently more or leſs thick.

Notwithſtanding that this creature has no legs, it is able to move itſelf very ſwiftly, and, in its firſt attempt to move its body, is extended to its greateſt length, and aſſumes ſomething of the figure of a pointed cone. The pointed part of this cone is the head of the animal, and is not ſeparated from the next ring by any deeper furrow than the reſt of the rings are from one another. In ſome ſtates of the animal, one may ſee two ſhort horns thruſt out from the head; but what are more conſtantly obſervable are two brown ſcaly hooks; theſe are, however, ſometimes hid, and have each of them a ſheath, or caſe, into which the animal can retract them at pleaſure. Theſe hooks are bent into an arch, the concavity of which is toward the plane on which the creature is placed, and they are thickeſt at their inſertion in the head, and thence diminiſh gradually, till they terminate in a fine ſharp point.

Theſe two hooks are placed in a parallel direction, and can never come together, and therefore cannot ſerve in the place of teeth to grind the food between, but merely to pull and ſever it to pieces, that it may be of a proper ſize for the mouth of the creature.

The creature has beſide theſe two hooks a kind of dart, which is of about a third part of their length, and is placed at an equal diſtance between them. This alſo is brown like them, and ſcaly; it is quite ſtrait, and terminates in a fine point. The hooks have, as it were, two ſcaly thorns at their points, and this dart ſeems intended, by reiterated ſtrokes, to divide and break the pieces of fleſh theſe have ſeparated from the reſt into ſmaller parts.

Immediately below the apertures for the egreſs of the hooks, is placed the mouth of the animal; the creature does not ſhew this little opening unleſs preſſed, but if the preſſure be properly managed, it will ſufficiently open it, and there may be diſcovered within it a ſmall protuberance, which may very naturally be ſuppoſed either the tongue, or the ſucker of the animal.

The hooks in theſe creatures not only ſupply the place of teeth, but alſo of legs, ſince it is by faſtening theſe hooks into the ſubſtance it is placed on, and then drawing up its body to it, that it pulls itſelf along.

The back of this creature lowers itſelf by degrees as it approaches the extremity of the belly, and near the place where the back begins to lower itſelf, are placed the creature's two principal organs of reſpiration. One may perceive there two ſmall roundiſh brown ſpots; theſe are very eaſily diſtinguiſhable by the naked eye, becauſe the reſt of the body of the creature is white; but if we take in the aſſiſtance of glaſſes, each of theſe ſpots appears to be a brown circular eminence raiſed a little above the reſt of the body. On each of theſe ſpots one may alſo diſcover three oblong oval cavities, ſomething of the ſhape of button-holes; theſe are ſituated in a parallel direction to one another, and their length nearly in a perpendicular direction to that of the body of the animal.

Theſe apertures are ſo many ſtigmata or air-holes, openings deſtined to admit the air neceſſary to the life of the animal. The creature has ſix of theſe ſtigmata, three in each ſide of its body.

The great tranſparence of the body of this inſect, gives us an opportunity alſo to diſtinguiſh that it has on each ſide a large white veſſel running the whole length of the body. It is eaſy to follow the courſe of theſe veſſels through their whole length, but they are moſt diſtinct of all toward its hinder part, and they are always ſeen to terminate each in the brown ſpot before deſcribed; this leaves us no room to doubt but that they are the two principal tracheæ.

Theſe poſterior tracheæ have been well known to the later naturaliſts; but there are two others beſides theſe which they ſeem not to have diſtinguiſhed. Theſe are ſituated in the anterior part of the animal, and are eaſily diſcovered by following the courſe of the tracheæ on each ſide; for though theſe all the way diminiſh in their diameters as they approach the head of the animal, yet it may be eaſily enough ſeen where they terminate, which is (taking the head for one ring) in the junction of the ſecond and third ring. In this place the naked eye eaſily diſcovers a ſmall ſpot at the extremity of each, which viewed with a good microſcope appears to be a plain ſtigma, of the figure of a funnel with half of it cut off, and very elegantly indented, and as it were fringed at the edges.

Theſe ſtigmata in the anterior part of the body, are as conſtant in this creature as the poſterior ones, but it ſeems to have none of thoſe which the caterpillar claſs are furniſhed with along their ſides; though it ſeems from the ſtructure of the fly it afterwards transforms itſelf into, that it ought to have them, ſince that has ſtigmata in their places.

The ramifications of the two great tracheæ are very beautifully ſeen in this creature, eſpecially on its belly; and it is remarkable, that no veſſel analogous to the great artery in the caterpillar claſs can be diſcovered in theſe; though, if there were any ſuch, their great tranſparence muſt needs make them very eaſily diſtinguiſhable; nor could its dilatations and contractions, if ſo conſiderable as in that claſs of animals, be leſs ſo. See ERUCA.

Malpighi imagined that artery, in the caterpillar claſs, a ſeries of hearts; in its place, however, there may be ſeen in theſe animals a true heart. It is eaſy to obſerve in theſe creatures, about the fourth ring of their body, a ſmall fleſhy part, which has alternate contractions and dilatations, and is not only diſcoverable in the body by means of the creature's tranſparence; but on making a proper ſection of them in the ſecond, third, and fourth rings, will be thrown out of the body of the creature, and will afterwards continue its beats for ſome minutes. *Reaumur*'s Hiſt. Inſect. vol. 4. p. 166, ſeq.

MAGIC (*Cycl.*)—The moſt ignorant and barbarous people have been generally moſt ſuſpected of *Magic*. Among ourſelves, the moſt miſerably ignorant perſons have been accuſed of it; and among foreign nations the Laplanders and Iſlanders have been ſuppoſed moſt converſant of all others in it. Theſe people themſelves place an abſolute confidence in the effects of certain idle words and actions, and the reſt of the world is deceived in the ſame manner. The famous *magical drum* of the Laplanders is ſtill in conſtant uſe in that nation, and Scheffer, in his hiſtory of Lapland, has given us an account of its ſtructure.

This inſtrument is made of beech, pine, or fir, ſplit in the middle, and hollowed on the flat ſide where the drum is to be made. The hollow is of an oval figure, and is covered with a ſkin clean dreſſed, and painted with figures of various kinds, ſuch as ſtars, ſuns, and moons, animals, and plants, and even countries, lakes, and rivers; and of later days, ſince the preaching chriſtianity among them, the acts and ſufferings of our Saviour and his apoſtles, are often added to the reſt. All theſe fignres are ſeparated by lines into three regions or cluſters.

There is beſide theſe parts of the drum an index and a hammer. The index is a bundle of braſs or iron rings, the biggeſt of which has a hole in its middle, and the ſmaller ones are hung to it. The hammer or drum-ſtick is made of the horn of a rein deer, and with this they beat the drum ſo as to make theſe rings move, they being laid on the top for that purpoſe. In the motion of theſe rings about the pictures figured

gured on the drum, they fancy to themſelves ſome prediction in regard to the things they are to enquire about.

What they principally enquire into by this inſtrument, are three things: 1. What ſacrifices they ſhall offer as moſt acceptable to their gods. 2. What ſucceſs they ſhall have in their buſineſſes or undertakings, ſuch as hunting, fiſhing, curing of diſeaſes, and the like. And, 3. What is done in places remote from them. On theſe ſeveral occaſions they uſe ſeveral peculiar ceremonies, and place themſelves in ſeveral odd poſtures as they beat the drum, which influences the rings to one or the other ſide, and to come nearer to one or the other ſet of figures. And when they have done this, they have a method of calculating a diſcovery, which they keep as a great ſecret, but which ſeems merely the buſineſs of imagination in the diviner or magician.

MAGICAL (*Cycl.*) — MAGICAL *arrows*, a ſort of weapon very common among the barbarous inhabitants of Lapland, and many other of the northern climates, and ſuppoſed to poſſeſs great and very ſtrange virtues. The people who are poſſeſſed of them, pretend that they can, by their means, cauſe diſeaſes even to people at a great diſtance from them; and not only diſeaſes, but any other kind of miſchiefs they deſire; and they pretend to practiſe this not only againſt ſtrangers, but one another. There is a ſtory recorded in Scheffer's hiſtory of this country, as a legend univerſally believed among them, of a magician who, by means of one of theſe arrows, tore up a rock, near which another magician, with whom he was at enmity, was ſleeping, and buried him under it.

MAGIOTAN, a name given by the people of Provence, and ſome other places, to the ſtony matter, as they eſteem it, which choaks up in time the mouths of ſome of their rivers. This is a ſoft ſpongy matter, reſembling a coarſe and very friable ſtone; and, according to the opinion of count Marſigli, it is no other than a congeries of the ſand from the bottoms of the rivers farther up the country, which is rolled downwards, and in theſe places is full of ſparry and bituminous matter, which, in the place where it meets the full body of ſea-water, is ſtopp'd and coagulated by it into this firm and ſolid ſtate.

MAGMA, a word uſed by medical writers on many occaſions, ſometimes in a very lax, and ſometimes in a more appropriated ſenſe. Some writers uſe it to expreſs a maſs of any thing; others for a thick ointment made up with very little fluid matter, to prevent its running; and others for the remains of an ointment after expreſſion from its ingredients. Galen reſtrains the word *Magma* to expreſs only the fæces of mirobalans.

MAGNA (*Cycl.*)—MAGNA *Aſſiza eligenda*, a writ directed to the ſheriff to ſummon four lawful knights before the juſtices of aſſize, there, upon their oaths, to chuſe twelve knights of the vicinage, *&c.* to paſs upon the *great aſſize* between A. B. plaintiff, and C. D. defendant, *&c.* Reg. Orig. 8. *Cowel.*

MAGNALE, a word uſed by Van Helmont, and other enthuſiaſtical chemiſts, to expreſs what he calls a kind of ſpirit, which adminiſters to ſympathy and antipathy, and is the prompter and promoter of actions, and by virtue of which magnetiſm is conveyed, as by a vehicle, to a diſtant object. In other places he ſays *Magnale*, in mixed ſubſtances, is the æther, which is thinner than the air; and, as he expreſſes it, of an ambiguous nature between body and no body. In other places he ſays, that as the *Magnale* has nothing like itſelf in created beings, ſo it will admit of no manifeſtation by reſemblance. The *Magnale*, he ſays, is not light, as many ſuppoſe, but is a ſort of conjugal form aſſiſting the air.

MAGNANINE, in zoology, the name of a ſmall bird deſcribed by Aldrovand, Geſner, and ſome other authors, and ſeeming to be the ſame with our hedge-ſparrow, commonly known among authors by the name *curruca*. *Ray*'s Ornitholog. p. 158.

MAGNES *Carneus*, in natural hiſtory, a name given by Cardan, and ſome other authors, to a white earth dug in Italy and ſome other places, and called alſo by many *calamita alba*. It is an indurated earthy ſubſtance of the hardneſs of oſteocolla, and is of a white colour variegated with black lines. It adheres very firmly to the tongue, and is hence ſaid to attract fleſh in the ſame manner as the magnet does iron. It is even pretended, that if an iron ſtylus be rubed over with this ſtony earth, and then plunged into the fleſh, the virtue of the earth will heal the wound as ſoon as made, and when the weapon is taken forth, there will remain no appearance of hurt. Cardan affirms that he ſaw this tried with ſucceſs, but ſuſpects witchcraft in the caſe! *De Boet.* de Gem. p. 474.

MAGNET (*Cycl.*)—MAGNET, in medicine. Some writers of the middle ages have, from a miſtaken tranſlation of Theophraſtus, been induced to account the *loadſtone* poiſonous, which the antients were ſo far from doing, that they gave it inwardly. Galen aſcribes a purgative quality to it, and recommends it in dropſies; and Dioſcorides preſcribes it as a good medicine to evacuate groſs melancholic humors.

It is doubtleſs poſſeſſed of the ſame virtues with the other ores of iron, though of late never uſed inwardly, being only made an ingredient in ſome plaſters.

Arſenical MAGNET, a cauſtic made of equal quantities of antimony, common ſulphur, and white cryſtalline arſenic; which are to be kept in a ſand heat, till the whole melts into one uniform maſs. It ſucceeds very well in taking down fungous fleſh in wounds.

MAGNETIC *Needle*, in navigation, *&c.* See the article NEEDLE, *Cycl.*

MAGNETICAL *Meridian*, in navigation. See the article MERIDIAN, *Cycl.*

MAGNETIS *Lapis*, in the natural hiſtory of the antients, the name given in different ages to two very different ſubſtances. The earlieſt Greek authors expreſſed by it the loadſtone, which became afterwards called *heraclius lapis*; and then the word *Magnetis* was applied to a very different ſtone brought from the ſame place, the neighbourhood of Magneſia in Lydia.

This was a fine beautiful and bright ſubſtance, of a pure white, and ſo very bright and gloſſy, as to carry a reſemblance of poliſhed ſilver. It was dug in large maſſes, and was of a texture eaſy to be wrought into any figure; this made it in great eſteem among the antients, who had it in conſtant uſe turned into veſſels of different kinds for the uſe of the table. It ſeems to be wholly unknown at preſent among the nations we have commerce with. *Hill's* Theophraſt. p. 79.

MAGNISSA, in mineralogy, a name given by ſome of the antients to the white pyrites, called by others *leucolithos* and *argyrolithos*. Many have ſuppoſed the *Magniſſa* to be the ſame with the magneſia, that is, manganeſe, but this is an error; nor is there the leaſt ſimilitude between the two ſtones. It is plain, indeed, that the antients called a white and ſilvery looking ſtone alſo by the name *Magneſia*; but neither does this appear to have been the *Magniſſa* here deſcribed, for Theophraſtus deſcribes it as a ſtone that artificers uſed for turning things out of, which is utterly impoſſible to be done with the pyrites; the ſhattery texture of which would make it fall to pieces on the ſlighteſt attempt to cut it into ſhape by the wheel. The chemiſts of the preceding ages have plainly underſtood this word *Magniſſa* of the pyrites, and have made theſe two words and the *ſory* ſynonymous. Pliny mentions a gold-coloured and ſilver-coloured pyrites; theſe therefore were diſtinctions ſufficient for the white and yellow pyrites; but Dioſcorides has only mentioned one kind of the marcaſite or pyrites, which is the yellow or braſſy one, the moſt common of all the ſpecies. When the word pyrites, therefore, was only the name of this yellow ſtone, it is not wonderful that the white one ſhould be called by another name, as *Magniſſa*. See the article MARCASITE.

MAGNITUDE (*Cycl.*)—*Geometrical magnitudes* may be uſefully conſidered as generated or produced by motion. Thus, lines may be conceived as generated by the motion of points; ſurfaces, by the motion of lines; ſolids, by the motion of ſurfaces; angles may be ſuppoſed to be generated by the rotation of their ſides.

Geometrical magnitude is always underſtood to conſiſt of parts; and to have no parts, or to have no *Magnitude*, are conſidered as equivalent in this ſcience. There is, however, no neceſſity for conſidering *Magnitude* as made up of an infinite number of ſmall parts; it is ſufficient that no quantity can be ſuppoſed to be ſo ſmall, but it may be conceived to be farther diminiſhed; and it is obvious, that we are not to eſtimate the number of parts that may be conceived in a given *Magnitude*, by thoſe which in particular determinate circumſtances may be actually perceived in it by ſenſe, ſince a greater number of parts become ſenſible, by varying the circumſtances in which it is perceived. See *Mac Laurin*'s Fluxions, Art. 290, 291.

Many of late have ſuppoſed geometrical *Magnitude* to be compoſed of infinitely ſmall parts, and infinite in number; and hence have raiſed many paradoxes and myſteries in a ſcience wherein there ought to be none. Nay, infinitely ſmall parts of infinitely ſmall parts, *&c. ad infinitum*, have been introduced without the leaſt neceſſity. See *Mac Laurin*'s Fluxions in the Introduction, where he makes ſeveral remarks on Monſieur de Fontenelle's *Geometrie de L'infini*. See the article EXTENSION.

MAGNOLIA, in botany, the name of a very beautiful genus of plants, the characters of which are theſe: The perianthium is compoſed of three oval and hollow leaves, which look like petals, and fall with the flower. The flower conſiſts of nine petals of an oblong form, hollowed, narrow at the baſe, and broader at the apex, and terminating in an obtuſe point. The ſtamina are very numerous, ſhort, and pointed filaments; they grow to the common receptacle of the piſtil, which is placed beneath the germen, and are of a compreſſed figure. The antheræ are oblong and ſlender, and grow on every ſide to the filaments; the germina are numerous, of an oval oblong figure, and are placed about a clavated receptacle; the ſtyles are crooked and contorted; the ſtigmata are placed longitudinally on the ſtyles, and are hairy; the fruit is a ſtrobilus of an oval form, with compreſſed, roundiſh, and ſcarce imbricated capſules; theſe are compoſed of two valves, and contain one cell; they ſtand cloſe to one another without pedicles, and open in their outer part. The ſeeds are ſingle, and

hang by a thread from every ſcale or capſule of the fruit when that is ſo ripe as to burſt thoſe ſcales. *Linnæi* Gen. Plan. p. 254. *Dillen.* Hort. Elth. p. 168.

MAGNUM *Os Carpi*. This is the third bone of the ſecond row in the carpus, and is the largeſt of all the bones of that part. It is of a conſiderable length, and has a kind of articular round head, which is received into the cotyloide cavity formed by the two firſt bones of the firſt row; and this articulation is capable of a ſmall degree of flexion and extenſion. The digital ſide is a cartilaginous baſis unequally and obliquely triangular, the apex being turned inward. It is articulated with the ſecond metacarpal bone, and is alſo a little notched on the radial edge for its articulation with the ſmall edge of the metacarpal bone. The radial ſide is very ſmall, and near the baſis, being articulated with the os pyramidale; the reſt of this ſurface is without cartilage; the cubital ſide is double, anſwering to a like ſide in the os uniforme with which it is articulated. The outer ſurface, which forms a part of the outer ſurface of the carpus, is broad, rough, and uneven, for the inſertion of ligaments; the inner ſurface is likewiſe rough, but narrower; and round both ſurfaces are ſeveral depreſſions, which, while the bone is in the body, are filled with ſmall glands, ligaments, &c. *Winſlow*'s Anatomy, p. 84.

MAGODUS, among the Romans, a name given to thoſe players who ſometimes acted the part of men, and ſometimes of women. *Pitiſc.* Lex. Ant. in voc.

MAGOSTANS, in botany, the name by which Garcias calls the genus of plants, afterwards named by Linnæus *garcinia*. See the article GARCINIA.

MAGRA, a word uſed by ſome writers for a ſort of red earth, and by others for the cornelian, the red jaſper, or any other ſtone of a red colour.

MAGUDARIS, a name by which Dioſcorides calls the ſilphium. See SILPHIUM.

MAGYDARIS, in botany, a name uſed by Theophraſtus, and other of the old authors, for the laſerpitium or laſerwort. *Ger.* Emac. Ind. 2. See LASERPITIUM.

MAHALEB, in the materia medica, the name of the fruit of a ſort of wild cherry called *ceraſus ſylveſtris amara*, or the wild bitter cherry, by Bauhine. The wood of the tree is of a greyiſh caſt and fine grain, with a mixture of red in the veins, and is very firm, and of a ſweet ſmell; the leaves and flower carry a rude reſemblance of thoſe of the common cherry; the fruit is round, black, and reſembles a cherry, having the ſame ſort of ſtone in it, the kernel of which is like the bitter almond in taſte. It is commended in external applications, and the perfumers of France uſe it in their waſhballs. It is to be choſen freſh and ſweet, for it very often has an intolerable ſtinking ſmell, like that of bugs. *Lemery*'s Dict. of Drugs.

MAHOMET *Pigeon*, the common Engliſh name of a ſpecies of pigeon, called by Moore the *columba numidica alba*. It is of the ſame ſhape and ſize with the Barbary pigeon, and has all the characters of that ſpecies, but is always perfectly white, which gives the red circle about the eyes a more lively look. *Moore's* Columbarium, p. 51.

MAJA, in zoology, the name of a bird deſcribed by Nieremberg as very common in the iſland of Cuba, and frequenting the fields of rice in large flocks. It is deſcribed to be a ſmall bird of a yelloviſh colour, very delicate, and well taſted, and remarkable for having a ſtomach on the back or outſide of the neck. *Ray*'s Ornithol. p. 297.

MAIAGUE, in zoology, the name of a Braſilian bird of the web-footed kind, but having its hinder toe looſe. It is of the ſize of the common gooſe; its head is large and round; its neck long, and it always carries it crooked like the ſwan; its beak is ſtrong and hooked at the end; it is all over of a browniſh black in colour, except that its throat is yellow. It is found about the mouths of rivers, and feeds on fiſh; it builds on the ground; it is very nimble both in running, flying, and diving, and is not eaſily taken, but is a very well-taſted fowl. *Marggrave*'s Hiſt. Braſil.

MAIDEN (*Cycl.*)—MAIDEN *Aſſizes*, aſſizes where no perſon is condemned to die, are thus called.

MAIDEN-*hair*, *Adiantum*, in medicine. See the article ADIANTUM.

MAIDEN-*rents*, in our old writers, a noble paid by the tenants of ſome manors on their marriage. This was ſaid to be given to the lord, for his omitting the cuſtom of marcheta, whereby he was to have the firſt night's lodging with his tenant's wife, but it ſeems more probably to have been a fine for a licence to marry a daughter. *Blount*.

MAILE, in our old writers, a ſmall kind of money. Silver half-pence were likewiſe termed *Mailes*, 9 Hen. 5. By indenture in the mint, a pound weight of old ſterling ſilver was to be coined into three hundred and ſixty ſterlings, or pennies, or ſeven hundred and twenty *Mailes*, or half-pennies, or one thouſand four hundred and forty farthings. *Lownd*'s Eſſ. on Coins, p. 38. *Blount*.

MAIN, (*Cycl.*) a term applied to ſeveral parts of a ſhip, as the *Main-capſtan*, *Main-maſt*, *Main-top-maſt*, *Main-ſail*, &c. and ſignifying the chief or largeſt of the kind. See the articles CAPSTAN, MAST, SAIL, &c.

MAIN-*body of an army*, is the body of troops that marches between the advance and the rear guard. In a camp it is that part of an army which is encamped betwixt the right and left wing.

MAINIS, in ichthyology, a name uſed by Ariſtotle, Athæneus, and others of the old Greek writers, for the fiſh now called the *mena menerela*, and *menola*. It is a ſpecies of the ſparus, and is diſtinguiſhed from all the other ſpecies of that genus, by having four large teeth, and a variegated body, ornamented with a black ſpot in the middle of the ſides. This is the fiſh the Narbons call *jaſcele*. See the article SPARUS.

MAINPERNABLE, in law, is applied to one that is bailable, or who may be let to bail. *Terms of law*, *Blount*. See the article BAIL, *Cycl.*

MAINTAINERS, are thoſe that maintain or ſecond a cauſe depending between others, by diſburſing money, or making friends for either party, &c. not being intereſted in the ſuit; or attornies employed therein. Stat. 19 Hen. 7. c. 14. *Blount*. See the article MAINTENANCE, *Cycl.*

MAJOR (*Cycl.*)—MAJOR *Helicis*, in anatomy, a name given by Albinus to one of the muſcles of the eye, called by Santorini and others, *helicis muſculus*. This author diſtinguiſhes it under the name *Major*, from another muſcle which he calls the *minor helicis*, and which Santorini calls only *fibræ muſculares in plana helicis facie*, tho' it be a true and proper muſcle.

MAJORANA, *Marjoram*, in botany, the name of a genus of plants, the characters of which are theſe: The flowers and ſeeds are wholly like thoſe of origanum, but the heads are rounder, more denſe, compact, and ſhort, and compoſed of four orders of leaves, placed regularly in the manner of ſcales. *Tourn.* Inſt. p. 199.

The ſpecies of *Marjoram*, enumerated by Mr. Tournefort, are theſe: 1. The common ſweet *Marjoram*. 2. The broad-leaved golden *Marjoram*. 3. The round-leaved hairy *Marjoram*, with the ſmell of ſavory. 4. The round-leaved ſentellated *Marjoram*. And 5. The narrow-leaved woody *Marjoram*.

Marjoram is an attenuant, diſſolvent, and detergent. It is good in nervous caſes, and diſorders of the breaſt and lungs. Its flowery tops, dried and powdered, and given a ſcruple for a doſe, are greatly recommended in epileptic caſes. The dried plant is only kept in the ſhops.

The common ſweet *Marjoram*, though a plant ſo commonly cultivated with us, never ripens its ſeeds in England: And, as it is an annual plant, we are obliged yearly to have a ſupply of its ſeeds from Marſeilles, and other places in the ſouth of France, where it grows wild in great abundance.

It is to be ſown in the latter end of March, or beginning of April, on a dry warm ſpot; and when they are come up, they muſt be carefully watered and cleared from weeds. In June the plants will be grown pretty ſtrong, at which time ſome beds of rich light earth ſhould be prepared, to tranſplant ſuch into as ſtand too thick. Theſe muſt be planted at four inches diſtance, and the others left in the ſame manner. Theſe are to be watered till they have taken root; and it is always found that thoſe which have been tranſplanted produce finer and larger knots of heads, than thoſe which remain where they were ſown. They flower toward the latter end of July, at which time they are to be pulled up, and dried in a ſhady place for uſe. *Miller*'s Gardener's Dict.

MAIZ. The Indians in New England, and many of our other ſettlements in America, had no other vegetable but *Maiz*, or Indian corn, for the making their bread of. They call it *weachin*; and where our colonies are at this time numerous, there is yet much of the bread of the country made of this grain, not of the European corn.

The ear of the *Maiz* yields a much greater quantity of grain than any of our corn ears. There are commonly about eight rows of grains in the ear, often more if the ground be good. Each of theſe rows contains at leaſt thirty grains, and each of theſe gives much more flour than a grain of any of our corn. The grains are uſually either white or yelloviſh, but ſometimes they are red, bluiſh, greeniſh, or olive-colour'd, and ſometimes ſtriped and variegated.

This ſort of grain, though ſo eſſentially neceſſary to the natives of the place, is yet liable to many accidents. It does not ripen till the end of September; ſo that the rains often fall heavy upon it while on the ſtalk, and the birds, in general, peck it, while it is ſoft and unripe. Nature has, to defend it from theſe accidents, covered it with a thick huſk, which keeps off ſlight rains very well; but the birds, if not frighted away, often eat thro' it, and devour great quantity of the grain.

There ſeem to be three or four diſtinct ſpecies of *Maiz*, in different parts of America. That of Virginia is very tall and robuſt, growing to ſeven or eight foot high; that of New England is ſhorter and lower. And the Indians, further up in the country, have a yet ſmaller kind in common uſe. The ſtalk of the *Maiz* is jointed like the ſugar cane; it is very ſoft and juicy, and the juice is ſo ſweet and ſaccharine, that a ſyrup, as ſweet as that of ſugar, has been often made of it; and things ſweetened with it have been found not diſtinguiſhable from thoſe done with ſugar. It has not been tried yet whether it will cryſtallize into ſugar; but in all probability it will.

The Americans plant this corn any time from the beginning of March to the beginning of June; but the beſt ſeaſon is the middle of April. The ſavage Indians, who knew nothing of our account of months, uſed to guide themſelves in the ſeed-time of this uſeful plant, by the budding of ſome particular trees of that country, and by the coming up of a fort of fiſh into their rivers, which they call the *aloofe*. Theſe things were both ſo regular, that they were in no danger of miſtaking the time. Phil. Tranſ. N°. 142.

The manner of planting *Maiz* is in rows, at equal diſtances, every way abont five or ſix feet. They open the earth with a hoe, taking away the ſurface to five or ſix inches deep, and of the breadth of the hoe; they then throw in a little of the finer earth, ſo as to leave the hole four inches deep, or thereabouts, and in each of theſe holes they place four or five grains at a little diſtance from one another. If two or three of theſe grow up, it is very well; ſome of them are uſually deſtroyed either by the birds or other animals.

When the young plants appear, they hoe up the weeds from time to time; and when the ſtalk gathers ſome ſtrength, they raiſe the earth a little about it, and continue this at every hoeing, till it begins to put forth the ears; then they enlarge the hill of earth, round the root, to the ſize of a hop-hill, and after this they leave it till the time of harveſt without any farther care.

When they gather the ears, they either immediately ſtrip off the corn, or elſe hang up the ears, tied in traces at diſtances from one another; for if they are laid near together, they will heat and rot, or elſe ſprout and grow; but kept cool and ſeparate, they will remain good all the winter. The beſt method of all others, is to threſh out the corn as ſoon as the harveſt is over, and then lay it up in holes of the ground, well lined with mats, graſs, or the like, and afterwards covered at top with more earth. The moſt careful among the Indians uſe this method, and this ſort of ſubterranean granary always proves good. Id. Ibid. See the article TRACING.

The uſes of this plant among the Indians are very many. The great article is the making their bread of it; but beſides this, the ſtalks, when cut up before they are too much dried, are an excellent winter food for cattle; but they uſually leave them on the ground for the cattle to feed on. The huſks about the ear are uſually ſeparated from the reſt, and make a particular ſort of fodder, not inferior to our hay. The Indian women have a way of ſlitting them into narrow parts, and they then weave them artificially into baſkets and many other toys.

The original way of eating the grain, among the Indians, was this: They boiled it whole in water till it ſwelled and became tender, and then they fed on it either alone, or eat it with their fiſh and veniſon, inſtead of bread. After this, they found the way of boiling it into a ſort of pudding, after bruiſing it in a mortar; but the way of reducing it to flour is the beſt of all. They do this by parching it carefully in the fire, without burning, and then beating it in mortars, and ſifting it. This flour they lay up in bags, as their conſtant proviſion, and take it out with them when they go to war, eating it either dry or with water. Id. Ibid.

MAKINBOY, a name given by the people of Ireland to a kind of ſpurge, or tithymale, common there: This is a very violent purge, as all the other ſpurges are; but the Iriſh have an opinion, that it will produce this effect only by being carried in the pocket. This opinion, which had been univerſally believed for many ages, was proved to be falſe by Dr. Mullen, who carried a large quantity of it about him many days together, on purpoſe to give a fair trial; but it had not any the leaſt effect on him.

MAKING *Up*, a term uſed by the diſtillers to expreſs the bringing ſpirits to a certain ſtandard of ſtrength by the addition of water. See LOWERING.

It is uſed principally in the diſtilling ſpirits, after their firſt drawing, either by way of rectifying them, or of giving them the virtues of aromatic ingredients, in order to make the compound waters; ſuch as cinnamon, anniſeed, and the like. See DISTILLERY.

In the making theſe compounds, ſome uſe an alcohol, or totally inflammable ſpirit, which is much the beſt method; others uſe ordinary proof ſpirit of malt, or melaſſes. If the latter be uſed, it is beſt not to put any water with it into the ſtill; but if the former, ſo much water is to be added as will reduce it to the proof ſtrength, which is juſt an equal quantity. When this is done, there ſhould be drawn off three fifths of the whole by diſtillation; and the far better way would be to keep this liquor in this very ſtate, which is juſt the ſtrength of the trois cinques brandy of the French: But as people require theſe waters to be kept for drinking, in ſuch a ſtate as not to exceed, at the utmoſt, the ſtrength of proof ſpirit, generally to fall much ſhort of it, it is neceſſary to reduce this three fifths, to the whole, or more than the whole quantity of the proof ſpirit put into the ſtill. The apothecaries, to this end, uſually let the ſtill continue to work without changing the receiver, till an equal quantity is produced to the ſpirit put in, or one fourth more; it being the uſual ſtandard in theſe waters, to have five quarts made from a gallon of the ſpirit. By the method of doing this, by letting the ſtill run, the faints are taken into the water, and give it a vapid and diſagreeable taſte. Inſtead of this the diſtiller, when he has drawn off his three fifths of the quantity of proof, makes up the whole to the deſtined quantity, by adding the two other fifths, or more than that, if requir'd, of common water, in which it is alſo cuſtomary to diſſolve ſome fine ſugar; and this gives a fullneſs in the mouth to the water, and makes it mellow, or looſe the fiery taſte of the ſtill much ſooner. If it be only made up to the ſtrength of proof, it will mellow much ſooner than if reduced one fifth below that ſtandard, as the oil is much more perfectly diſſolved in ſpirit of a ſtandard proof ſtrength, than in ſuch as is weaker. The water employed in the *making up*, ſhould be either ſoft and clear river water, or elſe ſpring water rendered ſoft by diſtillation, otherwiſe it is apt to turn the water thick, and precipitate a ſediment, eſpecially if the water be drawn lower than proof, or if the ſpirit, originally employed, partake of an alkaline nature from the ſalts uſed in its rectification, as is uſually the caſe in the malt ſpirits, the groſs oil of which requires to be ſeparated, by mixing ſalt of tartar or pot-aſh with it in the ſtill in the rectification.

When it is neceſſary to *make up* waters lower than proof, they are generally cloudy; but this may be remedied, and they may be fined down in a day or two with a ſmall quantity of alum, or with whites of eggs, or the jelly of iſinglaſs beat up to a froth, and mixed in the ſame manner as is uſually done in the refining of wines.

The ſugar, added to theſe cordial waters, has not only the advantages of mellowing and filling the mouth, but it unites the oil to the ſpirit in a manner that it could never be united in without it. *Shaw*'s Eſſay on Diſtillery.

MALA *Aurea*, in botany, a name by which ſome authors have called the *poma amoris*, or fruit of the lycoperſicon. *J. Bauhin.* vol. 3. p. 620.

MALABATHRUM, among the antients, an excellent ſweet-ſcented ointment. *Hofm.* Lex. in voc.

MALABATHRUM, *Indian Leaf*, in botany. See the article TAMALAPATRI.

MALACCA *Stones*, a name given by many authors to the pedro del porco, or hog bezoar. A ſtone found in the gall-bladder of the Indian boars, and ſuppoſed as a remedy for the plague, and many other diſeaſes. It is uſually kept in a gold box, and infuſed for a few minutes in any liquor, till it communicates a bitterneſs to it.

MALACHE, a term uſed by authors in a different ſenſe; ſometimes expreſſing ſuch medicines as gently looſen the belly, and ſometimes ſuch ointments as relax and mollify.

MALACHITES, or MOLOCHITES, in natural hiſtory, a ſpecies of jaſper, but of leſs beauty than moſt of thoſe of that claſs. It is naturally of a pure and deep green, but ſometimes variegated with whitiſh or blackiſh ſpots and clouds. It is found in the Eaſt and Weſt Indies; alſo in many parts of Europe. See JASPER.

Its amuletic virtues, formerly in great eſteem, are too ridiculous to be particularized. It is ſaid to be a violent purgative, operating both by vomit and ſtool, and as ſuch given in dropſies, in ſo ſmall a doſe as five or ſix grains. If, as is very probable, its green colour be owing to particles of copper, it is not wonderful that it ſhould have this effect; but there are ſo many better medicines for this purpoſe, as to ſuperſede its uſe. See COPPER.

MALACOCISSOS, in botany, a name uſed by ſome authors for the common ground ivy, or *hedera terreſtris*; and by ſome others for the marſh-marygold. *Ger.* Emac. Ind. 2.

MALACODERMATA, in natural hiſtory, a term uſed to expreſs ſuch animals as have only ſoft ſkins for their covering; in oppoſition to the oſtracodermata, which have hard ſhelly matters for their covering, ſuch as crabs, lobſters, *&c.*

MALACOIDES, in botany, the name of a genus of plants, the characters of which are, that they have the flower of the mallow-kind, but their fruit reſembles that of the common bramble, except that it is dry, not juicy. It conſiſts of a number of capſules, collected into a head, and fixed to a placenta, and containing ſeeds like thoſe of the mallow, or of a kidney-like form.

The ſpecies of *Malacoides* are only two. 1. The betony-leav'd kind. 2. The ſmall-flowered *Malacoides*, with an angular leaf. *Tourn.* Inſt. p. 98.

MALACOPTERYGII, in the Linæan ſyſtem of zoology, the name of a large order of fiſhes which have not prickly fins.

The term is derived from the Greek μαλάκος, ſoft, and πτερυγίον, a fin. The fiſh of this order, are thoſe which have bony fins, with all their extremities not pointed or ſharp, but ſoft and harmleſs. Of this order are the carp, *&c.* *Linnæi* Syſtema Naturæ, p. 55.

MALACOSTOMOUS, in ichthyography, the name of a large genus of fiſhes, called in Engliſh the leather-mouth'd kind. Theſe fiſhes are wholly deſtitute of teeth in their jaws, but have them placed in their throats, near the orifice of the ſtomach. *Ray*'s Ichthyography, p. 245.

The word is derived from the Greek μαλακὸς, ſoft, and στόμα, a mouth. All the fiſh of this genus have their ſwimming, or air-bladder, divided into two parts; and of this genus are the carp, tench, bream, chub, and the like. *Ray*, Ichthyogr. p. 245.

MALA-

MALACOSTRACA, in natural hiſtory, a term uſed by ſome, as Ariſtotle, to diſtinguiſh what we call cruſtaceous animals of the ſea, &c. from thoſe which he calls oſtracodermata, or teſtaceous, as we expreſs it. See table of teſtaceous and cruſtaceous animals.

Ariſtotle ſays, that cruſtaceous animals, or *Malacoſtraca*, are ſoft within, and hard without; but that though their covering is not apt to be parted by contuſions, yet the one part of it may eaſily be torn from the other; and the teſtaceous animals, or oſtracodermata, are ſoft within, and hard without; and their covering may be bruiſed or broken to pieces, though its parts are not liable to be torn from each other. Theſe definitions have been uſually acquieſced in, but being in reality inſufficient for the diſtinctions they are intended to make, they have been the origin of great confuſion and error. The conſequences which Ariſtotle puts into his definition or characteriſtics, neceſſarily ariſe from doctrines founded on facts; for when the ſhell is but one, as is the caſe in all the teſtaceous kind, it may be bruiſed, or it may be broken, according as it is more or leſs brittle, but it cannot be torn aſunder; whereas in the whole cruſtaceous kind, the coverings which are over every ſeveral part, as the legs, back, belly, and tail in lobſters, are joined to each other only by membranes, which though tough may be torn aſunder, though the body of the cruſt in any part is too firm to be ſo torn. The naturaliſts of late ages have been much diſtreſſed about a place for the *echini marini*, or ſea urchins, in their cabinets and books, ſome calling them teſtaceous, and others cruſtaceous animals.

It is very evident, however, according to Ariſtotle's diſtinctions, that the echini are of the claſs of theſe malacoſtraca, or cruſtaceous animals, for they move upon their ſpines, which demonſtrates that their covering is moved by parts, and ſo put together, that it may be torn aſunder, as the legs of a lobſter may from the body; and indeed every ſpine is riveted into its proper cruſt, which alſo by conſequence muſt have its peculiar muſcle which guides the motion of the ſpine, by means of which the animal moves itſelf about any way that it pleaſes; it being peculiar to theſe animals, that they move by rolling about upon their ſpines, not by walking upon them, as the other animals do on their legs, the purpoſes of which theſe ſpines ſeem formed by nature to anſwer. Phil. Tranſ. N° 219. p. 195.

It is evident alſo, even to ocular inſpection, that all the cruſts of the echini are united by membranes, as they are in the crabs and lobſters. Aguſtino Scilla has accurately figured the internal parts of ſeveral ſpecies of theſe animals in his book of petrifactions, and theſe draughts of his put the matter out of all doubt, as they exactly agree with nature, and are of the nature of the joinings of the lobſter kind. The fiſh of the echinus kind are by theſe proved to be cruſtaceous animals in the ſtricteſt ſenſe of the term.

MALAGMA, a word uſed by ſome authors to expreſs a cataplaſm in general, of whatever nature, or made of whatever ingredients; but ſome have uſed it only for the emollient cataplaſms.

Galen never uſes it in any ſenſe but the laſt; it was a form of medicine meant only for external uſe, and was not very different in its conſiſtence from a plaſter. It ſeems to have conſiſted only of emollient ingredients at firſt, but afterwards to have been compoſed of aſtringents, or of medicines of any other kind, whoſe virtues could be conveyed under that form; gums, aromatics, ſalts, and other ſtimulating ingredients, often made a part of the compoſition; and ſometimes a ſmall quantity of oil, lard, or wax, entered the maſs; very often the malagma's conſiſted only of gums diſſolved in wine or vinegar, and ſometimes only of reſins, which naturally hardened of themſelves after being reduced to powder, and mixed with wine and vinegar to a proper conſiſtence for applying to the part.

MALANKUA, in the materia medica, the name by which ſome authors have called the plant whoſe root is the round zedoary.

Many indeed eſteem the long and round zedoary the roots of different plants, but they ſeem rather to be only the different parts of the roots of the ſame ſpecies. Hort. Mal. 11, 17. *Dale*'s Pharmac. p. 251.

MALARMAT, in ichthyology, a name given by authors to the fiſh called by ſome *lyra atera* and *cornuta*. It is a ſpecies of the trigla, and is diſtinguiſhed by Artedi by the name of the trigla, with many cirri, and with an octogonal body.

MALARUM *Oſſa*, in anatomy, are the cheek bones; they make the prominent upper part of the cheeks moſt remarkable in lean perſons: They form likewiſe a portion of the orbit, and compleat the zygomatic arches. They have their name from the Latin *mala*, the cheek; they are two in number, and are ſituated in the lateral and middle parts of the face. They are, in ſome meaſure, triangular or irregularly ſquare, and are divided into two ſides, the external gently convex, the internal unequally concave.

The eminences in each bone are the ſuperior or angular orbitary apophyſis, which joins by ſuture with the external angular apophyſis of the os frontis, and aſſiſts in forming the external angle of the orbit: from this apophyſis another ſubaltern proceſs runs inward on the inſide of the bone, one ſide of which forms a portion of the orbit, the other a portion of the zygomatic foſſa: The inferior or maxillary orbitary apophyſis, which with the angular apophyſis forms the inferior external portion of the orbit: The apophyſis malaris, which is in ſome meaſure the baſis of the reſt, and together with the apophyſis maxillaris, joins the orbitary apophyſis of the os maxillare, and the zygomatic apophyſis, which makes a part of the zygoma, and alſo of the zygomatic foſſa.

The cavities are the great orbitary ſlope, which makes the inferior external portion of the edge of the orbit; the zygomatic notch above the zygoma, and one or more little holes on the outſide, and in the orbitary apophyſis. Each bone is compoſed of two pretty compact tables, with a ſmall quantity of diploe between them, except in the anterior part of the apophyſis malaris. The os malæ on each ſide is joined to the os frontis by the angular apophyſis; to the os ſphœnoides by the ſubaltern apophyſis; to the os temporis by the zygomatic apophyſis; and to the os maxillare by its baſis. *Winſlow*'s Anatomy, p. 34.

MALKARABÆLA, in zoology, the name of an Eaſt Indian ſpecies of ſerpent found in the iſland of Ceylon. It is remarkably variegated with white and duſky-brown, in various figures. *Ray*'s Syn. Anim. p. 332.

MALL, or *Sea*-MALL, in zoology, the Engliſh name of a bird of the gull or larus kind, and diſtinguiſhed by authors by the name of *larus cinereus minor*. It is very like the *larus cinereus major*, or herring gull, but much ſmaller, not weighing above a pound. Its head and neck are grey, with ſome brown ſpots; the lower part of the neck is white, the back is grey, and the breaſt and belly white as ſnow; the tail is alſo perfectly white, and is not forked. *Ray*'s Ornitholog. p. 263.

MALLEOLUS, in ichthyology, a name given by Gaza and ſome others, to the fiſh called by Ariſtotle and the other old writers, *ſphyræna*, and by the Italians *luzzo marino*.

It is a beautiful fiſh, and ſeems to belong to the ſcombri, or mackrel kind. Salvian has figured it under the name of *ſudis*, a name by which it is alſo called by Varro and ſome other old authors, but Salvian's figure is very imperfect; he has omitted the back fin.

MALLEOLI, among the Romans, bundles of any combuſtible matter beſmeared with pitch, and uſed by the Roman ſoldiers either for giving light in the night-time, or for ſetting fire to ſome of the enemies works.

The *Malleoli* were ſometimes fixed to a dart or javelin, that they might be ſure to catch firm hold, and communicate the fire wherever they happened to light. *Pitiſc.* in voc.

MALLEUM *Movens*, in anatomy, a name given by Fabricius to one of the muſcles of the ear, called by Cowper the *internus auris*, and by Albinus, who had conſidered its proper uſe, *tenſor tympani*. See TENSOR.

MALLEUS (*Cycl.*)—The *malleus*, or hammer of the ear, is a long bone with a large head, a ſmall neck, a handle, and two apophyſes, the one in the neck, the other in the handle. The top of the head is conſiderably rounded, and from thence it contracts all the way to the neck; both head and neck are in an inclined ſituation, and the eminences and cavities in it anſwer to thoſe in the body of the incus. The handle is looked on by ſome as one of the apophyſes of the *Malleus*, and in that caſe it is the greateſt of the three. It forms an angle with the neck and head, near which it is ſomething broad and flat, and decreaſes gradually toward its extremity. The apophyſis of the handle, termed by others the ſmall or ſhort apophyſis of the *Malleus*, terminates the angle already mentioned, being extended toward the neck, and lying in a ſtrait line with that ſide or border of the handle which lies next it. The apophyſis of the neck, called alſo the apophyſis gracilis, is in a natural ſtate very long, but ſo ſlender withal, that it is very eaſily broken, eſpecially when dry, which is the reaſon why the true length of it was for a long time unknown. It ariſes from the neck, and ſometimes appears much longer than it really is, by the addition of a ſmall dried tendon ſticking to it. When the *Malleus* is in its true ſituation, the head and neck are turned upwards and inwards, the handle downwards, parallel to the long leg of the incus, but more forward; the apophyſis of the handle upwards and outward, near the ſuperior portion of the edge of the tympanum, near the center of which is the extremity of the handle; and the apophyſis gracilis forward, reaching all the way to the articular fiſſure in the os temporis. By the knowledge of this, the *Malleus* of the right ear may be known from that of the left when out of their places. *Winſlow*'s Anat. p. 49.

MALLOW, in botany. See the article MALVA.

MALMIGNATTO, in natural hiſtory, a name given by the inhabitants of the iſland of Corſica to a ſpecies of animal, or large inſect, called by ſome *tarantula*, and ignorantly ſuppoſed to be the ſame with the tarantula of Apulia. This iſland produces neither wolves, ſerpents, nor many other of the miſchievous and deſtructive animals which infeſt the neighbouring countries, but it produces two ſpecies of this venomous inſect, called the *Malmignatto*; the one of theſe has a round body, and the other an oblong one, reſembling that of our large kind of ant; it has alſo ſix legs, not eight, and never makes any web. From all which it appears not to be a ſpider, but

but truly of the ant kind, though a monſtrous ſized one, and very venomous. The round bodied kind, by its bite, occaſions violent pains, a ſenſation of coldneſs, and cramps all over the body; and the long-bodied one is yet more venomous. Its ſting occaſions an immediate lividneſs of the fleſh, with intolerable cramps and convulſions over the whole body; ſometimes the natural evacuations by ſtool and urine are alſo wholly ſtopped by it. The cure in both caſes, is to be attempted by cutting and cauterizing the wound, and dreſſing it with Venice treacle, as alſo by giving the ſame in large doſes diſſolved in wine. *Boccone*, Muſ. de Fiſ.

MALOGRANATUM, the *Pomgranate*, in botany. See the article POMGRANATE.

MALPIGHIA, in botany, the name of a genus of plants deſcribed by Plumier and Linnæus, the characters of which are theſe: The perianthium is ſmall, hollow, and permanent, and is compoſed of one leaf divided into five ſegments, in the ſinus of each of which there is placed a melliferous glandule. The flower is compoſed of five very large petals, which ſtand hollow, and are of a kidney-like ſhape, with long and ſtrait ungues. The ſtamina are ten broad and erect filaments which grow into a ſort of cylinder. The antheræ are ſimple, the germen of the piſtil is roundiſh and ſmall, the ſtyles are three, they are erect, ſhort, and crowned with obtuſe ſtigmata; the fruit is a large globoſe berry, having one cell, in which are contained three oblong, obtuſe, and hard ſtones, each of which contains an oblong and obtuſe kernel. *Plumier*, Rar. Plant. Hiſt. p. 36. *Linnæi* Gen. Plant. p. 194.

MALPOLON, in zoology, the name of a ſpecies of ſerpent found in the iſland of Ceylon, and very beautifully variegated with red marks in the form of ſtars. *Ray*'s Syn. Anim. p. 332.

MALT (*Cycl.*)—Almoſt every malſter has his ſecret in the making *Malt*, but there are ſome neceſſary cautions to be obſerved by all, which will enſure ſucceſs in the work; theſe are, 1. That the barley be newly thraſhed, or at leaſt newly winnowed. 2. That the whole be of one kind, not mixed up of ſeveral ſorts. 3. That it be not over-ſteeped in the ciſtern, or ſo long as to make it ſoft. 4. That it be well drained. 5. That it be carefully looked after in the wet couch, ſo as to ſtop the firſt tendency of the blade to ſhooting. 6. To turn the wet couch inſide outermoſt, if the barley comes, that is, ſhoots more in the middle than on the ſides. 7. To keep it duly turning after it is out of the wet couch. 8. To give it the proper heating in the dry heap. 9. To dry and criſp it thoroughly on the kiln, but without a fierce fire, ſo as to be ſeveral days in drying a kiln of pale *Malt*. *Shaw*'s lectures, p. 187.

Good *Malt* may be made of the grain of the maiz or Indian corn, but then a particular method muſt be taken for the doing it. Our barley *Malt*-makers have tried all their ſkill to make good *Malt* of it in the ordinary way, but to no purpoſe; that is, the whole grain will not this way be malted or rendered tender or floury, as in other *Malt*; for it is found, by experience, that this corn, before it be fully malted, muſt ſprout out both ways, that is both root and blade, to a conſiderable length, that of a finger at leaſt, and if more the better. For this purpoſe it muſt be laid in a heap a convenient time; and in this proceſs, if it be of a ſufficient thickneſs for coming, it will quickly heat and grow mouldy, and the tender ſprouts will be ſo entangled, that the leaſt moving of the heap will break them off; and the farther maturation of the grain into *Malt*, will be hindered by this means; and on the other hand, if it be laid thin, and often ſtirred and opened to prevent too much heating, thoſe ſprouts which have begun to ſhoot ceaſe growing, and conſequently the corn again ceaſes to be promoted to the mellowneſs of *Malt*. Phil. Tranſ. N° 142.

To avoid all theſe difficulties, the following method is to be uſed: Take away the top of the earth in a garden or field, two or three inches, throwing it up half one way, and half the other; then lay the corn for *Malt* all over the ground ſo as to cover it; the earth that was pared off is now to be laid on again, and nothing more is to be done till the field is all over covered with the green ſhoots of the plant. The earth is then to be taken off, and the roots of the grain will be found ſo entangled together, that they will come up in large cakes or parcels; it muſt be gently waſhed in order to take off all the dirt, and then dried on a kiln, or on a clean floor expoſed to the ſun. Every grain of the maiz will be thus tranſmuted into good *Malt*, and the beer brewed with it will be very pleaſant and very wholeſome, and of an agreeable brown colour, but very clear.

It may be worth trying whether the ſame proceſs is not with due care applicable to the malting of turneps, potatoes, carrots, parſneps, and the like. It might poſſibly be of ſervice alſo to attempt this leſs laborious way of making *Malt* of barley and other ſmall grains; the diſadvantages would be the not ſo eaſily ſeparating the dirt from the grain as in that larger kind; and as barley requires the root only, not the ear, to ſhoot in order to the making of *Malt*, it would be ſome difficulty to know the exact time of taking it up; but with all theſe diſadvantages the method is worth a trial.

MALT *Diſtillery*. This is an extenſive article of trade, and by which very large fortunes are made. The art is to convert fermented *Malt* liquors into a clear inflammable ſpirit, which may either be ſold for uſe in the common ſtate of a proof ſtrength, that is, the ſame ſtrength with French brandy; or is rectified into that purer ſpirit uſually ſold under the name of ſpirit of wine; or made into compound cordial waters, by being diſtilled again from herbs and other ingredients. See the articles BREWING and WASH.

To brew with *Malt* in the moſt advantageous manner, it is neceſſary, 1. That the ſubject be well prepared. 2. That the water be ſuitable and duly applied; and, 3. That ſome certain additions be uſed, or alterations made, according to the ſeaſon of the year, and the intention of the operator; and by a proper regulation in theſe reſpects, all the fermentable parts of the ſubject will thus be brought into the tincture, and become fit for fermentation.

The due preparation of the ſubject conſiſts in its being juſtly *malted* and well ground. When the grain is not ſufficiently *malted* it is apt to prove hard, ſo that the water can have but very little power to diſſolve its ſubſtance; and if it be too much *malted*, a part of the fermentable matter is loſt in that operation. The harder and more flinty the *Malt* is, the finer it ought to be ground; and in all caſes, when intended for diſtillation, it is adviſeable to reduce it to a kind of finer or coarſer meal. When the *Malt* is thus ground, it is found by experience, that great part of the time, trouble, and expence of the brewing is ſaved by it, and yet as large a quantity of ſpirit will be produced; for thus the whole ſubſtance of the *Malt* may remain mixed among the tincture, and be fermented and diſtilled among it. This is a particular that very well deſerves the attention of the *Malt* diſtiller, as that trade is at preſent carried on; for the diſpatch of the buſineſs, and the quantity of ſpirit procured, is more attended to, than the purity or perfection of it.

The ſecret of this matter depends upon the thoroughly mixing, or briſkly agitating and throwing the *Meal* about, firſt in cold, and then in hot water; and repeating this agitation after the fermentation is over, when the thick turbid waſh being immediately committed to the ſtill, already hot and dewy with working, there is no danger of burning, unleſs by accident, even without the farther trouble of ſtirring, which in this caſe is found needleſs, though the quantity be ever ſo large, provided that requiſite care and cleanlineſs be uſed: And thus the buſineſs of brewing and fermenting may very commodiouſly be performed together, or reduced to one ſingle operation. *Shaw*'s Eſſay on Diſtillery.

Whatever water is made choice of, it muſt ſtand in a hot ſtate upon the prepared *Malt*, eſpecially if a clear tincture be deſired, but a known and very conſiderable inconvenience attends its being applied too hot, or too near to a ſtate of boiling, or even ſcalding with regard to the hand. To ſave time in this caſe, and to prevent the *Malt* running into lumps and clods, the beſt way is to put a certain meaſured quantity of cold water to the *Malt* firſt; the *Malt* is then to be ſtirred very well with this, ſo as to form a ſort of thin uniform paſte or pudding; after which the remaining quantity of water required may be added in a ſtate of boiling, without the leaſt danger of making what, in the diſtillers language, is called a pudden.

In this manner the due and neceſſary degree of heat in the water, for the extracting all the virtues of the *Malt*, may be hit upon very expeditiouſly, and with a great deal of exactneſs, as the heat of boiling water is a fixed ſtandard which may be let down to any degree by a proportionate mixture of cold water, due allowances being made for the ſeaſon of the year, and for the temperature of the air.

This little obvious improvement, added to the method juſt above hinted for the reducing brewing and fermentation to one operation, will render it practicable to very conſiderable advantage, and the ſpirit improved in quality as well as quantity.

A much more profitable method than that uſually practiſed for the fermenting *Malt* for diſtillation, in order to get its ſpirit, is the following: Take ten pound of *Malt* reduced to a fine meal, and three pounds of common wheat meal: Add to theſe two gallons of cold water, and ſtir them well together, then add five gallons of water boiling hot, and ſtir all together again. Let the whole ſtand two hours, and then ſtir it again, and when grown cold, add to it two ounces of ſolid yeaſt, and ſet it by looſely covered in a warmiſh place to ferment.

This is the Dutch method of preparing what they call the waſh for *Malt* ſpirit, whereby they ſave much trouble and procure a large quantity of ſpirit. Thus commodiouſly reducing the two buſineſſes of brewing and fermenting to one ſingle operation. In England the method is to draw and maſh for ſpirit as they ordinarily do for beer, only inſtead of boiling the wort, they pump it into large coolers, and afterwards run it into their fermenting backs, to be there fermented with yeaſt. Thus they beſtow twice as much labour as is neceſſary, and loſe a large quantity of their ſpirit by leaving the groſs bottoms out of the ſtill for fear of burning. *Shaw*'s Lectures, p. 216.

All ſimple ſpirits may be conſidered in the three different ſtates of low-wines, proof ſpirit, and alcohol, the intermediate degrees of ſtrength being of leſs general uſe; and they are to be judged of only according as they approach to, or recede from theſe. Low-wines, at a medium, contain a ſixth part of pure inflammable ſpirit, five times as much water as ſpirit neceſſarily ariſing in the operation with a boiling heat. Proof goods contain about one half of the ſame totally inflammable ſpirit; and alkohol entirely conſiſts of it.

Malt low-wines, prepared in the common way, are exceeding nauſeous; they have, however, a natural vinoſity, or pungent agreeable acidity, which would render the ſpirit agreeable to the palate, were it not for the large quantity of the groſs oil of the *Malt* that abounds in it. When this oil is detained in ſome meaſure from mixing itſelf among the low-wines, by the ſtretching a coarſe flannel over the neck of the ſtill, or at the orifice of the worm, the ſpirit becomes much purer in all reſpects; it is leſs fulſome to the taſte, leſs offenſive to the ſmell, and leſs milky to the eye. *Shaw*'s Eſſay on Diſtillery.

When theſe low-wines, in the rectification into proof ſpirits, are diſtilled gently, they leave a conſiderable quantity of this groſs fetid oil behind them in the ſtill along with the phlegm; but if the fire be made fierce, this oil is again raiſed and brought over with the ſpirit; and being now broken ſomewhat more fine, it impregnates it in a more nauſeous manner than at firſt. This is the common fault of the *Malt* diſtiller and of the rectifier both; the latter, inſtead of ſeparating the ſpirit from this naſty oil, which is the principal intent of his proceſs, attends only to the leaving the phlegm in ſuch quantity behind, that the ſpirit may be of a due ſtrength as proof or marketable goods, and brings over the oil in a worſe ſtate than before. To this inattention to the proper buſineſs of the proceſs, it is owing, that the ſpirit, after its ſeveral rectifications, as they are miſcalled, often is found more ſtinking than when delivered out of the hands of the *Malt* diſtiller. All this may be prevented by the taking more time in the ſubſequent diſtillations, and keeping the fire low and regular, the ſudden ſtirring of the fire, and the haſty way of throwing on freſh fuel, being the general occaſions of throwing up the oil by ſpurts, where the fire in general, during the proceſs, has not been ſo large as to do that miſchief.

The uſe of a balneum mariæ, inſtead of the common ſtill, would effectually prevent all this miſchief, and give a purer ſpirit in one rectification, than can otherwiſe be procured in ten, or indeed according to the common methods at all.

Malt low-wine, when brought to the ſtandard of proof ſpirit, loſes its milky colour, and is perfectly clear and bright, no more oil being contained in it than is perfectly diſſolved by the alcohol, and rendered miſcible with that proportion of phlegm, which is about one half the liquor; its taſte alſo is cleaner, though not more pleaſant; there being leſs of the thick oil to hang on the tongue in its own form, which is not the caſe in the low-wines, where the oil being undiſſolved, adheres to the mouth in its own form, and does not paſs lightly over it.

When proof ſpirit of *Malt* is diſtilled over again, in order to be rectified into alcohol, or as we uſually call it, ſpirits of wine, if the fire be raiſed at the time when the faints begin to come off, a very conſiderable quantity of oil will be raiſed by it, and will run in the viſible form of oil from the noſe of the worm. This is not peculiar to *Malt* ſpirit, but the French brandy ſhews the ſame phænomenon, and that in ſo great a degree, that half an ounce of this oil may be obtained from a ſingle piece of brandy.

Malt ſpirit, more than any other kind, requires to be brought into the form of alcohol, before it can be uſed internally, eſpecially as it is now commonly made up in the proof ſtate, with as much of this nauſeous and viſcous oil as will give it a good crown of bubbles. For this reaſon it ought to be reduced to an alcohol, or totally inflammable ſpirit, before it is admitted into any of the medicinal compoſitions. If it be uſed without this previous caution, the odious taſte of the *Malt* oil will be diſtinguiſhed among all the other flavours of the ingredients.

Malt ſpirit, when it has once been reduced to the true form of an alcohol, is afterwards more fit for all the curious internal uſes than even French brandy, it being after this purification a more uniform, hungry, taſteleſs, and impregnable ſpirit, than any of the other ſpirits which we eſteem ſo much finer. *Shaw*'s Eſſay on Diſtillery.

A pure ſpirit being thus procured, ſhould be kept carefully in veſſels of glaſs or ſtone, well ſtopped to prevent the evaporation of any of its volatile part. If preſerved in caſks, it is apt to impregnate itſelf very ſtrongly with the wood. The quantity of pure alcohol obtainable from a certain quantity of *Malt*, differs according to the goodneſs of the ſubject, the manner of the operation, the ſeaſon of the year, and the ſkilfulneſs of the workman; according to which variations, a quarter of *Malt* will afford from eight or nine, to thirteen or fourteen gallons of alcohol. This ſhould encourage the *Malt* diſtiller to be careful and diligent in his buſineſs, as ſo very large a part of his profits depends wholly on the well conducting his proceſſes.

After every operation in this buſineſs, there remain a quantity of faints, which in their own coarſe ſtate ought never to be admitted into the pure ſpirit; theſe are to be ſaved together, and large quantities of them at once wrought into alcohol. It is eaſy to reduce theſe to ſuch a ſtate, that they will ſerve for lamp ſpirits. Their diſagreeable flavour being corrected by the adding of aromatics during the diſtillations, the reducing them into a perfect and pure alcohol is practicable, but not without ſuch difficulties as render it ſcarce worth the trader's while. One way of doing it is by diſtilling them from water into water, and that with a very ſlow fire. By this means a pure alcohol may be made out of the fouleſt faints.

The *Malt* diſtiller always gives his ſpirit a ſingle rectification *per ſe*, in order to purify it a little, and make it up proof, but in this ſtate it is not reckoned fit for internal uſes, but ſerves to be diſtilled into geneva and other ordinary compound ſtrong waters for the vulgar.

The Dutch, who carry on a great trade with *Malt ſpirit*, never give it any farther rectification than this, and it is therefore that the *Malt ſpirit* of England is in general ſo much more in eſteem. The Dutch method is only to diſtil the waſh into low-wines, and then to full proof ſpirit; they then directly make it into Geneva, or elſe ſend it as it is to Germany, Guinea, and the Eaſt-Indies, for the Dutch have little notion of our rectification. Their ſpirit is by this means rendered very foul and coarſe, and is rendered yet more nauſeous by the immoderate uſe they make of rye meal. *Malt* ſpirit, in its unrectified ſtate, is uſually found to have the common bubble proof, as the *Malt* diſtiller knows that it will not be marketable without it.

The whole matter requiſite to this is, that it have a conſiderable portion of the groſs oil of the *Malt* well broke and mixed along with it; this gives the rectifier a great deal of trouble if he will have the ſpirit fine; but in the general run of the buſineſs, the rectifier does not take out this oil, but breaks it finer, and mixes it faſter in by alkaline ſalts, and diſguiſes its taſte by the addition of certain flavouring ingredients. The ſpirit loſes in theſe proceſſes the vinoſity it had when it came out of the hands of the *Malt* diſtiller, and is in all reſpects worſe, except in the diſguiſe of a mixed flavour. *Shaw*'s Eſſay on Diſtillery.

The alkaline ſalts uſed by the rectifier, deſtroying the natural vinoſity of the ſpirit, it is neceſſary to add an extraneous acid in order to give it a new one. The acid they generally uſe is the *ſpiritus nitri dulcis*; and the common way of uſing it is the mixing it to the taſte with the rectified ſpirit: this gives our *Malt* ſpirit, when well rectified, a flavour ſomewhat like that of French brandy, but this ſoon flies off; and the better method is to add a proper quantity of Glauber's ſtrong ſpirit of nitre to the ſpirit in the ſtill. The liquor in this caſe comes over impregnated with it, and the acid being more intimately mixed, the flavour is retained. See the article SPIRITUS *nitri dulcis*.

MALT-*worm*, in the manege. See the article CREPANCE.

MALTA *Earth*. See the article MELITENSIS *terra*.

MALTHA, the name of a voracious fiſh of the ſhark kind, called the *ſorrat*, and the *lamiola* by ſome authors, a diminutive of *lamia*, ſignifying a ſmall ſhark. Its teeth are broad and pointed as thoſe of the ſhark; the fiſh has alſo many rows of theſe; the noſe is ſhort, and its fleſh lax and ſoft. *Willughby*'s Hiſt. Piſc. p. 50.

MALTHOCODE, a term by which the Greek writers expreſs'd the emollient topical remedies prepared with oil. Hippocrates expreſsly forbids the uſe of theſe in old ulcers.

MALVA, *mallow*, the name of a very large genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is very open at the mouth, and divided into ſeveral ſegments; from the bottom of the flower there ariſes a pyramidal tube, which is uſually loaded with ſtamina; and from the cup there ariſes a piſtil, which is fixed like a nail to the lower part of the flower, and alſo to the tube. This ripens into a flat orbicular fruit, though ſometimes pointed, uſually ſurrounded by the cup, and compoſed of a number of capſules, ſo placed round an axis, as that each of its ſtriæ receive their capſule as if in a kind of articulation. The ſeed contained in theſe is uſually of the ſhape of a kidney. This genus is alſo diſtinguiſhed from the alcea, or vervain *mallow*, by having its leaves leſs divided and cut in, and from the althæa, by having them leſs hoary. *Tourn.* Inſt. p. 94.

The ſpecies of *Mallow* enumerated by Mr. Tournefort, are theſe: 1. The roſe *Mallow*, or, as we call it, the hollyoak, with round leaves and pale-red flowers. 2. The white flowered roundiſh leaved roſe *Mallow*. 3. The deep red flowered round leaved roſe *Mallow*. 4. The ſhining purple flowered round leaved roſe *Mallow*. 5. The blackiſh red flowered round leaved roſe *Mallow*. 6. The violet coloured round leaved roſe *Mallow*. 7. The ſingle yellow flowered round leaved roſe *Mallow*. 8. The double flowered red round leaved roſe *Mallow*. 9. The double white flowered round leaved roſe *Mallow*. 10. The double fleſh-coloured round leaved roſe *Mallow*. 11. The double purple-flowered round leaved roſe *Mallow*. 12. The double black-flowered round leaved roſe *Mallow*. 13. The double yellow-flowered

round leaved roſe *Mallow*. And, 14. The pale yellow-flowered round leaved roſe *Mallow*, without ſtalk. Theſe are the ſpecies of what we call hollyoaks, and moſt of which we have in our gardens. The others are, 15. The Virginian maple-leaved *Mallow*, with ſmooth leaves. 16. The hairy Virginian maple-leaved *Mallow*. 17. The American *Mallow* of Caſpar Bauhine. 18. The hairy ſhrubby American *Mallow*, with cluſtered yellow flowers. 19. The curled-leaved *Mallow*. 20. The cut-leaved large flowered *Mallow*. 21. The white-flowered wild *Mallow*, with ſinuated leaves. 22. The blue-flowered wild *Mallow*, with ſinuated leaves. 23. The purpliſh flowered wild *Mallow*, with ſinuated leaves. 24. The wild *Mallow*, with ſinuated leaves, and blue flowers ſtreaked with white. 25. The wild *Mallow*, with ſinuated leaves, and a very ſmall purple flower. 26. The large flowered wild *Mallow*, with a deep green leaf, rounded and much ſinuated. 27. The erect wild *Mallow*, with gloſſy leaves and large flowers. 28. The ſmall flowered rounder leaved wild *Mallow*. 29. The round leaved variegated wild *Mallow*. 30. The ſtellated *Mallow*, with various leaves. 31. The purple bottomed early *Mallow*, called by authors *malva trimeſtris*. 32. The ivy leaved *Mallow*. 33. The round leaved ſmooth Spaniſh *Mallow*, with large red flowers. 34. The round leaved Italian *Mallow*, with a large purple flower. 35. The annual white-flowered *Mallow*, with the flowers ſtanding in rundles. 36. The hairy *Mallow*, with a heart-faſhioned leaf. 37. The hairy annual *Mallow*, with angular leaves, reſembling thoſe of ivy. 38. The currant-leaved Portugal *Mallow*. 39. The Indian *Mallow*, with the heart-faſhioned leaf. 40. The elm-leaved *Mallow*, with the roſtrated ſeed. 41. The elm-leaved *Mallow*, with the double-beaked ſeed. 42. The elm-leaved *Mallow*, with the double-beaked ſeed, and with flowers ſtanding in long cluſters. 43. The roundiſh-leaved Indian *Mallow*. 44. The mulberry-leaved Canada *Mallow* with double-beaked ſeeds. 45. The elm-leaved American *Mallow*, with flowers cluſtered together in the alæ of the leaves. 46. The vine-leaved American *Mallow*, with a roundiſh echinated fruit. 47. The purple-flowered ivy-leaved American *Mallow*. 48. The low American *Mallow*, with the leaf and the whole appearance of ground-ivy, and with bifurcated capſules. 49. The melon-leaved hairy American *Mallow*. *Tournefort*'s Inſt. p. 95, 96.

The freſh roots of *Mallow* are uſed as a diuretic and emolient, and the dried leaves as an ingredient in clyſters, and in emolient fomentations and cataplaſms. The antients gave the juice of the *Mallow*, in large doſes, for inflammations and obſtructions of the viſcera. A ſtrong decoction of *Mallow* root is apt to be mucilaginous, and to ſit ill on the ſtomach. It is a good common drink in pleuriſies, peripneumonies, and peculiarly in caſes of gravel, or inflammations of the kidneys; alſo in ſtranguries and ſuppreſſions of urine of all kinds.

MALVA *Marina*, the *Sea Mallow*, in botany, a name not very judiciouſly given by ſome writers to a ſpecies of ſubmarine plant, ſuppoſed in ſome degree to reſemble the leaves of the common *Mallow*. It is very common in the places where they fiſh for coral, and grows to the rocks without any regular root; it is found at different depths, but moſt uſually far from the ſurface, and its height is uſually about two inches. It is of a duſky greeniſh colour, with an admixture of a faint yellow; it is compoſed of ſeveral leaves of about half an inch broad, and a little more than that in length. Each of theſe is faſtened to a pedicle of about an inch and half long; the leaves are of a fine thin membranaceous ſubſtance, but their ſtalks or pedicles are thick and tough like horn. When examined by the microſcope many glandules diſcover themſelves upon the ſurfaces of the leaves, but the ſtalks or pedicles are entirely covered with glandules in form of ſmall protuberances, which make it as rough in thoſe parts as the common chagrin. The ſtalks when cut tranſverely ſhew an infinite number of pipes or veſſels running up to every part of the leaves. Count Marſigli has given an elegant figure of this, both as it appears to the naked eye, and by the microſcope. *Marſigli*, Hiſt. de la Mer.

MALUS, the *apple tree*, in botany, the name of a genus of trees, the characters of which are theſe: The flowers are of the roſaceous kind, each being compoſed of ſeveral petals arranged in a circular form; the cup finally becomes a fleſhy fruit of a roundiſh figure, umbilicated and divided within into ſeveral cells, containing oblong callous ſeeds. See the article APPLE.

MALUS *Aſſyria*, in botany, one of the many names given by the antients to the citron: They alſo called it *malus medica*, and by ſeveral other names, as theſe were expreſſive of the country whence they had the fruit. See the articles CITRON and CITREÆ *menſæ*.

MAMIRA, in the materia medica of the Arabians, a root frequently mentioned by Aviſenna, Serapion, and other of the Arabian writers. It ſeems mentioned as a poiſonous drug, and is ſo deſcribed, that it ſeems to be the ſame with one ſpecies of the durunegi, or doronicum of the ſame authors, and the common doronicum of the ſhops, diſtinguiſhed from the antithora, or other ſort of durunegi, by the yellowneſs of the inſide of the root. Aviſenna ſays that it is hard and woody, and formed of knots or joints. This is the very deſcription the ſame author gives of the durunegi of the firſt or poiſonous kind. Paulus Ægineta ſays its root is compoſed of ſeveral joints alſo; and Alphagus calls it a *nodoſe* or jointed root. Some have ſuppoſed that the *Mamira* was the ſame plant which we call ſmall celandine, but this has no title to be placed among the plants ſuſpected as poiſonous, nor any other plea to be gueſſed at as the *Mamira*, but only its roots conſiſting of many tubercles. Many things beſide have been conjectured to be the *Mamira* of the Greeks and Arabians, but the doronicum ſeems to be the plant.

MAMMEA, in botany, the name of a genus of plants called *mammei* by Plumier. The characters are theſe: The perianthium is compoſed of two ſmall deciduous and oval leaves; the flower conſiſts of four roundiſh concave expanded petals larger than the cup; the ſtamina are numerous ſimple filaments, of about half the length of the flower; the antheræ are roundiſh; the germen of the piſtil is roundiſh; the ſtyle is conic, and of the length of the ſtamina; the ſtigma is ſimple and permanent; the fruit is a very large and fleſhy berry, of a ſpherical figure, but acuminated with the ſtyle; the ſeeds are of an oval figure and callous texture, and there are ſometimes found four of them, ſometimes only one in the ſingle cell of the fruit. *Linnæi* Gen. Plant. p. 234. *Plumier* Gen. p. 4.

MAMMOTH's *Teeth*, or MAMMOUT *Bones*, in natural hiſtory, a name given by travellers and other writers to certain foſſile teeth, and other bones, found in Ruſſia and ſome other parts of the world, and that uſually at great depths in the earth. The Ruſſians and other people give them this name, ſuppoſing them to have belonged to an animal which they deſcribe as being of a monſtrous ſize, and living in caverns under ground. But the true account of them is, that they are in reality the teeth and other bones of elephants, there being no ſuch beaſt as theſe people deſcribe.

Breynius has given a very good account of theſe bones to the Royal Society, which is printed in the Philoſ. Tranſactions. He obſerves, that they are principally found in the northern parts of Siberia about the borders of rivers, toward the icy ſea; they are originally buried in the mountains; but when the froſts have cracked the higher banks of thoſe rivers, as they run under the ſides of the mountains, the earth falls in, and they are diſcovered among it. Sometimes compleat ſkeletons are found in theſe places, but more frequently the bones of ſome particular parts of the body, and nothing ſo frequently as the teeth. The teeth and bones are not always found of the ſame ſize, but often ſmall, and appearing to have belonged to young animals, often ſo large, that the grinders weigh from twenty to forty pounds; and often the ivory tuſks or dentes exerti weigh more than two hundred pounds each. It is very evident that theſe laſt are the tuſks of elephants, and the reſt of the bones, when ſtrictly examined, will all be found to have the ſame origin, all being reducible to ſome part of the ſkeleton of that creature. The tuſks are actually uſed as ivory, and the Czar of Muſcovy carries on a very large trade with them; they are wrought both there and abroad into combs and other works; and, according to the obſervation of captain Muller, perfectly reſemble the common ivory, except that they are more brittle, and are apt to turn yellow ſooner in the uſing. See Philoſ. Tranſ. N° 446. p. 129.

The compariſon of the deſcriptions and figures of the Siberian *Mammoth*'s teeth with the foſſile elephant's teeth of Ireland, and ſome parts of England, proves very clearly that the bodies are the ſame.

The foſſile bones of elephants are found in many other places beſide Siberia, but not in ſuch plenty as in this country; Italy, Germany, Poland, England, France, and Ireland, all afford them; but they are more altered by lying in the earth in theſe places. The greater warmth of theſe climates may be naturally enough ſuppoſed to have brought on this change in them, and the ſevere cold of Siberia to have been the principal agent in the preſerving them intire in the manner in which we ſee them.

The bones and teeth of elephants found under ground in other places, and called *ebur foſſile*, are of the ſame origin with theſe, as are alſo thoſe dignified in the German ſhops with the pompous title of *unicornu foſſile*, the difference in the preſervation being all that diſtinguiſhes them. Phil. Tranſ. N° 447. p. 149. and Mem. Acad. Par. 1727.

MAN, in the materia medica of the antients, a name by which manna has been called by the oldeſt writers. There has been, however, ſome confuſion in the hiſtory of manna, owing to the too general uſe of this word, the ſame authors uſing it as the name of ſeveral other ſubſtances of very different kinds, which came to their hands in form of ſmall granules or flakes like the manna. The fragments of frankincenſe in particular were called by this name, with the addition of the word *thuris*, and ſometimes without, *Man* or *Men* ſtanding ſingly for that drug.

MAN *the Capſtan*, on board a ſhip. See the article CAPSTAN, *Cycl.* and *Suppl.*

MAN *the Side, or Ladder*, on board a ſhip, is when an officer, or any perſon of diſtinction is at the ſhip's ſide ready to come aboard, the men are commanded to wait, and help him up the ſide.

MAN *the Top, or Yard*, on board a ſhip, a word of command for the men to go up to the top, or yard, for ſome particular ſervice.

MAN *of War*, the ſame with a ſhip of war. See the articles SHIP and RATE, *Cycl.*

MAN-*Eaters*. See the article ANTHROPOPHAGI.

MAN-*Bird*. See the article BIRD.

MANAA, in the Jewiſh cuſtoms, a kind of offerings made in the temple, otherwiſe called *Mincha*. The word *Manaa* is uſed in the ſeptuagint. See the article *Mincha*.

MANANAOG, in the materia medica, a name by which ſome call the fruit known with us by the name of St. Ignatius's bean. *Pluk.* Mantiſſ. p. 60.

MANATI, the *ſea cow*, a marine animal, the head of which is like that of a calf, but ſomewhat narrower; its eyes are like thoſe of a dog, its ſkin very thick and tough, and covered with a few greyiſh brown hairs. Its uſual length is about ſixteen foot, and it meaſures ſeven or eight foot round the body. At the fore part of the body it has two ſhort legs, with very broad feet, armed with claws; on the hinder part of the body it has no legs, but has a broad tail, with which it ſwims very ſwiftly. From the navel to the tail the body gradually leſſens, but juſt at the tail it becomes very broad again. *Cluſius. Ray*, Syn. Quad. p. 193.

Its eyes are very ſmall in proportion to its ſize, and it has, in the place of ears, two apertures like thoſe of the ſea calf, and the female has two teats on the breaſt, for they bring forth two young ones, and nouriſh them by ſuck. It feeds on vegetables, uſually living in large rivers, and riſing near the ſhore to feed on the herbs and roots that are found there.

MANATI *Lapis*, a name given to a bone, of which there are two found in the head of the *Manati*, or ſea cow; they are roundiſh and are uſually of the ſize of a hand-bell. They are ſaid to have great virtues againſt the ſtone and gravel, when burnt to aſhes, and given in white wine. The world need not, however, regret the ſcarcity of this remedy, for probably any animal bone, when burnt to aſhes, is poſſeſſed of all its virtues.

MANBALLA, in zoology, the Ceyloneſe name of a ſpecies of ſerpent, called alſo the *canine*, or *dog-ſerpent*, from its manner of flying at every thing that comes in its way, as our dogs do. It is of a deep brown colour, beautifully variegated with white. *Ray*, Syn. An. p. 332.

MANBOTE, in our old writers, a compenſation or recompenſe for *homicide*, particularly due to the lord for killing his man or vaſſal. *Terms of Law.*

MANCANILLA, in botany, a name given by Plumier to a genus of plants, ſince characterized by Linnæus in the name of Hippomane. See the article HIPPOMANE.

MANCORON, a word uſed by the antients to expreſs what they call a ſort of honey, which ſeems to have been evidently our modern ſugar. They ſay that it was a ſort of dry honey found concreted in canes or reeds, and was of the conſiſtence of ſalt, and that it was found in India and Arabia Felix, and that when taken into the mouth, it broke under the teeth like ſalt. See the article SUGAR.

MANDATARY, *Mandatarius*, he to whom a command or charge is given: Alſo he that comes to a benefice by a *mandamus* is called by this name. *Blount.*

MANDRAGORA, the *Mandrake*, (*Cycl.*) the name of a genus of plants, the characters of which are theſe: The flower is compoſed of one leaf, faſhioned like a bell, and divided into many ſegments at the end. This is encloſed in a cup, from the bottom of which riſes a piſtil, which perforates the baſe of the flower, and grows finally into a roundiſh ſoft fruit, in which are contained a number of ſeeds, which are uſually of the figure of a kidney.

The ſpecies of *Mandrake* are, 1. That with a round fruit, called the male *Mandrake*. 2. The bluiſh or purpliſh-flower'd kind, called the female. 3. The blue flower'd one, with ſmall leaves, and a round fruit. Moſt of the *Mandrakes* may be known even when not in flower, by their having large roundiſh leaves of an ill ſmell, and very large roots. *Tournefort*, Inſt. p. 76.

Mandrake has been recommended in caſe of barrenneſs, but without foundation. Its freſh root is a violent purge, the doſe being from ten grains to twenty in ſubſtance, and from half a dram to a dram in infuſion. It has been found to do ſervice in hyſteric complaints, but muſt be uſed with great caution, otherwiſe it will bring on convulſions, and many other very miſchievous ſymptoms. It has alſo a narcotic quality. At preſent we only uſe the freſh leaves in anodyne and emollient cataplaſms and fomentations.

MANDRAGORITES *Vinum*, *Mandrake Wine*, a ſort of medicinal impregnation of wine with the virtues of *Mandrake* root. It is prepared by cutting into thin ſlices half a pound of the bark of *Mandrake* roots, and ſtringing them on a thread, and letting them down into a veſſel containing nine galllons of white wine, ſo that they may hang looſely in it, and by that means fully impregnate it with their virtues. It was uſed in ſmall doſes as an anodyne and ſoporific. It had the ſame effects alſo, if only ſmelled to, and was ſometimes injected in clyſters to the ſame purpoſe. They ſay that half a pint of this liquor mixed with twelve times its quantity of wine, brings on a carus; and that even a ſmaller doſe than this, leſs diluted, is mortal.

MANDRAKE, *Mandragora*, in botany and medicine. See the article MANDRAGORA.

MANE-*Sheet*, in the manege, is a ſort of covering for the upper part of a horſe's head, and all round his neck, which at one end has two holes for the ears to paſs through, and then joins to the halter upon the fore part of the head, and likewiſe to the ſurcingle, or long girth, upon the horſe's back.

MANEGE. A horſe is ſaid to *manege* when he works upon volts and airs, which ſuppoſes him broke and bred. See the article MANEGE, *Cycl.*

MANEGE *for a Soldier's Horſe*, is a gallop of unequal ſwiftneſs, but ſo that the horſe changes hands readily.

High MANEGE, is the high or raiſed airs, which are proper for leaping horſes. See the article AIRS, *Cycl.*

MANEGED. A horſe is ſaid to be thoroughly *maneged*, or a finiſhed horſe, that is well broken, bred, and confirmed in a particular air or manege, ſo as to bear well upon the hand, know the heels, and ſit well upon the hips.

MANGANESE, *Magneſia*, in natural hiſtory, a very poor kind of iron ore. See the article IRON.

It is a denſe, ponderous, and heavy ſubſtance, in its fineſt and pureſt pieces, approaching greatly to the texture of the *lapis hæmatites*, being compoſed of regular parallel ſtria, diverging from a center to the circumference. This kind, however, is rare; beſide which there is another ſomewhat leſs pure kind of an iron grey colour, and irregularly ſtreaked like the ſteel-grained lead ores. But the common *Manganeſe* is of a perfectly irregular ſtructure. It is very heavy, moderately hard, and of a deep duſky grey, approaching to black, though ſometimes of a ferrugineous brown. It is found in large maſſes of no determinate ſhape, and of a rude, rugged, and unequal ſurface.

Manganeſe gives fire but difficultly with ſteel, and makes no effervescence with aqua fortis. It is found in many parts of England and Germany.

This ſubſtance is of vaſt uſe in the glaſs trade, but neither the induſtrious Neri, nor any others who have written of the art, can ever deliver the true proportions in which it is to be mixed with the glaſs metal on the ſeveral occaſions. The ſame thing is alſo to be obſerved in regard to zaffer, another ſubſtance in continual uſe with them. And the reaſon of this is, that there is vaſt difference in the quality of theſe bodies, ſome which are ſold being very pure and rich, others good for almoſt nothing, and much of middle degrees of purity between theſe. For this reaſon there is no determining how much of each is to be added to the glaſs, but the conciator adds them at ſeveral times and in ſmall quantities, and takes frequent proofs by his eye, till he knows that they are properly proportioned. *Merret's* Notes on Neri, p. 274.

MANGANUM, Μαγγανον, among the Greeks, a general name for inſtruments to throw large ſtones with. *Potter*, Arch. Græc. T. 2. p. 95.

MANGARATIA, in botany, a name given by ſome authors to the plant of which the common ginger of the ſhops is the root. *Piſo*, p. 227.

MANGER, in a ſhip, a circular place made with planks faſtened on the deck, right under the hawſes, being about a foot and half in height; the uſe of which is to catch and receive the ſea-water, beating in at the hawſes in a ſtreſs of weather.

MANGOUSTAN, in natural hiſtory, the name of a fruit of the Eaſt Indies. The tree which produces it is large, and uſually much branched. The leaves are ſix inches long, and two inches wide, of a lively green, and ornamented with a double ſeries of ribs, one part of which makes a border that ſurrounds the whole verge of the leaves. The flower is ſmall, and of a pale green colour; it is compoſed of four petals, which, when they open, ſhew the rudiments of the fruit forming itſelf within. Theſe leaves do not fall off at all, but remain faſtened to the bottom of the fruit till it is ripe, ſerving as a ſort of ſupport to it. The fruit grows to the bigneſs of an apple. It is perfectly round, and is covered with a hard and tough ſkin, which is of the twelfth of an inch thick, and is of a lively red, ſtreaked with ſeveral yellow lines, which are ſo many filaments running along it: At the extremity there are placed ſeveral rays, which running to the length of a tenth of an inch, meet together, and terminate in a point. The ſubſtance of the fruit is white, ſoft, and of a very agreeable taſte, approaching to that of raſpberries. The body of the fruit is compoſed of ſeveral lobes or quarters, as we call them, which will ſeparate from one another like thoſe of an orange; but they are not encloſed each in a ſeparate ſkin as thoſe are. Theſe are in number the ſame with the rays at the end of the fruit, that is, there are ſeven of them. When the fruit is eaten before it is perfectly ripe, the whole is eaten together; but when it is thoroughly ripened, there is found a ſingle kernel in the middle; this is greeniſh without and white within, and

is of an inſipid taſte, and therefore uſually thrown away. Mem. Acad. Scienc. Par. 1699.

This is an extremely agreeable fruit, and the eating it is never attended with any bad conſequences, even though it be eaten in ever ſo large quantities. People who are not uſed to the Indies are apt to give this the preference to all the fruits of the place; but the natives, and others who have accuſtomed themſelves to the ſmell of the *durion*, give that infinitely the preference. This is a large prickly fruit of the ſize of a melon, of an intoxicating quality, and of a taſte like that of ſugar and cream, but with a ſmell like that of rotten onions. The ſmell is intolerable to ſtrangers, but cuſtom has made it familiar to the Indians, and they diſregard it. The peel or rind of the *Mangouſtan* is a more powerful aſtringent than the pomegranate bark, and is given in decoction in diarrhœas and dyſenteries with great ſucceſs, as alſo in all other hæmorrhages. There is a ſort of wild *Mangouſtan*, called by the Portugueſe, *mato*, which grows in the woods both in the Eaſt Indies and in America. The fruit of this perfectly reſembles the true *Mangouſtan*, but is not eatable.

MANHEB, a word uſed by ſome chemical writers to expreſs ſcoriæ of any kind.

MANIA, (*Cycl.*) *Madneſs*, the moſt violent and acute ſpecies of a delirium, ariſing from a perturbation of the imagination and judgment.

Signs of it. Theſe are a bold and reſolute aſpect, and eyes ſuffuſed with blood; only it is to be obſerved, as to the firſt-mentioned ſymptom, that thoſe perſons who have gone *mad* through fear, have always in their aſpect a mixture of that terror the object firſt gave, and of that natural boldneſs which ariſes from *Madneſs*. The patient often lays traps and ſnares for the getting other people into his power, with intent to hurt them, though they never have in jured him. Sometimes mad people have been known to murther others; and they always have ſo much ſtrength as to overpower almoſt any one perſon; and though they have no actual fever, yet they are inſenſible of the external cold, and in general of other pains or injuries; nay, they are ſo loſt in ſpeculation, as often ſcarce to feel the blows and laſhes they receive in the courſe of their cure. They often do not even hear the people who ſpeak to them, and are naturally of a very jocund and chearful imagination, fancying themſelves kings and princes, and are delighted with muſic. They have a violent propenſity to venery, and ſuch an abſence of ſhame, that they will go to ſtool, or do any thing of a like kind, before any body. This is the uſual caſe in the height of the diſorder; and in its decline ſome are dull and ſtupid, others very ſorrowful and melancholy, and ſenſible of their unhappy diſorder. *Junker*, Conſp. Med. p. 689.

Perſons ſubject to it. Theſe are principally men of a choleric habit of body, and of violently paſſionate diſpoſitions. Thoſe who have continual domeſtic quarrels, are alſo frequently thrown into *Madneſs* by it; and women frequently incur this diſeaſe from long ſuppreſſions of the menſes, and a habit of giving looſe to laſcivious thoughts. Suppreſſions of the hæmorrhoids, and of the evacuation of the ſemen, have ſometimes alſo driven men into *Madneſs*; worms have alſo ſometimes occaſioned it, and ſometimes drunkenneſs.

Prognoſticks. *Madneſs* ariſing from immaterial cauſes, is much more difficult of cure than when it ariſes from diſorders of the bodily organs; hence when it ariſes from violent perturbations of the mind, or from intenſe ſtudy, it is almoſt incurable. When it ariſes from ſuppreſſions of the ſemen, or of the uterine, or hæmorrhoidal diſcharges, there is great hope of a cure by proper means. But *mad* perſons in general, when they ſleep ſound, and always awake in outrageous fits, are to be eſteemed incurable, or at leaſt greatly more difficult of cure than others.

Method of Cure. A briſk purge is firſt to be given; after this the patient is to be blooded pretty freely, ten ounces at the leaſt ſhould be taken away; after this the ſenſes are to be attempted to be rouſed by ſtrong vomits. White hellebore was famous on this occaſion among the antients; and there are ſome caſes in which it may be given with ſafety, and with great good effect. After this the violent emotion of the blood is to be attemperated by nitrous and abſorbent medicines; and, after theſe, the ſeveral remedies uſually eſteemed ſpecifics take place. Of this number are decoctions of the red anagallis or pimpernel, the ruta muraria, or white maidenhair, the ſeveral preparations of ſilver, the berries of the *Herba Paris*, aſſes blood, and the like; and great care is to be taken to bring the hæmorrhoidal and menſtrual diſcharges as far as poſſible to regularity. In caſes of retention of the ſemen, purified nitre is to be given in great quantities, and may be alſo externally uſed, applying it to the teſtes in a cataplaſm. The uſe of opiates is ſcarce to be ſuffered in any delirium, but of all things is never to be given in *Madneſs*, for it never gives them any ſleep, but enrages and adds to the complaint, having the ſame effect that ſtrong liquors would have upon them. The uſe of white hellebore, as a vomit, may be of great ſervice in ſome caſes; but in all hypocondriac complaints, and conſequently in *Madneſs*, in the cauſes of which theſe complaints have a ſhare, it is certain to encreaſe the diſeaſe. Id. Ibid. p. 691. We read of a *Mania* ariſing from a callous pia-mater. See Med. Eſſ. Edinb. vol. 4. art. 26. See alſo the article MADNESS.

MANICUM *Strychnum*, in botany, a term uſed by the old Greek writers to expreſs a kind of nightſhade, which, when taken internally, cauſed madneſs. Pliny, deſcribing this ſpecies, ſays that it has leaves like the ocymum or baſil; and Theophraſtus and Dioſcorides ſay it had leaves like the eruca or rockett. Where Pliny had his information is not eaſy to gueſs, for he commonly copies from theſe authors. They are, however, much more to be depended on; and as the leaves of the ocymum or baſil are not at all like thoſe of the rockett, Pliny is certainly wrong in his account; and the moſt probable reaſon for his error is, that he miſtook the Greek name of the plant, to which theſe authors compared the leaves of the *Manicum Strychnum*, and tranſlated *euzomon*, which is the name of the rockett into ocymum, baſil; a name ſomewhat like the Greek one in ſound, but wholly different in ſignification; the two plants baſil and rockett not only having leaves very unlike one another, but being alſo of different genera. A yet greater error of Pliny, in regard to this plant, is his placing it among the eſculent garden herbs, and ſaying that it was in uſe as a food, immediately after he had told us of its cauſing madneſs in thoſe who eat it. This is an evident confuſion of the maniac ſolanum with the pomum amoris or love-apple, the fruit of which is eaten in ſoups at this time.

MANIFESTUS *Clitoridis*, in anatomy, a name given by Veſalius and others to one of the muſcles of the female pudenda, called by Verheyen ſimply the *muſculus clitoridis*, but by Albinus and Cowper, *erector clitoridis*. Verheyen is not to be cenſured for calling it only the *muſculus clitoridis*, for it is properly the only muſcle of that part, the other generally attributed to the clitoris, and called by Riolan and others, *clitoridis inferior* and *latus*, not properly belonging to that part, but being truly a ſphincter vaginæ, or as Albinus by a more coarſe name calls it, the *conſtrictor cunni*. See the article SPHINCTER.

MANIHOT, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the one-leav'd kind, and is ſhaped like a bell, and is wide open, and divided into many ſegments at the edge. The piſtil finally becomes a roundiſh fruit, containing three capſules joined cloſely together, each of an oblong figure, and containing a ſeed of the ſame figure.

The ſpecies of *Manihot*, enumerated by Mr. Tournefort, are theſe: 1. The common *Manihot* of Thevet, called *jucca*, and *caſſada*. 2. The prickly American *Manihot*, with vine-like leaves. 3. The American *Manihot*, with broad elm-like leaves. 4. The American *Manihot*, with narrow elm-like leaves. 5. The climbing American *Manihot*, with leaves like betony. And 6. The ſmalleſt germander-leav'd American *Manihot*. *Tourn.* Inſt. p. 658.

This plant is alſo called *Manioc*; its juice is poiſonous; but the bread made of the plant, after the expreſſion of the juice, is innocent, and in frequent uſe in the Braſils, and other parts of the Weſt Indies. Mem. Acad. Par. 1700.

MANIQUE, in the materica medica, the name given by authors to an American root, commended greatly for curing tertian and quartan agues, and as an infallible remedy againſt venomous bites. Redi procured ſome of this famous root, and gave it many very fair trials, but could never diſcover any of theſe virtues in it. *Redi*, Eſperien.

MANNA (*Cycl.*)—This is a ſubſtance in many things very nearly related to ſugar and to honey; it is inflammable in the ſame manner, and it melts in water as eaſily as ſugar, and in the ſame manner is indiſſoluble in ſpirit of wine, except in regard to a very ſmall quantity of ſome ſeemingly extraneous particles: This is a very ſufficient proof that ſalts abound in it more than ſulphurs. M. Lemery, in his analyſis, drew from *Manna* a vinous liquor, of the ſame kind with that obtained from honey. Mead may alſo be made of *Manna*, in the ſame way that it is made from honey; but it is neither ſo ſtrong, nor ſo agreeable to the taſte, as that of honey. From as much mead as was made from two pounds of *Manna*, M. Lemery drew off by diſtillation eight ounces of a ſort of brandy, and on rectifying this, procured an ounce and half of a pure burning ſpirit, like in all reſpects to rectified ſpirit of wine. This ſpirit of *Manna* is accounted by ſome a ſudorific, and is given from half a dram to a dram and a half. M. Lemery having left the remaining liquor, after the diſtillation of the ſpirituous part of the *Manna*-mead, in a warm place for two years, found that it depoſited to the bottoms of the bottles ſeven drams of an eſſential ſalt of *Manna*, which was white, hard, brittle, and formed into fine needles, and was of an acid taſte, with an admixture of ſweet. This ſalt is purgative, and its doſe is a dram. All the remaining acid liquor being diſtilled, there remained at the bottom of the retort a quantity of matter of the conſiſtence of honey, which weigh'd twenty ounces; ſo that out of two pounds of *Manna*, there had been twelve ounces conſumed, to make the ſpirit, and to give the acidity to the remaining liquor. This honey-like reſiduum, being finally diſtilled with a ſtrong fire, there aroſe a reddiſh liquor of an acrid taſte, and with a ſtrong empyreumatic ſmell, and with this a few drops of a blackiſh oil; after this operation, the remainder in the retort was four ounces of a very light black coal. The coal, it is to be obſerved, is here only one eighth

of the weight of the *Manna*, which is ſomewhat ſingular, ſince in the pureſt honey, treated in the ſame manner, it always weighs one fourth of the original whole quantity. It is plain from hence, that *Manna* is a much purer ſubſtance than honey: It is alſo remarkable, that in farther treatment of this coal, there is a ſmall quantity of iron always diſcovered in it. *Manna*, honey, and all the other ſweet ſubſtances, we ſee, alſo loſe all their ſweetneſs, as ſoon as ever their acid is ſeparated from their oil. Hiſt. Acad. Par. 1708. p. 56.

Manna is far from being peculiar to the aſh tree of Calabria, on which it is uſually found. It is no other than the matter of the ſenſible tranſpiration of trees and plants in general, and is found on many different kinds in different quantities. The lime and ſycamore uſually have a great deal of it on their leaves in the heats of ſummer, and if ſteeped in water, render it ſweet and purgative. The ſweet matter found in the bottom of the trefoil, or jaſmine flowers, is alſo *Manna* in a certain ſtate. The bees are well acquainted with the ſameneſs of this extravaſated juice in different plants, and collect it for their honey, as well from the leaves of the lime and ſycamore, and many other trees, as from the flowers of plants. The elaboration it ſuffers under their management afterward is all that makes the difference between that and what men collect in Calabria; and honey is *Manna* in a certain ſtate.

At Briançon in France they collect *Manna* from all ſorts of trees that grow there; and the inhabitants obſerve, that ſuch ſummers as produce them the greateſt quantities of *Manna*, are very fatal to their trees. Their walnut-trees produce annually a conſiderable quantity; but if there happen a year in which they produce more than ordinary, they uſually find many of them periſh in the following winter.

It ſeems very plain from the whole, that *Manna* is only the extravaſated juice of the tree, which cannot ſurvive ſo great a loſs of it: And what not a little confirms this is, that the very hot ſummers are always thoſe which are the moſt abundantly productive of *Manna*. The antients were ſenſible of this ſpontaneous production of *Manna*, of ſeveral ſpecies of trees, ſo very different from one another, and from thence fell into the error of ſuppoſing it ſomething wholly foreign to the tree; an error very natural to thoſe who did not know that the nutritive juices of very many trees are nearly, if not wholly, the ſame. It was from this opinion of its origin, that they called it aerial honey.

My Boyle tells us, that in Apulia and Calabria, between the months of March and November, they obtain, by inciſion, from the common aſh-tree, a ſweet juice ſo like *Manna*, in that ſeaſon adhering to the leaves of the ſame kind of trees, that they call it *Manna del Corpo*, trunk-*Manna*; and uſe it ſucceſsfully. Works abr. vol. 1. p. 51.

MANNA *Alhagina*, a word uſed by ſome authors to expreſs that kind of *Manna* called by others *Manna maſtichina*, from its drops reſembling maſtic in ſmall tears. It is called *alhagina* from the plant which produces it, it being collected from the *alhagi maurorum*, in the ſame manner as the common *Manna* from the Calabrian aſh. See the article MANNA *Perſicum*, infra.

MANNA *Libanotis*, in the materia medica, a name given by the old Greek writers to the ſmall flakes and fragments of the frankinſenſe which flew off the larger pieces in the gathering and putting them up. See the article LEPTOS *Libanotis*.

MANNA *Maſtichina*, in the materia medica, a name given by ſome authors to a kind of *Manna* which they deſcribe as reſembling maſtic in its colour, and the ſize of the lumps it is collected in. This is what we uſually know at this time under the name of *Manna Perſicum*, or Perſian *Manna*, which is at this time in uſe in medicine in the Eaſt, as a common purge. See the next Section.

MANNA *Perſicum*, *Perſian Manna*. It does not appear in the writings of the antient Greek phyſicians, that they were acquainted with any ſpecies of *Manna*, though that medicine be now ſo common in the ſhops. They had the word indeed, but they applied it to a very different ſenſe; what they called *Manna* being what ſome authors ſtill call the *Manna* of frankincenſe, that is, ſuch pieces of the common olibanum as broke off in the carriage from the larger pieces. Philoſ. Tranſ. N°. 472. p. 86.

The Arabians are by ſome ſuppoſed to have firſt brought what we call *Manna* into uſe in medicine; but if they were not the abſolute inventors of this uſe of it, it is certain they were the firſt who made it general and common as a purge. Their country afforded ſeveral diſtinct ſpecies of *Manna*, all which ſeem to have been ſo common among them, that they thought deſcriptions of them needleſs; and for that reaſon have not left us ſufficient accounts of them, from which to determine what were their characters and differences. They diſtinguiſhed three kinds of this purging medicine, under three abſolutely different names, which were *Mamma*, *tereniabin*, and *ſiracoſt*; but it is not eaſily proved whether theſe are all now known, or by what appellations they are at this time diſtinguiſhed.

Rawwolf, in his itinerary publiſhed by Mr. Ray, and Tournefort in his voyage to the Levant, have given the cleareſt intimations, in regard to this ſubject, of any of the known writers; and if to theſe we add Cluſius, we have among the three all that is to be expected of any certainty upon the ſubject; yet the deſcriptions of theſe, though eye-witneſſes of all they write, have not prevented ſo eminent and late a writer as Geoffroy from falling into an error concerning the *Manna* of the Arabians. It is very evident, however, that we have ſtill one ſpecies of the *Manna Arabum*, that is, the *tereniabin*, produced in ſome parts of the world, there having been ſpecimens of it ſent over into England from Peterſburgh, near which place it is collected from a plant, known among botanical writers under the name of *alhagi maurorum*.

This is uſually called *Manna Perſicum*; it appears at firſt ſight a mixed maſs of a dirty reddiſh brown colour, but, upon a nearer view, it is ſeen to conſiſt of ſeveral ſorts of particles. Firſt, a great number of globular cryſtalline and almoſt tranſparent bodies of different ſizes, and of a yellowiſh white colour. The largeſt of theſe do not much exceed a large coriander-ſeed in ſize, and they have ſomewhat of the appearance of ſmall lumps of maſtic, but are of a ſomewhat reddiſh caſt. Secondly, there are among theſe a large quantity of ſmall prickles, and other little woody bodies, which ſeem to have been the pedicles of leaves. Thirdly, there are a few ſmall leaves, which are of a firm texture, and terminate in narrow points. Fourthly, there are a large number of ſmall long reddiſh-colour'd pods, of a ſweetiſh gelatinous taſte, containing from one to ſix or ſeven hard irregular and kidney-ſhap'd ſeeds, which to the taſte are very acerb. And fifthly, there is uſually ſome ſand and earth among it. Four ounces of this *Manna* diſſolved in water uſually leaves about one ounce of theſe ſubſtances in the filtre.

The globules firſt deſcribed are ſomewhat hard, they break between the teeth like ſugar-candy, and are of a pleaſant ſweet taſte, but have much leſs of the *Manna* flavour than the Calabrian, but enough of it to diſcover to what family the ſubſtance belongs. The ſeeds, ſticks, leaves, and pods, ſeem to be all of them parts of the plant which produces the *Manna*; and the ſeeds having been ſown with us, have raiſed plants of the alhagi. About the year 1537, when Rawwolf wrote his itinerary, it appears that large quantities of this kind of *Manna* were brought from Perſia to Aleppo, where it was then known by the name of *trunſchibil*, or *trunſchibin*, a corruption doubtleſs of the word *terenjabin*, or, as it ought to be written, according to Denſingius, *tereng jabin*.

Rawwolf alſo expreſsly informs us, that this ſpecies of *Manna* was gathered from a plant called *alhagi*. This plant is minutely deſcribed by Tournefort, who confirms the account of the *Manna* being gathered from it, which Rawwolf had given ſo long before.

Tournefort ſays, that it is chiefly gathered about Tauris a city of Perſia, under the name of *trunjibin*, or *terenjabin*, mentioned by Aviſenna and Serapion; he adds, that thoſe authors thought it fell upon certain prickly ſhrubs, whereas it is really the nutritious juice of the plant; and that, during the great heats in that part of the world, there are perceived ſmall round drops, as it were, of honey ſtanding upon the leaves of this plant; and that theſe harden into globules about the ſize of coriander-ſeeds, and are then gathered by the inhabitants, together with leaves, ſtalks, dirt, and the like foreign matter, which greatly take off from their virtue. Mr. Tournefort obſerves, that this *Manna* is greatly inferior to the Calabrian in virtue; and that twenty or thirty drams of it are given for a doſe. Philoſ. Tranſ. N°. 472. p. 90.

Cluſius tells us, that the *terenjabin* of the Arabians is gathered from a prickly ſhrub, ſuch as the alhagi is deſcribed to be; and Aviſenna declares, that it was found upon a thorny plant; though his tranſlators have been miſled from the near reſemblance of two Arabic words, to make it ſtones, not a plant, that it was gathered from.

It appears very plainly from the whole, that this ſubſtance now known in Ruſſia, and ſome other parts of the world, under the name of *Manna Perſicum*, is truly the *terenjabin* of the Arabians and of Cluſius, Rawwolf, and Tournefort; only that the word is differently ſpelt by the latter authors, and it is probably alſo that *Manna* called by Bauhine, and ſome other writers, *Manna Maſtichina Orientalis*, from the round globules it is compoſed of, reſembling the drops of maſtic. See the article TERENJABIN.

MANNA *Thuris*, the *Manna of Frankincenſe*, a term uſed by the antient phyſicians to expreſs ſuch ſmall pieces of frankincenſe, or olibanum, as broke off from the larger in the carriage. See the articles MANNA *Perſicum*, ſupra, and LEPTOS *Libanotis*.

MANNIFERA *Arbor*, in the materia medica, the name by which the round-leav'd aſh, on which the manna is found, is often called. *Dale*, Pharm. p. 332.

MANNING, in the navy. To *man* a ſhip or fleet, is to provide them with a ſufficient number of men for an expedition.

In *manning* the navy, it is uſual to promiſe, by proclamation, a bounty to all ſeamen and able-bodied land-men, who come into the ſervice by a certain time, which is commonly two months pay, and but ſeldom any more. This does indeed prevail on a good many, yet great numbers conceal themſelves till the fleet is at ſea, and others lurk about till the time limited for ſuch bounty is expired, which does not a little prevent the fleet's being in a readineſs for an early expedition.

And as ſeamen are thus encouraged to enter themſelves voluntarily, ſo there is another method uſed to compel them to it, and that is *preſſing*, by warrants from the lord high admiral to the captains, which are by them aſſigned to their lieutenants: And to render this the more effectual, veſſels are purpoſely hired into the ſervice, to proceed from place to place, with thoſe officers and their preſs-gangs, not only to receive volunteers, but alſo to impreſs what men they can light on. But their ſucceſs has been very uncertain, and always very expenſive; therefore it were much to be wiſhed, in a matter of ſo great conſequence to the nation, that more ſpeedy and effectual methods could be taken for *manning* the fleet.

MANONOETOC, in natural hiſtory, a name given by the people of the Philippine Iſlands to a ſpecies of horned owl common in thoſe parts.

MANSORIUS *Muſculus*, in anatomy, a name given by ſome writers to that muſcle of the face more generally known under the name of the *Maſſeter*. See the article MANSORII, *Cycl.*

MANTECU, a ſort of preparation of butter uſed by the Turks when they travel with their caravans. This is firſt oiled over the fire, and then ſalted and kept in veſſels made of a tough leather, worked round a wooden frame, of the ſame ſhape with the veſſels in which they bring their balſam from Mecca. *Pocock*'s Egypt, p. 186.

MANTICA, in zoology, the name by which Piſo and ſome other writers have expreſſed the pouch or bag of ſkin under the belly of the opoſſum, into which the young are received in time of danger. See the article OPOSSUM.

MANTICHORA, in natural hiſtory, a name given by the Roman authors to a fierce and terrible creature, which they deſcribe from the Greeks, who call it ſometimes alſo *Mantichora*; but when they write more correctly *Marticora* and *Martiora*. We have formed the name *man-tiger* on the ſound of the Roman name, though expreſſing a very different ſenſe; and our authors of the hiſtories of animals, figure to us under this name a terrible creature, partly from the accounts of Pliny exaggerated, and partly from their own imagination, with three rows of teeth, and with ſuch a ſhape as no animal ever poſſeſſed. Pliny tells us, that this creature had three rows of teeth which cloſed in with one another in a ſurpriſing manner; and Pauſanias, Ariſtotle, and Cteſias, all agree in the account of its having three rows in the under, and as many in the upper jaw. They alſo add, that the teeth, when they cloſe, fall in one with another in the manner of the teeth of a comb; and this they have alſo told us of the crocodile; and that therefore no bite is ſo terrible as that of theſe animals. Pliny and Ariſtotle both add to this, that the *Mantichora* had the face and ears perfectly reſembling thoſe of a man; and Ariſtotle adds, that its eyes were grey or bluiſh, and perfectly like the eyes of a man alſo. The voice of this animal is as oddly repreſented as its body; Cteſias and Ariſtotle, and many other of the Greek authors, ſay it had the ſound of a muſical inſtrument of the pipe kind; and Pliny ſays, that it was a ſort of mixed ſound, like that of the pipe and trumpet together; and Ælian gives it a power of imitating either the one or the other, as it pleaſed, by the different modulations of its throat. The Greek authors alſo give it a very great ſwiftneſs; but the Latins, not contented with any thing that does not look miraculous in ſuch an animal, give it a power of leaping in its running, which is little leſs than flying.

The whole ſtory of this animal ſeems founded on the love of the wonderful; and very probably the *Mantichora*, properly ſpeaking, was no other than ſome of the large hyænas which was at firſt ill deſcribed, and afterwards more and more wonders were added to the ſtory, till all ſhadow of truth was loſt.

MANTIS, the preying locuſt. See Tab. of Inſects, N°. 4. and the article LOCUST.

MANUAL, *manualis*, ſignifies what is employed, or uſed by the hand, and whereof a preſent profit may be made. Thus ſuch a thing is ſaid to be in the *manual* occupation of one, where it is actually uſed or employed by him. *Staundf.* Prærog. p. 54. *Cowel*, *Blount*.

MANUALIS *Lapis*, in natural hiſtory, the name of a ſtone found in America, of which Monardes relates that it has great virtues in curing chaps and cracks in the hands and feet; but he does not deſcribe it.

MANUBIÆ, among the Romans, the ſpoils of the enemy, or rather the money made of the booty, when ſold by the quæſtor. *Pitiſc.*

MANUCMANUC, in natural hiſtory, a name given by the people of the Philippine Iſlands to a very beautiful ſpecies of parrot, which is found very frequently wild in the woods there. It is of the ſame bigneſs with the common parrot, and is variegated with a great many different colours.

MANUCODIATA, in zoology, the name of the bird of paradiſe, as it is uſually called in Engliſh; a bird of which many fabulous accounts have been propagated, as that it had no legs, that it took in no food, and lived only on the dews; that it was always on the wing, and had no other way of reſting than as it hung in the air; that it was never taken alive, and that the male had a cavity in his back, which ſerved for the female to lay her eggs, and hatch her young in; all which are wholly fabulous. The bird is a bird of prey, but of a peculiar kind, the uſe of whoſe long feathers is not well known. See Tab. of Birds, N°. 6. *Ray*'s Ornithol. p. 55.

There are ſeveral ſpecies of this beautiful bird; Mr. Ray has reckoned eleven, and others have mentioned more, which were unknown to that author; but it is much to be queſtioned whether many of theſe are not rather the varieties of age and ſex in the ſame ſpecies. The diſtinguiſhing character of theſe birds is their extremely long feathers which they carry behind. It is well known now that they feed on ſmall birds, and build in the woods, perching upon trees like other birds, moſt of thoſe now brought into Europe being killed while ſitting. *Ray*'s Ornitholog. p. 62.

MANULCA, in antiquity, that part of the *catapulta* to which the cord uſed in working it was fixed. *Pitiſc.* See the article CATAPULTA, *Cycl.*

MANURE. See the article MANURING, *infra.*

MANURING (*Cycl.*)—Sea ſand is often made uſe of by way of *manure*, in ſome parts of Cornwall, near the ſea-ſhore. When the ſand is notably ſhelly, that is, much mixed with the broken pieces of ſea-ſhells, it is reckoned beſt. It is ſpread upon ſuch land as is intended for wheat, or uſually in the firſt crop of four, whatever be the grain; for after four crops it is the cuſtom in Cornwall to leave the land ſix or ſeven years for paſture before it is tilled again; and the graſs will be ſo good the firſt year, where this *manure* is uſed, as to be fit for mowing: This is called *mowing of gratton* by the people there. The Corniſh acre is eight ſcore yards, at eighteen foot to the yard. In one of theſe acres, the farmers beſtow, according to the diſtance from the ſea-ſhore, from three hundred ſacks to one hundred, each ſack containing thirteen gallons, which is called a horſe load, the roads in many parts of this country being ſo bad, that they are forced to carry the ſand on horſeback from the water-ſide to the land, though eight or ten miles diſtant. In this caſe the ſand coſts them in the whole about eight pence a load. Where the lands lie very diſtant from the ſhore, and from all water-carriage, they beſtow very little of this *manure*, but they do not care to be any where wholly without it. In ſome of theſe places they lay twenty load on an acre, and find a proportionable advantage from it. Where much ſand is uſed, the corn is large and plentiful, and the ſtraw little. Hence has grown the old Corniſh phraſe of *a buſhel of corn to a peck of ſtraw*; which is not miraculous in a place where the ears of barley are frequently found as long or longer than the ſtalks they grow on.

Where little of this ſand is uſed, there is generally a great deal of ſtraw, and but little and hungry ears of ſmall grain. After the corn is taken off, the graſs that naturally comes up is a white clover; and where the land is any thing deep, a red kind comes up among it. This is uſually but ſhort the firſt year, but it grows thick, and affords good feeding for the cattle; and they are found to thrive better, and give better milk than when they are fed on the high graſs, which generally ſucceeds where there has been leſs ſand uſed.

Another great advantage of the lands where much ſand is uſed, is, that no ſnow lies upon them; there is a continual winter-ſpring, and an early harveſt, uſually ſix weeks before the neighbouring lands that do not uſe it in proper quantities; ſo that all the expence of procuring it in quantities, is many ways amply repaid to the farmers.

We have about Erith, and in many other places, the ſame ſort of ſand in great abundance in the Thames, that is uſed with this great advantage in Cornwall; and if it ſhould be found on trial to anſwer as well, probably there would be found few places where this river would not afford it at ſome depth, or in ſome part of its bed. The coral ſand of Falmouth is dredged up from under about a foot thickneſs of the Ouze; and perhaps in the Thames, where the bottom ſeems of another nature, the ſame ſand, or ſome of equal efficacy, may be found underneath. The ſand taken up out of the Thames at Erith, is uſed by the brick-makers, and they obſerve that the graſs always grows particularly freſh and ſtrong about the edges of their heaps of it, and that clover naturally grows there among the other graſs. Phil. Tranſ. N° 113.

In ſome counties of England, particularly in Oxfordſhire, they uſe, by way of *Manure* for ſome of their lands, the cuttings and chippings of ſtone in the quarries, which is ſuppoſed to enrich the land by means of a ſalt that the ſtone contains, which being diſſolved by the weather is imbibed by the earth. *Plot*'s Oxfordſhire, p. 249.

MANUS *Martis*, in botany, a name given by ſome authors to the common cinquefoil, or *quinque folium vulgare*. *Ger.* Emac. Ind. 2.

MAO, or *Mau*, in botany, a name by which ſome authors have called the *magna Indica*, or Indian mango tree. *Hort.* Mal. vol. 4. p. 1.

MAPLE, *Acer*, in botany, the name of a genus of trees, the characters of which are theſe: The flower is of the roſaceous kind, and is compoſed of ſeveral petals arranged in a circular form. The piſtil ariſes from the cup, and finally becomes

comes a fruit compoſed uſually of two, ſometimes of three capſules, which are terminated by a foliaceous wing, and contain roundiſh ſeeds.

The ſpecies of *Maple* enumerated by Mr. Tournefort, are theſe: 1. The greater *Maple*, called the white mountain *Maple*, and by ſome the plane tree. 2. The common great *Maple*, with variegated leaves. 3. The mountain great *Maple*, with deep green leaves, reſembling thoſe of the platanus. 4. The great *Maple*, with rounder and leſs jagged leaves, ſuppoſed to be the Italian opulus of ſome authors. 5. The common or ſmall *Maple*. 6. The trifoliate *Maple*. 7. The bindweed leaved climbing American *Maple*, with flowers of a ſcarlet and gold colour. 8. The citron-leaved climbing American *Maple*, with blue ſpiked flowers. 9. The purple-flowered climbing American *Maple*, with pſeudo-acacia leaves. *Tourn.* Inſt. p. 615.

The ſeveral ſorts of this tree are eaſily propagated by ſowing the ſeeds, ſoon after they are ripe, in an open bed of common earth, covering them about half an inch thick with light ſandy earth. The ſpring following they will appear above ground, and will grow to a foot high the firſt ſummer. About the Michaelmas following they are to be removed, and planted at three feet diſtance, in which place they may remain four years; and at that time they will be large enough to plant out into the places they are to ſtand in.

The great *Maple* commonly, though very improperly called the *ſycamore-tree*, is raiſed very eaſily in this manner, and is a very valuable tree for gentlemen who have plantations near the ſea, as it bears the ſpray of the ſalt water very well, and will defend all the reſt if planted behind them.

The Virginian kinds may be propagated, either thus by ſowing, or by laying down the young branches early in the ſpring, giving them a little ſlit at a joint, by which means they will take ſufficient root in a twelve-month to be tranſplanted out. *Miller*'s Gard. Dict.

MAPLE *Sugar*, a kind of ſugar made from a ſpecies of the *Maple* called by Monſieur Sarazin, *Acer canadenſe ſacchariferum fructu minori*. Mr. Sarazin, a phyſician at Quebeck, intending to enquire at large into the nature of this ſort of ſugar, obſerved that there were four ſpecies of *Maple* common in the places where it was made, all which he ſent over to the garden at Paris. One of theſe ſpecies, diſtinguiſhed from the reſt by the ſmallneſs of its fruit, is called the ſugar *Maple*; this grows to ſixty or eighty foot high, and its juice, which is very redundant in the months of April and May, is eaſily made into a very good ſugar. They procure this juice from the tree by piercing a hole into the trunk, and placing veſſels to receive it: This juice, being evaporated, yields about one twentieth part of its own weight in pure ſugar. A middle-ſized tree, of this ſpecies, will yield ſixty or eighty pints of this juice, without receiving any damage as to its growth; and much more than this may be drawn, but then the tree manifeſtly ſuffers for it.

Mr. Sarazin obſerved ſome very remarkable particulars in regard to the ſaccharine quality of this juice, without which it never had it in the proper perfection. 1. The tree at the time that the juice is drawn out, muſt have its bottom covered with ſnow; and if it is not naturally ſo, the Indians know ſo well the neceſſity of it, that they always bring ſnow from elſewhere, and heap it up round it. 2. This ſnow muſt afterwards be melted away by the ſun-ſhine, not gradually thawed by a warm air. 3. There muſt have been a froſty night before the opening the hole in the trunk. It is remarkable that theſe circumſtances are ſuch as cuſtom and experience alone could have pointed out, ſince they ſeem contrary to reaſon; and ſo it is in many of the operations in chemiſtry, where the moſt ſeemingly rational means fail, while thoſe which ſhould ſeem quite contradictory to reaſon ſucceed. It is obſerved, that if the juice of the *Maple* be not in a condition to become ſaccharine while the ſnow lies at its root unthawed, that it almoſt immediately becomes ſo on the melting of the ſnow, and its penetrating into the earth. Mem. Acad. Par. 1730.

MARACANA, in zoology, the name of a bird of the parrot kind, but larger than the common ſpecies, and covered all over with bluiſh-grey feathers. It is very common in the Braſils.

The natives alſo call another bird of the parrot kind by the ſame name, which is of a fine green on the head, neck, and back, but the crown of the head looks a little bluiſh; the tail is mixed of red and a bluiſh-green; the under part being red, as is alſo the under part of the wings; at the origin of each wing, it has alſo a red ſpot; and on each ſide of the head a brown one. The noiſe this bird makes, is oe, oe, oe. *Marggrave*'s Hiſt. Braſil.

MARANA, in botany, a name by which ſome authors have called the ſtramonium, or thorn apple, a plant kept in ſome gardens. *Ger.* Emac. Ind. 2.

MARATHRUM, in botany, a name by which ſome authors have called the common fœniculum or fennel. Id. ibid.

MARBASIS, in botany, a name given by ſome to a kind of plant which they ſay climbed up trees, and there hung down from their branches in form of long jointed and naked filaments.

The word ſeems to be only a corruption of the word *anabaſis* of Pliny, which he calls alſo *ephedra*, and gives the ſame characters to. It ſhould ſeem that this is all an error, that no plant, ſuch as they deſcribe, ever exiſted, but that the whole was founded on this: The hippuris, or horſetail, was diſtinguiſhed by having naked and ſlender ſtalks full of joints; it thence became natural for the Greeks to call by the ſame name any thing that was in like manner compoſed of ſuch long and naked filaments; and the common *uſnea*, or hairy tree moſs, which hangs down from the branches of large foreſt trees, is more like a horſe's tail by far than the plant commonly ſo called is: it is not wonderful, therefore, that it ſhould be called by the ſame name.

The Greeks, from the watery places in which the common horſetail uſually grows, called it *ephydron*; and this word miſ-ſpelt ſeems to have made the *ephedra* of Pliny in this place. If this was found hanging from the branches of trees, and no body had ever mentioned its growing on the trees themſelves, it is no wonder that ſo careleſs a writer as Pliny ſhould deſcribe it as growing on the ground near the roots of trees, and climbing up their trunks, and then hanging down from their branches in form of horſes tails.

This ſeems to account for the whole that Pliny has left us concerning this plant; and it is very evident, that the common *uſnea*, or hairy tree moſs, very well agrees with his deſcription of the *ephedra* and *anabaſis*, though no other plant does. He ſays it hangs down from the large branches in form of numerous hairy threads, which are naked or wholly without leaves. The *Marbaſis* of the antients ſeems, therefore, to mean our *uſnea*. See the article USNEA.

MARBLE, *Marmor*, (*Cycl.*) in natural hiſtory. *Marbles* make a peculiar genus of foſſils, the characters of which are theſe: They are bright and beautiful ſtones, compoſed of ſmall ſeparate concretions, moderately hard, not giving fire with ſteel, and fermenting with and ſoluble in acid menſtrua, and calcining in a ſlight fire.

By theſe characters the *Marbles*, properly ſo called, are diſtinguiſhed from the porphiries and granites, which are properly ſtones of a very different kind, being compoſed of very different particles, and exhibiting contrary properties. See the article PORPHIRITIS, &c.

The *Marbles* are a genus of bodies ſuppoſed to be very well known, becauſe ſeen every day, and in common uſe; but they are in reality, notwithſtanding that, perhaps one of the moſt confuſed, and leaſt underſtood of all the bodies of this kind. The people who work upon them, know nothing more of them than that this will, and that will not receive a poliſh in a high degree; and that this may be worked, and another refuſes the tools; and the men of ſcience have conſidered them even leſs than theſe.

The *Marbles* were one of thoſe ſets of bodies that the antients were well acquainted with, and it may give no ſmall light into their true hiſtory, to pay a ſtrict attention to what they have left us concerning them, and enquire which of thoſe in uſe among them are known to us, and which loſt, and by what names we now call their *Auguſteum*, *Tiberianum*, *Luculleum*, and the reſt. This may ſerve to give a certain account of what they knew, and perhaps may point out to the builder, ſtatuary, and phyſician, ſome new uſes, at leaſt new to us, of many of them. *Hill*'s Hiſt. of Foſſ. p. 461. See the article LUCULLEUM, AUGUSTEUM, &c.

Ægyptian MARBLE, a name given by our artificers to a very beautiful green-and-white *Marble*, greatly in uſe among us, and brought in great quantities from Egypt and other places. It was alſo in frequent uſe, and in great eſteem among the Romans, who received it alſo from Egypt, and diſtinguiſhed too lightly two kinds of it, from the different diſpoſition and order of its variegations, and honoured them with the names of two of their emperors in whoſe reign they were firſt brought into uſe. Theſe were the *marmor Auguſteum* and *Tiberianum*. Thoſe pieces in which the variegations were waved and thrown into arches and circular figures, they called the *Auguſtan*, and thoſe which were marked with more diffuſed and ſcattered veins, they called the *Tiberian*. Theſe were the whole differences between the two; and if we were to acknowledge different ſpecies from ſuch differences as theſe, we muſt allow almoſt as many different ſpecies as we ſee blocks of *Marble*. *Hill*'s Hiſt. Foſſ. p. 482. This kind of *Marble*, in all its appearances, is, tho' a very beautiful yet a very rude, irregular, and various maſs. It is of a firm compact texture, and moderately heavy, and may be properly called a green *Marble* variegated with white, for thoſe are its two conſpicuous colours; but it has theſe mixed in ſo great a variety as to afford lights and ſhades of a vaſt number of degrees of colours. It has beſides theſe, alſo many other variegations of a duſky colour approaching to black. It is very bright and glittering when freſh broken, and variouſly ſo in its various parts. In the white parts it is brighteſt of all, and the other colours are more lucid as they are paler, or nearer approach to the white. It has, however, among its other particles, ſome of a very beautiful green foliaceous talc. The whole is capable of a good poliſh, and is common

mon in tables, &c. in the houſes of the polite part of the world. *Hill*'s Hiſt. Foſſ. p. 481.

Coralloide MARBLE, in natural hiſtory, the name given by authors to ſuch *Marbles* as have ſpecimens of the marine corals or bodies of that kind immerſed in them, as the ſea ſhells are buried in, and make a part of the body of others.

There are ſeveral ſpecies of *Marble* ſubject to hold theſe bodies, but we have in England principally two in uſe, the one of a greyiſh black, the other of a fine deep jetty black.

The firſt is found in many parts of Derbyſhire, and the corals it contains are of the porus kind, and of one of the moſt elegant ſpecies in the world; they are lodged in it at all angles, and in all directions, and are in general about an inch and half long, and three quarters of an inch broad, though ſome are much larger, and others ſmaller. They are compoſed of longitudinal plates, very fine and thin, and of a ſnow white, ranged in diſtinct orders, and finely interſperſed at ſmall diſtances, with thin tranſverſe plates; the whole internal part of the coral being thus divided into a ſort of ſquare cells. This net-like diviſion runs through about three-fourths of the body, but the top has only the longitudinal plates without the tranſverſe ones. It is plain that theſe before they were received into the bed of marble, had been ſuſtained in a fluid containing a very beautiful greyiſh white ſpar, for the net-like plexus of the bed is full of this matter; but the open part at top having no plates for the retaining this matter, has remained empty till received into the *Marble*, and is there found filled up with the common blackiſh matter of the reſt of the ſtratum. It is an extremely beautiful ſubſtance when poliſhed, and is uſed in many ornamental works. It is found in many parts of Derbyſhire and in Wales.

The other, or black *coralloide Marble*, is alſo a very beautiful ſpecies; it is a very cloſe compact ſubſtance, and of a fine even texture, very hard, of a deep jetty black, and capable of a high poliſh. It is elegantly variegated with fair and perfect ſpecimens of a coralloide porus, approaching to the nature of the former, but ſmaller and of a leſs elegant texture; and among theſe has uſually a great number of ſea ſhells, both of the turbinated and bivalve kinds. Theſe are lodged in various directions, and all of them, the corals as well as the ſhells, are of a pure ſnow white; and as the matter and texture of the others plainly ſhewed that they had been filled with ſpar before they were immerſed into the bed of *Marble*; theſe, on the other hand, retaining now no part of their original texture, though exactly their external figure, but being all made up of the ſame plain white ſpar, plainly ſhew that they were lodged in the *Marble* empty, and in their own native ſtate; for the cavities both of the corals and ſhells are all nicely filled with the matter of the *Marble*; but they have now no coralline nor teſtaceous matter about them, but in tract of time have plainly periſhed, and the cavities they left in the hard and ſmooth maſs of the *Marble* have been nicely and finely filled up with this ſpar, which therefore now as perfectly repreſents their figures, as if themſelves were there. *Hill's* Hiſt. Foſſ. p. 473.

It is found in great plenty in many parts of Ireland, particularly about Kilkenny, and is brought in great quantities to London, and uſed about chimney-pieces, and other ornamental works, and is commonly known among the artificers by the name of Kilkenny *Marble*.

Alabandium MARMOR, a name given by the antients to a very remarkably gloſſy ſpecies of black marble, dug near a city of that name in Caria, and much uſed in building among the Romans.

Caryſtium MARMOR, a name given by the antients to a ſpecies of marble, dug in the iſland of that name, and much uſed in ornamenting the public buildings; it was of a beautiful green, deeper than the Tiberian and Auguſtan marble, and without the white variegations. We meet with it ſometimes among antient remains; and the Italian antiquaries particularly mean this, by a name alſo in uſe among us, and proſtituted to every other ſpecies of green marble, the *verde antiquo*.

Chium MARMOR. See the article CHIUM *Marmor*.

Fuſile MARBLE. See the article FUSILE *Marble*.

MARMOR *Hymettium*. See the article HYMETTIUM *Marmor*.

Imitation of MARBLE in brimſtone. See the article BRIMSTONE.

Jaſſenſe MARMOR. See the article JASSENSE *Marmor*.

Lychnitis MARMOR. See the article LYCHNITIS *Marmor*.

Lydium MARMOR. See the article LYDIUM *Marmor*.

Lygdinum MARMOR. See the article LYGDINUM *Marmor*.

Lunenſe MARMOR. See the article LUNENSE *Marmor*.

Melium MARMOR. See the article MELIUM *Marmor*.

Numidicum MARMOR. See the article NUMIDICUM *Marmor*.

Parium MARMOR. See the article PARIUM *Marmor*.

Thaſium MARMOR. See the article THASIUM.

Tiberianum MARMOR. See the article TIBERIANUM *Marmor*.

Derby MARBLE, among our artificers, a name given to a very beautiful ſpecies of *Marble*, found in many parts of Derbyſhire, and frequently worked into chimney-pieces in London.

It is a very ſingular and beautiful ſpecies; its conſtituent matter is a pale, fine, whitiſh brown *Marble*, of a fine cloſe texture, and very bright and glittering hue: This is ſo full of entrochi, that they make more than half the ſubſtance of the maſs; and theſe cutting in different directions, and taking a fine poliſh, add greatly to the beauty of the whole, when wrought. *Hill*'s Hiſt. of Foſſ. p. 479.

The various forms in which theſe bodies appear in the ſtone, when cut, might give a ſuſpicion that many of them were ſome other foſſile; but this is only owing to their lying in all directions in the maſs; but when nicely examined, the oddeſt of them will be found to be no other than what a ſingle common entrochus may be cut into. They are of all ſizes, from the thickneſs of a large pin, to half an inch or more.

Italian MARBLE. See the article ITALIAN *Marble*.

Kilkenny MARBLE. See the article *Coralloide* MARBLE, *ſupra*.

Namur MARBLE. See the article NAMUR.

Colouring of MARBLE. The colouring of *Marbles* is a nice art, and in order to ſucceed in it, the pieces of *Marble*, on which the experiments are tried, muſt be well poliſhed, and clear from the leaſt ſpot or vein. The harder the *Marble* is, the better it will bear the heat neceſſary in the operation; therefore alabaſter, and the common ſoft white *Marble*, are very improper to perform theſe operations upon.

Heat is always neceſſary for the opening the pores of the *Marble*, ſo as to render it fit to receive the colours; but the *Marble* muſt never be made red hot, for then the texture of the *Marble* itſelf is injured, and the colours are burnt, and loſe their beauty. Too ſmall a degree of heat is as bad as too great; for, in this caſe, though the *Marble* receive the colour, it will not be fixed in it, nor ſtrike deep enough. Some colours will ſtrike, even cold, but they are never ſo well ſunk in as when a juſt degree of heat is uſed. The proper degree is that which, without making the *Marble* red, will make the liquor boil upon its ſurface. The menſtruums uſed to ſtrike in the colours, muſt be varied according to the nature of the colour to be uſed. A lixivium made with horſe's or dog's urine, with four parts quick-lime, and one part pot-aſhes, is excellent for ſome colours; common lye of wood-aſhes does very well for others: For ſome, ſpirit of wine is beſt; and finally, for others, oily liquors, or common white wine.

The colours which have been found to ſucceed beſt with the peculiar menſtruums, are theſe: Stone blue diſſolved in ſix times the quantity of ſpirit of wine, or of the urinous lixivium; and that colour which the painters call litmouſe, diſſolved in common lye of wood-aſhes. An extract of ſaffron, and that colour made of buckthorn berries, and called by the painters, ſap green, both ſucceed well diſſolved in urine and quick-lime, and tolerably well in ſpirit of wine. Vermillion, and a fine powder of cochineal, ſucceed alſo very well in the ſame liquors. Dragons blood ſucceeds very well in ſpirit of wine, as does alſo a tincture of logwood in the ſame ſpirit. Alkanet root gives a fine colour, but the only menſtruum to be uſed for this is oil of turpentine; for neither ſpirit of wine, nor any lixivium, will do with it. There is another kind of *ſanguis draconis*, called dragon's blood in tears, which, mixed with urine alone, gives a very elegant colour. Phil. Tranſ. N°. 268. Beſide theſe mixtures of colours and menſtruums, there are ſome colours which are to be laid on dry and unmixed. Theſe are dragons blood, of the pureſt kind, for a red; gamboge for a yellow, green wax for a green, common brimſtone, pitch and turpentine for a brown colour. The *Marble*, for theſe experiments, muſt be made conſiderably hot, and then the colours are to be rubbed on dry in the lump. Some of theſe colours, when once given, remain immutable, others are eaſily changed or deſtroyed. Thus the red colour given by dragons blood, or by a decoction of logwood, will be wholly taken away by oil of tartar, and the poliſh of the *Marble* not hurt by it.

A fine gold colour is given in the following manner: Take crude ſal armoniac, vitriol and verdegreaſe, of each equal quantities; white vitriol ſucceeds beſt, and all muſt be thoroughly mixed in fine powder.

The ſtaining of *Marble* to all the degrees of red, or yellow, by ſolutions of dragons blood or gamboge, may be done by reducing theſe gums to powder, and grinding them, with the ſpirit of wine, in a glaſs mortar; but for ſmaller attempts, no method is ſo good as the mixing a little of either of theſe powders with ſpirit of wine in a ſilver ſpoon, and holding it over burning charcoal. By this means a fine tincture will be extracted, and with a pencil dipped in this, the fineſt traces may be made on the *Marble*, while cold, which, on the heating it afterwards, either on ſand, or in a baker's oven, will all ſink very deep, and remain perfectly diſtinct in the ſtone. It is very eaſy to make the ground colour of the *Marble* red or yellow by this means, and leave white veins in it. This is to be done by covering the places where the whiteneſs is to remain with ſome white paint, or even with two or three doubles only of paper, either of which will prevent the colour from penetrating in that part. All the degrees of red are to be given to *Marble* by means of this gum alone; a ſlight tincture of it, without the aſſiſtance of heat to the *Marble*, gives only a pale fleſh colour, but the ſtronger tinctures give it yet deeper; to this the aſſiſtance of heat adds yet greatly; and finally the addition of a little pitch to the

tincture gives it a tendency to blackneſs, or any degree of deep red that is deſired.

A blue colour may be given alſo to *Marble* by diſſolving turnſol in a lixivium of lime and urine, or in the volatile ſpirit of urine; but this has always a tendency to purple, whether made by the one or the other of theſe ways. A better blue, and uſed in an eaſier manner, is furniſhed by the canary turnſol, a ſubſtance well known among the dyers: This needs only to be diſſolved in water, and drawn on the place with a pencil; this penetrates very deep into the *Marble*, and the colour may be encreaſed by drawing the pencil wetted afreſh ſeveral times over the ſame lines. This colour is ſubject to ſpread and diffuſe itſelf irregularly; but it may be kept in regular bounds, by circumſcribing its lines with beds of wax, or any other ſuch ſubſtance. It is to be obſerved, that this colour ſhould always be laid on cold, and no heat given even afterwards to the *Marble*; and one great advantage of this colour is, that it is therefore eaſily added to *Marbles* already ſtained with any other colours, and it is a very beautiful tinge, and laſts a long time. Mem. Acad. Par. 1732.

MARBLE *Colour*. To give this variegated colour to glaſs is a very eaſy operation: There needs no more than to put cryſtal frit into a pot in the furnace, and to work it before it has ſtood the uſual time to purify in the fire. *Neri*'s Art of Glaſs, p. 99.

MARBLE *Wood*, a name given by the people of ſome parts of America to the *lignum rhodium*, or roſe-wood, from the heart of the tree being ſometimes variegated like *Marble*.

MARBLED (*Cycl.*)—MARBLED *China Ware*, a name given by many to a ſpecies of porcelain, or China-ware which ſeems to be full of cemented flaws. It is called by the Chineſe, who are very fond of it, *tſou tchi*.

It is generally plain white, ſometimes blue, and has exactly the appearance of a piece of China which had been firſt broken, and then had all the pieces cemented in their places again, and covered with the original varniſh. The manner of preparing it is eaſy, and might be imitated with us. Inſtead of the common varniſh of the China-ware, which is made of what they call oil of ſtone and oil of fern mixed together. They cover this with a ſimple thing made only of a ſort of coarſe agates, calcined to a white powder, and ſeparated from the groſſer parts by means of water, after long grinding in mortars. When the powder has been thus prepared, it is left moiſt, or in form of a ſort of cream, with the laſt water that is ſuffered to remain in it, and this is uſed as the varniſh. Our cryſtal would ſerve fully as well as theſe coarſe agates, and the method of preparation is perfectly eaſy. Obſ. ſur les Cout. de l'Aſie.

The occaſion of the ſingular appearance of this ſort of Porcelain is, that the varniſh never ſpreads evenly, but runs into ridges and veins. Theſe often run naturally into a ſort of moſaic work, which can ſcarce be taken for the effect of chance. If the *marbled* China be deſired blue, they firſt give it a general coat of this colour, by dipping the veſſel into a blue varniſh; and when this is thoroughly dry, they add another coat of this agate oil.

MARCASITE, (*Cycl.*) in natural hiſtory, a name uſed in a very vague ſenſe by many writers upon foſſils, but reſtrain'd by Dr. Hill to be the name of a peculiar genus of foſſils, the characters of which are, that they are compound inflammable metallic bodies, naturally conſtituting whole ſtrata; of a ſolid and firm ſubſtance, of an obſcurely and irregularly foliaceous ſtructure, and of a bright glittering appearance, very freely and readily giving fire with ſteel, not fermenting with acid menſtruums, and when put into the fire, yielding a deep blue flame, and finally calcining into a purple powder.

Though the natural diſpoſition of theſe bodies be to form whole ſtrata, and that they are moſt uſually found in this ſtate, yet they are at times found in looſe maſſes, as many, even of the ſtones of ſtrata, at times are. They are ſubject alſo, by their frequent admixture with adventitious matter, the ores of metals, and other foſſile bodies, to ſuch various external appearances, that their varieties are almoſt innumerable, and moſt of them are very beautiful: But tho' theſe accidental differences are ſo very numerous, the genuine ſpecies are very few, the naturaliſt allowing only three. Theſe are, 1. The bright ſilver-colour'd *Marcaſite*. 2. The bright gold-colour'd *Marcaſite*. And 3. The pale heavy dead white *Marcaſite*.

The firſt ſpecies uſually conſtitutes ſtrata of great extent, and of about a foot in thickneſs; very often much leſs, but ſcarce ever much more: It is compoſed of a number of foliaceous flakes, not regularly diſpoſed, but oddly contorted and waved, and often folding round one another; though ſometimes this ſtructure is leſs diſtinct, and the whole ſeems run into one ſolid maſs. Its colour is extremely bright, very like ſilver, but more glittering. This is its common and its more pure ſtate; but it is liable to a vaſt number of varieties. Sometimes it contains a large quantity of the ore of lead or tin, and very often a duſky brown ferrugineous matter is intimately mixed with it; at other times many of the angular and regularly figured phlogoniæ are immerſed in it, and ſeem to make a part of its very ſtructure; and ſometimes where it has room, its conſtituent flakes riſe on its ſurface in ſeveral conjunct ſeries, and form a very elegant foliaceous top to it. Nor is this all the difference of appearance it puts on; for very often, where there has not been a ſufficient quantity of it to form itſelf into any figure alone, it is found depoſited in ſpecks, or flat cakes, of a more or leſs complex, but always of a flaky ſtructure, on ſtones or ores of various kinds; and frequently, beſide its native ſilvery white, it has all the rainbow-colours on its different parts, as differently turned to the light. *Hill*'s Hiſt. of Foſſ. p. 609.

The *golden Marcaſite* is a more beautiful ſubſtance than the former: It is of a leſs firm or compact ſtructure than the others, and is uſually found in very long but very thin ſtrata, and is of an extremely bright and glittering appearance, and is ſometimes found in large and miſ-ſhapen nodules, or looſe maſſes. It is liable to all the accidental varieties that the former is, and in many of them makes a very elegant appearance. The third, or dead white kind, is the hardeſt and heavieſt of all. It is, in its more uſual and natural appearance, of much leſs beauty than the former kinds, but it is, like them, ſubject to various accidents, under ſome of which its makes a very gay and ſplendid appearance. It, like the reſt, ſometimes forms compleat ſtrata, ſometimes detach'd nodules; but its moſt uſual appearance is in the horizontal cavities of other ſtrata; in theſe it often forms a ſort of baſtard ſtratum of many yards continuance, and frequently of very conſiderable thickneſs, for it almoſt always fills up the whole vacuity, and that ſo cloſely as ſeldom to leave room for any foliaceous ſhoots at its ſurface, or protuberances at its edges, but forms a plain maſs like that of a metal melted and poured into the place. It is of the ſmoothеſt ſurface of all the *Marcaſites*, and is ſomewhat ſoft to the touch, and in colour reſembles tarniſhed pewter.

This is its common appearance, but it ſometimes ſhews itſelf like the reſt in ſmall patches on the ſurfaces of ſtones, and is there often very beautifully foliated; it is liable alſo to all the accidents of the other kinds.

The *Marcaſites* are all found in great plenty in the Engliſh and German mines. Devonſhire and Cornwall afford vaſt quantities of them; and very beautiful ones are found in Derbyſhire. They often contain the ſeveral metals, but the quantity of ſulphur has yet baffled all the attempts that have been made to work them to advantage. *Hill*, Hiſt. of Foſſ. p. 610.

Aviſenna mentions four kinds of *Marcaſite*; the golden, the ſilvery, the braſſy, and the iron *Marcaſite*. He does not pretend that the two firſt contain really the metals whoſe names they bear, but ſays they are ſo called from their likeneſs in colour, and that they are thought by ſome to poſſeſs, in part, their virtues. Dioſcorides mentions only one kind, that is, the braſſy pyrites or *Marcaſite*. This is, of all others, the moſt common; and the preference is given by this author to ſuch of it as is of a bright braſs colour, and ſuch as, when ſtruck againſt ſteel, yields the largeſt ſparks. This is the kind called by Aviſenna and Serapio, *Marcaſita nuhaſi*, and it is called by the Perſians, *hagiar alruxenani*, that is, the ſtone of light or brightneſs, there being a very vivid and ſparkling luſtre in this ſtone when newly broken. The antients uſed to calcine it, and then made it an ingredient in their ſeveral compoſitions for diſeaſes of the eyes. The calcining it renders it a ſort of colcothar of vitriol, for the ſulphureous parts burn away in the operation, and leave only the *caput mortuum* of the vitriol behind; ſome have ſuppoſed it called *lapis lucis*, from its reſtoring light to the eyes; but this is a very far fetch'd etymology.

The firſt opinion of the world, in regard to this glittering ſubſtance, was, that it was almoſt all gold or ſilver, according to the colour: But the error of this opinion being ſoon diſcovered by trials, there grew another contrary one, that *Marcaſite* never contained any metal at all. This is, in general, true of our *Marcaſites*, but it is not to be extended into a general rule for thoſe of all the world. The ſearchers after royal mines are not to throw away all theſe ſubſtances as uſeleſs, wherever they find them. For Alonſo Barba, a very great judge of theſe things, and himſelf very converſant in mines, aſſures us, that the *Marcaſites* of the mines of Montſerrat *en los chicas* contain uſually one half ſilver: And in the mines of Potoſi there is great plenty of a *Marcaſite*, in which there is embodied a large quantity of the black ſilver ore, well known there, and eſteemed one of the richeſt kinds, except the native ſilver. They always are glad to find this *Marcaſite* vein, it being eſteemed a proof, that the black ore is very rich in ſilver. They make the ſame ſort of obſervation in regard to orpiment and gold, that they do in regard to *Marcaſite* and ſilver; that the orpiment uſually contains itſelf ſome gold, and is a certain ſign that there is gold in the neighbourhood wherever it is found. *Alonſo Barba* de Met.

MARCH, (*Cycl.*) in military affairs, is in general the ſteps made in marching, or the moving of a body of men from one place to another.

But the beat of the drum, when the ſoldiers are upon *March*, or beginning to march, is likewiſe called the *March*. It is likewiſe a word of command, when a battalion is to alter its diſpoſition.

To *march* is to move from one place to another. The orders being given the evening before a *March*, that the drums beat at a certain hour, the ſoldiers are then ready drawn up at their ſtandards and colours, in ſquadrons or battalions, ready to begin their *march*.

As many accidents may happen in the *March* of an army, as defiles, marſhes, woods, and the like, it is the prudence of a general to order his *March* accordingly, and to take care that the columns of his army have a free communication one with the other. The *March* of an army is compoſed of an advance guard, the main body, and the rear guard, and is ſometimes in two, four, ſix, or eight columns, according as the ground will allow.

MARCH, *Marchia*, in our old writers, is uſed for a limit or border. Thus we read of the *Marches*, between England and Wales; or England and Scotland; which laſt are divided into *Weſt* and *Middle Marches*. And the word is uſed generally for the precincts of the king's dominions, in 24 Hen. 8. c. 12. Terms of Law.

The word comes from the German *Marck*, i. e. *Limes*; or from the French *Marque*, i. e. *Signum*, uſed for the marks or ſigns to diſtinguiſh between two countries or territories. *Blount*, *Cowel*.

MARCHANTIA, *Liverwort*, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: It is of the nature of what we generally call the *lichens* or *liverworts*, and produces male and female flowers on the different parts of the ſame plants.

The male flower ſtands on a long erect peduncle, which ariſes from a ſort of cup or caſe on the plant. The cup is a common perianthium, of the peltated kind, and divided into four, five, or ten parts, every ſegment having its edges depreſſed, and all being of the ſame ſize. This perianthium is large, and contains under it as many flowers as there are ſegments of it. Each flower is monopetalous, of a turbinated form, ſtanding erect, and ſomewhat ſhorter than the cup. The ſtamen in each flower is ſingle, and is a ſlender filament, longer than the flower. The apex or anthera, ſuſtained on this ſtamen, is of an oval figure, and is commonly found burſt at the top into as many parts as there are ſegments in the perianthium, be that four, five, or ten. The farina within it is affixed to a ſort of hairyneſs.

The female flower has no pedicle; the cup is a one-leav'd perianthium, erect, open at the top, and undivided, conſiſting of a ſort of membranaceous ring, which does not fall off till the ſeeds are ripened. There is no other flower but this cup, which contains ſeveral naked ſeeds in the bottom; they are of a roundiſh compreſſed figure. Dillenius has compriſed this genus under the general term *lichen*; and Micheli has called different ſpecies of it by the different names of *lunularia* and *hepatica*; and, according to theſe diſtinctions, the *Marchantia* is the name of thoſe ſpecies which have the cup of the male flower divided into eight or ten ſegments, which are flat, and do not encloſe the flowers. The *hepatica* is the name of thoſe ſpecies which have the male cup, of a conic figure, divided into five ſegments, and thoſe bending inwards, and the *lunularia* of thoſe ſpecies which have the male cup, of a cruciform figure, with curled ſegments, encloſing the flowers. *Linnæi* Gen. Plan. p. 506. *Micheli* Nov. Gen. Plant. *Liverwort* is ſaid to be aperient, attenuant, and reſolvent, and therefore good in obſtructions of the liver, and other viſcera; but at preſent is only uſed as an ingredient in ſome compoſitions.

MARCHERS, or *Lords* MARCHERS, in our old writers, noblemen that lived on the marches of Wales, or Scotland. Theſe, in times paſt, according to Cambden, had their laws, and power of life and death, *&c.* like petty kings. But ſuch powers were aboliſhed by the ſtat. 27 Hen. 8. c. 26. and 1 Edw. 6. c. 10. Terms of Law, *Blount*.

MARCHIONIS *Pulvis*, a term uſed for a certain compound powder, preſcribed in the Leyden Diſpenſatory, and greatly recommended by many as an anti-epileptic and abſorbent.

The ingredients are male piony root, half an ounce, wood of miſſetoe of the oak, raſpings of ivory, elks hoof, ſpodium, the tooth of the unicorn fiſh, or, in its ſtead, the antlers of the ſtag's horn, red and white coral, and pearls, of each a dram. Theſe are all to be rubbed into a powder, with twenty leaves of pure gold, and given half a dram twice a day.

MARCULUS, among the Romans, a knocker, or inſtrument of iron to knock at the doors with. *Pitiſc.* Lex. Ant.

MARDAC, in the materia medica of the antients, a name given by ſome to litharge. The Arabian writers have ſometimes called it by this name, and ſometimes by that of *merdeſengi*. Many of their commentators have thought that they meant two different ſubſtances by theſe two names; but it does not appear to be truly the caſe, the two words ſtanding, in different writers, for the ſame thing. Aviſenna has given us a chapter on *Mardac*, in which he has tranſlated the chapter of Dioſcorides on litharge: And Serapio has given us a chapter on the *merdeſengi*, in which he has given us an account of the ſame ſubſtance, under the terms that Galen uſes for the deſcription of litharge, and even quotes him for the account.

MARES, *Equa*, in zoology, the female of the horſe kind. See the articles EQUUS and HORSE.

No *Mares* in the world are better for breeding out of of than the Engliſh, provided they are properly choſen for the ſort of horſe intended to be bred. The *Mare*, whatever ſort of horſe is intended to be raiſed from her, ſhould be perfectly ſound, and as free from all defects as the ſtallion. They ſhould have no ſplaint, ſpavin nor curb about them; for the colt will certainly take after them if they have. The higheſt ſpirited *Mares* are beſt, and, in general, if there be any natural defect in the *Mare*, it ſhould be remedied in the ſtallion; and if any in the ſtallion, it ſhould be remedied in the *Mare*, as much as poſſible, in order to the having good colts.

The particular directions regarding the kinds of horſes to be bred, are theſe: If for the manege, or pads, the *Mares* ſhould have their heads well ſet on, and their breaſts broad; their legs not too long, their eyes bright and ſparkling, and the bodies large enough, that the foal may have room to lie in their belly. They ſhould be of a good and gentle diſpoſition, and their motions eaſy and graceful: The more good qualities the *Mares* have, the better, in general, the colts will prove.

If the owner would breed for racing, or for hunting, the *Mares* muſt be choſen lighter, with ſhort backs and long ſides; their legs muſt be longer, and the breaſt not ſo broad; and ſuch ſhould always be choſen as have good blood in their veins. If the ſpeed and wind of any particular *Mare* have been tried, and found good, there is the more certainty of a good colt from her: But ſhe ſhould be in full health and vigour at the time, and not above ſeven years old, or eight at the utmoſt. The younger the breeders are, the better, in general, the colts will be.

A *Mare* may be covered any time after ſhe is two years old; but the beſt time is after ſhe is four; at this age, or between this and ſeven, ſhe will nouriſh a colt beſt of all; and though ſhe will breed till ſhe is thirteen, yet it is generally obſerved, that when ſhe is paſt ten, the colts bred from her are dull and heavy. People who regard the moon, in theſe caſes, will have their *Mares* covered only between the end of the firſt quarter and the full; they pretend that theſe colts will be the moſt ſtrong and vigorous, but that thoſe begot in the waning of the moon, will always be weakly and tender. A much more eſſential caution, however, is, that before the *Mare* is to be covered, ſhe ſhould be taken into the houſe for ſix weeks, at leaſt, and fed well with good hay and oats, well ſifted, to give her ſtrength to go through the operation. If there is any reaſon to ſuſpect that the *Mare* will not conceive, the beſt method to inſure it is to let her blood in the neck, about ſix days before ſhe is cover'd: The quantity of blood taken away ſhould be about two quarts, or ſomewhat leſs. It is a general cuſtom to open the veins on both ſides the neck for this, taking half the quantity from each, but this is trifling.

The method of covering, ſo as to make it moſt ſure to ſucceed, is this: The *Mare* is to be brought into ſome open place, and tied to a poſt; and the ſtallion is to leap her in the morning faſting, and as ſoon as he diſmounts, a pail of cold water is to be thrown upon her, to make her ſhrink in and retain the ſeed. She is then to be taken away out of hearing of the horſe, and is neither to eat or drink for four or five hours after.

It may be known if ſhe ſtands to her covering, by her keeping a good ſtomach, and not neighing at the ſight of a horſe. Some, to make it quite ſecure, put the *Mare* and horſe together in an empty houſe every night, for four or five nights, taking away the horſe in the morning, and feeding him very liberally, and the *Mare* very ſparingly, and particularly giving her very little water.

There muſt be proper care taken of her after covering. The ſame method of feeding her with good hay, and ſifted oats, muſt be continued three weeks, or a month, and ſhe muſt be kept within doors, and without any exerciſe; her ſtable muſt be kept very clean, and her feet pared, and with thin ſhoes on. After this ſhe may be turned out for the ſummer ſeaſon, and only taken up in September, in order to be kept well fed till ſhe foals. If there be great difficulty in her foaling, or the ſecundine be retained, the method is to hold her noſtrils, ſo that ſhe cannot breathe; and if this does not do, a decoction of madder-root, or of fennel, in water, with a mixture of ale or wine, is found very effectual.

When the whole is over, the *Mare* is very apt to eat up her ſecundine; but this ſhould be prevented, for it is an unnatural food for her, and will injure her health. When ſhe has licked her foal, ſome perſons ſhould ſtroak and milk her before the foal ſucks. This will make the milk come down in greater plenty, and will prevent it from clotting into lumps, or from diſagreeing with the young creature's ſtomach. It often happens, that the milk clods in the udder, and the foal, being able to get none out, the *Mare* is ſuppoſed to be dry; and in conſequence of this ſuppoſition, ſhe actually becomes ſo. But the remedy is eaſy. Let as much milk as can be got from her be boiled with ſome lavender flowers, and the udder bathed thoroughly with it warm, ſeveral times a day: If no milk, or not enough can be obtained from her, other milk or common water will do; for the principal effect is from the heat of the liquor, and the virtue of the lavender, which breaks the clods and lumps, and then the foal's ſucking more as it grows ſtronger, will prevent the like accident for the future.

The water given the *Mare* for the firſt month after foaling, muſt be what the dealers in horſes call the white maſh, that is,

is, bran and water, ſtirred together till the liquor is white: A month after foaling a decoction of brimſtone and ſavin will be very proper, and will give ſtrength to the colt.

After this the *Mare* may be put to any moderate exerciſe, as harrowing, or the like, and both ſhe and the colt will be the better for it; only care is to be taken that ſhe do not let the colt ſuck while ſhe is hot.

Many are of opinion, that the winter is a very bad time for a *Mare* to be foaling; but though there is ſcarcity of graſs, the *Mare* may be houſed at this time, and well fed with hard meat, and, in this caſe, it will prove better both for her and the colt; he will be better limbed and ſtronger than if bred at graſs. See the article FOAL.

MARECA, in zoology, the name of a Braſilian ſpecies of duck, much valued there at table. It is of the ſhape of our duck. Its head is grey, but has a beautiful red ſpot on each ſide, at the inſertion of the beak, and a whiteneſs in the lower part under the eyes. Its breaſt and belly are of the colour of freſh cut oak, variegated with black ſpots. Its legs and feet are black. Its tail grey; and its wings elegantly variegated with grey and brown; but they have in the middle a large mixture of that gloſſy green which we ſee in the necks of our drakes. There is, beſide this, another ſpecies of the *Mareca*, which is of a duſky olive-colour'd brown on the back, white on the throat, and grey on the breaſt and belly, and very remarkable for the fine bright red colour of its feet. *Marggrave*, Hiſt. Braſil.

MARENA, in zoology, the name of a fiſh of the harengiform kind, much approaching to the nature of the common pilchard; but differing from it in that it has not the ſerrated longitudinal line under the belly, and lives in lakes, not in the ocean. It ſeldom arrives to more than five inches in length; its back is blackiſh, and its ſides white and ſilvery, and its ſcales are very looſe, and eaſily rubbed off. It is a better taſted fiſh than the pilchard, and its fleſh is firmer. *Willughby*, Hiſt. Piſc. p. 229.

MARGA, *Marle*. See the article MARLE.

MARGEN, in the materia medica, a name uſed by ſome of the later Greek writers to expreſs red coral. It is founded on an error, however, the word *Margen* being made from the Arabian *margian*, which does not ſignify coral, but a purple ſea wrack, or fucus, uſed in dying. See the article MARGIAN.

MARGENSTEIN, in natural hiſtory, a name given by the German writers to a ſort of indurated marle, which while in the ſtrata is nearly of the hardneſs of ſtone; but when laid on the ſurface of the earth, and expoſed to the wind and rain, ſoon diſſolves, and enters the pores of the ground, enriching the ſoil to a very great degree. We have the ſame ſort of ſtony marle in ſome parts of England, only that ours is leſs hard, and yet takes more time to break and diſſolve in the air. They are both moſt proper for lands of a looſe loamy nature, and keep them in heart a long time. *Swedenborg*, de Rebus Natural.

MARGGRAVIA, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium is compoſed of ſix ſcales, diſpoſed in oppoſite pairs, and the ſmaller placed below the others. The flower is very ſingular, it conſiſts of one petal, and is of a conic oval form, every where whole and perfectly cloſed at the mouth; this never opens, but, when it has ſtood a ſmall time, is thruſt off at the baſe by the other parts of the fructification. The ſtamina are numerous, ſhort, and expanded filaments; the antheræ are large, erect, and of an oval figure; the germen of the piſtil is oval; there is no ſtyle, and the ſtigma is obſolete. The fruit is a globoſe berry, having only one cell, in which there are numerous very ſmall ſeeds. Beſide the flowers there is ſomething very ſingular in the umbels of this plant: In the middle of theſe there ſtand a number of oblong ſeſſile bodies of a wonderful figure; they are compoſed of one leaf with an open mouth, and are bent downwards, and open at the baſe. Theſe are not flowers, but mere excretory glands for the plant, thus oddly ſituated. *Linnæi* Gen. Plant. p. 282. *Plumier* Gen. p. 29.

MARGIAN, in botany, a name given by ſome of the antient writers, particularly the Arabian phyſicians, to the plant called by others *argina* or *arginem*. This is deſcribed to be a purple ſea plant. Some have ſuppoſed that cochineal was meant by this word, but that is an error. Others have come ſomewhat nearer, in ſuppoſing it to be the name of coral; but as the antients have ſaid that it was uſed in dying, it could not be coral; and indeed there is no other plant that it can mean, but that fucus uſed by the Greeks in dying, and called *fucus porphyrizon*, or the purple dying ſea plant. See the articles ARGINA and FUCUS.

MARIGOLD, in botany. See the article MARYGOLD.

MARQUES *de Ladre*, in the manege. See the article DULL.

MARINE-*Barometer*. See the article BAROMETER, *Cycl.*

MARINE *Remains*, a term uſed by many authors to expreſs the ſhells of ſea fiſhes, and parts of cruſtaceous and other ſea animals, found in digging at great depths in the earth, or on the tops of high mountains. Their being lodged in theſe places, is an evident and unqueſtionable proof of the ſeas having once been there, ſince it muſt have covered thoſe places where it has left its productions.

It has been a favourite ſyſtem with many, and particularly with the late Dr. Woodward, that all theſe marine bodies were brought to the places where they now lie, by the waters of the univerſal deluge; which, as we are informed by holy writ, covered the whole ſurface of the globe, and even the higheſt mountains. But though this is a very ready expedient to account for many of the natural phænomena, yet there are evident proofs that it cannot have been the cauſe of all that is attributed to it; and there muſt neceſſarily have been ſome other cauſe of many of theſe remains having been placed where we now find them. Neither does the opinion of ſome particular authors, that partial inundations of different places have left theſe *marine* bodies behind them at the receſs of the waters, ſeem ſufficient to account for the multitudes of theſe remains, many of which we find thrown upon places inacceſſible to ſuch floods. *Moro* de Cruſtaceis in Montib. deprehenſ.

Signior Moro has attempted to account for theſe phænomena on a new plan of reaſoning. He obſerves, that it is the beſt baſis of argument to begin from facts; and that if we can certainly find how ſome part of theſe animal remains come to be depoſited at ſuch great diſtances from their natural reſidence, we may very rationally conclude, that by the ſame means, be they what they will, all the reſt were alſo brought thither. He adds, that the earth, once the bottom of the ſea, or the level ſurface of a plain, may be, and frequently has been, in the memory of man, raiſed up into a mountain by ſubterranean fires, earthquakes, and volcanos. He mentions the famous inſtance of the new iſland raiſed out of the bottom of the ſea near Santorini in the year 1707, which became of a circumference not leſs than ſix miles, and of the new mountain raiſed near Puzzoli in 1538.

Theſe and many other like facts, prove that the origin of mountains and iſlands may have been ſuch, and that the matter they conſiſt of may have been the ſame with what was once the bottom of the ſea; and that the *marine* bodies found in theſe mountains, were ſuch as were living, or remaining of living fiſh at the time when the iſlands or mountains were ſo raiſed above the ſurface of the water which before covered it.

This is no new opinion; but this author has ſet it in a new and much ſtronger light than it ever had appeared in before, by the inſtances and examples he has brought in proof of it.

Some have been fond of believing that the bodies we call *marine remains*, were never indeed any parts of living animals, but that they are mere *luſus naturæ* formed in the places where they are found; but Fabius Columna proved this to be an error, ſhewing that the ſhark's teeth, or gloſſopetræ of the iſland of Malta, when calcined by a ſtrong fire, yielded aſhes, the ſame with thoſe from animal bodies, and by no means of the ſame nature with thoſe produced from calcined ſtones.

That changes of parts of the bottom of the ſea into dry land, have often been made, is proved not only from the late known inſtances, but from the teſtimonies of Strabo, Pliny, and other writers of credit: And nothing is more obvious to reaſon, than that in the ſudden riſe of ſuch parts of the bottom of the ſea, all its contents, all the ſhells, and other hard parts of fiſhes lying there, would be carried up with it.

As ſome mountains and ſome iſlands muſt have certainly been produced in this manner, it is not impoſſible but that all of them may have been ſo; and there is no more than this required to account clearly and evidently for all the vaſt profuſion of *marine* bodies at land as we find them, without having recourſe to the improbable means of the univerſal deluge, which for many plain reaſons cannot have been the cauſe; or to the effects of particular inundations, which muſt have been wholly incapable of lodging many of them there. The lodgment of ſhells in the ſolid ſtrata of mountains, is better accounted for by this ſyſtem of Signior Moro than any other: And if it be aſked why ſome mountains afford them in great plenty, and others not at all, it will not be difficult to anſwer, by obſerving, that among the mountains of the more known parts of the world, ſome conſiſt of more ſolid rock, and others of various ſtrata of earthy and other matter; that the firſt of theſe may be ſuppoſed primary or natural mountains, and the others ſecondary or accidental ones; and that theſe *marine remains* are always wanting in the former, and uſually are found in the latter, which is a fact greatly favourable to this ſyſtem.

There are many difficulties attending the accounts of all authors of the formation of the earth, and the lodging theſe bodies in it; nor is this laſt ſyſtem without difficulty. The cauſes here aſſigned as to the origin of mountains and iſlands, doubtleſs have been ſo in regard to ſome, but ſcarce to all; and the bodies here treated of are ſo numerous, in ſome particular places, that ſcarce any account can ſolve the difficulty of their being collected together in ſo ſtrange a manner.

MARINE *Salt*. See the article SALT.

MARINELLA, in botany, a name by which ſome authors have called the great *plu*, or garden valerian. *Ger.* Emac. Ind. 2.

MARINER, the ſame with ſeaman or ſailor. See the article SAILOR, *Cycl.*

MARINERS-*Compaſs*. See the article COMPASS, *Cycl.*

MARIO, in ichthyology, a name given by Pliny, and other of the old Roman authors, to a large fiſh allied to the accipenſer or ſturgeon. There ſeems, from all that they have ſaid of it, great reaſon to believe that it was the fiſh we at preſent call *huſo*, or the ichthyocolla fiſh, from iſinglaſs made of it. Artedi makes this a ſpecies of the accipenſer or ſturgeon, and diſtinguiſhes it by the name of the accipenſer without tubercles. See the article ACCIPENSER.

MARJORAM, in botany. See the articles MAJORANA and ORIGANUM.

MARIS, in ichthyology, a name given by Charleton and ſome others, to a fiſh called, by the generality of both the antient and modern writers, *ſmaris*, and by ſome *leucomenides*, from its whitiſh colour, and its external reſemblance to the fiſh called *mænis* and *mæna*; it is, like that fiſh, a ſpecies of the ſparus; and is diſtinguiſhed by having a black ſpot on each ſide, and the tail and belly fins red.

MARISCA, a word uſed by chirurgical writers to expreſs an excreſcence about the anus.

MARITACACA, in zoology, the name of a very remarkable American animal, more uſually known by the name of the opoſſum. See the article OPOSSUM.

MARITUS, in the chemical jargon, a word uſed to expreſs the ſulphur of metals. The writers on the ſubject of the philoſophers ſtone uſually expreſs themſelves in this enigmatical manner, calling ſulphur the huſband, and mercury the wife in all metals; which, as they are more or leſs perfectly combined, make the metal more or leſs pure, and approaching to perfection.

MARK, (*Cycl.*) at ſea, the ſame with *land-mark*. See the article LAND-*Mark*.

MARK, in the manege. A horſe *marks*, that is, he ſhews his age by a black ſpot, called the bud or eye of a bean, which appears when he is five and an half, in the cavity of the corner teeth, and is gone when the horſe is eight years old. After that age he ceaſes to *mark*, and is ſaid to have razed. See the article EYE *of a Bean*.

Falſe-MARKED is the ſame with *counter-marked*.

MARK, among bowlers. See the article BOWLING.

MARLE (*Cycl.*)—The *Marles* in the northern parts of England contain ſand, and run into a ſort of loam: Thoſe in Suſſex are more like fullers earth, and therefore are by much the fatteſt and richeſt.

Marle, in general, is much of the nature of chalk, and the potters find, that when either chalk or *Marle* happen to be mixed with their clay, they will burn with the reſt of the ſubſtance, and the veſſels will ſeem very ſound; but as ſoon as any water is put in them, they will run, the chalk or *Marle* having been burnt into a ſort of lime, and ſlaking like common lime with the water.

The *Marles* that are ſo ſandy, that they can ſcarce hold together, are a very good manure for cold clay lands, and are an objection to the general rule, that *Marle* is not to be uſed to clay. *Marle*, in general, ſuits beſt with hot lands, for it is apt to bind and ſadden the tough clays; but as there are no rules without their exceptions, where *Marle* is not laid too thick, and is not of too binding a kind, it will often very much improve paſture grounds, though they are upon a clayey ſoil.

Cowſhut or ſtone *Marle* is, in moſt countries, found under clay, or low black land, eight or ten foot deep; clay and ſteel *Marle* ſometimes under ſandy land: In clayey ground it ſeldom lies more than three foot deep; but in ſandy ones it is often much deeper. The Suſſex *Marle* commonly ſhews itſelf pretty low among the broken ſtrata of hanging grounds.

For the digging of *Marle* they commonly uſe pick-axes, ſhovels, ſpades, and wheel-barrows; and where the pit is broad, that they can make an eaſy aſcent, ſmall carts of four foot ten inches long, and two foot three inches wide, and about fourteen inches deep, made ſo that a load is very eaſily ſhot out of them.

Marle is ſuppoſed to be fruitful from its ſalt and oily quality: The ſalt it is ſuppoſed to contract from the air, and therefore many are of opinion, that the longer it is expoſed to the air before it is uſed, the better. They lay it upon the graſs ground, in ſome places, three or four years before they plow it up; and when they cover the arable lands with *Marle*, they will not plow, in many places, to more than an inch deep, that they may not bury it. Markham, indeed, is of a contrary opinion, and would have it buried deep, that the ſun may not draw out its virtue. The *Marles* of different places are in themſelves ſo different, that both theſe opinions ſeem right in part; the *Marles* of Suſſex being found to ſucceed beſt where buried deep, as ſoon as taken from the pit; and thoſe of the north of England ſeldom doing much good to the lands, unleſs they are expoſed a long time firſt.

The experience of the farmers in different places has ſhewn alſo, that different times are to be obſerved for the laying it on, according to its nature and that of the land to be improved by it. In Suſſex they always lay on the *Marle* in the beginning of winter; and in Staffordſhire in May and June. Good *Marle* will ſlake like lime with the ſun's heat in a hot day, eſpecially if there has happened any rain. Some farmers harrow in the *Marle*, juſt before they plow the land, which is a very good way to mix it perfectly. Cole ſeed, clover, and all kinds of hay plants, grow well upon marled lands. Lands ſeated on *Marle* are uſually very rich, tho' in their own nature cold and heavy. The deeper theſe lands are turned up in plowing, the better crops they will always yield. *Mortimer*'s Huſbandry, p. 95.

It is a very material circumſtance in the marling of land, to find out how much the land requires of this manure; and till experience has thoroughly ſhewn this, it is better to err in laying on too little, than too much; becauſe the latter is a fault not to be remedied. It is to be obſerved alſo, that *Marle* never makes ſo great an improvement on land the firſt year, as it does afterwards.

In Staffordſhire they lay two hundred load of *Marle* upon an acre of land of the common kind; but where the ſoil is black, looſe, and ſandy, or full of worms, they will lay on three or four hundred load to an acre; it being a rule with them, that this ſort of ſoil cannot be marled too much. If the mould be thin, the leſs *Marle* does; if deep, it muſt have the more.

'Tis beſt ſowing of marled lands under furrow; becauſe if theſe lands are well huſbanded, they will be very mellow and hollow, which will occaſion the earth's ſinking from the roots of the corn, if it ſtand too high. If *Marle* ſaddens land, or makes it ſtiff or binding, it muſt be well dunged, and laid down for graſs. In Staffordſhire, after their land is marled, their way is to take the crops following. After the firſt crop of wheat is off, they plow in the wheat ſtubble in December, and if the weather proves froſty, to mellow it, they do not plow it again till April. They then ſow it with barley, allowing three buſhels of ſeed to an acre. The common produce of this is thirty buſhels. After this they ſow peaſe, for which they plow only once in the February following, allowing only three buſhels of ſeed to an acre, as in the barley. Next after this, if they intend ſix crops, they ſow wheat again upon the peaſe crop; the fifth crop is barley again; and the ſixth year's crop is red oats. Some ſow two or three crops more, when the ground has been well marled, but that is much better let alone.

In digging for the *Marle* they uſe in manuring their lands in Ireland, they meet with foſſile horns, and other curious foſſils. The *Marle* always lies in the bottoms of low bogs. It is never met with in any other places, and is found by boring with augurs made for that purpoſe. It uſually lies at five, ſeven, or nine foot depth. The obtaining it in many places is attended with very conſiderable expences, in draining off the water. The manner of digging it is this: They employ ſix able labourers, and a ſupernumerary; and theſe cut up a hole of twelve foot ſquare, which is ſuppoſed a pit that this number of men can manage in one day. Two men dig, two throw it up, and two throw it by, and the ſupernumerary man ſupplies defects on all occaſions. For the firſt three foot they dig through a fuzzy earth, fit for making of turf or fuel. Under this lies a ſtratum of gravel, of about half a foot. Under this often, for three foot more, there is a more kindly moſs, which would make better fuel. This lower ſtratum of turf is always full of foſſile wood, which is uſually ſo ſoft, that the ſpade cuts as eaſily through it, as through the earth it lies in. Under this, for about three inches, is found a ſeries of leaves, principally of the oak; theſe appear very fair to the eye, but fall to pieces on touching; and this ſtratum is ſometimes interrupted with vaſt heaps of ſeed, which ſeem to be broom or furz-ſeed. In ſome places there appear berries of different kinds; and in others, ſeveral ſpecies of ſea plants, all lying in the ſame confuſed manner as the oak leaves. Under this vegetable ſtratum, there lies one of blue clay, half a foot thick, and uſually full of ſea ſhells. This blue clay is not ſo tough as common clay, but is thrown carefully up, and uſed as *Marle* in ſome places. Under this always appears the right *Marle*; the ſtratum of this is uſually from two to four foot thick, and ſometimes much more. Phil. Tranſ. N°. 394. p. 122.

This *Marle* looks like buried lime, and is full of ſhells; which are uſually of a ſmall ſize, and of the perwinckle kind; but there are ſeveral other ſorts, at times, found among them. Among this *Marle*, and often at the very bottom of it, are found great numbers of very large horns of the deer kind, which are vulgarly called elks horns. Theſe, where they join to the head, are thick and round; and at that joining there grows out a branch, which is about a foot long, and ſeems to have hung juſt over the creature's eyes; it grows ſtill round for about a foot above this, and then ſpreads broad, and terminates in branches long and round, turning with a ſmall bind. The labourers are obliged to work in a hurry in all theſe pits, ſo that they ſeldom bring them out whole. There are alſo, at times, found the leg bones, and other parts of the ſkeletons of the ſame beaſts; but this more rarely, only a few together, and but in few places.

MARLE, in medicine, is eſteemed an aſtringent, and given as ſuch in diarrhœas, dyſenteries, and hæmorrhages; the red kind is preferred for the laſt intention, though the difference is hardly worth regarding. The Germans give it alſo in fevers, in convulſions, and particularly in epileptic caſes; alſo in internal bruiſes.

Dice MARLE, in husbandry, a name given by the people of Staffordshire to a reddish *Marle*, that breaks into small square pieces like dice, or else into thin flakes, in the manner of lead ore, and looks smooth on the surface. This is a good manure, and the way of judging which of it is best, is to expose it to the air in rainy weather, or to put it in water. That which moulders soonest to powder in the air, and breaks quickest in the water, is sure to be the best, and proves very beneficial to land.

MARLINE, aboard a ship, is a small line made of hemp untwisted, that it may be the more gentle and pliable: Its use is to seize the ends of ropes from farcing out. They use it also to seize the straps at the arse (as they call it) or lower end of the block.

MARLING *a Sail*, is when being so ript out of the bolt rope, that it cannot be sewed in again, the sail is fastened by a *Marline*, put through the eye-let holes, made in it for that purpose, unto the bolt rope.

MARMARYGÆ, a word used by the old writers in medicine to express sparks of fire, or the appearance of such flashing before the eyes in some disorders.

MARMORA, *Marbles*, in natural history. See the article MARBLE.

MARMORARIA, in botany, a name given by some authors to the *brancha ursina*,

MARMORATA *Aurium*, a term used by some authors to express ear-wax.

MARMORELLA, in botany, a name by which some authors have called agrimony. *Ger.* Emac. Ind. 2.

MARMOREUS *Tartarus*, a word used by some authors to express the hardest kind of the calculus, or stone in the human bladder. See the article STONE.

MARMOTTE, *Marmotta*, the mountain rat, a creature very common in many parts of Europe, and frequently carried about as a shew by the poor Savoyards. It is of the size of a leveret, or between that of the hare and the rabbit; and is larger bodied than a cat, but much shorter legged. Its whole figure and appearance are like the common rat, whence it has its name. Its furr is much harder or harsher than that of the rabbit, and its colour a reddish tawney, sometimes lighter, sometimes darker; the end of its tail is back. Its eyes are large and prominent, and its ears short, and seeming as if cut off. It has two large teeth at the front of each jaw, as the squirrel, and other creatures of this kind, and these are not white, but yellow, as in the beaver. Its nose and mouth are adorned with a large number of black whiskers, making a sort of beard. The tail is about five inches long, and the legs are thick, and these and the belly are covered with long hair. Its toes are dispos'd as in the bear, and its claws are very long and strong, by means of which it digs the earth very readily. It makes great use of its hinder legs, and sometimes walks on them in an erect posture. Its back always appears very fleshy and fat, tho' the rest of the body be ever so lean; but this is not real fat, but a provision made by nature to guard the animal from cold. *Ray*, Syn. Quad. p. 221.

They will play with one another in the manner of kittens, and make a soft and not disagreeable noise on those occasions; but when they are provoked, or when they are affected, as they always are by a change of weather, they make a very shrill and disagreeable squeaking. They feed on vegetables, and are very fond of the roots of several plants; they are very fond also of milk, butter, and cheese. They sit on their buttocks to eat, and use their fore-feet as hands to reach their food to their mouths, in the manner of the squirrel. They lie hid in the winter in holes which they dig in the earth, and sleep away a great part of that season. They make their holes in a very nice and artful manner, and make themselves a bed of straw, and other soft matters, that they may lie the softer and the warmer. It is a creature easily bred up tame, and will be perfectly good-humour'd and familiar, but it hates dogs.

Its legs are very robust and strong, and it digs extremely quick. It runs but slowly on even ground, so that a man may overtake it; but if it once gets into the earth, it is said, it will burrow faster than a man with a spade can dig after it to take it.

This animal, in Poland, is said to herd in large communities, and be governed by a regular policy, making war with parties of its own species from other places, and taking spies and slaves, and keeping them for the most servile uses; particularly in the carrying in their provision for the winter, which they lay on the bellies of these slaves, first laying them on their backs, and then drawing them along with the load, in manner of a cart or waggon.

MAROGUS, a word used by Paracelsus to express a very powerful narcotic.

MARQUE (*Cycl.*)—*Letters of* MARQUE. See the article PRIZE.

MARRIAGE (*Cycl.*)—The people in Java *marry* and have children at nine or ten years old, and the women leave childbearing before they are thirty; and at Tunquin there are women common to any that will hire them, at eight or nine years of age.

Potter gives a large account of the several ceremonies observed by the Greeks in their *Marriages*. The Spartans were not permitted to *marry* till they arrived at their full strength. The reason assigned for this custom by Lycurgus, was, that the Spartan children might be strong and vigorous: And the Athenian laws are said to have once ordered, that men should not *marry* till thirty-five years of age. *Potter*, Archæol. Græc. l. 4. c. 11. T. 2. p. 263. seq.

Most of the Grecian states, especially such as made any figure, required their citizens should match with none but citizens. The usual ceremonies in promising fidelity was kissing each other, or giving their right hands, which was a general form of ratifying all agreements. Before the *Marriage* could be solemnized, the gods were to be consulted, and their assistance implored by prayers and sacrifices, which were offered to some of the deities that superintended these affairs, by the parents, or neareſt relations of the persons to be married. When the victim was opened, the gall was taken out and thrown behind the altar, as being the seat of anger and malice, and therefore the aversion of all the deities who had the care of love, as well as those who became their votaries. For the particularities relating to the bride and bridegroom, see the articles BRIDE and BRIDEGROOM.

The ceremonies of the Spartan *Marriages* being different from all others, deserve to be mentioned at length, as related by Plutarch. "When the Spartans had a mind to marry, "their courtship was a sort of rape upon the persons they had "a fancy for; and those they chose not tender and half-"children, but in the flower of their age, and full ripe for a "husband. Matters being agreed between them, the Νυμ-"φευτρία, or woman that contrived and managed the plot, "shaved off the bride's hair close to her skin, dressed her up "in man's cloaths, and left her upon a mattress: This "done, the bridegroom entered in his common cloaths, "sober and composed, as having supped at his ordinary in "the common hall, and stole as privately as he could into "the room where the bride lay, untied her virgin girdle, and "took her into his embraces. Having stayed a short time "with her, he returned to his comrades, with whom "he continued to spend his life, remaining with them "as well by night as by day, unless when he stole a short "visit to his bride; and that could not be done without a "great deal of circumspection, and fear of being discovered: "Nor was she wanting (as may be supposed) on her part, to "use her wit in watching the most favourable opportuni-"ties for their meeting, and making appointments when "company was out of the way. In this manner they lived "a long time, insomuch that they frequently had children by "their wives before they saw their faces by day-light. The "interview being thus difficult and rare, served not only for "a continual exercise of their temperance, and furthered "very much the ends and intentions of *Marriage*; but was "a means to keep their passion still alive, which flags and "decays, and dies at last by too easy access, and long conti-"nuance with the beloved object." *Potter*, Archæol. loc. cit. p. 295. seq.

According to Mr. Kersseboom's observations, there are about 325 children born from 100 *Marriages*. See Phil. Trans. N°. 468. Sect. 3.

Mr. Kersseboom, from his observations, estimates the duration of *Marriages*, one with another, as in the following table.

Those whose ages, taken together, make

40	live together between 24 and	25 years.
50	22	23
60	23	21
70	19	20
80	17	18
90	14	15
100	12	13

Phil. Trans. N°. 468. Sect. 3. p. 319.

MARROW (*Cycl.*)—The greatest part of the bones contain, in their large cavities or cells, this unctuous soft substance, which is more solid in some, and more soft in others. This, while it lies in the cavities of the large bones, is more particularly called *Marrow*; when dispersed in the small cellulous cavities, it is commonly called the medullary juice. The *Marrow* of the large hollow bones is a mass composed of an infinity of small vesicles, or membranous cells, joined together, and communicating with each other, furnished with blood-vessels and nerves, and filled with a fine sweet oily matter. All these cells are surrounded by a fine membrane, which, like an internal periosteum, sticks close to the inner surface of the bone, by means of an infinite number of capillary vessels, and of several other kinds of very small filaments. The reticular substance of the bones runs through this medullary mass, and, as it were, interlards it, and by this means sustains it in the middle of the great cavities. The *Marrow* of the cellulous or cavernous substance of the bones, is divided by small bony septa or plates, and by filaments of the reticular substance of the bones into a vast number of vesicles or membranous cells, which line the bony cells, and communicate with each other.

This cellular *Marrow* in the cavernous texture of some bones, differs from that in the great cavities of others both in colour and consistence. It is liquid, and of a red colour throughout; whereas

whereas the other is more ſolid, and is only red on its ſurface. This difference is owing to the blood-veſſels which run thro' each membranous cell, whereas the *Marrow* in the great cavities ſeems to be furniſhed with them in the common membrane only. Many of thoſe medullary cells are likewiſe divided by the bony filaments of the cavernous ſubſtance; and theſe ſmall filaments, as well as thoſe of the reticular texture, are covered by portions of the medullary membrane, as by a perioſteum.

The medullary membranes may be ſeparated from the liquor which they contain, by ſteeping the whole maſs in very hot water, and afterwards compreſſing it by gentle degrees. But it is to both theſe ſubſtances, taken together, that the anatomiſts give the common name of *Marrow*, not to either of them taken ſingly. The medullary membrane is very ſenſible, but not the juice, which is neceſſary to be obſerved, to underſtand properly what is meant by the ſenſibility of the *Marrow*. The *Marrow*, by its liquid and unctuous part, renders the bones in ſome meaſure pliable, and leſs brittle, as it continually pervades their ſubſtance in ſmall degrees: This continues to old age, and then the bones, being deprived of their *Marrow*, become very brittle.

In the bones of the oſſa innominata, there are no internal large cavities; but their ſubſtance being cellulous or cavernous, they contain no medullary maſs, but their cells are all moiſtened with a medullary juice, which diſtils inceſſantly through the membrane with which they are lined. In the os femoris the *marrow* lies in a large maſs, in the middle cavity of the bone, and in ſmall diſtinct cluſters in the cells of each extremity. The firſt is penetrated at different diſtances by the bony filaments, and is thereby ſuſtained in all violent motions and ſhocks, as running, leaping, and the like. In the bones of the leg the diſpoſition is exactly the ſame; and in the bones of the foot, the *Marrow* is ſuitable to their internal ſtructure, and is lodged in moleculæ, in the cavernous portions, and in maſſes in thoſe which have cavities to receive them. Thus the *Marrow* of all the tarſal bones is diſperſed in moleculæ, becauſe their internal ſtructure is ſpongy. In the metatarſal bones, and firſt phalanges of the toes, it is diſpoſed in the ſame manner as in the tibia and fibula, that is, it lies in moleculæ in the extremities, and in their middles in greater or leſſer maſſes, according to the ſizes of the cavities. In the other phalanges, which are entirely ſpongy, it is accordingly diſpoſed in moleculæ. In the vertebræ, ſternum, and ribs, the internal ſtructure of all which is cellular and ſpongy, the *Marrow* is contained only in ſmall ſeparate portions, and is no other than a red medullary juice. The bones of the head alſo being in like manner cellular in their internal ſtructure, contain alſo their *Marrow*, in like manner, in diſtinct portions, and lying in membranous cells in the diploe. *Winſlow*'s Anatomy, p. 118, 136, 150, 152.

The tranſpiration of the unctuous matter of the *Marrow* is not confined to the time of the animal's life, it is even carried on in the dead carcaſs, and is one great obſtacle to the whitening and cleaning the bones in a ſkeleton; for if there be not an opening made at one end of a bone, and the *Marrow* waſhed out of the whole bone at this aperture, by means of proper liquors injected with a ſyringe, the bone, though made ever ſo white at firſt, will certainly turn yellow afterwards, by this tranſpiration of the *Marrow* contained within it, which certainly happens on the leaſt heat of the weather, or otherwiſe. For this reaſon it is alſo, that the workmen who uſe bones always cut them longitudinally in two, and take out all the *Marrow*, and even all the ſpongy ſubſtance of the bone, which might be ſuppoſed to contain it, otherwiſe they know that the heat of any one's hand will turn their works yellow, tho' ever ſo white when firſt made. It is to be obſerved, that there are in the hollow bones ſeveral ſmall apertures thro' which there paſs blood-veſſels, which go from the membrane encloſing the *Marrow*; whence it appears that the bones are indeed nouriſhed from within as well as from without, though that be not by the *Marrow*, but by the blood-veſſels only: Thus the two tables of the ſkull are evidently nouriſhed; the external one by the veſſels of the pericranium, and the interior by the branches of thoſe veſſels which are ſpread along the *dura mater*.

It has been ſuppoſed that the quantity of *Marrow* increaſed in the bones according the increaſe of the moon; but this has been found a wholly erroneous opinion, the increaſe of the *Marrow* in all the bones depending on the quantity of nouriſhment, and the ſtate of reſt which the creature is allowed.

The ſenſation of the *Marrow* has been a point very variouſly ſpoken of. When a limb has been taken off, and the *Marrow* is left bare, if any thing touch it roughly, the patient feels an exquiſite pain. Some had ſuppoſed that this ſenſation might rather ariſe from the membranes, than from the ſubſtance of the *Marrow*: This, however, was put beyond all doubt by a curious, tho' very cruel operation, performed before the Paris academy. A living animal had its leg taken off before the academy, and the end of the bone left very bare, the membranes were all carefully removed, to the exquiſite pain and torture of the creature; and when the pain of this was over, the end of a ſtyle was plunged into the *Marrow*, without touching any other part whatever, and the creature, on this, expreſſed as violent a ſenſation of pain as from any of the former operations: This was repeated ſeveral times, and always with the ſame event; ſo that it is very evident that the *Marrow* is, in its natural ſtate, highly ſenſible of pain; and how much more may it be ſo in diſtempered bodies! Mem. Acad. Par. 1700.

The antients ſuppoſed that the *Marrow* ſerved for the nouriſhment of the bones; and their reaſons for believing it were, that they ſaw no blood-veſſels enter the ſubſtance of the bones, by which they could be nouriſhed, all the veſſels of that kind, which they could diſcover, going directly into their cavities, where the blood they contained ſeemed to undergo a ſort of concoction, which converted it into *Marrow*, and by that means rendered it fit nutriment for the bones; and they obſerved, in proof of this, that the longer any bone was, and the more violent uſes it was intended for, the larger was its cavity for the containing this nutritious matter.

Theſe reaſons, though they carry a great ſhew of probability, yet are eaſily refuted by accurate obſervation. We ſee, in young ſubjects, a vaſt number of blood-veſſels diſtributed thro' the ſubſtance of the bones, the texture of which, at that time, is lax and ſpongy. It is alſo to be obſerved, that there are many bones in the human body, as well as in brutes, which, according to this ſyſtem, could not be nouriſhed at all, ſince they contain no *Marrow*. Of this kind alſo are the horns of deer, and many other creatures, which, tho' they contain no *Marrow*, yet grow very vigorouſly. There are alſe other bones which are hollow, yet are only cloathed with a glandulous membrane; ſuch are the cavities between ſeveral parts of the two tables of the ſkull: And in the elephant, the foliaceous bones, which are in the place of the diploe, contain no *Marrow*, and are only covered with a membrane, which has ſeveral blood-veſſels ſcattered through it. The hollows of thoſe bony ſubſtances alſo which compoſe the claws of crabs, lobſters, and the like, contain no *Marrow*, but only the muſcles, whoſe office it is to move thoſe parts; and yet all theſe grow, and are nouriſhed, as well as thoſe bones which contain ever ſo much *Marrow* in their cavities. In fine, it may be well concluded, that it is not for the ſake of containing *Marrow*, that the bones are made hollow, but merely that they may be lighter, and more fit for motion. Mem. Acad. Par. 1700.

Obſervation gives abundant proofs, that a great quantity of the *Marrow* continually tranſpires through the ſolid ſubſtance of the bones, and in this action it is of great uſe, though not in the nouriſhing, yet in the preſerving the bones, its oily and unctuous matter ſoftening the rigid fibres of which the bone is compoſed, and rendering them more ſupple, ſoft, and flexile, and conſequently the whole bone much leſs liable to break.

MARRUBIASTRUM, baſtard *Horehound*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is of the labiated kind. The upper lip is hollowed in the manner of a ſpoon, and the lower is lightly divided into three ſegments. The piſtil ariſes from the cup, and is fixed, in the manner of a nail, into the hinder part of the flower. It is ſurrounded alſo by four embryos, which afterwards become as many ſeeds of a roundiſh ſhape, ripening in a ſort of open caſe, which was the cup of the flower. There is, beſide theſe marks, alſo a peculiar face in the flower of this plant, by which it is, at ſight, diſtinguiſhed from the galeopſis.

The ſpecies of *Marrubiaſtrum*, enumerated by Mr. Tournefort, are theſe: 1. The common *Marrubiaſtrum*, called by ſome, the Germander-leav'd Ironwort, or Sideritis. 2. The marſh ſtinking *Marrubiaſtrum*. 3. The white-flowered ſideritis-leav'd *Marrubiaſtrum*, with prickly flower-cups. 4. The ſideritis-leav'd *Marrubiaſtrum*, with prickly cups, and yellow flowers, with edges of a blackiſh purple. 5. The motherwort-leav'd *Marrubiaſtrum*. 6. The American *Marrubiaſtrum*, with the flowers collected into heads, and with a ſweet ſmell like that of baum. *Tourn.* Inſt. p. 190.

MARRUBIUM, *Horehound*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is of the labiated kind; the upper lip ſtands erect, and is divided into two horns; the lower is divided into three ſegments. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower. It is ſurrounded by four embryos, which afterwards become four oblong ſeeds, and are contained in a ſort of open capſule, which was before the cup of the flower. *Tourn.* Inſt. p. 192. The ſpecies of *Horehound*, enumerated by authors, are theſe: 1. The common white *Horehound*. 2. The hairy white *Horehound*. 3. The broad and roundiſh-leav'd exotic *Horehound*. 4. The ſhort-leav'd white *Horehound*. 5. The narrow-leav'd white *Horehound*. 6. The procumbent Spaniſh *Horehound*, with ſtellated and prickly flower-cups. 7. The procumbent Spaniſh *Horehound*, with ſilky and ſilvery leaves. 8. The ſtinking *Horehound*, as we call it, is the *ballote*, a different genus of plants; and the water *Horehound*, which is the *lycopus*, is alſo to be ſeen under its proper head.

Marrubium is ſaid to be an attenuant and reſolvent; it is famous for the relief it gives in moiſt aſthmas, and in all diſ-

eaſes

eaſes of the breaſt and lungs, in which a thick and viſcous matter is the cauſe. It is alſo capable of doing great good in many chronic complaints, where the cauſe is of the ſame kind. At preſent, however, it is very little uſed in the ſhops. There uſed to be a compound ſyrup of it, which is now out of uſe. See the article ASTHMA.

MARSHMALLOW, *Althæa*, in botany, the name of a genus of plants, the characters of which are the ſame with thoſe of the mallow, excepting that this has hairy or hoary leaves. See the article MALLOW.

The ſpecies of *Althæa* or *Marſhmallow*, enumerated by Mr. Tournefort, are theſe: 1. The common *Marſhmallow*, the *Althæa* of all the old medicinal writers. 2. The angular-leav'd *Marſhmallow*. 3. The rounder-leav'd *Marſhmallow*. 4. The ſhort blunt-leav'd *Marſhmallow*. 5. The round-leav'd hoary ſhrubby *Marſhmallow*. 6. The great-flowered *Marſhmallow*. 7. The ſharp-pointed-leav'd tree *Marſhmallow*, with ſmaller flowers. 8. The round-leav'd Spaniſh tree *Marſhmallow*. 9. The Portugal tree *Marſhmallow*, with round undulated leaves. 10. The larger-leav'd leſs hairy Portugal tree *Marſhmallow*. 11. The Venetian ſea tree *Marſhmallow*, the common *malva arborea* of authors. 12. The French tree ſea *Marſhmallow*. And 13. The Spaniſh *Marſhmallow*, with undulated leaves. *Tourn.* Inſt. p. 97.

The parts of *Althæa*, uſed in medicine, are the leaves and roots. The leaves, by decoction, afford a ſoft mucilaginous ſubſtance, good in all complaints ariſing from acrimony; of great ſervice in dyſenteries, &c. where the *mucus* of the inteſtines is raked off, and in many kinds of colics. It is alſo found of uſe in obſtructions of the urinary paſſages, ſtranguries, heat of urine, &c. and is, by ſome, held a great ſecret for the cure of a *gonorrhœa*. Ray and others alſo ſpeak of it as a pectoral; of uſe in coughs, and alſo pleuriſies.

Marſhmallow root is a very valuable medicine. It is emollient and diuretic, and gives great relief in diſorders of the kidneys and bladder, whether ariſing from acrimony of the urine or gravel. It is good alſo in all diſorders of the breaſt and lungs, ariſing from a thin acrimonious phlegm. In both which caſes, a decoction of the freſh root is the beſt way of giving it. In diarrhœas and dyſenteries, a ſtrong decoction of *Marſhmallow*-root, given clyſterwiſe, is alſo of great uſe. Externally, in form of a cataplaſm, it is excellent for ſoftening and maturating hard tumours.

The ſyrup of *Marſhmallows*, is leſs efficacious than the decoction; on account of the ſugar in the former, which makes an improper mixture with medicines of the mucilaginous kind.

Ointment of *Marſhmallows*, called *Unguentum Dialthææ*, is applied to tumours and inflammations, as an emollient and ſuppurative; which qualities it derives from the mucilage of the plant, being boiled a long time with the oil, before any of the other ingredients are mixed.

The *Emplaſtrum Diachylon* receives much of its virtue from the ſame plant.

The *Althæa* of the antients was plainly a different plant from that which we call by that name. Our *Althæa*, or *Marſhmallow*, is a very common plant, and grows in watery places, principally near the ſea; but the *Althæa* of the antients was a ſcarce herb, and grew in the barren deſarts of Arabia, Aſia, and the iſland of Sicily. Theophraſtus ſays it was found in no other place. The Arcadians called it, the *wild Mallow*; and only the people who uſed it in medicine called it *Althæa*. Theophraſtus gives us this account of it, and adds, that its flowers are yellow; a circumſtance in which it wholly differs from any of the accounts of later authors of the *Marſhmallow*. and from the plant itſelf, which we know by this name, its flowers being white. Dioſcorides gives the ſame account of the colour of the flower, and adds, that it was like a roſe in ſhape: And other authors ſay, that its flower was like a roſe, but do not mention whether that likeneſs conſiſted in the ſhape or colour. Others have recorded the likneſs of a roſe, and applied it to the colour of this flower, calling it a little flower, of the pale colour of a roſe. Theſe authors may, probably, have adapted the deſcriptions of the antients, in the caſe of the roſe-like flower, to the common *Marſhmallow* of our times; but the deſcriptions, as we find them in the antients, ſeem rather to refer us to the *Abutilon*, or yellow *Mallow* kind, than to our own *Althæa*. *Theophraſt.* l. 9. c. 15. See the article ABUTILON.

MARSHY *Lands*, a name given by our farmers to a ſort of paſture land, or grazing ground, which lies near the ſea, rivers, or fens.

As to lands lying near rivers, the great improvement of them is their being overflowed, which brings the ſoil of the uplands upon them, ſo that they need no other mending, though kept conſtantly mowed. The great inconveniency of theſe lands, is their being ſubject to floods, which high hills near the ſides of rivers, and the long courſe of them, beſpeak to be frequent. And though the richeſt land generally lies near ſuch rivers, yet there is the greateſt danger of the crops being ſpoiled, eſpecially when they are not encloſed; and therefore cannot be fed with cattle. This, when feeding bears any thing of a price, would be the very beſt way of managing theſe uncertain lands; and encloſing them would be highly beneficial, on this account. *Mortimer*'s Huſbandry.

The *Marſh*-lands in Lincolnſhire, and many other parts of England, produce a ſort of graſs, which feeds ſheep in a better manner than that of almoſt any other land, in regard to their ſize, and the quantity of wool. The ſheep about Grimſby, and ſome other places in this county, produce ſuch luſty wool, or, as they call it, wool of ſo large a ſtaple, that three or four fleeces uſually make a tod of twenty-eight pound weight. Several hundred loads of this wool are yearly carried from theſe places to Norfolk, Suffolk, and other parts of the kingdom, for the cloth manufacturers. They ſend this in large packs, which they call pockets, each containing about five and twenty hundred weight. Phil. Tranſ. N°. 223.

When *Marſh*-lands lie flat, it is neceſſary for the owner to keep all the water he can from them. The ſea water, in particular, is to be kept from them as much as poſſible; and this is uſually done at a very great expence, by high banks and walls.

Two things greatly wanting in theſe lands in general, are good ſhelter for the cattle, and freſh water. The careful farmer may, however, in a great meaſure, obviate theſe, by digging, in proper places, large ponds to receive the rain water, and by planting trees and hedges in certain places toward the ſea, where they may not only afford ſhelter to the cattle, but keep off the ſea breezes, which often will cut off the tops of all the graſs in theſe places, and make it look as if it had been mowed.

Theſe lands fatten cattle the ſooneſt of any, and they preſerve ſheep from the rot. It would be a great advantage to them, if there were raiſed, in the middle of every large *Marſh*, banks of earth in a croſs, or in the form of two ſemicircles, and theſe planted with trees; theſe would ſerve as a ſhelter for cattle, let the wind blow from what quarter it would, and would ſoon repay the expence of making. *Mortimer*'s Huſbandry.

There are, in different parts of England, very large quantities of land upon the ſea coaſts that would be worth taking in, though no one has yet thought of doing it. The coaſts about Boſton, Spalding, and many other parts of Lincolnſhire, give frequent inſtances of this, where the ſea falls from the land, ſo that on the outſide of the ſea walls, on the owſe, where every tide the ſalt water comes, there grows a great deal of good graſs, and the owſe is firm to ride upon when the water is upon it.

This owſe, when taken in, hardly ſinks any thing at all, and they dig the walls from the outſide of it, all the earth they are made of being taken from thence, and the ſea, in a few tides, filling it up again: And though the ſea, at high water, comes only to the foot of the bank, yet once in a year or two ſome extraordinary tides go over the banks, though they are ten foot high. Theſe banks are fifty foot broad at the bottom, and three foot at the top; and the common price of making them is twenty-ſix ſhillings a pole, the earth being all carried in wheel-barrows, and the face toward the ſea, where the greateſt ſlope is, being turfed. *Mortimer*'s Huſbandry.

MARSILÆA, in botany, the name by which Linnæus has called the pepper-graſs, called by the Engliſh botaniſts, *gramen piperinum*; by Vaillant and others, *pilularia*; and *ſalvinia* by Micheli. The characters are theſe: It is one of the *cryptogamia*, or thoſe plants which perform their fructification in ſecret. The male flowers are very numerous, and ſtand on the leaves without any pedicles. Theſe have no cup, but are each only a ſingle filament, or receptacle, of a hemiſpherico-convex form, with four pointed antheræ, which are long, erect, and ſpirally twiſted. The female part of the fructification has no cup or petals, but conſiſts of a round quadrilocular fruit, which contains a vaſt number of roundiſh ſeeds. *Linnæi* Gen. Plant. p. 508. *Micheli*, p. 58. *Vaill.* Bot. Par. 15. 6. See the article PILULARIA.

MARSUIN, in zoology, a name by which many have called the *phocæna* or *porpeſſe*, a fiſh too often confounded with the dolphin. *Willughby* Hiſt. Piſc. p. 31. See the articles DELPHINUS and PHOCÆNA.

MARSUPIALE, in natural hiſtory, a name given by Tyſon to the creature commonly called, the *poſſum*, or *opoſſum*. The peculiar diſtinction of this creature from all others, is its having a pouch, or *marſupium*, under its belly, into which it receives its young in time of danger. This has given occaſion to its name *Marſupiale*, but it is more generally called *opoſſum*. See the article OPOSSUM.

MARSUPIALIS *Muſculus*, in anatomy, a name given by Cowper, and ſome others, to a muſcle of the thigh, called alſo by ſome, *burſalis*. It is that muſcle, called by Albinus, Winſlow, and the generality of modern authors, *obturator internus*.

MARSUPIUM *Carneum*, in anatomy, a name given by Spigelius, Cowper, and ſome other authors, to certain muſcles of the thigh, called by the French writers, *les petits jumeaux*, and by Albinus, *gemini*. Veſalius does not eſteem them ſeparate muſcles, but calls them only *carneæ portiones decimo femur moventium muſculo attenſæ*, fleſhy portions affixed to the tenth muſcle of the thigh.

Riolan, who calls the *pyriformis*, or pyramidal muſcle of the thigh, the *quadrigeminus*, or *quadrigeminus prior*, calls theſe the *quadrigemini ſecundi & tertii*. They are ſometimes diſtinct, ſometimes they grow together.

MARTEAU, the name given by French naturaliſts to a peculiar ſpecies of oyſter, called alſo *malleum* by others. It is one of

of the moſt curious ſhells in the world. Its figure is that of a hammer, with a very long head, or rather of a pick-ax. It has a body of moderate thickneſs, and two long arms. It is of a browniſh colour, with a beautiful tinge of a violet blue. Notwithſtanding the ſtrange ſhape of theſe ſhells, they cloſe very exactly. See the article OSTREA.

MARTIALES *Flores*. See the article FLORES *Martiales*.

MARTES, the *Martin*, or *Martlet*, in the hiſtory of quadrupeds, the name of a creature of the weaſel kind, called alſo by ſome *Fogua*. There are two ſpecies of this creature, the one called the *Martes Abietum*, or fir *Martin*, the other the *Martes Fagorum*, or beech *Martin*. The beech *Martin* is diſtinguiſhed from the other by having a larger and blacker tail, and being all over of a darker colour, and by being white on the throat, whereas the others are yellow; but the ſpecies are ſcarce kept up diſtinct, the creatures mixing with one another in the breed. When diſtinct, the beech *Martin* is found to be a much tamer creature than the other, and may be kept about houſes like a cat; and often lives of its own accord about houſes, and among old walls. Their ſkins make a valuable furr; and that of the fir *Martin*, or yellow kind, is much the moſt valuable. *Ray*'s Syn. Quad.

The *Martin* is of the ſize of a cat, but longer bodied; its legs alſo are ſhorter, and its claws leſs ſharp, and ſhorter. Its whole body is covered with hair of a yellowiſh black, except only the throat, which, in the beech *Martin*, or tame kind, is white; and in the wild kind, or fir *Martin*, yellow. Its teeth are ſharp and ſtrong, and the dog-teeth, in particular, ſtand out a great way.

Geſner once kept one of the beech *Martins* tame like a dog, which would go out with him, and run about to the neighbours houſes, always returning carefully home again, and would play like a cat, lying on its back, and biting in jeſt, but never hurting any thing. *Geſner*, de Quad.

This creature leaves ſo ſtrong a ſcent, that the hounds, when out in a morning, will often take it, and make a noble cry. The chace, in this caſe, is very good while it laſts, but it is very perplexed; for the creature is not able to run long; and when ſhe is tired, ſhe gets up into a tree; the hounds often loſe her on this occaſion; but if ſhe is ſpied up in the tree, ſhe is to be hunted down with ſticks, *&c.* When killed, the hounds are not to be ſuffered to eat her fleſh, for it is unwholeſome. See Tab. of Quadrupeds, N°. 22.

MARTICHORA, in natural hiſtory, the name given by the antient Greeks to the animal which we call the *Mantichora* or *Man-tyger*. See the article MANTICHORA.

MARTIN, in zoology. See the article MARTES, ſupra.

MARTINAZZO, in zoology, the name of a ſpecies of water fowl, of the larus or gull kind, and called by the Dutch, the burgomaſter of Greenland; by the Corniſh people, the *waggell*, or the *great grey gull*. It is a large bird, uſually weighing a pound and half. It is all over of a mottled colour of brown, grey, and white; but is much darker on the back than on the belly. The back and wing feathers are all brown in the middle, and grey at the edges; but thoſe of the rump are moſtly white. They ſay that this gull will follow the ſmaller lari, and perſecute and terrify them till they void their food in excrements half digeſted, which he afterwards picks up, eſteeming it better than freſh food. *Ray*'s Ornithology, p. 266.

MARTINO *Peſcatore*, in ichthyology, a name given by Salvian, and ſome others, to the *Rana Piſcatrix* of authors; the *lophius* of Artedi. See the article LOPHIUS.

MARTIOBARBULI, among the Romans, a deſignation given to ſoldiers, who carried leaden balls to annoy the enemy with. *Pitiſc.* Lex. Ant. in voc.

MARTIORA, or MARTICORA, in natural hiſtory, the name which the antient Greeks gave to the animal which the Romans called *Mantichora*, and we, from a corruption of that word, the *man-tyger*. See the article MANTICHORA.

MARTIS *Arbor*. Beſide the common *Arbor Martis*, which is but a poor reſemblance of the *Arbor Dianæ*, Mr. Lemery has found a method of making a ſaline or vitriolic one, which is of greater beauty than any other metallic vegetation, and which differs from the generality of them, in that it is produced above the ſurface of the liquor, not under it, and buried in a fluid as they are. Mem. Acad. Par. 1707.

The method by which he firſt made this beautiful production was this: He diſſolved ſteel filings in ſpirit of nitre, and adding to the ſolution oil of tartar *per deliquium*, when the fermentation was over, there aroſe beautiful vegetations above the ſurface of the liquor, many of which expreſſed trees and plants, not only in their leaves and branches, but even in their roots, the ſmall fibres which repreſent them in this vegetation being truly hollow, and ſeeming to ſerve the office of roots in conveying up the fluid matter to the other parts, there to condenſe into leaves and branches.

In the making the ſolution of iron for this proceſs, there is always a great quantity of red vapours thrown up out of the mouth of the veſſel; if theſe are ſaved, by making the ſolution in a cucurbit, they are found to be a weak ſpirit of nitre, impregnated with the ſulphur of iron; and this ſpirit ſerves much better for the making this *Arbor Martis* than the plain ſpirit. Mr. Lemery obſerving this, diſtilled ſpirit of nitre on purpoſe for this uſe, from a ſolution of a large quantity of iron in the ſame ſpirit.

This new ſpirit evidently contained many of the ſulphureous particles of the iron, and produced infinitely more beautiful vegetations than the plain kind. Nor is it wonderful that it ſhould do ſo, ſince the ſucceſs of the proceſs ſeems wholly to depend on the quantity of the ſulphur of iron which is concerned in it. The ſolution of iron in ſpirit of nitre, whether the common kind, or this prepared on purpoſe for this vegetation, is of a reddiſh colour, and when the oil of tartar is mixed with it, the vegetation is more or leſs perfect according to the proportions, as will be learned by experiment, and very often the whole liquor, or nearly the whole, raiſes itſelf up to the top of the veſſel in form of beautiful branches. Mem. Acad. Par. 1707.

The oil of tartar, when firſt mixed with the ſolution, cauſes an effervеſcence, and when this is over, the liquor becomes quiet and clear again, but is of a deeper red colour than before. Soon after this the vegetations begin to form themſelves, by ſmall cryſtals, which appear upon the ſurface of the liquor. Theſe are extremely ſmall and ſlender, and they increaſe in length continually by the addition of others at their bottoms, thruſting them farther up, till at length they form threads or filaments, which ariſe out of the ſurface of the liliquor, and thence diverge and divaricate into all the beautiful variety of trees, buſhes, and herbs. Theſe nicely adhere to the internal ſurface of the glaſs, and, when they have riſen to its verge, fall over it, and run down the outſide in the ſame manner, ſo as beautifully to repreſent vines, ivy, or other creeping plants running along a wall. Many of the firſt formed filaments, in this caſe, encreaſe greatly in ſize, often becoming, at length, as thick as a writing quill; and theſe are always hollow within, and reſemble ſo many pipes. They are ſo arranged at the bottom of the glaſs, round the ſurface of the liquor, as to ſupport the reſt of the vegetations. The leaſt heat melts and deſtroys all theſe vegetations; barely touching them with the finger being ſufficient to reſolve them into the liquor from which they aroſe.

The eſſential ſubſtance of this beautiful vegetation is a mixture of iron with ſalt petre. The differences in the time and manner of the formation of the branches, does not depend wholly upon the different proportions of the liquors, but frequently on the temperature of the air; and ſometimes on the ſhape and ſize of the veſſels. When the vegetation is firſt formed, it is uſually leſs beautiful and diſtinct than afterwards. This is owing to its being too humid, the abundant moiſture ſwelling the parts, and injuring their figure. When it is dried to a certain degree, it appears in all its beauty; and after this it uſually ſoon changes for the worſe, the leaves appearing as if faded, and their red colour being changed to a faint orange colour.

The ſame vegetations which have been once raiſed, will not, on melting them in water, vegetate again; but only form a number of flat and thin cryſtals. This is the general event of the operation; yet ſometimes, when the ſolution has been ſuffered to ſtand till it acquires a deep red colour, a part of the ſalts will riſe up from the ſurface, in ſomething like their priſtine form; but this is only a ſmall portion of the whole that does it, the greater part remaining at the bottom of the veſſel, in form of rigid cryſtals.

The author of this curious diſcovery acknowledges that it was owing to accident; for that he had a very different thing in his thoughts, when he mixed the oil of tartar with the ſolution of iron; but as ſo beautiful an effect appeared, he was at the pains to vary all the ingredients, in different mixtures afterwards, to try what differences would be produced. He mixed the volatile alkalis inſtead of the fixed; other acids inſtead of ſpirit of nitre, and other metals inſtead of iron, in the ſeveral proceſſes, the events of which were as follow:

Spirit of ſal armoniac added to the ſolution inſtead of oil of tartar, precipitates a yellow powder to the bottom of the veſſel, but does not make the leaſt tendency towards vegetating. All the other acids were tried alſo in the place of ſpirit of nitre, and though all of them made the liquor begin to riſe ſooner than that, yet they only produced a ſaline cruſt over the ſurface, without any tendency to vegetation. Nay, ſpirit of nitre itſelf cannot form the vegetations, if impeded by a mixture of any of the other acids. Diſtilled vinegar, uſed inſtead of theſe acids of the mineral kingdom, produced only a a ſet of cryſtals which croſſed one another, without any appearance of vegetation. Copper ſeemed the metal moſt likely to ſucceed inſtead of iron, as being, of all the others, the moſt ſulphureous; but the event, on trial, by no means anſwered the expectation, and not the leaſt tendency to vegetation was found on treating it in this manner. Copper and iron, mixed together, produced only a low and very poor vegetation, evidently ſhewing that the copper did nothing but impede the iron from ſhewing itſelf in its natural beauty. Quickſilver ſucceeds no better than copper; there is only formed, by long ſtanding, a thin cruſt upon the ſurface of the glaſs, whence the liquor has evaporated, and the mercury is finally found precipitated to the bottom of the veſſel. Biſmuth was alſo tried

tried with the ſame circumſtances, but without ſucceſs. Mem. Acad. Par. 1707.

MARTIS *Lixivium.* See the article LIXIVIUM *Martis.*

MARTLETT, in zoology, a name uſed by ſome for the *Martin*, a creature of the weaſel kind. See the article MARTES.

MARTNETS, in a ſhip, ſmall lines faſtened to the leetch of a ſail, being reeved through a block on the top-maſt head, and coming down by the maſt to the deck. Thoſe *Martnets* which belong to the top-ſails are faſtened after the ſame way to the heads of the top-gallant maſts, but their fall comes down no farther than the top, when it is haled. The word is, *top the Martnets*; *i. e.* hale them up. Their deſign is, in furling the ſail, to bring that part of the leetch which is next the yard-arm cloſe up to the yard, that ſo the ſail may furl up the cloſer.

MARTYNIA, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium is compoſed of one leaf, divided into five ſegments, which are pointed at the ends, and ſerrated at the ſides; three of theſe ſtand erect, the other two are reflex. The flower conſiſts of one petal, and is of the bell-faſhioned kind. The tube is large, inflated, and open, and contains a honey juice in its baſe. The limb is ſmall, and is ſlightly divided into five ſegments, the lower of which is larger than the reſt, and is more erect and crenated at the edges. The ſtamina are four capillary and and crooked filaments, one pair of them being bent between the other, and returning back again; and between the upper pair there appears the rudiment, as it were, of another filament, which terminates in a point. The antheræ are connected together, and bend toward each other at the points. The germen of the piſtil is oblong, and placed beneath the cup. The ſtyle is ſhort and ſimple. The ſtigma is flat. The fruit is an oblong, gibbous capſule, of a ſquare figure, each ſide having two furrows on it. It is pointed at each end, and, when fully ripe, opens at the top into two parts, and is found to encloſe four oblong ſeeds in a ſort of ſquare caſe or nucleus. The bending of the ſtamina is a very ſingular thing in this plant; but it does not happen till the apices have burſt, and diſcharged their farina. *Linnæi* Gen. Plant. p. 292. *Martin.* 1. 42. Hort. Malab. 9. 53.

The plant called by Houſton *martyniæ ſpecies*, is properly another genus, and has been ſince deſcribed by the accurate Linnæus under the name of *craniolaria*. *Houſton*, A. A. See the article CRANIOLARIA.

MARTZIAN, in the materia medica, a word formed by the modern Greek writers, to expreſs a ſort of ſea plant, uſed in painting, dying, *&c.*

The word is formed of the Arabian name *margian*, by changing the *g* into *tz*, a very common practice among theſe writers, and of which we have numerous other inſtances. It is generally ſuppoſed that the *Margian* of the Arabs, and conſequently the *Martzian* of the Greeks, is coral. But all accounts of the antients diſagree with this, and ſhew that the plant, meant by theſe names, is the *fucus thalaſſius* of the old Greeks, a red kind of ſea weed, growing upon the rocks, and uſed in painting and dying. The antient Arabs all uſed the word in this ſenſe. But the modern Greeks have been led away by the errors of the ſucceſſors to the Arabians; ſo that they uſe it as a name for coral.

MARU, in botany, a name by which Dodonæus and ſome others have called the *cerinthe*, or *honey-wort*. *Ger.* Emac. Ind. 2.

MARUBIUM, *Horehound*, in botany, *&c.* See the article MARRUBIUM.

MARVELL *of Peru*, a name given to the plant more uſually called *jalap*. See the article JALAP.

There are many ſpecies of this beautiful plant propagated in flower-gardens. They are all to be raiſed by ſowing their ſeeds in March, on a moderate hot bed. When they come up, they are to be tranſplanted to another hot bed, where they are to be ſet at ten inches diſtance; and when they are grown to about a foot high, they are to be tranſplanted into pots filled with light earth, and ſet in the ſhade till they have taken root, after which they may remain abroad till October. The ſtronger kinds ſhould be then removed into the greenhouſe, where they muſt be frequently watered during the winter, and in ſummer they muſt be often pruned to keep them in ſhape.

They flower in June, and continue flowering till the froſt prevents them. Some take up the roots when the ſtalks are dead, and lay them up in ſand till ſpring, when they are planted again in pots, and plunged into a moderate hot bed to facilitate their taking root. And the plants, from the roots of the former year, will always flower much ſtronger than the ſeedlings of the ſame year's growth. *Miller*'s Gardener's Dict.

MARUM, the herb *Maſtic*, in botany, a name given to one of the ſpecies of *thymbra*. See the article THYMBRA.

It is a plant very common with us in the gardens of the curious, and is propagated by planting cuttings in any of the ſummer months on a bed of freſh light rich earth, where they are to be carefully watered and ſhaded till they have taken root; after which they may be removed either into pots or borders. But the greateſt difficulty attending the keeping this plant, is the preſerving it from cats, which will come a great way, and tear them to pieces. It is obſerved, however, that though theſe animals never ſpare a plant that grows ſingle, they will not meddle with it when planted in large cluſters, which is indeed the only way to ſave it. *Miller's* Gardener's Dict.

The common herb *maſtic* is a cephalic, and is of ſervice in all diſorders of the nerves. It has alſo an aſtringency, by means of which it is of ſervice in hæmorrhages of all kinds, particularly in profluvia of the menſes.

MARYGOLD, *Caltha*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the radiated kind; its diſk is compoſed of ſeveral floſcules, and its outer circle of ſemi-floſcules; theſe are all placed upon the embryo ſeeds, and contained in a common cup. The The embrios finally become flat, crooked, and marginated capſules, containing a long ſhaped ſeed.

The ſpecies of *Marygold*, enumerated by Mr. Tournefort, are theſe: 1. The common *Marygold*, with pale yellow flowers. 2. The common *Marygold*, with deeper yellow flowers. 3. The common *Marygold*, with reddiſh yellow flowers. 4. The talleſt many-flower'd *Marygold.* 5. The common great many flower'd *Marygold.* 6. The great many flower'd *Marygold*, with bright yellow flowers. 7. The great many flower'd *Marygold*, with honey-colour'd flowers. 8. The *Marygold* with bending flowers. 9. The great flower'd proliferous *Marygold.* 10. The great proliferous *Marygold*, with honey-coloured flowers. 11. The proliferous *Marygold*, with ſmaller flowers. 12. The *Marygold* with variegated flowers. 13. The wild or field *Marygold.* 14. The ſmalleſt dwarf *Marygold.* 15. The African *Marygold*, with flowers white within, and of a violet blue on the outſide. 16. The wild Portugal *Marygold.* 17. The woolly ſea Portugal *Marygold.* *Tourn.* Inſt. p. 498.

The flowers of the common *Marygold* are cordial and alexipharmic; they promote ſweat, and are good to throw out the ſmall-pox, or any other eruption. They alſo promote the menſes, and are ſo far aperient, that they are found of ſervice in the jaundice, and in indurations of the ſpleen. The midwives burn them under women whoſe labour does not come on properly, and ſuppoſe they are of great virtue in promoting the pains. They alſo diſtil a water from them, as a remedy for ſore eyes; but theſe laſt virtues are not ſo well warranted.

African MARYGOLD. See the article TAGETES.

Corn MARYGOLD. See the article CHRYSANTHEMUM.

Marſh MARYGOLD. See the article POPULAGO.

Zoophyte MARYGOLD, in natural hiſtory, the name of a ſpecies of ſea animal, of a very beautiful kind, and of the nature of thoſe commonly called *Zoophytes*, or plant animals, by the old naturaliſts. In St. Lucy's pariſh, in Barbadoes, there is a cave in which is a baſon of very clear ſalt water; and in the midſt of this baſon lies a ſtone, which has been for many years found to be the habitation of a great number of animals of this ſpecies.

The ſtone is always covered with water; and from ſmall holes in its ſides, in ſeveral parts, there appear, at all times of the year, a number of creatures repreſenting the flowers of ſome of the radiated plants, and particularly of the common *Marygold*: They are yellow, and ſeem compoſed of a very great number of petals. Theſe, in their natural ſtate, are all regularly and beautifully expanded; but as ſoon as any thing diſturbs them, if it be only the motion of a ſtick that comes within three or four inches of them, they in an inſtant cloſe all the leaves up together, and the whole body, flower, ſtalk and all, is retracted back into the hole of the ſtone; but if the water be left a few minutes undiſturbed again, they will appear and expand themſelves in the former manner.

When they are nicely obſerved, there is a yet farther reſemblance of a flower in their ſtructure; for there ariſe from the center of the body certain oblong bodies, which very naturally reſemble the ſtamina ariſing from the center of a flower; but theſe have evidently the powers of animal limbs; for they no ſooner appear, but they dart themſelves about to the verge of the flower in ſeveral directions, and are plainly buſied in ſearch of prey. They are compoſed of ſeveral joints, and the creature often makes them meet in the manner of a forceps, to lay hold of any thing it pleaſes. Theſe parts, however, ſeldom appear thus exerted any long time together, but are, after a time, received back into the body.

Theſe arms may eaſily be conceived to be of uſe to draw in the prey within the compaſs of the body of the animal; and as ſoon as it is there, the ſame contraction of the ſeveral rays which ſerves them to eſcape danger, and bury themſelves in the cavity of the ſtone, will alſo ſerve to hold faſt the prey till the creature has fed on it.

Beſide theſe large yellow radiated *Zoophytes*, the top of the ſtone uſually affords a number of others of a blue colour, which ſtand among a ſort of veſicles of water bladders, diſpoſed like cluſters of grapes. Philoſ. Tranſ. N°. 470. p. 591.

MARYGOLD *Flower*, in zoology. See the article REGULUS *Criſtatus*.

MASARINO, in zoology, a name given by the Portugueſe, in the Braſils, to a large bird of the curlew kind, approaching to the gooſe in ſize; and more commonly known by its Braſilian name *curicaca*. See the article CURICACA.

MASCHARADA, in the Italian muſic, is applied to muſic compoſed for the geſtures of pantomimes, buffoons, mimics, and ſuch groteſque characters.

MASLACH, the name of a medicine greatly in uſe among the Turks, and called alſo *Anſion* or *Amphion*. It is prepared principally of opium. They take a dram of it at a time, and ſometimes two or three: They always uſe it when going to battle, and very often as a provocative to venery, as they do the crude opium.

MASLIN. See the article BULLIMONY.

MASORAH and MASORITES. See the article CABBALISTS.

MASSALIS, a word by which ſome of the chemical writers have expreſſed mercury.

MASSIMA, in the Italian muſic, is a note or character made in a long ſquare, with a tail to it; thus,  . It contains eight ſemi-breves in common time. This character is diſuſed in the modern muſic, for they have found other ways to ſeparate the bars, and to mark the length of notes.

MASTED. A ſhip is ſaid to be *maſted*, when ſhe has all her maſts compleat.

Armed MAST, in a ſhip, one that is made of more than one tree.

Over-MASTED, or *Taut*-MASTED, is ſaid of a ſhip whoſe maſts are either too long or too big; which makes her lie too much down by the wind, and labour too much *a-hull*.

Spending a MAST, at ſea, is when it is broke by ſoul weather.

Springing a MAST, at ſea, is when it is cracked in any place.

Under-MASTED, or *Low*-MASTED *Ships*, ſuch whoſe *Maſts* are either too ſmall, or too ſhort: In which caſe ſhe cannot bear ſo great a ſail as ſhould give her true way.

MASTER (*Cycl.*)—MASTER *of a Ship of War*, the next officer to a lieutenant; he has under his care and direction every thing relating to the conducting and ſailing of the ſhip, as to determine the courſe ſhe is to ſail, command the ſailors, and give orders for ſteering, trimming and ſailing the ſhip. He is to keep the moſt accurate account of the ſhip's way, and be at all times able to give eſtimate, or prick off her place on the true ſea-chart; and is allowed mates to aſſiſt him in his office.

In merchantmen the *Maſter* is the chief officer.

MASTER *Load*, in mining, a term uſed to expreſs the larger vein of a metal, in places where there are ſeveral veins in the ſame hill. Thus it often happens, that there are ſeven, ſometimes five, but more uſually three veins or loads, parallel to each other, in the ſame hill. Of theſe the middle vein is always greatly the largeſt. This is called the *Maſter Load*; and the others which lie three, two, or one, on each ſide of this, are called the concomitants of the *Maſter Load*.

The general breadth of the *Maſter Loads*, in Cornwall, is from three to ſeven foot. They are ſeldom larger than this, except in certain peculiar places, as where all the veins meet together, as they ſometimes do, and form a knot, from which they ſeparate again, and each takes its peculiar courſe. The ſize of ſuch a knot is not eaſily determined, and it is uſually very rich in tin, or the other metal of the mine. The ſeveral parts, even of the *Maſter Load*, are not at all regular in breadth, but from ſix foot, it will, in ſome places, dwindle to one foot, or even to an inch broad, in a very ſmall ſpace; but the miners are not diſheartened at this, for they know it will ſoon grow wider again, unleſs really worked out. Phil. Tranſ. N°. 69.

The *Maſter Load* uſually lies in a hard rocky or ſhelfy ſtratum, made up of metalline matter, ſpars, mundic, and other unprofitable ſubſtances, or weeds, as the miners call them, and is, as it were, all along a continued rock; but has many veins and joints, as they are called. In ſome places the matter in which the ore lies is ſofter, and then it is much more eaſily worked. In Cornwall they uſually allow two ſhovel-men to three beele-men or pickers; but where the load runs in a ſofter ſubſtance, there muſt be a greater proportion of the ſhovellers or carriers away.

There is generally water found about the *Loads* of the metal. In moſt places it is met with at ſome feet deep from the *loady* ſurface; and it often runs through the heart of the *Load*, not in a direct channel, but windingly, in and out, inſenſibly through the veins and joints of the *Load*. When the miners have followed a *Load* to ſome depth, and the water begins to be troubleſome, as it generally ſoon is, if there be any in the work, they deſcend to the bottom of the hill, where they have that conveniency, and at the loweſt place begin as little a drift as the convenience of working or driving will permit, ſcarce half ſo big as that for a *Load*; they carry this on, on a level, till they come to the work itſelf. In this the uſe of the dial is needful, which they term *plumming* and *dialling*. See the article DIALLING, *Cycl.* and PLUMMING, *Suppl.*

By this means the exact place of the work is known, where to bring the adit, or where to ſink down to make an air ſhaft. Though the water is troubleſome in the *Loads*, yet there is always one great convenience attending it; which is, that where there is water, there is never want of air for the reſpiration of the miners, and the candles always burn well. But it is alſo to be obſerved, that in a ſoft, looſe, quagmire country, the earth ſometimes falls in after the workmen, in ſuch a manner as, though it does not choak up the whole ſhaft, yet it ſo far ſtops it, as to render the current of air leſs free, and the miners find the utmoſt neceſſity of opening a ſhaft for air to reſpire from the ſurface. If the ſoil be ſo ſoft as not to be able to ſupport itſelf in the working, as is ſometimes the caſe in theſe wet clayey hills, it is neceſſary to prop it up, as they go on, with boards, poſts, and the like. This adds greatly to the expence of mining; but in the working a *Maſter Load*, it is often worth while. When the miners are out of heart at the trouble of walling and propping, on this occaſion, it ſometimes happens, that a dipping of the *Load* carries them down into a firmer ſtratum, and they are at once reliev'd from all that trouble and danger.

MASTER-*Wort*, in botany, *&c.* See the article IMPERATORIA.

MASTER-*Yaw*, a large *Yaw* ſometines remaining after ſalivation. Se the article YAWS.

MASTICA *De ſoho*, in the materia medica, the name given by the Indians to the ſtone commonly known among authors by the name of *Pedro del Porco*, a ſort of bezoar taken out of the gall-bladder of an Indian boar. The Indians, and many of the European nations, eſteem this one of the greateſt medicines in the world in peſtilential diſeaſes, and the ſmall pox.

MASTIC (*Cycl.*)—The Arabian writers, Aviſenna and Serapio, in their chapters of the turpentine tree, often mention the lentiſk and its reſin, which they ſay was very much like the reſin of the common turpentine tree. But beſide this, Aviſenna has a peculiar chapter on *Maſtic*; whence it ſhould ſeem, that by the name lentiſk they do not mean the tree which produces *Maſtic*, as we do, but ſome peculiar ſpecies of the turpentine tree.

Aviſenna diſtinguiſhes two kinds of *Maſtic*, the one called *rumi*, and the other *cupti*: The *rumi* came from the iſland of Chios, and was white; the *cupti* was of a blackiſh colour, and was brought from Ægypt. See the article LENTISCUS.

MASTIC is alſo uſed as the name of an herb, otherwiſe called *Marum*. See the article MARUM.

MASTICHE *Terra*, *Maſtic Earth*, a name given by ſome of the old writers on the materia medica to the Chio earth, or *Terra Chia*. The reaſon of this ſtrange appellation ſeems to have been, that the fineſt *Maſtic* coming from the Iſland of Chios, had obtained the name of *Kie*, or *Chie*, and *Maſtic* and *Chia* being thus become, in one ſenſe, ſynonimous words, the uſe of them was, in this manner, carried much farther, and the earth of that iſland called by the name of the *gum*.

The Arabians ſeem to explain this very well, in their name of this earth; they not calling it *Maſtic earth*, but *thin beled Almaſtichi*, that is, *Terra Regionis Maſtichis*, the earth of the country where *Maſtic* is produced.

MASTICHINA, in botany, a name given by ſome authors to the herb maſtic, or garden *marum*. *Boer.* Ind. 156. See the article MARUM.

MASTIGADOUR, or SLABBERING-BIT, in the manege, is a ſnaffle of iron, all ſmooth, and of a piece, guarded with pater noſters, and compoſed of three halves of great rings, made into demi-ovals of unequal bigneſs, the leſſer being incloſed within the greateſt, which ought to be about half a foot high. A *Maſtigadour* is mounted with a head-ſtall and two reins. A horſe, by champing upon the *Maſtigadour*, keeps his mouth freſh and moiſt.

To put a horſe to the *Maſtigadour*, is to ſet his croupe to the manger, and his head between two pillars in the ſtable. Horſes that uſe to hang out their tongue, cannot do it when the *Maſtigadour* is on; for that keeps their tongue ſo much in ſubjection, that they cannot put it out.

MASTIGOPHORI, Μαστιγοφόροι, among the Greeks, certain officers appointed to preſerve the peace, and correct ſuch as were unruly at the olympic games. *Potter*, l. 2. c. 22. See alſo Mem. Acad. Inſcript. T. 1. p. 338, 339.

MASTON, in botany, a name by which Pliny and ſome other authors have called the *ſcabioſa*, or *ſcabious*, a blue-flowered plant, common among corn. *Ger.* Emac. Ind 2.

MATCHING, in the wine trade, the preparing veſſels to preſerve wines and other liquors, without their growing ſour or vapid. See the article WINE.

The method of doing it is this: Melt brimſtone in an iron ladle, and, when thoroughly melted, dip into it ſlips of coarſe linnen cloth; take theſe out, and let them cool. This is what the wine-coopers call *match*. Take one of theſe *matches*, ſet one end of it on fire, and put it into the bung-hole of a caſk; ſtop it looſely, and thus ſuffer the *Match* to burn nearly out; then drive in the bung tight, and ſet the caſk aſide for an hour or two. At the end of this time examine the caſk, and you will find that the ſulphur has communicated a violently pungent and ſuffocating ſcent to the caſk, with a conſiderable degree of acidity, which is the gas, and acid ſpirit of the ſulphur. The caſk may, after this, be filled with a ſmall wine, which has ſcarce done its fermentation, and bunging it down tight, it will be kept good, and

will ſoon clarify. This is a common and a very uſeful method; for poor wines could ſcarce be kept potable, even a few months, without it. Nor could ſtums be prepared in large quantities without this help. *Shaw*'s Lectures, p. 191.

MATER (*Cycl.*)—MATER *Metallorum*, in natural hiſtory, a name given by the Saxon mineraliſts, and thoſe of ſome other places, to a peculiar kind of marcaſite or mundic, which they ſuppoſe, according to the expreſſion, to be the mother, or parent of metals.

The marcaſite they call by this name is the common yellow kind, but in a foul ſtate, it being uſually mixed with ſome, poor ore of iron, or with ſome ſtony matter, which has made it concrete looſely and irregularly, and it is found ſometimes formed into thin undulated plates, and ſometimes into complex maſſes; but is always cavernous or ſpungy, or full of ſmaller or larger holes. Theſe are often empty; but in ſome pieces they contain parcels either of pure native metals, or of rich ores. Pieces of native copper are found in ſome, and ores of iron and tin in others. And it is ſaid in Saxony, that native ſilver, in thin plates, is found in ſome few.

MATERFILON, in botany, a name given by ſome authors to the *jacea nigra*, or common knapweed. Our Engliſh name *matfellon* ſeems a corruption of this. *Ger.* Emac. Ind. 2. See the article JACEA.

MATERIA (*Cycl.*)—MATERIA *Chemica*, a term uſed by authors to expreſs ſuch bodies as are the peculiar objects of chemical experiments.

The *Materia Chemica*, in a larger ſenſe, takes in all the bodies of the globe, all theſe being the ſubjects of chemiſtry in its extenſive ſenſe; but the curious, in chemical reſearches, may be deſirous of knowing in general, what bodies they ought to procure, and have in readineſs for them. Dr. Shaw has given a liſt of theſe for his portable laboratory, which will ſerve in general as well as on that particular occaſion.

This collection being diſtributed under proper claſſes, will come into a ſmall compaſs, and may be conveniently carried either by land or ſea, along with that uſeful furnace, and its neceſſary apparatus.

The natural arrangement of the *Materia Chemica* is into the general diviſion of animal, vegetable and mineral ſubſtances. But thoſe who are deſirous of a larger collection, may enlarge the number of general diviſions, according to Becher's method, by which all chemical ſubjects are arranged into eight general claſſes; metals, minerals, decompounds, ſalts, gums, earths, ſtones, ſpirits, and oils.

The claſs of metals contains gold, ſilver, copper, iron, tin, and lead; and all theſe are to be kept both in their natural and artificial ſtate; that is, in their ores, and as ſeparated from them for human uſes. To theſe natural metals are to be added the artificial or compound ones, *viz.* pewter, bell-metal, braſs, gun-metal, pin-metal, Bath-metal, wells-metal, princes-metal, London-metal, white copper, white gold, and yellow ſilver. Under minerals are included, antimony, biſmuth, zink, marcaſite, cobalt, zaffer, ſmalt, arſenic, manganeſe, orpiment, mercury, native cinnabar, and ſulphur. All theſe are to be kept both in their natural ſtate as dug out of the earth, and as purified. *Becher*'s Phyſ. Subter. p. 187.

The decompounds of minerals include aurum fulminans, luna cornea, the calxes of gold and ſilver, ultramarine, diſtilled verdegreaſe, burnt copper, putty, or calcin'd tin, ſugar of lead, cadmia, tutty, black lead, red lead, litharge, white lead, glaſs of lead, ſimple and martial regulus of antimony, glaſs and cinnabar of antimony, the preparations of quick-ſilver, as ſublimate, precipitate, and the reſt. The ſame ſort of arrangement may alſo take in the ſeveral kinds of decompounds of animal and vegetable ſubſtances. *Shaw*'s Port. Laborat.

The claſs of ſalts takes in ſea ſalt, nitre, alum, vitriol, borax, tartar, ſugar, potaſh, and the compound ſaline fluxes for ſtubborn ores. And to theſe are to be added the tribe of artificial ſalts, of which number are the tartarum vitriolatum, fixed nitre, ſoluble tartar, terra foliata tartari, nitrum nitratum, ſal ammoniac, Epſom ſalts, volatile ſalts, and ſeveral others of a ſimilar nature.

Under the gums are ranked pitch, reſin, turpentine, wax, camphor, amber, pit-coal, jet, and all bitumens, balſams, and inſpiſſated juices.

Among the earths are taken in ores, waſhed ores, fluds, calxes of metals, lime, plaſter, gypſum, chalk, boles, ſhells, ſand, and the foſſils commonly and properly called earths, whether they be of the calcarious or of the vitreſcible kinds; that is, whether in the fire they are converted into a ſort of lime, or run into a glaſs.

Stones include flints, pebbles, quarry ſtone, cryſtal, talc, the vulgar ſtones, and all the gems from the diamond down to the ſpars.

Laſtly, under ſpirits and oils come aqua regia, aqua fortis, oil of vitriol, ſpirit of ſalt, ſpirit of nitre, ſpirit of ſulphur, ſpirit of alum, ſpirit of vinegar, ſpirit of wine, ſpirit of urine, ſpirit of tartar, ſpirit of turpentine, oil of tartar per deliquium; the eſſential oils of nutmegs, cloves, and the like; the expreſſed oils of olives, almonds, linſeed, and the like; and the compound oils, as butter of antimony, artificial balſams, &c.

It is eaſy tn ſee that this ſort of claſſing is not fit for the naturaliſt, who ſtudies bodies for their natural qualities, nor indeed for the nice diſtinguiſher of any kind; but in this manner Becher adviſes the young operator in chemiſtry, to procure to himſelf a ſort of artificial alphabet of nature, and this will ſerve the purpoſe very well, where no more is meant than a mere *Materia Chemica*, to be put in ſuch order, that it may be readily had recourſe to in all its parts. With this the young operator is to proceed regularly, as he would do in learning a language. Forming firſt ſyllables out of the joining of two or more letters of this alphabet, and then words, by combining theſe firſt ſets together, and finally, whole diſcourſes; that is, forming theſe various ſimple bodies into mixts, compounds, and decompounds. *Becher*'s Phyſ. Subter. p. 179.

To avoid miſcarriages, and prevent being impoſed upon, it will be very proper to cultivate a knowledge of the productions of nature in their crude ſtate, and peculiar places of growth, where being firſt viewed and examined before they are gathered or dug up, an exact knowledge of them, as nature furniſhes them, may be procured. For want of this previous qualification, men, otherwiſe of great ſagacity, have erred in their operations, and perhaps blamed the original author of a proceſs, in which they miſcarry; while they are all the while uſing a wrong ſubject, or an adulterated or imperfect one, inſtead of the true. From this miſtake alone, numberleſs complaints have ariſen of the failure and uncertain ſucceſs in the proceſſes and experiments recorded even by the beſt authors.

The perſon who would work in chemiſtry with pleaſure and ſucceſs, ſhould make a ſufficiently copious collection of a *Materia Chemica* of this kind, all the particulars of which he is well aſſured of, as to their genuineneſs and perfection in in their kinds. Theſe being always ready, will prevent the neceſſity of ſending to the druggiſt at every turn, where the things ſent for are often either not to be had, or only in a ſophiſticated ſtate; when this alphabet of nature, compoſed of the ſeveral materials of chemical reſearches, is like the letter in a printing-houſe, diſtributed and lodged in proper cells, it may readily be drawn out for uſe as occaſion requires. It is impoſſible to expreſs with how little expence and trouble, yet with how great profit and pleaſure, numerous experiments, and thoſe of the moſt difficult kind, may be made, when the operator has, in this manner, all his materials about him.

Becher tells us, that he has, in this manner, gone through fifty experiments in a day; and, while writing on chemical ſubjects, if any difficulty or uncertainly occurred, he immediately got up from his deſk, made the neceſſary experiment, and ſat down again to write the certain fact: So that he affirms, there was very little more trouble in making the experiment at the fire, than in deſcribing the proceſs by the pen.

MATES, on board a ſhip, are aſſiſtants to the ſeveral officers; as *Maſter's Mates*, *Surgeon's Mates*, *Gunner's Mates*, *Carpenter's Mate*, *Boatſwain's Mate*, *Cook's Mate*, *Corporal's Mate*.

MATHEDORAM, a name by which ſome chemiſts have called *ſal gemm*.

MATITES, in natural hiſtory, the name of a ſtone deſcribed by ſeveral authors. The characters they give of it are, that it is of a pale greyiſh colour, and of the form of the nipples of a woman's breaſt, ſeveral of theſe nipples appearing upon one ſtone.

There have been many abſurd and idle conjectures, as to the origin of this ſtone; but it may be eaſy to account for its figure on very plain and natural principles. We find in the earth many ſtones, reſembling exactly the figures of ſhells of various kinds, and parts of other animals. Theſe have, in general, once been the things they thus repreſent petrified, or altered into the nature of ſtone, by the inſinuation of ſtony particles into their pores.

Among theſe none are ſo frequent as the remains of the *echini marini*, or ſea eggs, as we call them. Theſe we find in various forms; ſometimes ſingle ſpines, ſometimes whole ſhells, and ſometimes only parts of ſhells preſerved. It is well known, that all the *echini marini* have ſpines or ſpikes, whence they have their name; and in many of the ſpecies which we find recent on our ſhores, theſe ſpines are joined to the body of the ſhell by a ſmall protuberance, which, from its reſemblance to a nipple, we call *papilla*. Now we frequently find theſe papillæ delineated in creux, in pebbles, and other ſtones, ſometimes ſingly, and ſometimes in numbers together, in the form in which they adhered to the ſhell. We find, in other foſſils, that whatever ſhell, *&c.* is ſometimes delineated in creux on ſtone, is alſo ſometimes done in the elevated manner; and it is plain, that there needs no more to the formation of one of theſe *matitæ* than the petrifaction of a piece of the ſhell of one of thoſe *echini* which have large papillæ, ſuch as thoſe of the red ſea, with ſome of its papillæ upon it. As to the colour, it is not to be limited to grey alone, but may be as various as the colours of ſtones, ſince any ſpecies of ſtone may have gone to the formation of it; and whatever colour the ſtony matter was, of that will the *Matites* be.

MATKNELTZEL, in zoology, the name of a bird approaching to the ſnipe kind, and called by Geſner *gallinula erythra*;

and

and by the common people of Germany, *mattkern*. It is all over of a reddiſh or ruddy hue, except the belly, which is white; on the back the colour is more duſky, and is variegated with black ſpots. On the wings the colour is much fairer and clearer, ſome of the longer feathers of them approaching to the colour of the painters red earth, called reddle. It is common in watery places, in many parts of Germany and Italy. *Ray*'s Ornithology, p. 226.

MATO, in natural hiſtory, the name of a tree growing both in the Eaſt and Weſt Indies, and bearing a fruit of the ſize of an apple, and covered with a thick and tough red ſkin. This is called by ſome, the wild *mangouſtan*. Its fruit perfectly reſembles that of the mangouſtan in figure, but is not eatable. Mem. Acad. Par. 1699.

MATORIUM, a word uſed by ſome of the chemical writers to expreſs the *gum ammoniacum*, and by others *galbanum*.

MATRASS (*Cycl.*)—The *Matraſs*, uſed in aſſaying, is a veſſel of very pure and tranſparent glaſs, not too thick at the bottom, which would make it apt to burſt in the fire. It is, for this uſe, to be about eight or ten inches high, and to have an orifice ſcarce ſo much as half an inch wide, leſt the matters contained in it, being in a violent ſtate of ebullition, ſhould either riſe over the mouth of the veſſel, or at leaſt be partly thrown out in form of ſmall drops, like a thin rain, which drops always carry ſome of the metal with them. The bottom is capacious enough, when it will hold an ounce or two of aqua fortis, and the height of the veſſel is of farther uſe in making a greater repercuſſion of the fumes. The mouth ought alſo to be turned backwards, in form of a broad lip, that the ſolutions, when poured out, may not run down the ſides of the veſſel. *Cramer*, Art Aſſ. p. 68.

MATRICARIA, *Feverfew*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is naturally of the radiated kind. Its diſk is compoſed of floſcules, and its outer circle of ſemi-floſcules, all placed on the embryo ſeeds, and contained in one common cup, which is of a ſquammoſe ſtructure, and hemiſpheric figure. The embrios finally become ſeeds of an oblong figure, affixed to the thalamus of the flower. To this it is to be added, that the flowers always grow many together, in a ſort of cluſters, and the leaves are divided ino ſomewhat regular ſegments, ſtanding in pairs over againſt one another.

The ſpecies of *Feverfew*, enumerated by Mr. Tournefort, are theſe: 1. The common garden *Feverfew*. 2. The garden *Feverfew*, with red ſtalks. 3. The wild *Feverfew*, with flowers altogether yellow. 4. The ſweet-ſcented *Feverfew*. 5. The double-flowered *Feverfew*. 6. The white-flowered *Feverfew*, with three ſeries of ſemi-floſcules. 7. The *Feverfew*, with fiſtular petals. 8. The curled-leav'd *Feverfew*, with the petals of the flower all fiſtulous. 9. The *Feverfew*, with the marginal petals of the flower flat, the inner ones fiſtular. 10. The naked-flower'd *Feverfew*. 11. The tanzy-leav'd *Feverfew*, with large flowers, and umbilicated ſeeds. 12. The tanzy-leav'd *Feverfew*, with ſmaller flowers, and umbilicated ſeeds. 13. The buphthalmum-leav'd Pyrenean *Feverfew*. 12. The American *Feverfew*, with leaves like the *ambroſia*, and with ſmall white flowers. *Tourn.* Inſt. p. 493.

Feverfew has always been allowed one of the firſt places among the hyſteric and uterine plants. It is preſcribed in powder from a ſcruple to half a dram the doſe; but the much better way is in a ſlight infuſion made in the manner of tea. Taken in this eaſy manner for a continuance of time, it will bring the menſes, tho' ſubject to be interrupted and irregular, to their true period; and will remove a number of complaints, the natural conſequence of ſuch an irregularity.

It is alſo an agreeable carminative and bitter. It ſtrengthens the ſtomach, and diſperſes flatulences; and the expreſſed juice is ſaid to kill worms. Some likewiſe commend it in diſorders of the head, and in all nephritic complaints. Hoffman gives it great praiſes, uſed as a febrifuge. We uſed to keep a ſimple water and ſyrup of *Feverfew* in the ſhops; but at preſent they are wholly diſuſed, and the dried herb only kept ready for fomentations, and ſometimes as an ingredient in clyſters.

Many ſpecies of this plant are cultivated in gardens, for the beauty of their flowers. They are propagated by ſowing them in March, on a bed of light earth; when they are come up, they ſhould be tranſplanted out into nurſery beds, at about eight inches aſunder; and in the middle of May they ſhould be removed into the flower beds, where they are to ſtand. They flower in July and Auguſt; but they ſhould not be permitted to ſeed, which always weakens, and often deſtroys the roots: So that the ſtalks ſhould be cut down to the ground, when the flower decays. *Miller*'s Gardener's Dict.

MATRIMONY. See the articles ESPOUSALS and MARRIAGE.

MATRISYLVA, in botany, a name by which ſome authors call the common honey-ſuckle, or wood-bind, aud others the wood-ruffe.

MATRIX, (*Cycl.*) in anatomy. See the articles WOMB, UTERUS, FOETUS, *&c. Cycl.* and *Suppl.*

MATRIX *Succini*, in natural hiſtory, a name given by Hartman, and ſome other authors, to a ſort of ſubſtance reſembling foſſile wood, or the barks of trees, common in the cliffs of the ſhores of the Baltic, and found in digging all over Pruſſia. This is the bed in which the foſſile amber of that kingdom is lodged, and it is ſuppoſed to have no ſmall ſhare in the production or formation of that foſſile. The workmen who dig for amber always make this their guide, and follow the veins of it, never ſearching any where elſe for the amber. The very ſurface of this foſſile ſubſtance is often covered with a kind of amber; but this is poor, and of no value. Many authors have ſuppoſed this cortical or wood-like ſubſtance to be real foſſile wood; but this is an error. The maſſes of it are too large, ever to have been trees, and their fibres run often to twenty, thirty, or forty foot diameter, in the ſame unbroken compages. It differs from trees alſo in this, that as they have been form'd by ſucceſſive additions of matter by vegetation, their whole bulk is compoſed of circular ſtrata, if they may be ſo called, or additions of coats round a medulla or pith; but in this foſſile wood, as ſome have ſuppoſed it to be, there is no pith or medulla, no addition of circular coats, but the ſame vaſt maſs of it is continued to a vaſt length and breadth, in the manner of an earthy ſtratum, and is compoſed of thin laminæ, or plates laid flatwiſe one over another. Were this ſubſtance really formed of the bodies of trees, we ſhould alſo find in it that variety of fibres which the ſeveral parts of wood are known to conſiſt of; but nothing of this kind appears, we ſee the whole maſs, conſiſting of abſolutely the ſame ſhaped fibres; and there never was found, in any of this ſubſtance, the leaſt reſemblance of a knot or leaf, or the pedicle of a leaf, as might well be expected, had leaves ever grown from it. Phil. Tranſ. N°. 248. p. 14.

The foſſile wood, which is truly ſuch, and has been once vegetable matter, whatever part of the world it is found in, agrees in the ſame general marks of diſtinction and knots, and other evident proofs of its having been once vegetable are found in all of it; but this *Matrix* of amber, whether found in Pruſſia, Denmark, or elſewhere, is ſtill of the ſame kind, and ſhews none of theſe characteriſtic marks of wood. See the article SUCCINUM.

MATTS, on board a ſhip, a kind of broad, thick clouts, wove out of ſpun yarn, ſinnet, or thrums; and uſed to preſerve the main and fore-yards from galling againſt the maſts at the ties, and at the gunnel of the loof. They alſo ſerve to keep the clew of the ſail from galling there; as alſo to ſave the clews of the fore-ſail from doing ſo at the beak-head and boltſprit.

MATTAGESS, in zoology, the Engliſh name of the larger ſpecies of the *lanius* or *butcher bird*.

The word *Mattageſs* is borrowed from the Savoyards, and ſignifies the murdering pye; and has been given it from its ſavage diſpoſition, and its reſemblance to the magpye in the ſhape of its tail.

It is barely of the bigneſs of a thruſh; its beak is moderately long, black, and hooked at the end, but ſtrait all the way to that. Its tongue is bifid and hairy, and there are ſeveral black and ſhort briſtles at the top of the beak. Its head, back, and rump, are grey. Its chin and belly white, and its throat and breaſt variegated with duſky ſtreaks. Its feet and legs are black. It is very common in Germany, and is ſometimes ſeen in the northern parts of England, but with us is not very frequent. It lives among low buſhes, and builds in them. Its neſt is made of moſs, wool, and ſoft herbs, and the tender branches of heath. It has ſeven young ones at a brood, which are of a greeniſh colour, and very little reſemble their parent. It feeds on thruſhes, and ſmaller birds, and is a very terrible deſtroyer among them. *Ray*'s Ornithology, p. 53.

MATTHIOLA, in botany, the name of a genus of plants, the characters of which are theſe: The cup is a cylindric perianthium, is very ſhort, erect, and undivided, and remains after the flower is fallen; the flower is monopetalous, and conſiſts of a very long tube, which dilates, by degrees, into a large and wide mouth, with a ſmooth or undivided edge. The ſtamina are five pointed filaments, ſhorter than the flower. The apices are ſimple. The germen of the piſtil is globoſe, and is placed beneath the cup. The ſtyle is very ſlender, and of the length of the cup. The ſtigma is large and obtuſe. The fruit is a drupa of a globoſe figure, containing only one cell, and crowned with the cup. The ſeed is a globoſe nut or ſtone, containing a kernel of the ſame globoſe form. *Plumier*, 6. *Linnæi* Gen. Pl. p. 519. *Ponteder*. p. 39.

MATTKEM, in zoology, a common name in Germany for the *matkneltzel*. See the article MATKNELTZEL.

MATUITUI, in zoology, the name of a Braſilian bird, of the turdus or thruſh kind, and of the bigneſs of the common ſtarling. Its neck is ſhort; its breaſt large and ſtrong; its legs ſhort, and its beak a little hooked at the end, and of a fine high red. Its head, neck, back, wings and tail, are all of a fine deep brown, variegated with ſpots of a pale yellow. Its throat is yellow, and its breaſt and belly white, a little ſpotted with brown. Its thighs are grey. *Marggrave*'s

Hiſt. Braſil. See the article CURICACA, where *Matuitui* is corruptly printed *Matrictici*.

MATURAQUE, in natural hiſtory, the name of an American fiſh, of the harengiform kind, and having only one ſhort fin on the back. It ſeldom grows to more than four inches long, and is ſomewhat flattiſh, but not very broad. Its head is very broad, and covered with a ſhelly cruſt. Its lower jaw is ſomething longer than the upper, and has ſeveral very ſharp teeth, uſually ſix in number. The upper jaw has a larger number, but they are ſmall. Its gills are large, and its tail is made of a ſomewhat ſquare fin, a little rounded at the extremity. Its ſcales are large, and very regularly arranged. Its head, back, and the upper part of its ſides, are black, and its belly of a hoary white, and its fins are all black. It is caught in lakes, not in rivers, and is a well taſted fiſh. *Willughby*, Hiſt. Piſc. p. 235.

MAUDIHOCA, the *Caſſada*, or the poiſonous root of which bread is made in many parts of the Weſt Indies. See the article MANIHOT.

MAVIS, in zoology, the common name of the ſong-thruſh, or throſtle, called by authors the *turdus viſcivorus minor*, to diſtinguiſh it from the larger ſpecies, called in Engliſh the *miſſel bird*; and uſually known among us alſo by the ſimple name *thruſh*. It is called *viſcivorus* by authors, from its reſemblance in colour to the other *viſcivorus*, not from its feeding on the miſletoe-berries, as that does.

It is much ſmaller than the miſſel bird, and of a middle ſize between the fieldfare and redwing. Its back is of a greyiſh brown, ſomewhat like the colour of the Spaniſh olives; its belly white, and its breaſt yellowiſh, and ſpotted with brown and blackiſh ſpots, and it is ſpotted round about the eyes; its under ſmall feathers of the wings are of a yellowiſh or reddiſh brown, and thoſe under the tail whitiſh. Its legs are brown. It feeds on worms, ſnails, and ſmall inſects, and remains with us the whole year. It builds with moſs and ſtubble, and lines the neſt with mud. On this it lays five or ſix eggs, which are of a bluiſh green, variegated with a few black ſpots. It ſits on hedges and buſhes, and ſings very agreeably. *Ray*'s Ornithology, p. 138.

MAUMY *Soil*, in agriculture, an earth conſiſting of a white marly clay, chalk, and ſand, which cauſes it to work very ſhort, as the farmers call it, when any thing dry. This ſort of land is uſually ſowed with wheat, miſcellan, or barley, and requires the ſame tillage that the clay land does, and muſt be kept dry and warm.

Its moſt proper manure is the rotteneſt dung. As they frequently ſow beans next after wheat in clayey grounds, ſo in theſe they chooſe to ſow peas, chuſing a fair and ſettled ſeaſon for their ſeed-time; for if there happen a ſmart ſhower ſoon after their ſowing, the earth will bind ſo firmly together after it, that moſt of the ſeed will be loſt. *Plot*'s Oxfordſhire, p. 246.

MAUND, in our old writers, a kind of great baſket or hamper, containing eight bales, or two fats: It is commonly a quantity of eight bales of unbound books, each bale having one thouſand pounds weight. Book of Rates, p. 3. *Blount*.

MAUROUSE, the name of a creature of the deer kind, mentioned by Joſſelyn. It ſeems to be the ſame with the *Dama Virginiana* of Mr. Ray, one of which creatures was, in his time, kept alive in St. James's park. See the article DAMA. This is not certain, however; for Joſſelyn's deſcription is very imperfect; he only ſays it is like the mooſe-deer, but is ſmall, and has ſmall horns.

MAUZ, a name uſed by ſome authors for the *muſa*, or plantain-tree. *Alpin*. Egypt. p. 78.

MAXILLA (*Cycl.*)—MAXILLÆ *Quartus*, in anatomy, a name given by Veſalius, and ſome others, to one of the muſcles of the lower jaw, commonly known by the name of the *digaſtricus*, and called by Albinus, *biventer maxillæ inferioris*.

MAXILLAM *Atollens Tertius*, in anatomy, a name given by Riolanus, and ſome others, to a muſcle of the face, more generally known by the name of *maſſeter*.

MAXILLARY (*Cycl.*)—MAXILLARY *Bones*, *Maxillaria oſſa*. The *maxillary* bones, or great bones of the upper jaw are two in number, ſituated one on each ſide, in the anterior and middle part of the face; their conformation is very irregular, and they are of very conſiderable extent. Anatomiſts generally divide them into the external and internal ſides. By the external ſide they mean all that appears in an entire ſkull, without taking in the arch of the palate, and by the internal ſide, that which makes part of the arch of the palate, and all that is turned to the *ſeptum narium*. The ſeparation of this bone, by a ſmall tranſverſe ſuture behind the *foramen inciſorium*, is ſeldom found but in young ſubjects, before the oſſification is compleated. The *maxillary* bone is almoſt all compact, and without diploe, except in the alveolary arch, and at the point of the orbitary apophyſis.

The *Oſſa Maxillaria* are connected with the *os frontis*, *os ethmoides*, *os ſphenoides*, *oſſa unguis*, *oſſa malarum*, *oſſa naſi*, *oſſa palati*, *vomer*, *conchæ narium inferiores*, and with one another. They aſſiſt in forming the organ of maſtication, the arch of the palate, the cheeks, the orbits, the noſe, *&c.* *Winſlow*'s Anatomy, p. 33. ſeq.

MAXILLARY *Muſcles*, in fiſh, two large muſcles placed under the lower jaw, and ſerving to move it; theſe, with the two hypophthalmic muſcles, which are placed under the eyes, are the four cephalic muſcles of fiſhes, according to authors.

MAXIMIS ET MINIMIS. For the *method of Maximis & Minimis*, ſee the article MAXIMUM, *Cycl.* and *Suppl.*

MAXIMUM (*Cycl.*)—The fluxion of the baſe of a curve, or of its abſciſſa being given, when the fluxion of the ordinate vaniſhes, the tangent becomes parallel to the baſe, and the ordinate, moſt commonly, is a *Maximum* or *Minimum*, according to the rule given by authors on this ſubject, and mentioned in the Cyclopædia, under this head. But it is to be obſerved, that if the ſecond fluxion of the ordinate vaniſh at the ſame time, and the third fluxion be real, this rule does not hold; for the ordinate is, in that caſe, neither a *Maximum* nor a *Minimum*. If the firſt, ſecond, and third fluxions vaniſh, and the fourth fluxion be real, the ordinate is a *Maximum* or *Minimum*. The general rule given by Mr. Maclaurin, is, that when the firſt fluxion of the ordinate, with its fluxions of any ſubſequent ſucceſſive orders, vaniſh, and the number of all theſe fluxions that vaniſh is odd, then the ordinate is a *Maximum* or *Minimum*, according as the fluxion of the next order to theſe is negative or poſitive. But if the number of all the fluxions of the ordinate, of the firſt and ſubſequent ſucceſſive orders that vaniſh, be an even number, the ordinate is then neither a *Maximum* nor a *Minimum*. See Treat. of Fluxions, B. 1. c. 9. and B. 2. c. 5. art. 859. ſeq. The greateſt and leaſt ordinates are likewiſe diſcovered in ſome caſes, by ſuppoſing $\dot{y}$ to be infinite in reſpect of $\dot{x}$. But there are ſeveral exceptions to this rule. See *Maclaurin*, loc. cit. art. 262, 865.

A late author has formed ſome objections to the univerſality of Mr. Maclaurin's rule. See the Harmony of Antient and Modern Geometry, by Mr. *Paman*, Lond. 1745. 4°. in the Preface.

MAXY, in mineralogy, a name given by ſome to mundic, a ſulphureous mineral, common in the tin mines of Cornwall, and elſewhere. *Boerhaave*, Chem. p 99. n.

MAY *Dew*. See the article ROS *Mayalis*.

MAYA, in natural hiſtory, a name given by the people of the Philippine iſlands to a ſmall ſpecies of ſparrow, much leſs than ours, and very common among them. It feeds on rice, and is very deſtructive of it.

MAZA, a name given by the antients to a ſort of food, in common uſe among the poorer ſort of people. It was made of the meal of parched barley, ſprinkled with ſome liquid, and was eaten with honey or with defrutum.

Hippocrates every where ſpeaks of this as of a coarſe kind of bread, and adviſes the changing the common finer bread, in the ſpring ſeaſon, for this coarſer kind, as a thing very conducive to health. He ſeems every where to conſider bread as the drier, and *Maza* as the moiſter diet.

MAZA, Μαζα, among the Athenians, a ſort of cake, which was the common fare of ſuch as were entertained at the public expence in the common hall, or *prytaneum*. *Potter*, Archæol. Græc. l. 1. c. 25. T. 1. p. 136.

Theſe cakes were made of flour boiled with water and oil. *Pitiſc*. Lex. Ant. in voc.

MAZONOMUS, among the antients, a very large diſh, commonly of wood, in which the *Maza* was ſerved. *Pitiſc*. Lex. Ant. in voc. See the article MAZA.

MAZORAH, among the Jews, denotes the ſcience of reading the ſcriptures. See the article CABBALA.

MAZUR, a ſpecies of birds, which the Arabian ſailors eſteem very lucky, becauſe it lays its eggs cloſe by the ſea ſhore before a tract of good weather; ſo that when theſe are obſerved, they promiſe themſelves a ſafe voyage. They alſo pretend that this bird gives notice to ſailors, when the ſhip approaches any danger, by flying and fluttering up and down. *Hofm*. Lex. in voc.

MEADOW *Land*. Too much water, and too little, are equally prejudicial to *Meadow* grounds. The beſt lands for *Meadow* paſture are either low lands, or hanging grounds, where there is a rich ſoil and a moiſt bottom; eſpecially where any little brook, or running ſpring, may be brought over it; and where there is ſome deſcent in the *Meadow*, that the water may not lodge on it. Theſe *Meadows* are much better for the farmer than thoſe near large rivers, where great crops are often loſt. *Mortim*. Huſb.

MEADOW-*Saffron*, *Colchicum*. See the article SAFFRON.

MEAL. The *Meal* or flour of England is the fineſt and whiteſt in the world. The French is uſually browner, and the German browner than that. Our flour keeps well with us, but in carrying abroad it often contracts damp, and becomes bad. All flour is ſubject to breed worms; theſe are white in the white flower, and brown in that which is brown; they are therefore not always diſtinguiſhable to the eye; but when the flour feels damp, and ſmells rank and muſty, it may be conjectured that they are there in great abundance.

The colour, and the weight, are the two things which denote the value of *Meal* or flour; the whiter and the heavier it is, other things being alike, the better it always is. Pliny mentions theſe two characters as the marks of good flour, and tells us, that Italy, in his time, produced the fineſt in

the world. This country, indeed, was famous before his time for this produce; and the Greeks have celebrated it; and Sophocles, in particular, ſays, that no flour is ſo white, or ſo good, as that of Italy. The corn of this country has, however, loſt much of its reputation ſince that time; and the reaſon of this ſeems to be, that the whole country being full of ſulphur, alum, vitriol, marcaſites, and bitumens, the air may have, in time, affected them ſo far, as to make them diffuſe themſelves through the earth, and render it leſs fit for vegetation; and the taking fire of ſome of theſe inflammable minerals, as has ſometimes happened, is alone ſufficient to alter the nature of all the land about the places where they are. *Deſland.* Trait. Phyſ.

The flour of England, though it pleaſes by its whiteneſs, yet it wants ſome of the other qualities valuable in flour; the bread that is made of it is brittle, and does not hold together, but after keeping a few days becomes hard and dry, as if made of chalk, and is full of cracks in all parts; and this muſt be a great diſadvantage in it when intended for the ſervice of an army, or the like occaſions, where there is no baking every day, but the bread of one making muſt neceſſarily be kept a long time.

The flour of Picardy is very like that of England, and after it has been kept ſome time, is found improper for making into paſte or dough. The French are forced either to uſe it immediately on the grinding, or elſe to mix it with an equal quantity of the flour of Bretany, which is coarſer but more unctuous and fatty; but neither of theſe kinds of flour keep well.

The flour of almoſt any country will do for the home conſumption of the place, as it may be always freſh ground; but the great care to be uſed in ſelecting it is in order to the ſending it abroad, or furniſhing ſhips for their own uſe. The ſaline humidity of the ſea air ruſts metals, and fouls every thing on board, if great care be not taken in the preſerving them. This alſo makes the flour damp and mouldy, and is often the occaſion of its breeding inſects, and being wholly ſpoiled.

The flour of ſome places is conſtantly found to keep better at ſea than that of others; and when that is once found out, the whole caution needs only be to carry the flour of thoſe places. Thus the French find that the flower of Poitou, Normandy, and Guienne, all bear the ſea carriage extremely well, and they make a conſiderable advantage by carrying them to their American colonies.

The choice of flour for exportation being thus made, the next care is to preſerve it in the ſhips; the keeping it dry is the grand conſideration in regard to this; the barrels in which it is put up ought to be made of dry and well-ſeaſoned oak, and not to be larger than to hold two hundred weight at the moſt. If the wood of the barrels have any ſap remaining in it, it will moiſten and ſpoil the flour; and no wood is ſo proper as oak for this purpoſe, or for making the bins and other veſſels for keeping flour in at home, ſince, when once well dried and ſeaſoned, it will not contract humidity afterwards. The beach wood, of which ſome make their bins for flour, is never thoroughly dry, but always retains ſome ſap. The fir will give the flour a taſte of turpentine; and the aſh is always ſubject to be eaten by worms. The oak is preferable becauſe of its being free from theſe faults; and when the ſeveral kinds of wood have been examined in a proper manner, there may be others found as fit, or poſſibly more ſo than this for the purpoſe. The great teſt is their having more or leſs ſap. See the articles FLOUR and WOOD.

MEAL *worm.* See the article WORM.

MEAN (*Cycl.*)—MEAN *Anomaly*, in aſtronomy. See the article ANOMALY, *Cycl.*

MEAN { *Conjunction*, / *Oppoſition*, } in aſtronomy, is when the *mean* place of the ſun is in { *Conjunction*, / *Oppoſition*, } with the *mean* place of the moon in the ecliptic. See the articles CONJUNCTION and OPPOSITION, *Cycl.*

MEAN *diſtance of a planet from the ſun*, in aſtronomy, is the right line drawn from the ſun, to the extremity of the conjugate axis of the ellipſis the planet moves in; and this is equal to the ſemitranſverſe axis, and is ſo called becauſe it is a *mean* between the planets greateſt and leaſt diſtance from the ſun.

MEAN *Motion*, in aſtronomy, that whereby a planet is ſuppoſed to move equally in its orbit, and is always proportional to the time.

MEASURE (*Cycl.*)—We have lately had ſome accurate compariſons between ſome of the French weights and meaſures, and thoſe of England, the reſult of which is, 1. The Paris half toiſe, as ſet off on the ſtandard kept in the Royal Society, contains of Engliſh inches, by the ſame ſtandard, 38.355. whence it appears, that the Engliſh yard and foot is, to the Paris half toiſe and foot, nearly as 107 to 114; for as 107 to 114, ſo is 36 to 38.35514.

2. The Paris two marc, or ſixteen ounce weight, weighs Engliſh Troy grains 7560; whence it appears, that the Engliſh Troy pound of twelve ounces, or 5760 grains, is to the Paris two marc, or ſixteen ounce weight, as 16 to 21; that the Paris ounce weighs Engliſh Troy grains 472.5; and that conſequently the Engliſh Troy ounce is to the Paris ounce, as 64 is to 63.

3. The Engliſh avoirdupois pound weighs Troy grains 7004; whence the avoirdupois ounce, whereof ſixteen make a pound, is found equal to 437.75 Troy grains. And it follows, that the Troy pound is to the avoirdupois pound, as 88 to 107 nearly; for as 88 to 107, ſo is 5760 to 7003.636; that the Troy ounce is to the avoirdupois ounce, as 80 to 73 nearly; for as 80 to 73, ſo is 480 to 438. And, laſtly, that the avoirdupois pound and ounce, is to the Paris two marc weight and ounce, as 63 to 68 nearly; for as 63 to 68, ſo is 7004 to 7559.873.

4°. The Paris foot, expreſſed in decimals, is equal to 1.0654 of the Engliſh foot, or contains 12.785 Engliſh inches. Phil. Tranſ. N°. 465. Sect. 5.

MEAT (*Cycl.*)—MEAT, in the manege. See the article DRY *Meat.*

MEB, or *Sea* MEB, in zoology, the name of a water bird of the larus or gull-kind, which is all over of a duſky grey on its upper part; its head is blackiſh at the top, and the beak is red. The legs are ſhort and black, and the wings very long, reaching beyond the tail when folded.

MECAXOCHITL, in the materia medica, the name of the *piper longum humilius*, or ſmall American long pepper. *Dale*, Pharm. p. 286.

MECHANICAL (*Cycl.*)—MECHANICAL *Force.* See the article FORCE, *Appendix.*

MECHANICAL *Operation of Medicines.* See the article MEDICINE.

MEDAL (*Cycl.*)—*Impreſſions of* MEDALS. A very eaſy and elegant way of taking impreſſions of *Medals* and coins, not generally known, is this: Melt a little iſinglaſs glue, made with brandy, and pour it thinly over the medal, ſo as to cover its whole ſurface; let it remain on for a day or two, till it is thoroughly dry and hardened, and then taking it off, it will be fine, clear, and hard as a piece of Muſcovy glaſs, and will have a very elegant impreſſion of the coin. *Shaw*'s Lectures, p. 430.

Sulphur is ſometimes uſed to take off impreſſions of *Medals*, coins, *&c.* The method is this: Having made a ledge of clay about the work, whoſe impreſſion is deſired, and carefully oiled the whole, gently pour brimſtone melted in a covered veſſel, to prevent its firing upon the metal. About the edge of this mould make a border of clay, as before, and lightly oil the internal ſurface of both; then gradually put into it, to the thickneſs of about a quarter of an inch, a mixture made up with calcined alabaſter and water, to the conſiſtence of ſtiff honey. This ſoon growing hard, may be taken out of the mould, and gives figures of the coin or *Medal. Boyle*'s Works abr. vol. 1. p. 151. A method ſomewhat different is deſcribed in the article BRIMSTONE.

We have an eaſy method of procuring the true impreſſion or figure of *Medals* and coins, by Mr. Baker in the Phil. Tranſ. N°. 472. Sect. 13.

Take a perfect and ſharp impreſſion in the fineſt black ſealing-wax, of the coin or *Medal* you deſire. Cut away the wax round the edges of the impreſſion; then with a preparation of gum-water, of the colour you would have the picture, ſpread the paint upon the wax impreſſion with a ſmall hair pencil, obſerving to work it into all the ſinking or hollow places, theſe being the riſing parts of the *Medal*; and the colouring muſt be carefully taken from the other parts with a wet finger. Then take a piece of very thin poſt paper, a little larger than the *Medal*, and moiſten it quite through. Place it on the wax impreſſion, and on the back of the paper lay three or four pieces of thick woollen cloth or flannel, of about the ſame ſize. The impreſſion, with its coverings, ſhould be placed between two ſmooth iron plates, about two inches ſquare, and one tenth of an inch thick. Theſe muſt be carefully put into a ſmall preſs, made of two plates of iron, about five inches and an half long, one inch and a half wide, and half an inch in thickneſs, having a couple of long male ſcrews running through them, with a turning female ſcrew on each, to force the plates together. Theſe being brought evenly together, by means of the ſcrews, will take off a true and fair picture of the *Medal*; which, if any deficiencies ſhould appear, may eaſily be repaired with a hair pencil, or pen, dipped in the colour made uſe of.

If a relievo only be deſired, nothing is neceſſary, but to take a piece of card, or white paſte-board, well ſoaked in water, then placing it on the wax mould, without any colouring, and letting it remain in the preſs for a few minutes, a good figure will be obtained.

This Method of taking off *Medals*, *&c.* is convenient, and ſeems much more ſo than the ſeveral inventions uſually practiſed in ſulphur, plaſter of Paris, paper, *&c.* wherein a mould muſt be formed, either of clay, horn, plaſter, or other materials, which require a good deal of time and trouble.

Some take impreſſions on paper from the *Medals* themſelves, by paſſing them through the rolling-preſs, and colouring them afterwards; but this is not only more difficult, but does great injury to the *Medals*, by impairing the ſharpneſs of their moſt delicate

delicate and expreſſive ſtrokes: Whereas wax does not hurt the fineſt *Medal* in the leaſt degree; and though a brittle ſubſtance, yet it effectually reſiſts the force of a downright preſſure.

Red ſeems the beſt colouring, and therefore black wax is directed to be uſed; but if the pictures are choſen in black and white, to reſemble copper plates, the wax ſhould be red; for the wax and paint ought to be of different colours, in order to diſtinguiſh when the colour is laid on properly, or rightly cleared away.

The ſubſtance of *Medals*, being metalline, is liable to be corroded; and the figures being raiſed, are alſo liable to be effaced by friction. Hence it is rare to find any perfectly preſerved. Gems are not ſubject to theſe inconveniencies. See the article GEM.

MEDEA, the name of a ſtone deſcribed by Pliny and the antients. They ſay it was black, and was variegated with gold-coloured veins, and that, when rubbed in water, it yielded a yellowiſh red juice, which had the flavour of wine. We know no ſtone at preſent anſwering theſe characters. Rulandus, indeed, mentions a kind of black hæmatites, or blood-ſtone, which tinges water to a ſaffron colour. This account he takes from Encelius; but this wants the much greater character, of giving it the taſte of wine.

MEDENA, a word uſed by Paracelſus to expreſs an inveterate kind of ulcer,

MEDEOLA, in botany, the name given by Linnæus to a genus of plants, called *ſalſa* by other authors. The characters are theſe: There is no cup, but ſome have erroneouſly taken the flower for a cup, and have deſcribed it under this name, and allowed no flower. The flower conſiſts of ſeveral petals, of an oblong oval figure, equal in ſize, and ſtanding expanded, with their ends often bent backwards. The ſtamina are ſix ſubulated filaments, of the length of the flower. The antheræ are incumbent. The piſtil has three corniculated germina. The ſtyles are of the ſame number, one terminating each germen. The ſtigmata are thick and crooked. The fruit is a roundiſh berry, dividing into three parts, and containing three cells. The ſeeds are ſingle, and of a cordated form. *Linnæi* Gen. Plant. p. 154.

MEDIALE, in botany, a name given by the antients to the central part of any tree. It is ſometimes uſed to ſignify the ſpungy pith that fils up the young branches of a tree, as in the elder, and the like. And ſometimes for the firm and hard ſubſtance, called the heart of the wood, and found to be much harder than any other part of it. Thus the name of *tree*, to which the word *Mediale* is annexed, muſt be the means of explaining what is meant by the word, whether a ſpongy pith, or a ſound and hard wood. The moſt accurate writers, however, make a diſtinction which ought to be kept up, that is, the calling the heart, or ſound internal part of wood, only *Mediale*, and the ſpungy part within the elder, *&c. Medulla.*

MEDIANTE, in muſic. *The Mediant of a mode* is that note which is a third higher than the final; or that which divides the fifth of every authentic mode into two thirds. See the articles MODE and THIRD.

This term is chiefly in uſe among the French. See *Broſſard*, Dict. Muſ.

MEDIATORS *of Queſtions*, in our old writers, were ſix perſons authorized by ſtatute, who, upon any queſtion ariſing among merchants, relating to any unmercable wool, or undue packing, *&c.* might, before the mayor, or officers of the ſtaple, upon their oath, certify and ſettle the ſame; to whoſe order and determination therein, the parties concerned were to give entire credence, and ſubmit. 27 Edw. 3. Stat. 2. c. 24. *Blount.*

MEDIATORS, Μεσαζονλες, under the emperors of Conſtantinople, officers of ſtate who had the direction of all affairs tranſacted at court. Their chief, or preſident, was called *megas meſazon*, Μεγας μεσαζων, and anſwered to the prime or grand viſier of the Turks. *Hofm.* Lex. in voc.

MEDICA, *Lucerne*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the papilionaceous kind, and its piſtil, which ariſes from its cup, becomes finally a ſeed-veſſel, of the ſhape of a ſnail, containing uſually kidney-ſhaped ſeeds.

The ſpecies of *Medica*, enumerated by Mr. Tournefort, are theſe: 1. The great upright *Medica*, with purple flowers. 2. The great upright *Medica*, with violet-coloured flowers. 3. The great upright *Medica*, with yellow flowers. 4. The great upright *Medica*, with variegated flowers of violet co-colour and yellow. 5. The wild *Medica*, with ſaffron-coloured flowers. 6. The wild *Medica*, with pale yellow flowers. 7. The wild *Medica*, with bluiſh green flowers. 8. The ſmall wild *Medica*, with blue and yellow flowers. 9. The ſea *Medica*. 10. The *Medica*, with broad ſcutellated fruit. 11. The *Medica* with orbiculated fruit. 12. The *Medica* with ſmooth leaves, marked with black ſpots, and with echinated fruit. 13. The echinated-fruited *Medica*, with ſmooth leaves, without the black ſpots. 14. The great *Medica*, with turbinated fruit. 15. The hairy *Medica*, with very rigidly echinated fruit. 16. The hairy echinated *Medica*. 17. The ſmalleſt echinated *Medica*. 18. The little coronated *Medica*. 19. The many fruited *Medica*, with obtuſe, and not crenated leaves. 20. The many-fruited *Medica*, with obtuſe crenated leaves. 21. The prickly two-fruited ſnail *Medica*, with elegantly divided leaves. 22. The perennial *Medica*, with the ciliary fruit. 23. The perennial ſhrub *Medica*, with orbiculated fruit. 24. The many-fruited orbicular-headed *Medica*, with a ſmaller fruit. 25. The orbiculated *Medica*, with a broad fruit, with a ſingle voluta. 26. The ſmaller orbiculated prickly *Medica*, with a ſingle large voluta. 27. The elegant orbiculated *Medica*, with the fruit rugoſe at the edges. 28. The barrel-fruited *Medica*, with the circles of the fruit wrinkled on each ſide, and turning black with age. 29. The larger and ſmaller ſmooth *Medica*, with the turned fruit. 30. The elegant *Medica* of Catalonia. 31. The prickly cochleated *Medica*, with large echinated fruit, turbinated at each end, and armed with ſpines turning backwards. 32. The *Medica* with the leaves and ſeeds of the heart-leav'd *Medica*, and with harder fruit. 33. The large double-fruited prickly barrel-headed *Medica*. 34. The two-fruited prickly *Medica*, with oval fruit, and ſhort rigid ſpines. 35. The many-fruited prickly barrel-headed *Medica*. 36. The leaſt, hairy and prickly barrel-fruited *Medica*. 37. The great prickly ſea *Medica*. 38. The *Medica* with lax fruit, of the ſmall echinated kind, but with prickles not ſtanding out. 39. The ſoft and hoary-leav'd hop *Medica*, with heart-faſhion'd ſeeds. 40. The great fruited *Medica*, with the prickles of the head turning both upward and downward. 41. The *Medica* with a large fruit, with the prickles turning all upwards. *Tourn.* Inſt. p. 413. See the article LUCERNE.

Malus MEDICA, in botany, a name given by ſome authors to the citron tree. *Ger.* Herb. 1287.

MEDICAL *Stones*. See the article STONE.

MEDICAGO, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the papilionaceous kind, and its piſtil, which ariſes from the cup, finally becomes a plain orbiculated fruit, of a ſort of falcated ſhape, and containing one kidney-ſhap'd ſeed.

The ſpecies of *Medicago*, enumerated by Mr. Tournefort, are theſe: 1. The annual trefoil-like *Medicago*. 2. The Spaniſh *Medicago*, with the appearance of the kidney vetch. 3. The cretic *Medicago*, with the appearance of the kidney-vetch. And 4. The hoary trifoliate ſhrubby *Medicago*, commonly called the Cytiſus with crooked pods. *Tourn.* Inſt. p. 412.

MEDICINES (*Cycl.*)—By *Medicines* is meant whatever corrects a depraved or vitiated conſtitution of body, and reſtores it to a heathful ſtate: So that they differ from aliments, which preſerve the body in a ſound ſtate, whereas *Medicines* reſtore it when impaired; and from poiſons, which tend to deſtroy the body. All the parts of diet may indeed be termed alimentary *Medicines*, in as much as they may ſerve to confirm health, againſt the firſt approaches of a diſeaſe; as poiſons, which are always detrimental to the body, have been called deleterious *Medicines*.

Medicines are either ſimple, or compound: Simple *Medicines* are thoſe which are formed ſpontaneouſly, or by the aſſiſtance of nature alone; and thoſe are called compound, which are owing to the art and induſtry of men; and to the mixtures of various ſimples put together.

The principal differences of ſimple *Medicines* are taken either from their form and texture, or from their virtues. In reſpect to their texture, they are divided into minerals, vegetables, and animals; each of which diviſions is termed a claſs, kingdom, or family.

In what the antients have left us concerning the *Medicines* they uſed, there is the utmoſt confuſion and obſcurity; the ſame ſubſtance is frequently called by many different names; ſome *Medicines* are barely mentioned by them, without any account of their nature or deſcription; and in regard to many others, the virtues aſcribed by them to one ſimple, have been, by later writers, attributed to others. To clear up, and ſet right all thoſe difficulties, at this time, would be a taſk as difficult as it would be uſeful. So great and ſo many virtues are aſcribed, by different authors, to particular *Medicines*, that, if they could be depended on, each ought to be looked on as an almoſt univerſal remedy; but as many of theſe virtues are merely imaginary, it requires even the greateſt caution to diſtinguiſh the fictitious from thoſe which truly belong to them; and though the knowledge of the virtues of *Medicines* be at this time carried to a very great length, there are nevertheleſs many things remaining yet to be diſcovered, and room enough ſtill to enrich the ſcience with new ſpecific remedies; nor will the judicious phyſician find leſs worthy employment for his thoughts, in endeavouring to determine the manner in which thoſe *Medicines* act, whoſe effects are already known, and to aſcertain the ſafeſt and beſt methods of adminiſtring them. *Geoffroy*, Tract. p. 2.

Such *Medicines* as are of a terreſtrial, or other the like nature, and will not diſſolve in water, the new Diſpenſatory of the college has ordered to be prepared in the following manner:

They are firſt to be pounded in a mortar, and then levigated with a little water, upon a hard and ſmooth marble, into an impalpable powder, and afterwards dried upon a chalk ſtone,

and then ſet by for a few days, in a warm, or at leaſt a very dry place. In this manner are to be prepared amber, antimony, bezoar, which ſhould be levigated with ſpirit of wine inſtead of water, blood-ſtone, calamy, firſt calcined for the uſe of the makers of braſs, chalk, coral, crabs claws, crabs eyes (ſo called); egg-ſhells cleanſed from the membrane adhering to them by boiling in water, oyſter-ſhells firſt cleanſed, pearls, verdegreaſe, tutty.

In antimony, calamy, and tutty, ſingular care ought to be taken to reduce them to the moſt ſubtle powder that can be. *Pemberton*'s College Diſp. p. 145.

Mechanical Operation of MEDICINES. To account for the operations of *Medicines* mechanically, ſeems to have been the favourite ſcheme of phyſicians and phyſiologers of the laſt and preſent century. Stahl and his diſciples reject theſe accounts, and think them ſufficiently refuted by the operation of opium, and of aſtringents. One grain of opium, properly taken, will, for a time, aſſwage pains all over the body. A very few grains of crocus martis aſtringens ſometimes ſtop an hæmoptyſis, before they can be ſuppoſed to have entered into the humours of the body. Is it not paſt all belief, ſay they, that ſo few grains mixed with ſo many pounds of fluids, ſhould retain any mechanical force, eſpecially as it is well known that aſtringents loſe their force by dilution. They farther urge, that the various effects of the ſame *Medicine* are a refutation of the mechanical hopotheſis; thus emetics ſometimes purge, and *vice verſa*; aſtringents encreaſe hæmorrhages; opium excites alacrity in ſome, inſtead of ſtupifying. Again, the ſight, or even bare imagination of ſome *Medicines*, will produce a ſenſible effect on the body, without any contact. Stahl and his followers therefore hold, that *Medicines* operate chiefly by exciting the vital ſenſe; and that this is the chief effect of *Medicines*, even where they ſeem moſt to act mechanically. See *Juncker*'s Conſp. Therap. p. 3. ſeq.

Hoffman, Heiſter, and others, have attacked the hypotheſis of Stahl. We ſhall not pretend to give any farther account of the controverſy. Perhaps in this, as in others, there may be a good deal of logomachy. Strictly ſpeaking, mechanical principles muſt be inſufficient to account for the operation of *Medicines*, as this ſometimes undoubtedly depends (in the *primæ viæ* at leaſt) on chemical principles; and no body has hitherto been able to account mechanically for the phænomena of chemiſtry. The laws of the *minima naturæ* have not hitherto been reduced to thoſe of the preſſure and impulſe of large ſenſible maſſes. And perhaps when the laws, that obtain in the minute parts of matter, have been found, we ſhall ſtill be at a loſs to account for all the phænomena of animated bodies, particularly the human.

Heiſter ſays, Stahl pretends that the rational ſoul and nature are ſynonimous terms; and that it is the rational ſoul which formed the fœtus in the womb, and which directs all vital, animal, and natural actions, to the preſervation of the body; hence ſometimes exciting evacuations, ſometimes ſpaſms, to get rid of diſorders. *Heiſter*, Diſſert. de Medicin. Mechan. præſtantia in Compend. Medicin. Practic. where he endeavours to refute the Stahlians.

Juncker, who wrote according to Stahl's principles, does not deny that there is ſomething mechanical in the operation of *Medicines* independantly of the will or ſpontaneity of nature; but he aſſerts that their chief operation is owing to nature, which makes uſe of the remedy to attain its end. His words are, *Operationem Medicamentorum ab ipſa natura gubernari innumeræ confirmant Obſervationes. Licet enim non negamus, ſubeſſe interdum actioni eorum aliquid mechanici, a naturæ arbitrio non pendentis, tanti tamen hoc non eſt habendum, ut operandi modus illi maxime adſcribi mereatur. A potiori enim ſit denominatio, & natura utitur remedio ad finem ſuum.* *Juncker*, Conſpect. Therap. p. 1, 2.

A late author obſerves, as to *Medicines*, that let what diſeaſe ſoever be named, and any *Medicine*, as univerſally uſeful in it, yet he can ſhew circumſtances of patients, or of the diſeaſe, where that *Medicine* would be very improper. He mentions ſeveral inſtances of this kind. See Medic. Eſſ. Edinb. vol. 1. p. 267. ſeq.

MEDICINES *from Metals*. See the article METALS.

Pocket MEDICINES, in ſurgery, are ſuch neceſſary remedies as the ſurgeon ought never to be without; but always to carry in a convenient caſe or box about him. Theſe are the common digeſtive ointment, and the brown or Ægyptian ointment, for cleanſing and digeſting foul ulcers, and ſome vulnerary balſams, as the *linimentum Arcæi*, or the balſam of Peru, of Gilead, or Capivi, or the Samaritan balſam: To theſe muſt alſo be added a plaſter or two, as the diachylon, or ſtypticum Crollii, ſince one or other of theſe is almoſt conſtantly wanted. Neither ſhould there be wanting a piece of blue vitriol for the taking down luxuriant fleſh, and to ſtop hæmorrhages; but if vitriol is wanting, burnt alum, red precipitate, the infernal ſtone, or any other corroſive *Medicine*, will ſupply its place in corroſive intentions, and the laſt will alſo ſerve to open abſceſſes, to make iſſues, and perform many other operations of that kind. With theſe there ſhould always be kept in readineſs alſo a quantity of ſcraped lint, that the ſurgeon may be able to give immediate aſſiſtance to wounded perſons, ſince, if he is unprepared for this, they may be eaſily taken off by an hæmorrhage, a circumſtance which ought alſo to prevail with the ſurgeon never to be wholly unprovided with bandages. *Heiſter*'s Surg. p. 11.

MEDIMNUM, Μεδιμνον, among the Greeks, a meaſure of capacity, holding ſix Roman *modii* or buſhels. *Danet*. in voc.

MEDINE, an Egyptian piece money, of iron ſilver'd over, and about the ſize of a ſilver three-pence. *Pocock*'s Egypt. p. 173.

MEDINUS, a name given by ſome to the *medus*, a ſtone celebrated by the writers of the middle ages for many imaginary virtues. See the article MEDUS.

MEDITRINALIA, among the Romans, feaſts inſtituted in honour of the goddeſs *Meditrina*, and celebrated on the 30th of September. They were ſo called from *medendo*, becauſe the Romans then began to drink new wine, which they mixed with old, and that ſerved them inſtead of phyſic.

MEDIUM, in botany, a name given by Dioſcorides to the violet, and by Lobel, to the ſea flag-flower, or *iris maritima narbonenſis*. *Ger*. Emac. Ind. 2.

MEDLAR, *Mepſilus*, in botany. See the article MEPSILUS.

We have two kinds of *Medlar* propagated very frequently in orchards, for the ſake of their fruit; the one is the common *Medlar*, or, as it is called by ſome, the Nottingham *Medlar*; the other the Dutch *Medlar*. The firſt of theſe was once almoſt the only kind known in England; but ſince the other has been introduced, it is found ſo much ſuperior in the ſize, and flavour of the fruit, that it is now almoſt the only kind thought worth the cultivating.

They are propagated by budding or grafting them upon the hawthorn, or the pear ſtock, upon either of which they take very well, and may be afterwards tranſplanted into the fruit-garden, either as ſtandards, or trained up againſt an eſpalier, in both which methods they will ſucceed very well. If the larger ſort are trained up in an eſpalier, the fruit will be much larger; but great care muſt be taken in the pruning, not to ſhorten the bearing branches, for the fruit is almoſt all produced at the extremities of theſe. The *Medlar* will grow on any ſoil; but on a moiſt and ſtrong ſoil, the fruit will grow larger, and on a dry one, it will, though ſmaller, be much better taſted. *Miller*'s Gardener's Dict.

The fruit ſhould be ſuffered to remain on the branches till October, at which time it will begin to fall of itſelf, and it ſhould then be gathered in the middle of a dry day, and laid up in a dry place till ſoft, and beginning to decay, which is uſually about a month after it is gathered; at this time they are fit for eating, for, till they begin to decay, they are too harſh for the palate.

MEDOKINA, in natural hiſtory, the name of a ſpecies of oyſter. See the article OSTREA.

MEDULLA (*Cycl.*)—MEDULLA *Spinali*. In fiſhes, the ſpinal marrow does not run through the middle of the vertebræ, as it does in other animals, but is carried through a whole ſeries of the apophyſes which ſtand on the upper part of the bone, and are therefore called the *apophyſes dorſales*, to diſtinguiſh them from the others, which their ſituation occaſions to be called the lateral and ventral. All theſe dorſal apophyſes of the vertebræ are hollow at their baſe, and by that means afford a continued channel for this marrow. The baſes of the lower apophyſes reaching from the anus to the tail, have alſo the ſame ſort of hollow at their baſe; but this ſerves only for the paſſage of the larger blood-veſſels.

MEDUS, or MEDINUS, a name given by the writers of the middle ages to a ſtone brought from Media, of which they ſay there were two kinds, the one black, and the other green. They attribute many ſtrange virtues to theſe ſtones; the black they ſay was a fatal poiſon when taken inwardly, but that if wetted with milk, and rubbed upon the ſkin of a woman with child, it cauſed her to bring forth a boy. This, and a number of other as probable virtues, did theſe ignorant and fanciful writers beſtow at pleaſure on ſtones never known to the world before, and of which themſelves gave no deſcriptions. This ſeems to be only a falſe hiſtory of the *Medea* of Pliny.

MEDUSÆ *Caput*, in natural hiſtory, a name given by authors to the *ſtella marina*, called by ſome, from its various branchings, *ſtella arboreſcens*. Rumphius, Geſner, and many other authors, have deſcribed this ſtrange fiſh in its recent ſtate, and in the acta eruditorum, we have an accurate figure, and a very remarkable account of one which was found foſſile, and preſerved in a remarkably perfect manner in ſtone.

The ſtone in which it was found was of the fiſſile or ſlaty kind, and it was ſo large as to extend over a piece of this ſtone of four foot in length, and between three and four in breadth. The body of the fiſh, from which all the reſt ſeemed originally to have ariſen, lay at one corner of the ſtone, and the arms extended themſelves lengthways in a very diſtinct and natural manner the whole length of the ſtone; and from theſe there parted, on every ſide, other ſmaller ones, and theſe were finally divided into others more minute, in ſuch a manner as to repreſent the niceſt painting. Act. Erudit. Ann. 1725. p. 377.

The ſtudy of foſſils is more improved by this ſingle ſpecimen, than by thouſands of others, and by the reaſonings of almoſt as many authors. The foſſils called *entrochi*, have always perplexed the writers on theſe ſubjects to account for; ſome having judged them a ſort of ſtony vegetables; ſome *luſus naturæ*; and others as different things; but in this

this table the whole fiſh is ſo perfectly preſerved, that there can remain not the leaſt doubt of its being really the *ſtella arboreſcens*; and in this both the figure and the author's words expreſs, in the plaineſt manner poſſible, that the long arms or branches reaching from one end to the other of the ſtone, are compoſed of a number of *entrochi* as it were, tied together in the ſame manner as the ſingle joints of thoſe *entrochi* which we meet with are to one another; or, in plain fact, that our *entrochi*, which have perplexed us ſo much to account for their origin, are in reality the fragments of the arms or branches of this fiſh. Theſe branches in this famous ſpecimen, were compoſed of what we call *trochitæ*, and had many rudiments of ſmaller branches, as well as perfect ones, growing from their ſides, and would have been ſo many common *entrochi*, if broken off.

What was moſt remarkable in this foſſil was, however, the ſeparating of ſmaller branches which ran entire to their ends, and there terminating in an infinite number of ſmall ramifications, all growing from one head; they formed cluſters of four or five inches in diameter, and of an inconceiveable beauty, reſembling the compound flower of ſome elegant plant. The matter of the larger branches, when examined, appeared to be the ſame with that of the common *entrochi*, that is, ſpar. The author calls it *ſelenites*, but that was a word indeterminately uſed by authors, till of late, for all plated and bright foſſils.

It is plain that this compleat fiſh could have no way come into this ſtone but at the time when it was yet moiſt and ſoft; and the author calls it *novum diluvii monumentum*, a new remembrancer of the deluge.

MEER, in mining, a ſpace containing twenty-nine yards in length in any vein. *Houghton*'s compl. Miner in the Explan. of the Terms.

MEER-*Stake*, in mining, is a pin of wood drove into the ſuperficies of the earth, to ſhew the extent or end of a *Meer* of ground. *Houghton*'s Compl. Miner in the Explan. of the Terms.

MEER-*Swiin*, in zoology, a name given by ſome to a ſea fiſh, more uſually known by the name of *capriſcus*. *Ray*'s Ichthyogr. Append. p. 1. See the article GOAT-*Fiſh*.

MEGALARTIA, Μεγαλαρτια, in antiquity, a feſtival in honour of Ceres, being the ſame with *Theſmophoria*. *Potter*. Arch. Græc. See the article THESMOPHORIA.

MEGALASCLEPIA, Μεγαλασκληπεια, in antiquity, a feſtival in honour of Æſculapius. See the article ASCLEPIA.

MEIDANS, in the eaſtern nations, are a ſort of country ſeats, where the greater people have open ſummer-houſes, to which they retire on the three days of the week in which they do not attend the paſhas divan, and where they divert themſelves with ſeeing their ſlaves ride, ſhoot, and throw the dart, while they are regaling with their pipe and coffee. *Pocock*'s Egypt, p. 184.

MEL, *Honey* (*Cycl.*)—See the article HONEY.

MEL *Cedrinum*, in the materia medica of the antients, a term uſed to expreſs a ſort of liquid manna, uſed rather as a pleaſant ſweet in foods, than as a medicine, and which ſeems to have been the ſame with the *Mel Roſcidum* of Galen, and with the liquid manna of mount Sinai; that mountain having been the place where it was annually collected in large quantities, even in Galen's time; and the account Bellonius gives of the manner of collecting it in his time, agreeing very well with what Galen has left about it. It is, however, an error in Bellonius, to ſuppoſe this to be the *terenjabin* of the Arabians, that being evidently a ſolid, not a liquid ſubſtance, and being, from all accounts the ſame with what is now called, *manna Perſicum*, or Perſian manna. See the article MANNA *Perſicum*.

The *Mel Cedrinum* is a term uſed only by Hippocrates for this ſubſtance, and ſeems ſo odd, that many are apt to believe there is an error in the text, and that the author never meant any ſuch thing. Foeſius is of opinion, that theſe ought to be read as two diſtinct names, with a comma between them, and that the author only meant by them two ſubſtances very well known in his time, which were common honey, and the liquid ſubſtance called *Cedrinum*, or *Cedria*. See the article CEDRIA.

MEL *Roſcidum*, in the materia medica of the antients, a name given to a kind of liquid manna collected in their time, as it is at preſent, in conſiderable quantities, on mount Sinai. The monks who collect it call it *terenjabin*, after the name of a kind of manna, common among the Arabians. But this is an error, the terenjabin of thoſe authors not being a liquid manna, but the ſmall round kind, collected from the *alhagi maurorum*, and now called *manna Perſicum*. It does not appear that the *Mel Roſcidum*, or any other ſpecies of manna, was uſed in medicine by the antients; this was eſteemed a curioſity, rather than a thing of any uſe, by Galen; and other authors ſay, it was ſweeter than honey itſelf, with no farther account; whence it ſeems rather to have been uſed as a delicacy than as a medicine. See the articles TERENJABIN and MANNA *Perſicum*.

MELAMPYRUM, *Cow-wheat*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the perſonated kind, conſiſting of one leaf, and divided into two lips, the upper of which is hooded, and the lower uſually whole, not divided into any ſegments. The piſtil ariſes from the cup of the flower, and is fixed to its hinder part in the manner of a nail, and finally ripening into a roundiſh capſule, divided into two cells, containing grains like thoſe of wheat. *Tourn.* Inſt. p. 173.

The ſpecies of *Melampyrum*, enumerated by Mr. Tournefort, are theſe: 1. The purple-flower'd *Melampyrum*. 2. The broad yellow-leav'd *Melampyrum*, 3. The purple and white flower'd creſted *Melampyrum*. The plant called the ſmalleſt yellow *Melampyrum* by Caſpar Bauhine, has no right to that name, being truly a ſpecies of the ranunculus.

MELAN *Pharmacon*, a word uſed by Hippocrates, and by ſome ſuppoſed to mean common writing ink: He orders this to be poured upon the cranium, in caſe of a fiſſure, in order to diſcover how far it has penetrated. Galen ſeems to refer to this, in ſome places, and mentions his having treated of it in his book of ulcers; but as no ſuch medicine is found preſcribed there, it is probably one of the loſt compoſitions of the antients. In the ſpurious editions of Hippocrates, his book treating of the diſeaſes of women, there is a black medicine ordered to be made of the ſquammæ and flos æris.

MELAENATOS, the *black eagle*, a ſpecies called alſo *aquila valeria* by ſome authors. It is a ſmall eagle, of twice the bigneſs of a crow. Its jaws and eyebrows are deſtitute of feathers, and look reddiſh; its head, neck, and breaſt, are black, and in the middle of its back he has a large triangular ſpot, of a pale browniſh red, with ſomething of whiteneſs intermixed. His rump is a reddiſh brown, and his wings variegated with black, white, and grey. His beak is not large, black at the end, the ſkin covering the noſtrils red, and the iris of his eye hazel-colour'd. His legs are feathered a little below the knee, and below that are red; and the claws very ſharp. *Willughby*'s Ornithology, p. 30.

MELANCHOLY, *Melancholia*, (*Cycl.*) in medicine, the name of a diſeaſe which conſiſts in the perturbation or injury of the imagination, which prevents it from forming a regular and determinate idea of things, as at other times; ſo that its due operations are interrupted, and often ſecond ideas, having no connection with the firſt, crowd in, and are ſucceeded by actions no way analogous to that firſt idea, and therefore appearing irrational.

Authors diſtinguiſh *Melancholy* into three kinds; the ſad, the merry, and the mixt, partaking of the nature of both; but in all theſe the cauſe is the ſame, and the difference is only owing to the temperament and habit of the patient.

This diſtemper has, however, its more eſſential differences, in regard to the cauſes from which it is produced. In ſome people, it ſeems wholly to depend upon a falſe prefiguration and judgment of things in the mind; and in this caſe it is uſually habitual and incurable. In others it ariſes from injuries of the body; and in theſe it always is obſerved to bear a proportion to the injury or debility of the parts. This peculiar ſpecies is called hypochondriac *Melancholy*; and finally, in others it ſeems of a mixt nature; as when it has taken its firſt origin from diſtemperatures in the body, but is afterwards ſo encreaſed by mental diſorders, that even after the total removal of the corporeal ones, it ſtill remains in all its force upon the mind. This is a too common, and very unhappy caſe.

Signs of it. Theſe are a perpetual anxiety of mind, without any rational cauſe; a diſtaſte and diſlike to every thing, even before it comes in ſight, and often a wearineſs even of life itſelf. A frequent weeping for imaginary cauſes, or for no cauſe at all. Many people, in this caſe, ſeem always to want room; they are for opening all the windows they can, and for running out into the ſtreets or fields, thinking themſelves every where impriſoned; others leave their houſes, and dread being taken up for capital offences, tho' never guilty of any; and, in others, theſe diſtemperatures of the mind are evidently joined with others of the body, ſuch as palpitations of the heart, ſighing very deeply, painful reſpiration, ſtrictures of the tonic motions of the parts, tremblings, paleneſs of the countenance, and extenuation of the body. Sometimes, inſtead of theſe reſtrictions, there are frequent remiſſions of the ſame tonic motions, whence ariſe ſudden fluſhings of the face, uncertain heats in the body, and a general laſſitude and loſs of ſtrength. In moſt caſes of this kind, there is an obſtinate coſtiveneſs of the bowels, and the affections of the mind are increaſed by terrible watchfulneſs, and if the perſons ſleep a little, they are terrified with troubleſome dreams all the while; if of ſanguine habits, they are continually dreaming of blood, of battles, and of fires; and, if of phlegmatic conſtitutions, of water and drowning. Dreadful apprehenſions happen alſo between ſleeping and waking, and they uſually awake in agonies, with violent tremblings, and difficulty of reſpiration. In the merry *Melancholy*, the alienations of the patient's mind are employed about chearful, and often obſcene ideas; and ſometimes their fancy exalts them to the ſtate of kings and princes.

Perſons ſubject to Melancholy. Theſe are principally men of great learning, and of ſedentary lives, hypochondriac people, and ſuch as are troubled with diſorders of the ſpleen; and to theſe are to be added women ſubject to hyſteric complaints.

Cauſes of it. Theſe are principally a ſpiſſitude of the blood, and a detenſion of it about the vena portæ; a bad diſpoſition of the internal parts, as a ſchirrous or ulcerous conſtitution in them, or an actually ulcerated ſtate. Perſons who are afflicted with

Melancholy

Melancholy from these causes, are usually subject to very unruly passions, and those of various kinds; love, fear, dejection of spirits, despair and anger, are often very predominant in them. A suppression of the hæmorrhoidal discharges in men, and of the menstrual ones in women, will also frequently throw them into this distemper; as will also an over great application to study, especially on abstruse subjects; a conscientious dread from past crimes; continual disappointment in the expectations; and sometimes a timorous disposition, brought on in infancy, by the folly of nurses.

Prognostics in it. That kind of *Melancholy* which is brought on by immaterial causes alone, such as that arising from too intense study, or other imaginations or effects of the mind, is always greatly more obstinate and difficult of cure than that which depends upon material causes, and has its origin in a distempered state of the body. The hypochondriac *Melancholy* is the most easy of all to be cured, especially if the hæmorrhoidal discharges can be brought on regularly again, yet even these cases must be taken in time, for when the *Melancholy*, even from such causes, is become habitual, it will remain after the cause is removed which gave them origin.

Method of Treatment. *Melancholy*, when it depends on immaterial causes, requires physic for the mind rather than for the body, and the frequent conversation with an ingenious friend, of a calm and quiet disposition, will go farther towards a cure than a thousand medicines. Persons in this state must be as little thwarted or contradicted as possible, and whips and chains are to be avoided, unless in cases of the most extreme necessity; this is also a method equally necessary in those cases where habit has confirmed upon the mind that disorder, which at first arose merely from material causes. But when the disease not only arises, but as yet depends entirely upon material causes, the cure is easy, and is to be performed in the following manner: The *primæ viæ* are to be cleansed by purges, particularly those made of black hellebore, and after this the patient is to be blooded in the foot, taking away about six ounces. Then the blood is to be attemperated by giving, three or four times a day, powders composed of purified nitre, and the common absorbents; and after a due use of these, the parts are to be restored to their pristine tone and vigour, by the milder chalybeates; the greatest care must also be taken to bring the hæmorrhoidal discharges in men, and the menstrual ones in women, to a natural and proper state, and then a sufficient quantity of weak liquors drank at meals, and a moderate degree of exercise, will bring the patient usually to an absolute state of health.

Hypochondriac *Melancholy* always is more relieved by bleeding than by any other practice; and indeed all attempts of a cure are vain, if this be not first done: Purified nitre dissolved in small quantities in all the patient's drink, will, in time, be found to do great things alone, as to a cure. It is the practice of some persons to give vomits in these cases; but they often turn *Melancholy* into a true *mania*. See the article MANIA.

MELANCORYPHUS, in natural history, the name of a bird, in the nests of which, the antients tell us, they found the callais or turquoise. This seems a very ridiculous story, and the whole to be only founded on the resemblance of colour between that stone and the eggs of this bird. It has been also disputed among authors, what was meant by the *melancoryphos* of the antients; the general opinion is, that it was that little bird which, from the blackness at the top of the head, we call the *black cap*. But the antients themselves seem to have meant a somewhat larger bird by it; for they tell us, that the ficedula, at a certain time of the year, changed colour, and became the *Melancoryphos*, or black crown. There is no great foundation for such an opinion as this, but it may, however, serve to shew, that these two birds were much of a size.

MELANOCERASUS, a name given by some botanical authors to the *solanum lethale*, or *bella donna*, a poisonous sort of nightshade, with a beautiful berry resembling a large black cherry. *Pluk.* Almag. p. 352.

MELANOPIPER, in the materia medica, a name given by some writers to the common black pepper. *Mont.* Exot. p. 9.

MELANTERIA, in natural history, the name of a fossile substance, much talked of by the antient writers in medicine, and supposed by most of the moderns to have been lost among the later ages. This, however, is an erroneous opinion, for it is really produced at this time in many parts of the world; though its resemblance to some of the other fossils, in its external appearance, has made it almost universally overlooked by the writers on these subjects. It is, in its most perfect state, a very beautiful substance, of a close, even, and regular texture, moderately heavy, and of a very beautiful yellow, like that of the finest gold. It is, in this state, found in loose irregular lumps, never very large, being usually only from an ounce to two ounces in weight, and of a smooth, even, and polished surface. This is the case when it is pure and solid, and it is then also of as bright and fine a colour on the outside as within. *Hill's* Hist. of Foss. p. 607.

This is a state, however, in which it is very rarely found; we usually meet with it either in the form of a downy efflorescence on various species of vitriolic minerals, particularly on the common marcasites and pyritæ; or else in loose, shattery, and friable masses, of rough surfaces, of a spongy texture, and of a coarse dusky yellow; in either of these states, however, it so much resembles a more or less pure native sulphur, that it is generally mistaken for that body. It makes no effervescence with acid menstruums, and when put into the fire, is found not to be inflammable, but calcines first to a whitish, and finally to a strong red colour.

Water dissolves a part of its substance, and this may again be procured separate from the liquor, by evaporation and crystallization, and then it appears in form of rhomboidal bluish green crystals.

It is found in the mines of some parts of the harts forest in Germany, and is often met with on the sides of hills in many parts of the East Indies, and in America; it is usually mistaken in all these places for a native sulphur. Id. ibid.

MELANTZANA, in botany, a name given by many authors to the mad apple, called more usually *Melongena*. See the article MELONGENA.

MELANURUS, in zoology, the name of a fish caught in the Mediterranean, and sometimes, though rarely, in the British seas; and called by some writers, *occulata* and *occhiata*.

It is of an oblong and rounded body, and its back very little prominent, and of a bluish black. Its sides are of a silvery white, but are variegated with dusky transverse streaks. Its eyes are remarkably large, and their iris of a fine shining yellow. Its mouth is moderately large, and its fore teeth broad, its hinder ones narrow, slender, and sharp. It has only one back fin, the anterior rays or nerves of which are prickly, but the hinder ones soft and inoffensive. Its scales are moderately large, and its tail is very remarkably forked. It seldom exceeds five or six inches in length: And its tail has a remarkable black spot in it, whence it has its name, as it has that of *occulata*, from the largeness of its eyes. *Gesner*, de Pisc. p. 638. *Aldrovand.* de Pisc. l. 1. p. 63.

MELAONES, a word used by certain authors for a black kind of worm found in meadows, in the month of May, which, when bruised, emit an agreeable smell. Some also have called a small species of beetle by the same name.

MELASMA, a sugillation, or black mark, from a bruise.

MELASSES. See the article MOLASSES, *Cycl.* and *Suppl.*

MELASTOMA, in botany, the name of a genus of plants, called by Burman, *acinodendron*. The characters are these: The perianthium consists of one leaf, and is obtuse and permanent; it is inflated in the middle, and scarce at all divided at the edge. The flower consists of five roundish petals, inserted near the rim of the cup. The stamina are ten filaments, short, and inserted into the cup. The antheræ are long and erect, but somewhat crooked. The germen of the pistil is roundish, and placed under the cup. The style is crooked and emarginated. The fruit is a berry containing five cells; it is of a roundish figure, but crowned with a cylindric rim, and surrounded by the cup. The seeds are numerous and small. *Linnæi* Gen. Pl. p. 190. *Burman.* Thesaur. Zeyl. p. 363. Hort. Malab. vol. 4. p. 42.

MELCHITES, a name of reproach given to the orthodox, who asserted and maintained the canons of the council of Chalcedon. It was given to the catholics by the heretics, and not by the catholics to the heretics, as mentioned in the Cyclopædia. See the article MELCHITES, *Cycl.*

The word is derived from the Hebrew *melech*, a king or prince, and signifies the same as royalists, or those who were of the emperor's religion. For the same reason the emperor Justinian had the epithet *Chalcedonensis* given him. *Hofm.* Lex. in voc.

MELDFEE, in our old writers, a recompence due and given to him that made the discovery of any breach of penal laws, committed by another person, called the promoters or informers fee. *Leg.* Inæ. c. 20. *Blount.*

The word is Saxon from *meldfeoh*.

MELEAGRIS, the *Turkey*. In the Linnæan system of zoology, this makes a distinct genus of birds, of the order of the gallinæ; the distinguishing characters are, that it has four toes on each foot, a fleshy papillose crest on its forehead, and long naked wattles. *Linnæi* System. Natur. p. 48.

MELECH, a word used by some of the chemical writers to express salt. See the article SALT.

MELECHIL, a word sometimes used as the name of the gum *bdellium*, and sometimes as that of the fruit of a tree of the palm kind, much used by the antients as a cordial and restorative. The word *mokel* has the same double sense, and both are, by the more accurate writers, determined in their meaning by the epithets annexed to them, the gum *bdellium* being called *Molechil*, or *mokel judaicum*, and the fruit *mokel mechense*; yet the consequence of even this has been more confusion; for the later writers supposed, that the fruit was not produced by a palm-tree, but by the same tree which produced the gum. See the articles MOKEL and BDELLIUM.

MELEGEION, a word used by some writers in medicine to express a fætid matter, of the consistence of honey, discharged from old ulcers.

MELES, the *Badger*, in the Linnæan system of zoology, makes a distinct genus of animals, among which the author includes the civet cat, as the creature which affords us the perfume

perfume of that name is uſually called. The characters of this genus are, that the animals of it have eight paps, two on the breaſt, and ſix on the belly, with feet with five toes on each, on the hinder as well as the fore ones. The author diſtinguiſhes the common *Badger* by his having the claws of his fore feet much longer than thoſe of the hinder ones; and the civet animal by its having all its claws of the ſame length. *Linnæi* Syſtem. Natur. p. 37. See the article TAXUS.

MELET, in zoology, a name uſed by ſome for a ſmall tranſparent ſea fiſh, called by authors, *hepſetus* and *anguilla*, and by ſome, *atherina*. *Willughby*'s Hiſt. Piſc. p. 210. See the article HEPSETUS.

MELIA, Μελία, of the Greek writers, the name of a vegetable that often occurs in the Greek naturaliſts, and which has ſo many ſignifications, that it is not eaſy to underſtand the authors, without being well acquainted with them. All late writers have perplexed the world by miſcalling things, and thence rendering names ſynonimous and confuſed, which were at firſt clear and diſtinct; but the confuſion of the ſenſes of the word *Melia* is as old as the earlieſt writers we are acquainted with: Theophraſtus complains of it in his time.

The moſt common uſe of the word is for the *fraxinus*, or aſh-tree. The antients uſed to make the handles of their ſpears and darts of this, and therefore they ſometimes called them *Melia*. This word was alſo uſed as the name of a ſeed, called alſo by ſome, *meline*. This was of the nature of panic, and by ſome confounded with the panic. Suidas mentions this as different from the panic; but Diocles ſeems to have made them the ſame ſeed. Pliny has tranſlated the paſſage from Diocles, and, by an unaccountable error, has called the plant *melfrugum*, and ſays, that it has the ſame virtues with millet.

MELIA, in botany, the name by which Linnæus calls the *azedarach*. See the article AZEDARACH.

MELIA *Terra*, in natural hiſtory, a name given by ſome authors to the *melinum*, or white earth of the iſland of Melos, uſed among the antients in painting; but in the works of Dioſcorides and Galen ſignifying a ſubſtance of a very different kind; the *melinum* of the painters having been a *Marle* (ſee the article MELINUM) and the *Melia Terra* of the phyſicians a tripela. The confuſion between theſe two ſubſtances, ariſes from the ſame ſource with that of a vaſt number of others in the materia medica, and natural hiſtory of the antients, things having, though ever ſo different in their nature and ſtructure, been at different times called by the ſame name, merely becauſe brought from the ſame place.

The *Terra Melia* of Dioſcorides, and the antient phyſicians, is a dry, looſe, and harſh earth, found in maſſes of different ſize, and lodged among the looſer ſtrata of other matter, never making a ſtratum of itſelf. It is very firm and hard, of a pale greyiſh white or light aſh colour, very heavy, of a looſe, open, and ſpungy texture, and of a rough, uneven, and duſty ſurface. It adheres ſlightly to the tongue, and does not ſtain the hands, but leaves a duſt after the handling, which is ſo harſh as to make a grating noiſe, when the fingers are afterwards rubbed together. It makes no efferveſcence with acids. It is found in all the iſlands of the Archipelago, and was uſed by the antients for the ſame purpoſes that the pumice was. *Hill*'s Hiſt. of Foſſ. p. 68.

MELIANTHUS, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the polypetalous anomalous kind, being compoſed of four leaves, ſometimes expanded into the ſhape of a fan, and ſometimes contracted into that of a cone. The cup is unequally divided into ſeveral ſegments, and from it ariſes a piſtil, which afterwards becomes a ſquare fruit, inflated in the manner of a bladder, and divided into four cells, which contain roundiſh ſeeds. *Tourn.* Inſt. p. 430.

The ſpecies of *Melianthus*, enumerated by Mr. Tournefort, are theſe: 1. The African *Melianthus*, called the great ſpiked African pimpernel. 2. The ſmaller procumbent African pimpernel-leav'd *Melianthus*. And 3. The leaſt American *Melianthus*. See Tab. 1. of Botany, Claſs 11.

MELICA, in botany, a name given by ſome authors to the plant which produces the *ſorghum*, or Indian millet. *Park.* Theatr. 1136.

MELICA, a word uſed by the antients as the name of a food of a refrigerating and moiſtening quality. It ſeems to have been a kind of *oxygala*; for Galen, where he directs perſons of a hot habit to uſe a refrigerating diet, among other aliments of that kind, directs the eating of *Melica*, which, he ſays, is prepared of milk. Conſtantine, in his book of Agriculture, mentions *Melica*, and ſays it was made by pouring milk into an earthen veſſel, firſt well impregnated with boiling hot vinegar, by means of which there was a ſeparation of the milk into whey and curd.

MELICERIOLA, a diminutive of the word *Meliceris*, a ſmall encyſted tumour. See the article MELICERIS, *Cycl.*

MELICHLORUM, in natural hiſtory, a name given by ſome of the antient writers to a ſpecies of jaſper, of a greeniſh yellow, uſually found variegated with other colours.

MELILOTUS, *Melilot*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of papilionaceous kind. The piſtil ariſes from the cup, and finally becomes a naked capſule or pod, not incloſed in the cup in the manner of thoſe of the trefoil, and containing one or two roundiſh ſeeds. The leaves grow three on every ſtalk. *Tourn.* Inſt. p. 406.

The ſpecies of *Melilot*, enumerated by Mr. Tournefort, are theſe: 1. The common or German *Melilot*. 2. The common *Melilot*, with white flowers. 3. The *Melilot* with long and ſharp pods. 4. The tall ſhrubby white-flower'd *Melilot*. 5. The tall ſhrubby yellow-flower'd *Melilot*. 6. The greater *Melilot*, with reflected pods. 7. The little creeping *Melilot*, with reflected pods. 8. The Italian *Melilot* with roundiſh ſeed-veſſels. 9. The narrow-leav'd creeping *Melilot*, with roundiſh ſeed-veſſels. 10. The little yellow *Melilot*, with ſmall flowers, and ſeed-veſſels arranged in thick ſpikes. 11. The little yellow-flower'd *Melilot*, with larger flowers and ſeed-veſſels, diſpoſed in longer and looſer ſpikes, and with narrower leaves, each having a black ſpot near the pedicle. 12. The procumbent *Melilot*, with longiſh rugged leaves, and ſhort ſpikes of flowers. 13. The *Melilot* with kidney-ſhaped ſeed-veſſels collected into heads, called the yellow-field trefoil, with numerous ſeeds. 14. The great ſweet-ſcented *Melilot*, with violet-colour'd flowers. 15. The cretic *Melilot*, with very large fruit. *Tourn.* Inſt. p. 408.

In the acts of the academy of Peterſburgh, we have a deſcription and draught of a new ſpecies of *Melilot* growing from ſeeds gathered in Siberia. It is there called *Melilotus ſeliqua membranacea compreſſa*. See Tom. 8. p. 229. ſeq.

Melilot is ſcarce ever given internally, but uſed externally; it is a great emollient, reſolvent, and digeſtive. It is a good ingredient in cataplaſms and fomentations of this intention. The flowers are recommended by ſome in infuſion, in the manner of thoſe of chamomile, as a remedy for the *fluor albus*.

MELINTZANIUM, in botany, a name given by the later Greek writers to the plant called *ſtrychnus* by the earlier writers of that nation. Theophraſtus, and all the old Greeks, uſe the word *ſtrychnus*, and ſay there are three kinds, two of which are poiſonous, and the other not. The firſt cauſing madneſs, the ſecond cauſing ſleep, and the third bearing an eſculent fruit. This laſt is the plant we call *pomum amoris*, the fruit of which is at this time eaten by many people.

It is not agreed by the late Greek writers whether this word *Melintzanion* ſhall ſtand for ſome one kind of the nightſhade, or for them all: If they borrowed it from the Italian *melanzana*, which ſeems probable enough, then it can only ſtand for that kind, not for the whole claſs of nightſhade; but we find ſome of them uſing it for the whole number of the nightſhades, poiſonous and not poiſonous, and making it only a ſynonym to *ſtrychnus*, others uſing it as the name of the fruit of the *pomum amoris*, or love-apple, and others for the fruit of the male mandrake, which is alſo eſculent, and which, Dioſcorides tells us, was eaten by the peaſants of his time, but that it made them ſleepy, if eaten in too large quantities.

The Arabian phyſicians uſe the word *bedengian* in the ſame ſenſe, ſometimes applying it to the love-apples alone, and ſometimes to the whole family of the nightſhades; and it is probable enough, that both the Italians and later Greeks copied their name *melanzana* and *melantzanion*, from *melongena*. Myrepſus has the words *melentzanon* and *agriomelentzanon*, that is, a wild kind of the *pomum amoris*, very frequent, and commends the ſeeds, and other parts of the plant, in fevers, and many other diſeaſes. Fuchſius confeſſes that he does not know what to make of the word; but it is wonderful that the ſimilitude of ſound between this and the *melanzana* and *melongena* did not lead him to the knowledge of what it was, as he was acquainted with thoſe words.

MELINUM, in natural hiſtory, the name of an earth, famous in the earlieſt ages of painting, being the only white of the great painters of antiquity; and, according to Pliny's account, one of the three colours with which alone they performed all their works.

It is a fine white marly earth, of a very compact texture, yet remarkably light; a ſort of texture which muſt render any earth fit for the painter's uſe, that is of a proper colour. It is frequently found forming a ſtratum in the earth, lying immediately under the vegetable mould. It is of a very ſmooth, but not gloſſy ſurface, is very ſoft to the touch, adheres firmly to the tongue, is eaſily broken between the fingers, and ſtains the ſkin in handling. It melts readily in the mouth, and is perfectly fine, leaving not the leaſt grittyneſs between the teeth. Thrown into water, it makes a great bubbling and loud hiſſing noiſe, and moulders away into a fine powder. It does not ferment with acids, and ſuffers no change in the fire. Theſe are the characters by which the *Melinum* of the antients is diſtinguiſhed from all the other white earths. It is ſtill found in the ſame place from whence the painters of old had it, which is that from whence it has its name, the iſland of Milo, called Melos by the Greeks, and is common in moſt of the adjacent iſlands. It has been of late tried here as a paint, and is found not to make ſo bright a white as the other ſubſtances now in uſe among the painters, but ſeems not liable, like them, to turn yellow; and if ſo, would be worth the conſideration of perſons in the colour trade, eſpecially as it may be had in any quantities for carriage. *Hill*'s Hiſt. of Foſſils, p. 43.

MELINUS *Color*, Μηλινον χρῶμα, in antiquity, a colour often mentioned in ſpeaking of the habits of players. It was a reddiſh yellow, or the colour of ripe apples, in Greek called μηλα, and their colour μηλοειδες χρῶμα. *Hofm.* Lex. in voc.

MELISSA, *Balm*, or *Baum*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is compoſed of one leaf, and is of the labiated kind. The upper lip is erect, and of a roundiſh figure, but bifid at the end. The lower lip is divided into three ſegments. The piſtil ariſes from the cup, and is fixed, in the manner of a nail, into the hinder part of the flower, and ſurrounded with four embryos, which afterwards become ſo many roundiſh ſeeds, ripening in an open capſule, which was the cup of the flower. The flowers of *Baum* always grow in the alæ of the leaves, but they do not always ſurround the ſtalks like thoſe of the ſideritis. *Tourn.* Inſt. p. 193.

The ſpecies of *Baum*, enumerated by Mr. Tournefort, are theſe: 1. The common garden *Baum*. 2. The hairy ſtrong ſmelling Roman *Baum*. 3. The low broad-leav'd *Baum*, with a large purple flower. 4. The low broad-leav'd *Baum*, with a very large white flower. 5. The low narrow-leav'd *Baum*, with a very large flower. 6. The ſhort-ſtalk'd, plantain-leav'd Pyrenean *Baum*.

Baum is greatly eſteemed among the common people, as good in diſorders of the head and ſtomach; but is leſs regarded in the ſhops. It is moſt conveniently taken by way of infuſion, like tea; and the green herb, contrary to the general rule in regard to other plants, is much better than the dry. See the article BALM.

Hoffman has contrived a proceſs for the obtaining the virtues of this plant, which affords its principles better than any other, and gives two medicines to the phyſician, unknown before, but of great value.

This method might be purſued with the ſame ſucceſs in other caſes, and many plants, not ſufficiently eſteemed at preſent, might thus afford uſeful preparations.

He took a large quantity of the leaves of *Baum*, freſh picked from the ſtalks, and filling a glaſs veſſel more than half full, with them, fixing the ſtopper carefully in, he put the veſſel into a dung-hill, where he let it remain three months: At the end of this time he took it out, and found the whole reduced to a kind of pultice. This being diſtilled in a retort, yielded firſt an empyreumatic liquor, but afterwards, when the fire was increaſed, a black and ſtinking oil came over, in form of thin laminæ, ſpreading itſelf over the ſurface of the liquor. There remained at the bottom of the retort a black and burnt maſs, reſembling a coal, which, being thrown on burning charcoal, had very much the ſmell of the common tobacco.

In this firſt diſtillation no volatile ſalt appeared, but the empyreumatic liquor being examined, was found very ſharp and acrid on the tongue, and of a ſharp and pungent ſmell. Spirit of vitriol being mixed with it, it afforded no efferveſcence; but on the mixing it with ſpirit of hartſhorn, ſpirit of urine, or the like, a ſmall ebullition always was produced, though it laſted but a few moments.

This liquor, rectified by a ſecond diſtillation, affords the volatile ſalt of *Baum*, which is a fine white and pellucid ſubſtance, adhering to the neck of the glaſs, in form of fine white and ſtriated cryſtal, and a yellow ætherial oil, of a very penetrating ſmell, and ſharp taſte, becomes ſeparated by the ſame rectification. Theſe are both found to be very great medicines, the ſalt as a ſudorific, and the oil as a high cordial, a carminative, and a deobſtruent. *Hoffman*, Act. Laborat. Chem.

MELITENSIS *Terra*, *Earth of Malta*, in the materia medica, an earth of which there are two very different kinds, the one of the genus of the boles, the other of the marles. The latter is that known by medicinal authors under this name; the former is the Malta earth now in uſe: But both being brought from the ſame place, are confuſedly called by the ſame name.

The Malteſe bole, which is what we uſe now, is a fine earth, of a cloſe compact texture, and very heavy; when dug, it is of a very pure white, but it is apt to contract a yellowneſs in drying, and become of a cream colour. It is of a very ſmooth and ſhining ſurface, ſcarce at all ſtains the ſkin in handling, adheres ſtrongly to the tongue, and melts into a butterlike ſubſtance in the mouth. It makes no efferveſcence with aqua fortis, or any other acid menſtruum, and ſuffers no change of colour in the fire. *Hill*'s Hiſt. of Foſſils, p. 4.

The Malteſe marle, which is the *Terra Melitenſis* of medicinal authors, is a looſe, crumbly, and very light earth, of an unequal and irregular texture, and when expoſed to the weather, ſoon falls into fine ſoft powder; but when preſerved and dried, it becomes a looſe light maſs, of a dirty white colour, with a greyiſh caſt; it is rough to the touch, adheres firmly to the tongue, is very eaſily crumbled to powder between the fingers, and ſtains the hands. Thrown into water it ſwells, and afterwards moulders away into a fine powder. It ferments very violently with acid menſtruums.

Both kinds are found in great abundance in the iſland of Malta, and the latter has been much eſteemed as a remedy againſt the bites of venomous animals, but with how much juſtice we cannot ſay. The other has ſupplied its place in the German ſhops, and is uſed there as a cordial, a ſudorific, and aſtringent. *Hill*'s Hiſt. of Foſſils, p. 37.

MELITITES, in natural hiſtory, an indurated clay, of a yelloviſh colour, but in many reſpects approaching to the nature of the morochthus or common French chalk.

It has its name from the Greek μελι, honey, according to Dioſcorides, from the ſweet taſte of the liquor it diſſolved into on rubbing with water; and probably it might be alſo ſo called from its colour, which does not ill reſemble that of honey.

The antients uſed it much in medicine; they applied it externally in ulcers, and gave it inwardly as a ſoporific to people who were to ſuffer pain, ſuppoſing it would make them leſs ſenſible of it. It is at preſent very common in Italy, and probably in many other places, but is not known or regarded. It is a very ſmooth ſubſtance, nearly as hard as the *morochthus*, of a very compact texture, and of great weight, of a fine even and gloſſy ſurface, very ſmooth and ſoft to the touch, and in colour of a greyiſh yellow. It does not at all adhere to the tongue, nor ſtain the fingers in handling; but drawn along a rough ſurface, leaves a fine ſlender white line; and ſhaved into very thin pieces, has ſome faint degree of tranſparence. It diſſolves, on rubbing in water, into a yellow thick liquor like cream, which has a luſcious or ſweetiſh taſte. It does not ferment with acids, and burns to a pure white. The ſweet taſte of this is common, in ſome degree, to the *ſteatites*, *morochthus*, and all the indurated clays, as are alſo their ſemi-tranſparence in thin pieces, and all their other properties. *Hill*'s Hiſt. of Foſſils, p. 24.

MELITITES *Lapis*, a name given by ſome authors to ſome of the rounder ſpecies of *echinitæ*, from their reſembling an apple in their ſhape.

MELITTOMA, a word uſed by the antients to expreſs a ſort of ſweet-meat, or confection, made with pleaſant ingredients mixed in honey.

MELLAGO, a word uſed by medicinal writers to expreſs any medicine that has the conſiſtence and ſweet taſte of honey. It is often applied to the rob, or inſpiſſated juice of fruits, mixed with ſugar in the making.

MELLE, or MULLI. The Peruvians, by gently rubbing the fruit of this tree between their hands in warm water, deprive it of all its ſweetneſs; after which they ſtrain the liquor, and leaving it a few days to ſubſide, it becomes a very tranſparent drink, and by boiling becomes an excellent kind of honey. Garcil. ap. *Boyle*'s Works abr. vol. 1. p. 53.

MELLEGUETTA, in the materia medica, a name uſed by ſome authors for the great cardamom, commonly called grain of paradiſe. *J. Bauhin.* vol. 2. p. 204. *Jonſ.* Dendr. p. 114.

MELLEUM *Marmor*; in natural hiſtory, the name of a plain yellow marble, reſembling honey or pure Venice turpentine in colour, and thence called by Cæſalpinus, *Marmor ſpecie Mellis aut Terebinthinæ*. It is a very beautiful marble, tho' but of one plain colour, and 'tis a wonder it is not more imported into England. It is of a very agreeable colour, and is conſiderably hard, and capable of a very elegant poliſh. It is dug in many parts of Italy, and is greatly eſteemed there. It never has any veins. *Hill*'s Hiſt. of Foſſils, p. 464.

MELLINE, in botany, a name given by many of the antient writers to the garden plant we call *Baum*. It had the name *Melline* from its yielding honey to the bees.

It has many other names, derived from the ſame ſource; ſuch as *apiaſtrum*, from *apis* the bee, *meliphyllum*, the honey-leaf, and from this, *meliſſophyllum*. Many alſo are of opinion, that the *amello* of Virgil is the ſame plant. He deſcribes it as having a gold-colour'd flower, and purple leaves at the bottom; this they explain by obſerving, that in *Baum* the ſtamina of the flowers which ſtand out, and are the moſt conſpicuous parts, are yellow, and the leaves of the calyx or flower-cup are purple: Theſe, they ſay, are what Virgil means by the leaves at the bottom, not the common leaves of the plant growing from the root, which are not to be ſuppoſed purple in any plant.

MELLISODIUM, a word uſed by ſome chemical writers to expreſs burnt lead.

MELLITA, in natural hiſtory, the name of a genus of the *echini marini*, of the general claſs of the placentæ. The characters of the *Mellita* are, that they are plain and flatted ſhells, with their edges arched and waved, and have on their ſuperficies two or more oblong apertures, which reach to the baſe. Of this genus, there are two known ſpecies; 1. A ſmooth one with a circular vertex. 2. A ſcutellated kind, reſembling the ſhell of the tortoiſe, and with a pentagonal vertex. *Klein*'s Echin. p. 30. See Tab. of Teſtaceous Animals, N°. 9.

MELO, the *Melon*, in botany. See the article MELON.

MELOCACTUS, the *Melon Thiſtle*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the monopetalous kind, and is tubulated at the bottom, and expanded into the form of a bell at the top, with ſerrated edges; this ſtands upon a cup, which finally becomes a ſoft fleſhy fruit, of the ſhape of an olive, which contains a ſmall ſeed. In many of the ſpecies, however, the fruit is collected into an elegeant head.

The ſpecies of *Melocactus*, enumerated by Mr. Tournefort, are theſe: 1. The common Eaſt Indian *Melocactus*. 2. The purple

purple *Melocactus*, with crooked ſpires. 3. The ſquare creeping American *Melocactus*, with white flowers and ſcarlet fruit. 4. The creeping trigonal American *Melocactus*, with white flowers. 5. The ſquare tree American *Melocactus*, with white flowers. 6. The arboreſcent American *Melocactus*, with ſtriated very prickly leaves, white flowers, and yellow tuberoſe fruit. 7. The very prickly American *Melocactus*, with ſeveral globules joined together in the manner of the opuntia. 8. The ſmall lanuginous tuberous American *Melocactus*. 9. The ſingle-ſtalked American *Melocactus*, with white flowers, and blackiſh purple fruit. 10. The tuberous purple American *Melocactus*, with very ſtrong and ſharp prickles. 11. The trigonal undulated American *Melocactus*, with very robuſt prickles, and white flowers and greeniſh fruit. 12. The trigonal American *Melocactus*, with ſhort prickles and white flowers, and ſcarlet fruit. 13. The creeping pentangular American *Melocactus*, with white flowers and red fruit. *Tourn.* Inſt. p. 653.

MELOCARPUS, a word uſed by ſome of the old authors to expreſs the fruit of the *ariſtolochia*, or *birthwort*, uſed in ſome external applications. See the article ARISTOLOCHIA.

MELOLANTHUS, the name of a peculiar ſort of beetle, which is found in all parts of England, and in many other countries among trees and hedges. The French call them *hanneton*, and we *cock-chafers*, *dorrs*, and by many other names. The name *melolanthus* is as old as Ariſtotle, and is given this creature from its feeding on the bloſſoms of the crab or wild apple. We have, of late years, had great damages done by the grubs of theſe beetles working under ground; but in Ireland they have been uſed to come in ſwarms, in certain years, in the beetle ſtate, and have been ſo terrible to this country, that the people have called them locuſts.

The firſt time they are remembered by authors to have appeared in this vaſt abundance, in this country, was in the year 1688. They then appeared in the ſouth-weſt part of the county of Galway; they appeared firſt upon the coaſt, and were brought by a ſouth-weſt wind, a wind ſo common there, that it may almoſt be called, the trade wind of Ireland; from the coaſt they ſoon ſpread over the inland parts of the county, and were ſeen every where in ſuch numbers, as were ſcarce to be conceived. They never ſtirred in the day-time, but were ſeen covering the leaves and branches of trees and hedges, and in many places hanging down in prodigious cluſters on one another's backs, in the manner of bees when they ſwarm. As ſoon as the ſun ſet, they uſed to leave the hedges, *&c.* and take wing, gathering into bodies, and making a humming confuſed noiſe like that of drums at a diſtance. They ſometimes formed bodies together, that darkened the air for three or more miles ſquare. They flew ſo low ſometimes, that it was ſcarce poſſible for a perſon, going along, to make his way through them; and by ſtriking againſt the faces and necks of women and children, they did much miſchief, every one leaving a mark behind it; and thoſe of this ſex or age, who had been among them, came home all over bruiſes.

This, however, was little to the miſchief they did the fields; for though the middle of the ſummer was the ſeaſon in which they came, they had, in a few days, eaten up all the leaves of the trees ſo compleatly, that they all looked as bare as in the depth of winter. The noiſe they made, while eating in vaſt numbers together, was like that of ſawing timber. The gardens fared no better than the hedges, for they eat up leaves, young ſtalks, and fruit, and every thing that was green and ſoft there, and left only a parcel of naked ſticks behind them. Many of the trees, thus ſtripped, wholly periſhed. Phil. Tranſ. N°. 234.

MELOMELI, a word uſed by the antients to expreſs honey impregnated with quinces.

MELON, *Melo*, in botany, makes a diſtinct genus of plants, the characters of which are theſe: The flowers conſiſt only of one leaf each, and are wide at the mouth, and divided into ſeveral ſegments, wholly reſembling the flowers of cucumbers. Of theſe alſo ſome are male or ſteril flowers, having no embryo fruit; others are fruitful or female flowers, having an embryo which ripens into a large fruit of an oval figure, ſometimes ſmooth, ſometimes rough, divided into three cells, and containing oblong ſeeds; each of theſe cells ſeems alſo divided into two.

The ſpecies of *Melon*, enumerated by Mr. Tournefort, are theſe: 1. The common *Melon*, with Dodonæus calls the *cucumis* of Galen. 2. The great ſmooth green *Melon*, with ſmaller ſeeds. 3. The Spaniſh *Melon*. 4. The ſmall round *Melon*, called the ſugar *Melon*, and round muſk *Melon*. 5. The turbinated *Melon*. 6. The reticular *Melon* of John Bauhine. 7. The little Egyptian *Melon*. *Tourn.* Inſt. p. 104.

Melon ſeed is cooling and diuretic, and has the ſame virtues with the other cold ſeeds, as they are called. See the article GOURD.

The proper management and culture of *Melons* is this: The ſeeds ſhould be procured from good *Melons*, produced in ſome diſtant garden; for if ſowed on the place where it was raiſedan ripened, it is very apt to degenerate. This ſeed ſhould be kept three years before it is ſowed, and it ſhould be ſowed at two ſeaſons. The firſt for the early crop, to be raiſed under frames, ſhould be ſown in January or the beginning of February; the ſecond, to be raiſed under bell or hand-glaſſes, is to be ſowed in *March*, and this is the ſowing which produces the general crop of *Melons*, which ripen in July and Auguſt. About a week before the time of ſowing the ſeed, ſome dung ſhould be prepared in a heap with the litter, or ſome coal-aſhes, and the ſame methods uſed as in the early cucumbers, for the firſt crop; but for the ſecond, which is of more general uſe, the ſowing may be on the upper ſides of the hot-beds that were for the early *Melons* or cucumbers, or on a freſh moderate hot-bed. When the young plants are come up, they muſt be removed to another hot-bed, and covered with hand-glaſſes, and watered and ſhaded till they have taken root; and after this they muſt have as much air and ſun as the ſeaſon will permit, and their ſtalks ſhould be earthed up as they grow, which will vaſtly ſtrengthen them.

In the beginning of April the plants will begin to ſhew their rough leaves, a parcel of dung is then to be prepared with the litter and coal-aſhes. The common quantity is a load to five holes; a trench muſt then be dug, which ſhould be ten inches deep, if the ſoil be dry, but only three if it be wet. The dung muſt be evenly laid in this, and heaped up to three foot high. Then the places intended for the holes muſt be marked out, at each of which muſt be laid a baſket-full of light rich earth, thruſting a ſtick of two foot long into the middle. Then cover the dung all over with the earth which was dug up out of the trench, laying it ſmooth, and about three inches thick; then the glaſſes are to be placed cloſe down over the place where each of the ſticks is, and in two days the earth will be warm enough to receive the ſeedling plants. The ſticks are now to be taken out, and the earth formed in the places into a hollow like a baſon, that it may retain the water which is given to the plants. The plants are then to be taken up, and two ſtrong and thriving ones put into each of theſe holes, which muſt be watered and ſhaded till they have taken root. The plants having taken root, and thruſt out a fourth leaf, the top of each of them ſhould be pulled off, in order to force out ſhoots from the bottom, and as the weather becomes warmer, the glaſſes muſt be raiſed with ſtones on the ſouth ſide, to give them air, and about twice a week they ſhould have a little water.

About the middle of May the ſtalks of the plants will begin to preſs upon the glaſſes on every ſide, and the glaſſes are then to be raiſed up on bricks, to give them room to run out; and they ſhould be pegged down with forked ſticks, and turned into a proper direction for their running, ſo that they may be out of the way of tangling one with another: They ſhould now, if the weather be ſevere, be ſheltered with mats in the night, and watered gently at times. When the ſtalks of the plants are grown to the edges of the bed, the earth muſt be raiſed with old dung buried under it, till it be upon a level with the beds, for two foot wide on each ſide. The branches are here to be trained in a proper courſe, and the glaſſes are to be left over the roots of the plants, and after this, what water is given them is to be ſprinkled all over the plants. When the fruit begins to appear, the waterings muſt be very gentle on the plants; but it will be proper to ſoak the earth well with large quantities of water about the beds, which will ſpread a moiſture even to the roots of the plants; from this time the plants ſhould be gently watered twice a week, and that always in the evening. When the *Melons* are grown of the ſize of a tennis ball, a piece of tile ſhould be laid under each to keep them from the ground. As they afterwards approach to ripeneſs, they ſhould be turned ſeveral times, that they may ripen equally on every ſide; and if the weather be not very favourable, they ſhould be covered with glaſſes. If the *Melon* is deſigned to be eaten as ſoon as cut, it ſhould be ſuffered to remain on the plant till it changes pretty yellow, and the ſtalk begins to ſeparate from the fruit; but if it be to be kept two or three days after cutting, it muſt always be cut proportionably ealier.

It is a practice with many to take off the leaves about the fruit, that it may have more ſun; but it is wrong, and the fruit is always the worſe taſted for it, and the ſkin is hard and tough. *Miller's* Gardener's Dict.

Whenever a *Melon* appears well knit on a branch, it is proper to cut off all the reſt of the branch beyond it, that the fruit may receive all the nouriſhment that would have been conveyed into the whole branch; only it muſt be obſerved, that a ſufficiency of leaves, of the neighbouring branches, be left or brought over it, to ſhade it from the exceſſive heat of the ſun in the drought and heat of the day.

There is uſually required the ſpace of forty days, from the time of a *Melon's* firſt knitting on the branch, to its being perfectly ripe: But in cold ſeaſons they are ſometimes longer. In order to ſave good ſeed for the next year, no other ſeeds are to be taken out than thoſe which have lain in that part of the fruit which is next the ſun, and theſe ſhould be taken out at the time of the eating the *Melon*, and immediately wiped dry with a cloth, and laid up in a dry place.

Melons ſhould not be eaten till they have been gathered twenty-four hours; they ſhould, in the mean time, be laid in a cool but dry place. The proper time of gathering them is a thing of great conſequence to the eating them in perfection; they generally diſcover the proper degree of ripeneſs

for gathering, by their ſmell, and by the ſplitting of their tail. The common kinds ſhew the approaching ripeneſs by a yellowneſs coming on in ſome part: This begins in one place, and ſpreads, by degrees, over a great part of the fruit. It is to be obſerved that twenty-four hours after the time of the firſt appearance of a yellowneſs in ſome part, is the exact ſeaſon for the gathering of theſe *Melons*. A *Melon* that ripens too faſt is never good; ſuch a ripeneſs is unnatural, and proceeds only from the poorneſs or ſickneſs of the root, which makes it turn thus ſuddenly. Phil. Tranſ. N°. 46.

When a *Melon* is perfectly fine, it is full, without any vacuity: This is known by knocking upon it, and when cut, the fleſh muſt be dry, no water running out, only a little dew, which is to be of a fine red colour. Large *Melons* are not to be coveted, but firm and well flavour'd ones. Our Gardeners, who raiſe *Melons* for ſale, ſow the ſeeds of the large rather than the good kinds, and they encreaſe the ſize of theſe by much watering the roots, but this ſpoils the taſte. Some of the French raiſe at this time particularly fine *Melons*, by a method kept as a ſecret, but which we find, on a ſtrict enquiry, is no other than the ingenious Mr. Quintiny's, of that nation, publiſhed near eighty years ago in our Philoſophical Tranſactions.

The *Melons*, particularly proper to be treated in this manner, are thoſe which have a thin and ſomewhat embroidered ſkin, not divided by ribs, and have a red pulp, dry and melting on the tongue, not mealy, and of a high flavour. Theſe are what ſucceed in the following method, and are greatly improved in ſize and flavour by it.

When the ſeeds of this *Melon* are placed in the ground, the firſt thing that appears is a pair of ſeminal leaves, or ears, as the Gardeners call them. Between theſe two leaves there ſhoots, ſome days after, a leaf, called the firſt leaf, or knot; and out of the ſame place, after ſome days more, there ſhoots another leaf, called the ſecond knot. Out of the midſt of this ſtalk of the ſecond knot, there ſhoots a third knot: This third knot muſt be cut off at its inſertion, without hurting the branch of the ſecond knot from whence it grows. Out of this place there will grow, after this cutting, a branch, which will be what the gardeners call the firſt arm, and this arm will, in the ſame manner as the firſt plant, ſhoot out, firſt one, then a ſecond, then a third knot; this third knot muſt be cut again as before, and thus the third knots are all along to be cut off, and arms or branches will grow up in the places of them, all the way in the ſame manner as the firſt; and it is at thoſe arms that the *Melons* will be produced; and they will be always good, if the foot or root be well nouriſhed in good earth, and cheriſhed by a good hot bed and the ſun. The foot of the *Melon* muſt never be ſuffered to paſs into the dung, nor the earth muſt not be watered but moderately, when it is ſeen to grow too dry; but in this caſe, it muſt be moderately moiſtened in time, leaſt the ſhoot ſuffer by it. Twice or three times a week is often enough to water in the drieſt weather, and this muſt always be done about ſunſet; and when the heat of the ſun is too violent, the *Melons* muſt be covered with ſtraw mats from eleven in the morning to about two in the afternoon. When it rains much, the *Melons* muſt alſo be covered, leſt it hurt them by too much moiſture. Phil. Tranſ. N°. 45.

If the root produce too many branches, the weakeſt are to be cut off, and only three or four left; and thoſe which are left are to be ſuch as have their knots cloſeſt to one another.

When the plants are removed from the ſeed-bed to the places where they are to ſtand, if they are very ſtrong, they ſhould be planted ſingle, but if otherwiſe, two are to be ſet in each hole.

When they are planted ſingle, the two branches which always grow on each ſide, from the baſe of the ſeed-leaves, are to be left on; but when two plants are ſet together, theſe branches are to be cut off, otherwiſe all the branches will be too numerous, and they will entangle and ſpoil one another.

When the *Melons* are knit, two of them only are to be left upon each foot, chuſing thoſe which are beſt placed, and next to the firſt and principal ſtalk that is to the heart of the foot. None but fair fruits are to be left, and ſuch as have a thick and ſhort tail; and the foot of the *Melon* muſt be ſhort, well truſſed, and not far diſtant from the ground. *Melons* of a long ſtem, and having the ſtalk of the leaf too long and ſlender, are never vigorous.

All the ſuperfluous branches muſt be cut off from time to time, as they ſhoot out.

There ſometimes ſhoots out a branch more than is here mentioned, between the two ſeed-leaves or ears. If this is ſtrong and vigorous, it is to be kept on, but if weakly, it is beſt to take it off, for it will never bear good fruit.

MELON *Seeds*. We read of *Melon* ſeeds thirty-three years old, vegetating and producing a fine number of plants. Phil. Tranſ. N°. 475. Sect. 6. and in N°. 464. we read of *Melon* ſeeds 43 years old, producing fruit.

Petrified MELONS, a name given by the people who have written books of travels, &c. to certain ſtones found on mount Carmel. The monks who inhabit that mountain at this time, and who pretend to be the followers of Elias the prophet, tell a legendary ſtory about theſe ſtones, which has given occaſion to the name. They ſay, that when Elias lived on that mount, a certain Gardener paſſing by his cave with *Melons*, the prophet aſked one of them; but the fellow replying, that they were not *Melons*, but ſtones that he carried, the prophet miraculouſly fulfilled the ſaying, and converted them into ſtones. Travellers who are fond of theſe ſtories, were uſually glad to pick up one of theſe ſacred ſtones as they went on; and the monks have been careful enough to gather all they could find for the better opportunity of obliging their viſiters; ſo that though they were once very common, they are now only to be had by the favour of theſe people.

Breynius is the only author who has given a good account of them; he ſays that they are ſpheric or ſpheroidal ſtones, of various ſizes, from that of a hen's egg to that of the largeſt *Melon*, or even more than that. They are generally found bedded in a very hard ſand ſtone, of a greyiſh or aſh colour; but they come out whole on breaking the ſtone, and are of a ſmooth ſurface; a greyiſh colour, or ſometimes a browniſh ferrugineous hue. When they are broken, there is always a cavity found in them, ſometimes regular and even, ſometimes very irregular, and generally proportioned to the bigneſs of the ſtone. This cavity is lined on all ſides with minute cryſtals, which are very bright and pellucid, and have their points ſtanding toward the center of the cavity. The ſubſtance of the ſtone itſelf approaches to the nature of marble, of a yellowiſh colour, and capable of a good poliſh; when wrought looking very like the Florentine marble. This is a cruſt of about half an inch or an inch in thickneſs, according to the bigneſs of the ſtone, and ſometimes this is covered with a paler-coloured cruſt, of the thickneſs of a ſtraw, which in ſome degree reſembles the bark or rind of the fruit. Theſe ſtones are truly a ſort of concave natural nodules, of the nature of our hollow flints. They have had no fruit for their matrix, nor have ever any of the ribs and furrows which the *Melon* has, nor any mark of the ſtalk; and within they have neither the natural diviſions of the *Melon*, nor any thing reſembling the ſeeds. It is not only the want of many parts abſolutely eſſential to the fruit ſuppoſed to be petrified, which ſhews that opinion to be erroneous; but the courſe of nature, in petrifactions in general, argues alſo greatly againſt it.

The things we meet with, in this ſtate, are all of them ſuch as are naturally hard, dry, and permanent, and none of the tender and ſucculent bodies, ſuch as the *Melon*, and the like fleſhy fruits, which muſt neceſſarily rot in the water that conveys the ſtony matter, before it could at all enter their pores. And the ſtones are certainly analogous to thoſe concave nodules of a ferrugineous colour, in the cavities of which amethyſts are produced; and to that genus of ſtones which Woodward calls concave cryſtalline balls, common in many parts of the world.

The fallacy of an extravagant opinion, in regard to foſſils of any particular form, is not peculiar to theſe ſtones, as witneſs the ſmall ſhells petrified and found in Ægypt, which from their flat and roundiſh ſhape, are ſaid to be the lentiles which the children of Iſrael eat when making the pyramids; the *cornua ammonis*, which is the remains of a ſea ſhell, and yet is ſuppoſed to be a petrified ſerpent; the *nummi minerales*, which are the operculums of ſhell-fiſh, but are generally ſuppoſed by the vulgar, about the places where they are found, to be medals and coins, petrified with lying in the earth, and many the like follies. *Breyn.* de Melon. Petr. Mont. Carm.

MELON *Thiſtle*. See the article MELOCACTUS.

MELONGENA, *Mad Apple*, in botany, the names of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is of a rotated form, and divided into ſeveral ſegments at the edges. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the middle part of the flower. This afterwards changes to a fleſhy fruit, in which there are contained a number of kidney-ſhaped ſeeds.

The ſpecies of *Melongena*, enumerated by Mr. Tournefort, are theſe: 1. The long violet-fruited *Melongena*. 2. The *Melongena* with long white fruit. 3. The *Melongena* with long yellow fruit. 4. The *Melongena* with long bright red fruit. 5. The *Melongena* with cylindric violet-coloured fruit. 6. The round fruited *Melongena*. 7. The crooked-fruited *Melongena*. 8. The thorny *Melongena*, with round ſaffron-colour'd fruit. 9. The *Melongena* with round fruit, armed with violet-colour'd thorns. 10. The *Melongena* with round fruit, armed with greeniſh white thorns. 11. The *Melongena* with prickles, and with a round black fruit. 12. The prickly *Melongena*, with a long black fruit. *Tourn.* Inſt. p. 151.

This plant is propagated in the gardens of the curious with us; and in Spain, Italy, and Barbary, common in the kitchen gardens, the fruit of them being frequently eaten there boiled with fat fleſh, putting thereto ſome ſcraped cheeſe, and preſerving it through the winter with vinegar, honey, or ſalt pickle. This they eſteem of great efficacy to provoke venery. In ſummer alſo, when the fruit is juſt ripe, they eat it freſh dreſſed, with ſpices and other ingredients.

The manner of propagating them with us, is to ſow the ſeeds in March, upon a moderate hot bed, and when the plants are come up, they are to be thinned by planting them in another hot

hot bed at about four inches aſunder, watering and ſhading them till they have taken root. They muſt afterwards have as much air as the ſeaſon will allow, and in May they muſt be tranſplanted into a warm border, ſetting them at two foot diſtance every way. About the middle of June the fruit will appear, and if the weather be dry at this time, they muſt be often watered, which will make the fruit grow large. The fruit ripens in the end of July. *Miller*'s Gardener's Dict.

MELOPEPO, in botany, the name of a genus of plants, of a middle nature, as their name expreſſes, between the melon and the pompion. The characters which diſtinguiſh this genus from the others of the like kind, are, that the fruit is roundiſh, ſtriated, angular, and uſually deeply divided into five parts. The ſeeds are flat, and fixed to a ſpongy placenta.

The ſpecies of this genus, enumerated by Mr. Tournefort, are theſe: 1. The flatted or compreſſed *Melopepo*. 2. The great white-fruited *Melopepo*. 3. The yellow rough-fruited *Melopepo*. 4. The broad depreſſed *Melopepo*. 5. The citron-ſhaped *Melopepo*. 6. The conic *Melopepo*. 7. The *Melopepo* with a doubly turbinated fruit. 8. The yellow thin-ſkinned *Melopepo*. 9. The clypeated, or ſhield *Melopepo*. 10. The verrucoſe or warted *Melopepo*. 11. The tuberoſe warted *Melopepo*. 12. The lightly ſtriated yellow warty *Melopepo*, with rough leaves. 13. The white lightly ſtriated warty *Melopepo*, with rough leaves. 14. The warty *Melopepo*, with a white fruit and white ſeeds.

MELOTIS, a word uſed by the chirurgical writers to expreſs a ſmall probe, properly one intended to be uſed only to the ear.

MELT (*Cycl.*)—MELT *of Fiſhes*. In the *Melt* of a living cod-fiſh there are ſuch incredible numbers of thoſe ſmall animalcules found in the male ſeed of all animals, that in a drop of the juice of it, no more in quantity than a ſmall grain of ſand, there are contained more than ten thouſand of them; and, conſidering how many ſuch quantities there are in the whole *Melt* of one ſuch fiſh, it is not exceeding the bounds of truth to affirm, that there are more animals in one *Melt* of it, than there are living men at one time upon the whole face of the earth. However ſtrange and romantic ſuch a conjecture may appear at firſt ſight, a ſerious conſideration, and calculation, will make it appear very plain. An hundred ſuch grains of ſand as are here mentioned, will make about an inch in length; therefore in a cubic inch there will be a million of ſuch ſands.

The *Melt* of one of theſe fiſhes is frequently about the quantity of fifteen cubic inches, it muſt therefore contain fifteen millions of quantities as big as one of theſe ſands; and if there be ten thouſand animals in each of thoſe quantities, there muſt be, in the whole, a hundred and fifty thouſand millions: Which is a number vaſtly exceeding the number of mankind, even tho' we were to ſuppoſe the whole earth as populous as Holland. See Philoſophical Collections, p. 4.

MELTING (*Cycl.*)—MELTING *Cone*, in aſſaying, is a ſmall veſſel made of copper or braſs, of a conic figure, and of a nicely poliſhed ſurface within. Its uſe is to receive melted metals, and ſerve for their precipitation, which is effected, when two bodies melted together, and yet not mixing perfectly with one another in the fuſion, ſeparate in the cooling into two ſtrata, on account of their different ſpecific gravity. This precipitation might be made in the ſame veſſel in which the fuſion is performed; but then the melting-pot or crucible muſt be broken every time to get it out, whereas the conic ſhape, and poliſhed ſurface of this veſſel, makes it eaſily got out without violence. The ſhape of this veſſel is alſo of another uſe in the operation; for by means of it, the heavy matter ſubſiding to a point, is formed into a perfect and ſeparate regulus, even where the whole quantity, as is very frequently the caſe, has been but very ſmall.

When the quantity of the melted matter is great, it is common to uſe, inſtead of this cone, a large braſs or iron mortar, or any other conveniently ſhaped braſs or iron veſſel. It is neceſſary, when the cone is of braſs, to be cautious that it be not made too hot; for the brittleneſs of that metal, when hot, makes it eaſily break, on the ſtriking with any force on that occaſion, to make the melted maſs fall out.

Theſe, and all other moulds for the receiving melted metals, muſt always be well heated before the maſs is poured into them, leſt they ſhould have contracted a moiſture from the air, or have been wetted by accident; in which caſe the melted metal will be thrown out of them with great violence and danger. They ought alſo to be ſmeared over with tallow on their inſide, that the regulus may be the more eaſily taken out of them, and the ſurface of the mould not corroded by the melted maſs poured in.

If a very large quantity of a metal is, however, to be received into them, and eſpecially if any thing ſulphureous have place among it, this caution of tallowing the moulds does not prove ſufficient; for the large quantity of the maſs makes it continue hot ſo long, that this becomes but a ſlight defence to the ſurface of the mould. In this caſe the aſſayer has recourſe to a lute, reduced to a thin pap with water, which being applied in form of a very thin cruſt, all over the inſide of the cone, or mould, ſoon dries up indeed, but always preſerves the ſides of the veſſel from the corroſion of the maſs. And this caution is found neceſſary, even when pure copper is melted alone, without any mixture of ſulphur. See Tab. of Chemiſtry, N°. 31. *Cramer*, Art. Aſſ. p. 72.

MEMÆCYLUM, in botany, a name by which ſome authors have called the *arbutus*, or ſtrawberry-tree, a ſhrub preſerved in the gardens of the curious. *Ger.* Emac. Ind. 2.

MEMAICULA, in the materia medica of the antients, a name given to a fruit, ordered in ſome compoſitions as an aſtringent and a cooler. When the Greek writers uſe this word, their Latin tranſlators uſually render it by the word *unedo*. Pliny ſays, that *unedo* is the name of the fruit of the *arbutus*, or ſtrawberry-tree; but we find the earlieſt Latin writers do not countenance this. Varro calls the fruit of the *arbutus* by the name *arbutus*, as he does the fruit of the mulberry or morus, by the name *morus*. And it ſeems to have been contrary to the general cuſtom of the times to have impoſed a name upon a fruit, different from that of the tree which bore it. Some of the commentators ſay that the *Memaicula*, or *Unedo* was no other than the common wood-ſtrawberry. And Ægineta in one place ſays, that the fruit of the *camarus*, that is, of the *arbutus*, was called *Memaicula*; but in another place he gives a much better explication of the word, ſaying, that ſome of the Greeks uſed it as the name of the fruit of the *cornus mas*, or male cornel-tree. See the article CORNUS.

MEMBRANE (*Cycl.*)—Mr. Lewenhoek has been at the pains of examining, with great nicety, the fine *Membranes* which encloſe the faſciculi or ſmall bundles of fibres of which a muſcle is compoſed. Between theſe faſculi the *Membrane* is of a conſiderable thickneſs; but it divides itſelf every way into very fine and ſmall branches. This *Membrane* is evidently compoſed of a number of ſmall veſſels, and theſe may be diſtinguiſhed not only in its thick parts, but even where it is ever ſo ſmall and fine, ſo far as the microſcope can trace it; but this is not ſo far as might be wiſhed; for the *Membrane* ſtill divides itſelf in its progreſs into more and more ramifications, and where it envelopes only a ſingle fibre, is not to be diſtinguiſhed with any degree of preciſion, even with the beſt microſcopes. The ſmall veſſels extended through this *Membrane*, are doubtleſs intended to convey nouriſhment to it; but it is very certain, that the globules of blood can never paſs into ſuch ſmall canals. Phil. Tranſ. N°. 122. p. 140.

Adipoſe MEMBRANE, *Membrana Adipoſa*. It was the opinion of Boerhaave that the ſeat of the *lues venerea*, or pox, was in the *Membrana Adipoſa*. There are many ſeeming difficulties which have prevented the generality of the learned world from giving into this; but there have been ſeveral particular caſes, the ſymptoms of which ſeem to prove it really to be ſo.

Of theſe Dr. Huxam gives one, which alone may ſeem ſufficient to prove the reality of it. This is of a gentleman of about 27 years of age, and of a hot bilious conſtitution, who ſome years before his death had got a gonorrhœa, and before that was well cured, a ſecond, and after that a third; and after all theſe, had frequent impure converſations with the negro women in the Weſt Indies, who probably had that worſt ſpecies of pox, the yaws. He had, after this, a terrible itching under his ſkin, and a terrible ſtinking breath, and ſpit corrupt matter, but had no running ulcer, bubo, node, or other of the common ſymptoms of a confirmed pox; but after repeating his raſh conduct with ſome women in England, he had a Gonorrhœa of which he could not get cured; but a bubo appeared in the groin, and verrucoſe ſwellings about the anus.

One of theſe breaking diſcharged a great quantity of matter, and after that others appeared, the bubo would not ſuppurate, and ſcabs appeared in ſeveral parts of his body. He was fumigated with cinnabar, and a ſalivation propoſed; but after taking, at times, five drams of calomel, he had not the leaſt ſoreneſs of the gums, though that medicine had not purged nor vomited him. At length turbith vomits, and large doſes of mercurials, to which he had been much accuſtomed before, brought on a ſoreneſs of the mouth; but the ſpitting was tough, and did not amount to a pint a day. During this courſe the ſcaly eruptions encreaſed, and he was at length covered with them all over, and his limbs ſwelled, and even burſt in many places, the fiſſures diſcharging a ſtinking ichorous matter.

Hot baths and mercurial ointments were uſed on this, but the diſeaſe ſtill encreaſed under theſe means; the ſcales grew ſo ſtiff, that he could not move his limbs, and ulcers appeared in many parts, particularly a large tumour on each breaſt, which diſcharged vaſt quantities of an oily ſtinking matter. It was obſervable, that where theſe tumours and ulcers appeared, they only ran under the ſkin, being entirely ſeated in and feeding on the *Membrana Adipoſa*, ſo that the muſcles and tendons underneath appeared as fair and florid as in the moſt healthy conſtitution.

It was now plain, that mercury could do nothing toward a cure in any form, and the old method of ſweating was attempted with warm baths, to looſen the ſcales; by this means they came off apace in the manner of thoſe of the confluent ſmall pox, but larger, ſome of theſe being four or five inches over. In a week's time, the coat of mail was cleared off,

off, and his breath became ſweet; but the ulcers ſtill diſcharged great quantities, and notwithſtanding all that had been done, two large ſhankers appeared on the glans, and a bubo in each groin: He was alſo ſeized with a cough, and ſpit purulent and bloody matter. It was evident that the whole *Membrana Adipoſa* had been conſumed from the external part of the body, and the diſeaſe now began to ſeize on that part of it which inveſted the more vital parts; but nature could ſupport it no longer, and he died in the moſt extreme degree of a pocky conſumption. It is obſervable, that not one bone in the whole body appeared to be touched, though he died with more than forty ulcers upon him. Phil. Tranſ. N°. 460. p. 671.

MEMBRANACEOUS *Leaf*, among botaniſts. See the article LEAF.

MEMBRAS, in ichthyology, a name given by Rondeletius, Aldrovand, and ſeveral other writers, to the *halec* or herring. See the articles HALEC and CLUPEA.

MEMIREN, in the materia medica, the name by which Serapion and ſome other authors have called the pilewort, or ſmall celandine. *Ger.* Emac. Ind. 2.

MEMITHA, in the materia medica of the antients, the name of a plant which ſome have ſuppoſed to be our cerinthe, but others the glaucium, or yellow-horned poppy.

MEMORY (*Gycl.*)—Many have been the attempts, in all ages, to aſſiſt the *Memory*. Some have had recourſe to medicine, ſuch as Horſtius [a], Marſilius Ficinus [b], Johnſton [c], and others. That good health, a good digeſtion, and a mind free from care, are helps in this reſpect, is an old obſervation [d]. That attention, application, frequent recapitulation, are neceſſary, is known to every one. But whether, beſides natural health and parts, and the exerciſe of our faculties, art may not give a farther aſſiſtance to *Memory*, has been a queſtion. Simonides is ſaid to be the firſt who found out the art of *Memory* [e]. His method was by a choice of *places* and *images*, as a repoſitory of ideas; ſuch, for inſtance, as a large houſe divided into ſeveral apartments, rooms, cloſets, *&c.* All theſe, and their order, were to be rendered extremely familiar to the imagination and *Memory*. Then, whatever was to be remembered, was by ſome ſymbolical repreſentation or another, as an anchor for navigation, to be connected with ſome part of the houſe, or other artificial repoſitory, in a regular manner. Cicero [f] and Quinctilian [g] give us ſome account of this method, and ſpeak of it with reſpect. Several moderns have attempted improvements of artificial *Memory*. There was a collection of various treatiſes of this kind publiſhed at *Leipzig* [h]; this and Bruxius's Simonides Redivivus [i] are commended by Morhof [k]. Paſchius gives us ſome account alſo of ſeveral authors who have treated of this art [l]. It is certainly of uſe in hiſtory and chronology. The chief artifice, in this reſpect, is to form an artificial word, the letters of which ſhall ſignify numbers. Hence a date or æra may more eaſily be recapitulated and remembred than without ſuch a contrivance. This invention is mentioned as a ſecret known to few, by Paſchius [m]. It has been proſecuted lately in England [n], by Dr. Grey.—[[a] De Sanitat. Studioſor. lib. 2. c. 1. [b] De Vita, lib. 1. c. 25. [c] *Johnſton*, Idea Medicin. Practic. lib. 8. c. 4. Vid. *Paſch.* de Nov. Invent. p. 134. [d] *Quinctil.* Inſt. Orat. p. 992. [e] *Quinct.* lib. cit. p. 985. [f] Ad Herenn. lib. 3. [g] Lib. cit. [h] Variorum de Arte Memoriæ Tractatus, Lipſ. 1678. 8°. [i] Polyhiſtor. lib. 1. p. 374, 375. [k] *Adami Bruxii*, Simonides Redivivus, ſeu Ars Memoriæ & Oblivionis. Lipſ. 1640. in 4°. [l] Lib. cit. p. 133—140. [m] Lib. cit. p. 140. *Numerus per certas literas, verbo memoriali comprehenſas, exprimitur.* [n] Vid. *Memoria Technica*, or a New Method of Artificial Memory, *&c.* Lond. 1730. 8°. alſo *Lowe*'s Mnemonics.]

The method is this: To remember any thing in hiſtory, chronology, geography, *&c.* a word is formed, the beginning whereof being the firſt ſyllable or ſyllables of the thing to be remembred, does, by frequent repetition, of courſe draw after it the latter parts, which is ſo contrived as to give the anſwer. Thus in hiſtory, the deluge happened in the year before Chriſt 2348. This may be ſignified by the word Dél-*étok*; Del ſtanding for deluge, and *etok* for 2348. How theſe words come to ſignify theſe things, or contribute to the remembring them, is now to be ſhewn.

The firſt thing to be done, is to learn exactly the following ſeries of vowels and conſonants, which are to repreſent the numerical figures, ſo as to be able at pleaſure to form a technical word, which ſhall ſtand for any number, or to reſolve a word already formed into the number it ſtands for.

a	*e*	*i*	*o*	*u*	*au*	*oi*	*ei*	*ou*	*y*
1	2	3	4	5	6	7	8	9	0
b	*d*	*t*	*f*	*l*	*s*	*p*	*k*	*n*	*z*

Here *a* and *b* ſtand for 1, *e* and *d* for 2, *i* and *t* for 3, and ſo on. Theſe letters are aſſigned arbitrarily to the reſpective figures, and may very eaſily be remembred. The firſt five vowels in order naturally repreſent 1, 2, 3, 4, 5. The diphthong *au* being compoſed of *a*, 1, and *u*, 5, ſtands for 6; *oi* for 7, being compoſed of *o*, 4 and *i*, 3; *ou* for 9, being compoſed of *o*, 4 and *u*, 5: The diphthong *ei* will eaſily be remembered for 8, being the initials of the word. In like manner for the conſonants, where the initials could conveniently be retained, they are made uſe of to ſignify the number, as *t* for 3, *f* for 4, *s* for 6, and *n* for nine. The reſt were aſſigned without any particular reaſon, unleſs that poſſibly *p* may be more eaſily remembred for 7 or *ſeptem*, *k* for 8, or ὀκτω, *d* for 2, or *duo*; *b* for 1, as being the firſt conſonant, and *l* for 5, being the Roman letter for 50, than any others that could have been put in their places. Memor. Techn. p. 2, 3. 'Tis farther to be obſerved, that *z* and *y* being made uſe of to repreſent the cypher, where many cyphers meet together, as 1000, 1000000, *&c.* inſtead of a repetition of *azyzyzy*, *&c.* let *g* ſtand for 100, *th* for a thouſand, and *m* for a million. Thus *ag* will be 100, *ig* 300; *oug* 900, *&c.* *ath* 1000, *am* 1000000, *loum* 59000000, *&c.* Ib. p. 5.

Fractions may be ſet down in the following manner: Let *r* ſignify the line ſeparating the numerator and denominator, the firſt coming *before*, the other *after* it; as *iro* $\frac{3}{4}$, *urp* $\frac{5}{7}$, *pourag* $\frac{79}{100}$, *&c.* When the numerator is 1 or unit, it need not be expreſſed, but begin the fraction with *r*; as *re* $\frac{1}{2}$, *ri* $\frac{1}{3}$, *ro* $\frac{1}{4}$, *&c.* So in decimals, *rag* $\frac{1}{100}$, *rath* $\frac{1}{1000}$. Ibid.

This is the principal part of the method, which conſiſts in expreſſing numbers by artificial words. The application to hiſtory and chronology is alſo performed by artificial words. The art herein conſiſts in making ſuch a change in the ending of the name of a place, perſon, planet, coin, *&c.* without altering the beginning of it, as ſhall readily ſuggeſt the thing ſought, at the ſame time that the beginning of the word, being preſerved, ſhall be a leading or prompting ſyllable to the ending of it ſo changed. Thus, in order to remember the years in which Cyrus, Alexander, and Julius Cæſar, founded their reſpective monarchies, the following words may be formed; for Cyrus, Cyr*uts*; for Alexander, Alex*ita*; for Julius Cæſar, Juli*os*. *Uts* ſignifies, according to the powers aſſigned to the letters before mentioned, 536; *ita* is 331, and *os* is 46. Hence it will be eaſy to remember, that the empire of Cyrus was founded 536 years before Chriſt, that of Alexander 331, and that of Julius Cæſar 46. Mem. Techn. Introd. p. viii and ix.

For the farther application of this method, we refer to the ingenious author of the laſt cited book. We ſhall only add, that *technical verſes* contribute much to the aſſiſtance of the *Memory*, both as they generally contain a great deal in a little compaſs, and alſo becauſe, being once learned, they are ſeldom or never forgot. The author before quoted has given us ſeveral ſpecimens of ſuch verſes in hiſtory, chronology, geography, and aſtronomy, as alſo the Jewiſh, Grecian and Roman coins, weights and meaſures, *&c.* He adviſes his reader to form the words and verſes for his own uſe himſelf; as he perhaps will better remember them than thoſe formed by the author. Lib. citat. Introduct. p. xi.

It was a practice among the Jews not only to abbreviate ſentences and names of many words, by putting together the initial letters of thoſe words, and making out of them an artificial word to expreſs the whole, as *Rambam* for *Rabbi Moſes ben Maimon*; but they alſo made uſe of natural words to repreſent numbers, when they could meet with ſuch as happened to anſwer the number which they wanted to expreſs [a]. It is to obſervations of this kind the author laſt quoted ſeems to ſay he owed the firſt hints of his method [b].—[[a] Mem. Tech. Introd. p. xv, xvi. [b] Lib. cit. p. xvii.]

As to Simonides's method, Quinctilian ſays he will not deny it to be of ſome uſe; for inſtance, in repeating a multitude of words in the order they occur, and in things of this nature: But he thinks it of leſs uſe in getting by heart a continued oration, and in this reſpect rather an incumbrance [a]. He himſelf adviſes, if the ſpeech to be remembred be long, to get it by heart in parts, and thoſe not very ſmall. The partition ought chiefly to be made according to the different topics. He thinks it beſt to get things by heart tacitly, and if, the better to fix the attention, the words be pronounced, yet it ſhould be in a low voice. Apt diviſions help the *Memory* greatly. But after all, the great art of *Memory* is exerciſe: To get many things by heart, and daily, if poſſible. Nothing increaſes more by uſe, or ſuffers more by neglect, than the *Memory*. At whatever age a man aims at the improvement of this faculty, he ſhould patiently ſubmit to the uneaſy labour of repeating what he has read or written. Here, as in other caſes, where habits are to be acquired, exerciſe ſhould be increaſed by degrees [b].—[[a] *Nonne impediri eorum, quæ dicit, decurſum neceſſe eſt duplici memoriæ cura? Nam quomodo poterunt copulata fluere, ſi propter ſingula verba ad ſingulas formas reſpiciendum erit.* *Quinct.* Inſt. Orat. Lib. xi. c. 2. p. 989. [b] *Quinct.* loc. cit. p. 993. ſeq.]

Lord Bacon enumerates ſeveral helps to *Memory*, as order, artificial place, verſe, whatever brings an intellectual thing to ſtrike the ſenſes, and thoſe things which make an impreſſion by means of a ſtrong paſſion, as fear, ſurprize, *&c.* Thoſe things alſo ſink deepeſt, and dwell longeſt in the *Memory*, which are impreſſed upon a clear mind unprejudiced either before or after the impreſſion; as the things we learn in childhood, or think of juſt before going to ſleep; as likewiſe the firſt times things are taken notice of.

A multitude of circumſtances alſo, or, as it were, handles or holds to be taken, help the *Memory*; as the making many breaks in writing, reading or repeating aloud: But as to this laſt, ſee Quinctilian's opinion before mentioned. Thoſe things which are expected, and raiſe the attention, ſtick better than ſuch as paſs ſlightly over the mind; whence if a man reads any writing twenty times over, he will not remember it ſo well, as if he read it but ten times; with trying between whiles to repeat it, and conſulting the copy where his *Memory* failed. *Bacon*'s Works abrid. vol. 2. p. 475. See alſo vol. 1. p. 135, 136. vol. 3. p. 176. and the article MNEMONIC *Tables*.

Weakneſs of the MEMORY, in many caſes, is to be conſidered as a diſeaſe, and is looked on in that light by the medical writers, who have preſcribed various remedies for it. The principal cauſes of this debility, are a too frequent and conſtrained uſe, or rather abuſe of it, in the getting by rote numbers of words and ſyllables, particularly in the learning different languages; a paralytic affection in the head; violent external injuries in the ſame part; violent pains in the head, attended with deliriums, or attending a phrenitis. And to theſe are to be added drunkenneſs, and an abuſe of venery.

Prognoſtics. All debilities of *Memory* are cured with great difficulty by medicines alone; and indeed this complaint is ſeldom removed, unleſs the whole frame of mind and courſe of life be altered; all paſſions avoided, and exceſs of every kind left off. But of all other kinds, that debility of *Memory* which proceeds from a paralytic diſorder of the head, particularly when that diſorder affects the tongue, is found to be the moſt obſtinate and difficult of cure. Much ſleep, or exceſſive waking, are equally hurtful to the *Memory*, and frequently bring on an almoſt total loſs of it.

Method of treatment. All ſuch medicines as are of an agreeable taſte or odour, are generally ſuppoſed to be of ſervice in ſtrengthening the *Memory*; and lignum aloes, ambergriſe, and ſome other of the ſcented drugs, have been known to do great good. The aromatic, volatile, and ſpirituous medicines, alſo all help in this caſe, if taken in ſmall doſes, and continued for a long time together. The analeptics and nervine medicines are alſo greatly recommended, but they are ſeldom found of uſe; for among people afflicted with a debility of *Memory*, many are thoſe of robuſt conſtitutions and ſtrong appetites, who eat already more than nature requires, and have therefore very little uſe for analeptics or nutritive things.

Bleedings in ſmall quantities frequently repeated, in caſes where there is no contrary indication, frequently prove of great ſervice in this caſe; but the *primæ viæ* are firſt to be cleanſed before ſuch a courſe is entered upon. Many greatly recommend bags of aromatics to the head, to be conſtantly worn in caps; but it is much to be feared theſe can have but very little effect. *Junck*. Conſp. Med. p. 682.

MEN *allegro*, in the Italian muſic, is uſed to denote a movement not ſo briſk and lively as *allegro*. See the article ALLEGRO.

MEN *forte*, in the Italian muſic, intimates that the part to which it is added ought to be played or ſung not ſo ſtrong or ſo loud as the reſt.

MEN *preſto*, in the Italian muſic, ſignifies leſs quick. See the article PRESTO.

MENALD *deer*, a ſpecies of the common fallow deer, beautifully variegated. See the articles CERVUS and DEER.

MENENCHYTA, in medicine, certain compoſitions of medicinal ingredients made for injecting into the womb, in the cure of ſeveral diſeaſes of that part.

MENINGOPHYLAX, a word uſed by Celſus as the name of a chirurgical inſtrument, contrived for guarding the membranes of the brain while the bone of the cranium is raſped or cut, after the operation of the trepan.

MENING, in botany, a name given by the people of Guinea to a plant of the ricinus or palma Chriſti kind, which they uſe in medicine: They dry and powder the leaves, and then give them to be ſnuffed up the noſtrils to cure all ſorts of ſtuffings or ſtoppages in the head. Its leaves reſemble thoſe of the finch and ivy, and are hairy; whence Petiver has named it *ricinus Guineenſis hæderæ quinquefoliæ Virginianæ facie foliis hirſutis*. It is not known to grow any where in America. Phil. Tranſ. N° 232.

MENOGENIEN, in botany, a name by which ſome authors have called the pæonia, or common garden piony. *Ger*. Emac. Ind. 2.

MENSARII, among the Romans, officers appointed to manage the public treaſury, being ſometimes three, and ſometimes five in number. *Pitiſc*. in voc.

MENSORES, among the Romans, harbingers or officers, whoſe buſineſs it was to go and fix upon lodgings for the emperor, when he took a journey to any of the provinces. Their office was alſo to mark out encampments, and aſſign every regiment its poſt. *Danet*. in voc.

MENSORES alſo ſignified land-ſurveyors, architects, or appraiſers of houſes and public buildings. Thoſe likewiſe who diſtributed the proviſions in the army, were called *menſores frumentarii*; and ſervants who waited at table had the appellation of *Menſores*. *Pitiſc*.

MENSORES was likewiſe the title of officers among the Romans, appointed to receive the proviſions brought to the city by ſea, and to ſee them carefully laid up and preſerved in public granaries, of which there were great numbers. *Hoffm*. Lex. in voc.

MENSTRUUM (*Cycl*.) — As many more things might be done in chemiſtry than we now find practicable if we had more *Menſtruums* than are at preſent known, it muſt be a ſubject of infinite uſe in chemiſtry to diſcover new ones. To this purpoſe let it be conſidered, that in whatever way ſalts are united with other ſalts, new *Menſtruums* are produced by the mixture.

Thus if pure alkali be added to a ſolution of ſea ſalt, earthy matter is precipitated, and the ſalt afterwards obtained by criſtallization, from the clear liquor, will be a ſea ſalt much purer than before, and capable of acting on bodies in a different manner.

The ſame fixed alkali being added to the brine of nitre, makes the liquor thick and milky, and precipitates an earthy matter; after which the nitre, obtained by criſtallization, is much purer than before.

When fixed alkali is added to the brine of ſal armoniac, it lays hold of the acid of that ſalt, and ſets the volatile alkali of the compoſition free, and ſuffers it to fly off in the air, leaving only a very pure and fixed ſea ſalt at the bottom of the veſſel. If a pure volatile alkali be added to the brine of ſea ſalt, it makes the liquor thick, then purifies it, and flies off; and it does the ſame when added to a ſolution of nitre; and when added to a ſolution of ſal armoniac, it, in like manner, purifies the ſalt without altering its nature, and flys off as it was poured on. Vegetable acids produce but little alteration on being mixed with ſea ſalt, nitre, and ſal armoniac. Fermented vegetable acids, even after being purified by diſtillation, produce no great alteration when mixed with the ſame ſalts. If calcined vitriol, or alum, be mixed with nitre and diſtilled, they yield aqua fortis, which contains nothing of the acid of vitriol or alum, but is a mere ſpirit of nitre; and if mixed with ſea ſalt, and treated in the ſame manner, the produce is a ſpirit of ſalt; and if with nitre and ſea ſalt together, they make an aqua regia. So if nitre and calcined vitriol be melted together in an open fire, the acid of the nitre is diſcharged, and a kind of tartarum vitriolatum is left behind. Sea ſalt, treated in the ſame manner, leaves a ſort of Glauber's ſalt behind; and, in general, what way ſoever it be by which ſalts are joined with ſalts, new ſaline productions, and new *Menſtruums* will ariſe; whence the art of chemiſtry may be perpetually improved, and new *Menſtruums* will give new phænomena on different bodies. New *Memſtruums* of particular virtues, may alſo be made by variouſly combining the known *Menſtruums* together; and this may be done by an almoſt infinite variety of ways; much may be alſo done by reducing every known *Menſtruum* to its utmoſt degree of purity. And, laſtly, by reducing ſome of them into the minuteſt particles, they can be reduced to, whether by art or nature; for upon theſe three particulars the extraordinary ſkill of the chief chemiſts ſeems principally to depend. For inſtance, ſuppoſe an extremely pure, ſtrong, and ſubtle fermented vegetable acid was wanting: Take fine verdegreeſe prepared from copper corroded by the ſubtile vapour of a fermenting acid; add to it twenty times its weight of the ſtrongeſt diſtilled vinegar that can be made; digeſt them together till the verdigreeſe is thoroughly diſſolved, and the whole become a deep green liquor; purify this by filtration, and inſpiſſate it over a gentle fire to a pellicle; ſet it in a quiet place, where it will ſhoot into cryſtals like emeralds, conſiſting of an acid vinegar and diſſolved copper; pour off the liquor, collect the cryſtals, and evaporate as before; and by this means collect all the cryſtals that can be obtained; then dry theſe, and diſtil them in a retort, and the produce will be a moſt pure and ſtrong vegetable acid, not in the leaſt partaking of the nature of copper. But this experiment will not ſucceed with lead, tin, or any other of the metals ſoluble in vinegar; for the copper attracts the acid free of its water, and again reſtores it unaltered; but the others, though they equally attract and ſeparate it, yet always yield it altered and impure. Zwelfer imagined this acid to be the alkaheſt, or univerſal diſſolvent; but Tachenius ſoon proved that it was no other than diſtilled vinegar of a much greater purity than uſual.

To ſhew that by the compounding one *Menſtruum* with another, new, and often, excellent ſalts may be produced, let it be conſidered, that the regenerated tartar, properly prepared, may be intimately united to pure alcohol, and thus produce a vegetable *Menſtruum*, compoſed by the moſt cloſe union of the moſt ſubtile vegetable particles, *viz*. alkali, acid, and ſulphur; whence the effect of ſuch a liquor cannot but be extremely great, both as a *Menſtruum* and a medicine. So again, if a pure ſtrong alkaline ſpirit be united with pure alcohol, it produces an admirable *Menſtruum* called the offa Helmontii, which intimately diſſolves diſtilled vegetable oils, and thus makes a *Menſtruum* compounded of the genuine vegetable ſulphur, and an alkali, and is perhaps one of the beſt medicines, as well as the beſt *Menſtruums* hitherto known.

In like manner pure ſpirit of nitre ſaturated with the alkaline ſpirit of ſal armoniac, makes a kind of volatile nitre, and thus affords an opportunity of examining, by experiments, whether the great things expected from a volatile nitre by the chemiſts, will be performed by it or not. Experiments of this kind are extremely worth proſecuting. It is not certain whether any *Menſtruum* will diſſolve any ſubſtance without the aſſiſtance of fire, as no experiment could ever be made in any place deſtitute of all fire; there being evidently fire in our utmoſt known degree of cold; and we all know that *Menſtruums*, of whatever kind, act greatly the better for being aſſiſted by heat.

Menſtruums can ſcarce act as ſuch, unleſs reduced to a fluid form, or at leaſt approaching thereto; this is chiefly given them by means of fire, air, water, and triture: Theſe are the four cauſes which uſually excite the latent powers of *Menſtruums*. Certain *Menſtruums* contain a cauſe within themſelves apparently capable of exciting motion, though in reality it depends upon the near approach of ſome other body. Thus if a good loadſtone be ſuſpended by a thread, and hang at reſt in a great degree of cold, it will ſeem to have no active virtue; but if iron come near it, a motion is produced in both theſe bodies, till they come together, and remain in contact; and this kind of power generates motion ſpontaneouſly, without the aſſiſtance of any fire ſenſible to us, and is not excited by motion. So likewiſe ſtrong ſpirit of nitre confined in a cloſe veſſel, yields an acid fume conſtantly playing about the ſurface of the liquor, and iſſuing out whenever the veſſel is unſtopped. So alſo the alkaline ſpirit of ſal armoniac yields a fume never obſerved to be at reſt; and the ſpirit of this ſalt, made with lime, yields a fume much more volatile and moveable: All the bodies of this kind therefore ſtrangely retain, and ſtrangely excite motion. We are always to remember alſo that air, even in the coldeſt places, has always a ſtrong vibratory motion, and therefore may often excite theſe motions in theſe bodies; as on the other hand ſolutions are often immediately performed by means of the motion peculiar to the *Menſtruum* ariſing from it; while another motion of a different kind, and proceeding from a different cauſe, would not produce the effect. Thus, for inſtance, if a fine piece of Engliſh chalk be calcined in a ſtrong fire, or even in the focus of a burning-glaſs, it will ſcarce alter its nature by this violent motion, nor again by being expoſed to a hot or cold air, either at reſt, or agitated by winds; and though if long boiled in water, or a brine of ſalt of tartar, it will not diſſolve; yet it immediately melts and diſappears when put into cold vinegar. Whence we ſee there is a very great difference between the motion excited by the reciprocal force of the ſolvent and ſolvend, and the motion excited by fire, air, water, and impulſe. The acrimony of a *Menſtruum*, with reſpect to a human body, ſo as to excite pain, corrode or conſume the parts thereof, is no ſign that ſuch a *Menſtruum* is ſuited to diſſolve other bodies, as appears from oil of vitriol, ſpirit of nitre, ſpirit of ſalt, and *aqua regia*, which though they readily conſume fleſh, yet do not conſume or diſſolve wax and ſulphur, though theſe two may be eaſily diſſolved in the body. Many bodies incapable of ſolution in certain *Menſtruums*, may be ſuited for diſſolving therein, by being previouſly diſſolved in other *Menſtruums*. Thus if common ſulphur be boiled ever ſo long in alcohol, it diſſolves no more than a ſtone in water; but if the ſulphur be firſt melted with ſalt of tartar into a duſky maſs, the alcohol will then diſſolve it; ſo alſo powdered antimony remains untouched after boiling in alcohol; but if firſt boiled to a dry maſs in an alkaline lixivium, this maſs preſently yields a golden tincture to alcohol. Some chemiſts have conceived ſo highly of this regular and ſucceſſive application of different *Menſtruums*, particularly Mr. Boyle and Mr. Homberg, that they ſay even metals may by this means be reſolved into their component running mercury and fixing ſulphur. Thus they aſſert, that if ſilver be firſt diſſolved in ſpirit of nitre, and then long digeſted with pure fixed alkali, and afterwards ſeveral times ſublimed with ſal armoniac, it will at length, by means of theſe reſuſcitating ſalts, afford a true running mercury; in which operation the acids procure an entrance for the alkalis into the ſubſtance of the metal, as the fixed alkalis procure admiſſion to the volatile ones, which elſe could not enter. Boerhaave waves diſputing upon the point, whether the metals can be thus reſolved into their running mercuries, and only affirms, that after many trials, he was never able to effect it. *Boerh.* Chem. part 1. p. 562. ſeq.

It is an error to think a *Menſtruum* cannot be too ſtrong. Oil of vitriol diluted with ſeveral times its weight of water, diſſolves iron beſt. So aqua fortis diluted works beſt in lead. And Mr. Boyle makes the like obſervation as to the ſolution of ſilver. Works Abr. vol. 1. p. 165.

Animal MENSTRUUM. There are of the animal *Menſtruums* very many both of the natural and artificial kind; the natural are blood, ſerum, gall, urine, ſaliva, rennet, whey, buttermilk, *&c.* moſt of which, being properly employed, will either produce or diſcharge colours, and might be made ſerviceable in the painting and dying trades. Thus recent urine diſcharges the common ink out of linnen, *&c.* Blood affords, by proper management, the noble Pruſſian blue; and gall is a natural yellow, well deſerving to be treated in the manner of blood in that preparation. Of the artificial kind are the ſpirit of urine produced by chemiſtry, which ſerves to produce, alter and deſtroy a vaſt number of colours. The liquors diſtilled from recent, or fermented whey, buttermilk, *&c.* might be alſo found of great value; and variouſly compounding theſe ſeveral animal ſubſtances, even by random trials, or chance experiments, new diſcoveries in colours might be made; though much more, probably, by a right reaſoning and analogy. As for inſtance, the common bones burnt to a blackneſs, being found to afford the bone black, the experiment was eaſily transferred to ivory, and ſo the ivory black was diſcovered: And ſo of the reſt. *Shaw*'s Lectures. p. 183.

MENSTRUUM *Peracutum*. Mr. Boyle gives the name of *Menſtruum peracutum* to a *Menſtruum* made by pouring on the rectified oil of butter of antimony as much ſtrong ſpirit of nitre as would ſerve to precipitate out of it all the bezoarticum minerale; and then with a ſmart fire diſtilling off the liquor which would come over, and cohobating it upon the antimonial powder. Works Abr. vol. 1. p. 260, 377.

He put ſome highly refined gold into a large proportion of this *Menſtruum peracutum*, where it diſſolved ſlowly and quietly; and he found at the bottom of the glaſs a conſiderable quantity of a white powder, which the *Menſtruum* would not touch, and which was alſo indiſſoluble in aqua regia. The ſolution of gold being abſtracted, and the gold again reduced into a body, yielded, upon a ſecond ſolution, more of the white powder. This powder he melted down into a metal, anſwering in colour, malleability, ſolubility in aqua fortis, and in bitterneſs to the taſte of that ſolution, to ſilver. Hence he infers, that notwithſtanding the ſuppoſed unchangeableneſs of gold, this experiment ſhews it to be really changeable into ſilver, or at leaſt into a new kind of metal very different from gold. And he therefore concludes, that there is no impoſſibility in the nature of the thing, that one metal ſhould be tranſmuted into another. Ibid. p. 260—262.

By diſſolving gold in this *Menſtruum peracutum*, Mr. Boyle alſo tells us, he made the gold riſe in the retort, in the top and neck of which it was found in the form of yellow and reddiſh ſublimate. Works abr. vol. 1. p. 263, 377.

We do not find that Mr. Boyle gave the name of *Menſtruum peracutum* to the *Menſtruum* he extracted from bread, as it is ſaid he did, in the Cyclopædia, under the head MENSTRUUM. See Boyle's Works Abr. vol. 1. p. 34, 49.

MENTHA, *Mint*, the name of a well known genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is of the labiated kind; the upper lip is arched, and the lower is divided into three ſegments; and the whole is ſo diſpoſed, that at firſt ſight the flower appears a four-leav'd one, or at leaſt one regularly divided into four ſegments. The piſtil ariſes from the cup, and is fixed in the manner of a nail into the hinder part of the flower, and ſurrounded with four embryos which afterwards become ſo many ſeeds, and are contained in the cup of the flower.

The ſpecies of *Mint*, enumerated by Mr. Tournefort, are theſe: 1. The common round-leav'd wild *Mint*. 2. The purple-flower'd round-leav'd wild *Mint*. 3. The verticillated garden *Mint*, with the ſmell of baſil. 4. The common curled-leav'd verticillated *Mint*. 5. The round-leav'd ſpiked curled *Mint*. 6. The beautiful Daniſh or German curled *Mint*. 7. The round-leav'd ſpiked wild *Mint*. 8. The great roundiſh-leav'd marſh or Water *Mint*. 9. The great round-leav'd Marſh *Mint*, with variegated leaves. 10. The hairy verticillate field *Mint*. 11. The rounder-leav'd verticillate field *Mint*, with an aromatic ſmell. 12 The ſpiked *Mint*, with variegated leaves. 13. The narrow-leav'd ſpiked *Mint*. 14. The ſmooth narrow-leav'd wild *Mint*, with rugged leaves, and a ſtrong ſcent. 15. The long blackiſh-leav'd leſs hairy wild *Mint*. 16. The common thick ſpiked pepper *Mint*. 17. The long-leav'd horſe *Mint*. 18. The longer-leav'd water *Mint*. 19. The water *Mint*, commonly called *Pennyroyal*. 20. The common white-flowered *Pennyroyal*. 21. The water *Mint*, called by many authors *male Pennyroyal*. 22 The ſmalleſt woolly water *Mint*. 23. The ſavory-leav'd water *Mint*. *Tourn.* Inſt. p. 189. See the article MINT.

MENYANTHES, *Buckbean*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, is funnel-ſhap'd, and divided into ſeveral ſegments at the edges. From the cup there ariſes a piſtil, which is fixed in the manner of a nail to the hinder part of the flower, and afterwards becomes a fruit or ſhelly caſe, uſually of an oblong figure, bivalve, and full of ſmall roundiſh ſeeds.

The ſpecies of this plant, enumerated by Mr. Tournefort, are theſe: 1. The broad-leav'd trifoliate marſh *Menyanthes*, called by many writers, *Trifolium paluſtre*, and by us, *Marſh Trefoil*, or *Buckbean*. 2. The narrow-leav'd trifoliate marſh *Menyanthes*. And 3. The American white-flower'd *Menyanthes*, with leaves like thoſe of the water lilly. *Tourn.* Inſt. p. 117.

The characters of *Menyanthes*, according to Linnæus, are theſe: The cup is a perianthium conſiſting of one leaf, divided into five ſegments at the end, and is placed erect, and

remains

remains after the flower is fallen. The flower conſiſts of a ſingle petal, in form of a ſhort cylindric and ſomewhat open-mouth'd tube. The rim beyond the middle is divided into five ſegments, the jags being open, obtuſe, bent backward, and covered with a woolly hairyneſs. The ſtamina are five ſhort and tapering filaments, and the antheræ are acute, bifid at the baſes, and erect. The germen of the piſtil is of a conic form; the ſtyle is cylindric, and nearly of the length of the flower; and the ſtigma is bifid and compreſſed. The fruit is an oval capſule, containing only one cell, and ſurrounded with the cup. The ſeeds are very numerous, ſmall, and of an oval figure. *Linnæi* Gen. Plant. p. 64.

MENTZELIA, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium conſiſts of one leaf, divided into five expanded ſegments. Theſe are lanceolated and deciduous, and terminate in a very long germen. The flower conſiſts of five ovated petals, which ſtand expanded, and are ſomewhat longer than the ſegments of the cup. The ſtamina are numerous erect ſetaceous filaments; the antheræ are ſimple; the germen of the piſtil is of a cylindric figure, and is extremely long, and ſtands under the cup; the ſtyle is ſetaceous, and of the length of the flower; the ſtigma is ſimple; the fruit is a long capſule, of a cylindric clavated form, containing only one cell, in which there are lodged numerous ſmall and roundiſh ſeeds. *Linnæi* Gen. Plant. p. 236. *Plumier*, Gen. 6.

MERCATORUM *Feſtum*, among the Romans, a feſtival kept by the mercantile people on the ides or 15th of May, in honour of Mercury, to whom they ſacrificed a ſow; then ſprinkling themſelves with the water of a fountain called *aqua mercurii*, they prayed the god to proſper their trade. *Danet*, in voc.

MERCURIALIS, *Mercury*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the apetalous kind, conſiſting only of a number of ſtamina placed in a cup. Theſe flowers are barren, and the embryo ſeeds appear on other plants of the ſame ſpecies, which have no flowers. Theſe finally become a fruit compoſed of two capſules, containing a roundiſh ſeed.

The ſpecies of *Mercurialis* enumerated by Mr. Tournefort, are theſe: 1. The teſticulated *Mercury*, commonly called the male *Mercury*. 2. The ſpiked *Mercury*, commonly, but improperly called, the *female Mercury*; this being truly the male, and the teſticulate the female, thoſe teſticles containing the ſeeds. 3. The mountain teſticulate *Mercury*, called *Cynocrambe*, or *Dogs Mercury*. 4. The ſpiked cynocrambe, or dogs *Mercury*. 5. The ſhrubby hoary teſticulate *Mercury*, called *Phyllon*. 6. The ſpiked *Phyllon*, or ſhrub hoary *Mercury*. 7. The Portugal ſhrub almond-leav'd teſticulate *Mercury*. 8. The ſpiked almond-leav'd ſhrub ſpiked *Mercury*. 9. The round-leav'd three-mouths *Mercury*, the male and female kinds. *Tourn.* Inſt. p. 534.

Mercurialis is of an emollient nature, and eaten in the manner of ſpinach, which, when cultivated in a garden, it greatly excels. If eaten largely, it opens the bowels. A cataplaſm of the leaves is much recommended in pains of the limbs, in tumours, and even in ulcers, which it cleanſes and diſpoſes to heal. Poor people in country places uſe it as a cataplaſm for the rheumatiſm, and even for the gout, with ſucceſs. In the ſhops, it is chiefly kept as an ingredient in decoctions for glyſters.

MERCURIFICATION, in metallurgic chemiſtry, the obtaining the *Mercury* from metallic minerals in its fluid form. For the effecting this, thoſe who have been engaged in theſe reſearches have propoſed three methods. The firſt is by means of a certain mercury, ſo prepared as to have a diſſolving power, by which it could take up the mercuries of metals in the ſame manner as water diſſolves ſalt from aſhes. The ſecond is by means of certain regenerating ſalts, ſuch as ſal armoniac, which are to detain the more earthy parts of metals, and leave their mercuries ſeparate or ſeparable from them by ſublimation or otherwiſe; and the third method is by means of a large lens or burning-glaſs, in the focus whereof if any metal be applied, its mercurial part is ſaid to ſeparate and go off in fume, which when collected and condenſed, appears to be running mercury. *Shaw*'s Lectures, p. 160. The firſt of theſe methods would be very eaſy, if the proper mercury were to be readily produced; the ſecond is extremely laborious, and requires much patience and reiteration. But the third ſeems eaſy enough, and practicable to advantage, when a glaſs of three or four foot in diameter is at hand, the ſky ſerene, and the ſun ſhines ſtrong.

MERCURY (*Cycl.*) — The manner of ſeparating *Mercury* from its ore, when not ſulphureous, is this: Take a pound of the ore beat to powder; this with the aſſayer muſt ſtand for one centner; put this into a glaſs retort, coated half way to its neck, which muſt be long, and turned back with ſuch declivity, that a glaſs recipient may be applied perpendicularly to it. The retort muſt be of ſuch a ſize, that the belly of it may be filled nearly two thirds with the ore; and muſt be placed ſo that nothing of the fluid, adherent to the neck of it, may fall into the cavity of the belly, but that the whole may run forward into the recipient, which muſt be filled with cold water: This muſt be ſo placed as to receive the noſe of the retort about one half inch into the water. The joints need not be luted. *Cramer*'s Art of Aſſaying, p. 350.

Let the retort be ſurrounded with burning coals, placed at a diſtance, leſt it burſt; by degrees bring the coals nearer, and at length cloſe to the retort; add freſh charcoal, and make it ſlightly red hot. When this fire has been continued an hour, take off the recipient, firſt ſtriking the neck of the retort to throw off the looſe drops that may hang there; and in the bottom of the water you will find the *Mercury*. This proceſs may be alſo performed in a ſand heat; but the bottom of the retort muſt touch the bottom of the veſſel that contains the ſand, and that be made red hot. The *Mercury* is to be ſeparated from the water by filtration.

The ſuppoſition of a ſympathy between *Mercury* and gold has been the great baſis of the attempts of the alchemiſts of all times, toward the making gold of it. But if they mean that the common *Mercury* has this ſympathy with gold, the contrary is proved by that remarkable proceſs, in which it appears that *Mercury* will incaleſce with that metal. If they mean that *Mercury* which they call the ſeed of metals, it is hard to offer any thing in argument againſt it, this being a ſort of ideal ſubſtance which no body has yet ſeen. It is much diſputed by the alchemiſts, whether there be or be not any ſuch thing as *Mercury* that will heat or incaleſce with gold, or produce a ſenſible heat in the maſs, on being only ſimply mixed with that metal reduced to fine parts. It has been ſaid by ſome, that thoſe *Mercuries* which they call *Mercurii Corporum*; that is, ſuch as have been extracted from the compleat metals by certain proceſſes, which they keep as inviolable ſecrets, will incaleſce on the mixture with gold; and on this they build their proceſſes. But the negative part of the queſtion is more generally maintained, the famous *Mercuries* of metals being held as non-entities with them; and even the ſearchers after tranſmutation of metals have in general acknowledged, that they themſelves never ſaw any ſuch incaleſcence of *Mercury* with gold, though they had heard others ſpeak of it as a thing they had ſeen. A *Mercury*, however, was ſome years ago produced before the Royal Society, which in the hands of the preſident himſelf, on the faireſt trial, did incaleſce with that metal. Phil. Tranſ. N°. 122.

Among the ſeveral methods recommended for the fixing this fluid metal into ſolid ſilver, oil of talc, and oil of the human fæces, are the moſt ſtrongly affirmed to be the infallible mediums. The firſt of theſe which has been ſo much miſunderſtood, by reaſon of its name, as to be ſearched for in the ſtone talc, is truly an oil prepared from the flowers of zink. See the article *Oil of* TALC.

The other is required to be clear and colourleſs as water, and without any ill ſmell. Theſe were qualities ſo difficultly to be found in an oil of that fætid matter, that both the one and the other of theſe oils were looked upon by many as impracticable proceſſes. But after the firſt had been made by two or three chemiſts, Mr. Homberg at length hit upon the laſt, but without finding any the leaſt tendency to ſuch an effect in it, or any change at all produced by it on *Mercury*, after ever ſo long digeſtion, or ever ſo many proceſſes. Mem. Acad. Par. 1711.

If *Mercury* be diſſolved in aqua fortis, ſo that the ſolution be clear and total, and if whilſt it is yet warm ſome lead filings be poured in by degrees, the lead will be precipitated into a white powder, and the *Mercury* reduced to a maſs of running quick-ſilver. *Boyle*'s Works abr. vol. 1. p. 318.

Mercury may be diſſolved in vegetable acids. This is done by reducing it to a calx by a long digeſtion. A ſcruple of this calx may be diſſolved in an ounce of diſtilled vinegar, in a boiling heat. The ſolution being filtred and expoſed to the cold, will in part be changed into fine cryſtals. This calx diſſolves likewiſe in the juice of lemons, rheniſh wine, and other vegetable acids.

But a precipitate of *Mercury* made from its ſolution in aqua fortis, by means of oil of tartar *per deliquium*, and well edulcorated by boiling water, is more eaſily diſſolved in diſtilled vinegar. It may even be diſſolved cold without digeſtion. *Marggraf.* in Mem. de L'Acad. de Berlin, 1746.

Boerhaave has obſerved, 1. that quickſilver, however well purified, yields always a ſoft black powder, of a ſharp braſſy taſte, when long expoſed to violent conquaſſation, or to a degree of heat, twice as great as that of animals. 2. Heat, near as ſtrong as what is neceſſary for diſtilling quickſilver, changes the greater part of *Mercury*, if not all of it, into a heavy, ſhining, red, friable powder, of a ſharp nauſeous taſte, which long and violently diſorders the human body, and diſpoſes it to excretions. 3. The fluid quickſilver remaining after this red powder is ſeparated, is more fluid, and of leſs ſpecific weight than common *Mercury*. 4. All the black, and near the whole red powder, can be brought into the former fluid ſtate, by a more intenſe heat; and this revivified quickſilver enjoys all the properties of common *Mercury*.

The experiments on *Mercury* above-mentioned were ſent by Boerhaave to the Royal Society. He ſent an account of others to the Royal Academy of Sciences at Paris. The concluſions from theſe experiments are, that he could not change quickſilver into any other metal, and that no quickſilver was

to be got from lead or tin. See Mem. de l'Acad. Royal. des Scienc. 1734.

Mercury diſſolved by rubbing it ſtrongly with any chemical oil, or with Venice turpentine, has been given to the quantity of a ſcruple, half a dram, or two ſcruples in a day. Such pills keep ſome people's belly open, others they purge, and a gentle ptyaliſm has ſometimes been occaſioned, nay, a high ſalivation has been raiſed by them. See Medic. Eſſ. Edinb.

Dr. Dover, in his Phyſician's Legacy to his country, having recommended crude *Mercury* or quickſilver as a moſt beneficial medicine for ſeveral diſeaſes, it had for ſome time a great run at London, which occaſioned the writing a great many pamphlets for and againſt it. Dr. Cheyne alſo greatly recommends this medicine in his treatiſe, entituled, *The Rational Method of curing Diſeaſes.*

The authors of the medical eſſays of Edinburgh aſſure us, that though ſome they knew had taken an ounce or two of crude *Mercury* each morning for ſeveral weeks, yet they knew no inſtance of its encreaſing any of the ſenſible evacuations; but they have been told, that ſome who uſed it thus, had paſſed ſome of it with their urine, and that the hands of others, taking this medicine, had tinged their ſnuff-boxes, *&c.*

But we have an account of the effects of crude *Mercury* on a perſon who had the advice of his phyſician for the taking it, in a remarkable caſe recorded in the Philoſophical Tranſactions, about the time when Dr. Dover had brought it into ſuch general uſe; and as the effects of it, in this caſe, may ſerve to caution people as to the uſe of it, it may be proper to give the ſubſtance of it, which is this: A perſon had long been ſubject to great difficulty in going to ſtool, for which he at length took ſeveral ounces of crude *Mercury* at different times, but without relief. Upon the opening of the abdomen there iſſued out a great quantity of wind, before the ſtomach or guts were wounded. The ſtomach was empty, and its inner coat violently inflamed. The ſmall guts were, in many places, fouled with a black powder reſembling Æthiops mineral, and in ſeveral parts of them were found ſmall globules of quickſilver. The black powder was doubtleſs the quickſilver altered into a ſort of æthiops in the body. The colon was inflamed and diſtended, and contained ſix quarts of liquid excrement, among which was a great deal of crude *Mercury*, and of the ſame black powder. This gut alſo was inflamed on the outſide, and had formed an abſceſs where it adhered to the omentum; the other guts in contact with this part alſo ſhared this diſorder. In the lower part of the colon the coats became ſchirrous, and the paſſage was very ſmall. Some of the valves were alſo become ſchirrous, and obſtructed the paſſage, and a ſmall plumb-ſtone was found buried in the villoſe coat of this inteſtine. This had alſo formed a ſmall abſceſs, which diſcharged itſelf into the pelvis. What part of theſe ſymptoms was owing to the taking the quickſilver is eaſy ſeen, and ſuch effects may be guarded againſt for the future, by obſerving the ſtate of the patient before it is given. Philoſ. Tranſ. N°. 442. p. 295.

Chemiſts having obſerved that ſome ſimple preparations of antimony and *Mercury* had ſurprizing effects in the cure of obſtinate diſtempers, employed their art to change theſe Herculean medicines into various ſhapes, to ſeparate their noxious and uſeleſs parts, and to combine their active principles. To theſe labours are owing the butter and cinnabar of antimony, *Mercurius vitæ*, bezoard mineral, ſolar, lunar, jovial, and ſeveral other preparations, on which the moſt exorbitant encomiums have been laviſhed. But with all this care, many of theſe remained unactive, and others incorrigible, and unfit for uſe. However it is certain that theſe two minerals, properly combined, have wonderful effects. We have, in the medical eſſays of Edinburgh, a preparation of Dr. Plummers, which is much recommended from the experience of its effects. See PLUMMER's *Æthiops.*

Mercury is often uſed in anatomical preparations, eſpecially for ſuch parts that do not eaſily retain air, as the lungs, or ſpleen, and glans penis. See *Monro* in Med. Eſſ. Edinb. vol. 3. art. 10. But it is to be obſerved, that the quickſilver does conſiderable damage to the ſmall cells of the lungs and glans.

Beſide the numerous other phænomena attending this remarkable mineral, the light it gives when ſhaken in a glaſs tube, which proceeds from electricity, is not to be omitted.

If *Mercury* be encloſed in a glaſs tube, cloſe ſtopped, that tube is found, on being rubbed, to give greatly more light than when it had no *Mercury* in it. When this tube has been rubbed, after raiſing ſucceſſively its extremities, that the *Mercury* might flow from one end to the other, one ſees a light creeping in a ſerpentine manner all along the tube; that is to ſay, the *Mercury* is all luminous. The *Mercury* being made to run along the tube afterwards without rubbing it, was found to emit ſome light, though much leſs than before; this proves that the friction of the *Mercury* againſt the glaſs, in running along, does in ſome meaſure electrify the glaſs, as the rubbing it with the hand does, only it is in a much leſs degree. This is more plainly proved by laying ſome very light down near the tube, for this will be attracted by the electricity raiſed by the running of the *Mercury*, and will riſe to that part of the glaſs along which the *Mercury* runs; and it is very plain from this, that what has been long known in the world under the name of the *phoſphorus* of the barometer, is not a phoſphorus, but merely a light raiſed by electricity, the *Mercury* electrifying the tube. Phil. Tranſ. N°. 484.

If *Mercury* be put into large exhauſted tubes, and theſe afterwards rubbed to excite their electricity, it is obſerved that they give, on all ſides, rays of a very bright and very lively light.

Calcin'd MERCURY, *Mercurius Calcinatus*, a new and more expreſſive name for the preparation of *Mercury*, commonly called *precipitate per ſe.* It is made by ſetting purified quickſilver for ſeveral months in a ſand heat, in a glaſs veſſel with a broad bottom, and opening it to the air by a ſmall hole, till it is reduced to a red powder.

The quickſilver muſt have a communication with the external air, as is neceſſary to the calcining of all the metals. This opening is beſt made, not as in the common bolt-heads, but at the lower end of a ſtem, going into the body of the glaſs; that if the quickſilver riſe with the heat, it may not, by aſcending into the ſtem, be removed out of the heat that is to calcine it. *Pemberton*'s Lond. Diſp. p. 225.

Coralline MERCURY, *Mercurius Corallinus*, the name given in the London Diſpenſatory to a preparation of *Mercury*, commonly known by the name of *arcanum corallinum.* It is prepared in this manner: Pour upon the red corroſive *Mercury*, commonly called *red precipitate*, thrice its weight of rectified ſpirit of wine, digeſt them together in a gentle heat for two or three days, often ſhaking the phial, then ſet fire to the ſpirit, and continue ſtirring the powder till the ſpirit is burnt away. *Pemberton*'s Lond. Diſp. p. 227.

This operation proceeds upon the principle of ſpirit of wine dulcifying acid ſpirits.

Oil of MERCURY, the name given by the chemiſts to a preparation of *Mercury* in a fluid form, by means of a ſtrong acid. The preparation is this: Calcine *Mercury* with oil of vitriol to a dry ſnowy calx; ſuffer it to cool, then put it into a glaſs, and pour upon it an equal quantity of oil of vitriol; let this boil away almoſt to a dryneſs, carefully avoiding the poiſonous fumes; then increaſe the fire, and by degrees reduce it to a dryneſs again; which is, in this ſtate, a very difficult and tedious taſk. When the powder is dry, put the ſame quantity of oil of vitriol again to it, and proceed as before: At length it will ſcarce dry by means of ever ſo long or ſtrong a fire, but only ceaſe flowing freely, and become ſomewhat rigid like a fixed oil. It is then highly ſharp, cauſtic, and not to be touched, like the *ignis gehennæ* of Paracelſus. By this means the *Mercury* is ſo fixed with the oil of vitriol, as not to be evaporated, or fly off, by the action of a very violent fire. *Boerh.* Chem. p. 317.

By this proceſs we ſee the method of impregnating, ſaturating, and incerating metals by acids to any degree, and alſo of fixing, in a great degree, volatile *Mercury* by them; but no metal is hence to be expected, for in whatever manner *Mercury* is fixed with acids, it is always recoverable again in its priſtine ſtate, by grinding it with twice its weight of iron filings, and diſtilling in a glaſs retort, with the greateſt degree of a ſand heat. Ibid. p. 320.

Corroſive Sublimate of MERCURY. Mr. Boulduc deſcribes an eaſy manner of making corroſive ſublimate. He pours equal quantities of quickſilver and dephlegmated oil of vitriol into a retort, then draws off part of the acid, which does not incorporate with the quickſilver; the fire is continued till the white maſs of diſſolved *Mercury* is dry, when he ſpeedily mixes it with equal parts of dried ſea ſalt, and ſublimes it in the common way.

MERCURY, *Mercurialis*, in botany and medicine. See the article MERCURIALIS.

MERCURIUS *Dulcis.* *Mercurius Dulcis* in large doſes, with cinnabar of antimony, is recommended in nervous diſeaſes, palſy, hemiplegia, epilepſy, and apoplexy. Med. Eſſ. Edinb.

Mr. Dictericus gives us theſe rules for knowing whether ſublimate is ſufficiently edulcorated in making *Mercurius Dulcis.* If after rubbing the *Mercury* on gold, the gold becomes only pale, and not white, the *Mercury* is dulcified enough; or if ſweet *Mercury* becomes black when mixed with lime-water, it is fit for uſe; but if either the gold becomes white, or the *Mercury* is of a brown or yellow colour, after mixing with lime-water, it is not ſufficiently dulcified. Commerc. Norem. 1737. hebd. 29. §. 2.

MERCURIUS *Emeticus Flavus*, a name given in the late London Diſpenſatory to the mercurial preparation commonly known by the name of *turbith mineral.* *Pemberton*'s Lond. Diſp. p. 228.

MERCURIUS *Vitæ* may, according to Mr. Boyle, be moderated in its evacuating quality, by continually ſtirring it in a flat glazed earthen veſſel, over a fire, till it emits no fumes, and turns of a grey colour; and he thinks this is the *Mercurius Vitæ purgans* ſo often mentioned by Riverius. *Boyle*, Works Abr. vol. 1. p. 74.

Mr. Godfrey obſerves, that what is called *Mercurius Vitæ*, prepared of ſublimate mercury and antimony, has no *Mercury* in it, but is the reguline part of the antimony, with the acid of the ſublimate; and what remains is the *Mercury*

formed into cinnabar by the ſulphur of the antimony. Miſcel. vere Util. p. 58.

MERCY, in law, is uſed for the arbitrament of the king or judge, in puniſhing offences, not directly cenſured by law. *Blount*, *Cowel*.

MERDESENGI, in the materia medica of the Arabians, a name given by Serapio to litharge. Aviſenna calls this ſubſtance *mardac*, and it has been erroneouſly ſuppoſed from this, that *mardac* and *Merdeſengi* were not the ſame ſubſtance; but this is a falſe conjecture. See the article MARDAC.

MERDIVORÆ, the *Dung Eaters*, in natural hiſtory, the name given by authors to ſeveral flies which feed on excrements of different animals. Of theſe there are three kinds very common among us, the *coprophagos*, which is of a dun colour, with a reddiſh head, and a white ſtreak along the middle of it. The red *dung-fly*, which has ſilvery wings, a red body, and black ſhoulders. And 3. The green one, which is of a very glittering hue, and has ſilvery wings.

MERGANSER, in zoology, the name of a large water fowl, called in Engliſh, the *Gooſander*, and by ſome authors, the *Harle*. See MERGUS.

Its common weight is four pounds, its body is oblong, and its back broad and flat. Its head, and the upper part of its neck, is in the male of a fine bluiſh or greeniſh black, very bright and ſhining; the lower part of its neck is white, and the middle of the back, part of the neck and part of the wings are black, the reſt are grey; the tail is grey; all the under part of the body is of a faint aſh-colour. The beak is near four inches long, hooked and pointed at the end, and ſerrated, and is part black and part red. The feet and legs are red; the three fore toes are joined by a membrane, but the hinder one looſe, yet that is encreaſed in breadth by a ſmall membrane. Its head feathers ſtand looſe, and make the head look larger than it is; but it has not, properly ſpeaking, the creſt which many of the birds of the ſame genus have. *Ray*, Ornithol. p. 253.

This is the figure of the male *Merganſer*; the female differs ſo much from this, as to be not only eſteemed a different bird by the common people, but even deſcribed as ſuch by authors. It is called by our people the *Dundiver*, or *Sparling Fowl*, and by authors, *mergus cirratus longiroſter*, the long-beak'd creſted diver. The great difference, however, is, that the female is of a ſomewhat reddiſh brown on the head, and has a creſt. See the article DUNDIVER.

MERETRIX, among the Romans. The *Meretrices* were the better ſort of curtezans, and differed much from the *proſtibulæ*, or common proſtitutes, who had bills or inſcriptions, *tituli*, over their doors, and were ready at all times to entertain their cuſtomers; whereas the *Meretrices* entertained none but at night.

The *Meretrices* were diſtinguiſhed from the matrons by their dreſs, being obliged to wear the *toga* and ſhort tunics, like thoſe of the men; whereas the matrons wore the *ſtola*, which was a garment that reached down to their feet, as did likewiſe their *palla*, or outer robe. *Pitiſc.*

MERGEN, a word uſed by ſome of the chemical writers to expreſs coral.

MERGUS, in the Linnæan ſyſtem of zoology, the name of a diſtinct genus of birds, of the order of the anſeres. The diſtinguiſhing characteriſtic of this genus is, that the beak is ſomewhat cylindric, and has a crooked point. *Linnæi* Syſt. Natur. p. 46.

The characters of this genus, according to Mr. Ray, are theſe: The feet are webbed, the three fore toes being connected by a membrane, but the hinder toe is left looſe. The beak is narrow, hooked at the end, and ſerrated.

Of this genus are the *merganſer*, or gooſander, the female of which ſpecies is called the *dundiver*. 2. The *albellus* of Aldrovand. 3. The *ſerula* of the Venetians. Which ſee under their ſeveral heads. And laſtly, the *Mergus Rhein*; commonly called ſimply by the name *Mergus*. *Ray*'s Ornithol. p. 254.

This laſt is of the ſize of a duck, and ſomewhat reſembles that bird in ſhape. It is all over very beautifully variegated with black and white. Its beak is black; and its belly is variegated with grey, with the black inſtead of white. Its tail is black; its legs brown, and the membrane of its feet black. Notwithſtanding that this ſeems deſcribed as a different ſpecies by authors, there is much room to ſuſpect that it is the ſame with our *albellus*. *Aldrovand.* de Avib. T. 3. p. 275. *Ray*'s Ornithol. p. 254.

MERGUS *Albellus Dictus*, in zoology, the name of the common *Mergus*, called *Mergus cirratus major*, the greater creſted diver, and *Mergus Rhein*, the diver of the Rhine, and commonly known in England by the name of the *ſmew*.

Its common weight is a pound and a half, and its beak is an inch and half in length. Its head and neck are white, except that it has a large black ſpot ending in a point, and ſurrounding the bottom of that tuft of feathers which hang from the back part of the head, and are what authors call the *cirrus* or *creſt*; and another oblong black ſtreak which runs from the angles of the beak to the eyes. Its throat, breaſt, and belly, are all ſnow white, and its back all over of a fine deep black; but its ſhoulder feathers, which are long and hang over the back, in part on each ſide, are white. Near the joining of the wings to the back, there are two or three arched black lines; and on the lower part of the neck there is another line, making a ſort of ring of the ſame colour. The wing feathers are partly black, partly white. Its beak is of a lead-colour'd grey, large at the baſe, and tapering to a ſharp hooked point. In the female the head is reddiſh, the throat is white; but there is a ſort of circle of a browniſh colour on the breaſt. Its upper part alſo is almoſt all grey, and it has no creſt. It feeds on fiſh, and is very common on our coaſts. *Ray*'s Ornithol. p. 254.

MERGUS *Cirratus Minor*, in zoology, a name by which Geſner calls the *capo negro*, a ſpecies of duck, called in Engliſh, the tufted duck, from its having a tuft of feathers, of an inch and half in length, hanging from the back of its head. *Geſner*, de Avib.

MERIDIONAL (*Cycl.*)—MERIDIONAL *Parts*. To find the *Meridional Parts* to any ſpheroid, with the ſame exactneſs as in a ſphere.

Let the ſemi-diameter of the equator be to the diſtance of the focus of the generating ellipſe from the center as m to 1. Let A repreſent the latitude for which the *meridional* parts are required, s the ſine of this latitude, the radius being unit; find the ark B, whoſe ſine is $\frac{s}{m}$; take the logarithmic tangent of half the complement of B from the common tables; ſubtract this logarithmic tangent from 10.0000000, or the logarithmic tangent of 45°; multiply the remainder by $\frac{7915.7044678978}{m}$, &c. and the product ſubtracted from the *meridional* parts in the ſphere, computed in the uſual manner for the latitude A, will give the *meridional* parts expreſſed in minutes for the ſame latitude in the ſpheroid, provided it be oblate.

Example: If $mm : 1 :: 1000 : 22$, then the greateſt difference of the *meridional* parts in the ſphere and ſpheroid is 76.0929 minutes: In other caſes it is found by multiplying the remainder above-mentioned by 1174.078.

When the ſpheroid is oblong, the difference of the *meridional* parts in the ſphere and ſpheroid, for the ſame latitude, is then determined by a circular ark. Phil. Tranſ. N. 461. Sect. 14. See alſo *Maclaurin*'s Fluxions, art. 895—899.

Mr. Murdoch has ſolved this problem by infinite ſeries, and has computed a table of *meridional* parts for an oblate ſpheroid, ſuch as is mentioned in the foregoing example. See his Treat. intituled, *Mercator*'s *Sailing applied to the true Figure of the Earth*, Lond. 1741. 4°.

MERIS, in muſic, an appellation given by Mr. Sauveur to the forty third part of an octave. See Mem. Acad. Scienc. 1701. The word is Greek, μερις, a part.

MERLANGUS, in ichthyography, a name given by Bellonius, and ſome other authors, to a ſmall ſpecies of whiting or *aſellus mollis*, called by the Venetians, *mollo*, and by ſome other nations, the *capelon*. *Willughby*'s Hiſt. Piſc. p. 171. See the article MOLLO.

MERLANUS, a name given by ſome writers in ichthyography to the common whiting or *aſellus mollis ſive albus*. *Rondelet.* de Piſc. p. 97. See the article WHITING.

MERLUCIUS, in zoology, the name of a fiſh commonly called the *hake*, and by ſome authors the *aſellus alter*.

It is a moderately large fiſh, growing to two foot or more in in length, and reſembling the common pike in figure, from whence it has its name, *Merlucius*, *quaſi maris lucius*, the ſea pike. It in ſome meaſure reſembles the common whiting in colour, the back being of a pale greyiſh hue, and the belly white. It is covered with ſmall ſcales. Its head is broad and flat, and its mouth very wide, as in the freſh water pike. The jaws are both, but eſpecially the lower, armed with long ſharp teeth, with others ſmaller and ſhorter between them. The eyes are large, and their iris of a fine yellow. It has two fins on the back, the firſt near the head, the other not far diſtant from it, and ſo long as to reach nearly to the tail. Its gill-fins are narrow, and its belly-fins are placed very high. Its tail is not forked. It is caught in the Engliſh and other ſeas, and is a valuable fiſh for the table. *Ray*'s Ichthyogr. p. 174.

MEROPS, in zoology, the name of a bird called alſo *apiaſter*, and in Engliſh the *bee-eater*.

It reſembles the king-fiſher in ſhape, and is of the ſize of a black-bird. Its beak is long, black, and a little crooked, and the iriſes of its eyes of a fine red. Its head is long and large. The feathers growing at the inſertion of the upper chap are of a bluiſh green; but thoſe on the middle of the head are white; the crown, however, a little backwarder is of a reddiſh brown, ſometimes with a ſlight admixture of green; and there runs on each ſide a black line from the angle of the beak through the orbit of the eyes; its neck and ſhoulders are green, but with a caſt of redneſs; and its belly and breaſt are blue. The tips of the long wing feathers are blackiſh, and the reſt are variegated with a bright green and a fine orange colour. Its tail is of a fine blue, and the two middle feathers of it are longer than any of the others. Its legs are very ſhort and thick, and are of the ſame form with the

the kingfiſher's. It is very common in Italy, and extremely ſo in the iſland of Crete; but is not known in England. It feeds on bees and other inſects, and ſometimes on ſeeds. See Tab. of Bird, N°. 17. *Ray*'s Ornithol. p. 102.

MEROS, in zoology, the name of a very large American fiſh, growing to five or ſix feet long, and called by the Braſilians, *cugupu-guacu*. Its head is very large, and its mouth wide and toothleſs. Its eyes have a black pupil and a yellow iris. It has five fins, one running the whole length of the back, and reaching nearly to the tail; the anterior part of this is narrow, and armed with ſmall but ſharp ſpines; the other part is broader, and ſuſtained by ſofter rays. Behind the anus is one like the hinder part of that on the back, and two others behind the gills, which are large and broad. The tail fin is very large and broad, and much more ſo at its extremity than at its origin. Its ſcales are ſmall. Its head, back, and ſides, are of a browniſh grey, and its belly white. It is accounted a well taſted fiſh. See Tab. of Fiſhes, N°. 53. *Ray*'s Ichthyography, p. 303.

MERULA, in ornithology, the name of the black-bird, a bird of the turdus or thruſh kind, of which there are ſeveral ſpecies. 1. The common kind, well known in our hedges. 2. The kind called the *paſſer ſolitarius*, or ſolitary ſparrow. See PASSER. 3. The *Cæruleus*, of which there are two kinds. See CÆRULEUS. 5. The Braſilian *Black-bird*, remarkable for the ſhortneſs and crookedneſs of its beak, and for its remarkably beautiful colours. Its tail and wings are black, and the reſt of its body of a fine beautiful deep red. Its legs and feet are black, or of a browniſh grey. Its wing feathers alſo have ſome ſlight variegations of red. 6. The *Merula Roſea*, or roſe-coloured black bird; this is ſmaller than the common kind, and its back, breaſt and wings are of a pale red or damaſk roſe-colour. Its wings and tail black. 7. The red-breaſted Indian *Black-bird*, called by the Braſilians *jacapu*. See JACAPU. 8. The *Merula Torquata*, or ring amzell. See AMZELL. Beſide theſe there is the *Merula Montana*, or common amzell: And the *Merula Bicolor*: And two other birds, called *Merula Congeneres* deſcribed by Aldrovandus, but not now known. See Tab. of Birds, N°. 29, 30. and *Ray*'s Ornithol. p. 140.

MERULA, in ichthyology, the name of a ſea fiſh of the turdus or wraſſe kind, of a ſhort and flat figure, and all over of a dull and dead bluiſh black. The back, ſides, and belly, are all of this colour, as are alſo even the fins and tail. It is a fiſh not much eſteemed, being of an inſipid watery taſte, but is ſold among the poorer ſort in the Italian markets. *Rondelet*. de Piſc. L. 6. c. 5. p. 172.

MERULA *Aquatica*, the name of a bird, called the *water ouzel* in Engliſh.

It is about the ſize of the common black-bird, but has a ſhorter body, and a thicker neck. Its beak is ſtrait, ſharp, and black, and its head, and the upper part of its neck, are of a browniſh black. Its back and wings are variegated with black and grey; its throat and breaſt are of a ſnow white; but the belly toward the tail is black; its tail is ſhort, and it is very thick feathered, as are in general all the water birds. It frequents waters, and is very common in many parts of Germany, nor much leſs ſo in the northern counties of England. It feeds on fiſh, and ſometimes on inſects, and though not a web-footed fowl, will ſometimes dive under water after its prey. *Ray*'s Ornithol. p. 104.

MERULA *Fluviatilis*, in ichthyology, a name given by Schoneveldt, and ſome other writers, to the common tench. Theſe are whimſical and arbitrary names, and expreſs nothing. Artedi has much better diſtinguiſhed the fiſh, having taken away even its generical name, and reduced it to the *cyprini*, of which genus it is evidently a ſpecies: He has called it the *black mucous cyprinus*, with an even, not forked or invected tail. This is a name by which it can never be miſtaken. *Artedi* Gen. Piſ.

MERULA *Saxatilis*, a name given by ſome to the *tordo marino*. See the article TORDO *Marino*.

MERZENIUS, in botany, a name uſed by ſome authors for marjoram. *Ger*. Emac. Ind. 2.

MES-AIR, in the manege, is a manege half *terra a terra*, and half corvet. See the articles TERRA *a Terra*, and CORVET, *Cycl.*

MESANGIA, in natural hiſtory, the name of a bird common in France and Italy; it is of the ſize and ſhape of the ficedula, and differs from it in very little, except the having a black ſpot upon the head. This ſeems to be the *melancoryphos* of the antients, who ſuppoſed, as many do at this time, that the ficedula changed into this bird. The ficedula, or fig-eater, comes into the gardens in France only at the time when the figs, which are its proper food, are ripe: Theſe it devours in an inſatiable manner, and as ſoon as it has done with them, goes away again. Soon after this the *Meſangia* or black cap appears, and is ſuppoſed to be the ſame bird, with the addition of this beautiful ornament. The antients were very fond of this imaginary change of one bird into another; and Ariſtotle tells us that the upupa is the ſame bird with the cuckow, only changed in the colour and diſpoſition of its feathers. Æſchylus tells us in the ſame manner, according to the opinion of his times, that the cuckow ſings all the ſummer, and after that diſappears; and that ſoon afterwards it comes again in a new form, with a plume upon its head, and is called the *upupa*.

MESAZONTES, Μεσαζοντες, officers under the emperors of Conſtantinople. See the article MEDIATOR.

MESE, in the Greek muſic, was the ultimate note of the meſon tetrachord, and anſwers to Guido's *a la mi re*. *Wallis*, Append. *Ptolem*. Harm. p. 157. See the article DIAGRAM.

MESEMBRYANTHEMUM, in botany, the name by which Dillenius, Linnæus, and others, have called the plants uſually named *Ficoides*. *Linnæi* Gen. Pl. p. 250.

MESENTERICA *Febris*, a name given by ſome authors to a peculiar kind of acute fever, called by our Sydenham, *nova febris* in a peculiar treatiſe; and by Heiſter more properly the ſtomachic or inteſtinal fever. See the article INTESTINALIS *Febris*.

MESERA, a name given by ſome medicinal writers to the Alexandrian tutty.

MESENTERIC (*Cycl.*)—MESENTERIC or MESERAIC *Arteries*. Ruyſch [a] painted the *meſeraic* arteries and veins as having different courſes in the diſtribution of their branches in the inteſtines. Albinus [b] attributes this miſtake to Ruyſch's having injected the arteries at one part of the inteſtines, and the veins at another; and by a figure repreſenting the internal cellular membrane of the ilium, with both arteries and veins injected, ſhews their courſes to be the ſame.—[a Adv. Dec. 3. Tab. 1. fig. 4, 5, 6, 7. b Diſſert. de Arter. & Ven. Inteſtin. ap Med. Eſſ. Edinb.] See the article MESENTERIC, *Cycl.*

MESIRE, a name given by Aviſenna to a diſtemperature of the liver, attended with a ſenſe of heavineſs, tumour, inflammation, and pungent pain, and always with thirſt, a dry mouth, and a parched black tongue.

MESITICUM, among the Romans, a toll paid for a place to ſell goods in the forum. *Pitiſc*. in voc.

MESMARCHURES, in the manege. See the article PASTERN.

MESOCHORUS, Μεσοχορος, among the antients. The *meſochori* were muſicians who preſided in concerts, and by beating a deſk in a regular manner with their feet, directed the meaſure of the muſic. For this purpoſe in the theatre they wore wooden clogs on their feet, that they might be better heard, which were called by the Greeks, *Crupezia*. *Hofm*. Lex. in voc.

MESOCHORUS, among the Romans, was alſo uſed for a perſon in public aſſemblies, appointed to give the ſignal for acclamation at the proper time, that all might join in it at once. *Pitiſc*. in voc. See the article ACCLAMATION.

MESOCUROS, Μεσοκυρος, in antiquity, an actreſs in tragedies who had the middle part of her head ſhaven: But others think that *Meſocuros* ſignifies a girl, or very young woman. *Hofm*. in voc.

MESOGLOSSI, a name given by ſome writers to the muſcles of the tongue, more uſually called by anatomiſts, the *Genioglooſſi*.

MESOPYCNI, Μεσοπυκνοι, in the antient muſic, was an appellation given to ſuch chords as formed the middle notes of the ſpiſſa. There were five *Meſopycni* in the ſcale. See the articles PYCNI and SPISSUM.

MESORO, in ichthyology, a name given by Salvian to that fiſh which we call the butterfly-fiſh, the blennus or belennius of other authors. It is diſtinguiſhed by Artedi by the name of the *blennus*, with a furrow between the eyes, and a large ſpot in the back fin. Salvian has taken his name from the common appellation of this fiſh among the Italian fiſhermen. See the article BLENNUS.

MESORO is alſo uſed by the Italians for the fiſh commonly called the *uranoſcope* or *ſtar-gazer*. It is a ſpecies of the trachini, and is diſtinguiſhed by Artedi under the name of the *trachinus*, with many beards on the lower jaw. *Willughby*, Hiſt. Piſc. p. 132.

MESOTHENAR, a flat and nearly triangular muſcle, lying between the firſt phalanx of the thumb and the bottom of the palm of the hand. It is inſerted by a very broad baſis in the ligament which connects the os magnum to that which ſupports the thumb. It is likewiſe inſerted along the internal or angular part of that bone of the metacarpus which ſupports the middle finger, and in the ſmall extremity of that which anſwers to the index; from thence the fibres contracting to an angle, terminate in a flat tendon of different breadths, which is inſerted in that ſide of the head of the firſt phalanx of the thumb, which is turned to the hollow of the hand, and in the neighbouring part of the baſis of the ſecond phalanx, by means of the ſecond ſeſamoide bone belonging to that joint. *Winſlow*'s Anatomy, p. 197.

MESPILEUS *Lapis*, in natural hiſtory, a name given to ſome ſpecies of the echinitæ, from their reſemblance to the ripe fruit of a medlar. This was a name given them before they were much known, and they were ſome time afterwards called, from their five lines on the ſurface, *pentexoche*.

MESPILUS, the *Medlar*, in botany, the name of a genus of trees, the characters of which are theſe: The flower is of the roſaceous kind, being compoſed of ſeveral petals arranged in a circular form, the foliaceous cup of which becomes afterwards a fruit of a roundiſh figure, coronated at the end, fleſhy,

fleſhy, ſoft, and unicapſular, containing ſeveral ſtones, each having an oblong kernel. See Tab. of Botany, Claſs 21.

The ſpecies of *Meſpilus* enumerated by Mr. Tournefort, are theſe: 1. The common wild *Medlar*, or German *Medlar*, with bay-like, not ſerrated leaves. 2. The greater bay-leav'd *Medlar*. 3. The great bay-leav'd *Medlar*, with an early-ripe, oblong, ſoft, and ſweet-taſted fruit. 4. The great bay-leav'd *Maple*, with a ſoft ſweet-taſted ſmaller fruit. 5. The *Medlar* with a middle-ſized oblong auſtere and ill-taſted fruit, with the corona always cloſed. 6. The parſley-leav'd *Meſpilus*, called the *lazerole*. 7. The double-flowered jagged apium-leav'd *Meſpilus*. 8. The *Lazerole*, with a large deep red and well-taſted fruit. 9. the *Lazerole*, with a ſmaller yellowiſh fruit. 10. The wild ſmall-fruited yellowiſh white *Lazerole*, with a turbinated fruit. 11. The Canada ſervice-leav'd *Meſpilus*. 12. The prickly *Meſpilus*, with pear-like, ſhining, and denticulated leaves, and with very beautiful red fruit. 13. The common apium-leav'd prickly *Meſpilus*, called the white thorn. 14. The common *white Thorn*, with double flowers. 15. The almond-leav'd prickly *Meſpilus*. 16. The barren wild trifoliate apium-leav'd *Meſpilus*, with very ſtrong thorns. 17. The large-fruited wild *Meſpilus*, with ſtrong prickles, and with hairy palmated apium leaves. 18. The roundiſh-leav'd *Meſpilus*, with black ſweetiſh fruit. 19. The roundiſh-leav'd *Meſpilus*, with red fruit. And 20. The American *Meſpilus*, with red fruit, and with broad leaves prickly underneath. *Tourn.* Inſt. p. 644. See the article MEDLAR.

MESSE *da Capella*, in the Italian muſic, is uſed for maſſes ſung by the grand chorus. In theſe, various fugues, double counter-points, and other ornaments, are uſed *Broſſard.*

MESSE *Concertate*, in the Italian muſic, is a maſs wherein the parts reciting are intermixed with choruſſes. *Broſſard.*

MESUA, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium is permanent, and conſiſts of four ſmall oval leaves. The flower conſiſts of four large hollow and rounded petals. The ſtamina are numerous filaments, of the length of the cup. The antheræ are ſimple. The germen of the piſtil is roundiſh. The ſtyle is ſimple; and the ſtigma indented in four places. The fruit is a roundiſh, pointed, coriaceous capſule, with four longitudinal ſutures. It is compoſed of four valves, and contains four large fleſhy, obtuſe, three-corner'd, and turbinated ſeeds bedded in it. *Linnæi* Gen. Plant. p. 235. *Hort.* Mal. vol. 3. p. 53.

METACAL, an Ægyptian weight, uſed in the weighing of pearls, and conſiſting either of a carrat and a half, or of two carrats. Sixteen of theſe carrats make a dram, each of the carrats weighing four grains, and twelve drams an ounce. *Pocock*'s Ægypt. p. 175.

METACARPIUS, a ſmall very fleſhy muſcle, ſituated obliquely between the large internal annular or tranſverſe ligament of the carpus, and the whole inſide of the fourth metacarpal bone.

It is fixed by a ſmall ſhort tendon to the os orbiculare, and to the neighbouring part of the large ligament of the carpus; from thence its fibres run more or leſs obliquely toward the inſide of the fourth metacarpal bone, in the outer edge of which they are inſerted. The fibres of this muſcle are of unequal lengths, and extend all the way to the articulation of the firſt phalanx of the little finger, with the fourth metacarpal bone; but they have no manner of relation to that finger. *Winſlow*'s Anatomy, p. 194.

METACARPUS (*Cycl.*)—The antient anatomiſts reckoned five bones in the *metacarpus*, including that bone which is now looked upon to be the firſt phalanx of the thumb, the rejecting which from among them, has reduced the number to the four we allow. Theſe bones are all long, thicker at their extremities than in the middle, and of unequal length and bigneſs: The two firſt are ſometimes, though very rarely, equal, and the others leſſen by degrees from them. Anatomiſts, in their deſcriptions, divide each of theſe bones into a middle and two extremities, or into a baſis, body, and head. The baſes of them all are angular, and turned toward the carpus, and their head rounded like condyles, and turned toward the fingers. Both extremities are covered with cartilages, and the heads remain for a long time very diſtinct epiphyſes.

The firſt bone of the metacarpus is longeſt and largeſt, and ſupports the fore finger; its baſis is a little hollow, anſwering to the digital ſide of the os pyramidale of the carpus. On the outer edge there is a ſmall angular notch, and on the cubital edge of the baſis is a ſmall lateral ſide, which is articulated with the baſis of the ſecond bone. The inner edge is terminated laterally by an oblique angle, which is articulated with the neighbouring angle in the baſis of the os magnum; round the baſis are inequalities and depreſſions for the ligaments and articular glands. The outſide of the body of the bone is broader toward the head than toward the baſis.

The ſecond bone of the *Metacarpus* ſupports the middle finger, and has this very peculiar in it, that its baſis is very oblique, terminating at the outer edge by an angular point toward the firſt bone. By the triangular ſide of its baſis it is articulated with the baſis of the os magnum, and by its lateral ſides with thoſe of the firſt and third bones of the *Metacarpus*. The third bone is that which ſupports the ring finger, being leſs than the firſt and ſecond. Its baſis is irregularly triangular, and proportionably leſs than the two former, and by the principal ſide thereof, it is articulated with the firſt half of the ſide of the os unciforme; the ſmall lateral ſides of the baſis join thoſe of the ſecond and fourth bone. The fourth bone ſupports the little finger; the principal ſide of the baſis of this, inſtead of being triangular, as in other bones, is all of an equal breadth, a little oblique, and ſome part of it gently convex, the reſt gently concave, and articulated with the ſecond half of the ſide of the os unciforme; by its lateral ſide it joins the correſponding ſide of the baſis of the third bone, but in a much looſer manner than in the other articulations of that kind. In the oppoſite ſide there is a ſmall tuberoſity. *Winſlow*'s Anatomy, p. 86.

Fractures of the METACARPUS. In fractures of the hand or *Metacarpus*, the beſt method of reducing and replacing the bones, is, to extend the hand upon a ſmooth table, and while an aſſiſtant holds the whole hand evenly in that poſture, the ſurgeon is to replace the bones; and when that is carefully and perfectly done, to ſecure them with a proper bandage. *Heiſter*, Surg. p. 129.

Luxation of the METACARPUS. The four ſmall bones in the palm of the hand are ſometimes luxated from the carpus to which their upper parts are connected; this happens from external violences, not unfrequently, notwithſtanding that theſe bones naturally muſt much reſiſt ſuch a luxation; for the two carpal bones, which are ſeated in the middle between the two external ones, cannot be diſlocated to either ſide, as the two external ones, which ſuſtain the firſt and little fingers, cannot be luxated inwardly, but are very eaſily driven outward; and each of them may be luxated on the fore or back part of the hand; but which ever of theſe happens, the particular diſorder may be diſcovered and examined by feeling and inſpecting, and the cure may be performed by extending the hand on a flat board or table, and replacing with the thumb whatever of the bones have ſtarted from their natural ſituation. *Heiſter*'s Surg. p. 166.

METACHORESIS, a word uſed by Galen to expreſs a receſs of a morbid humour from one part of the body to another, a thing very common in many diſtempers.

METACOE, in botany, a name given by the people of Guinea to a plant, of which they are very fond, becauſe of its virtues as a balſamic and vulnerary. Its leaves, being bruiſed and applied to a freſh wound, cure it. They have alſo another uſe for it, twiſting the dried leaves into a ſort of match for their muſkets. Phil. Tranſ. N°. 232.

METAGITNION, Μεταγειτνιων, in chronology, the ſecond month of the Athenian year. It contained twenty-nine days, and anſwered to the latter part of our July and beginning of Auguſt. The Bœotians called it *Panemus*, and the people of Syracuſe, *Carnius*.

It was ſo called from *Metagitnia*, one of Apollo's feſtivals kept in it. Vid. *Potter*, Archæol. Græc. T. 1. p. 414.

METAL (*Cycl.*)—Experiments on *Metals*, made with the great burning-glaſs at Paris, have proved, that all the imperfect metals, copper, iron, tin, and lead, are compoſed only of two parts, a ſulphur or oily matter, and a more denſe ſubſtance, called their earth, capable of vitrification. That from this oil or ſulphur proceed the opacity, the glittering brightneſs, and the malleability of theſe metals; that this ſulphur or oil ſeems no way different from the oils of vegetables and animals, and that it is the ſame in all the four imperfect *Metals*, and in mercury: That theſe four metals have a different ſubſtance for their baſe, the earth of each vitrifying in a different manner; and that to this is owing their difference from one another. Mem. Acad. Par. 1709.

Specific Gravity of METALS. The ſpecific gravity of *Metals* can never be very exactly determin'd, for it varies a little from many cauſes; firſt, according to the different heat of the atmoſphere, which expands water, and other fluids, infinitely more than it does ſolid bodies; and by that unequal diminution of the weight, makes it impoſſible to aſſign them a conſtant proportion, unleſs the heat be determined with the greateſt exactneſs. Secondly, according to the ſeveral degrees of purity in the water, which difference is ſometimes found not inconſiderable. Thirdly, according to the different purity of the *Metals*; for there is hardly any *Metal* found ſo very pure, but that it may be eaſily demonſtrated to be mixed with ſome others. Fourthly, according to the different weight of the atmoſphere itſelf; though the effects of its variations be not ſo conſiderable as of the reſt. *Cramer*, Art. Aſſay. p. 4.

Hence it is that there are, in a manner, as many different accounts of the ſpecific gravities of *Metals* as there are authors who have given an account of their experiments on the ſubject. However, except the *Metals* be of a very great impurity, the ſum of all the variations reſulting from all theſe cauſes, is not ſufficient to hinder any *Metal* from being certainly diſtinguiſhed from any other *Metal*, by its ſpecific gravity.

Slight variations in hydroſtatical experiments are indeed neither new things, nor are they by any means avoidable, either

either in making these or other experiments of affinity to them. By way of proof to such as may distrust this, from their never having made such experiments themselves, two very eminent testimonies may be produced. That most industrious and diligent mathematician Mersennus candidly acknowledges, that when he has occasion to mention the experiments of the learned Ghetaldus, and of the accurate French engineer Monsieur Petit, with his own, there will be often a variety of weight of some few grains; but he says, it is only like the variety of astronomical observations, which do almost always differ also by a few minutes or seconds; and to this he afterwards adds, that he expected not an exact uniformity between the observations of Ghetaldus, *&c.* already made, and the trials of any new experimenter, who would go through the work again. And our famous experimenter the lord Verulam confesses, that it is not to be doubted but that many of the bodies which he has set down in the table he has given, of their dimensions and weights, differ in the same species or denomination, some being heavier than others, and that therefore there is some contingency in the affair; so that tis not necessary that the individuals he made his trials upon should be exact standards of the weight of their respective species, or should, which makes directly to our present purpose, agree altogether to a tittle with the experiments of other men. *Boyle*, Hydrost. Experim. in Pref.

But this scarce evitable imperfection of hydrostatical experiments does not hinder, but that by their help we may make good estimates of the weights and bulks of very many bodies; and these estimates will be found not only preferable to those that can be made of the same bodies by geometrical instruments, but accurate enough to be very useful on a great number and variety of occasions.

METALS *for Specula.* In the making reflecting telescopes, the greatest article of all is the hitting upon a proper *Metal* for the specula. The common search is for a white and hard *Metal*, that shall be bright and durable; but Sir Isaac Newton advises, that at the same time great care must be taken that the *Metal* be not full of holes or pores, which, though so small as to be only discoverable by the microscope, yet will greatly impede the office of the speculum. This *Metal* may seem to take a very fine polish, but, in reality, the edges of these small pores will wear away faster in the polishing, than any other part of the *Metal*, and then however polite the *Metal* may seem, yet it will not reflect with such an accurate regularity as it ought to do. Thus tin-glass, mixed with the common bell-*Metal*, renders it more white and capable of reflecting a greater quantity of light than it otherwise would do; but then the fumes of this semi-*Metal* raised in the fusion like so many aërial bubbles, fill the *Metal* with microscopic pores. White arsenic both blanches the *Metal*, and renders it rather more dense than before, giving it no microscopical pores, unless the fusion has been too violent. The stellate regulus of Mars is recommended by the same gentleman to farther trials.

When the proper mixture is hit upon for the making such a *Metal*, there requires yet great caution in the polishing it. Whatever this is done with ought to be of the most extreme fineness, for if otherwise, its particles will scratch the face of the *Metal*, and make such microscopical holes as the tin-glass gives in the other instance. The proportion of arsenic is to be judged by trials, but something between a sixth and an eighth part of the weight of the copper seems to be the just proportion; when there is much less than an eighth, the *Metal* wants of its whiteness and brightness; and when much more, it is rendered too brittle. The method of making the mixture is this: The copper is first to be melted alone, and then the arsenic is to be put in; but while this mixture is stirred, great care must be taken to avoid the poisonous fumes. When the copper and arsenic are mixed, the tin is to be put in; this soon melts, and then the whole is to be stirred together, and poured off. Some add silver; but it is found, on trial, that this does as much harm in rendering the *Metal* soft, as it does good in rendering it white and luminous. Six ounces of copper, two ounces of tin, and one ounce of arsenic, seems one of the best proportions. It is to be carefully managed in the fire, and not kept too long in fusion, lest it grow porous by that means. Phil. Trans. N°. 81.

Colours from METALS. As metals have a strong texture in their metalline form, so they preserve their natural colours durably, unless corroded or dissolved by particular menstruums, after which their solutions strike particular durable colours, or afford the strongest stains.

Iron dissolved in stale small beer gives the beautiful yellow used in callico printing; when sublimed with sal armoniac it also affords a yellow: And the common iron-moulds made by ink are owing to the iron dissolved in the copperas of which ink is made.

Copper melted with zink appears of a gold colour; dissolved in aqua fortis, it affords a beautiful green; and in any alkali, a beautiful blue. And these solutions may be reduced to dry colours by crystallization or evaporation; and the same *Metal*, precipitated out of aqua fortis with common salts, gives the turquoise colour to white glass.

Tin, a white or colourless *Metal*, affords a light blue colour, when fluxed with antimony and nitre. The same *Metal* is necessary in striking the scarlet dye, with aqua fortis and cochineal; and its calx, by strong infusion, turns to a glass of an opal colour.

Lead, corroded by the fumes of vinegar, gives the fine white cerus; burnt in a strong naked fire, it becomes the strong red lead or minium; and melted into a glass with sand, is of the hyacinth colour. *Shaw's* Lectures, p. 171.

Silver being dissolved in aqua fortis, if chalk be put to the solution, turns of a beautiful purple or amethyst colour; and its own solution, though pale as water, durably stains the nails, skin, or hair, brown or black.

Quicksilver mixed with brimstone makes a black mass, and this, by sublimation, affords the beautiful red pigment, called cinnabar, or vermillion; and the solution of quicksilver being precipitated with common salt, yields a snow-white powder, which also turns black by being mixed with sulphur.

Gold, dissolved in aqua regia, affords a fine yellow liquor, which stains animal substances beautifully purple; and if the solution be sufficiently weakened with water, and mixed with a solution of tin, a fine red or purple powder may be procured, very useful for staining of glass and pastes to a beautiful red.

Fluxes of METALS. See the article FLUXES.

Granulation of METALS. See the article GRANULATION.

Medicines from METALS. All medicines that have lead in their composition, are scarce to be trusted for internal use; for we have numerous instances of the poisonous nature of this *Metal*, in the workers at the white lead or cerus-houses, and indeed in all who work on that *Metal*: And it were enough to banish the internal use of *saccharum saturni*, and the *tinctura antiphthisica*, to read in the *Miscellanea Curiosa*, Decad. 3. Obs. 30. how many men were poisoned at a time by drinking of prick'd wine, which had been rendered sweet by litharge.

Metals, however, do not act in the body unless dissolved; whence large quantities of crude mercury being swallowed, prove harmless for want of a proper menstruum to dissolve it in the stomach: But when crude mercury is dissolved in its proper menstruum, as in the making corrosive sublimate, we see it becomes one of the strongest poisons. Lead, Iron, and copper, being much more easily dissolved than quicksilver, are seldom taken without some remarkable effect, which must always prove the greater, the more of an acid humour, or in case of copper, even an alkaline is lodged in the stomach or intestines. The internal use of the crystals of silver, though sometimes successfully given in dropsical cases, should hardly be trusted, on account of their corrosive acrimony, which has sometimes occasioned bloody stools, and extreme weakness. The common tinctures of copper and solutions of blue vitriol, can scarce be taken internally with safety; as being not only emetic, but in some degree corrosive and poisonous. Even the *aurum fulminans* cannot be safely given till thoroughly washed from its salts; and even then if it meet with an acid solvent in the stomach, it may do very great mischief. Iron and tin have not been found so pernicious in the body, but rather beneficial, especially iron, when properly prepared and used.

Metallic bodies corroded by acids, generally erode when applied to sores. Some of these, sublimate mercury, for instance, and particularly arsenic, have shaken the whole frame of the body, when applied externally; and mercurial preparations do sometimes enter the blood, and produce a salivation. Med. Ess. Edinb. vol. 5. art. 24.

Salts of METALS. The salts of the several *Metals* have been medicines long known in the world, and are of excellent use in the cure of many diseases: But they might be of yet infinitely more service to the world, if a happier way of extracting them could be found than the general one now in use, of doing it by acids, and such strong and corrosive menstruums. Beside the mischiefs these menstruums bring as corrosives, which is assuredly much less than is vulgarly supposed, because they lose the greater part of this in acting on the *Metal*, they produce a great number of bad effects, and render the salts unfit for a great number of uses, by making them all vitriols, that is, by converting them into salts, which, like the common native vitriols, have a septic and violently acrimonious quality. The crystals, or salt of silver, called by the chemists, lunar vitriol, are a plain instance of this.

Borrichius and Kunkell devised another method to be used for obtaining the salts of *Metals*. This was the use of fire instead of acids, as the menstruum that should prey upon the *Metal*, and seeking the salts of all *Metals* from the mere action of a reverberatory furnace; but this method, though a very laudable attempt, yet is by no means calculated to be of general use, because the quantity of salts thus obtained is very small, and that obtained with great pains and expence. Kunkell has given the world an account of the effects of another method of treating *Metals*, of which he relates wonders; but

but he conceals the method. The ſolemn manner in which he declares the fact, however, ſeems to imply, that what he relates is truth; and he every where ſpeaks from his own perſonal knowledge, and the work of his own hands. The menſtruum he uſed was known by himſelf and many others, at Hall in Saxony, under the name of *Eſſentia Dulcis*; he ſacredly affirms, that this was neither acid nor corroſive, even in the ſlighteſt degree; that it left behind it no fæces, no ſaline nor earthy matter on evaporation alone; and that it more approached to the nature of ſpirit of wine, than to any other known liquid. He ſays, that this liquor diſſolved even gold, and that ſo perfectly, that it would all riſe with the liquor in diſtillation. Mercury being diſſolved in it, and the ſolution diſtilled in a retort, he ſays, that only a ſmall quantity of earthy matter remained in the retort, which was white, of a ſpongy texture, and fixed in the fire; and that the reſt of the body of the quickſilver was converted into a thin colourleſs and pellucid ſpirit in the receiver: And that gold, treated in the ſame manner, and diſtilled with a very gentle heat, was left at the bottom of the retort in form of a reſin; and that this reſin was ſoluble in common rectified ſpirit of wine, as was alſo the earth of the mercury; and that ſome days after the ſolution of this laſt earth, the ſalt with which this ſubſtance abounded, would ſeparate itſelf from the menſtruum, and form regular cryſtals at the ſide of the glaſs. This, he ſays, is the true ſalt of mercury, containing all the virtues of that *Metal*, and not converted into a vitriol or corroſive ſubſtance, by means of the menſtruum uſed to extract it.

When the ſalt has thus formed as many ſhoots as it will yield by this proceſs, the remaining liquor is to be evaporated gently, and there will be found a like ſalt at the bottom of the veſſel, of a white colour, an agreeable ſmell, and inſipid to the taſte: This, he ſays, is ſo fixed in the fire, that it is no more to de deſtroyed or altered by it, like the *Metal* from which it is obtained. It readily melts into a maſs in the fire; but if it be not immediately after that taken off from the fire, it will run through whatever veſſel it is melted in.

The author attributes to this ſalt all the wonderful virtues that the metal it is made from is known to poſſeſs; and gives inſtances of cures performed by it, which are ſo well atteſted, as ſcarce to leave any doubt of his veracity. He ſays, it works mildly by ſtool, urine, and ſweat. The caſes he gives of cures performed by it, are theſe: Two women, who were very bad with the venereal diſeaſe, two men in the laſt ſtages of hectic fevers, ſeveral perſons in bad kinds of the ſmall pox, and ſome in peripneumonies. The reſin-like ſubſtance into which gold is converted by the ſame operation, he ſays alſo may be transformed in the ſame manner into a white and ſubtile ſalt, of a very penetrating taſte; and to this he attributes great virtues in the cure of hæmorrhages and epileptic caſes, and adds, that it is an ingredient of the black compound powder, ſo famed for epileptic caſes, prepared at the public orphan hoſpital at Hall. *Kunkel*'s Diſſert. de Sal Met.

That a diſcovery of a manner of extracting the ſalts of *Metals* thus without the help of acids would be of great uſe to the world, is very evident, and the ſolemn manner in which this author aſſerts the having done it, ſeems to infer a probability of its being arrived at by others. He is very blameworthy in not declaring the method; but perhaps ſome hints may be gathered from what he has been pleaſed to declare about it.

Prince's METAL. See the article PRINCE.

METALLIC (*Cycl.*)—The antients have uſed this word very frequently as an epithet in the diſtinctions of the ſeveral ſubſtances which they have treated of. But it is to be obſerved, that the various writers have taken the word in a very different ſenſe. The medical writers in general mean by it ſomething of the mineral kind, that more or leſs partakes of the nature of ſome one of the metals, and that is wholly different from earths, ſtones, &c. In this ſenſe they call the *Lapis Armenus*, which indeed is properly not a ſtone, though we call it ſo, but an ore of copper, *metallic*; and by this term alone they diſtinguiſh it from the laps lazuli, which they call a ſtone. The naturaliſts, on the other hand, make no ſuch diſtinction, but call every thing *metallic* that is obtained out of the bowels of the earth; and thus ſtones, earths, ſalts, and even the liquid bitumens, are by them called *metallic* ſubſtances. The terms *metallic* oil, and *metallic* pitch, are found in the Greek naturaliſts, as the names of the *Petroleum* and *Piſſaſphaltum*; but the medical writers of the ſame time diſtinguiſh theſe by the name *Oryctæ*, which is properly foſſil, a word of a very wide ſenſe, taking in every thing produced in the earth; but the particular ones, which contained the particles of metals in a more or leſs perfect form, they ſeparated from theſe, and treated diſtinctly of under the name of the *Metallics*; chalk, ſand, earth, and ſtones of all kinds, are called by the Greek naturaliſts *metalla*, and the Latins have ſometimes uſed the word *metallum* for *lapis* a ſtone.

METALLIC *Germination*. See the article GERMINATION.

METALLIC *Vegetation*. See the article VEGETATION.

METALLORUM *Mater*. See the article MATER *Metallorum*.

METAPEDIUM, in natural hiſtory, a name given by ſome authors to a kind of ſtone, called by others *metatarſum*, and ſuppoſed to imitate a human foot. It is only a luſus naturæ in the formation of a common pebble.

METAPTOSIS, a word uſed by many phyſical writers to expreſs a change of one diſtemper into another, whether it be by *diadoche* or *diadexis*, as it is called; when the change is for the better, and the morbid matter removes from a more noble to an ignoble part: Or by *metaſtaſis*, when the change is for the worſe, and the morbid matter removes from an ignoble to a more noble part.

METASTASIS, Μεταστασις, *Remotio*, in rhetoric, is uſed for the removing the blame from the perſon accuſed to another perſon, or laying it upon ſomething as a cauſe. Thus Adam's excuſing himſelf by blaming Eve, is an example of the former; and the laying the crime of drunkenneſs upon the wine, is an inſtance of the latter. *Voſſ.* Rhet. l. 1. p. 147.

METATARSUM, in natural hiſtory, a name given by authors to a ſort of ſtone, ſuppoſed to repreſent a human foot. See the article METAPEDIUM.

METATARSIUS, a fleſhy maſs lying under the ſole of the foot, fixed by one end in the fore-part of the great tuberoſity of the os calcis, and running forward from thence, terminates in a kind of ſhort tendon, which is fixed in the tuberoſity, and poſterior part of the lower ſide of the fifth bone of the *Metatarſus*. It may move this bone, much after the ſame manner as the metacarpus moves the fourth bone of the metacarpus. *Winſlow*'s Anatomy, p. 226.

METATHESIS, a word uſed by medical writers for a change of place in ſuch humours, or other diſeaſed parts, as cannot be abſolutely removed or ſent off. Thus a *Metatheſis* of a cataract is a depreſſion thereof, ſo that it no longer ſhuts out the light.

METATOR, among the Romans, a quarter-maſter. Out of every legion a tribune, and ſome centurions, were appointed to go before the army, in order to chuſe a place for a camp, and aſſign and mark out quarters to each legion. *Pitiſc.* Lex. Antiq. in voc.

METAXA, a word uſed by ſome medical writers to expreſs ſilk.

METEGAVEL, in our old writers, a tribute or rent paid in victuals; which was a thing uſual in this kingdom, as well with the king's tenants as others, till the reign of king Henry the firſt. *Blount.*

The word is Saxon, *metegavel*; i. e. *cibi gablum, ſeu vectigal.*

METEL, in natural hiſtory, the name of a ſort of *nux vomica*, of the ſame ſhape with the common kind, but ſomewhat larger.

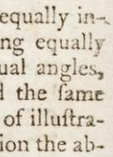
METEMPSYCHI, in church hiſtory, heretics, who, in imitation of the Pythagoreans, maintained the tranſmigration of ſouls. *Hofm.* Lex. in voc. See the article METEMPSYCHOSIS, *Cycl.*

METESSIB, an officer of the eaſtern nations, who has the care and overſeeing of all the public weights and meaſures, and ſees that things are made juſtly according to them. *Pocock*'s Egypt, p. 166.

METHOD (*Cycl.*) —The ſupreme law of the philoſophical *Method* is, to premiſe that which is neceſſary towards the underſtanding or eſtabliſhing what follows. *Wolf.* Diſc. Prælim. Logic. c. 4.

The mathematical and philoſophical *Method* are the ſame, as may be ſeen by the practice of the geometers of antiquity, who conſtantly obſerve the law here mentioned. Id. ib.

Several authors, as Ramus, Meſſrs. de Port Royal, &c. have accuſed Euclid of want of *Method*. Had theſe gentlemen attended to the ſupreme law of all true *Method*, they would have been more cautious in their cenſures. The jeſuit Caſtel has renewed this groundleſs accuſation; and to convince his reader how much he excels the antients, he begins his geometry by a *petitio principii*. Thus to prove that the oppoſite angles *a*, *b*, as alſo *c*, *d* are equal. He aſſumes this principle, that the two lines whoſe interſection forms theſe angles, are equally inclined to each other above and below. Now, being equally inclined to each other, is the ſame as forming equal angles, which is the very thing to be proved [a]. We find the ſame confuſion of thought, which he introduces by way of illuſtration, in his doctrine of parallel lines; not to mention the abſurdity of *parallels being as it were one broad line* [b].—[a *Caſtel.* Math. Univerſ. p. 264. b Ib. p. 271.]



METHOD *of Maximis & Minimis*. See the article MAXIMUM, *Cycl.* and *Suppl.*

METHODISTS, in botany, perſons who have attempted that ſtudy upon certain principles, and have beſtowed their labours upn the diſpoſition and arrangement of plants, and allotting them proper and diſtinctive names. *Linnæi* Syſt. Nat. p. 1.

METOPIUM, in botany, a name given by Pliny to the plant which produces the gum ammoniacum. He ſays that the antient Greeks called it alſo by this name, but in that he errs. See the article AMMONIACUM.

METRENCHYTES, a name given by chirurgical writers to a ſort of ſyringe, contrived on purpoſe for injecting medicinal ſubſtances into the womb.

METRETES, the name of a meaſure uſed among the antients, containing ſomewhat more than nine gallons.

METROCELIDES, a word uſed by medical writers to expreſs a mark made by the imagination of the mother on the fœtus in utero.

METRONOMI, Μέτρονομοι, among the Athenians, officers that inſpected all ſorts of meaſures, except thoſe of corn; there were five of them in the city, and double that number in the *Pyræus*, in which the greateſt mart in Attica was kept. *Potter*, Archæol. l. 1. c. 15. T. 1. p. 83.

METROPTOSIS, a word uſed by ſome medical authors to expreſs a falling down of the womb, or prolapſus uteri. There is a plaſter calculated to be of ſervice againſt this caſe, and called hence, *emplaſtrum metroptoticum*.

METTESHEP, or METTENSCHEP, in our old writers, an acknowledgment paid in a certain meaſure of corn; or a fine or penalty impoſed on tenants, for their defaults in not doing their cuſtomary ſervices of cutting the lords corn. Paroch. Antiq. 495.

METUPORANGA, in zoology, the name of a Braſilian bird, called alſo by ſome *Tepetototl*, and by Aldrovand by the too general name *Gallus Indicus*.

It much approaches to the Gallinaceous fowls, called *Mitu* and *Pauxi*, of the ſame country, but differs from them in having no tail, if the deſcriptions of authors are accurate, and from the *mitu* in having a protuberance of the ſize of a cherry over the top of its beak. *Marggrave*'s Hiſt. Braſil. *Aldrov.* de Avib.

METYS, a word uſed by many of the antient writers to expreſs a ſubſtance collected by bees, in order to the ſtopping up cracks and crevices in their hives.

The old authors mention three kinds of ſubſtances uſed by the bees on this occaſion, the *Metys*, *Piſſoceros*, and *Propolis*. The moderns uſe only the latter term to expreſs every thing of this kind. The *Metys* and *Piſſoceros* ſeeming to have been only the ſame *Propolis*, more or leſs mixed with wax. This ſubſtance is a reſin, of a middle conſiſtence between the hard and the fluid ones. It is uſually of a reddiſh brown on the ſurface, and yellow within, and is collected from ſeveral trees, of which the poplar ſeems to be the principal, and the willow the next. *Reaumur*'s Hiſt. Inſ. vol. 10. p. 83. See the article PROPOLIS.

MEVIUM, a name mentioned by *Fallopius* and others, as given by ſome medical writers to the venereal diſeaſe.

MEUM, in botany, the name of a genus of umbelliferous plants, the characters of which are theſe: The flower is of the roſaceous kind, conſiſting of ſeveral petals, arranged in a circular form, and ſtanding on a cup which afterwards becomes a fruit, compoſed of two oblong ſeeds, which are gibboſe and ſtriated on one ſide, and flat and plain on the other. To this it may be added, that the leaves are finely divided, and ſtand on branched ſtalks. There is only one known ſpecies of this genus. The plants uſually called by this name, and different from the common *Meum*, being all ſpecies of fennel; and Mr. Tournefort obſerves, that this anſwers ſo well to all the characters of fennel, that he ſhould have made it no more than a ſpecies of that genus, but in compliment to its having been ſo long received under a ſeparate name. *Tourn.* Inſt. p. 312.

The root of *Meum* is eſteemed by ſome a very great medicine in malignant diſeaſes.

It is alſo eſteemed an attenuant, and is preſcribed wherever there are thick humours to be evacuated. It is given in aſthma's, and all obſtructions of the lungs, and is by many recommended in flatulencies, colics, and ſuppreſſions of urine, and of the menſes. Dioſcorides and Galen tell us, that the too frequent uſe of this medicine, or the taking it in too large doſes, will occaſion violent pains in the head. It may be given in ſubſtance from half a dram to two ſcruples, or from a dram to two drams in infuſion. *Geoffroy*, Mat. Med. vol. 2. p. 105.

It ought to be choſen as long and large as can be had, round, not flatted, plump, and full, and of an aromatic ſmell, and a ſomewhat acrid taſte, and ſuch as is not duſty or worm-eaten. It is ſudorific and diuretic; but the principal uſe now made of it is only as an ingredient in the Venice treacle.

MEUTANG, in botany, the name of a flower much eſteemed by the Chineſe, which, on that account, they call the king of flowers. It is larger than our roſe, and imitates its figure, only its leaves are more expanded. As its ſmell comes ſhort of that of the roſe, ſo in beauty the roſe is outdone by it. It has no prickles, and its colour is a mixture of white with purple, but ſo as to incline moſt to white; yet ſometimes there are found reddiſh and yellow ones. The tree it grows on is not unlike our alder tree, and is cultivated throughout that large empire with great care, being covered in the ſummer time with a ſhade to defend it from the ſcorching heat of the ſun. *Hofm.* Lex. in voc.

MEZEREUM, the female *ſpurge laurel*, in botany, a ſpecies of thymelæa. See the article THYMELÆA.

The bark of the root of this ſhrub, or the inner bark of the trunk, are preſcribed by ſome in dropſies, and other caſes where ſtrong purges are neceſſary; but it is ſo violent, that it ought never to be uſed internally. Externally it is uſed as a ſeaton, to draw a copious diſcharge from the ear in inflammations of the eyes.

MEZUZOTH, in the Jewiſh cuſtoms, certain pieces of parchment which the Jews fix to the door-poſts of their houſes, taking that literally which Moſes commands them [a], ſaying, "Thou ſhalt never forget the laws of thy God, but thou "ſhalt write them upon the poſts of thy houſe, and on thy "gates." This expreſſion means nothing elſe, but that thou ſhalt always remember them, whether thou comeſt into thy houſe, or goeſt out. But the Hebrew doctors imagined, that the law-giver meant ſomething more than this. They pretended that, to avoid making themſelves ridiculous, by writing the commandments of God without their doors, or rather to avoid expoſing them to the profanation of the wicked, they ought at leaſt to write them on a parchment, and to encloſe it in ſomething. Therefore they wrote theſe words upon a ſquare piece of parchment, prepared on purpoſe, with a particular ink, and a ſquare kind of character, Deut. vi. 4, 5, 6, 7, 8, 9. "Hear O Iſrael, the Lord our "God is one Lord, *&c.*" Then they left a little ſpace, and afterwards went on, Deut. xi. 13. "And it ſhall come "to paſs, if thou ſhalt hearken diligently to my command-"ments, *&c.*" as far as, "Thou ſhalt write them upon "the door-poſts of thy houſe, *&c.*" After this they rolled up the parchment, and put it into a caſe of reeds, or other matter; they wrote on the end of the caſe the word *Shadai*, which is one of the names of God; they put it at the doors of their houſes, chambers, and all places moſt frequented; they fixed it to the knockers of the door, on the right ſide; and as often as they entered in, or went out, they touched it in this place with the end of their finger, which they afterwards kiſſed out of devotion. The Hebrew word *Mezuza* properly ſignifies the door-poſts of an houſe; but it is alſo given to this roll of parchment now mentioned. Leo of Modena may be here conſulted [b].—[[a] Deut. vi. 9. [b] Ceremon. of the Jews, part 1. c. 1. *Calmet.* Diction. Bibl.]

MEZZA *Pauſa*, in the Italian muſic, *half a pauſe*, intimates that the part wherein it is found muſt lie ſtill the time of a ſemi-breve in common time. See the article PAUSE.

MEZZA *Tirata*. See the article TIRATA.

MEZZO *Soprano*, in the Italian muſic, is the high tenor, which has the cleff C on the ſecond line.

MICA, in natural hiſtory, a name given by authors who have written of foſſils to many of the bractearia, or ſmall ſpangled talcs, whether in pure maſſes of themſelves, or immerſed in the matter of other foſſils.

The principal kinds of theſe are the white and the yellow, from their colour and ſplendid appearance, called the ſilver and gold glimmer, or *Mica aurea* and *Mica argentea*.

Of each of theſe there are ſeveral kinds, as many of the yellow and white bractearia, more or leſs, deſerve the name; but the moſt conſiderable ſpecies are thoſe called by Dr. Hill the *bractearium lucidum aureum bracteis parvis*, and the *bractearium argenteum lucidum bracteis variis*, the bright gold-colour'd bractearium with ſmall ſpangles, and the bright ſilvery bractearium with variouſly ſized ſpangles. Theſe have frequently led people of ſanguine imaginations, who have met with them in different places, to ſuppoſe they had found ores of gold and ſilver, but they, in reality, contain not the leaſt grain of either of thoſe metals, and are mere talc in ſmall flakes, accidentally colour'd. The yellow kind is found in many parts of the world, but no where ſo plentifully as in Arabia and Ægypt. In Germany and France there is alſo conſiderable plenty of it, and in our American plantations it is found in great abundance; nor is England without it even in various forms. We have ſome of it in pure homogene maſſes, ſome mixed among ſtony matter, ſome among ſand. The white is extremely plentiful in Sileſia and Bohemia, as alſo in France, Italy, and England. It is like the former, found either pure, or mixed among the matter of ſtone, and makes a very glittering and beautiful appearance. *Hill*'s Hiſt. of Foſſ. p. 77, ſeq.

MICARAGUÆ *Pomum*, a name given by ſome authors to the Spaniſh pear. *Chabræus*, p. 596.

MICHAH, a word uſed by ſome of the chemical writers to expreſs copper.

MICHALALATLI, in zoology, a name by which Nieremberg informs us, ſome of the Mexicans call the *achalalactli*. See the article ACHALALACTLI.

MICHELIA, in botany, the name of a genus of plants eſtabliſhed by Dr. Amman, the characters of which are theſe: The flower is monopetalous and of an anomalous kind, it is tubular, and opens into a kind of bilabiated mouth. The piſtil ariſes from the cup and finally becomes a fleſhy fruit, containing a kernel, or ſtone, divided into two cells, each of which contains one ſeed. This riſes to the ſize of a ſhrub, its branches are covered with a deep green bark, and do not grow ſtrait and even, but variouſly intorted; they ſend out many ſmall ſhoots, and are armed with very ſharp thorns of half an inch long; the leaves are about an inch and half long, and an inch broad; they ſtand on ſhort pedicles, and are of a pleaſant green on the upper ſide, and whitiſh underneath. The branches uſually terminate in long

and

and loose spikes of yellow flowers; these are each divided into four very uneven segments, the upper segment is very large and is arched; but the lower, and the side ones are much smaller and bend outwards. In the middle of the segments there stand two yellow stamina, sustaining each a round yellow head; the pistil arises between these, and is of the same colour, length, and thickness, with the stamina. The cup is very short, consisting only of one leaf; it is green and is divided in its upper part into two or three obtuse segments: The fruit is round and fleshy of the size of a walnut, green while young, but yellow when ripe, composed of a large quantity of a pale coloured pulp, surrounding a stone of an oval figure divided into two cells; in each of which is contained one kernel or seed. Act. Petropol. Vol. 8. p. 219.

MICROCOSMETER, a name given by Dolœus to an imaginary being, which he supposes to reside in the brain, and direct all the actions.

MICROCOUSTICS, the same with *microphones*. See the article MICROPHONES.

MICROPHONES, instruments contrived to magnify small sounds, as *microscopes* do small objects.

MICROSCOPE (*Cycl.*)—compound *Microscopes* sometimes exhibit a fallacious appearance, by representing convex objects, concave, and *vice versa*. See Philos. Transf. N°. 476. p. 387. See some accounts of the famous Leuwenhoek's *Microscopes* in the Philosophical Transactions, N°. 380. & 458.

The solar or *camera obscura Microscope*, and the *Microscope* for opaque objects, are the invention of Dr. Luberkhun; and have been executed by Mr. Cuff in England. Phil. Transf. N°. 458. p. 516, & 518.

Camera obscura MICROSCOPE. See *Solar* MICROSCOPE.

MICROSCOPE *for opaque objects*. The *Microscope* for opake objects remedies the inconvenience of having the dark side of an object next the eye: For by means of a concave speculum of silver, highly polished, in whose center a magnifying lens is placed, the object is so strongly illuminated, that it may be examined with ease. Phil. Transf. N°. 458. Sect. 9.

Solar MICROSCOPE. The *Solar Microscope* is composed of a tube, a looking-glass, a convex lens, and a *Microscope*. The tube is brass, near two inches in diameter, fixed in a circular collar of mahogany; which, turning round at pleasure, in a square frame, may be adjusted easily to a hole in the shutter of a window, in such a manner, that no light can pass into the room but through the aforesaid tube. Fastened to the frame by hinges, on the side that goes without the window, is a looking-glass, which, by means of a jointed brass wire coming through the frame, may be moved either vertically or horizontally, to throw the sun's rays through the brass tube into the darkened room. The end of the brass tube without the shutter has a convex lens, to collect the rays, and bring them to a focus; and on the end within the room, Wilson's pocket *Microscope* is screwed, with the object to be examined, applied to it in a slider. The sun's rays being directed by the looking-glass through the tube upon the object, the image or picture of the object is thrown distinctly and beautifully upon a screen of white paper; and may be magnified beyond the imagination of those who have not seen it. Phil. Transf. N°. 458. Sect. 9.

MICROSCOPIC *Objects*. All things too minute to be viewed distinctly by the naked eye, are proper objects for the *Microscope*. Mr. Hook has distinguished them to be exceeding small bodies, exceeding small pores, or exceeding small motions.

Exceeding small bodies must either be the parts of larger bodies, or things, the whole of which is exceedingly minute, such as small seeds, insects, sands, salts, &c.

Exceeding small pores are the interstices between the solid parts of bodies, as in stones, minerals, shells, &c. or the mouths of minute vessels in vegetables, or the pores in the skin, bones, and other parts of animals.

Exceeding small motions are the movements of the several parts or members of minute animals, or the motion of the fluids, contained either in animal or vegetable bodies. Under one or other of these three heads, almost every thing about us affords us matter of observation, and may conduce both to our amusement and instruction.

An examination of these objects, however, so as to discover truth, requires a great deal of attention, care, and patience, with some skill and dexterity, to be acquired chiefly by practice, in the preparing, managing, and applying them to the *Microscope*.

Whatever object offers itself as the subject of our examination, the size, contexture, and nature of it, are first to be considered, in order to apply it to such glasses, and in such a manner as may shew it best. The first step should always be to view the whole together, with such a magnifier as can take it in all at once, and after this the several parts of it may the more fitly be examined, whether remaining on the object or separated from it. The smaller the parts are which are to be examined, the more powerful should be the magnifiers employed; the transparency or opacity of the object must also be considered, and the glasses employed accordingly suited thereto, for a transparent object will bear a much greater magnifier than one which is opake, since the nearness that a glass must be placed at, unavoidably darkens an object if in its own nature opake, and renders it very difficult to be seen, unless by the help of the apparatus contrived for that purpose, which has a silver speculum. Most objects however become transparent by being divided into extremely thin parts. *Baker's* Microf. p. 52.

The nature of the object also, whether it be alive or dead, a solid, or a fluid, an animal, a vegetable, or a mineral substance, must likewise be considered, and all the circumstances of it attended to, that we may apply it in the most advantageous manner. If it be a living object, care must be taken not to squeeze or injure it, that we may see it in its natural state and full perfection. If it be a fluid, and that too thick, it must be diluted with water; and if too thin, we should let some of its watery parts evaporate. Some substances are fittest for observation when dry, others when moistened; some when fresh, and others after they have been kept some time.

Light is the next thing to be taken care of, for on this the truth of all our observations depends; and a very little observation will shew how very different objects appear in one degree of it to what they do in another; so that every new object should be viewed in all degrees of light, from the greatest glare of brightness to perfect obscurity, and that in all positions to each degree, till we hit upon the certain form and figure of it. In many objects it is very difficult to distinguish between a prominency and a depression, a black shadow and a black stain, and in colour between a bright reflection and whiteness. The eye of a fly in one kind of light appears like a lattice drilled full of holes, in the sun-shine like a solid substance covered with golden nails, in one position like a surface covered with pyramids, in another with cones, and in others with still different shapes.

The degree of light must always be suited to the object, if that be dark it must be seen in a full and strong light; but if transparent, the light should be proportionably weak; for which reason there is a contrivance both in the single and double *Microscope* to cut off abundance of the rays, when such transparent objects are to be examined by the largest magnifiers. The light of a candle for many objects, and especially for such as are very bright and transparent, and very minute, is preferable to day-light; for others a serene day-light is best; but sun shine is the worst light of all, for it is reflected from objects with so much glare, and exhibits such gaudy colours, that nothing can be determined from it with any certainty. This however, is not to be extended to the solar, or *camera obscura Microscope*; for in that nothing but sun-shine can do, and the brighter that is the better; but in that way we do not see the object itself on which the sun-shine is cast, but only the image or shadow of it exhibited on a screen; and therefore no confusion can arise from the glaring reflection of the sun's rays from the object to the eye, which is the case in other *Microscopes*. But then in that solar way we must rest contented with viewing the true form and shape of an object, without expecting to find its natural colour; since no shadow can possibly wear the colour of the body it represents,

Most objects require also some management in order to bring them properly before the glasses. If they are flat and transparent and such as will not be injured by pressure, the best way is to enclose them in sliders between two Muscovy tales or isinglasses. This way the feathers of butterflies, the scales of fishes, and the farinæ of flowers may be very conveniently preserved, as also the parts of insects, the whole bodies of minute ones, and a great number of other things. These are to be kept in sliders, each containing three, four, or more holes, and these must not be filled promiscuously; but all the things preserved in one slider should be such as require one and the same magnifying power to view them, that there may not be a necessity of changing the glasses for every object; and the sliders should be marked with the number of the magnifier it is proper to be viewed with. In placing the objects in the sliders, it is always proper to have a small magnifier, of about an inch focus, in your hand, to examine and adjust them by, before they are fixed down with the rings.

Small living objects, such as lice, fleas, bugs, mites, minute spiders, &c. may be placed between these tales without injuring them, if care be taken to lay on the brass rings without pressing them down, and they will remain alive many weeks in this manner; but if they are too large to be treated thus, they should be either preserved between two concave glasses, or else viewed immediately, by holding them in the pliers, or sticking them on the point at the other end of that instrument.

If fluids come under examination, to discover the animalcules in them, a small drop is to be taken with a hair pencil, or on the nib of a clean pen, and placed on a plate of glass; and if they are too numerous to be thus seen distinctly, some water warmed by holding it in the mouth must be added to the drop, and they will then separate and be seen distinctly. This is particularly necessary in viewing the animalcules in the *semen masculinum* of all creatures; which, tho' extremely minute, are always so numerous, that without this caution their true form can seldom be seen. But if we are to see the salts in a fluid, the contrary method must be observed, and

the plate of glaſs muſt be held gently over the fire, till part of the liquor is evaporated.

The diſſection of minute animals, as lice, fleas, &c. requires patience and care; but it may be done very accurately by means of a needle and a fine lancet, placing the creature in a drop of water, for then the parts will readily unfold themſelves, and the ſtomach, guts, &c. be very diſtinctly ſeen.

Theſe ſeem the beſt ways of preſerving tranſparent objects; but the opake ones, ſuch as ſeeds, woods, &c. require a very different treatment, and are beſt preſerved and viewed in the following manner.

Cut cards into ſmall ſlips about half an inch long, and a tenth of an inch broad; wet theſe half-way of their length in gum-water, and with that faſten on ſeveral parcels of the object, and as the ſpots of cards are of different colours, ſuch ſhould be choſen for every object as are the moſt different from its own colours. Theſe are very convenient for viewing by the *Microſcope* made for opake objects with the ſilvered ſpeculum; but they are proper for any *Microſcope*, that can view opake bodies.

A ſmall box ſhould be contrived for theſe ſlips, with little ſhallow holes for the reception of each; and this is conveniently done, by cutting pieces of paſte-board, ſuch as the covers of books are made of, to the ſize of the box, ſo that they will juſt go into it, and then cutting holes through them with a ſmall chiſſel, of the ſhape of the ſlips of card, theſe paſte-boards having then a paper paſted over their bottom, are cells very proper for the reception of theſe ſlips, which may be taken out by means of a pair of plyers, and will be always ready for uſe.

Great caution is to be uſed in forming a judgment on what is ſeen by the *Microſcope*, if the objects are extended, or contracted, by force or drineſs.

Nothing can be determined about them, without making the proper allowances; and different lights and poſitions will often ſhew the ſame object as very different from itſelf. There is no advantage in any greater magnifier than ſuch as is capable of ſhewing the object in view diſtinctly; and the leſs the glaſs magnifies, the more pleaſantly the object is always ſeen.

The colours of objects are very little to be depended on, as ſeen by the *Microſcope*; for their ſeveral component particles being by this means removed to great diſtances from one another, may give reflexions very different from what they would, if ſeen by the naked eye.

The motions of living creatures alſo, or of the fluids contained in their bodies, are by no means to be haſtily judged of, from what we ſee by the *Microſcope*, without due conſideration; for as the moving body, and the ſpace wherein it moves, are magnified, the motion muſt be ſo too; and therefore that rapidity with which the blood ſeems to paſs through the veſſels of ſmall animals muſt be judged of accordingly: Suppoſe, for inſtance, that a horſe and a mouſe move their limbs exactly at the ſame time, if the horſe runs a mile while the mouſe runs fifty yards; tho' the number of ſteps are the ſame in both, the motion of the horſe muſt notwithſtanding be allowed the ſwifteſt; and the motion of a mite, as viewed by the naked eye, or through the *Microſcope*, is perhaps not leſs different. *Baker*'s Microſcope, p. 62.

MICTUS *Cruentus*. See the article *Bloody* URINE.

MID-*Feather*, in the Engliſh ſalt-works, the name given to a ſort of partition placed in the middle of the furnace, over which the pan is ſet for boiling the ſea-water or brine into ſalt.

This partition divides the body of the furnace into two chambers. See the article SALT.

MID-*Ship Beam*. See the article BEAM, *Cycl.*

MIDA, in natural hiſtory, the name of a worm or maggot, of which is produced the purple fly, found on bean-flowers, and thence called the bean-fly.

MIDAD *Alhendi*, in the materia medica of the Arabians, a name given to the common indigo blue.

The expreſs meaning of the words is Indian ink; but this is an erroneous name, founded on Pliny's miſunderſtanding the words of Dioſcorides. The Greeks in general have called the common writing ink *Melan*; but they have alſo uſed this word *Melan* as an adjective, expreſſive not only of black, but of deep blue. Thus Theophraſtus has called both the violet flowers and the fine deep blue ſapphires, *Melanes*. Pliny, finding him call the indigo when of a very fine and deep colour, *Melan Indicon*, thought it to be different from the common indigo, and thence ſuppoſed it a ſort of Indian ink. Thus Indian ink has become a ſort of name for this blue.

MIDDLING-*Teeth*, in the manege, are the four teeth of a horſe that come out at three years and a half, in the room of other four foal-teeth, ſeated between the nippers and the corner-teeth; from which ſituation they derive the title of *Middling*. There's one of them above, and one below, on each ſide of the jaws. See the article TEETH.

MIDYON, a word uſed by Theophraſtus, as the name of a ſpecies of oak. It is preſcribed by ſome of the old phyſicians, in their compoſitions; but is uſually ſuppoſed to ſtand there, by an error of the copies; the word meant being miſy.

MIFRES, a name by which ſome writers have called alphaltum. See the article ASPHALTA.

MIGRATING-*Bog*.—Theſe ſoft maſſes of earth have been ſometimes known to move out of their place. An inſtance of this there was in Ireland, in the year 1697, about Charleville, in the county of Limerick. There was heard for ſome time a noiſe under ground like that of thunder at a great diſtance, or almoſt ſpent; and ſoon after this the earth of a large bog in the neighbourhood began to move, and a hill or riſing ſituated in the middle of it ſtood no longer above the level of the reſt, but ſunk flat.

The *bog* not only moved itſelf, but moved with the neighbouring paſture-lands, tho' ſeparated by a large and deep ditch; the motion continued a conſiderable time, and the ſurface of the moving earth roſe into a ſort of waves, but without breaking up or burſting any where. The paſture-land roſe very high, and was carried on in the ſame motion till it reſted upon a neighbouring meadow, the whole ſurface of which it covered, remaining ſixteen feet deep upon its ſurface. The whole quantity of the bog was torn from its former ſeat, and left great gaps in the earth where it had joined, which threw up foul water, and very ſtinking vapours. *Phil. Tranſ.* N° 233.

All the country came in to ſee ſo ſtrange a ſight as this, for it continued moving a long time; but few gueſſed the true cauſe of it, which was this: A more than ordinary wet ſpring occaſioned the riſing of the bog to a great height in one part, and thence propagated itſelf through the whole bog; ſo that the hill in the midſt was undermined, and naturally ſunk flat; this and the greater than ordinary weight of this large bog preſſing upon the adjoining paſture-land, forced up its foundations, which were only a looſe ſand. This was puſhed on ſideways where there was a deſcent from the bog, and at length having given the bog more room, all was quiet and remained in that ſtate. The bog was more than forty acres of ground.

MIGRATING-*Birds*. See the article *Birds of* PASSAGE.

MIHA, in the materia medica, a name uſed by ſome authors for ſtyrax. *Ger.* Emac. Ind. 2.

MILAX, a name by which *ſmilax* is often meant by the Greek writers. The adding or taking away the letter *s* from words beginning with an *m*, was a thing common and indifferent among them. This name is however one of the ſynonimous terms of the Greeks, ſometimes being uſed as the name of the yew-tree, and ſometimes as that of the creeping plant we call *ſmilax* at this time. Dioſcorides, and Galen, and moſt of the later Greek authors, call the tree *Milax*, and the herb ſmilax, as if there were a difference between the two names; but this is not regularly kept up by any of them, and in the antients is not regarded at all; there being no more difference between the words *Smilax* and *Milax*, than between ſmaragdus and maragdus, as that word, the name of the emerald, is at times variouſly written.

MILDEW (*Cycl.*)—Some have ſuppoſed the blight and *Mildew* to be both the ſame thing, but very erroneouſly. The *Mildew*, properly ſo called, ſometimes reſts upon the leaves of trees in form of a fatty juice, and ſometimes on the ears of corn; it is tough and viſcous to the touch, and the ſun's heat drying it up, it becomes yet more viſcous and hard, and ſo daubs over the young grains in the ear, that they can never after expand themſelves properly, nor grow to their due ſize or weight. Bearded wheat is leſs ſubject to the *Mildew*, than the common ſort; and it is obſerved, that newly dung'd lands are more ſubject to the *Mildew*, than others. The moſt happy remedy for this is out of the farmer's power, but often happens naturally; this is a ſmart ſhower of rain, and immediately afterwards a briſk wind. This wholly diſperſes it.

If the *Mildew* is ſeen before the ſun has any power, it has been recommended by many, to ſend two men into the field with a long cord, each holding one end, and drawing this along through the ears, the dew will be diſlodged from them before the ſun's heat is able to dry it to that viſcous ſtate in which it does the miſchief. Some alſo ſay, that lands which have for many years been ſubject to *Mildews*, have been cured of it by ſowing ſoot with the corn, or immediately after it. See the article BLIGHT.

MILE (*Cycl.*)—In Scotland the *Mile* is equal to 1184 paces, every pace being five feet; ſo that the Scotch *Mile* contains 5920 feet. Tr. Pract. Geom. p. 4. See the article MEASURE.

MILIARIUM, the name of a tall and narrow veſſel, uſed in the bathing of the antients, for heating water to any degree, to give warmth to the reſt. See Mem. Acad. Inſcript. Vol. I. p. 127.

MILIARY *Fever*. See the article PURPUREA *Febris*.

MILIOLUM, a word uſed by ſome medical writers, to expreſs a ſmall tumor in the eye-lid, of the ſize and ſhape of a ſeed of the common millet.

MILITARY *Rewards*. See the article REWARDS.

MILIUM, *Millet*, in the Linnæan ſyſtem of botany, makes a diſtinct genus of plants; the diſtinguiſhing characters of which are, that the calyx is a glume containing ſeveral flowers, and compoſed of three valves, which are of an oval figure and pointed;

pointed; the two inner ones are placed oppoſite to one another; the third is ſituated behind one of theſe. The flower is ſmaller than the cup, and is made up of two valves which are of an oval figure, and one of them much ſmaller than the other. The ſtamina are three very ſhort capillary filaments, the antheræ are oblong, the germen of the piſtil is roundiſh, the ſtyles are two in number and are very ſlender, the ſtigmata are like pencils. The flower incloſes the ſeed, and does not open to let it fall out. The ſeed is ſingle, and of a roundiſh figure. *Linnæi* Gen. Plant. p. 17. See Tab. 1. of Botany, Claſs 15.

Millet is reckoned by Pliny the moſt fertile of all grain; one grain of it producing three Roman ſextaries. *Hoffm.* Lex. in voc. See the article SEXTARIUS, *Cycl.*

MILIUM *Arundinaceum*, in botany, a name by which ſome authors call the lacrymæ Jobi, or Job's tears. *Herm.* Cat. p. 426.

MILIUM *Indicum*, in botany, a name by which ſome authors call the maize, or Indian wheat. *Park.* Theatr. 1138.

MILK (*Cycl.*)— *Milk* is evidently one of the beſt nouriſhments of the body; and it is not wonderful that it ſhould prove ſo, when we conſider that in all caſes of nouriſhment the proximate matter taken to nouriſh ought to be as like as may be to the body to be nouriſhed by it. We ſubſiſt by the ſame things by which we are generated, and even while in the ſtate of a fœtus in the womb, we are nouriſhed not by blood, as ſome ſuppoſe, but by a lacteous juice, which is ſeparated from the blood in the uterus by means of the placenta, as it is in the breaſts of women who give ſuck, by glandules and tubuli deſtined for that purpoſe. Meats which we daily feed upon paſs down into the ſtomach indeed in their own form, but they do not nouriſh us till they are changed into chyle, or a milky liquor.

Milk being analyſed is found to be compoſed of fatty, ſerous, and terreſtrial parts; and theſe its conſtituent principles being eaſily mixed and ſeparated again, are made of it matter for the nouriſhment of the different parts of the body. The ſerous part, which is alſo nitrous, being a proper vehicle to convey through the veſſels the fatty parts, which are as well adapted to all the offices of nutrition as any ſubſtance can be. It is eaſy to infer from this account of *Milk*, that it is not only a proper food for children, but for grown people alſo; but proper regulations are to be obſerved as to its uſe in particular caſes; no aliment any more than this being capable of ſuiting all conſtitutions and circumſtances. Meat in the ſtomach is converted into chyle, or a ſubſtance like *Milk*; this chyle paſſes into the heart through the blood-veſſels, and its fineſt and moſt ſpirituous parts are there tranſmuted into the red part of the blood; and after this the other groſſer parts of it are by different elaborations transformed into bile, and the ſeveral other humours in the body. It is evident that theſe humours, as well as the blood itſelf, muſt all have a ſupply; and that meat cannot give this ſupply, till it is converted into chyle or *Milk*; how much labour then is ſav'd the animal functions by giving at once into the ſtomach chyle ready form'd, that is *Milk*; and in caſes where the action or juices of that organ are ſo debilitated as not to be of power to convert the meat into chyle, what remains but that the perſon muſt die ſlowly, by a want of the ſupplies of the ſeveral fluids of the body, if ſomething be not given that is capable of paſſing into the blood with leſs preparation than meats are; and what is ſo proper on ſuch an occaſion as *Milk*, which is already ſo nearly allied to the nature of the fluid that ſhould have been there ſeparated from meat, that it will readily ſupply all its offices.

MILK-*Diet* is uſeful in the gout and ſtone. See the article STONE.

Dr. Cheyne recommends *Milk* and ſeed-diet with water for drink, as the ſureſt preſervative againſt diſeaſes, and cure of them. See the articles CANCER, PALSY, FITS, GOUT and STONE.

Upon opening a vein, eſpecially after meals, *Milk* is ſometimes found inſtead of blood. See Phil. Tranſ. N°. 6. pag. 100.

The ſalt of *Milk* may be prepared by boiling whey to one half, then filtrating it; the coction and filtration is to be continued, till the liquor becomes of the conſiſtence of a ſyrup. This being put into a cellar to chryſtallize, the ſalt will be formed into a cake of a ſaccharine taſte, reſembling manna.

This preparation is Dr. Gaubius's, and is ſomewhat different from that which Valentini, in his *Medicina Nov. Antiq.* alledges to be the famous ſaccharum lactis, ſo much cried up by Lodovicus Feſti, and recommended by others as an infallible cure for the gout. Med. Eſſ. Edinb.

MILK *of Sulphur*. See the article SULPHUR *Precipitatum*.

MILK, in the wine trade. The coopers know very well the uſe of ſkim'd *Milk*, which makes an innocent and efficacious forcing for the fining down of all white wines, arracks, and ſmall ſpirits; but is by no means to be uſed to red wines, becauſe it diſcharges their colour. Thus, if a few quarts of well-ſkim'd *Milk* be put to a hogſhead of red wine, it will ſoon precipitate the greater part of the colour, and leave the whole nearly white; and this is of known uſe in the turning red wines when prick'd into white; in which a ſmall degree of acidity is not ſo much perceived. *Shaw*'s Lect. p. 209.

Milk is, from this quality, of diſcharging colour from wines, of uſe alſo to the wine-coopers, for the whitening of wines that have acquired a brown colour from the caſk, or from having been haſtily boiled before fermenting; for the addition of a little ſkim'd *Milk* in theſe caſes, precipitates the brown colour, and leaves the wines almoſt limpid, or of what they call a water whiteneſs, which is much coveted abroad in wines, as well as in brandies.

Womens MILK.— The *Milk* is often a very troubleſome and dangerous thing to women in their lyings-in, and ſubjects them to many painful diſorders. About the third or fourth day after delivery they are uſually affected with chilneſſes and ſhiverings, which are well known to be owing to that cauſe, and are therefore not to be treated as a diſeaſe, nor any medicines to be given in them; only it is proper to keep the perſon warm, and promote perſpiration, eſpecially in the breaſts. Sometimes indeed this ſymptom is joined with a febrile heat, or a real inflammatory fever, which is then to be taken off by the proper means. See the article *Inflammatory* FEVER.

Very frequently there come on inflammations of the breaſts, of the erſypelous kind; theſe are uſually taken off by the external uſe of ſpirit of wine and camphor with a little ſaffron in it, and by carefully keeping the parts warm.

The *Milk* often proves very difficult to be drawn out; this is to be helped by the keeping the body carefully open by caminative and emollient clyſters, by keeping up a gentle diaphoreſis, and by attemperating medicines mixed with the milder alexipharmics. The breaſts are all the time to be kept carefully covered with flannel, and gently preſſed and rubbed at times; and finally they are to be drawn by means of a pipe, or by the mouth of an experienced perſon.

Deficiency of MILK, is alſo a very common complaint, and it is in ſome caſes abſolute, there being no *Milk* at all derived into the breaſts; in others, it is only a partial one, there being ſome *Milk*, though not enough to ſupply the child with nouriſhment. A total deficiency of *Milk* moſt frequently happens to perſons who have their firſt child when ſomewhat advanced in years, and to ſuch as are of a choleric diſpoſition; but a partial deficiency of it is often owing to a ſaltneſs of the ſerum, and ſometimes to the want of nouriſhments, and often is brought on by ſorrow.

When ſaline and bilious humours are in fault, then lac lunæ, calcin'd cryſtal, and other abſorbent powders, become of great uſe: Some alſo preſcribe the powder of earth-worms carefully dried, and the voiding the humours by ſtool, by means of gentle purges: When a want of nouriſhment is the only occaſion of it, the *Milk* may always be recovered in a proper quantity by means of good foods, with *Milk* and other nouriſhing fluids.

An over-abundance of MILK is as common a complaint, as a deficiency of it, and requires as much care in the treatment, otherwiſe the perſon is frequently ſubject to nodes and abſceſſes in the breaſt. The proper remedies are the eating and drinking more ſparingly, and the letting two children ſuck inſtead of one.

Many people do not ſuckle their children, and therefore find it neceſſary to drive away their *Milk* abſolutely. This is beſt done by taking internally the digeſtive ſalts, with diaphoretic and diuretic medicines. Externally, it is proper to apply to the breaſts bags of the dried leaves of parſley, mint, chervile, *&c.* with the ſeeds of coriander and parſley, and a little camphor; and ſpirit of wine with camphor, and a little ſaffron is to be rubbed in, or linnen rags wetted in it and applied. Cerates may alſo be made of white wax melted in oil of almonds, with a little camphor, and applied to the breaſts freſh every morning and evening, or oftner if neceſſary.

A too great thinneſs of the MILK, is another common complaint with nurſes; this is to be laid ſometimes to the diet, ſometimes to the concoction, and ſometimes to the unnatural tenuity of the humors; in this caſe the *Milk* is often perfectly watery, and the child is thrown into an atrophy by it. The remedies for this are, a change of diet, and a purging of the primæ viæ by ſome gentle cathartic, and afterwards a ſtrengthening of them by bitters, and ſtomachic medicines. Sometimes alſo, it is neceſſary to evacuate the ſerous humours by the common phlegmagogues, ſuch as jalap in proper doſes mixed with a little powder'd ginger, which is an excellent corrective for it.

The *Milk* is ſometimes ſalt to the taſte, and ſometimes of a bilious yellow colour; and theſe diſtemperatures of it uſually throw the child into colics, diarrhœa's, vomitings, cutaneous eruptions, with ſcabs, and ſometimes abſolute ulcerations, and ſometimes into fevers. In this caſe, the nurſe or parent is to take the abſorbents and nitrous medicines, with intermediate purges; thus, powders of crabs-eyes, oyſter-ſhells, and purified nitre, with ſmall doſes of rhubarb between whiles, often perfect a cure; but during the courſe of taking theſe remedies, and for ſome time afterwards, the diet muſt be under ſome regulations, particularly ſalt foods are to be avoided; and all acids, aromatics, and ſtrong liquors, either wholly let alone, or taken very ſparingly. The perſon muſt alſo carefully avoid all violent paſſions of the mind, as anger, fear,

fear, and the like; and from all violent emotions of the body.

A contrary extreme to the thinneſs and watery appearance of the *Milk* before deſcribed, is, *a mucous thickneſs of it*. This is principally troubleſome and dangerous to the parent, as it is apt to bring on tumors and nodes in the breaſt. The method of treatment in this caſe, is to give gentle alexipharmics for ſome days, then the gentle laxative medicines in ſmall doſes, and finally to allow a moderate uſe of wine.

Stagnations of the MILK. Theſe are very frequent in lyings-in, and are to be diſcuſſed by the ſame method as was before ordered for the ſending it back, in caſes where perſons do not chooſe to give ſuck; and, to the things there directed, may be added, the internal uſe of ſperma-ceti and of calcin'd mountain cryſtals, in powder; and externally, cataplaſms of ſperma-ceti with ſome volatile urinous ſalt, and the gentle compreſſion of the breaſts by wearing ſtrait cloths about that part.

Nodes of the Breaſts often ariſe from the abundance and the mucous nature of the *Milk*. They are to be diſcuſſed by plaſters of ſperma-ceti, with anniſe, parſley, and coriander ſeeds; and by gently rubbing with a ſoft fleſh-bruſh, as alſo by wearing ſome animal's ſkin that has a thick fur on it, which at once ſerves the double office of warmth and a gentle friction.

Abſceſſes of the Breaſts very often happen alſo from the ſame cauſes; and theſe when there appears no hopes of diſcuſſing them are always to be brought to ſuppuration as quick as poſſible. A maturating plaſter is to be laid on the parts that are to be broke, and the other parts are to be rubbed with ſpirit of wine and camphor, and ſaffron infuſed in it. When the matter in the abſceſs is ripe, if the ſkin do not burſt of itſelf it is to be immediately opened with a lancet; after this a plaſter of equal parts of diachylon ſimplex and that with the gums, with a little comphor mixed in it is to be applied; and afterwards digeſtives are to be wholly avoided, and no dreſſings but balſamics allowed. The liquor of myrrh, or a mixture of eſſence of myrrh and amber and ſpirit of turpentine, make an admirable dreſſing; and internally, gentle purges are to be given, and the milder dieuretics, with the nitrous and ſaline medicines.

Cracks and fiſſures of the Nipples, is another terribly troubleſome complaint with thoſe who give ſuck. The beſt applications to theſe, are the oil of eggs with the liquamen of the buds of the poplar, oil of wax, linſeed oil ſhook together with the whites and yelks of eggs, a liniment made of marygold-flowers and freſh butter, an ointment of liquorice, and the liquor produced from the flowers of mullein and marygolds, heated together in an oven. The ſucking out the *Milk*, by means of a glaſs pipe, is very neceſſary during the continuance of this complaint; but the beſt method of preventing it, is the applying white wax to the nipples for ſome time before, as well as after the time of the labour.

The Smallneſs of the Nipples is a trouble to many nurſes; theſe when the complaint is only owing to their lying-in, the breaſts are to be forced out by the ſucking of a robuſt child of ſix or more months old, by the application of the common glaſs-pipe firſt made warm, and by the ſucking of a grown perſon experienced in ſuch caſes: All natural accidents of this kind may be cured by this means; but often the nipples have been ſo forced in by ſtays, at the very time of their growth in young girls, and this force continued ſo long, that no art is able to recal them to their natural ſtate, or make them fit for an infant to ſuck from.

The miſchiefs that ſometimes attend perſons who have given ſuck, in the weaning of children, or on the death of a child, and the *Milk* being left undrawn out, are to be avoided, by letting ſome other child ſuck a little at a time, and that leſs and leſs every day, and by drawing afterwards a little every day with a pipe.

It is very common among nurſes to be extremely ſcrupulous about diet, and to require the niceſt foods for the creating good *Milk*; but it is evident, that though ſome care is neceſſary to this purpoſe, yet it is not this; for the poorer people, who live on the coarſeſt food, often have the richeſt *Milk*. The whole neceſſary caution ſeems to conſiſt in avoiding exceſs, and feeding as much as poſſible on ſimple foods, without too many vegetables, and not to lead too ſedentary a life.

Things hard of digeſtion are to be abſtained from, as alſo acids; too ſalt meats, and all flatulent things, and the acrid and aromatic things, are to be very carefully meddled with; ſince, tho' they do not affect the mother, they ſeldom fail to bring diſtempers upon the child. There is no better drink for thoſe who give ſuck than malt liquors, when they are well ſettled and clear. Stronger things, even wine in thoſe who are habituated to it, tho' it do not hurt them, is to be refrained from, ſince it ſubjects the child to convulſions and many other diſorders.

Over large draughts of cold liquors, and the expoſing the breaſts too much to the cold, are often the cauſes of very great diſorders both in the mother and the child. Gentle exerciſe, and motion of the body in general, is highly ſerviceable to nurſes, as is alſo that of the breaſts in particular. The gently ſhaking and preſſing them throwing off the aqueous part of the *Milk*, and filling the lactiferous ducts more freely and copiouſly, than would otherwiſe be done. The improper methods of dreſs in ſome places, and ſqueezing the girls into ſlenderneſs by ſtrait ſtays, often occaſions the lactiferous ducts to be ſo contracted, and the nipples ſo repreſſed, that no art can afterwards bring the perſon to be properly qualified for ſuckling a child. *Junker*'s Conſp. Med. p. 732, ſeq.

Violent paſſions of the mind are extremely injurious to thoſe who give ſuck. It is very common to ſee nodes and abſceſſes of the breaſts brought on by theſe alone, and eryſipelatous inflammations are as frequent in perſons of other habits, from the ſame cauſes. The child alſo is often thrown into diarrhœa's, by it; and in general, it is a very neceſſary rule to ſqueeze and ſhake the breaſts to diſcharge the *Milk* after a great fright, or a violent fit of paſſion, before the child is ſuffered to ſuck. If the menſes appear at the time of giving ſuck, the child is uſually greatly injured by the alteration the *Milk* ſuffers.

When women are newly lain in, if the breaſts become turgid, and there is danger of the *Milk*'s coagulating in them, the child if it be ſtrong ſhould be immediately put to ſuck; but if otherwiſe, the breaſts are to be gently ſhaken and preſſed to diſcharge the redundance, or another child, or grown perſon, put to ſuck them.

Extract of MILK, a ſweet dry extract of cows milk made by evaporation.

Fred. Hoffman recommends this extract boiled with pure water to the quantity of what is exhaled of the *Milk*, as an excellent drink in many diſorders, where *Milk* itſelf is not proper. See his Diſſert. *de ſaluberrima ſeri lact. virtut.* oper. Tom. VI. p. 13.

Milk is often thought improper with purgatives, and it certainly does render ſome perſons coſtive; but this does not hold generally, nor perhaps for a long time, even in thoſe whom it may ſo affect at firſt. Hoffman recommends an ounce of manna diſſolved in a pint of *Milk* as a good laxative.

Moon's MILK. See the article LAC *Lunæ*.

MILK-WORT. See the article LACTARIA.

MILK-*wort*, in botany. See the article GLAUX.

MILL (*Cycl.*)—MILL-*Dams*. A very firm way of making theſe in a quick or running ſand, which is uſually found a very troubleſome circumſtance in the making them, is by laying the foundation with unſlacked lime; which, by ſlacking among the ſand, runs together into a hard ſtone, which gives a very firm and ſure foundation. *Plot*'s Staffordſhire, p. 336.

MILL-*Stones*. The *Mill-ſtones* which we find preſerved from antient times, are all ſmall and very different from thoſe in uſe at preſent. Thoreſby mentions two or three ſuch found in England, among other Roman antiquities, which were but twenty inches broad; and there is great reaſon to believe that the Romans, as well as the Egyptians of old, and the antient Jews, did not employ horſes, or wind, or water, as we do, to turn their *Mills*, but made their ſlaves and captives of war do this laborious work; they were in this ſervice placed behind theſe *Mill-ſtones*, and puſhed them on with all their force. Sampſon, when a priſoner to the Philiſtines, was treated no better, but was condemned to the *Mill-ſtone* in his priſon. The runner or looſe *Mill-ſtone* in this ſort of grinding, was uſually very heavy for its ſize, being as thick as broad. This is the *Mill-ſtone* which it is expreſly prohibited in Scripture to take in pledge, as lying looſe it was more eaſily removed. The Talmudiſts have a ſtory, that the Chaldæans made the young men of the captivity carry *Mill-ſtones* with them to Babylon, where there ſeems to have been a ſcarcity at that time; and hence, probably, their paraphraſe renders the text "have borne the *Mills*, or *Mill-ſtones*;" which might thus be true, in a literal ſenſe. They have alſo a proverbial expreſſion of a man with a *Mill-ſtone* about his neck; which they uſe to expreſs, a man under the ſevereſt weight of affliction. This alſo plainly refers to theſe ſmall ſort of ſtones.

MILLAINS, according to Mr. Wingate, are the third ſubdiviſion of the primes in Gunter's line; and expreſs the thouſandth parts of ſuch primes.

MILLEFOLIUM, *Yarrow*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the radiated kind; its diſk is compoſed of floſcules, and its outer edge of ſemi-floſcules, which all ſtand up on the embryo-ſeeds, and are contained in one general ſquammoſe cup, of a ſort of cylindric figure. The embryo's finally ripen into ſlender ſeeds; to this it is to be added, that the leaves are always finely divided, and the flowers are collected into tufts.

The ſpecies of *Yarrow*, enumerated by Mr. Tournefort, are theſe: 1. The great white-flowered *Yarrow*, called Achillæa. 2. The common white-flowered *Yarrow*. 3. The great purple-flowered *Yarrow*. 4. The common *Yarrow*, with purple flowers. 5. The noble *Yarrow*, or ſcented *Yarrow*. 6. The Montpelier ſweet *Yarrow*. 7. The hoary alpine *Yarrow*, with fleſh-coloured flowers. 8. The hoary alpine *Yarrow*, with beautiful flowers. 9. The woolly yellow *Yarrow*. *Tourn.* Inſt. p. 495.

The

The common *Yarrow* which is in flower on our ditch-banks, and in dry paſtures the greateſt part of the ſummer, is a much nobler medicine than is ſuppoſed. The medical writers have ſaid much of it as a vulnerary, and recommended its external uſe in tumors and ulcers; and internally, as a remedy for hæmorrhages of all kinds; in which caſes experience ſhews us, that a ſtrong decoction of the whole plant, roots and leaves, does wonders. The flowers of this plant have the ſingular property of yielding a fine deep blue oil, by diſtillation. The flowers of Chamæmile do the ſame; but we do not know any other plant, except theſe two, that do it.

MILLEMORBIA, in botany, a name given by ſome authors to the ſcrophularia, or figwort, from its ſuppoſed virtues in many diſeaſes. *Ger.* Emac. Ind. 2.

MILLEPEDA, in conchyliology, the name given by authors to a ſpecies of murex of the ſpider ſhell-kind, ſo called from the great number of prominences in the ſhape of points called feet in this ſeries of ſhells, which ariſe from its lip which is greatly extended. The body of the ſhell is full of bumps and tubercles, and the tail is long and crooked. See the article MUREX.

MILLEPEDES (*Cycl.*)—Well-known inſects, uſed on many occaſions in medicine. This inſect is otherwiſe called *Aſellus*, or *Oneſcus*, in Engliſh the *Wood-louſe*. Mr. Ray deſcribes ſeven different ſpecies of this inſect, ſome of which we ſee every day, others are more rare. Theſe are, 1. The common *Millepes*, called the *Aſellus Aſininus*; this is thinner and flatter than the blue kind, and carries antennæ ſtrait forward, and its colour is a pale browniſh grey; the laſt ring of its body is acute, not annular, and the appendages of the ſides are forked, as is alſo the tail. This kind is common in old walls, and under the barks of old trees. 2. The greater blue or livid *Millepes*; this is conſiderably larger than the former, and is of a duſky bluiſh black colour; the laſt ring of its body is annular, not pointed, its tail is not forked; its body, like that of the former, is divided into fourteen rings, and it eaſily rolls itſelf up into a round ball. 3. The great ſea *Aſellus*; this is three times as large as the common kind, its body is divided into twelve rings, its eyes are large and round, the antennæ are long, and are compoſed only of three points, the tail is double, and has four horns; its colour is ſomewhat paler than the common kind. 4. The mountain *Aſellus*; this is of the ſize of the livid kind, and in the ſame manner rolls itſelf up when touched; its body is divided into eleven rings, and its colour is a mixture of black and red. 5. The great Cornwall *Aſellus*; this is about an inch in length, its antennæ are very long, it has fourteen feet, and is of a reddiſh brown colour; it is diſtinguiſhed from all the other kinds by the ſhape of its tail, which is a flat lamina, divided into three points at the end; the eyes are ſmall and black, and the body is compoſed only of ſeven rings beſide the head and tail; the feet have all a ſort of hooks at their end, and the hinder legs are longer than any of the others. 6. The *Aſellus aquaticus*, or water *Millepes*; this is ſomewhat ſmaller and ſlenderer than the common kind, its antennæ are very ſlender, and its colour is a pale browniſh grey, with a dark ſtreak running down the back; its body conſiſts of ſeven joints, each of which has a pair of legs; its hinder pair of legs are longer than the others, and it has another peculiar mark, which is, there are two very ſlender horns iſſuing from the tail, and making a kind of fork. The 7th kind is the ſhort ſea *Millepes*; this is broader as well as ſhorter than the common kind, and has two appendages on each ſide the tail, which it uſes in ſwimming; this is of the ſame colour with the common kind, but has a black liſt running down the back; the eyes are ſmall, the body conſiſts of ten joints, beſides the broad tail; it rolls itſelf up in the manner of the blue *Wood-louſe*, and has under each ring of the body, beſide a pair of legs, two fins that ſerve it in ſwimming. *Ray*'s Hiſt. Inſ. p. 41.

The firſt and ſecond kinds are uſed in common in medicine; but the ſecond or blue kind, which rolls itſelf up into a ball, is the proper medicinal kind.

Beſide theſe proper *Aſelli*, there are ſome other ſpecies commonly called *Pulices marini*, which ſeem greatly to approach to their nature. Theſe are, 1. The horned ſea *pulex*; its body is compoſed of twelve joints, it has ſeven pair of legs, and the hinder ones are longer than the others, the antennæ are a pair of very large horns, and at the baſe of theſe there ſtand two other very ſhort and ſlender ones: It has fins to ſwim with, and it is of a whitiſh colour, and very ſlender body. 2. The *pulex marinus* of Bellonius; this is of the ſhape of the common *aſelli*, but ſomewhat ſlenderer and rounder bodied, and its legs are much longer; its back is brown, its eyes are large and black, and the antennæ are articulated and have two ſmall ones growing from their roots; its body is pellucid, and it moves very ſwiftly in the water; the tail is compoſed of a large bundle of hairs. This is found in great plenty under ſtones by the ſides of rivers near the ſea. 3. The freſh-water *pulex*; this differs very little from the laſt ſpecies, but is ſingular in the places it inhabits, which are the banks and mud of hot ſprings, in which no other animal can live. *Ray*'s Hiſt. Inſect. p. 44.

MILLEPORA, in botany, a name by which Linnæus diſtinguiſhes that genus of ſea-plants, of a hard ſtructure and full of holes, which are not ſtellate or radiated, in which it differs from the madrepora.

MILLERS-*Thumb*, in ichthyology, an Engliſh name for the fiſh called alſo the bull-head, and by authors the cottus. See the article BULL-HEAD.

Some are ſo erroneous as to ſuppoſe this fiſh, and the loach to be the ſame. See the articles LOACH, and COBITIS.

MILLIARIA *Cohors*, in antiquity. See the article COHORS *Equitata*.

MILLMOTH, in natural hiſtory, the name of an inſect approaching to the nature of the beetle, but having no ſheath wings. It is common in the abodes of millers and bakers, and other perſons who deal in meal.

MILPHOSIS, a word uſed by the antient medical writers, as a name of the diſeaſe of the eye-lids, by which the hairs fall off from them, and the edges become red and tumid.

MILTOS, in the natural hiſtory of the antients, the name of what we call reddle, a red earth of the ochreous kind, uſed in painting. The Greeks uſed the word in a leſs determinate ſenſe, and called all the red earths by this name, with adjectives derived from the names of the places where they were found, *&c.* to denote their differences.

Many however have thought too boldly, that the cinnabar found native, and called by the Greeks *minium*, was alſo comprehended under this name; but for this there is no warrant, and the paſſage in Pliny which gave birth to the opinion, is merely an error in the copies from the falſe pointing; and all that Pliny ſeems really to have meant, was, that the Greeks called reddle by the name of *Miltos*, and minium by that of cinnabar. Reddle ſeems to have been of very antient uſe in painting; for we have plain teſtimony in Homer, that it was uſed by the Greeks in the time of the Trojan war, that poet calling their ſhips by an epithet which ſignifies their being painted with reddle; and the accounts of the earlieſt painters, which tell us that they uſed only four colours, make reddle to be one of theſe four. *Hill*'s Theophraſt. p. 124. See the articles REDDLE and RUBRICA.

MILVAGO, in ichthyology, a name given by Geſner and ſome others, to a fiſh called by authors in general *milvus* and *cuculus*, and by ſome *lucerna*, and the flying fiſh. It is a ſpecies of the trigla, and is called by Artedi the trigla, with a ſnout bifid at the extremity, and the ſide-lines forked near the tail. See the article TRIGLA.

MILUS, μιλος, a name given by the Greek writers to a plant uſed in garlands, and ſometimes to a tree. Theophraſtus evidently uſes it as the name of a tree, and Crato as that of a garland herb.

It ſhould ſeem by compariſon of what they ſay of this *Milus*, that it is no other than a corruption of the word *milax*, or *ſmilax*. This we know was uſed as the name of the yew-tree, and alſo as the name of that climbing plant which we at this time call ſmilax; and what ſtrengthens the opinion is, that this creeping ſmilax was one of the common herbs uſed in garlands, having got into eſteem on theſe occaſions by the length and toughneſs of its branches, which were eaſily twiſted into any form, and wound round about whatever they pleaſed.

Pliny tells us, that it was a melancholy herb, and not fit for garlands; becauſe it had been once a virgin, and was turned into this form in conſequence of an unhappy love for the inconſtant youth crocus; but if this were to have been an objection to the uſe of theſe plants among the antients, thoſe garlands muſt have been either very thin, or made of paltry weeds; for the fancy of their poets had ſcarce let any flower or herb worthy obſervation paſs without ſome ſuch hiſtory.

There ſeems to have been no plant uſed ſo frequently in the rites of Bacchus as the *ſmilax*, or this climbing herb; and this is by the earlieſt writers ſometimes called *Milax*, or *Milos*, and ſometimes *Smilax*; ſo that it ſhould ſeem that they were only the ſame word differently ſpelt.

Euripides frequently mentions it in his Bacchi, and ſometimes celebrates it in flower, ſometimes in fruit, calling it καλλικαρπος, and ανθεσφορος, the elegant fruited and the flowery ſmilax; and this laſt ſenſe of it Pliny has taken, calling it *anthophorus*, the flowery ſmilax. Athenæus, in his fifth book, mentions the bacchides as carrying ſpears covered with vines, ivy, and ſmilax, or *Milos*. In this ſenſe of ornamenting garlands, ſpears, *&c.* they meant only the herb ſmilax, not the yew-tree.

MILVUS, the *flying fiſh*, the name of a fiſh remarkable for the length and ſize of its gill-fins, which it ſometimes makes uſe of to fly with: It is of the cuculus or gurnard kind, and is called by ſome the rondine, and by others the falcone. See Tab. of fiſhes, N°. 41.

Its general ſize is about ſix inches in length; its head is broad and flatted, and its body long and rounded, and very ſlender toward the tail. The ſpace of the forehead between the eyes is large and hollow, and the whole head is covered with a ſtrong bony cruſt; this is rough and of ſeveral colours, as blue, yellow, and purple: This cruſt covers alſo ſome part of the back, and terminates in two very long and ſtrong ſpines, which lie down upon the back: It is covered with very hard ſcales, every one of which riſes into a ſharp tubercle in the middle. The back is of the ſame colours with the head, but ſomewhat

ſomewhat duſkier. Its eyes are large, and the coverings of the gills terminate on each ſide in a very long and ſharp thorn, which is ſerrated on the outſide. The mouth is ſmall, and is placed low in the head; and its jaws are granulated, rather than toothed. Its belly is white, and its tail forked. Its gill-fins, commonly called its wings, are ſo long as when laid cloſe to the body to reach to the tail, and they are as it were double, a ſmall fin compoſed of a ſeries of ſhort nerves or rays connected by a ſmall membrane ſtanding before each. Theſe wings are of an olive colour on their upper ſide, and are ſpotted with very beautiful blue ſpots near their edges. *Willughby*'s Hiſt. Piſc. p. 284.

This fiſh, when it pleaſes, is able to riſe out of the water and fly to a conſiderable diſtance in the air; but when its wings are dry, is obliged to plunge again into the water to moiſten them. It does this often, when purſued by an enemy; and whole ſhoals have been ſeen thus flying together. It is common in the Mediterranean, and ſome other ſeas; but is not known in ours, nor in any of the colder climates.

MILVUS, in ornithology, the name of the common kite: A bird diſtinguiſhed from all other birds of prey, by its forked tail. It remains with us the whole year; but in many other countries is a bird of paſſage. *Ray*'s Ornithol. p. 41.

MILVUS *Æruginoſus*, in zoology, the name of the moor-buzzard; a bird of the long-wing'd hawk kind, ſmaller than the common buzzard, and not ſo flat on the head. Its beak is large and crooked, covered with a greeniſh yellow ſkin near the top, and black in other places. Its mouth is bluiſh within. Its head is of a whitiſh orange colour, variegated with black ſtreaks; its throat is of the ſame colour; and all the reſt of its body, as well back as belly, is of a duſky ruſt colour, only that in each wing there is a yellowiſh white ſpot; and the feathers at the root of the tail are yellowiſh. Its legs are long and ſlender, and of a yellowiſh colour. The inſide of its wing-feathers are whitiſh. It is common with us about heaths and marſhes. *Ray*'s Ornithol. p. 42.

MIMOSA, the *ſenſitive plant*, in botany, the name of a genus of plants, the characters of which are theſe: The flowers are uſually collected into tufts or heads, and each conſiſt of one leaf of a fennel-like ſhape, containing a great number of ſtamina: The piſtil ariſes from the bottom of the flower, and finally becomes either a ſimple bivalve pod containing a number of oblong ſeeds, or elſe a compound one made up of ſeveral parts joined to one another by a ſort of tranſverſe articulation, each containing one roundiſh ſeed. To this it is to be added, that the leaves of all this genus of plants, when touched, become capable of a ſort of reciprocal motion. *Tourn.* Hiſt. p. 605.

The ſpecies of *Mimoſa*, enumerated by Mr. Tournefort, are theſe: 1. The common *ſenſitive ſhrub*. 2. The prickly and more *ſenſitive Mimoſa*. 3. The broad-leav'd *ſenſitive plant*, with pods collected in round cluſters. 4. The Jamaica *ſenſitive plant*. 5. The prickly Pernambuco *Mimoſa*. See the article SENSITIVE *Plant*.

MINA, or MNA, among the antient Greeks, a piece of money worth an hundred drachmas.

The *Mina* was ſomewhat more than three pounds Sterling; ſixty *Minæ* made the Attic talent. *Danet.* in voc. See the article COIN, *Cycl.*

MINCA, a name given by the antients to a very coarſe and bad kind of myrrh.

MINCHA, in the Jewiſh cuſtoms, offerings of meal, cakes, or biſcuits, made in the temple of the Lord [a]. The Seventy have ſometimes preſerved this word in their tranſlation [b]; but inſtead of *Mincha* they read *Manaa*, which doubtleſs was the received pronunciation in their time. We find *Manaa* in the ſame ſenſe, in Baruch i. 10 [c].—[[a] Levit. ii. 3, *&c.* [b] See the Greek of Jerem. xvii. 26. Dan. ii. 46. 2 Kings viii. 5, 9. xvii. 7. xx. 12. 2 Chron. vii. 7. Nehem. xiii. 5, 9, *&c.* [c] *Calmet.* Dict. Bibl.]

MINE (*Cycl.*)—The diſcovery of *Mines* is not always attended with a certainty of advantage. The firſt thing to be conſidered in regard to it, is whether it can be dug to profit; and to be able to determine in this reſpect, we are duly to weigh the nature and ſituation of the place, and compare the reſult of the whole with the profit from the richneſs of the ore, and the charges of digging, ſmelting, and working it.

A *Mine* is either found in a mountain, a hill, a valley, or a flat; of theſe, mountains and hills are dug with greateſt eaſe and conveniency, chiefly becauſe the drains and burrows, that is, the adits and avenues may be here readily cut both to drain off the water, and to form gangways for bringing out the ore. In whatever place the *Mine* lies we are to look for the veins, which rains or other accidents may have diſcovered; and where ſuch a vein is found, if it be tolerably large and rich, it is beſt to open the *Mine* there. Otherwiſe the moſt commodious place for ſituation is to be choſen, that is, neither on a flat, nor on the tops of mountains, but in their ſides. *Shaw*'s Lectures, p. 244.

The beſt ſituation for a *Mine*, is a mountainous, woody, wholeſome ſpot, of a ſafe eaſy aſcent, and bordering upon a navigable river. For wood is indiſpenſably neceſſary for making the engines and inſtruments, building the huts, fencing in the works, and working the ores. But tho' wood ſhould be wanting, if a navigable river be nigh, that may be ſupplied, as water-carriage is cheap. Water however muſt never be wanting. This is beſt ſupplied by a large river, and is neceſſary on a thouſand occaſions, to waſh the ores, turn the works, *&c.* Good convenience of carriage muſt alſo be regarded, both for the carrying the ore or metal to market, and the bringing neceſſaries to the workmen: For proviſions are ſeldom to be found where there are *Mines*. See the articles DIGGING, MINING, and TRACING.

MINE-*Dial*, is a box and needle with a braſs-ring divided into 360 degrees, with ſeveral dials graduated thereon; generally thus made for the uſe of *Miners*.

MINERAL (*Cycl.*)—*Engliſh*-MINERALS. Dr. Woodward has obſerv'd, that the Engliſh *Minerals* are much more valuable and numerous, than has been generally ſuppoſed. Fullers-earth, a thing ſo cheap as to be diſregarded by many, he obſerves, is of almoſt as much value to our commerce, as any article of foreign production. The property this earth has of imbibing oil and greaſe, is not confined to the trifling ſervice of taking out accidental ſtains in clothes, but it is of ſo much uſe in cleanſing the wool and the cloth made of it, that we could never have flouriſhed in the cloth-trade in the manner we have done, had we not this foſſil among us ſo very plentiful and cheap, and at the ſame time ſo excellently good. This earth is one inſtance of the pre-eminence of our ſoil above others. Another inſtance we have in our black-lead or wadd, a *Mineral* of great uſe and value in ſeveral branches of trade and arts; and which is found no where fine and good, except in England, and in our colonies; and that of the laſt place, tho' better than the black-lead of other nations, is greatly inferior to our own.

The amber and jet of England are found in conſiderable quantity, and are equal to thoſe of any other part of the world. Our cannal-coal comes very near the beauty of jet; and even our common coal for firing is greatly ſuperior in goodneſs, to that of any other part of the world, and is no where found in ſuch vaſt plenty as with us. The Engliſh earths and gravel are well known to be ſuperior to thoſe of other countries, in none of which ſuch graſs-plats or ſuch gravel-walks are to be ſeen, as in the Engliſh gardens. We have ſtones, ſlates, flags, and the other neceſſary foſſils for building, in ſufficient plenty.

Vitriol and alum are found in greater plenty in England, than in any other country; and are ſo eaſily worked or procured from their ores, that we can ſell them cheaper than any other people. *Woodw.* Cat. Foſ. Vol. I. p. 5.

Tin is another article in which England has always had a great pre-eminence; the county of Cornwall alone produces more tin than all the world beſide; and the tin of England is well known to excel that of other nations, as well in value as in quantity.

Lead ore is alſo richer in England than in any other country, and is found in greater quantity here than any where elſe; beſide this, it runs more kindly in the fire, and requires leſs trouble and expence in the working, than any other lead; and is, when wrought, much finer and more ductile, than any other lead.

This does not ariſe from any peculiarity in the metal, for lead is the ſame in all countries, when equally purified; but the ſpar which lies about, and is mixed with our lead-ore, is of ſuch a nature and diſpoſition, that it is eaſily wrought upon and readily parts from it, leaving the metal more pure than it can be procured by the common large operations in other countries; ſo that they are forced to ſend it away much leſs pure than ours is.

Copper and iron are alſo found in England in very great plenty, and ſeveral ores of theſe metals have of late been brought into uſe, which were not known before the modern improvements in chemiſtry.

MINERAL *Waters*. See the article *Mineral* WATERS.

Earth of MINERAL *Waters*. See the article EARTH.

MINERAL *Juices*. See the article JUICE.

MINERAL *Courts*, *Curiæ Minerales*, in law, courts for regulating the concerns of lead-mines; as *ſtannary courts* are for tin. *Blount*.

MINERVALIA, among the Romans, called alſo *Quinquatria*, were feaſts celebrated in honour of Minerva. They began March 19th, and laſted five days. The firſt day was ſpent in prayers to the goddeſs; the reſt in offering ſacrifice, ſeeing gladiators fight, acting tragedies upon mount Albanus, and reciting pieces of wit, wherein the conqueror had a prize given him. Scholars had then a vacation, and made a preſent to their maſters, which was called *Minerval*.

MINICULATOR, among the Romans, a ſervant who embelliſhed any writing with *Minium*. *Hoffm.* Lex. in voc. See the article MINIUM, *Cycl.* and *Suppl.*

MINING, the ſinking or digging into the earth in ſearch of metals, or other valuable foſſils.

The neceſſity of cleaving and opening rocks has been always accounted one of the moſt troubleſome articles in the buſineſs of *Mining*; they being often compoſed of ſuch ſtone as tools can work but very ſlowly upon in the common ways. Fire and gunpowder have been the two things principally had recourſe to on theſe occaſions; and both ſucceſsfully, but in dif-

ferent ways. The fire calcines ſtones, and they then eaſily become ſhattered to pieces, and give way to tools that would not touch them before; but in this caſe, beſide the expence of wood, the hindrance of the labourers is an article to be conſidered, for the rocks are made ſo hot all about the place where the fire has been, that the people cannot get to work again of a day or two, and then the effect of fire reaches but a little way in the rock.

Gunpowder makes its way much farther, and at the ſame time is much cheaper and does not delay the work, but the labourers may go on immediately afterwards. There have been many ways contrived of uſing this, but one of the ſimpleſt and beſt, ſeems that delivered by Mr. Beaumont, in the Philoſophical Tranſactions. For this there are only three ſimple inſtruments required, a borier, a gun, and the quinet or wedge. Theſe are the names the *Miners* on Mendip hills give the inſtruments. The borier is an iron inſtrument, ſteeled at the end; it is two foot two inches long, and is ſomewhat thicker at the ſteel'd end than in any other part: The uſe of this is to make the hole in the rock deep enough to receive the powder. The gun is about ſix inches long, and an inch and quarter in diameter; and has a hole drilled through it, to receive the priming. The quinet is a wedge of iron of about ſix inches long, and ſo ſhaped that its flat part on one ſide joins with a flat part in the gun made to receive it, and by that means the gun is faſtned very firmly in its place. Philoſoph. Tranſ. N°. 167. p. 854.

The manner of uſing theſe inſtruments, is this: One man holds the borier on the rock, turning it round while another forces its point in by blows of a large hammer on the other end. When the hole is made ſomewhat deeper than the length of the gun, they dry it with a rag, and then put into it two or three ounces of powder; over this they lay a paper, and then they put the gun into the hole, and faſten it in by driving in the quinet or wedge againſt its flat part. When the powder and gun are thus fixed, they paſs down a wire through the hole drilled in the gun, and with this they pierce a hole through the paper which covers the powder; they then prime the gun, and lay a train with a lighted match; but all go out of the *Mine* before the gunpowder takes fire, and as ſoon as it has gone off they go down to work again, finding the rock ſplit and the inſtruments unhurt. The paper in this caſe is put over the powder only that the tools may be ſafely employed in driving down the gun and the quinet, becauſe were not the powder covered it might do miſchief to the workmen by going off by ſome ſpark cauſed by ſtriking either againſt thoſe inſtruments or againſt the rock itſelf.

MINIUM, (*Cycl.*) in the natural hiſtory of the antients, a name given to what we now call *Cinnabar*. A native mineral of a ſhinining red colour, out of which quickſilver was extracted.

This native mineral becoming much in uſe, was ſoon adulterated, and that commonly with lead ore calcined to a redneſs; and hence, after the two words *Minium* and *Cinnabar* had been long uſed in common, the cinnabar became retained only to the native mineral, and the *Minium* to that adulterated with lead-ore, or to the red adulterating matter alone, which is the ſenſe in which it is ſtill uſed.

The word *Cinnabar* however, by which they at laſt diſtinguiſhed it, among the oldeſt writers on medicine, was uſed as the name of a very different ſubſtance, a vegetable juice of a ſtrong red colour, called by us dragon's blood, and among them long believed to be the dry'd blood of dragons; and when the antients called the mineral body here deſcribed by the ſame name, they always diſtinguiſhed the other cinnabar, where they had occaſion to name it, according to their uſual method by an adjective derived from the name of the place whence it was brought, calling it *cinnabari Indicum*, the Indian cinnabar.

The native *cinnabar* of the antients was the ſame with ours at this time, and was found in the ſame variety of forms. Theophraſtus tells us, that it was hard and ſtony, and that they had it from Spain and Colchis, where it was produced among the rocks. *Hill*'s Theophraſt. p. 140.

Many have ſuppoſed, from the name of a factitious *cinnabar* among the moſt antient writers, that they were acquainted with our method of making the artificial *cinnabar*; but this was by no means the caſe. What they called factitious *cinnabar*, was, according to the ſame Theophraſtus, no other than a fine arenaceous ſubſtance of a ſcarlet colour, and very bright and ſhining, which they had from one particular place only, which was in the country above Epheſus. This they carefully collected, and rubbed to a fine powder, in veſſels made of ſtone, and afterwards waſhed it in other veſſels of braſs or of wood; the coarſer matter they went to work upon again, rubbing and waſhing it as before, till by theſe repeated powderings and waſhings they ſeparated all the pure cinnabar, which always ſunk to the bottom of the veſſels, leaving the accidental foulneſſes at top.

The factitious *cinnabar* of the antients, was therefore no other than a preparation of a native mineral, which contained a quantity of true cinnabar mixed among a large quantity of other matter, and the operation conſiſted in nothing but the ſeparating it from its other matter. The invention of this is attributed to one Callias, an Athenian, who belonged to the ſilver mines; and was diſcovered, as moſt other things have been, by accident. This man had got together a vaſt quantity of this ſand, ſuppoſing from its colour and brightneſs that it contained gold; and tho' he found himſelf miſtaken in that, yet the working on it in hopes of diſcovering that precious metal diſcovered to him this excellent paint. See the article CINNABAR, *Cycl.* & *Suppl.*

The method in which *Minium* is made in large quantities with us, is this: They firſt burn lead in a furnace into a kind of litharge, by continually ſtirring it while melted with an iron rake; this they afterwards grind with two pair of ſtones, which deliver it from one to another, the firſt pair grinding it coarſer, the ſecond finer; theſe are worked by means of a mill which moves ſix pair of them at once. When thus reduced to a fine powder, it is waſhed and then put into a furnace, and is burnt with a reverberatory fire for two or three days, all the while they continue ſtirring it with a large iron rake, hung on a ſwivel or iron hook; and toward the end of the time they watch its being of the right colour. When this is doing, the fire muſt not be carried beyond a certain degree, leſt the matter clod and run together. *Ray*'s Engliſh Words, p. 138.

MINIUM, in medicine, is uſed externally; it obtunds the acrimony of the humors, allays inflammations, and is excellent in the cleanſing and healing of old ulcers: It is uſed, on theſe occaſions, in many of the plaſters and ointments of the ſhops.

MINORATIO, a word uſed by the antients to expreſs a ſlight or moderate evacuation, only ſerving to leſſen the humors, not to carry them off.

MINOW, or MINIM, in ichthyology, a name given by the Engliſh to the ſmall fiſh, called by authors the phoxinus. According to the new Artedian ſyſtem, this is a ſpecies of the cyprinus. See the articles CYPRINUS, and PHOXINUS.

MINT (*Cycl.*)—All the ſorts of *Mint* of which we have ſeveral propagated in gardens for medicinal uſe, are to be propagated by parting the roots in ſpring, or planting cuttings in any of the ſummer months, but they muſt have a moiſt ſoil; and if the weather proves dry, they will require very frequent waterings, after they are firſt planted. They ſhould be planted in beds of four foot width, with walks two foot wide between them, and ſhould be ſet at five inches diſtance. And they ſpread ſo faſt at the roots that the beds ſhould never ſtand above three years before they are taken up and tranſplanted; for the roots after this time will mat and clog together, ſo as to choak one anotber. *Miller*'s Gardener's Dict. See the article MENTHA.

Many people are fond of *Mint* ſallad early in the ſpring; the way to propagate this, is to take up ſome roots of *Mint* before Chriſtmas, and plant them pretty cloſe upon a moderate hot bed, covering them an inch deep with freſh earth; the beds muſt then be covered either with mats, or frames and glaſſes, and in a month's time the *Mint* will come up and will ſoon be fit for uſe.

When *Mint* is cut for drying, it ſhould be done juſt when it is in flower, and muſt always be done in a dry day; for if cut in wet weather, the leaves will change black. It ſhould then be ty'd in ſmall bunches, and hung in a ſhady place upon lines.

If the ſoil be good, *Mint* will afford three crops every ſpring; but after July, they ſeldom are ſo good, ſo that the ſhoots made after that time ſhould be ſuffered to remain till the end of September, to be cut for drying. After this cutting there ſhould be about an inch of freſh earth ſifted over them, which will make them ſhoot much better the following ſpring.

No plant grows ſo vigorouſly and readily in water as *Mint*; and therefore none is ſo proper to try experiments in vegetation upon.

It is generally ſuppoſed, that plants are the ſame in their taſte and virtues in whatever ſoil they grow; and this is true in regard to all of them, while they live and flouriſh; the greateſt difference being only in degree.

But plants removed into a ſoil in which they cannot thrive, but in which they will be killed in time, are often altered in their nature, before they periſh. This is inſtanced in nothing ſo clearly as in experiments made on *Mint*, growing in glaſſes of water. Let ſeveral ſhoots of the plant grow in this manner till very vigorous and ſtrong, and then place near one of them a glaſs of water in which ſea-ſalt is diſſolved, remove one of the roots from the freſh water into this, and the plant will be killed in a few days; and its leaves, ſtalk, and every part will taſte ſtrongly of ſea-ſalt, though none could be imbibed any other way than by this ſingle root. Let another plant of *Mint* be ſet near a bottle of ink, and one of its roots put into the ink, the whole plant will in a few days become black, and after that yellow, and will taſte of the copperas.

It is leſs wonderful that theſe unnatural ſalts ſhould affect the *Mint* in this manner, than that the infuſion of another plant ſhould do it; yet this is evidently the caſe. Let a quantity of the ſeeds of wild garlic be bruiſed and put into water, and let two or three of the roots of a vigorous plant of *Mint* growing in common water be put into this liquor, the whole plant will in a few days decay, and the whole plant being

chew'd

chew'd in the mouth will be found to have a very ſtrong flavour of garlic.

MINT, in medicine, is a famous ſtomachic and carminative; it is alſo eſteemed a great cephalic. There is a ſimple water, and an eſſential oil of it kept in the ſhops. The plant itſelf is taken by way of infuſion or decoction, and enters many compoſitions for the above intentions.

MINUET, or MENUET, in muſic, a compoſition anſwering to a kind of dance of the ſame name, ſaid to be invented in Poitou; the motion whereof is triple. It has commonly two ſtrains, each played twice over; the firſt has four or eight bars; the laſt note of which ſhould be either the *dominant*, or *mediant* of the mode, never the final; and the ſecond has eight bars, it uſually ends on the final of the mode, with a pointed minim or whole bar. *Broſſard.*

MINUTE *Tithes*, *Minores Decimæ*, ſmall tithes of wool, lambs, pigs, butter, cheeſe, *&c.* 2 Inſt. 649. *Blount.*

MIRALETUS, in ichthyology, a name given by Bellonius and ſome other writers, to the ſpecies of ray, commonly called by others *raja oculata*. This is accurately diſtinguiſhed by Artedi, by the name of the ray with a ſmooth back and belly, and with a row of ſpines round the eyes, and three other rows of them on the tail.

MIRROR (*Cycl.*)—*Burning*-MIRRORS. An experiment has of late been tried with a machine invented by Mr. De Buffon at Paris, conſtructed of a number of *Mirrors*, which ſeems the great ſecret of Archimedes revived, and vindicates the credit of antiquity in this point.

The machine conſiſts of 140 ſmall plane *Mirrors*, each about four inches long, and three broad; theſe are fixed at about a quarter of an inch diſtance from each other upon a large wooden frame about ſix foot ſquare, ſtrengthened with many croſs-bars of wood; for the mounting of theſe *Mirrors* each of them has three moveable ſkrews, which the operator commands from behind, and which are ſo contrived that the *Mirror* can be inclined to any angle, and in any direction that meets the ſun; and by this means the ſolar image of each *Mirror* is made to coincide with all the reſt.

They firſt tried the experiment with only 24 of the *Mirrors*, which readily ſet on fire a combuſtible matter which they had prepared of pitch and tow daubed upon a deal-board, at the diſtance of ſixty-ſix French feet. The only difficulty that was found, was the making the ſolar images exactly coincide; but this was the fault of the apparatus. Philoſ. Tranſ. N°. 483.

This trial, and ſo much ſucceſs from it, engaged the inventor to puſh the attempt much farther; he put together therefore a kind of polyhaedron conſiſting of 168 pieces of plane looking-glaſs of ſix inches ſquare each, and by means of this with the faint ray of the ſun in the month of March he ſet on fire ſome boards of beech-wood at an hundred and fifty foot diſtance; and by increaſing the number of the *Mirrors*, he is in hopes of doing the ſame at nine hundred feet off. This machine has, beſide other advantages, the convenience of being able to burn downwards or horizontally, as one pleaſes; and it burns either in its diſtant focus, or in any nearer interval, which our common burning-glaſſes cannot do, their focus being wholly fixed and determined. And perhaps this machine may afford a manner of meaſuring either light or the different degrees of heat of burning bodies. The difficulty is to find the method of marking the degrees and of fixing a point of compariſon, for the point of kindling will not determine it, becauſe that chiefly depends upon the greater or leſs degree of inflammability of different combuſtible bodies. Phil. Tranſ. N°. 483.

MIROUETTE, in the manege, is uſed for a dapple bay. See the article DAPPLE.

MISADIR, or MIXADIR, a name given by ſome authors to ſal armoniac.

MISEN, MISSON, or MIZEN, in a ſhip, denotes either the maſt, or ſail of that name; but at ſea, they always mean the ſail when the word *Miſen* is uſed.

The uſe of the *Miſen* is, to keep the ſhip cloſe to a wind: Wherefore if a ſhip is apt to gripe too much, they uſe no *Miſen*. But it is often uſed when a ſhip rides at anchor, to back her a-ſtern; ſo that ſhe may not foul her anchor, on the turning of the tide; and ſometimes a ſhip lies a-try with her *Miſen* only. See the article MAST, *Cycl.*

Set the MISEN, at ſea, the word of command to fit the *Miſen*-ſail right as it ſhould ſtand.

MISEN-*Stay*, in a ſhip. See the article STAY, *Cycl.*

MISEN-*Yard*, in a ſhip. See the article YARD, *Cycl.*

MISERERE-*Mei*, (*Cycl.*) a name by which many authors call the *Iliaca Paſſio*, or what is vulgarly termed a twiſting of the guts. Medical writers diſtinguiſh this into three kinds: 1. The convolutionary. 2. The hernioſe. And 3dly, the obſtructionary.

In the convolutionary kind, the ſituation of the inteſtines in regard to one another is altered, and very frequently has a remarkable duplicature. In the hernioſe kind, the inteſtines, diſtended with fæces and with flatulencies, are received into the ſcrotum, or ſome other part, ſo as not eaſily to be reduced into their natural places. And in the obſtructionary, there is no other cauſe but a violent coſtiveneſs.

The *Miſerere* differs from the ordinary kinds of colic, in degree, as all the ſymptoms are greatly more violent in this caſe; and in its ſituation, as the ilion and ſmall guts are affected in this, and in the other colics uſually the larger; and it is always a much more dangerous caſe than an ordinary colic.

Signs of it. Theſe are extremely ſharp and violent pains acroſs the navel, a remarkable anxiety of mind, with frequent eructations and heartburn, and great internal heat; a violent obſtruction in the bowels, in which glyſters have very little or no effect; and as the diſeaſe increaſes, a vomiting, which, as it continues, at length brings up the ſtools by the mouth, with violent pains, and frequent faintings; after this, unleſs the medicines take place, there comes on an inflammation of the ilion, and thence a ſuppuration and mortification, on which the pains inſtantly go off, and the patient falls into cold ſweats, and dies in a very little time after. It is a very rare caſe, and though many colics are called by this name, yet in reality it is rarely met with. People, however, of all ages and ſexes, are equally ſubject to it from the following cauſes.

Cauſes of it. Theſe are either a convolution of the inteſtines, with an immediate inflammation, or a tumour in the parts of the inteſtine contained in the hernial ſack, and the uſe of violent and powerful aſtringent medicines bringing on ſuch a coſtiveneſs as never happens naturally. Violent commotions of the body in leaping, riding, or running, have been known ſometimes to bring on the diſeaſe, as alſo violent ſneezing and coughing, and the carrying of too great weights; as alſo crude foods, and ſuch as have been indurated by ſmoak, and flatulent and fermenting liquors. Sometimes alſo it has been evidently owing to worms killed in the bowels, and not voided by ſtool.

Prognoſtics in it. This is a very terrible diſeaſe, both in regard to the danger that attends it, and to the pain. In caſes where its origin is from a diſtortion and convolution of the inteſtines, there is very little hope of recovery; and when it ariſes from a hernia, it is very often fatal alſo, eſpecially when attended with an inflammation and plethora. Its mildeſt ſtate is when it ariſes only from indurated ſtools, and an obſtinate coſtiveneſs; this is uſually cured, if proper aſſiſtance be given in time.

Method of Cure. When a convolution of the inteſtines is the cauſe, the whole effort is to be uſed to explicate them; but this is a thing more eaſily conceiv'd in the mind than effected; to this purpoſe ſome recommend the ſwallowing of a muſket-bullet, others a globule of antimony, and others a pound of quickſilver, taking before-hand a ſpoonful or two of oil of ſweet almonds, and ordering motion by walking or riding afterwards; others adviſe the introducing the noſe of a pair of bellows into the orifice of the rectum, and blowing up into the inteſtines; but as that gut is uſually ſo conſtricted in this caſe, as ſcarce to admit the pipe of a clyſter apparatus, there is no great hope of ſucceeding in the other attempt; and others finally adviſe the throwing in the fume of tobacco. The diſcuſſion of the inflammation is ſcarce leſs neceſſary than the other; this is to be done by powders of nitre, cinnabar, and crabs eyes, taken four times a day, and by rubbing the abdomen with camphorated ſpirit of wine, in which ſaffron has been infuſed; bags of carminative ingredients, with camphor, may alſo be applied to the abdomen with good effect: And finally, if there be a plethoric habit, bleeding is a very neceſſary operation.

In caſes where this is occaſioned by a hernia, the firſt thing to be done is the reducing the inteſtine into its proper place. To this purpoſe the patient muſt lie upon his back, and emollient and carminative fomentations muſt be applied to the part, made of decoctions of marſhmallows, camomile flowers, and the ſeeds of aniſe fennel, and fœnugreek, boiled in milk; and, when there is no inflammation, fomentations of this kind may be applied in the manner of cataplaſms, by wetting a ſponge with them, and applying it to the part. An inflammation is carefully to be guarded againſt, by nitrous medicines, and by gentle diaphoretics, and as ſoon as the gut is replaced, clyſters muſt be given to bring on again a laxity of the bowels.

When the caſe only ariſes from an induration of the fæces, there are firſt to be given internally nitrous and cinnabarine medicines, to prevent or take off an inflammation, and at the ſame time clyſters are to be given, with the emollient decoctions, and a little nitre and camphor, with ſome oil; and if it be neceſſary for a yet farther ſtimulus, ſome venice ſoap may be added; acrid ſuppoſitories are to be introduced into the rectum, and the ſoap plaſter to be applied to the abdomen, or elſe ſpirit of wine camphorated is to be rubbed in; bags with carminative ingredients may alſo be applied warm, and where the ſtate is plethoric, bleeding is neceſſary.

Theſe are the general methods, and uſually one or other of them takes effect in the milder caſes. But it is to be obſerved, that honey, though ordered by ſome, is never to be put into theſe clyſters, for where there is an inflammation, it promotes ſuppuration. Clyſters of common warm water, with ſalt, have ſometimes been found to have very great effect. The patient is to be kept warm during the courſe of the diſeaſe, and the diet is to be very ſparing, though the drinking warm liquors is to be indulged. *Junker*, Conſpect. Med. p. 574. ſeq.

MISERICORDIA,

MISERICORDIA *in Cibis & Potu*, in our old writers, is uſed for any gratuitous portion of meat and drink, given to the religious in convents beyond their ordinary allowance. *Matt. Paris.* And in ſome convents they had a ſtated allowance of theſe over-commons upon extraordinary days, which were called *Miſericordiæ Regulares.* Mon. Angl. T. 1. p. 149.

MISGUM, in zoology, the name of a fiſh of the anguilliform kind, but broader and flatter than the eel, and of much the ſame ſize from the head to the tail. It has five black lines, one on the back, two which are ſomewhat broader, in the middle of the ſides, and two others which are narrower lower down; theſe are all extended from the head to the tail. The intermediate ſpaces, and the belly, are of a ſomewhat bluiſh white, dotted with black ſpots. The fins are alſo ſpotted in the ſame manner. The mouth is ſmall and round, like that of the lamprey, and is ſurrounded with beards, ſix on the upper jaw, and four on the under. And there are two other very ſlender ones near the noſtrils. The eyes are ſmall; the gills four on a ſide; and beſide the back fin there are four, two near the gills, and two lower on the body. This is a common fiſh about the German ſhores, and is eſteemed a very delicate one at the table. It lays its ſpawn in March, and is in beſt ſeaſon for eating in January and February. It is caught principally in ſtanding and muddy waters; and it is ſaid, that when out of water, it makes a ſort of hiſſing noiſe. *Willughby*, Hiſt. Piſc. p. 119.

MISLETOE (*Cycl.*)—It has been formerly ſuppoſed that the *Miſletoe* was produced as a ſort of excreſcence from the tree it is found on; but time and experiments have ſhewn, that it is raiſed like other plants from ſeeds. Its berries are of a viſcous nature, and ſticking to the beaks of the birds that eat them, they may be rubbed off againſt the branches of other trees, and there take root and grow, but this is not neceſſary for their propagation, for the great numbers of plants of it uſually found on the ſame trees, ſeem to prove very plainly, that it is produced by the falling of its ſeeds, like all other plants, but that the matrix for theſe is not earth, but the branches of a living tree.

The trees on which *Miſletoe* is principally found, are the apple, the aſh, and other ſmooth-rind'd ones. It is very rarely found upon the oak; and though it may eaſily be propagated by its ſeeds on other trees, yet it has not been found to take readily upon the oak. *Miller*, Gardener's Dict.

Ariſtotle thought that *Miſletoe* was not a plant produced from ſeeds, but a mere excreſcence of the trees on which it was found, produced either by an extravaſation of the nutritive juices of the tree, or by a tranſpiration of it; and many authors who have written of it, have been of the ſame opinion. But Theophraſtus and Pliny were of opinion that it ow'd its origin to ſeeds, but that they muſt neceſſarily paſs through the bowels of a bird before they were in a condition to grow.

The ſeeds of *Miſletoe* are ſo ſoft, that one would imagine they would be digeſted by the ſtomach of a bird. Bonone, however, has obſerved, that they are voided entire; but there is no neceſſity of ſuppoſing their paſſing this ſtate, in order to their germinating. Malpighi has very perfectly deſcribed the ſeeds of *Miſletoe*; he ſays, that it germinates by puſhing out two horns from two of its angles; and Camerarius has made the very ſame obſervation. But the firſt account we have of *Miſletoe*'s being regularly raiſed by planting the ſeeds, is from Mr. Ray, who mentions its having been done by Mr. Doody.

The fruit of the *Miſletoe* are roundiſh ſoft berries, faſtened by a ſhort pedicle to the bottom of a fleſhy cup. That part of the berry which ſtands oppoſite to this pedicle, is ſomewhat flatted, and there may be ſeen there a ſmall ſhining brown body of an oval figure, which is that part of the piſtillum called by Linnæus, the *ſtigma*; and round about this ſtigma there are four longiſh marks, which ſhew the places where the leaves of the flower have been faſtened. The ſkin of the fruit, when ripe, is very ſmooth, tranſparent, and tough, and on examining it by the microſcope, it is ſeen very full of veſſels produced from the pedicle, and making frequent anaſtomoſes with one another. Within this is the ſeed wrapped up in a viſcous matter, and of a flatted ſhape, and greeniſh colour; they are beſt ſeparated from this viſcous matter by ſteeping in warm water, and are uſually found to be triangular, ſometimes oval.

When a berry of *Miſletoe* is cruſhed and broken againſt the bark of a tree, the viſcous matter which ſurrounds the ſeed ſoon dries away into a thick and tough ſkin, which ſurrounds the ſeed, and keeps it faſt down to the bark; but the rains frequently waſh theſe off afterwards, eſpecially when they have fallen upon the ſmoother part of the bark, or upon ſuch parts of a tree as are clean and free from moſs. And hence it is, that moſt of the *Miſletoe* we find, is either found upon the under part of the branch of a tree from whence the rain could not ſo eaſily diſlodge it, or on ſuch as have a rough bark, or are in part covered with the common tree-moſſes.

Mr. Du Hamel determined to inveſtigate the nature of this odd plant, put ſeveral of the ſeeds of it into ſmall ſlits, which he cut in the barks of different trees, by that means to defend them from being waſhed away by rains, and theſe all ſucceeded well and ſhot, except thoſe he planted on the fig, on which he made ſeveral unſucceſsful attempts; the miſchief done to the ſeeds by the milky juice of this tree, was probably the cauſe of this. It is no wonder that *Miſletoe* grows equally on all ſorts of trees, ſince there requires no more to make it grow than the effect of the rains and night dews; and this author found the ſeeds ſhooting on earthen pots and ſtones, which he kept ſhaded from the heat of the ſun; and from parallel experiments it ſhould ſeem alſo, that the tranſpiration of trees helps greatly the germination of theſe ſeeds.

The ſeeds of *Miſletoe* ſown, if we may ſo call it, on the bark of trees in February, begin to ſhoot in June, and at that time there are ſeen two little round bodies iſſuing out at the two angles of the triangular ſeeds; but as theſe ſeeds are ſubject to ſome irregularities in their figure, ſo they alſo are in their germination, for from the oval ſeeds there is only one ſhoot, and from thoſe which are irregularly angular, there are ſometimes four or five.

Each of theſe round bodies is faſtened to a pedicle, which has its inſertion in the fleſhy part of the ſeed, in which there are a ſort of grooves, which make it ſeem as if theſe pedicles came out of a ſort of caſe.

This ſort of germination is peculiar to *Miſletoe*, no other ſeed ſhooting out ſo many radicles. Theſe alſo are often found of very different lengths, tho' coming from the ſame ſeed, nor do they all appear at the ſame time, but ſeem to vegetate differently and diſtinctly.

The length of theſe radicles is in a great meaſure owing to the poſition of the ſeed on the branch of the tree, for they always grow in length till they reach the bark; ſo that if the ſeed be ſo placed that the germ iſſues out cloſe to the tree, it is proportionably ſhort; but if it happens to proceed from the upper part of the ſeed, it bends and grows in length till it reaches the bark to which it is to be fixed.

Mr. Du Hamel, willing to try how far this elongation of the radicle might be carried, placed two ſeeds of *Miſletoe*, which had already germinated, upon a ſmall ſupport, raiſing them from the branch of the tree. In the one of theſe the radicle was turned toward the branch, tho' at an unnatural diſtance, in the other it was directed a contrary way. The conſequence was, that the firſt grew to twice its natural length, and then the blackneſs of the round body at the end ſhewed it began to decay; after which it grew no more; the other turned its germ back to the ſupport, and fixing there, periſhed for want of nouriſhment. Another time, making a hole in the branch of a nut-tree, juſt when the radicle of a *Miſletoe* ſeed was ſtriking, he cauſed the radicle to grow to twice its natural length, and it finally reached the bottom of the hole, and ſtuck there, and produced a vigorous plant. It is to be obſerved alſo, in regard to the germination of theſe ſeeds, that they are the only ones in which the radicle takes indifferently any direction, in all other ſeeds it points ever downwards only.

The ſeeds of *Miſletoe* will ſhoot equally well on the upper and under ſides of a branch of a tree, and thoſe on the upper will bend their radicles downward, while thoſe on the under will ſtrike theirs directly upward with the ſame eaſe.

The radicles of *Miſletoe* are, as has been already obſerved, compoſed of a little round body, ſuſtained by a pedicle. When this pedicle has grown to ſuch a length that the round body touches the bark, it opens before into the ſhape of the trunks of flies, and other inſects, and by this means touching cloſely at all its edges, it becomes faſten'd extremely firm to the tree. From this reſemblance in ſhape to the trunks of ſmall animals, Dr. Du Hamel calls theſe radicles the trunks of the ſeed of *Miſletoe*. The ends of theſe trunks of the radicles are alſo faſtened to the bark of the tree by a viſcous matter, which, when the trunk is gently raiſed, draws out into ſtrings on all ſides to ſome length.

In the inner part of this trunk, or open button, there are two ſubſtances to be diſtinguiſhed; in the center there is a white granulated matter, and round that a greeniſh one; both theſe are juicy, but the outer leſs ſo than the central white part; the outer one is plainly the ſame with the outer rind of the root of the *Miſletoe*, or the ſecond bark of its trunk. Theſe both very quickly adhere to the tree, ſtriking their ſeveral granulæ into it, and theſe furniſh afterwards the roots of the *Miſletoe*.

The outer bark of *Miſletoe* is thin, of a deep green, and ſomewhat rough; it is ſtronger than that which it covers; and this is not extended to the roots of the plant, but ſpreads over the bark of the tree at the bottom of the ſtalk, juſt as the feet of the corals and other ſea plants do over ſtones. The viſcous matter, by which the trunk adheres to the tree, is furniſhed from all parts of the radicle, but principally from its outer bark, and is not at all owing to the juices of the tree, ſince it is found as abundantly on thoſe radicles which have been made to adhere to ſtones, as on thoſe which have been on trees. A little time fixes theſe trunks very firmly; but it is obſervable, that though the outer bark or edge of theſe open balls adheres equally all round to the bark of the tree, the granulæ of the inner ſubſtance always direct themſelves to and inſinuate in the little clefts or cracks of the rind of the tree. While the ſeeds of *Miſletoe* are in this ſtate, they may be tranſplanted to other places, and ſet on other trees, and ſeldom fail to thrive.

Seeds of this plant may be made to ſhoot on ſtones, and will fix their trunks to them, but here they naturally ſoon periſh; they may however be removed from theſe ſtones to the

branches of trees, as ſoon as they have affixed themſelves, and being then in a ſtate of drawing nouriſhment, they will affix themſelves to the tree, and from its juices begin to thrive immediately.

It has been very naturally ſuppoſed by thoſe who thought the *Miſletoe* no perfect plant, that it had no roots, nay even thoſe who allowed it to be a perfect plant, and produceable from ſeeds, yet have ſuppoſed it had no root. Malpighi, however, affirms that he plainly ſaw its roots. And Tournefort countenances the ſame opinion; but neither of theſe authors have perfectly deſcribed them.

In that part of the branch of a tree where the *Miſletoe* grows, there is always obſerved a thickneſs, and the bark is always chopped in ſeveral places; but the roots of the *Miſletoe* are by no means to be ſeen externally, being hid both by the bark of the tree, and by the expanſion of the bark of the plant itſelf at its bottom. It is neceſſary, therefore, for the diſcovery of the roots, to raiſe very nicely both the bark of the plant, and that of the tree; but the hardneſs of theſe barks, and their ſtrict attachments to the roots, makes this difficult; and there is indeed no way of ſucceeding well in the attempt, but by boiling the part in water, and making nice diſſections of it before it is cold. By this means the bark of the *Miſletoe*, and that of the tree, are both eaſily raiſed, and the roots of the *Miſletoe* are found partly inſerted into the bark, and partly into the wood of the branch.

The bark of trees is a ſubſtance compoſed of ſeveral beds or ſtrata, the upper or outer of which is an extremely thin one, and the others, which are thicker, are formed by the extenſion of the woody fibres, which run longitudinally into a ſort of network, the cells of which are filled with a parenchymatous ſubſtance. This is the ſtructure of all the barks of a tree, except the outer thin one; but of theſe, thoſe are always the moſt ſucculent and rich which lie innermoſt, or neareſt the wood of the tree.

It is obſervable, that when an inſect wounds the bark of a tree or plant, there is always a greater derivation of the juices to the wounded part than elſewhere, and hence galls and other protuberances are formed; this ſeems alſo the caſe here, and the application of the trunk of the *Miſletoe* ſeed, and the penetration of its roots ſeem alſo to wound the part ſo much, as to cauſe in the ſame manner a derivation of a great quantity of juices for the nouriſhment of the young plant: And as the roots ſtrike deeper in, there is made a greater extravaſation of the juices of the tree, and a ſort of tumour is neceſſarily formed.

Among the ſeveral roots of the *Miſletoe*, there are ſome which extend themſelves among the more ſucculent parts of the bark, and others which penetrate to the wood of the branch. Theſe ſpread themſelves every way with great eaſe, as they are principally formed at a time when the tree is full of ſap.

It has been ſuppoſed by many, that the roots of the *Miſletoe* penetrated the woody ſubſtance of the tree; but though appearances make greatly for this ſyſtem, it is by no means true in fact. The roots of the young plants, when they have penetrated through all the lamina of the bark, and reach the wood, turn off, as the roots of plants do which meet with ſtones, &c. in their paſſage, and ſpread horizontally between the inner bark and wood, or elſe re-aſcend the bark, the looſe and juicy nature of which is much fitter for affording them nouriſhment than the hard ſubſtance of the wood. It is true, that in making ſections of the branches where old plants of *Miſletoe* grow, there are often found roots, nay ſometimes even the woody ſtem of the plant plunged into the matter of the hard wood; but this is merely owing to the inner bark of the branch having become woody ſince the penetration of the roots, not to the roots finding their way into what was actual wood at the time.

There are alſo found always a multitude of woody excreſcences, like warts and wens, about the place where the *Miſletoe* grows; theſe are formed like the woody galls produced on trees by the punctures of inſects, by an extravaſation of the woody juices. Theſe make the ſwelling about that part of the branch where the *Miſletoe* grows, and theſe, as they become woody, and ſwell about the roots, ſerve to cover them with hard wood, which they never penetrated. Theſe make it probable enough that the roots of *Miſletoe* never penetrate hard wood; but what proves it much more evidently, is, that if the branches of trees full of *Miſletoe* plants be cut and ſplit in different directions, juſt at the place of the inſertion of the plant, the ſeveral annual circles of the wood within are found perfect, regular, and in their natural ſtate, ſo far as the branch was form'd at the time the *Miſletoe* took root upon it; theſe ſhew the age of the branch at that time, but above theſe there are always ſeveral other laminæ, which are what have been formed ſince the time of the *Miſletoe*'s growing there; and theſe which have been formed out of the inner laminæ of the bark, in which the roots of *Miſletoe* had made many wounds and great extravaſations of the juices, are found, tho' woody, full of the roots of the plant, and are very irregular, and full of the tubera which thoſe extravaſations occaſion, by by no means appearing like the annual circles of the wood formed before. The ligneous fibres in the outer, or ſince form'd wood, are laid in very irregular directions, and the roots of the *Miſletoe* may be eaſily diſtinguiſhed among them by their colour.

The *Miſletoe*, as the bark in which its roots were ſpread, hardened into wood, would be in the ſtate of a tree, planted in an earth which, by degrees, petrified about it, and muſt periſh; but nature has provided for it in this caſe; for as theſe roots are impriſon'd in wood, and a new bark is formed by the ſap of the tree, the trunk of the *Miſletoe* ſends out a new ſeries of roots, which ſpread thro' this in like manner; ſo that tho' a plant of *Miſletoe* has ever ſo many ſeries of its roots embodied in the hard wood, from which it can have no nouriſhment, it has alſo ſome, ſufficient for its ſupport, ſpread among its yet new-form'd bark.

The *Miſletoe* is frequently found in this ſtate; nor are we to ſuppoſe, indeed, that tho' the wood is not able to furniſh ſo much juice as the bark, that it furniſhes none at all; for the roots of the plant do not decay, when they have penetrated what afterwards becomes perfect wood; even in its hardeſt ſtate, they are ſtill found perfect in it, and in a living ſtate, and undoubtedly furniſh ſome, tho' not a great deal of nouriſhment to the plant. Another thing very remarkable in thoſe plants of *Miſletoe*, many of the roots of which are lodged in the hard wood, is, that the roots diffuſed through the bark have often a large tubercle at their ends, which probably is furniſhed with numerous openings for the receiving the juices the plant is to be nouriſhed by, and ſerves in the place of many roots.

There are ſometimes indeed found plants of *Miſletoe* which live wholly by the nouriſhment they receive from the wood; theſe are in the ſtate of grafts of common fruit-trees; but theſe are rare, and it very ſeldom ſucceeds when the *Miſletoe* is attempted to be propagated by the common method of grafting, though the plants of *Miſletoe* may very eaſily be grafted by approach into one another.

A farther circumſtance worthy obſervation, is, that tho' ſome plants of *Miſletoe* have been found growing very well with their roots only in the wood, yet this is generally fatal to them, and many plants of it are found dead and wither'd, by means of the woody part of the tree riſing into a ſort of wen or tubercle about them, and by its cloſely ſurrounding their ſtalk, preventing all intercourſe with the bark, by means of new roots. This is uſually the caſe when the plants of *Miſletoe* are weak, and the branch on which they grow very ſtrong and vigorous; and on the contrary, when the plants are very ſtrong, and the branch weak; in which caſe, the roots of a large *Miſletoe* plant will ſometimes penetrate the whole round of the bark, and taking in all the nouriſhment to itſelf, the end of the branch beyond it will periſh and rot off; but the *Miſletoe*, in this caſe, is not able to ſupply the place of the ſtarved part of the branch, but the remainder of the bough generally dies quite to the trunk of the tree, and the *Miſletoe* periſhes with it.

Though this plant is evidently propagated by its ſeeds, yet it alſo propagates itſelf very often by ſuckers, and it is not uncommon to find young ſhoots at a finger's breadth or two from the old one. The gardeners, who value their trees, are very careful to deſtroy the *Miſletoe* from them, and that very properly, ſince it is extremely obvious from what has been obſerved, that it robs the tree it grows on of a great deal of its nutritious juice. The common method of cutting off the plants to this purpoſe, is, however, by no means ſufficient; for the old ſtock frequently puſhes out new ſhoots, and the roots afford ſuckers, ſo that the caſe becomes worſe than before. There is indeed no way of deſtroying it, but the cutting away with it a part of the turbercle it forms on the branch where it grows.

The roots of *Miſletoe*, while young, are green, very tender, and granulated, as is alſo the bark of the older ones; but theſe have a woody filament within. They are not regularly round, but are often flat, and uſually adapted in their ſhape to the place where they are lodged; and about their inſertions it is not unfrequent to ſee a ſort of elongation of their bark, which blends itſelf with the bark of the tree on which they grow.

The progreſs of the branches of *Miſletoe* is much ſlower than that of the roots. The firſt year, and often the ſecond, is ſpent wholly on their part, in the raiſing themſelves into an erect poſture, and very often this operation proves fatal to them.

The ſeeds, as has been before obſerved, faſten themſelves to the branches of trees, by means of the viſcous juice contained in the berries. The radicles produced hence affix themſelves, by means of the hollow button at their extremity, to the bark of the tree; and the other end being yet held faſt in the ſeed, the whole proceſs forms a ſort of arch. When the button end of the radicle has got itſelf good root in the bark of the tree, and begins to ſend up ſap in abundance into its pedicle, which is to be the ſtalk of the plant, that by degrees begins to looſen itſelf from the ſeed; and this is often a work of great difficulty; for the ſeed being firmly attached by its viſcous matter now dried to the bark of the tree, holds down the end of the ſtalk, that very often the force of riſing in the young plant is not enough, and it remains in its arched form, and periſhes; and often

often the open end is forced away from its hold on the bark by the reſiſtance, and the young plant dies.

Thoſe ſhoots which are ſingle from ſingle ſeeds are oftenеſt deſtroy'd at this juncture, for they have ſingly the force of the whole ſeed to ſtruggle againſt, and when they ſucceed, uſually raiſe it up, and keep it on their extremity; but where the ſame ſeed ſends three or four radicles, theſe all ſtruggle ſo many different ways to riſe, and the huſk of the ſeed is uſually torn, by their efforts, into three or four pieces; and every radicle carrying its portion on the top, becomes a diſtinct plant. It might ſeem from this, that the ſeminal lobes were neceſſary to the growth of the young plant; but this is not the caſe, for if the ſtalks of the ſeveral radicles are cut off while they adhere to the ſeed, they thrive not at all the worſe for it.

It is a very ſingular circumſtance in this plant, that its ſeeds produce ſingly ſeveral young plants. No other vegetable has this property. 'Tis true, indeed, that two young hazels have been ſeen to riſe from the ſame nut; but then we know very well, that nuts have frequently double kernels in the ſame ſhell; but here the ſeed is contained ſingly in a berry, and, to all examination, appears of a ſimple uniform ſtructure, tho' it doubtleſs is compoſed according to the number of young plants it will produce, of three, four, or more perfect ſeeds.

When the young plant of the *Miſletoe* ſeed has freed itſelf from the huſk at its end, and raiſed itſelf upright, it is found terminated at the end by a ſort of button, like that of other young ſhoots, which contain the leaves. This button ſtands, however, unalter'd all the firſt year, and ſometimes all the ſecond; in the ſpring following there appear from the button two leaves, and in the alæ of theſe leaves there are ſeen two other buttons; and afterwards there iſſue from theſe buttons branches terminated uſually by two, but ſometimes by three leaves. Theſe are the produce of the third or fourth year; all the ſucceeding years there are new buttons formed in the alæ of the leaves, and the branches from theſe expand themſelves ſo regularly, that very frequently the whole ſhrub is of a regularly round figure.

The old leaves become yellow, and fall off, and there come no new ones in their places, ſo that the old ſtalks, and conſequently the whole inner part of the plant is naked, and the leaves are only found on the circumference growing on the young branches.

It is a remarkable obſervation, that every button of the *Miſletoe* contains the rudiments of three young branches, and hence every knot ought to be furniſhed with ſix branches; and this would ever be the caſe, but that ſeveral of the young branches die either before, or ſoon after their emerging from the button.

Among the other ſingularities of this plant, it is alſo worthy obſervation, that its ſtalks have not that tendency natural to thoſe of all other plants, of riſing directly upwards; for if it grow on the under part of a branch of a tree, it ſhoots as regularly downwards, as it does upwards when it grows from the other ſide, and this without ſeeming at all to ſuffer by it, or to have any inclination to turn upwards.

Some of the old authors have ſaid, that the *Miſletoe* kept its leaves all the winter, when it grew on an ever-green tree, but that when the leaves fell from the tree it grew on, its leaves fell alſo; but this is erroneous, *Miſletoe* holding its leaves all the year, on whatever tree it grows, and ſtanding unhurt in the ſevereſt winters.

Miſletoe will grow on all kinds of trees; but it does not grow on all with the ſame ſtrength and vigour. The pear, the apple, the white thorn, and the lime, are trees it grows on very ſucceſsfully. The oak, the hazel, and the juniper, are very ſtarving for it. Mr. Du Hamel could never make it ſucceed by ſowing on the laſt of theſe trees; but it has ſometimes been found naturally propagated on it, tho' in a ſtarving condition. It will alſo grow on annual plants, but on theſe it never can come to any height, as their ſtalks periſhing at the approach of winter, the *Miſletoe* periſhes with them. Mr. Du Hamel took great pains to ſow and try to raiſe it on the ground, and ſucceeded ſo well as to make the ſeeds ſhoot, and their radicles grow to ſome length; but finding no proper hold to fix themſelves upon, they all periſhed; whence it ſeems that this is abſolutely a paraſitical ſhrub, and can grow no where but on ſome other tree.

The *Miſletoe* is covered with two barks, an external thin one of a greeniſh colour, and ſomewhat wrinkled and granulated; and under this with a much thicker, of a paler green, and ſomewhat granulated, and interſperſed with woody fibres. Under this lies the wood, which, when dry, is very hard, but has no appearance of any grain, and cuts with equal eaſe in a longitudinal or tranſverſe direction. The ſtalk between every two knots is perfectly ſtrait, but at the knot it takes great inflections. Each of theſe pieces of the ſtalk in ſome meaſure repreſents the tibia of the human leg, being a little larger at one end than at the other, and always much ſmaller in the middle than at either extremity. It joins the ſucceeding ſtalk not in the common manner of vegetables, but by a ſort of articulation, and has a ſort of epiphyſes like the bones. The analogy is carried alſo yet farther, in that as in young animals the epiphyſes of the bones are all ſoft and tender, but harden in older ones; ſo in this plant the young branches ſeparate eaſily at their articulations, but in the old ones theſe are as hard as any other part of the ſtalk.

The leaves of *Miſletoe* are thick without being ſucculent, their pedicle is very ſhort, and there run from it four or ſix longitudinal ribs, which reach the outer end of the leaf without making any obſervable ramifications.

Miſletoe is a very vigorous and lively plant, and is one of thoſe to which nature has allotted males and females in diſtinct plants of the ſame ſpecies. Authors however are not perfectly agreed as to the manner of this. Pliny abſolutely affirms, that there are two ſorts of *Miſletoe*, the one which bears fruit, and the other which never does. And Mr. Edmund Barrell greatly confirms this opinion by his own obſervation, giving an account that he raiſed four plants of *Miſletoe* from ſeeds, two of which bore fruit, but the other two only flowers. Mr. Tournefort, Linnæus, and Boerhaave, however, affirm, that the flowers and fruit are not produced in different plants, but on the different branches of the ſame individual. The matter thus remained doubtful till Mr. Du Hamel determined to enquire thoroughly into the truth; and his obſervations wholly confirmed thoſe of the antients, and of Mr. Barrell. Nay, he adds, that the whole habit of the male and female plants of the *Miſletoe* is ſo different, that they are eaſily known aſunder, without having recourſe to their flowers, or fruit; and he never found, in all his obſervations, ſo much as a ſingle flower on a female plant, or a ſingle berry on a male one.

The buds which contain the male flowers of *Miſletoe* are rounder than thoſe which contain the female flowers, or the embryo fruit, and are three times as large. The buds ſhew themſelves diſtinctly on the branches in autumn, and in December they are of a conſiderable ſize, tho' not at all inclined to open; and the female plants are yet full of the berries of the former year. The male buds uſually grow three and three on the ſame pedicle, and they open in February or the beginning of March. Their flower is of one regular piece, forming a ſort of open bell; it is cut into four parts, the notches going down to the middle of the flower, and the ſegments being ſo many half ovals. There are four thick oval bodies, or four granulated ſhoots which are attached to the inner part of the bell, and which riſe over its lips; they are greeniſh at firſt, but they afterwards become yellow; theſe are full of an extremely fine powder: Theſe are truly the ſtamina of the *Miſletoe*, and that part of them which to the naked eye appears granulated, is by the microſcope found to be formed into a multitude of ſlight cavities, like thoſe of the morel. The flowers are placed in cluſters ſix or ſeven together, either in the alæ of the branches, or at their extremities; and having done their office, they fall off in May. The female plants have their flowers in the ſame places, but theſe have only three or four at a joint; they open at the ſame time that the male flowers do, on the other plants: When theſe flowers are perfectly opened, we ſee the embryo fruit crowned with four petals, which are planted in a ſort of cleft that runs all round the fruit, and which becomes more and more diſtinguiſhable as the fruit grows larger.

Theſe petals are at firſt united at their tops, and form a ſort of cone, but they ſoon after open and ſhew the figure of an antique crown; and there is then ſeen in the middle a ſort of rough eminence granulated like the peel of an orange, and of a browniſh colour. That part of the fruit which is below the inſertion of the petals grows much faſter than that which is above them, ſo that when theſe are grown to a conſiderable ſize, the petals ſeem placed merely upon them.

By the beginning of June almoſt all the petals are fallen, but the four inſertions remain however very diſtinguiſhable on the berry; and we may obſerve on their tops, as they are now about as big as a grain of hempſeed, a brown eminence which is the remains of the rough protuberance contained within the petals; and, on cutting them, the ſeed is found in the middle, of a greeniſh colour; the berries continue growing all July and Auguſt, and are ripe in September or October. Mem. Acad. Par. 1740.

MISOPTOCHOS, the *Beggar-hater*, an affected name given by ſome to the gout, a diſeaſe that ſeldom invades the poor or induſtrious.

MISSA, in the church of Rome. See the article MASS, *Cycl.*

MISSEL-*Bird*, in zoology, the common Engliſh name of the larger ſpecies of thruſh, called alſo the *ſhrite*, and by authors the *turdus viſcivorus major*. It is much larger than any other of the thruſh-kind. Its legs and feet are yellow; its head of a browniſh lead colour; and its back, tail, and rump, of the ſame colour, with an admixture of yellow; but in the ſummer months it a little changes its colour, and becomes more grey or of the colour of unripe pickled olives; its throat, breaſt and belly, are all variegated with black ſpots; the middle of its belly whitiſh, and the upper part of its breaſt and part of its ſides and the under feathers of its tail yellowiſh. *Ray*'s Ornithol. p. 138.

It uſually is ſeen on the top branches of tall oaks, elms, and other high trees, and ſings very ſweetly. It remains the whole year with us, and flies ſingly, except with its female. It is the beſt of all the kind for the table.

MISSILIA, among the Romans, a name given to largeſſes, thrown among the people on occaſion of games and ſhews, ſuch as ſmall gold or ſilver coins, ſweet-meats, and ſometimes animals, as ſheep, oxen, deer, &c. which were let looſe to be carried off by the people. *Hofm.* Lex. in voc.

The word comes from *mittere*, to throw, or let looſe.

MISSING *Wood*, a phraſe uſed among bowlers. See the article BOWLING.

MISSION, *Miſſio*, among the Romans, a term uſed to ſignify the emperor's ſending to reſcue a wounded gladiator from his antagoniſt. The *Munerarij* or perſons who exhibited the games, and likewiſe the people, uſed to reſcue a favourite gladiator. The manner of their ſignifying this favour, was *pollice preſſo*, or with the thumb hid in the palm of the hand. However the gladiator was only ſaved for that time; whereas by the *Rudis* he had a free diſcharge. *Hoffm.* Lex. in voc. See the article RUDIS.

MIST (*Cycl.*)—The bluiſh *Miſt* which we ſometimes ſee on our fields and paſtures in a morning, though often innocent, yet has been in ſome places found to be the actual cauſe of murrain, and other fatal diſeaſes among the horned cattle.

Dr. Winklar gives, in the Philoſophical Tranſactions, an account of a murrain affecting the cattle in Italy and other places, which was evidently ſeen to ſpread itſelf over the countries in form of a blue *Miſt*. Wherever this was perceived, the cattle were ſure to come home ſick; they appeared dull and heavy, and refuſed their food; and many of them would die in four and twenty hours. Upon diſſection there were found large and corrupted ſpleens, ſphacelous and corroded tongues; and in ſome places thoſe people who were not careful of themſelves in their management of their cattle, were infected and died as faſt themſelves. The principal cauſe of this diſeaſe ſeemed to be the exhalation of ſome unwholeſome ſteams from the earth; and it was obſervable, that there had been three earthquakes in Italy the year before it happened. The method of cure which ſucceeded beſt, was this: As ſoon as any beaſt appeared to be ſick, they examined the tongue, and if aphthæ or little bliſters were found on it, they ſcraped it with a ſilver inſtrument made with ſharp teeth at the ſides, till it bled in all thoſe parts where the aphthæ were; the blood was then wiped away with a cloth, and the whole tongue waſhed ſeveral times with vinegar and ſalt. After this the following medicine was given internally: Take of ſoot, brimſtone, gunpowder, and ſalt, of each equal parts; mix theſe in as much water as will make a mixture thin enough to be ſwallowed, and let a ſpoonful be given for a doſe three or four times a day. The cattle which were in health had this medicine given them, as well as the ſick; and the conſequence was, that very few died in Swiſſerland, while almoſt all died in other places.

It was very remarkable that the contagion, on this occaſion, ſeemed to travel ſlowly and regularly on: It came at the rate of about two German miles in twenty-four hours: This it kept regularly to during the whole time of its raging, and never appeared in very diſtant places at the ſame time.

The whole ſurface of the earth emitting theſe effluvia, no cattle eſcaped them in the courſe of their way, but thoſe which were kept within doors at rack and manger fell ill at the ſame time, and in the ſame manner with thoſe in the open fields. Dr. Slare was of opinion, that it was owing to certain inſects which could not fly faſter than at the rate of two German miles a day; and that they travelled regularly, and ſpread the miſchief where they paſſed; but there wanted ſome judicious perſons, verſed in theſe obſervations, to have examined both the ſtate of the air, and the beaſts, on this occaſion. Philoſ. Tranſ. No. 145.

MISURER, in our old writers, an abuſe of any liberty or benefit: As he ſhall make fine for his *Miſurer*. Old. Nat. Br. 149.

By *Miſurer*, a charter of a corporation may be forfeited; ſo alſo an office, &c. *Blount*, *Cowel*.

MISY, (*Cycl.*) in natural hiſtory, the name of a foſſile ſubſtance, uſed very frequently by the antients in medicine, and ſuppoſed to be one of their now loſt medicines, but erroneouſly; it being ſtill very common in the Turkiſh dominions, and not unfrequently found in the mines at Cremnitz in Hungary. It is a conſiderably firm ſubſtance, tho' of an irregular and ſeemingly not compact texture, and much reſembles ſome of our gaudy marcaſites; but that it wants their hardneſs and their weight, and is not inflammable.

It is commonly found in large looſe maſſes, which are uſually broad and flat, and uneven at their edges; but ſometimes it conſtitutes whole ſtrata, which are continued often for a conſiderable length, but are ſeldom of more than three inches in thickneſs, and uſually lie like horizontal veins among other metallic minerals. It is ſoft and ſmooth to the touch, and may be rubbed to pieces between the fingers; and is both on the outſide and within of a very elegant bright pale yellow, having much the appearance of braſs, when that metal is clean and well ſcoured. Its internal ſubſtance ſeems made up of numbers of very bright and ſmall moleculæ, moſtly of angular figures. It is never covered with any inveſtient coat or cruſt; but when it has lain ſome time expoſed to the air, it becomes of a duſkier colour than before on the ſurface. It will not raiſe any efferveſcence with acid menſtrua, and in the fire becomes of a deep purple. Water diſſolves a very conſiderable part of its ſubſtance, and this may afterwards be ſeparated from the liquor by evaporation and cryſtallization, and appears to be of the ſame nature with the common green vitriol: Its cryſtals being exactly of the ſame figure, and their effect upon a decoction of galls being the ſame, inſtantly turning it into ink. It has ſo much of the appearance of a ſulphureous body, that one is ſurpriſed not to find it inflammable. *Hill*'s Hiſt. of Foſ. p. 606.

It is at preſent no where put to any uſe. The antients eſteemed it of the ſame nature with the chalcitis, but that it poſſeſſed thoſe virtues in a more remiſs degree; they had it from Ægypt and Cyprus, and uſed it externally in hæmorrhages, and ſome cutaneous eruptions.

MISY, in botany, a name given by Theophraſtus, and all the old Greek writers, to a kind of truffle or ſubterranean muſhroom, of a very delicate flavour. The truffles of Numidia, and ſome other parts of Africa, were always eſteemed ſuperior to thoſe of any other part of the world. They are called *terfez*, *camaha* or *kema*, by ſome later writers, and were brought to Rome, and ſo greatly eſteemed, that no diſh was ranked above them. Theſe were called Libyan truffles by the Romans, and they ſeem to have been the ſame with the Cyrenian *Miſy* of the Greeks. It is to be obſerved, that the Greeks in general, in early times, were very little acquainted with the affairs of Africa; and all that they had from this part of the world, was ſaid to come from Cyrene, ſome old cities of their forefathers being there, and keeping up a friendſhip and traffic with them. The *thyon*, a tree growing plentifully in almoſt all parts of Africa, and which is the ſame with the citrus of the Romans, was in this manner attributed to Cyrene, by the ſame Theophraſtus. And thus, when ſpeaking of truffles, he adds, that the Cyrenean *Miſy* ſurpaſſed all the other kinds in flavour; his words ſtand at large in Athenæus; and thence Pliny has taken his account, which he cloſes in this manner: "The thing which they call *Miſy*, in "the province of Cyrene, is of this kind; but it is more fleſhy "and of a finer taſte and ſmell." This is the ſenſe of Pliny, as the text ſtands in our copies; but it is probable that he tranſlated Theophraſtus better than they, at leaſt as we know that what he ſays is not his own, but taken from that author, we have a right to underſtand it his way, and that is, that the roots of this Cyrenean *Miſy* have a delicate ſmell reſembling that of meat, or fleſh newly cut. *Pliny*, L. 19. c. 3.

It is very certain, that this Cyrenean *Miſy* of the old Greeks is the ſame thing with the delicate African truffle or terfez of LeoAfricanus, and the moderns; and Pliny had read ſome of the antients who were ſenſible of this, and has taken from them an account that the African truffles are the fineſt in the world; and yet did not perceive, that theſe African truffles were the ſame with the Cyrenean *Miſy*, which he immediately after mentions from Theophraſtus.

MITE, (*Cycl.*) in natural hiſtory, the name of a ſmall animal, very well known and found in old cheeſe, and in many other bodies both recent and periſhing.

To the naked eye the *Mites* in cheeſe appear like moving particles of duſt, but the microſcope diſcovers them to be perfect animals, having as regular a figure and performing all the functions of life as perfectly as creatures that exceed them many times in bulk. See Tab. of Microſcopical Objects, Claſs 1.

They are cruſtaceous animals, and are uſually tranſparent; the principal parts of them are the head, the neck, and the body. The head is ſmall in proportion to the body, and has a ſharp ſnout and a mouth that opens and ſhuts like a mole's. They have two ſmall eyes, and are extremely quick-ſighted; and when you have once touched them with a pin, you will eaſily perceive how cunningly they avoid a ſecond touch.

They are of different ſorts; for ſome of them have ſix legs, and others have eight. Each leg has ſix joints ſurrounded with hairs, and two little claws at the extremity, with which it very nicely takes hold of any thing. The hinder part of the body is plump and bulky, and ends in an oval form, from which there iſſue out a few exceeding long hairs. Other parts of the body and head are alſo beſet with thin and long hairs.

The males and females are eaſily diſtinguiſhed in theſe little animals. The females are oviparous as the louſe and ſpider, and from their eggs the young ones are hatched in their proper form, without having any change to undergo afterwards. They are however, when firſt hatched, extremely minute; and, in their growing to their full ſize, they caſt their ſkins ſeveral times.

Theſe little creatures may be kept alive many months between two concave glaſſes, and applied to the microſcope at pleaſure. They are thus often ſeen *in coitu*, conjoined tail to tail; and this is performed by an incredibly ſwift motion. Their eggs, in warm weather, hatch in twelve or fourteen days; but, in winter, they are much longer. Theſe eggs are ſo ſmall, that a regular computation ſhews, that ninety millions of them are not ſo large as a common pigeon's egg. *Baker*'s Microſcope, p. 187.

Mites are very voracious animals; they not only prey upon cheeſe, but on all ſorts of dry'd fleſh, fiſh, fruits, and ſeeds; and almoſt on all things which have ſome degree of moiſture, without

without ever being wet; and they have often been ſeen to eat one another. Their manner of eating is by thruſting alternately one jaw forward and the other backward; and in this manner grinding their food; and after they have done feeding, they ſeem to chew the cud.

There are ſeveral leſſer diſtinctions obſervable in the *Mites*, which are found among different ſubſtances. Thoſe in malt-duſt and oatmeal, are much nimbler than the cheeſe *Mites*, and have more and longer hairs. The *Mites* among figs reſemble beetles, and have two feelers at the ſnout, and two very long horns over them; theſe have only ſix legs, and are more ſluggiſh than thoſe in malt-duſt. Thoſe found among figs had alſo very long hairs, and thoſe beſet at certain diſtances with other ſmaller hairs; whence Mr. Lewenhoek conjectures, that theſe longer and larger hairs are jointed at thoſe places where the ſhort ones are found.

There are a ſort of wandering *Mites*, found wherever there is any thing they can feed on; theſe are often found in form of a white duſt, and are not ſuſpected to be living creatures.

The *Mite* is an animal very tenacious of life; it will live months without food; and Mr. Lewenhoek had one which lived eleven weeks on the point of a pin, on which he had fixed it for examining it by his microſcope. *Lewenhoek*'s Arcan. Nat. T. 4. p. 368.

MITELLA, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the roſaceous kind, conſiſting of many petals diſpoſed in a circular form. The piſtil ariſes from the cup of the flower, and finally becomes a roundiſh and pointed fruit, which when ripened ſplits into two parts, and in ſome degree reſembles a mitre, and contains uſually roundiſh ſeeds.

The ſpecies of *Mitella*, enumerated by Mr. Tournefort, are theſe: 1. The American *Mitella*, with fimbriated petals. 2. The American *Mitella*, with whole petals. 3. The great American dying *Mitella*, called *Orellana*, *Achiotl*, and *Wruow*. Tourn. Inſt. p. 241.

MITELLA, in ſurgery, a name given to the ſcarf for ſuſpending the arm when injured.

MITHRIDATES, in natural hiſtory, the name of a ſtone found in ſome parts of Perſia, ſeeming to be the ſame as the *mithridax* or *mithrax*. See the next article.

MITHRIDAX, in natural hiſtory, the name of a gem deſcribed by Solinus, and mentioned by ſome of the later writers, who have quoted him, or borrowed from him; but the name is not met with in any author earlier than his time. The qualities he beſtows upon it, are the ſame with thoſe given by Pliny to the *mithrax*; and as the word *mithrax* never occurs in Solinus, it is highly probable that he means this ſtone by it. He ſays, that when the ſun ſhines upon the *Mithridax*, it ſhews a great many various colours.

Iſidore ſays the ſame thing, evidently borrowing the account almoſt the words from him.

Pliny tells us, that the *mithrax* has the ſame quality, and that it is in itſelf whitiſh. Its name is taken from the Perſian word for the ſun, and is the ſame as *gemma ſolis*. Pliny indeed, in the latter end of his book, deſcribes a ſtone called *ſolis gemma*, without ſaying that it is the ſame with the *mithrax*; but his accounts in both places agree very well one with another; and the common cuſtom of that author of collecting at large from all the writers of his time, might eaſily lead him to deſcribe a thing twice, which he found in two authors called by two different names.

The *mithrax* both of Pliny, and all the other antients, is evidently the opal; and the *Mithridax* having no other qualities attributed to it, but thoſe the opal poſſeſſes, may be determined to be only a corruption of the ſame name.

MITHRAX, in natural hiſtory, the name given by Pliny and the antients, to a gem found in Perſia, which when held up to the ſun ſhewed many colours. It was probably no other than the opal. Hence the barbarous writers of the middle ages ſeem to have taken their account of the *Mithridates*. See the preceding article.

MITRE (*Cycl.*)—*Mitre* is uſed by the writers of the Iriſh hiſtory for a ſort of baſe money, which was very common there about the year 1270; and for thirty years before, and as many after. There were beſide the *Mitre*, ſeveral other pieces called according to the figures impreſſed upon them, roſaries, lionades, eagles, and by the like names. They were imported from France, and other countries, and were ſo much below the proper currency of the kingdom, that they were not worth ſo much as a half-penny each. They were at length decry'd in the year 1300, and good coins ſtruck in their place. Theſe were the firſt Iriſh coins in which the ſcepter was left out. They were ſtruck in the reign of Edward the ſon of our Henry the Third, and are ſtill found among the other antiquities of that country. They have the king's head in a triangle full-faced. The penny, when well preſerved, weighs twenty-two grains; the half-penny ten grains and a half. *Simon*'s Iriſh Coins.

MITTA, in our old writers, an antient Saxon meaſure. Its quantity is not certainly known; but it is ſaid to be *menſura decem modiorum*, a meaſure of ten buſhels. *Doomſday*.

Mitta, or *Mitcha*, beſides being a meaſure for ſalt and corn, is uſed for the place where the caldrons were put to boil ſalt. *Calderias quoque ad ſal conficiendum cum propriis ſedibus* Mitchæ *vocantur*. *Gale*'s Hiſt. Brit. 767. *Blount*.

MITTENDARII, among the Romans, commiſſioners ſent into the provinces by order of the *præfectus prætorio*, or captain of the guards, upon ſome public account, as to inſpect the behaviour and management of provincial governors, and obſerve whatever was amiſs; all which they were to lay before the præfect, who had authority to remedy ſuch abuſes. *Pitiſc.* in voc.

MITTENDO *Manuſcriptum pedis finis*, in law, a writ judicial, directed to the treaſurer and chamberlains of the exchequer, to ſearch for and tranſmit the foot of a fine, acknowledged before juſtices in eyre, into the common-pleas, *&c.* Reg. Orig. 14. *Blount. Cowel.*

MITU, or MITU-PORANGU; in zoology, the name of a Braſilian bird of the pheaſant-kind, according to Marggrave, and the generality of thoſe who ſpeak of it; but ſuppoſed by Mr. Ray, rather to approach to the nature of the peacock, or turkey-cock.

It is larger than the common Engliſh cock, and is all over the back, wings, *&c.* of a fine deep black; but on the belly of a partridge-brown; and has a ſeries of fine gloſſy black feathers on its head, which it occaſionally raiſes up into a ſort of creſt. Its beak is very beautiful, broad at the baſe and narrow at the point, and of a fine bright red. Its tail is very long, and it can at pleaſure raiſe and expand it like the turkey. It is very eaſily tamed, and loves to rooſt on trees. Its fleſh is very fine and delicate. See Tab. of Birds, N°. 24. *Marggrave*'s Hiſt. Braſil.

MIXT, in chemiſtry. See the article AGGREGATE.

MIXTURE (*Cycl.*)—MIXTURA *Simplex*, *ſimple* MIXTURE, in pharmacy, the name of a form of medicine uſed in the preſcriptions of ſome modern phyſicians. It is made by mixing ten ounces of the ſpiritus theriacalis camphoratus of Bates, ſix ounces of ſpirit of tartar, and two ounces of ſpirit of vitriol; theſe are to be ſet in a glaſs hermetically ſealed for three weeks that they may be perfectly mixed; the doſe is a dram or thereabouts. Its virtues are, that it reſiſts putrefaction, promotes ſweat, and is of great ſervice in malignant fevers. See the article MIXTURE, *Cycl.*

MIZNEPHETH, in the Jewiſh antiquities, a kind of mitre worn by the high-prieſt. See the article CIDARIS.

MIZQUITL, in botany, a name uſed by ſome authors for that ſpecies of the Acacia, or Egyptian thorn, whoſe unripe fruit affords the inſpiſſated juice, which is the true ſuccus acaciæ of the ſhops, and whoſe gum, naturally flowing from the trunk and branches, is the true gum arabic. *Hernand*, p. 59. *Dale* Pharm. p. 343.

MNEME-CEPHALICUM *Balſamum*, the name of a famous compound balſam, ſaid to have been purchaſed from a certain Engliſh phyſician by Charles Duke of Burgundy, at the price of ten thouſand florins. Some who have been very laviſh in its praiſes have affirmed, that it has a power of preſerving in the mind the remembrance of all things that are paſt; but this ſeems ſtretching the praiſe of it a little too far. It is prepared in the following manner: Take of the juices of the leaves of baum, and baſil juices, of the flowers of tamariſk lillies, primroſes, roſemary, lavender, borrage, and broom, of each two ounces; of lillies of the valley, roſes, and violets, each one ounce; of cubebs, cardamoms, grains of paradiſe, and yellow ſaunders, carpobalſamum, florentine iris, ſaffron, ſavory, piony-flowers, and thyme, of each half an ounce; of liquid ſtorax, ſtorax-calamita, oppoponax, bdellium, galbanum, gum ivy, and labdanum, of each ſix drams; roots of long birth-wort and piony, and oil of turpentine, ſpikenard, coſtus, juniper, bays, maſtich, ben, and ſpike, of each five drams. The dry ingredients are to be beaten to powder, then mixed with the reſt, and a ſufficient quantity of water being added the whole is to be diſtilled by an alembic, and the oil carefully ſeparated from the water. The method of uſing it is this: The firſt two months the paſſages of the ears and noſtrils are to be anointed with the bigneſs of a pea of it every day; then for two months longer, the ſame is to be repeated every third day; after this, it is to be uſed once a week, then once a fortnight, till a year is expired; and after this it is to be uſed once in two months for the ſucceeding years. This is the account of Sennertus. *Sennert*. Pract. L. 1. c. 5.

MNEMONIC *Tables*. Among the artifices to aſſiſt the memory, this is one of great uſe.

Mnemonic Tables exhibit in a regular manner, what is to be remembred of the ſame ſubject. And altho' the ſciences ought to be taught in a ſcientifical manner, as much as poſſible, and that every thing ſhould be ſo placed as to be intelligible and demonſtrable from what has preceded it; yet tables ought not to be rejected, as they are helps to retain the doctrines of which the mind has had ſufficient evidence [a]. In ſuch tables the properties of things are to be expreſſed conciſely; illuſtrations and demonſtrations ſhould be left out, as the propoſition ought to have been made ſufficiently clear and certain, before it is regiſtred in the table. Hence the contents of ſuch tables ought only to be the definitions, and the propoſitions relative to the ſubject. If a ſubject require a long table, this may be ſubdivided into ſmaller; by making firſt a table of the moſt general heads, and referring from

each

each of these heads to a separate table; by this means the order and connexion of the whole will be preserved. Such tables would produce a local and artificial memory, of great use to the retention and recollection of things. They would greatly facilitate a distinct view of the properties of their subjects, and facilitate recapitulation. Besides, as the expressions used in such tables ought to be very concise, so as just to be sufficient to excite the idea of the object to be remembered, soon after that idea has been acquired; after some time a certain obscurity will be found in perusing the tables, which will give us timely warning that our ideas begin to fade, and that they ought to be renewed. And this may be done without much trouble, if not too long delayed [b].—[[a] *Wolf.* Psycol. Empir. §. 200. not. p. 140. [b] Vid. Tabul. Mnem. Construct. & usus ap. *Wolf.* Horæ subseciv. Marburg. An. 1730. Trim. Æstiv. p. 468. seq.]

MNIUM, in natural history, the name of a genus of mosses, the characters of which are these: It has heads of two different kinds, the one sort naked and dusty, having no calyptra or other covering; the others are regular capsules, like those of the hypnum and bryum, containing a fine powder, and covered with a calyptra or hood. This diversity in the fructification distinguishes the *Mnia* from all the other mosses; but these diversly constructed heads are in some species found on the same plants; in others, on different ones of the same species, as the male and female flowers are in hemp, mercury, and many other of the larger plants. The stalks which support the membranaceous heads are long, and naked; those which support the naked heads, are in some naked, in others covered with leaves; but they are in all shorter than the others. See Tab. of Mosses, N°. 7. *Dillen.* Hist. Musc. p. 230.

It is the general opinion, that the fine powder included in the capsules of the hypnum and bryum, is of the nature of the farina fœcundans of the flowers of plants, and serves to impregnate the buds or young shoots in the alæ of the leaves, which are the female part of the fructification in this class of plants; and in this sense the membranaceous heads of the *Mnia* contain a like farina, which impregnates the globules in these naked heads, and qualifies them for acting as seeds or young plants; but all this is rather hypothesis and conjecture than observation; tho' Dillenius does suppose he has seen the germination from the globules of the dusty heads in one species of the *Mnium*. Haller says, that these dusty heads are only so many congeries of young plants when viewed with good glasses, and that therefore the *Mnium* is not properly a genus of plants, but should be referred to the bryums, to which it belongs. All this however is yet but lightly founded, and the more natural opinion seems to be that of supposing the powder in the capsules of all the mosses a true seed, not a farina. *Haller.* Helvet. p. 81. See the article Moss.

There are properly two orders of the *Mniums*. Those of the first order are erect; those of the latter procumbent, or creeping. Of the first order there are four known species: 1. The common narrow and short-leav'd *Mnium*: This is a very small moss, it grows in tufts, and produces stalks from a third of an inch to an inch in length; from these in March and April there are produced dusty or naked heads, of the size of poppy seeds. These soon ripen and shed their dust; but the membranaceous capsules arrive at their maturity more slowly, and retain their perfect state much longer: these are much less frequent than the dusty naked heads, but they usually grow upon the same stalks. 2. The transparent mother of thyme leaved *Mnium*: This seldom rises to more than an inch in height, and is very common about the bottoms of rocks and roots of trees. 3. The common large upright and forked bog *Mnium*: This is three inches high in a flourishing state, and has all its branches bifurcated: It is common in boggy places. 4. The greater bog *Mnium*, with many heads: This is less branched than the former, and has very numerous dusty heads.

Of the creeping or procumbent *Mniums*, there are only three known species: 1. The transparent trichomanes-leaved *Mnium*, with uncut leaves: This is a very elegant plant, and is common in boggy places. 2. The transparent trichomanes-like *Mnium*, with divided leaves: This is common about Hampstead and Highgate. And, 3. The lichen-leaved *Mnium*: This grows in shady places, and has the dusty heads at the extremities of the leaves.

MOAR-*Loore*, in husbandry, a term used to express a peculiar distemperature of corn, generally comprehended under the common term of a blight. In this case the earth sinks away from the roots of the corn, and leaves the plant standing in great part above ground with naked roots; these being too weak to support the stalks, the plants fall and the ears become light. This is a distemperature peculiar to corn growing on light and loose lands. *Tull's* Horsehoeing Husbandry.

The remedy is this: Turn a shallow furrow against the rows, when they are strong enough to bear it, and the mold is fine and dry, the motion of the stalks with the wind will draw in this loose powder, and it will spread itself equally among all the plants of the row, tho' it be triple or quadruple. It is easy to see that this remedy is only practicable in the method of the horsehoeing husbandry; for in the common way of sowing, there is no means of relief in this case. And in general, the horsehoeing husbandry prevents the falling of the wheat, the stalks never drooping so absolutely in the drill'd wheat as they do in that sown in the common way.

MOARING, at sea. See the article Mooring, *Cycl.*

MOBILES, in the antient music, was an appellation given to the two intermediate chords of a tetrachord; because their variations produced the different genera and species of music [a]. They were called by the Greeks κινητοι, or κινουμενοι [b].—[[a] Vid. Phil. Transf. N°. 481. p. 270, 271. [b] *Wallis's* Append. ad Ptol. Harm. p. 159.]

MOCHLICA, a term by which some authors call the violent or drastic purges.

MOEHRINGIA, in botany, the name of a genus of plants described by Linnæus; the characters of which are these: The perianthium stands expanded, and is composed of four leaves of a lanceolated figure. The flower is composed of four petals of an oval figure not indented at the ends, and smaller than the segments of the cup. The stamina are eight capillary filaments; the antheræ are simple; the germen of the pistil is globose; the styles are two, they are erect and of the length of the stamina; the stigmata are simple. The fruit is a globose capsule, composed of four valves, but having only one cell in which are several seeds, convex on one side and angular on the other. *Linnæi* Gen. Pl. p. 167.

MOCHUS, in botany, a name used by some authors for the orobus or bitter vetch. Dodonæus, among others, calls it by this name. *Ger.* Emac. Ind. 2.

MOCK-*Bird*, the name of an American bird of the merula kind, and very much approaching to the cæruleus or blauvogel. It is of the size of the common lark: Its beak is short, and strait; its tail very long; and its whole body of a very fine deep blue. *Ray's* Ornith. p. 142.

Mock-*Lead*, in mineralogy, a name given by the English writers to a sort of fossil, called also *blende* and *galena*. It has very much the appearance of an ore of lead, being bright and glossy, of a bluish black colour, and plated; but on trial it is found to yield very little or none at all of that metal.

MODERATA *Misericordia*, in law, a writ that lies for him who is amerced in a court-baron, or other court not of record, for any transgression, beyond the quality or quantity of the offence. It is directed to the lord of the court, or his bailiff, commanding them to take a *moderate amercement* of the party. This writ is founded upon *Magna Charta*.

If a man be amerced in a court-baron, on presentment by the jury, where he did not any trespass, he shall not have this writ, unless the amercement be excessive and outrageous: And if the steward of the court, of his own head, will amerce any tenant or other person without cause, the party ought not to sue for this writ of *Moderata Misericordia* if he be distrained for that amercement; but he shall have action of trespass. New. Nat. Br. 167.

When the amercement which is set on a person is affeered by his peers, this writ of *Moderatæ Misericordiæ* doth not lie; for then it is according to the statute 10 Edw. II.

MODERATOR (*Cycl.*)—Moderator-*Ring*, in anatomy, is used by Valsalva for that ring which the muscles of the eye make round the optic nerve, at the bottom of the orbit. He alledges, that the exterior fibres of these muscles which rise from the nerve, must shorten it when they contract, and when the interior fibres act they must compress it; so that these different fibres of the muscles affect the nervous fluid here very differently.

Valsalva also describes such another ring made round the motory nerves of the eye; but acknowledges, that it is neither so remarkable nor distinct as the former. Med. Ess. Edinb. abr. Vol. 2. p. 410, 411.

MODERN-*Music*, *Musica moderna*, may be divided into two parts: First, *Antiquo-Moderna*, which is generally a serious sort of music, consisting of many parts; and which has been in use from Guido's time, to the beginning of the last century. Secondly, the *Modern* which has been used in this and the last century: It is very different from the *Antiquo-Moderna*, being brisker, lighter, gayer, and more sprightly.

MODIOLI, in natural history, a name given by some authors to the trochitæ or single joints of the rays of the petrified magellanic star-fish, which when connected in numbers together form that fossil called *entrochus*. Others also have used this word *Modiolus* to express the compound body, or entrochus itself. Tho' the general form of the trochitæ be thin and flat, yet they are sometimes found considerably thick; and tho' the entrochi or compound *Modioli* are usually so many cylinders of equal diameter in all parts, yet there are sometimes found such as are thick in the middle, and thence gradually taper to each end; some also are composed of joints, each of this form; these differ very greatly from the common kind, and instead of consisting of a number of little wheels are made up of a series of little barrels, joined, as it were, end to end.

Among large quantities of these some are found ornamented with what naturalists call the summitates or fastigia, which are long and slender pieces, and have a little button at the top.

All entrochi have a central cavity, or hollow, running thro' the whole length; and they are of different ſpecies, according to authors, as this cavity differs in ſize and figure. It is ſometimes a mere point in the center of the ſtone, and ſometimes takes up a third part or more of its bulk. In ſome places there are indeed found entrochi which are perfectly hollow, being only a thin cruſt; of theſe, ſome are perfectly ſmooth and even on the ſurface, and others are in the common way, made up of rings, or marked with deep circular furrows. The hole in thoſe *Modioli* which are thicker, is ſometimes round, ſometimes formed like a cinquefoil-leaf; but this laſt is more rarely met with, and is called by ſome of the later writers on foſſils, *entrocho-aſteria*, the ſtarry entrochus, to diſtinguiſh it from the common kind. The roots, as they are called, of the entrochi have very often a configuration which leads to this; they have uſually five feet, and from each foot there paſſes inwardly a little furrow to the top of the ſtone. This may very well give birth to the five enlargements of the central hollow in the others, and make them *entrocho-aſteriæ*. There is a ſcarce ſpecies found ſometimes on Mendip-hills, which has ſix hollows inſtead of the five of the other, and theſe all terminate in angles, ſo that the whole is a ſexangular hollow, whereas the cinquefoil inlets are uſually round as the leaf whoſe name they bear, tho' ſome few of them have ſharp angles. Phil. Tranſ. N°. 129.

The joints and ſockets by which the entrochi are joined together are very various, for as ſeveral rays ſhooting from a center muſt of neceſſity have conſiderable wideneſſes between them, as they paſs toward the circumference, according to the bigneſs; ſo to fill up thoſe wide ſpaces in ſome, between two rays there iſſues from the center a third ray, which paſſes as the others to the circumference of the ſtone. Some have their rays gently widening from the center all the way to the circumference: In ſome, between two forks, made by a ray that parted ſingle from the center but divides afterwards, there riſes alſo a little ray which runs to the circumference: And ſome others are ramoſe, having a trunk riſing from the center, with three, four, or five branches, running to the circumference: Some alſo are ſmooth half way of the ſtone from the center, and have a circle of ſmall rays near the circumference; and ſome are perfectly ſmooth, and have no rays at all. Theſe are uſually very thick, and are joined together in the entrochus after this manner: One trochite, or ſimple *modiolus*, a little within the outer circle, in the upper and lower parts, where the rays uſe to be, has round inlets or ſockets conſiderably deep, ſo that only a thin tympanum hinders the trochite from being hollow at this width all through; and in the middle of this tympanum there is a hole as in the other trochitæ, which is ſometimes round, and ſometimes of a pentangular figure. The trochites that anſwer this, have ſmooth joints on both ſides, without any ſkrew-like ridges entering into theſe ſockets, thoſe joints being hollow alſo; and ſo other trochitæ with ſockets come on again upon theſe; and thus the entrochus is made up. Some of theſe *Modioli* have both ſockets and rays, and ſome have a ſocket alone on one ſide, and rays without a ſocket on the other. Finally, ſome are perfectly ſmooth, only that a ſmall ridge runs round them, a little within the outer circle, which enters into a ſmall furrow anſwering to it; and ſome are ſmooth and joined only *per harmoniam*. Some of the trochitæ hold of an equal thickneſs from the center to the circumference, and others are conſiderably thick at the circumference, and thence grow gradually thinner to the central cavity, at the verge of which, all round, they make a ſort of edge. Theſe have concavities on both ſides, to which convexities in the adjoining trochitæ anſwer: Some hold of an equal thickneſs half way from the circumference toward the center of the ſtone, but they then grow thin, and continue ſo to the very verge of the cavity.

Beſide the generality of theſe trochitæ which are round, there are others found which are of an oval figure, ſome rounded at the ends, and ſome pointed; theſe have their central cavity as well as the others, and ſome have it very ſmall, others very large. In theſe it is always oblong, according to the ſhape of the ſtone, not round, as in the round ones. Theſe uſually are not joined in the entrochus by means of rays, but have a ridge running all along the verge in one, which is received into a furrow in the other. Some of theſe joints are ſhaped with a double oval, the oval of the upper part of them ſtanding contrary to the oval in the lower: in others, the ovals do not ſtand ſo entirely oppoſite one to another, but only the oval in the upper part ſeems a little wreſted from the direct line of the oval of the lower part, ſo that they ſtand bendwiſe to each other, and make up a figure like a St. Andrew's croſs. There are entrochi made up in this manner, and it is in general obſerved, that moſt of the oval entrochi grow crooked and twiſting. Theſe oval ones are found leſs frequently in the entrochus ſtate, than in the ſingle trochites; but they are ſometimes met with, and are liable to all the accidents in figure and ſurface of the common round ones. The obſervations of the manner of joining of the ſeveral trochitæ into the entrochus, and of the rays and ſpaces, with the manner of filling up the latter, and the various divarications of the former, are a very pleaſing obſervation; but it is neceſſary, in many caſes, to have recourſe to the aſſiſtance of glaſſes for the perfectly underſtanding them, the naked eye loſing a great part of the ſtructure.

MODIRA *Kaniram*, in botany, a name given by ſome authors to the tree, whoſe wood is the *lignum colubrinum*, or ſnake-wood of the ſhops. Hort. Malab. vol. 8. p. 47.

MODULUS *of the logarithmic Syſtem*. See the article LOGARITHM.

MOFFAT *Waters*, mineral waters of conſiderable efficacy at *Moffat*, in the county of Annandale. They ariſe from two ſprings on the declivity of a hill, which yield about 1360 gallons of water daily. Theſe waters have a ſulphureous taſte, and ſmell of the waſhings of a gun-barrel; their colour is milky or bluiſh. The ſeaſon for uſing them is between the middle of April and the end of September; but they may be drank all winter, and if the rains be moderate, the ſtrength of the water is not found to be impaired. The water of the upper ſpring being too foul for drinking, is made uſe of for bathing, and is, for this purpoſe, made ſomewhat warmer than tepid. The quantities of water uſually drank are pretty large, exceeding ſometimes a gallon. It is uſual to join purgatives, and that in great doſes, frequently repeated with the uſe of the waters; but this is thought unjuſtifiable by ſome [a]. The water is alterant and diuretic. Its purging is owing to the large quantities drank, or to ſome ſingularity in the conſtitution, as a weak ſtate of the ſtomach and inteſtines. Few medicines are ſaid to be ſuperior to theſe waters in diſorders of the ſtomach and bowels. It has alſo proved uſeful in nephritic, nervous, and hyſteric colics, melancholy, barrenneſs, female weakneſſes and diſorders, as alſo in old gleets, either natural, or cauſed by venereal diſorders. In rheumatic and ſcorbutic complaints it is advantageous, and in cutaneous eruptions. It is ſaid ſeldom to fail in ſcrophulous diſorders [b]. This water gives no marks of a chalybeat nature with galls, nor of acidity with tincture of roſes, or ſyrup of violets, neither does it produce any efferveſcence with oil of tartar *per deliquium*, or ſpirit of ſal ammoniac. It ſeems to contain a ſubtil volatile ſulphur, but in ſmall quantity, ſince it ſoon loſes its remarkable ſmell and taſte, when expoſed to the air, and that acid liquors can neither ſeparate nor precipitate it. Upon evaporation there is found a dirty ſalt mixed with earth. This ſalt ſeems not to be nitre, nor ſal ammoniac, but common ſalt, and by a ſlow evaporation of a ſolution of ſea ſalt, cryſtals not unlike thoſe of the ſalt of *Moffat* water have been obtained [c].—[a] Medic. Eſſ. abr. vol. 1. p. 99. [b] Ibid. p. 101. [c] Ibid. p. 103. ſeq. where other experiments on theſe waters may be ſeen.]

MOGORIN, in botany, a name given by the Portugueſe to an Indian or Chineſe flower, growing on a ſmall ſhrub. It is of a wonderful white colour, and not unlike the *gin-ſeng*, only that it abounds more with leaves, and ſmells much ſweeter; one ſingle flower filling a whole houſe with its odoriferous effluvia. On this account the Chineſe put a high value upon it, and carefully defend the ſhrub it grows on from the inclemency of the winter, by covering it with vaſes provided on purpoſe. *Hofm.* Lex. in voc.

MOHAUKS *Corn*, in botany, a name given by the Indians to a peculiar ſort of the maiz, or Indian corn. It is moſt frequent in the more northerly parts of America. The general time of ſowing the maiz in Virginia and other places, is in the end of April; but this *Mohauk* kind need not be ſown before June, and yet will come well to maturity before the winter. The ſtalks of this kind are ſhorter than thoſe of the common ſort. The ears alſo are ſhorter, and grow nearer the ground, and the corn is generally of various colours. Phil. Tranſ. N°. 142.

MOIRE, in conchyliology, the mohair ſhell, a name given by the French virtuoſi to a peculiar ſpecies of voluta, which ſeems of a cloſely and finely reticulated texture, and reſembles on the ſurface a piece of mohair, or a very cloſe ſilk-worms web. See the article VOLUTA.

MOISTURE (*Cycl.*)—The *Moiſture* of the air has conſiderable effects on the human body. For the quantity and quality of the food, and the proportion of the meat to the drink, being given, the weight of a human body is leſs, and conſequently its diſcharges greater in dry weather than in wet weather; which may be thus accounted for: The *Moiſture* of the air moiſtens the fibres of the ſkin, and leſſens perſpiration, by leſſening their vibratory motion. When perſpiration is thus leſſened by the *Moiſture* of the air, urine, indeed, is by degrees increaſed, but not equally. See Dr. *Bryan Robinſon*'s Diſſ. on the Food and Diſcharges of human Bodies, p. 68. ſeq.

Hence we learn, that to keep a body of the ſame weight in wet weather as in dry, either the quantity of food muſt be leſſened, or the proportion of the meat to the drink increaſed; and both theſe may be done by leſſening the drink, without making any change in the meat.

MOLA, (*Cycl.*) a mole, or falſe conception, in medicine, is a membranaceous and fibrous concretion in the womb, containing uſually a large quantity of coagulated or thick blood. This is ſometimes produced alone in the uterus, ſometimes at the ſame time with a regular fœtus. There are many origins to be aſſigned to theſe concretions, but the moſt uſual ſeems to be the

the leaving behind of part of the ſecundines after abortion. In young people theſe are leſs dangerous, and ſeldom remain in the womb more than a year, but in older perſons they ſometimes remain many years, and at length often occaſion the death of the perſon. When they are produced in the womb at the ſame time with a regular fœtus, they uſually deprive it of part of its nutriment, and occaſion falſe pains, and many irregular complaints, during the time of geſtation; but theſe uſually are attended with fewer accidents at the time of delivery than when the ſame ſubſtances are produced alone in the womb. The German writers of wonders give accounts of theſe concretions being living animals, armed with claws and beaks, or wide mouths, and deſtroying the fœtus when they are in the womb at the ſame time with one; but theſe are idle reports, and are to be looked upon in the ſame light with the hiſtories of Sooterkins. *Junk.* Conſp. Med. p. 721.

The ſigns of a *Mole* in the uterus are very dubious, and during the firſt months of geſtation, it is ſcarce poſſible to diſtinguiſh it from a genuine fœtus; but after this, if the ſymptoms of pregnancy go on, and there is no motion perceived at a time when the fœtus ought to ſtir, it is ſhrewdly to be ſuſpected that this is the caſe; and this becomes the more evident, if after this time there come on irregular and uncertain diſcharges of blood from the uterus, at different times; in this caſe there is alſo uſually ſo great a flaccidity in the ligaments of the uterus, that it does not retain its place in the body; but when the perſon turns in bed, is plainly felt falling like a dead weight from one ſide of the abdomen to the other. It is alſo obſerved, that in theſe caſes, tho' the belly ſwells as much as when there is a genuine fœtus, yet it is not ſo regularly rounded before, but is flatter at the middle, and more turgid toward the ſides, ſo that the burthen ſeems carried on one or the other ſide, or partly in both, while the middle remains empty. There is always in this caſe alſo a ſenſation of a weight on the lower part of the abdomen, greater by much than in the caſe of their being really a child there. At the regular time of delivery, the caſe becomes much plainer than before; for there then come on either no pains at all, or thoſe which come are ſlight and inconſiderable, very irregular in their periods and returns, and by no means ſufficient for the exclusion of a fœtus. When the *Mole* happens at the ſame time with the fœtus, it is ſeldom to be diſcovered till the time of delivery, or if it be found out ſooner, there can be nothing done till both that and the fœtus are excluded; after this the womb is to be very carefully cleanſed, as in abortions. At other times, when the caſe is obvious, that there is a *Mole* without any fœtus, the common forcing medicines are to be given for ſeveral days every month, about the time of the periodic returns of the menſes; and if theſe do not bring it away, recourſe is to be had to the hand of the midwife. *Junker*'s Conſp. Med. p. 723.

We find a very ſingular inſtance in Kerkring, of a *Mole*, in which a child was encloſed. The whole was declared a falſe conception, and might have been ſacrificed as ſuch, had not ſome perſon preſent obſerved ſomething ſtir within it, and, on the opening it, taken out the living child. *Kerkring*, Specil. Anat.

MOLA, in zoology, the name of a fiſh commonly called in Engliſh, the *ſun fiſh*. It is of a very ſingular figure. Its body is broad and ſhort, and its hinder extremity is terminated by a circular fin, which ſerves it for a tail; ſo that it looks like the head of a large fiſh ſever'd from its body; it is frequently of two foot in length, and ſometimes very much exceeds that ſize, growing even to two hundred weight. It has no ſcales, but is cover'd with a hard, harſh, and rough ſkin. Its back is black, and its belly white; the ſides are of a middle colour between both. Its back and belly both terminate in a narrow edge. Its mouth is very ſmall for the ſize of the fiſh, and, when open, is round. Its jaws are hard, and edged like a knife within; externally they are rough, as if beſet with ſeveral rows of ſmall teeth. The head does not at all project from the reſt of the body. The eyes are very ſmall. It has only one pair of fins, which are ſituated near the gills, which are only two elliptic holes covered with their proper membranes. Its fleſh is very ſoft, and its bones are all griſly and tender. The ſkin ſticks very firmly to the fleſh, and is not eaſily taken off. It is caught in the Mediterranean, and ſometimes in the Britiſh ſeas. See Tab. of Fiſhes, N°. 27. *Willughby*'s Hiſt. Piſc. p. 151.

MOLAGO *Codi*, in botany, a name by which ſome authors have called the plant which produces the common black pepper. Hort. Mal. vol. 8. p. 23.

MOLANGA, in botany, a name given by ſome authors to the plant which produces the common black pepper. *Piſo.* Mant. Arom. p. 492.

MOLARES *Dentes* (*Cycl.*)— Theſe are twenty in number, five being placed on each ſide of both jaws, immediately after the canini. The two firſt in each row are ſmall, the two next larger, as is alſo the laſt, which appears very late, and is often wholly wanting. The *Molares* have been, according to this difference in their ſize, diſtinguiſhed into ſmall grinders, large grinders, and *dentes ſapientiæ*, or the teeth of wiſdom, ſo called, becauſe they ſeldom appear till people are arrived at years of diſcretion.

The bodies of the *Molares* in general are very thick, ſhort, and irregularly cylindrical, or rather with four ſides, a little rounded, and terminated by a broad end, more or leſs filled with obtuſe points, cut, in ſome meaſure, like ſo many diamonds. The name of *crown* is alſo frequently given to the bodies of theſe teeth, from ſome ſort of reſemblance they are ſuppoſed to have to it. In the two ſmall *Molares*, the crown is leſs than in the others, and often not ſo large as the bodies of the canini: they have uſually but two points. In the two large *Molares*, the crown has a much greater extent, and the points are three, four, or five in number. The fifth grinder, or *dens ſapientiæ*, has uſually a crown much like the two former, but commonly more rounded, and with fewer points. The roots of the *Molares* are long, and more or leſs flat; in ſome ſingle, in others two, three, or four, and ſometimes, but rarely, five in number; ſometimes all theſe roots are diſtinct, ſometimes they are wholly united, and ſometimes they are united only in part; they are generally ſtrait, and at a greater diſtance from one another at their extremities than at the crown of the tooth. The roots of the ſmall grinders appear often ſingle, without being ſo in reality; for in examining them narrowly, they are found to have two roots united, or ſoldered together; and ſometimes all the diſtinction that appears, is in their having two ſeparate points. The great *Molares* have commonly ſeveral roots, the firſt three, and the ſecond four; or ſometimes, the firſt four, and the ſecond five; but theſe numbers are variable. The roots are ſometimes all perfectly diſtinct, and ſometimes they are partly diſtinct, and partly united in the ſame tooth in different degrees; and in ſome ſubjects, one or more of their points are bent outward, inward, or in other directions; and it is not always that more roots are met with in the upper teeth than in the lower. The fifth grinder has often but one root, and that is ſometimes very ſhort, and ſometimes remarkably long. It is common to meet with this tooth in grown perſons almoſt wholly hid in its ſocket, and it has, in theſe caſes, but a very ſmall opening for it to appear at. In all the *Molares*, near the collar, the roots, be they ever ſo many, meet and unite into one body. *Winſlow*'s Anatomy, p. 43.

MOLARES, in the natural hiſtory of the antients, the name for the compound mineral bodies we now call *pyritæ* and *marcaſites*. See the articles PYRITÆ, and MARCASITE.

MOLDAVICA, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is of the labiated kind. The upper lip is ſomewhat arched, bifid at the extremity, and turned upwards; the lower one is alſo bifid, and both of them terminate in marginated edges, reſembling the mouth of ſome animal. The cup is tubulated, and uſually divided into two unequal lips. The piſtil ariſes from this, and is fixed in the manner of a nail to the hinder part of the flower, and ſurrounded by four embryos, which ripen into oblong ſeeds, and are contained in the cup of the flower.

The ſpecies of *Moldavica*, enumerated by Mr. Tournefort, are theſe: 1. The blue-flowered betony-leaved *Moldavica*. 2. The white-flowered betony-leaved *Moldavica*. 3. The betony-leaved *Moldavica*, with fleſh-coloured flowers: And 4. The ſtrong-ſcented trefoil *Moldavica* of America, called by ſome, the balm of Gilead plant, from its ſmell. *Tourn.* Inſt. p. 184.

MOLE, *Talpa*, in zoology. See the article TALPA.

MOLE, *Mola*, in medicine. See the article MOLA.

MOLE-*Hills*. Theſe little hillocks of earth are a very great prejudice to the paſture lands, not only in waſting ſo much of the land as they cover, but in hindering the ſcythe in mowing. In the weſt of England they uſe a peculiar inſtrument for the breaking up of theſe; it is a flat board, very thick, and of about eight inches in diameter, into which there is faſtened a perpendicular handle of three or four foot long. It has four broad and ſharp iron teeth at the front, which readily cut through the hill, and ſpread the earth it conſiſts of; and behind there is a large knob, proper for breaking the clods with, if there are any. Some uſe a ſpade, or other common inſtrument, in the place of this, but not ſo well. There is, however, a much better inſtrument even than this, for deſtroying theſe hills, where they are in very great numbers. This is a kind of horſe machine; it has a ſharp iron about three foot over, and with a ſtrong back. It is about four or five inches broad, and has two long handles for a horſe to be harneſſed to, and a croſs bar of iron to ſtrengthen it at the bottom of the handles, reaching from the one handle to the other. The middle of this croſs bar is furniſhed with one, two, or more, ſharp pieces of iron, like ſmall plow-ſhares, to cut the *Mole-hills* into two, three, or more parts. The iron behind is of a ſemicircular figure. A ſingle horſe is harneſs'd to this machine, and a boy muſt be employed to drive it, and a man to hold and guide it; the ſharp irons or ſhares are the firſt things that meet the hill, they run through it, break its texture, and cut it into ſeveral parts, and the circular iron following immediately behind them, cuts up the whole by the roots, and leaves the land level. This inſtrument will deſtroy as many *Mole-hills* in one day as a common labourer can in eight, and would be of very great advantage to the kingdom, if brought into general uſe. *Mortimer*'s Huſbandry, p. 331.

It is to be obſerved, that this leaving a naked ſpace in the place of every hill, it will be neceſſary to go over the land, and ſow them with hay-ſeed, otherwiſe theſe ſpots will want

the produce of graſs the firſt years. The farmers in ſome parts of England are not willing to deſtroy the *Mole-hills*, but let them ſtand from year to year, ſuppoſing that they get ſome ground by them; but the advantage by this means is ſo little that it does not ballance the unſightlineſs and damage to the mowing.

MOLE-*Cricket*. See the article GRYLLOTALPA.

MOLES-*Carnea*, in anatomy, a name given by Veſalius, and others, to a muſcle, called by Winſlow, Albinus, and others, the *complexus*. Spigelius calls it the *Carnea Moles Trigemino adjuncta*. See the article COMPLEXUS.

MOLES *Carnea Labia formans*, in anatomy, a name given by Fallopius to the muſcle called by Albinus *orbicularis oris*, and by Cowper *conſtrictor labiorum*.

MOLLE, in botany, the name of a genus of plants: The characters of which are theſe: The flower is of the roſaceous kind, or compoſed of a number of petals arranged in a circular form; the piſtil finally becomes a fruit reſembling a grain of pepper. *Tourn.* Inſt. p. 661.

There is only one known ſpecies of this genus, which is the *Molle* of Cluſius, called by Caſpar Bauhine the Peruvian lentiſk.

MOLLE, in ichthyography the name of a ſmall ſpecies of whiting, common in the Mediterranean, and in the markets of Rome, Venice, &c. and called by authors the *Aſellus omnium minimus*, and the *merlangus*. It is the ſmalleſt of all the aſellus kind, ſeldom exceeding four inches in length; it has a beard like the cod, hanging from the angle of its lower jaw; and has on each ſide nine ſpots on its noſe and gills; the back is of a pale brown, the belly white, and it has extremely ſmall and ſoft ſcales. The fleſh is very delicate. *Ray*'s Ichthyogr. p. 171.

MOLLE, in the antient muſic, a name given to a ſpecies of the diatonic; and alſo to a ſpecies of the chromatic. See the articles DIATONIC, and CHROMATIC.

The Greeks called it μαλακον, and uſed the term in oppoſition to *intenſum*, συντονον. As the latter was formed by increaſing the tenſion of the chord, and thereby making it approach nearer to the higheſt extreme of the tetrachord, ſo the *Molle* was formed by remiſſion or relaxation. Hence the diviſion of the diatonic into *Molle*, μαλακον, and *intenſum*, συντονον. *Ariſtoxenus*, p. 50, 51. edit. Meibom. See the articles DIATONIC, and GENUS.

MOLMAN, in our old writers, a man ſubject to do ſervice. It is applied to the ſervants in a monaſtery. *Spelm.* Gloſſ. *Blount.*

MOLOCH, an effected term uſed by ſome chemical writers, to expreſs a leaden pot, through which mercury is made to paſs in the fire.

MOLOCH, in antiquity, the name of the Phœnician god. See the article DÆMON, *Cycl.*

MOLOCHITES, in natural hiſtory. See the article MALACHITES.

MOLOPS, a word uſed by ſome medical writers, to expreſs the purple ſpots which appear upon the ſkin in malignant fevers.

MOLOSSES (*Cycl.*)—*Artificial* MOLOSSES. There has been found a method of making *Moloſſes* from apples, without the addition of ſugar. The apple that ſucceeds beſt in this operation is a ſummer-ſweeting of a middle ſize, pleaſant to the taſte, and ſo full of juice, that ſeven buſhels will yield a barrel of cyder.

The manner of making it is this: The apples are to be ground and preſſed, then the juice is to be boiled in a large copper, till three quarters of it be evaporated: This will be done with a moderate fire in about ſix hours, with the quantity of juice above-mentioned; by this time it will be of the conſiſtence and taſte as well as of the colour of *Moloſſes*.

This new *Moloſſes* ſerves to all the purpoſes of the common kind, and is of great uſe in preſerving cyder. Two quarts of it put into a barrel of racked cyder, will preſerve it, and give it an agreeable colour.

The invention of this kind of *Moloſſes* was owing to Mr. Chandler of Woodſtock in New-England, who living at a diſtance from the ſea, and where the common *Moloſſes* was very dear and ſcarce, provided this for the ſupply of his own family, and ſoon made the practice general among the people of the neighbourhood. It is to be obſerved, that this ſort of apple the ſweeting, is of great uſe in making cyder, one of the very beſt kinds we know being made of it. The people in New-England alſo feed their hogs with the fallings of their orchards of theſe apples; and the conſequence of this is, that their pork is the fineſt in the world. Phil. Tranſ. N°. 374. p. 230.

MOLOSSES *Spirit*; a very clean and pure ſpirit, much uſed in England, and made from *Moloſſes* or common treacle diſſolved in water, and fermented in the ſame manner as malt for the common malt-ſpirit. If ſome particular art is not uſed in the making this, it will not prove ſo vinous as the malt-ſpirit, but more flat and leſs pungent and acid, tho' otherwiſe much cleaner taſted, as its eſſential oil is of a leſs nauſeous flavour. Whence if good freſh wine leys, abounding in tartar, be duly fermented in the ſolution made thin for that purpoſe, the ſpirit will by that means become much more vinous and briſk, and approach more to the nature of the foreign ſpirits.

After the firſt diſtilling of *Moloſſes* ſpirits from the waſh into low wines; it is to be rectified, and in the ſucceeding rectifications proper additions are to be made. Alkaline ſalts, ſo common in the rectifying the malt ſpirits, muſt be avoided in this caſe, as not at all ſuiting this ſpirit, and the neutral ones only muſt be uſed, ſuch as ſandiver, common decrepitated ſalt, ſal enixum Paracelſi, and the like; but upon the whole nothing ſo conſiderable is to be expected from theſe ſalts, as from a careful rectification in balneo mariæ, without any other admixture; by this alone repeated two or three times with freſh water each time, the ſpirit will at once be made fit for the niceſt uſes.

Where the *Moloſſes* ſpirit is brought to the common proof ſtrength, if it be found not to have enough of the vinoſity in it, it will be very proper to add to it ſome good ſpiritus nitri dulcis; and if the ſpirit be clean worked, it may by this addition alone be made to paſs on ordinary judgments for French brandy.

When newly diſtilled, this ſpirit like all others is colourleſs, and limpid as water; but our diſtillers always give it the ſame ſort of yellow tinge, which the foreign ſpirits are found to obtain from the caſks they are ſent over in. They have many ways of giving this colour extempore; but the two moſt in uſe are, either by an extract of oak-wood, or by burnt ſugar. *Moloſſes* ſpirit coming dearer than that of malt, it is frequently met with baſely adulterated with a mixture of that ſpirit, and indeed ſeldom is to be bought without ſome daſh of it. Many have a way of mixing malt in the fermenting liquor, by this the yield of the whole is greatly increaſed, and the maker may aſſure the buyer that the ſpirit is pure as it ran from the worm.

England is the principal place where this ſpirit is made at this time; it was at one time prepared in great quantities in France, eſpecially in the river Loire; but it is now forbid there, under a ſevere penalty. In Holland alſo they have it not, on account of the high duty laid upon treacle in favour of their own ſugar-bakers.

We meet with very little of *Moloſſes* ſpirit reduced to the ſtrength of alcohol or ſpirit of wine, tho', when rectified to this ſtate in a proper manner, it is very little inferior to the real alcohol of wine, the name of which is ſo well known among us, tho' the thing itſelf is perhaps never ſeen here. All that we call ſpirit of wine being no other than malt ſpirit reduced to an imperfect alcohol, or a ſpirit almoſt totally inflammable. Great quantities of *Moloſſes* ſpirit are uſed in the adulterating of brandy, rum, and arrack; and great quantities are uſed alone in the making cherry-brandy and other drams by infuſion, in all which many prefer it even to the foreign ſpirits.

In moſt of the nice caſes in our compound diſtillery the *Moloſſes* ſpirit ſupplys the place of a pure and clean malt ſpirit, which we have not yet the way of producing in the large way to advantage. Our cinnamon, citron, and other fine cordial-waters, are made with it; for the malt ſpirit would give theſe a very diſagreeable flavour.

There is alſo another uſe to which this ſpirit ſerves extremely well, and which even a foreign ſpirit that has any remarkable flavour will not do ſo well in; this is the making the extemporaneous wine, which ſome people are ſo fond of. See the article *Extemporaneous* WINE.

It gives a yellow ſtain to the hands, or other ſubſtances dipped into it; and may therefore be of uſe in dying. It is poſſible alſo, that the vinegar-makers may find uſe for it in their way; but the moſt advantageous of all its uſes, is to the diſtiller himſelf, a quantity of it added to new treacle intended for fermentation will be of great uſe in the proceſs, and increaſe very conſiderably the quantity of ſpirit; but the proportion in regard to the new matter muſt not be too great. *Shaw*'s Eſſay on Diſtillery.

MOLTEN-*Greaſe*, in the manege, is a fermentation or ebullition of pituitous and impure humours, which precipitate and diſembogue into the guts, and oftentimes kill a horſe. This diſeaſe does not commonly ſeize upon any but very fat horſes, when over-rid in very hot weather.

MOLVA, in zoology, a name by which ſome authors have called the common cod-fiſh, called the *morhua*, and *aſellus major* by other writers. *Geſner* de Piſc. p. 102. See the article COD-*Fiſh*.

MOLUCCA, in botany, the name of a genus of plants; the characters of which are theſe: The flower conſiſts of one leaf, and is of the labiated kind; the upper lip is hollowed in the manner of a ſpoon, and the lower is divided into three ſegments. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower, and ſurrounded by four embryos, which afterwards become four angular ſeeds, ripening in a bell-faſhioned open capſule, which was before the cup of the flower. See Tab. 1. of Botany, Claſſ. 4.

The ſpecies of *Molucca*, enumerated by Mr. Tournefort, are theſe: 1. The ſmooth *Molucca*. 2. The prickly *Molucca*. And, 3. The ſhrubby *Molucca* of Sicily, called by ſome authors ſhrubby balm. *Tourn.* Inſt. p. 187.

Theſe plants are otherwiſe denominated *Anacardiums*. See the article ANACARDIUM.

MOLUCCA-*Beans*, a name given by Sir Robert Sibbald, in his prodromus; and by Mr. Wallace, in his deſcription of the Orkney-iſlands, to a ſort of fruit frequently caſt on ſhore in the north-weſt iſlands of Scotland; eſpecially on the coaſts moſt expoſed to the waves of the great ocean.

They are called by ſome Orkney-beans, and are not the produce of that iſland, or indeed of any other part of Europe, but of America.

Sir Hans Sloane procured four ſpecies of them little injured by the ſea, and found on examination that three of them were the common produce of the iſland of Jamaica; where he had himſelf gathered them, and deſcribed them in his catalogue and hiſtory.

The firſt ſort was a kind of kidney-bean, and the plant which produces it is deſcribed by Sir Hans under the name of the great perennial kidney-bean with a great crooked lobe. It is alſo figured in the Hortus Malabaricus, by the name of *Perim Kakuvalli*, and Sir Robert Sibbald alſo calls it *Nux Indica ex qua Pyxides pro pulvere ſternutatorio parant.* This is a native of the Eaſt and Weſt-Indies, and is ſometimes found thrown on ſhore in the county of Kerry in Ireland; and in ſome other places.

A ſecond kind of fruit thrown on ſhore in the Orkneys, is a very common fruit in Jamaica, known there by the name of the horſe-eye bean; it has this name from its reſembling the eye of ſome large animal by reaſon of a hilus or welt which ſurrounds it. This is deſcribed by many authors, and among the reſt by Sir Hans Sloane, in his catalogue of the Jamaica plants; and is found in many other of the hotter parts, both of the Eaſt and Weſt-Indies.

A third kind of fruit found on theſe ſhores, is that called by the people of Jamaica the aſh-coloured nickar-nut; it has this name from its colour, and from its being perfectly round and of the ſhape of a nickar or marble, ſuch as boys play with: This alſo is common to the Eaſt and Weſt-Indies.

A fourth kind is alſo a Jamaica fruit, with the hiſtory of which we are not yet well acquainted; no body has ſeen it growing, but the fruit itſelf is preſerved in many of the collections of the curious, and has been figured and deſcribed by Cluſius, and others, under the name of a round exotic fruit ridged with four riſing nerves.

Theſe are the principal kinds of fruit thus toſſed on ſhore with us; but how the products of Jamaica, or other parts of America, ſhould be brought to the ſhores of Scotland and Ireland, ſeems not eaſy to determine on any certain foundation. It is eaſy to conceive, that when they grow by the ſides of rivers they may fall off from the trees into them, and be thence conveyed into the ſea. It is likewiſe eaſy to ſee, that when they are thus floating on the ſurface of the ſea they may be carried about by the winds and currents, and be carried a great way; but their journey this way muſt naturally be ſtopped by the main continent of America, and they muſt be forced through the gulf of Florida, or the canal of Bahama, going thence conſtantly eaſt, and into the North-American ſea. This is eaſily conceived by a ſimilar fact which happens every day: which is, that a kind of ſea-lentil, called *ſargaſſo*, which grows very plentifully on the rocks about Jamaica, is waſhed off from thence and carried by the winds and currents, which for the moſt part go impetuouſly the ſame way, toward the coaſt of Florida, and thence into the North-American ocean; and are there found floating on the ſurface. Thus far it is eaſy to trace our fruits from their native ſoil; but how after this they ſhould make the reſt of their voyage is a great myſtery, and not to be accounted for by us, unleſs we ſuppoſe, that as ſhips when they go ſouth expect a trade eaſterly wind, and when they come north expect and generally find a weſterly wind, for at leaſt two parts in three of the year; ſo we are to ſuppoſe theſe fruits being brought north by the current from the gulf of Florida, are put into theſe weſterly winds way, and by them conveyed to the coaſts of Scotland and Ireland. Philoſ. Tranſ. No. 222. p. 300.

By the ſame means that theſe beans came to Scotland, it is reaſonable to believe that the ſame winds and currents brought from America thoſe ſeveral things towards the Azores and Porto Santo, which are recorded by Ferdinand Columbus, in the life of his father; which gave this bold adventurer the firſt notions of there being ſuch a place as America. The things he mentions as waſhed aſhore in this manner, were a piece of wood very ingeniouſly wrought, but evidently without the help of iron tools. This was taken up by a Portugueſe pilot, four hundred and fifty leagues from ſhore, off cape St. Vincent, after a weſt wind, which had blown violently for many days: After this ſuch another piece of wood was taken up on the ſhores of Porto Santo, after ſuch another long and violent weſt wind. After this large canes, vaſtly ſuperior to any of the growth of the then known parts of the world, were found thrown on the ſame ſhores, and the fruits of pines which did not grow in any known part of the world; and finally the bodies of two men appearing to be of a different nation from any of the known people, and two of their canoes, were driven on ſhore on the iſland Flores, one of Azores. All theſe things having been found only after ſtrong and continued weſt winds, it appeared very evident, that there muſt be land ſomewhere to the weſt, where fruits and men were to be found; and that theſe men had no knowledge of our arts, by their want of iron. It was eaſy to ſee from this how uſeful we might be to them, if they could furniſh us with any thing of value. And on this plan was founded the greateſt diſcovery of the modern times.

MOLY. The name of this plant is rendered famous by Homer, and has been on this occaſion much enquired into as to its true ſenſe, by the botaniſts of almoſt all times. The old interpreters of Homer all explain this word by the wild rue; and the only reaſon for this is, that at ſome time, probably long after the days of Homer, the people of Cappadocia called the wild rue *Moly*. But this plant is wholly different from the *Moly* of Homer, which Theophraſtus affirms grew in his time in Arcadia, in great plenty, and had a round bulbous root like an onion, and long and graſſy leaves like the ſquill. The authority of this author, who wrote profeſſedly on the ſubject of plants, and wrote ſo early, is ſufficient to explode the abſurd opinion of the *Moly* of Homer, being wild rue; but tho' the commentators are thus eaſily ſet aſide, there is yet another author who will lead into no leſs errors. This is Pliny, who has blended together the accounts of all the writers before him on this ſubject; and as they have contradicted one another, he has preſerved all their contradictions. After telling us the fabulous ſtory of its being found out by the god Mercury, and being good againſt witchcraft and the like, he tranſlates the words of Theophraſtus, that it grows about Phineas and Cyllene, in Arcadia; and has a round and black root of the ſhape of an onion, and leaves like the ſquill. To this Theophraſtus has added, that it is not however difficult to be dug up, as Homer ſeems to think; but Pliny, to make Theophraſtus and Homer agree at any rate, leaves out the word *not* in his tranſlation, and ſays, that it is very difficult to be dug up. *Pliny*, L. 25. c. 4.

The phyſicians of Italy, in the time of Pliny, were fond of believing that they had the true *Moly* of Homer growing in the Campania of Rome; and Pliny ſeems to have been alſo wholly convinced of it; and mentions as a reaſon of his conviction, that they had brought to him a root of *Moly*, which was dug up with prodigious difficulty from among rocks and ſtones, and which, when he ſaw it, meaſured thirty foot long, yet was not compleat, but broken off at the end; ſo that it might poſſibly have been much longer. The author's ſkill in botany appears to have been very little, that could make him believe, becauſe of the ſingle obſervation of the difficulty of getting it up, that this was the true *Moly* which he had juſt before deſcribed from Theophraſtus, as having a round root like an onion.

It is probable that this was the root of the ſaint-foin or lucerne, both theſe plants growing wild in Italy, and both having roots of a prodigious length, probably not leſs than that here mentioned by Pliny; but that he could ſuppoſe theſe roots to be of the bulbous kind, ſhews an ignorance that but ill agrees with the veneration ſome people have for this author. This plant had nothing in common with the *Moly* of Homer and that of Theophraſtus, excepting the difficulty of getting it up, which Theophraſtus denys to be a truth; and in which probably Homer was miſinformed, as no bulbous root can be very difficult to get up; but Pliny, that the Roman root might agree with the true *Moly*, firſt compels Theophraſtus againſt the letter of his own account, to ſay *Moly* was hard to be dug up, and then makes this a reaſon for a plant's being the true *Moly*, which does not appear to have had any one character in common with it. Nature is uniform in her productions, and tho' a bulbous plant ſuch as the *Moly* of Theophraſtus, would naturally have graſſy leaves, as all bulbous plants have; yet this long-rooted plant, deſcribed by Pliny, in the common courſe of nature could not have ſuch, but probably had either pennated or trifoliate leaves.

Pliny adds, that the Greek authors have made the flowers of the *Moly* yellow, whereas Homer ſays that they were white; but it does not appear that this is a juſt accuſation, for neither any of the Greek writers extant at this time, nor any of the fragments of others which we find recorded, expreſs any ſuch thing: On the contrary, the whiteneſs of the flower ſeems to have been always looked upon as one of the great and eſſential characters of the *Moly*; and the wild rue ſeems to have been ſuppoſed the *Moly* of Homer, only becauſe it has white flowers, and roots black on the outſide. The error of Pliny in ſuppoſing the Greeks to have called the flowers of the *Moly* yellow, ſeems to have ariſen from a Greek writer having ſaid, that the flowers are like thoſe of the leucoium, but white as milk. He has probably taken this ſentence, but without the laſt word, and then accuſed the author of ſaying they were like the leucoium flowers in colour, when he only ſays they are ſo in ſhape.

The author of the Priapeian verſes ſeems to follow this, and ſays, that yellow or gold-coloured flowers ariſe from the *Moly*; but this is by no means conſonant to Homer's account, who ſays they are white like milk. And ſo ſay all that have written after him.

On the whole, the *Moly* of Homer ſeems to have been a ſpecies of allium or garlic. See the article GARLICK, ſp. 32.

MOLYBDÆNA, *Leadwort*, in botany, a name given by ſome authors to the great toothwort, or dentillaria of Rondeletius. *Ger.* Emac. Ind. 2. See the article PLUMBAGO.

MOLYBDÆNA is alſo a mineral ſubſtance, called *black lead*. See the article BLACK *Lead*.

MOLYBDIA, in natural hiſtory, the name of a genus of cryſtals. The word is derived from the Greek Μόλιβδος, lead; and expreſſes cryſtals altered in their figure by particles of that metal. The cryſtals of this genus are of a cubic form, or compoſed of ſix ſides, at right angles, like a die.

Of this genus there are three known ſpecies. 1. A colourleſs one, compoſed of extremely fine cruſts. This is found in many parts, both of this and other kingdoms, where there are lead mines; and tho' naturally colourleſs, is ſometimes tinged with a red, green, or blue. 2. A dull one with thicker cruſts, ſometimes whitiſh, and ſometimes coloured to a yellowiſh or other hue. This is found in the lead mines of Yorkſhire, and ſome other places. And 3. A dull bluiſh white one, with very thick cruſts. This is very frequent in the lead mines in Derbyſhire, and is generally found in large cluſters. *Hill*'s Hiſt. of Foſſ. p. 193.

MOLYBDOMANTIA, Μολυβδομαντεια, in antiquity, a ſpecies of divination, by obſerving the motions, figures, &c. of melted lead. *Potter*, Archæol. Græc. lib. 2. c. 18.

MOLYZA, μώλυζα, a word uſed by the Greek phyſicians to expreſs a head of garlick. Hippocrates has ſeveral times preſcribed this under the name of *Molyza*, and this having ſome ſort of reſemblance to the word *moly*, ſeveral of the interpreters of Hipprocrates have been very deſirous of making it the ſame thing with the *moly* of Homer. But the words of Hippocrates himſelf, in his book of the diſeaſes of women, ſet this in a clear light; for he there adds the name of garlick to the *Molyza*, and orders a *Molyza* of garlick to be ſcraped clean for uſe. Heſychius calls *Molyza* a head of garlick, and Pſellus, on the antiquated words of the Greek phyſicians, ſays the ſame thing.

MOMENT (*Cycl.*)—A *Moment* ought not to be conceived as the leaſt part of time, but as a termination or limit of time. *Maclaurin*'s Fluxions, vol. 1. p. 245.

MOMISCUS, a word uſed by ſome as a name of the *dentes molares*, and by others only as the name of that part of thoſe teeth which is near the gums.

MOMORDICA, in botany, the name of a genus of plants called by many authors, *balſamina* and *charantia*. The characters of the plants of this genus are theſe: The flower conſiſts of one leaf, ſhaped like a bell, wide open at the mouth, and deeply divided into five ſegments, ſo as to ſeem a five-leaved flower. Of theſe, ſome are male or ſteril flowers, having no embryo fruit, others are fruitful, and have each its embryo fruit at the bottom, which ripens into a capſule, more or leſs turbinated, fleſhy, hollow, and endued with an elaſtic power, by means of which it throws out the ſeeds on touching it, when ripe, to a conſiderable diſtance.

The ſpecies of this genus, enumerated by Mr. Tournefort, are theſe: 1. The common *Momordica*, called the round-leaved, male, or creeping *balſamina*. 2. The *Momordica* of Ceylon, with a ſhorter fruit, and a vine-like leaf. 3. The longer-fruited *Momordica* of Ceylon, with vine-like leaves.

The flower of this genus of plants is ſo very deeply cut into its ſegments, that there is ſome doubt whether it be not properly a five-leaved flower. The error of calling it *balſamina*, and confounding it with the ſpecies of that genus, is very great. See the article BALSAMINA.

MOMOT, the name of a bird deſcribed by Nieremberg, and ſaid to be an inhabitant of the hot countries. It is of the ſize of a pigeon; its beak is black and crooked, three fingers breadth long, and ſerrated at the edge. Its head is blue like the peacock's, and its feet brown. The reſt of the body is of a pleaſant green. But what is moſt ſingular in this bird, is, that it has in its tail one feather much longer than the reſt, which is naked for a great way, and is feather'd only at the end. This laſt circumſtance Mr. Ray judges wholly falſe, as no birds have ſingle feathers in their tails, but all that are there grow in pairs.

MONACANTHUS, in zoology, a name given by ſome to the alpheſtes, or cinedus, a fiſh approaching to the turdus kind; but differing, in that its back fin is prickly all along, whereas the forepart only is ſo in the turdus.

MONACHELLE, in ichthyology, a name given by ſome to the fiſh called, by the oldeſt Greek writers, the *chremps*, and by the later ones, as alſo by the Latin authors on theſe ſubjects, *chromis*. It is properly a ſpecies of the ſparus, and is diſtinguiſhed by Artedi from the others, by the length of the ſecond ray of the belly fins.

MONADELPHIA, in botany, a claſs of plants whoſe ſtamina or male parts, by reaſon of their filaments running in among one another, are all formed into one body.

The word is formed of the Greek μονος, ſingle, and ἀδελφὰ, brotherhood, or community. Theſe coalitions of the ſtamina in flowers being underſtood in botany by that term.

Of this claſs are the craneſbill, mallow, &c.

The general characters of this claſs of plants are theſe: There is always a perianthium to the flower, no ſpecies of the whole claſs being without it. This is always permanent, and ſurrounds the baſe of the ſeed-veſſel, after the flower is fallen. The flower always conſiſts of five petals, which are cordated at the top. The ſtamina are a great number of filaments, which grow together in one body at the baſe, and are looſe at the top. The external ones are ſhorter than the others; and the antheræ are always incumbent. In the piſtils there is found a receptacle of the fructification, which is placed in the center of the flower. The germina are erect, and ſurround in a rotary manner the apex of the receptacle. The ſtyles are all found growing together at the bottom, into one body with the receptacle, and in their upper part they are divided into as many filaments as there are germina. The ſtigmata are ſlender and expanded. The fruit is a capſule, divided into as many cells as there were piſtils in the flower. This is of very various figures in the various genera and ſpecies; but the ſeeds in all are reniform, or ſhaped like kidneys. See Tab. 1. of Botany, Claſs 1.

This is an extremely natural claſs, and there is not one plant uſually allowed to belong to the reſt of this kind, that this character ſeparates, nor one of any other kind that it brings in among them. Tournefort has been guilty of a very great error, in regard to the flowers of the plants of this claſs; he ſays that they are monopetalous, and only divided into five ſegments; but a ſtrict obſervation will ſhew, that they really conſiſt each of five ſeparate petals, which only are joined at the baſe by certain filaments, which together make one body. Hence it follows, that they are ſtrictly and truly pentapetalous, tho' they fall off together, not ſeparately, on ſhaking the plant. *Linnæi* Gen. Pl. p. 325.

It is obſerved, that all the plants of this claſs are mucilaginous and emollient, and have great virtues, as diuretics, &c. The common marſhmallow deſervedly ſtands at the head of theſe, and is common in the preſcriptions of phyſicians on theſe occaſions, as well as in many of the ſhop compoſitions, as the ſyrrup of marſhmallows, and the like.

Tho' authors in general have kept this claſs of plants together, they have been much divided in their opinions, as to the characters or parts of them, by which they ſhould divide them into genera. Some have had recourſe, on this occaſion, to the ſeed-veſſel; others finding that inſufficient, have conſulted the leaves. Linnæus uſes the cup of the flower on this occaſion, which is a very eſſential part in this claſs of plants, and ſufficiently different in the different genera.

MONANDRIA, in botany, a claſs of plants which have hermaphrodite flowers, with only one ſtamen in each.

The word is formed of the Greek μόνος, ſingle, and Ἀνηρ, male. Of this claſs of plants are the blite, turmeric, and the like. See Tab. 1. of Botany, Claſs 1.

MONARCHICI, in church hiſtory, heretics towards the end of the ſecond century, who allowed but one perſon in the godhead, and taught that the father was crucified. *Hofm.* Lex. in voc.

MONARDA, the name by which Linnæus calls the plant which is the *origanum ſpurium*, or baſtard wild marjoram of Rivinus. This, in the Linnæan ſyſtem of botany, makes alſo a diſtinct genus of plants, the characters of which are, that the cup is made of one leaf, and is cylindric and tubulated, with an even edge marked with five notches. The flower conſiſts of only one petal, which is a cylindric crooked tube, longer than the cup, and with a labiated opening. The upper lip is long, narrow, ſtrait, whole, and ſurrounded with rims; the lower lip is bent back, is broad, and ſlightly trifid, the middle ſegment being the longer, narrower, and rimmed round the edge. The ſtamina are two filaments, of the length of the upper lip of the flower, in which they are hid. The antheræ are of a compreſſed form, truncated above, and convex below. The piſtil is a quadrifid germen, with a thread-like ſtyle involved among the ſtamina, and a ſtigma bifid and pointed. It has properly no fruit, the cup encloſing in its bottom the ſeeds, which are roundiſh, and four in number. *Linnæi* Gen. Plant. p. 6.

MONEMERION, Μονημεριον, among the antient Romans, a ſhew, according to ſome, wherein none but tame beaſts were expoſed to view.

Others will have it to be a ſhew of one day's continuance. *Pitiſc.* in voc.

MONEY (*Cycl.*)—*Madning* MONEY. See the article MADNING.

MONGER, a little ſea-veſſel which fiſhermen uſe. Stat. 13 Eliz. c. 11. *Blount.*

MONK-*Fiſh*, the Engliſh name of a ſpecies of the ſqualus, according to the new Artedian ſyſtem; called *rhina* and *ſquatinus* by the old authors. It is diſtinguiſhed by Artedi from the other ſquali, by the name of the *ſqualus* with no *pinna ani*, and with the mouth on the top of the head. See Tab. of Fiſhes, N°. 7.

MONK's *Hood*, a name given to ſeveral ſpecies of aconite, or wolfs-bane. See the article ACONITE.

The flowers of this plant are in common uſe in the country, to garniſh diſhes, tho generally ſuſpected of being poiſonous; but the ſtalks have been found very violently ſo, according to an account given in the Philoſophical Tranſactions, of a perſon who eat them inſtead of celeri.

The firſt ſymptom this perſon felt, was a biting, and ſenſation of a tingling heat, not only affecting his tongue, but his jaws;

jaws; his teeth, after this, ſeemed looſe, and his cheeks were ſo much irritated, that he thought they were ſwelled to three times their natural ſize, and he could not be perſuaded of the contrary by the people who were about him, nor by his glaſs. This tingling ſenſation by degrees ſpread itſelf farther, till by degrees his whole body, but eſpecially the extremities, were affected by it; he then felt a weakneſs in his joints, eſpecially in his knees and ankles, and frequent twitchings of the tendons. At length, he felt a pain that gave him an idea of the circulation of the blood being wholly affected, and abſolutely ſtopped in his legs toward the feet, and from his wriſts to his fingers ends. He had all this time no ſickneſs, or diſpoſition to vomit. He took near a pint of oil, and ſwallowed after that great quantities of carduus tea; this made him vomit; but after this his head grew miſty, his eyes dim, and a humming noiſe was continually in his ears; after this he fell into abſolute faintings, and his eyes were cloſed, his limbs ſtiff, and his teeth fixed. He was, however, recovered at length by repeated draughts of carduus tea, and cordial draughts of wine, with tincture of ſaffron, caſtor, and the like, between the times of his reachings to vomit. Philoſ. Tranſ. N°. 432.

The young ſhoots of this plant have ſome reſemblance to ſalary, and were put into the ſalad as ſuch. The whole quantity put in, was but the top of one root; and one other perſon eat of the ſallad beſide the man. She eat more ſparingly, and had all the ſymptoms of which the man complain'd, only in a leſs degree.

MONOCEROS *Minor*, in ichthyography, the name of a fiſh caught in the American ſeas; its uſual length is a foot and half; its height about nine inches, very flat bodied, and high backed like a perch, and bow bellied. Its head has ſome reremblance to that of a baboon. Its mouth is ſituated low, and is not above an inch over. Its teeth are of the eighth of an inch long, and of the thickneſs of a midling needle; and the gills are ſubtended to the eyes and mouth, like the ſegment of a circle. The eyes ſtand near the top of the head, and are an inch over. From the top of the head is prolonged a ſmooth, round, tapered, ſtrait horn, two inches round about the root, and about three inches long. This ſeems to have no bone within it, nor is inſerted into any, but ſeems merely the cuticle hardened, as in corns, into a ſort of horny ſubſtance. The back fin reaches from the head to the tail. It is covered with a tough thick ſkin, feeling ſomewhat rough. *Grew*'s Muſ. Soc. Regal. p. 104.

MONOCEROS *Piſcis*, is alſo uſed as the name of a fiſh, common in the American ſeas, and called *pira-aca* by Marggrave, and ſome other authors; and by the Portugueſe, *piexe porco*.

It is a very ſmall fiſh, of about three fingers breadth long, and two broad where broadeſt; it is of a flatted or compreſſed ſhape; the mouth is very ſmall, but of the figure of that of a hog; and there are in the lower jaw only two broad teeth, and ſeveral ſmall ones in the upper. The eyes are very large and yellow, with black pupils. A little behind the eyes, on the ridge of the back, it has an upright horn, a little bending backwards, leſs than a finger's breadth long, of a rounded figure, and of the thickneſs of a large thread; this is ſerrated on each ſide by a row of ſmall teeth or prickles, their points bending downwards; and the whole horn ſeems ſupported by a ſmall membrane, which is laid tranſverſely on the back. It has a ſmall furrow under each eye, in the cavity of which is placed a little fin; under the belly it has another larger fin, at the inſertion of which there is alſo another horn like that on the back, but ſmaller. Its ſkin is very rough to the touch, and is of an obſcure yellowiſh colour. The fins and the ridge of the back are yellower than any other part of it. See Tab. of Fiſhes, N°. 36. *Cluſ.* Exot. lib. 6. c. 28.

MONOCOLI, Μονόκωλοι, a kind of fabulous men, who, as the Arabians give out, inhabit the country of Segir in Arabia Felix. They are furniſhed with only half the head, breaſt and belly; and have but one eye, one ear, one hand, and one foot; notwithſtanding which they can walk very ſwiftly, and even climb trees; talk with one another, and ſing verſes very elegantly compoſed. Their chief reſidence is ſaid to be by the ſides of lakes, or the ſea ſhore. *Hofm.* Lex. univ. in voc.

The word is Greek, compounded of μονος, one, and κωλον, a member.

MONODON, in the Linnæan ſyſtem of zoology, the name of the monoceros, or ſea unicorn, a fiſh of the whale kind, which makes a diſtinct genus of fiſhes; the characters of which are, that it has no fin on the back, and a very long tooth in its upper jaw. *Linnæi* Syſt. Nat. p. 51.

The word is Greek, compounded of Μονος, one, and οδους, a tooth, and expreſſes this fiſh's having only a ſingle tooth.

Artedi makes the *Monodon* a peculiar genus among the cetaceous fiſhes, or plagiuri. The *Narwal* is the only known ſpecies of this genus. See the article NARWAL.

MONOECIA, in botany, a claſs of plants which have not the male and female parts, that is, the ſtamina and piſtillum in the ſame, but in different flowers; and thoſe on the ſame individual, or on the different ſtalks, growing from the ſame root; thoſe which contain the ſtamina are called the male flowers, thoſe which contain the piſtillum, the female ones.

The word is derived from the Greek, μονος, the ſame, and οἶκος, habitation. The plants of this claſs are the alder, mulberry, amaranth, &c. See Tab. of Botany, Claſs 1.

MONOGASTRIC, in anatomy, a name given by Vieuſſens, and ſome of the French writers, to one of the muſcles of the ear, called by Cowper, the *internus auris*, and more properly by Albinus, the *tenſor tympani*.

MONOGRAPHI, in botany, authors who have written expreſs treatiſes on only one plant; as Douglaſs on the Guernſey lilly, &c. *Linnæi* Fund. Bot. p. 1.

MONOMACHON, a name given by ſome to the inteſtine, otherwiſe called *cæcum*.

MONOMERES, a word uſed by the antients alone, but more frequently joined with the word *phorbeia*, to expreſs one ſort of the bandage uſed to confine the breath, by thoſe who played on the antient pipe. This conſiſted only of one ſtrait, and one tranſverſe piece; and the latter came fully over the mouth, and cloſed it up, except that a hole was cut in it to receive the mouth-piece of the pipe. The *diemeres* conſiſted of ſeveral pieces, and only tied up the lower lip.

MONOPAGIA, a word uſed by ſome medical writers, for that ſpecies of headach which affects only one point, or ſmall part of the head.

MONOPETALOUS (*Cycl.*)—See theſe flowers repreſented in Tab. 1. of Botany, Claſs 1.

MONOPHAGI, Μονοφαγοι, in antiquity, a deſignation given to thoſe who celebrated the Æginean feſtival, becauſe they feaſted or eat together without the aſſiſtance of their ſervants; none but denizens of that iſland being allowed to be preſent. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 364.

MONOPODIA, among the antients, a ſort of tables uſed in their feaſts, and diſtinguiſhed by this name from their having but one foot; the name being derived from the Greek, μονος, one, and πους, foot. *Hardouin.* in Plin. vol. 2. p. 641.

MONOPS, in natural hiſtory, a name given by Ælian, and ſome other of the old Greek writers, to the *bonaſus*. It ſhould appear from this name, which expreſſes a ſingle eye, that the creature had but one eye; but this is not the caſe, and the word is rather formed upon the name *monopus*, which was originally written *monapus*, and the *a* only changed into an *o*, by the corruption of the copies of the authors who had treated of it. The name *monapus* was given this animal, according to Ariſtotle, by the people of the country where the creature was moſt frequent, and therefore is not to be attempted on any Greek etymology. Some of the Greeks have called the ſame creature *monepos*, and ſome *bolinthos*. See the article BONASUS.

MONOSCELI, Μονοσκελεις, a fabulous race of men, who are repreſented by Pliny to have only one leg. They were alſo called *ſicapodes*. See the articles SICAPODES and MONOCOLI.

The word is Greek, compounded of μονος, one, and σκελος, a leg.

MONOSPERMALTHÆA, in botany, a name given by Mr. Iſnard, in the *Acta Germanica*, to a genus of plants afterwards called *waltheria* by Linnæus. *Iſnard*, A. G. 1720. See the article WALTHERIA.

MONOTROPA, in botany, the name of a genus of plants, called by Tournefort, *orobanchoides*, and by Dillenius, *hypopitis*. See the article OROBANCHOIDES.

MONRINGION, in botany, a name given by ſome authors to the tree whoſe fruit is the ben nut, and whoſe wood the *lignum nephriticum* of the ſhops. Hort. Mal. vol. 6. p. 19.

MONSTER (*Cycl.*)—The French Academicians have of late diſputed whether *Monſters*, that is, creatures born with their organs preternaturally formed or ſituated, ſupernumerary or defective, were originally ſo formed in their firſt ſtamina; or whether this deformity has been owing to ſome accidental change upon them. The arguments for theſe opinions, are remarks on particular hiſtories of ſuch *Monſters*, which we cannot abridge, and therefore muſt refer to the Memoirs de l'Acad. des Sciences, 1733, 1734, 1731, 1739.

MONTENSES, a name given to the Donatiſts. See the articles CAMPITÆ, *Suppl.* and DONATISTS, *Cycl.*

MONTH (*Cycl.*)—Among the antient Greeks, the year was divided into twelve *Months*, which contained thirty and twenty-nine days alternately; but ſo as the *Months* of thirty days always went before thoſe of twenty-nine; the former were termed πληρεις, full, and δεκαφθινοι, as ending on the tenth day; the latter were called κοιλοι, *hollow*, and from their ending on the ninth day, ἐναφθινοι.

In order to underſtand their method of reckoning the days of the *Month*, it muſt be conſidered that every *Month* was divided into τρια δεχημερα, or three decads of days; the firſt decad they called μηνος ἀρχομενου or ἱσαμενου; the ſecond, μηνος μεσουντος; the third, μηνος φθινοντος, παυομενου or ληγοντος. Whence the firſt day of the *Month* was called νεομηνια, as falling upon the new moon, and πρωτη ἀρχομενου or ἱσαμενου, as being the firſt day of the firſt decad; the ſecond day was termed, δευτερα ἱσαμενου; the third, τριτη ἱσαμενου; and ſo on to the δεκατη ἱσαμενου.

The firſt day of the ſecond decad, which was the eleventh day of the *Month*, was called πρωτη μεσουντος or πρωτη ἐπιδεκα; the ſecond of this decad, δευτερα μεσουντος, or ἐπιδεκα, and ſo on to εικας, the twentieth, which was the laſt of the ſecond decad.

The

The first day of the third decad was termed πρωτη επ' εικαδι; the second, δευτερα επ' εικαδι, and so of the rest. Sometimes they inverted the numbers of this last decad, the first being called φθινοντος δεκαλη; the second, φθινοντος ενναλη; the third, φθινοντος ογδοη; and so on to the last day of the *Month*, which was called Δημητριας, *Demetrias*, from Demetrius Poliorcetes; before whose time, particularly in Solon's laws, it was called ενη και νεα, *the old and new*; because the new moon falling out on that day, part of it belonged to the old moon, and part to the new. It was also called τριακος, *the thirtieth*; and that not only in the *Months* which consisted of thirty days, but also in those of twenty-nine; for in these, according to some accounts, the twenty-second day was omitted; or, according to others, the twenty-ninth: But which day soever was omitted in computation, the thirtieth was constantly retained. Hence, according to Thales's first scheme, all the *Months* were called *Months* of thirty days; tho', by Solon's regulation, half of them contained only twenty-nine: And the lunar year of Athens was called a year of 360 days; tho' really, after Solon's time, it consisted of no more than 354. Vid. *Pott.* Archæol. Grec. l. 2. c. 26.

The names of the *Months* being various in different parts of Greece, it will be sufficient particularly to consider those of Athens, barely mentioning those of others that correspond with them. 1. *Hecatombæon*, this was the first *Month* of the Athenian year, beginning on the first new moon, after the summer solstice, and so answered to the latter part of our June, and the first part of July. It consisted of thirty days, and was by the Bœotians called *Hippodromus*, and by the Macedonians *Lous*; but its antient name was *Cronius*. 2. *Metagitnion*, the second *Month* of the Athenian year, answering to the latter part of our July, and first of August. It contained only twenty-nine days, and was called by the Bœotians *Panemus*; and by the people of Syracuse, *Carnius*. 3. *Boedromion*, the third *Month* of the Athenian year, which contained thirty days, and corresponded to the latter part of our August, and first of September. 4. *Mæmacterion*, the fourth *Month* of the Athenian year, consisting only of twenty-nine days. It answered to the latter part of our September, and first of October; and was called by the Bœotians *Alalcomenius*. 5. *Pyanepsion*, the fifth *Month* of the Athenian year: It contained thirty days, corresponded to the latter part of our October, and first of November; and was called by the Bœotians, *Damatrius*. 6. *Antheſterion*, the sixth *Month* of the Athenian year, answering to the latter part of our November, and first of December. It contained twenty-nine days, and was called by the Macedonians *Dæsion*, or *Desion*.. 7. *Posidion*, the seventh *Month* of the Athenian year, answering to the latter part of our December and first of January, and containing thirty days. 8. *Gamelion*, the eighth *Month* of the Athenian year; it answered to the latter part of our January and first of February, and consisted of twenty-nine days. 9. *Elaphebolion*, the ninth *Month* of the Athenian year, corresponding to the latter part of our February and first of March; it contained thirty days. 10. *Munychion*, the tenth *Month* of the Athenian year: It contained twenty-nine days, and answered to the latter part of our March and first of April. 11. *Thargelion*, the eleventh *Month* of the Athenian year: It contained thirty days, and answered to the latter part of our April and first of May. 12. *Scirrophorion*, the twelfth and last *Month* of the Athenian year: It contained twenty-nine days, and answered to the latter part of May and first of June. Vid. *Pott.* Archæol. Grec. L. 2. c. 26. & *Stephan.* Thes. Ling. Græc. T. 5. p. 223. seq.

As the Roman *Months* were the same with those now in use among the Europeans, we shall only refer to the article CALENDS, *Cycl.* and *Suppl.* where the manner of their computation is explained.

MONTIA, in the Linnæan system of botany, the name of a distinct genus of plants; the characters of which are these: The cup is a perianthium composed of two oval, hollow, obtuse and erect leaves, which remain when the flower is fallen. The flower is composed of three petals, joined together at their insertion; these are of an oblong oval figure, and the two side-ones are larger and placed lower than the others. The stamina are three capillary filaments, of the length of the flower: The antheræ are small: The germen of the pistillum is of a turbinated form; the styles are three, hairy and expanded, the stigmata are simple. The fruit is a capsule of a turbinated form, obtuse, of one cell, separated by three valves: The seeds are three in number, and roundish. *Linnæi* Gen. Plant. p. 21.

MONTIFRINGILLA, in zoology, the name of a bird known in English by the name of the *bramble*, *brambling*, or *mountain-finch*; and called by the antients *orospiza*. It is of the size and shape of the chaffinch; its beak is large, very strong, and strait, beginning with a large base, and ending in a point in form of a cone. Sometimes this is altogether black, sometimes it is partly black and partly yellow; from the head to the middle of the back it is of the blackish colour of the common starling, with a variegation of a greyish red from the edges of the feathers being of that colour; the hinder part of the back is white; the throat is of a reddish yellow, and the breast white. It is common in Italy, and is sometimes found in England. *Ray*'s Ornithol. p. 189.

There are beside this, two other species of the *Montifringilla*, or brambling; the one large, of the size of the common lark, and having the claw of its hinder toe longer than the rest, as in the lark; and the other a smaller, and seeming of a middle nature between the lark and brambling. It is reddish on the back, and white on the belly, and variegated with black and reddish brown on the wings. These are both common in Lincolnshire, and some other parts of England.

MONTROSE-*Waters*. Steel spaws are very numerous in the country about *Montrose* in Scotland: The principal of these are at Aberbrothoc, Kincardin, and Peterhead [a]. That of Aberbrothoc is in greatest esteem [b].—[[a] Medic. Ess. Abr. Vol. 1. p. 106, 107. [b] Ibid. p. 111.]

Beside these, there is a well near *Montrose*, the water of which is of a whitish colour, soft taste, and faintly discovering the mineral quality. This water is of a different nature from the steel-springs. The alcali prevails in its salt; it resembles the Scarborough-water, and no salts come up to any analogy with those of the *Montrose* water, and those of Scarborough, but nitre and sea-salt. See Med. Ess. Vol. 3. Art. 8. Abr. Vol. 1. p. 112. seq. where various experiments with those waters are enumerated, and a comparison instituted between them and the Scarborough waters.

The water of this *Montrose* well is universally diuretic; being drank from two to three pints, purges; and half the quantity succeeds with some. It has been found very useful in stranguries and stoppage of urine, scorbutic disorders, flatulencies, spasmodic colic, and spitting of blood. In rheums and strains it has been of good use by way of cold pump, where persons could not bear such use of ordinary cold water. Med. Ess. Vol. 3. Art. 9. Abr. Vol. 1. p. 122. seq.

MONYCHA, an epithet applied by naturalists to those animals whose hoofs are single and undivided; such are the horse, and the like.

MOON (*Cycl.*)—It is commonly agreed among philosophers and astronomers, that the *Moon* turns about the earth; but father Alexander supposes they may be all mistaken, and that the earth really turns about the *Moon*; and from this extraordinary hypothesis, he endeavours to account for the flux and reflux of the sea. See Journ. des Scav. Oct. 1727.

Mons. Grand-jean de Fouchy endeavours to prove, that there is no matter about the *Moon*, that can sensibly inflect the rays of light: And hence, that this secondary planet has no atmosphere whose refraction is observable. It might indeed have a circumambient fluid, the horizontal refraction of which might amount to 1″ or 2″, and some observations may seem to give ground for admitting something of this sort. But with respect to astronomers the *Moon* may be said to be destitute of an atmosphere. See Phil. Trans. N°. 455. sec. 3.

We have some observations and tables concerning the *Moon*'s motion, by Mr. Richard Dunthorn, in the Philosophical Transactions, N°. 482, sec. 13. where he gives an hundred observed longitudes of the *Moon* compared with the tables, *viz.* 25 eclipses of the *Moon*, taken (except the first) from Flamstead's Historia Cœlestis, the Philosophical Transactions, and the Memoirs of the Royal Academy of Sciences; the two great eclipses of the sun in 1706, and 1715; 25 select places of the *Moon*, from Flamstead's Historia Cœlestis; and 48 of those longitudes of the *Moon*, computed from Flamstead's Observations by Dr. Halley, and printed in the 1st edit. of the Historia Cœlestis.

In the Philosophical Transactions, N°. 473. we have a new method of computing the appulses of the *Moon* to the fixed stars and planets; as also of eclipses of the earth, commonly called eclipses of the sun, by Mr. Gersten, professor of the mathematics at Giessen.

The full *Moon* appears to the naked eye broader than a circular object subtending an equal angle seen by perfect vision. In a *Moon* of three or four days old the illuminated part appears too broad, in proportion to the obscure part, and likewise seems to extend more outwards, or to have a greater diameter than the obscure part. Also in an eclipse of the sun or *Moon*, the bright part appears too broad in proportion to the dark part, and the eclipse appears less than it really is.

This observation was made by Horrox, and is accounted for by Dr. Jurin, in his essay upon distinct and indistinct vision.

MOON-*Eyes*, in the manege. A horse is said to have *Moon-eyes* when the weakness of his eyes increases or decreases according to the course of the *Moon*; so that in the wane of the *Moon* his eyes are muddy and troubled, and at new *Moon* they clear up; but still he is in danger of losing his eye-sight quite.

MOON-*Fish*, a name given to the fish called by authors, *orbis*. See the article ORBIS.

MOP, in some counties of England, is the term for what is called the statute in other places; being the time that young people who intend themselves for servants, meet at some certain place, in order to be hired into services. *Plot*'s Oxfordshire, p. 207.

MOOR (*Cycl.*)—MOORS, in the isle of Man, those who summon the courts for the several *sheadings*; such are the lords bailiffs:

bailiffs: Every *Moor* has the like office with our bailiff of the hundred. *King*'s Descript. of the Isle of Man.

MOOR-*Cock*, an English name for the red-game, or our lagopus, more commonly called the gor-cock. It is a very delicate bird, larger than a partridge, and common on the hills in Derbyshire and Yorkshire. *Ray*'s Ornithol. p. 128. See the article GOR-*Cock*.

MOORS-*Head*, in the manege. See the article MORE's-*Head*.

MOOR-*Hen*, *Gallinula*, in zoology, the name of a genus of water-birds; the characters of which are these: The head is small, the body compressed, the beak short and moderately crooked, the wings small and hollowed like those of the common cock and hen kind, the tail very short, the legs long, and the toes remarkably so.

The common *Moor-hen*, called *Gallinula Chloropus* by authors, is a very well known bird, somewhat like the coot in shape, but smaller, and very much flatted in the body. Its feet are greenish, and its breast a lead-coloured blue; its belly greyish. It is common about our rivers, and is a very well tasted bird. *Ray*'s Ornithol. p. 233.

MOOR-*Land*, or MOORY-*Land*, in agriculture, is a black, light and soft earth, very loose, and without any admixture of stones; and with very little clay, or sand.

The uppermost stratum of the fen-lands is usually of this earth, and it usually constitutes a moderately thick or deep bed. Intermixed with water it cannot easily be worked up into a paste; and when with labour worked up into somewhat of a firm mass, its surface appears spongy and porous; and as soon as dry, it easily moulders away to powder.

It is usually soft to the touch, unless it be worked very closely between the fingers, then it shews a mixture of a small quantity of sand, both to the touch and to the eye.

It seems indeed to consist almost entirely of pure vegetable matter, and this lying in such plenty on the surface of the fen-lands, is the cause of their being so very fertile.

The great disadvantage of the places which have this soil, is their being liable to be glutted with wet; and to remedy the inconveniencies arising from thence, the farmers who rent these lands have a custom of burning the soil at proper seasons. It burns very freely and easily, the surface readily catching flame, and a substance somewhat bituminous, usually contained among the soil, helps the burning. *Moreton*'s Northamp. p. 36.

MOOR-*Stone*, the name of a very remarkable stone found in Cornwall, and some other parts of England, and used in the coarser works of the present builders.

This is truly a white granite, and is a very valuable stone. It is a very coarse and rude, but beautiful congeries of variously constructed and differently figured particles, not diffused among, or running into one another, but each pure and distinct, tho' firmly cohering with whatever it comes in contact with. Its colours are principally black and white; the white are of a sort of marbly texture, and opake, formed into large congeries, and emulating a sort of tabulated structure; among these there are many of a pure crystalline splendor and transparence, and among these are lodged in different directions many small flaky masses of pure talcs of several colours; some are wholly pellucid, others of an opake white, others of the colour of brown crystal, and a vast number perfectly black. *Hill*'s Hist. of Foss. p. 498.

It is found in immense strata in some parts of Ireland, but is disregarded there.

It is found with us in Devonshire, Cornwall, and some other counties; and brought thence in vast quantities to London. It never forms any whole strata there, but is found on the surface of the earth in immense and unmanageable masses; and to separate these into portable ones, they dig a hole with a wedge in some part of them, and surrounding it with a ridge of clay they fill it up with water; this by degrees soaks in, and finding its way into the imperceptible cracks so far loosens the cohesions of the particles there, that the day after they drive a larger wedge into the hole, and the stone breaks into two or more pieces. It is used in London for the steps of public buildings; and on other occasions, where great strength and hardness are required.

The people of Cornwall who have this stone in great plenty, use it in their tin-works, and particularly in their tin-kiln, on the good effect of which a great deal depends. This kiln is four-square, and at its top is placed a large block of *Moor-stone*; the usual size of this block is six foot in length and four in breadth; in the middle of this block there is made a hole of about six inches in diameter. This stone serves as a head to cover another like stone placed beneath it; but this under one is not so long as the upper by six inches. The reason of this is, that it must not reach the innermost or back part of the wall, which is the open place thro' which the flame ascends from another place below that, where a very strong fire of furze is constantly kept up; and there is another little hole also on the outside. The forepart is like a common oven, and has such a sort of chimney.

The tin ore is roasted in this kiln, to burn away the mundick, in this manner: The ore is brought in powder, and poured out in heaps on the surface of the top-stone, a man stands there and thrusts it down through the hole in this stone into the kiln, that is, to the surface of the under-stone; a person who stands below spreads this as it falls with an iron rake, and gives notice to the person above when there is enough down, that is when the surface of the lower stone is covered three or four inches thick. When this is done, the hole at the top is covered with green turfs, that the flame may reverberate the stronger; and the heat that the *Moor-stone* acquires helps to roast the ore; while the flame that comes up from the ore is blue, there yet remains mundic among it; but when this is burnt off, the flame is yellow. Philos. Trans. N°. 69.

The miners in some parts of Cornwall use the name *Moor-stone* for a sort of coarse free-stone, which lies very often over the tin ore; this is of a greyish colour, and is somewhat softer than that usually employed in building.

MOOR-*Titling*, a commong English name for the œnanthe, more frequently called the stone-chatter. See the article STONE-CHATTER.

MOORING (*Cycl.*)—MOORING *a fair Birth at Sea*, is *Mooring* in a place free from any annoyance.

MOORING *a Proviso*, at sea, is to have an anchor out, and a hawser a-shore; then the ship is *moored* with her head a-shore. And two cables is the least, and four the best to *moor* by. See the article ANCHOR.

MOORING *Water-shot*, is to *moor* neither alongst nor athwart the tide, but quartering between both.

MOOSE-*Deer*. The first mention we find of this remarkable animal, is in a tract of Mr. Josselyn's, entitled New-England Rarities. That author says, it is a very fine creature, growing to twelve foot high; the horns are extremely beautiful with broad palms, some of those full grown being two fathom from the tip of one horn to the tip of the other. The same author, in another work, entitled, Two Voyages to New-England, calls this creature a monster of supernuity; and says, that when full grown it is many times larger than an ox. What Neal says of this animal seems copied from Josselyn. But the best account we have of it, is from Mr. Paul Dudley; this gentleman says, that they are of two kinds: The common light-grey *Moose-deer*, called by the Indians *Wampoose*, and the larger black *Moose*. The grey *Moose* is the same animal which Mr. Clayton, in his account of the Virginian quadrupeds, published in the Philosophical Transactions, calls the elk: And this is the creature, described in the Anatomical Discoveries of the Paris Academy, under the name of the stag of Canada. Horns of this creature have been sent from Virginia, and called elks horns: They are wholly the same with those of our red-deer, except in size; weighing about twelve pounds, and measuring from the burr to the tip about six foot long. Phil. Trans. N°. 444. p. 386.

Mr. Dudley says, that the grey *Moose* is like the English deer; and that these creatures herd together thirty or more in a company. The black or large *Moose* has been taken, he says, measuring fourteen spans in height from the withers, which, allowing nine inches to the span, is ten foot and a half.

The stag or male of this kind has a palmed horn, not like that of our common or fallow deer, but the palm is much longer and more like to that of the German elk; but it differs from that in having a branched brow antler between the burr and the palm, which the German elk hath not.

The large horns found fossile in Ireland, have, from their vast dimensions, been supposed to have originally belonged to the black *Moose-deer*; but they, as likewise most other of the large horns found in this part of the world, appear to be the horns of the German elk, having no brow-antlers.

Mr. Ray mentions, in his Synopsis of animals, a pair of extremely large fossile horns, which he saw in a museum in Sussex; but he mentions no brow-antlers in these, and therefore probably they, as well as most others preserved in museums, were the horns of the German elk.

It is not agreed by authors what number of young the *Moose* brings forth at a time; Mr. Dudley says but two; but Josselyn, and from him Neal, say three; and these authors add, that they do not go so long with young as our does, by two months.

There is, beside the *Moose*, another animal of the deer-kind, very common in Virginia, and other of the Northern provinces of America. This creature has round horns, not spreading out as in the stag or red-deer, but meeting nearer together at the tips, and bending forwards over the creature's head; and the brow-antlers are not crooked and standing forward, but strait and upright. The skin of this deer is of a sandy colour with some black hairs, and is spotted all over while young with white spots as some of our fallow deer are, and it is about the bigness of our fallow deer when full grown. The *Dama Virginiana* of Mr. Ray was different from this, if the description be exact, and the horns of the palmated kind. This *Dama* of Mr. Ray seems to be what Josselyn, in his Voyages, calls the *Maurouse*; but his description is too short to form any regular judgment from, he only says that the *Maurouse* is like the *Moose*, but that its horns are small, and the creature about the bigness of a stag. Phil. Trans. N°. 444. p. 388.

Josselyn mentions also the buck, the stag, and the rain-deer; but it is very much to be doubted whether they are the same

animals that we mean by thoſe names. He mentions alſo another ſort of American deer, an animal called a *Macarib*, a *Caribo*, or a *Pohano*; but this ſeems a mere fiction; no ſuch animal exiſting in nature.

MORBUS-*Comitialis*, the epilepſy, one of the moſt terrible diſeaſes to which human nature is ſubject.

The ſymptoms of this diſorder vary greatly in different perſons; ſometimes it ſeizes them ſuddenly, and unexpectedly; at others, it is preceded in every paroxyſm by a train of concomitant ſymptoms, ſuch as a general laſſitude and wearineſs of the whole body, a pain in the head, great perturbation of the ſpirits, and an unuſual dread and terror; ſometimes alſo a ringing in the ears gives notice of its approach, or an inflation of the præcordia or palpitation of the heart and difficulty of breathing. It is common alſo to feel a cold air as it were aſcending from the extremities up to the heart and brain; ſometimes the joints feel cold, and often rumblings are felt in the abdomen, and fetid ſtools are diſcharged.

In the fit, the thumbs are uſually faſt clenched to the hands, the eyes diſtorted, ſo that only the white of them is ſeen, the patient is wholly ſenſeleſs, and a froth burſts out of the mouth with a ſort of hiſſing noiſe; the tongue is often lacerated by the teeth, and the joints uſually feel a violent ſuccuſſion. But ſometimes violent ſpaſms ſeize all the limbs, inſtead of theſe ſuccuſſions or tremblings; and they remain forcibly bent, ſo as to make the patient reſemble a ſtatue of wood. In infants the penis is erected; in more grown perſons the ſemen is often ejected, and the urine diſcharged to great diſtances. And theſe ſymptoms, ſometimes ſooner, ſometimes later, gradually go off.

The paroxyſms, according to the diverſity of cauſes, are longer or ſhorter, and fewer or more frequent; but they generally return at ſtated periods, as on certain days, hours, or months, or on the changes of the moon, eſpecially at the new and full moon.

Women are uſually ſeized with theſe paroxyſms at the time of the return of the menſes; and what is moſt obſervable is, that they are frequently occaſioned by ſeemingly ſlight cauſes, commotions of the mind, a colder ſeaſon than ordinary, the uſe of ſtrong liquors, cloſe application of the mind to any thing, and finally, the uſe of venery, often bring on theſe fits. Infancy and youth are the times of life moſt ſubject to this diſorder; and it more frequently attacks perſons of a nice and delicate conſtitution, than thoſe of a robuſt and hardy make.

The cauſe of this terrible diſorder appears to be a ſtricture of that membrane which ſurrounds the brain and the ſpinal marrow. The cauſes are very various, and thence alſo the diſeaſe varies in its ſpecies and appearance. The moſt terrible and mortal epilepſies have been brought on by external violence, by blows, wounds, fractures, and depreſſions of the cranium. Theſe are generally preceded by pains of the head, and a torpor of the ſenſes; and in theſe, after the patient's death, corrupted blood or ſerum is always found either between the *dura* and *pia mater*, or between the *dura mater* and *cranium*.

Chronical epilepſies, returning at ſtated periods, are alſo frequently occaſioned by certain acute bony protuberances ariſing internally in the baſis of the cranium, and ſometimes in the lateral ſinus. It is eaſy to ſee that this ſpecies of epilepſy is incurable; yet medicine can do great ſervice in it, by keeping the brain in ſuch a condition, that its preſſure on theſe protuberances may not be enough to produce a violent fit.

Polypoſe concretions in the jugular veins, and obſtructions of the ſinuſes of the *dura mater*, are alſo cauſes of incurable epilepſies. The paſſions of the mind alſo, as anger, fear, and the like, contribute greatly to bring on epilepſies, as they act immediately upon the nervous parts, and either conſtringe or dilate them preternaturally, which cannot be done very often without inducing a bad habit. Infants are often rendered epileptic either from ſucking the milk of a nurſe in a violent fit of paſſion, or from the violent commotions of mind the mother was ſubject to while pregnant. The terror of the ſight of one perſon in an epileptic fit, has frequently thrown another into the ſame diſorder; and it has been often known, that a ſtrong propenſity to venery, from a natural redundancy of ſemen, being ſuppreſſed by chaſtity, has brought on this diſeaſe. Women have fallen into it from violent love alſo, and have, in that caſe, found their cure in marriage.

In the cure of an epilepſy, the firſt intention muſt be to correct and expel from the body the remote material cauſes of the diſorder; ſecondly, to mitigate the ſpaſms of the *dura mater* and nervous parts by medicines of a ſedative and corroborating nature; the former, to check and allay the violent motion of the fluids, the other to reſtore the due tone and natural elaſticity to the parts, the weakneſs of which, occaſioned by a former fit, gives frequent occaſions for ſucceeding ones. Of the firſt kind are poppy-ſeeds or flowers, ſaffron, nutmeg, and the like; and among the chemical medicines, the *ſpiritus nitri dulcis*, when truly prepared. Of the corroboratives to be given in epileptic caſes, roſemary, rue, lavender, cardamom ſeeds, and ambergreaſe. Spirit of hartſhorn, and the oil of hartſhorn, made pure by frequent rectifications, is alſo greatly beneficial. The decoctions of the woods, as guaiacum, ſaſſafras, and the like, are alſo good remedies: And ſeveral epilepſies have been known to be perfectly cured, by taking half a pint of a ſtrong decoction of guaiacum twice a day, with a few drops of ſpirit of vitriol in each doſe, and making all the while a weaker decoction ſerve for the common drink. It is neceſſary, however, if there be a redundance of blood, to begin the cure with frequent bleedings. Cupping on the parts near the head is alſo of great ſervice, and ſometimes the opening the jugular vein is neceſſary, by which alone patients have ſometimes been cured.

But tho' theſe are the methods of cure, in ſome caſes, yet in others, where the diſeaſe has had a different origin, very different means are required. When an epilepſy ariſes from an impure ſerum, lodged in the veſſels and membranes of the head; which too often happens from the ſudden drying up of old ulcers, ſtopping of iſſues, or the like means; then the intention of cure conſiſts in the diſcuſſion, evacuation, and derivation of the ſerum to other parts. For this purpoſe cathartics are to be exhibited, and ſetons. Iſſues and bliſters are of ſingular ſervice. Nature has been known to cure epilepſies of this kind, by an eruption of pimples all over the body. And there is recorded in Willis a memorable inſtance of a girl, ſubject to frequent returns of epileptic fits; who, in one of them, happening to fall with her her head into the fire, and ſo accidentally cauteriſing it, remained well ſo long as the ulcers diſcharged any thing; but when they dried up, the former fits returned.

In epilepſies ariſing from violent emotions of the mind, in which acrid, bilious, and acrimonious humours are conveyed into the nervous ſyſtem, the uſe of whey, mineral waters, and a proper regimen added to the ſweetening powders, uſually produce a cure. Acidulated medicines are alſo highly proper, and ſpirit of vitriol, or *ſpiritus nitri dulcis*, are of very ſingular efficacy. When an epilepſy ariſes merely from pain, as that of the ſtone, the tooth-ach when violent, or ſpaſms of the ſtomach or inteſtines, then clyſters of oil are of very great uſe; and after theſe, bleeding is uſually very proper.

In the epilepſies of infants, ariſing from gripes, corrupted milk, or difficult dentition, great benefit is to be had from clyſters of milk with a little Venice ſoap diſſolved in it. A few grains of cinnabar, given internally, often prove alſo of ſingular benefit: And muſk is known to be a remedy ſecond to none in theſe caſes. When Epilepſies are cauſed by worms eroding the inner coats of the inteſtines, after the uſe of the common anti-epileptic remedies, the medicines for worms muſt be given, and their uſe continued, till, by the ſymptoms ceaſing, there is reaſon to think theſe pernicious animals are deſtroyed.

When an epilepſy returns at ſtated periods, or at the changes of the moon, the cauſe is uſually in the ſtomach or duodenum, or its adjacent parts, the biliary ducts and pancreas. In this caſe therefore there ſhould always be a clyſter given, and afterwards a vomit, before the expected fit.

In the time of the paroxyſms of epilepſies, people ought to abſtain from the uſe of ſubſtances that are too volatile, ſpirituous, fragrant, or fetid; for all theſe fill the head with vapours; nor ſhould ſuch things be exhibited as promote ſneezing or vomiting, ſince they derive the humours to the head, and often recall the paroxyſms. The moſt uſeful means, in the fit, are to keep the patient in an erect poſture, to rub his hands and feet. In all kinds of epilepſies it is proper to abſtain from wine and malt liquors, and to drink only water. Opiates, and too volatile medicines, muſt be very cautiouſly given to children, and to perſons of tender habits: And when epilepſies return on the ſlighteſt cauſes, it is proper to abſtain from a load of medicines, and truſt to nature and a proper regimen alone. In this regimen the patient muſt abſtain from all ſtrong liquors, from great heat, or exceſſive cold, from venery, from ſeeing any terrible ſight, from anxiety of mind, and from buſineſs. Young perſons are to abſtain from fruit; and all violent emotions of the mind are carefully to be avoided.

Many phyſicians have preſcribed the root of the wild valerian, as a remedy which is alone capable of curing this terrible diſeaſe.

MORDEHI, an Eaſt Indian name for a diſeaſe, to which the people of that country are ſubject. It conſiſts in a violent diſorder of the ſtomach. The great heats, copious ſweats, and ſupervening cold of that country, all naturally tend to weaken the ſtomach. Now if the inhabitants eat or drink immoderately at night, the concoction of their aliments can be but very unduly performed. Hence, beſide this diſtemperature of the ſtomach, they are ſubject to others of the bowels; and diarrhœas are very common among them, and with difficulty cured. *Hoffman*, de Morb. Endem.

MORDEXYN, or MORDOXI, a name given to a diſeaſe very frequent among the inhabitants of Goa, which conſiſts in a nauſea, and continued vomiting, and uſually ſeizes the patient ſuddenly and unexpectedly, and often proves fatal.

MORDILAPIS, a name given by ſome writers to loaches, a ſmall fiſh, often found under ſtones in ſhallow waters.

MORE'*s-Head*, in the manege, implies the colour of a *Roan horſe*, who beſides the mixture or blending of a grey and a bay, has a black head, and black extremities, as the main and tail. See the article ROAN.

MORELLA, in botany, a name uſed by ſome as a common term for all the nightſhades; others have appropriated it to the

lycopersicon, or love-apple only. Æmilius Macer tells us, that in his time all the plants called by the Greeks *strychna*, were called by the Latins *Morella*.

MORETUM, among the Romans, a kind of sallad, composed of the eight following Ingredients, *viz.* garlic, parsley, rue, coriander, onions, cheese, oil and vinegar. *Pitisc.* in voc.

MORGAY, an English name for the sea fish called also the *rough hound-fish*, one of the galeus kind; the *catulus minor* of Salvian, and *mustelus stellaris tertius* of Bellonius.

It is of a pale, and somewhat reddish grey, and is spotted with brown and whitish spots; the belly is silver white, and the body long and round; its skin is very rough, and its flesh very firm, and finely flavour'd. Some say it tastes of musk, or some such perfume. It is the smallest of all this genus of fishes, and seldom weighs above a pound and half. *Willughby*'s Hist Pisc. p. 64.

It is common in the Mediterranean, and is frequent in the markets in Italy.

MORGII, among the Mahometans, a sect who lay much stress upon belief, and stand opposed to the *Alwaidii*. See the article ALWAIDII.

MORHUA, in zoology, a name used by some authors for the common cod-fish. *Bellon.* de Pisc.

MORIAM, in our old writers, a head-piece called a pot, Stat. 4 & 5 P. & M. c. 2. The word comes from the French *Morion*, or Italian *Morione*, *i. e. Cassis*. *Cowel.*

MORILLON, in zoology, the name of a species of duck, seeming the same with the *capo rosso*, a small red-headed wild duck. See the article CAPO *Rosso*.

MORINA, in botany. This plant, in the Linnæan system, makes a distinct genus, the characters of which are, that the cup is double, and of two kinds, in the same plant; the one a perianthium of the fruit, which is monophyllous, cylindraceous, and remains after the flower is fallen off. The rim of this has ten notches in it, two of which have longer segments, which stand opposite to one another. The other cup is the perianthium of the flower, which is also composed of one leaf, and is of a tubular form, and slightly bifid, the segments being rimmed at their edges, pointed, and remaining also when the flower is fallen. The flower is a single petal, forming a very long tube, a little bent, and wider at top than the bottom. The rim is plain, obtuse, and divided into two lips; the upper of which is bifid, and the lower trifid. All the segments are of a roundish figure, and nearly equal in size. The stamina are too slender filaments, laid close against the style, shorter than the flower. The antheræ are erect, and applied closely to one another. The pistil has a roundish germen, placed under the receptacle of the flower; the style is of the same length with the stamina; and the stigma is formed into a small head. It has properly no fruit; the seed succeeding each flower being single, roundish, and surrounded with the cup of the flower. *Linnæi* Gen. Plant. p. 7.

MORINELLUS, in zoology, the name given by authors to the bird commonly called in English, the *dotterel*.

The usual weight of this bird is a quarter of a pound; but the male is smaller than the female, and weighs usually half an ounce less. Its Beak is a finger's breadth long. Its head is very beautifully variegated with small black and white spots; and has a line of white over the eyes. Its throat is of a greyish white, variegated with streaks of brown. Its breast and the under part of its wings are of a dusky yellow. The belly is white; and its back and wings are brown, with variegations of a whitish and yellowish colour. Its rump is grey; as is also its neck; and its tail is variegated with grey, black, and white. It is common in Lincolnshire, and some other counties of England; and is a very delicate bird. It is commonly caught in the Night. *Ray*'s Ornith. p. 230.

MORINELLUS *Marinus*, the *Sea Dotterel*, a name given by authors to the bird, commonly known in England by the name of the *turnstone*; and called by Turner, *cinclus*. *Ray*'s Ornithol. p. 231. See the article TURNSTONE.

MORINGA, in botany, the name by which some authors call the tree which produces the ben nut, or *glans unguentaria*, and whose wood is the *lignum nephriticum*, or nephritic wood of the shops.

MORION, in botany, a name given by the antients to a kind of nightshade. The antient Greeks, Theophrastus, and others, called all the nightshades in general by the name *strychnos*. Some of these they said were poisonous, and others esculent. The poisonous were of two kinds, some bringing on sleepy disorders, and others making the patient mad.

The esculent kind was the *pomum amoris*, or love-apple, eaten at this time by the Portuguese, and many other nations, and by some in England. Some after-writers used the word *Morion* as a distinctive name for those kinds of nightshade which caused sleepy disorders; and after these, some used it as the peculiar name of one species, and others as the name of the male mandrake of Dioscorides, whose fruit, according to that author, was commonly eaten by the shepherds; but when taken too largely, threw them into sleepy disorders. From this word *Morion* has come, in all probability, the Latin name *morella*, given at first to the *pomum amoris*, or love-apple; and afterwards, according to Æmilius Macer, to all the nightshades; for he expressly says, that those plants which the Greeks called *strychna*, the Latins called *morella*; and we find that the old Greeks called all the nightshades *strychna*.

MORION, in the natural history of the antients, a name given to one of the semi-pellucid gems, more commonly called *pramnion*. It is a stone appearing externally only of a fine deep black; but when held up against a candle, or against the sun-shine, giving a very beautiful red, in different degrees, from that of the hyacinth to that of the amethist or carbuncle. *Hill*'s Hist. of Foss. p. 471. See the article PRAMNION.

MORISONA, in botany, the name of a genus of plants, the characters of which are these: The perianthium is one-leaved, inflated, and divided at the top into two lips. These stand open; but the neck is contracted, and the whole soon withers. The flower consists of four oblong obtuse petals, which are expanded when they are out of the cup. The stamina are numerous filaments. The antheræ are simple. The style is capillary and erect, and is longer than the tube of the flower. The germen of the pistil is oval. The stigma is capitated, and of a plano-convex figure. The fruit is a globose berry, with a hard smooth rind. It has only one cell, and is supported by the style by way of pedicle. The seeds are numerous, and are of the shape of the common kidney-beans, but small. *Plumier*. Gen. 23. *Linnæi* Gen. Plant. p. 230.

MORLING, or MORTLING, in our old writers, the wool which is taken from the skin of dead sheep, whether killed, or dying of the rot, 4. Edw. 4. cap. 2. & 3. 27 Hen. 6. cap. 2. 3 Jac. 1. cap. 18. 14 Car. 2. c. 18. *Blount*, *Cowel.* See the article SHORLING.

MOROCHITES, in natural history, a name by which some of the old authors have called the *morochthus*, or French chalk. *Hill*'s Hist. of Foss. p. 22. See the next article.

MOROCHTHUS, in the history of fossils, a name of an indurated clay, commonly known among us by the name of French chalk, or marking-stone; and its principal use with us is the taking spots out of cloaths, and the serving taylors to mark with, as it makes a much more determinate and a neater line than chalk. The antients, however, had it much in esteem in medicine, and used it as an astringent, and in colics and hæmorrhages, and externally in disorders of the eyes.

It is distinguished from all other earths, by being the hardest of all, considerably heavy, very smooth to the touch, and in colour of a greyish white, with a considerable admixture of green. It is of a disagreeable brackish taste, and does not ferment with acids. It is dug in Germany, the island of Sardinia, and many other places; but no where so plentifully as about Brianson in France, whence it is there commonly called *Brianson chalk*. *Hill*'s Hist. of Foss. p. 22.

MOROCTES, one of the names by which Pliny, and some other of the older authors called the *Morochthus*, or French chalk. *Hill*'s Hist. of Foss. p. 22. See the foregoing article.

MORONA, a name used by some for the *huso*, or isinglass-fish. *Willughby*, Hist. Pisc. See the article HUSO.

MORPHASMUS, Μορφασμος, among the antients, a kind of dance, wherein, by a great many figures, they imitated the transformations of Proteus. *Hofm.* Lex. in voc.

MORRHA, in natural history, a name given by some to the substance more properly called *murra* or *myrrha*, of which the cups called *murrhina* and *myrrhina* were made. See the articles MURRHINA and MORRHINA.

MORRHINA *Vasa*, in the writings of the antients, a term very frequently met with, and used to express a sort of cup and vases used for drinking out of, and on some other occasions.

The word is generally written *myrrhina*, and various conjectures have been formed concerning it, some supposing it to be meant of vessels made of myrrh, some of the onyx, and some of a peculiar sort of spotted stone. See the article MYRRHINA.

The word, however, is written by all the most correct writers *Morrhina*. Pausanius and many others give us proofs of this. It is evident that there is no stone mentioned by the antients under the name *morrha*, nor is this word ever found used as a synonym for the onyx, or any other stone, but always as the name of the matter of which the vessels were made.

The antients had many things in use among them, the nature and origin of which were unknown to them; and this *morrha* seems to have been one of that number. Some of them say it was a stone, and others call it a fluid, condensed by being buried under ground. And if to this we add the beauty of the polish, the tender texture of the substance, which was easily broken by a fall, and the size of some of the vessels made of it; for we are told that Heliogabalus had his chamber-pot made of it; it will appear very probable that it was a factitious matter, and was of the nature of our China ware. The antients, not knowing that the *morra* was a factitious substance, which it does not appear indeed that they did, does not prove it not to be such; for they for many ages wore garments of silk, and had that substance in use on many other occasions, and all the time believed it to be the *lanugo* or down of a tree, dressed by combing, *&c.* and it was not till the

the days of Juſtinian that they knew it was ſpun by worms. Their ignorance of the origin of ſilk, however, no more altered its nature, than their ignorance of the fabric of their *morrhina vaſa* did that of the ſubſtance they were made of.

The antients had their moſt elegant and valuable *morrhina vaſa* from India and Carmania; but Arrian tells us, that there was a great quantity of them made at Dioſpolis in Ægypt. This he calls another ſort of *Morrhina* work; and it is evident, from all accounts, that the *morrha* of Dioſpolis was a ſort of glaſs ware, made in imitation of the porcelane or *morrha* of India.

There is ſome difference in the accounts given by Pliny and Martial, of the *Morrhina vaſa*. The firſt author ſays, that they would not bear hot liquors, but that only cold ones were drank out of them. The latter, on the other hand, tells us, that they bore hot liquors very well. It ſhould ſeem, that the moſt credit was to be given to Pliny; but if ſo, their porcelane was greatly inferior to ours in this particular.

MORSE; in zoology, the name of a monſtrous ſea animal, called by ſome the *roſmarus* and *walrus*, and by others, very improperly, the *hippopotamus* and *equus marinus*. See the article HIPPOPOTAMUS.

The *Morſe* is an ill-ſhaped amphibious animal, of the ſize of a large ox, covered with a ſkin like that of the ſeal, and ſomewhat reſembling an ox in the head; for which reaſon ſome have called it the ſea cow, or *vacca marina*, whence it has been erroneouſly confounded by ſome with the *manati*.

It has two large prominent and crooked teeth before, which are as fine as ivory, and are uſed by artificers for the ſame purpoſes. It brings forth uſually but one young one at a time, never more than two. It is a very ſtrong and vigorous animal, and difficultly taken; when it is caught, it is uſually at land, ſeldom at ſea.

Vorſtius, who met with a young one of this creature, has very accurately deſcribed it; whence we have the beſt deſcription extant of the nature of the animal. This young one was of the ſize of a large dog, and in ſhape much reſembled the phoca or ſea calf. Its head was round; its eyes large, and like thoſe of an ox; its noſtrils depreſſed and wide, and opening, and drawing together as the creature pleaſed. It had apertures on the ſides of the head for ears. Its mouth opened round and not very large; and on the upper lip it had a ſort of whiſkers, compoſed of thick cartilaginous briſtles. The lower jaw was of a trigonal form; the tongue ſhort and thick, and the mouth well furniſh'd with broad and flatted teeth. Its fore feet, as well as the hinder ones, were very broad; and the hinder extremity of its body very much reſembled that of the *phoca* or ſea calf. When it walked, the fore feet were directed forwards, the others turned backward. The toes were five on each foot, and theſe were joined by a membrane, which was remarkably thick. The hinder feet had claws, the fore ones had not; and the creature had no tail, and crept rather than walked on the hinder parts. Its ſkin was thick and tough, and covered with a few ſhort grey hairs. It made a noiſe like the grunting of a hog. *Ray*'s Syn. Quad. p. 191.

MORT (*Cycl.*)—MORT, among the fiſhermen of ſome parts of England, a name given to the ſalmon while in its third year's growth. *Willughby*'s Hiſt. Piſc. p. 189. See the article SALMON.

MORTALITY (*Cycl.*)—*Bills of* MORTALITY. Mr. Simpſon makes the proportion of the number of inhabitants of any place, to the number of births that happen there annually, as 26 to 1. Whereas Mr. Kerſſeboom [a] makes it 35 to 1; which Mr. Simpſon thinks owing to a want of obſervations. But Mr. Kerſſeboom has ſince ſhewn, in 29 tables, that the proportion of 26 to 1 cannot be admitted, and that his own, of 35 to 1, is right. He alſo proves, from Mr. Maitland's obſervations, that children in London, of two years old, continue to live, on a medium, above 37 years; and he obſerves, that by Dr. Halley's table [b], they live 38½.—[a Doctr. of Annuit. p. 127. b Phil. Tranſ. N°. 465. Sect. 3. p. 319.]

Mr. Kerſſeboom ſuppoſes, that out of every 100 children born, five come dead into the world; and that out of every 100 children born alive, near 20 die under a year old. Mr. Simpſon's calculation differs greatly from this, he ſuppoſing that full 32 out of 100 children, die under a year old. Phil. Tranſ. ibid.

There is a ſurprizing diſparity obſerved between the chriſtenings and burials of the city of London; which is chiefly owing to diſſenters of all ſorts baptizing their children without ſending in accounts of their chriſtenings to the pariſh clerk. See Mr. *Maitland* in Phil. Tranſ. N°. 450. Sect. 16.

From the account there given of the chriſtenings and burials in London for ten years, from 1626 to 1635 inclusive, it appears that the chriſtenings exceeded the burials; nor can it be doubted that they do ſo ſtill. This obſervation will ſhew the cauſe of ſome miſtakes of Mr. Kerſſeboom. See Phil. Tranſ. ibid.

Mr. Maitland, in his account of London, ſhews, that at a medium of nine years, there are annually buried in London 29542, and in Paris only 17804; ſo that the number of inhabitants in London exceed thoſe in Paris by nearly in the proportion of 5 to 3. Hiſt. of Lond. p. 540, 548.

MORTAR (*Cycl.*)—The ſalt-petre workers in France uſing the *Mortar* of old buildings for extracting that ſalt, Mr. Petit has thought it worthy a peculiar attention, and has made ſeveral trials, by way of analyſis, of *Mortar*, to determine whether it really and eſſentially contains nitre in it, or whether it be only ſerviceable in that mixture of ſalts from which nitre is produced.

The common managers of the ſaltpetre-works are of opinion, that *Mortar* contains in it all the ſaltpetre they procure from it, and that the wood-aſhes, and other ſubſtances they uſe with it, only ſerve to abſorb the fat or oily parts, and ſo ſet the ſaltpetre at liberty to ſhoot. This they pretend to affirm upon experience; but they do not conſider that tho' they can procure ſaltpetre from the rubbiſh or *Mortar* without the addition of wood-aſhes, yet it is not pure *Mortar* that they make their experiments upon, but ſuch as is taken from their own heaps, upon which they always throw all the reſiduum of their former works, and all that liquor which will ſhoot no more cryſtals, but which they call the mother-water of ſaltpetre.

This gentleman therefore very properly judged, that to make a regular trial of the *Mortar* or rubbiſh alone, he muſt not take it from their ſtores, uſed in the ſaltpetre-works, but pick it himſelf from the ruins of old buildings.

The mark the ſalt-petre workers have to know good *Mortar* for their purpoſe, is, that it taſtes acrid and ſalt when applied to the tongue; but to this it may be alſo added, that it ought to be of a greyiſh colour, and ſuch as when powdered and ſprinkled upon burning charcoal yields ſome ſparks of fire; and the more ſparks it gives, the better it is for the purpoſe. And another character of the goodneſs is, that theſe well impregnated *Mortars* have a certain unctuoſity or fattineſs to the touch, which other kinds have not.

The fineſt of all kinds of *Mortar* for ſalt-petre work, is ſuch as is had from the ruins of old buildings in a low ſituation, and out of the way of much ſunſhine; where there has been no great quantity of fire kept, and eſpecially ſuch as has ſerved for the cements of the walls of ſtables, or the like.

Mr. Petit choſe from ſuch a wall twelve pounds of old *Mortar*; this he had beat to powder, and poured upon it eighteen pints of water; the whole was then ſet over the fire, and ſtirred from time to time for three or four hours, that the water might be well tinctured from the *Mortar*; after this the water was filtred through paper, and was then found to be tinctured to a pale yellow, tranſparent, bitter, and ſomewhat acrid to the taſte.

The impregnation may be made without heat, by only ſtirring the *Mortar* about for nine or ten days in cold water, and the quantity of the ſalts taken up will be according to the goodneſs of the *Mortar* and the quantity of water employed. The common ſpecific gravity of this liquor to water, is as 32 to 31, or thereabouts. Mr. Petit having procured the tincture of fifty pounds of *Mortar* by ſeveral impregnations in ſeventy-two French pints of water, evaporated it ſo far till it appeared highly charged with ſaline particles, taſting very acrid and bitter, and being of a browniſh red colour; and its ſpecific gravity was in this ſtate to water, as 4 to 3, there being more in quantity than about four pints. This was ſtill limpid and of a duſky colour, and was afterwards evaporated over a gentle fire to the conſiſtence of an extract, which as it cooled became much thicker and firmer, reſembling butter. This being left open to the air ſoon relented into a liquor of the conſiſtence of a ſyrup: Its ſpecific gravity was now to water as 5 to 3; but in leaving it open to the air, it continually attracted freſh humidity, and became leſs ſpecifically heavy. Experiments made with this extract ſucceeded in the following manner.

1. It turned the common blue paper to a fine deep red. The impregnations in water uninſpiſſated do this alſo in different degrees according to their ſtrength.

2. Mixed in equal quantities with ſpirit of nitre and with ſpirit of ſea-ſalt, it made no effervescence or alteration in either.

3. A leaf gold being put into the mixture of this impregnation with ſpirit of nitre was immediately diſſolved, and in an hour or two afterwards the liquor was much clearer than before.

A leaf of gold being put into the mixture of this impregnation and ſpirit of ſea-ſalt, was in the ſame manner diſſolved in a few minutes. It is generally ſuppoſed indeed that ſpirit of ſalt alone will diſſolve gold, but there ſeems an error in this founded on the inaccuracy of the preparation of ſuch ſpirit of ſalt; for Meſſ. Geoffroy and Boulduc have at different times produced before the French Academy ſpirit of ſalt carefully prepared by themſelves, which would not at all diſſolve gold, not even with the aſſiſtance of heat; even ſuch ſpirit of ſalt would however be made to diſſolve gold by mixing this impregnation with it: So that it has the power of diſſolving gold in a great degree.

4. A leaf of ſilver being diſſolved in ſpirit of nitre, and this impregnation of *Mortar* added to the ſolution, the whole became turbid, and a precipitation happened, part of the matter

ter being thrown to the bottom, and part remaining ſuſpended in form of a white cloud, which kept its place without falling.

5. The impregnation being mixed in equal quantities with oil of vitriol formed a coagulum, and made a great effervescence, with copious red vapours, and a ſtrong ſmell of aqua fortis; and theſe vapours appeared at any time on ſtirring the mixture for ſeveral days together. If a larger quantity of oil of vitriol be added to this coagulum, it all becomes fluid, but ferments violently; and finally there will be a white matter precipitated to the bottom of the clear liquor; and if a leaf of gold be brought near this mixture it will be diſſolved even by the vapour which exhales from it. Spirit of nitre has no effect upon this mixture, either in its ſtate of a coagulum, or when reduced by more oil of vitriol into a clear liquor; but the volatile ſpirit of urine ferments violently without the leaſt heat with it.

6. Oil of tartar *per deliquium* being added to the impregnation, the liquors would not readily mix, but remained ſeparate, the impregnation ſinking to the bottom; but on ſtirring them thoroughly together, they finally were made to unite into a white ſubſtance like butter, with a ſtrong urinous ſmell. If a ſmall quantity of corroſive ſublimate be added to this mixture, the urinous ſmell ceaſes; and if oil of vitriol be added, there is a violent fermentation occaſioned; and, in fine, a large quantity of precipitate.

7. This impregnation of *Mortar* being mixed with an equal quantity of a ſolution of corroſive ſublimate, there is nothing remarkable produced, though the mixture be ever ſo much ſhaken; but if a little oil of tartar *per deliquium* be added to this, the mixture becomes turbid, and, on ſtirring all together for ſome time, it becomes white and thick like butter. If to this, more corroſive ſublimate be added in ſolution, it becomes orange-coloured; and, on more ſtirring, this becomes again white; and finally gives a white precipitate at the bottom, of a tranſparent liquor.

8. If inſtead of oil of tartar an equal quantity of lime-water be added, this in the ſame manner gives an urinous ſmell, and the whole difference is, that the mixture will not become thick with this, as it will with oil of tartar.

9. The impregnation of *Mortar* produced the ſame coagulum on mixing with ſpirit of urine, that it did with oil of tartar *per deliquium*; but it made no coagulation with ſpirit of ſal armoniac with lime; the occaſion of this difference is, that the ſpirit of urine contains a great deal of volatile ſalt, and the other but little. It is a common error to ſuppoſe that the ſpirit of ſal armoniac, which is moſt pungent, contains the greateſt quantity of ſalt; but this is not the caſe, for the ſpirit made with lime is much more pungent than that with ſalt of tartar, though the laſt is well known to contain a greatly larger portion of ſaline particles.

10. If a piece of paper or linnen be wetted in this impregnation, and afterwards dried, it takes fire very violently, and ſparkles with the ſame violence as if it was impregnated with ſalt-petre.

From theſe experiments it is abundantly proved, that the impregnation of *Mortar* contains a large quantity of a ſaline and nitrous ammoniac ſalt; for a diſſolution of ſal armoniac and ſpirit of nitre mixed together are found to produce all the changes in the different bodies before-named, that the impregnation does. On the whole, though it has been ſuppoſed by Mr. Tournefort, and others, that *Mortar* contained ſal-petre, ſea-ſalt, and a fixed alkali; yet there does not appear any proof of its containing any one of thoſe ſalts; no fixed alkali can ever be ſeparated from the impregnation of it; and tho' the linnen or paper wetted in the impregnation of it ſparkled when on fire, yet it is not nitre, but merely a nitrous ſal armoniac, which occaſions that phænomenon. The ſame effect is produced, if the linnen or paper be wetted with a mixture of ſpirit of urine and ſpirit of nitre. And the ſeveral experiments before recited prove, that there is in *Mortar* a ſpirit of nitre and a ſpirit of ſea-ſalt, which with the volatile urinous ſalts form a nitrous or a ſaline ſal ammoniac. Mem. Acad. Scienc. Par. 1734.

MORTARIOLUM, a word applied by different writers to different things, from their reſemblance to a mortar in ſhape. The chemiſts expreſs by this name a ſmall mould made for the faſhioning their cupells; and anatomiſts call the ſockets of the teeth the *Mortariola* of the jaws.

MORTIFICATION (*Cycl.*)— MORTIFICATION, in religion, any ſevere pennance obſerved on a religious account. How antient and how univerſal the practice of it has been, and for what reaſons obſerved. See the article FASTING.

MORUS, the *Mulberry*, in botany, the name of a genus of trees, the characters of which are theſe: The flower is of the amentaceous kind, conſiſting of a great number of ſtamina, with their apices which ariſe from a four-leaved cup; theſe are male-flowers, and the embryo-fruits appear on different parts of the tree, and finally become a ſort of compound berry, ſoft and full of juice, and compoſed of cluſters of ſucculent ſquammæ which contain roundiſh ſeeds. *Tourn.* Inſt. p. 589.

The ſpecies of *Mulberry*, enumerated by Mr. Tournefort, are theſe: 1. The common *Mulberry*, with black fruit. 2. The *Mulberry* with ſmall black fruit, and elegantly divided leaves. 3. The *Mulberry*, with white fruit. 4. The *Mulberry*, with ſmall purpliſh white fruit. And 5. The *Mulberry*, with ſmall inſipid white fruit.

The fruit of this tree, while unripe, is very aſtringent; but when thoroughly ripe, it is of a contrary quality, rather purgative, cooling, very pleaſant, and quenching thirſt. Its ſyrup, which is very pleaſant, is the only uſe made of it in the ſhops.

The more general cultivating *Mulberry* trees in England might be of greater uſe than is at preſent ſuppoſed in many reſpects. In Devonſhire they have a way of mixing *Mulberry* juice with their cyder in the making, and thus make the very beſt of all Engliſh vinous liquors. And as to the great article of breeding ſilk-worms, though a recommendation from the crown could not bring about the planting theſe trees in ſufficient number for it in James the Firſt's time, yet the trees have been found to flouriſh every where with us when properly planted, and the worms feed very kindly and work very well with us. When this manufacture was firſt attempted, the people of many parts of England, nay and in ſome parts of the dampeſt places in Ireland, tried it, and always with ſucceſs. The only thing that ſtopped the progreſs of ſo valuable a thing at that time, was the want of a ſufficient quantity of *Mulberry* trees, and the ſcheme has been neglected ever ſince. Phil. Tranſ. N°. 133.

The tree was always eſteemed by the antients for its delicious fruit, before the uſe of its leaves was ever found out. The Romans, in the height of their luxury, preferred it before all the foreign fruits; and Columella, and the other antients are very expreſs in the methods of propagating it.

MORXI, the Indian name of a peſtilential diſtemper, very common in Malabar, and in ſome other parts of the Eaſt-Indies, frequently carrying off great numbers of people.

MOSCH, a name of a ſort of roriferous veſſels, ſaid to have been diſcovered by Bilſius, in the kidneys.

MOSCHELÆUM, a name given by authors to a compound, fragrant and aromatic oil, in which muſk is a very predominating ingredient.

MOSCHATELLINA, in botany, the name of a little plant common under our hedges in ſpring, which conſtitutes a peculiar genus; the characters of which are theſe: The flower conſiſts of one leaf, and is rotated and divided into ſeveral ſegments at the edge. From the cup of this riſes a piſtil, which is fixed in the manner of a nail to the middle of the flower; and finally becomes a ſoft ſucculent berry, containiug flatted ſeeds. *Tourn.* Inſt. p. 156.

MOSCHELAPHUS, in natural hiſtory, a name given by ſome writers to a creature of a mixed nature, produced by the copulation of a ſtag and a cow. Wagner tells us, that theſe creatures are ſometimes ſeen in the mountainous parts of Swiſſerland; as are alſo the Hippotauri, generated between a bull and a mare; but neither of theſe ever propagate their ſpecies. *Wagner*'s Hiſt. Helvet.

MOSCHIFERUM *Animal*, in natural hiſtory, the name of the creature which affords us the perfume called muſk.

This creature ſeems to be neither of the goat nor deer-kind, and it is doubtful whether or not it chews the cud; it has however no *dentes inciſores* in the upper jaw, which ſeems a mark that it does; but it has, according to the obſervation of Ariſtotle, exerted teeth or tuſks there, in the manner of the boar. His noſe is ſharp, like that of a greyhound; his ears like a rabbit's, about three inches long, and erect; and his tail or ſcut, about two inches; his foot is deeply cloven. The hair on the body is about half an inch long, and very thick, and of a brown and white colour. *Ray*'s Syn. Quad. p. 140.

The *Muſk* bladder or bag is about three inches long and two over, ſwelling out an inch and half from the belly, and ſtanding as much before the groin. It has no horns, and its tuſks by their figure ſeem intended equally for feeding and fighting.

MOSCHOSITERON, a name given by Myrepſus, and other old writers, to Fœnugreek.

MOSS (*Cycl.*)—Theſe ſmall plants, tho' neglected of many ages, have, by the induſtry and application of the later botaniſts, been found a very numerous and very beautiful claſs of plants; and not without their uſes in medicine and mechanics, and to various purpoſes of human life. Dr. Dillenius, who has ſtudied them with an uncommon care, and given a very valuable hiſtory of them, has deſcribed more than ſix hundred ſpecies; the greater part of which are found in our own country, though ſome peculiar to others; and doubtleſs, there yet remain vaſt numbers unheeded and unknown in many countries. See Tab. of *Moſſes*.

The *Moſſes* of Virginia, Penſilvania, and other parts of North-America, are in part the ſame with ours, and in part different; about two thirds of the number of *Moſſes* of theſe countries hitherto obſerved being common to our own country alſo, the reſt peculiar to that part of the world. Thoſe of South-America, are almoſt all wholly different from ours. The *Moſſes* of Greenland and Lapland are moſtly of the ſame kind with thoſe of our Welch mountains. And in the mountainous

tainous parts of the world between the Tropics, there are many extremely beautiful fern-like *Moſſes*, unknown in all other places.

Ireland and Scotland yet remain to be ſearched in a great meaſure, and probably will afford great numbers hitherto wholly unknown. It cannot but be acknowledged, that the diſtinctions of theſe little vegetables are ſo minute, and their appearance ſo various in their different ſtates, that very probably ſucceeding obſervations will much retrench the number deſcribed by Dillenius; but as the ſame obſervers will probably add as many new and truly diſtinct ſpecies, as they find occaſion to ſtrike off from the old liſt, there is no doubt but that the number will be found at leaſt as great as it ſtands at preſent with that author.

Uſes of MOSSES. Were there no other uſe in theſe minute and beautiful objects than the admiring the wonderful works of the creator, this were enough to make the ſtudy of them worthy of attention; the almoſt endleſs variety of the figure and ſtructure of their leaves, the ſlenderneſs of the ſtalks that ſupport them, and the regularity and nice order in which they are arranged; the minuteneſs of their roots, and the ſlenderneſs of the pedicles which bear the heads, each of which is often ſmaller than the fineſt hair, and the extreme exility of the veſſels through which juices are conveyed along theſe for the nouriſhment of the plant and ſeeds, can never enough be admired; and the various ſtructure of the heads or ſeed-veſſels with their coverings, by means of which the tender ſeeds and farinæ are defended, afford to the microſcopic obſerver an endleſs fund of admiration.

But theſe are not all the uſes they were intended for, many may yet remain unknown; but we at preſent well know that ſeveral of the uſneas are great and valuable medicines, uſed as deſiccatives and aſtringents; that the common cup *Moſs* is one of the greateſt remedies in the convulſive coughs of children, called the chin-cough, is known to every one; and Dr. Mead has ennobled the grey ground-lichen, by publiſhing its virtues in one of the moſt terrible of all diſeaſes, the bite of a mad dog. The common green liverworts are known medicines in diſorders of the breaſt, as are alſo all the ſpecies of polytricha. The ſeeds of our lycopodium are given with ſucceſs in nephritic caſes; and the Indians give one of their ſpecies in many diſtempers, and as they ſay, with great benefit. The common white ground coralloides ſerves the rain-deer of Lapland for food, when all other herbage is loſt; and the confervæ ſerve for food to many of the fiſhes both of the ſea and rivers, and to ſeveral water-fowl. And theſe, as well as the land *Moſſes* afford ſhelter and habitation to many inſects, and their young. Many of the ſpecies of coralloides and lichenoides are found of great uſe in that profitable branch of commerce the art of dying; and doubtleſs many others have alſo the ſame qualities, though not yet diſcovered; and we may be guided in ſearches of this kind by obſerving that many of them tinge the papers between which they are dried, to very beautiful and laſting colours. The *Moſſes* which cover the trunks of trees, as they always are freſheſt and moſt vigorous on the ſide which points to the north, if not only produced on that, ſerve to preſerve the trunk of the tree from the ſeverity of the north-winds, and direct the traveller in his way, by always plainly pointing out that part of the compaſs.

The ſoft marſh and bog *Moſſes* ſerve the poor in many places for ſtuffing their beds, and in the buſineſs of tranſporting plants from other countries; nothing is of ſo great uſe as the ſtalks and leaves of theſe little vegetables: The ſucculent plants coming over in great beauty and vigour when rolled up in dry *Moſs*; and trees and ſhrubs, by having their roots covered with ſuch as is ſomewhat moiſt.

The great quality of the *Moſſes*, which makes them ſo ſerviceable in this caſe, is, that they do not heat and ferment on being moiſtened, as hay and ſtraw would.

Characters of MOSSES. What the botanical writers ſtrictly underſtand by the word *Moſs*, is a claſs of plants appearing of an inferior rank, to the common vegetables; the leſs perfect genera of which ſeem to be wholly deſtitute of flower or ſeed or any thing analogous to either, at leaſt as far as our obſervations have hitherto been able to carry us, and to conſiſt of ſimple, ſimilar, and uniform parts; the genera a little above theſe have ſome diverſity of parts, and carry ſomething that looks analogous to vegetation in the common way, having a reſemblance of thoſe parts which ſerve other plants for their fructification. The more perfect genera of the *Moſſes* not only conſiſt of different parts, but have alſo their appropriated organs containing a pulpy matter, which finally becomes dry, and aſſumes the form of a fine and ſubtle powder, compoſed of granules, each of which is either a ſeed or a granule of farina ſerving for the propagation of the ſpecies.

The more imperfect *Moſſes* are diſtinguiſhed from the others by their appearance to the naked eye; they are either in form of a fine lanugo, or down covering the ſurface of different bodies, or elſe they appear as ſlender filaments or foliacious bodies floating about in the water, or as filaments of a tougher texture hanging down from the branches of old trees, or as little ſhrubs or ſingle horns growing erect on the parched earth of mountains and heathy places; or finally, as broad and foliaceous bodies ſpreading themſelves over the dry barks of trees or rocks, without any pedicle or other ſupport.

The more perfect kinds of *Moſſes* are found in the ſhape of ſmall but regular plants, dividing into ſeveral branches, and clothed with leaves; theſe are of various forms and ſtructures, ſome being broad and thin, others ſlender as hairs; ſome pellucid, others opake; ſome ſmooth, others hairy. From the alæ of theſe leaves in ſome kinds, and from the ſummit of the ſtalks in others, there ariſe heads or capſules of a various figure and ſtructure, but all unicapſular; ſome of theſe are naked, others covered with a calyptra or hood; ſome ſtand on long pedicles, and others are placed cloſe to the ſtalks. Theſe heads are uſually called *capſulæ*, and their pedicles *ſetæ*, in the *mnia*, *hypna*, *brya*, and *polytricha*; but in the *lichenes* and *lichenaſtra* the pedicles are called *pediculi*, and the heads *capitella*.

The *byſſi*, *confervæ* and *tremellæ*, appear to be wholly deſtitute of ſeeds; the ſeveral parts of theſe genera have no difference from one another; and in the *tremellæ*, though there is often an appearance of leaves like thoſe of trees, yet when examined they will be found to differ in this, that the upper and under ſides are no way different.

The *uſneæ*, *corolloides*, and *lichenoides*, all have ſomething which ſeems analogous to a flower or fruit in the perfect plants; and all the other genera of *Moſſes* as the *ſphagna*, *hypna*, &c. have perfect fructifications, and produce the powder before-mentioned ſerving in the place of farinæ or ſeeds, and regularly propagating the plants. The mnia, lycopodioides, and above all others the lichens or liverworts, have perfect and regular fructifications obvious to the eye. The mnia have duſty heads, which appear plainly to be the female part of the fructification.

The lycopodioides has ſeveral capſules containing farinæ, and beſide theſe ſeveral female capſules containing ſeeds, and not farinæ, interſperſed along the ſame ſpikes.

The heads of the lichens or liverworts which contain the farinæ, differ from all the others in that they are polycoccous; in this alſo they differ from the ſeed, bearing heads of the ſame plants or ſcyphi, as they are called, which are ſingle, and contain the rudiments of ſeeds, obvious to the naked eye, which may be daily ſeen to encreaſe; and the propagation of the plant from them is eaſily obſerved through its ſeveral ſtages: This however is very ſingular, and extremely different from that of all other plants, in that the whole operation conſiſts only in the dilatation of the ſeeds, they having no heart or eye, as it is called, in the ſeeds of the larger plants, no place from whence the radicle is to ſhoot, nor any ſeminal leaves, but expanding ſimply into breadth, they become young plants like the parent.

The other genera of *Moſſes* have all capſules for the containing their ſeed or farinæ. Theſe, in ſome, are covered with a calyptra or hood, in others they are naked. Of the firſt kind are the *ſphagna*, *brya*, *fontinales*, *hypna*, and *polytricha*; and of the latter, the *ſelagines*, *lycopodia*, *poroniæ*, *anthocera*, and *lichenaſtra*.

The capſules of the *ſphagna* have no calyptra, becauſe the heads being placed on extremely ſhort pedicles, and the leaves of the plant long, they are covered and defended by them; and having beſide a very rigid and ſtiff operculum, they are in no neceſſity of any other covering; but the *fontinales*, *hypna*, *brya*, and *polytricha*, are all defended in their capſules by calyptræ, leſt the too abundant humidity ſhould deſtroy the ſeeds. The operculum ſlides off from all theſe in a tranſverſe direction; for when the included pulp in the capſule becomes ripened into ſeeds or farinæ, the notched parts of the rim ariſe from the ſurface, and expand themſelves outward, by means of which the operculum is at liberty to fall off, and the ſeeds have liberty to fall out, and propagate the plants.

The *ſelagines*, *lycopodia*, and *lycopodioides*, have neither capſule, operculum, nor calyptra; for the fruits of theſe genera lying immerſed in the alæ of the leaves, they need no ſuch coverings; but they ſtand naked cloſe to the ſtalk, and when mature, they open longitudinally, and throw out their ſeeds.

The fruits of the anthocera open in the ſame manner, but they are of a very different figure, reſembling pods, whereas the others are of a kidney-like ſhape.

The poroniæ are very ſingular, in that their capſules are perforated with many holes, thro' which the ſeeds or farinæ are diſcharged when ripe. The heads of the lichenaſtra, when they are ripe, become lucid, and opening into four parts, carry the appearance of a tetrapetalous, or four-leaved cruciform flower.

The ſubſtance with which the heads or capſules of all the *Moſſes* are filled, reſembles either ſeeds, or the ſmall globules of the farinæ of flowers, which all reſemble ſeeds of particular figures in miniature. The fructifications of theſe minute plants ſeem to be either from theſe, as ſeeds falling to the earth; or, according to the opinion of ſome, they ſeem to contain only farinæ in the capſules, which impregnating certain bulbs or nodules in the alæ of the leaves, cauſe them to grow and vegetate, as is ſeen in ſome of the larger plants, as in the bulbs produced in the alæ of the leaves of the dentaria, and of the lillies, and ſome others. The former opinion, of the powder in the heads or capſules, being actually

perfect

perfect ſeeds, is the more probable, as theſe bulbs in the alæ of the leaves are found only in ſome of the hypna, and others of a few other genera, whereas the propagation is as quick and certain in thoſe which have none of them, as in thoſe which have; and the want of female parts of fructification, which makes ſo many deſiderata in the Linnæan ſyſtem of botany, is eaſily made up, and the whole explained according to the uſual courſe of nature in other vegetables, by allowing the powder in the capſules to be real ſeeds, and the ſmall globules on the pointals ſurrounding the aperture of the capſule, the farina.

The opinion of the *Moſſes* growing only from theſe nodules in the alæ of the leaves, or from the impregnated ends of the branches which had received the powder from the capſules, was originally founded on the obſerving, that the trailing or branched hypnums annually grew out into length, from the extremities of all their branches, and annually loſt as much of the old ſtalk at the root, as they gained of the new at the ſummit; but it appears from further obſervations, that they are real ſeeds which are contained in form of powder in the capſules; ſince the bryums, and many others, are found growing from ſmall points or ſpots, which are aſſemblages of their minute leaves, propagated on the ground, under the old ones juſt where the powder of the capſules has fallen; and tho' it be allowed, that the hypnums and other trailing *Moſſes* do grow from the ends of the branches, yet they may alſo be produced in form of new plants, from regular and perfect ſeeds ſhed from the capſules. It is certain that the bryums are by this means propagated and ſpread into large tufts, and the other genera may alſo be ſo propagated, tho' they have beſide a property of encreaſing by growth of the ſtalk; which ſeems no other than the property of many of the larger plants to creep at the root, and ſhoot out in length greatly from the extremities of their horizontal branches, lying on or under the ground, as thoſe ſpreading parts may more properly be ſo called than roots, the fibres puſhed out from them perpendicularly into the earth, being properly the roots; and it is well known that theſe plants, tho' they propagate themſelves thus by the root, produce ſeeds alſo like the others, by which they may be equally propagated; and this analogy is to be carried yet farther; for as thoſe plants which creep by the roots, produce fewer ſeeds than thoſe which are propagated only by ſeeds, ſo the hypnums, which are the genus of *Moſſes* in which this growth by the ſtalk is principally obſerved, are very thinly beſet with capſules of ſeed, and many of them produce but very few in a ſeaſon; whereas the brya, and other *Moſſes*, which have not this advantage of growing from the ends of the ſtalks, are found every year profuſely covered with capſules from every tuft; nay, there is ſcarce any branch which does not produce its capſule. Now if theſe capſules contained only a farina capable of impregnating the nodules, or the ends of the branches, it is obvious there would be as much of it required for the hypna as for any other kinds of *Moſſes*; but if they are real and perfect ſeeds, it is no wonder that nature has given them profuſely, to ſuch kinds as are to be propagated only by ſeeds, and more ſparingly to thoſe which are propagated alſo by the increaſe of the branches.

To this it may finally be added, that the ferns and other epiphylloſpermous plants approach moſt of all others to the nature of the *Moſſes*; and tho' it has been ſuſpected by many, that the fine powder at the back of their leaves was not ſeeds, but only a farina; yet it is now well known that it is true and perfect ſeed, ſince, under many ſpecies of them, there are conſtantly found new and ſelf-ſown plants ariſing in their firſt rudiments of leaves and figure, which have plainly grown from the duſt or powder fallen from the old plants; and as this is now found to be the caſe in regard to the ferns, probably it will alſo appear the ſame in regard to the *Moſſes*, when they have been yet farther examined than at preſent. But whether theſe grains of powder have the lobes and radicle by which the ſeeds of larger plants propagate themſelves, or whether they grow into plants like the parent ones, in the manner of the lichens, by mere expanſion, is a thing that requires farther obſervations to determine.

Some of the *Moſſes*, it is evident, approach to the nature of the plants, which have their male and female parts in the ſame flower, and to thoſe which have them in different ones. The lichens have their leaves notched and jagged like thoſe of the perfect plants, and have, in the ſame manner, their under ſurface different from the upper. Theſe have their male flowers or heads on long pedicles; theſe heads contain only farina, and the ſeeds are lodged in little cups or diſhes on the ſurface of the leaves. The next in perfection to theſe are the lycopodioides, which have flowers with farina, and fruits with ſeeds, diſpoſed along the ſame ſpike. The mnia have heads of two kinds, the one membranaceous, like thoſe of the hypnums and other *Moſſes*, and the other duſty, and containing a powder viſible on their ſurface; the one of theſe plainly contains the farina, the other the ſeed. The lichenaſtra are very ſeldom found with ſeeds on them; but they creep greatly by the roots; whence a new propagation by ſeeds is leſs neceſſary. The polytricha are ſuppoſed to carry only a farina in their heads, and their branches ſtellated at the ends, to carry the ſeeds which are to be impregnated. This has been the common opinion; but it wants confirmation. Some of the bryums have the ſame appearance of a female part, and the young nodules in the alæ of the leaves of the hypnums are generally alſo referred to the ſame uſe. But theſe are conjectures; and the much more probable opinion is, that the powder in the heads of all the *Moſſes* is true ſeed, which in general is impregnated with farina from the pointals, over the mouth of the capſule; and in ſome inſtances, as in the mnia, *&c.* as in ſome of the more perfect plants, from different flowers in a different part of the plant. *Dillen.* Hiſt. Muſc. Introit.

The manner of ſeeding of *Moſſes* in general may be in ſome degree gueſſed at by that of one genus of them, which has been traced through all its ſtages, and to which moſt of the others, though every genus has its diſtinct fructification in ſome reſpects, yet bear a very great general analogy.

The genus already obſerved, is that called by Dr. Dillenius, the *hypnum*. The ſpecies of this are very numerous and common; but that particular one which was the ſubject of theſe obſervations, is the ſhort-branched ſilky kind, common on old walls; and called by that author in his hiſtory, *Hypnum vulgare, ſervicum, recurvum, capſulis erectis cuſpidatis*.

The head of this *Moſs* appears to the naked eye a ſmall ſmooth browniſh yellow oblong body, of about a ninth of an inch long; this is covered at its upper end with a membranaceous calyptra or hood, in ſhape reſembling an extinguiſher, or a funnel inverted. When this calyptra is taken off, and the head viewed with a microſcope, the ſurface of it is ſeen to be ridged with longitudinal ſtriæ. The baſis of the head is of a deep orange colour, and more opake than the reſt; and the top is bounded by an orange-coloured ring ſwelling out ſomething beyond the ſurface of the contiguous parts of the head. Good glaſſes ſhew that in this head there are not wanting the parts eſſential to the fructification of what are uſually called the more perfect plants. This ring is truly a monophyllous undulated calyx, within which ariſe ſixteen pyramidal fimbriated ſtamina; theſe are of a pale greeniſh colour, and are loaded with a whitiſh oval farina. The ſtamina all bend toward each other from their baſes, and almoſt meet in a point at their tops. This is their appearance when the head is nearly ripe; and immediately under the arch formed by theſe ſtamina, is a cylindric hollow piſtillum, through which the farina makes its way, and is diſperſed among the ſeeds in the head. The fruit is a large capſule, filling every part of the membrane which ſhews itſelf on the outſide of the head, and in moſt places is contiguous to it. This capſule is filled with perfect and very beautiful ſeeds; they are round, tranſparent when unripe, but afterwards opake, and of a very beautiful green, which colour they retain even when dried. Philoſ. Tranſ. N°. 478. Sect. 12.

When this head is firſt produced from the plant, the ſtamina are very ſlender, and ſtand erect; the head is ſcarce any thicker than the ſtalk, and the calyptra covers it all over, to ſhield the tender ſubſtance of the farina from external injuries. As the farina afterwards ſwells in the ſtamina, the ſeeds in the head increaſe alſo in bulk, and by their increaſe the head is more extended in thickneſs, and the ſtamina are by this means ſeparated farther and farther from each other at their baſes, but bend inwards toward their points, ſo as to form a kind of arched covering over the ſtigma of the piſtillum which is ſingle; and from hence the farina falls as it ripens into the head, and impregnates the ſeeds. Id. Ibid.

All the *Moſſes*, liverworts, and the other plants of the ſame character, poſſeſs the ſame general virtues of drying and aſtringency.

Moss *on Trees*, in gardening. The growth of large quantities of *Moſs* on any kind of tree is a diſtemper of very bad conſequence to its increaſe, and much damages the fruit of the trees of our orchards.

The preſent remedy is the ſcraping it off from the body and large branches, by means of a kind of wooden knife, that will not hurt the bark, or with a piece of rough hair cloth, which does very well after a ſoaking rain. But the moſt effectual cure, is the taking away the cauſe. This is to be done by draining off all the ſuperfluous moiſture from about the roots of the trees, and may greatly be guarded againſt in the firſt planting of the trees, by not ſetting them too deep.

If trees ſtand too thick in a cold ground, they will always be covered with *Moſs*; and the beſt way to remedy the fault, is to thin them. When the young branches of trees are covered with a long and ſhaggy *Moſs*, it will utterly ruin them; and there is no way to prevent it, but to cut off the branches near the trunk, and even to take off the head of the tree, if neceſſary; for it will ſprout again; and if the cauſe be in the mean time removed by thinning the plantation, or draining the land, the young ſhoots will continue clear after this.

If the trees are covered with *Moſs*, in conſequence of the grounds being too dry, as this will happen from either extreme in the ſoil, then the proper remedy is the laying mud from the bottom of a pond or river, pretty thick about the root, opening the ground to ſome diſtance and depth to let it in; this will not only cool it, and prevent its giving growth to any great quantity of *Moſs*, but it will alſo prevent the

other great miſchief which fruit-trees are liable to in dry grounds, which is the falling off of the fruit too early. *Mortimer*'s Huſbandry, vol. 2. p 78.

Heath-Moss. See the article HEATH.

Silk-Moss, in botany, a name given by Count Marſigli to a ſpecies of ſea *Moſs*, of a very remarkable fineneſs and ſoftneſs, much more reſembling ſilk than any other of the vegetable productions. It is wholly compoſed of a ſort of tuft of fine hairs or filaments, and is of a bluiſh green colour, and almoſt tranſparent. It grows on rocks, ſtones, ſhells, or any thing elſe that lies in its way, and is found uſually at ſmall depths; it is not ſo tough and flexible as many other of the ſea plants, but is eaſily rubbed to powder between the fingers. When examined by the microſcope, the ſingle filaments do not appear of the ſame equable ſurface and uniform texture; but they are ſeen to be jointed and made up as it were of a great number of pieces faſtened end by end to one another, in the manner of the beads of a lady's necklace. It is of a fine bluiſh green, and perfectly tranſparent before the microſcope, and reſembles a ſtring of gems, ſuch as the aqua marina, or ſome other like ſtone. *Marſigli* Hiſt. de la Mer. p. 79.

Sea-Mosses. Theſe ſmall plants are very beautiful when viewed by the naked eye; but when examined with the microſcope, they afford a very pleaſing variety of ſtructure and conformation.

The common kinds afford a great variety of colouring, the different parts of the ſame plant often appearing ſome brown, ſome yellow, ſome red, and ſome grey. On drying, theſe colours become leſs elegant; but on putting the dried plant again to ſoak in water, they are in ſome degree recovered, and the variations are uſually found to be owing to the joints and knots in the ſtalks, which interrupt the courſe of the general colour, and are often themſelves either black, or of a dark and deep brown.

The ſummits of their branches are frequently terminated by little tranſparent bubbles; theſe ſome have taken for fruit, but very erroneouſly; they are in reality only globules of clear water. Some of them are jointed at ſeveral diſtances, and every joint has its regular ſhape and ſtructure. This is the caſe in the two great claſſes of the corallines and the confervas. Others are elegantly variegated with brown, yellow, and green, and though leſs tranſparent, are not leſs beautiful than the former; theſe are in general of the fucus or fucoides claſs. Others are white and tranſparent, like *Moſſes* of cryſtal. Theſe are ſmall and elegant corallines, and their joints are uſually variegated with black ſpots: It is not unuſual alſo to ſee, at the extremities of the branches of theſe, certain ſmall black globules, which appear to be the fruit; but they are in reality no other than globules of water thus tinged by ſome juices from the plant.

It is poſſible, however, that theſe liquid globules may be ſo far of the nature of a fruit, as to contain the ſeed of the plant. We know that the ſeeds of the ſea fucus's in general are enveloped in a glutinous liquor, and kept at the ſummit of the branches of the plant; they are indeed in thoſe large plants ſurrounded with a viſible and ſenſible membrane, which is indeed thicker and longer than any other part of the plant; and it is not impoſſible that theſe fine and ſmall globules may have their covering membrane, too fine and thin to become the object of our ſenſes. *Marſigli* Hiſt. de la Mer, p. 80.

The generical characters of theſe plants are to be ſeen under their ſeveral heads of *fucus*, *coralline*, and the reſt; but theſe minute plants are often omitted by the writers on botany, though they make ſo elegant a figure on being viewed with the aſſiſtance of glaſſes.

Moss is alſo a name given by ſome to the boggy ground in many parts of England, more uſually called a *fen* and *bog*.

In many of theſe grounds, as well in England and Ireland as in other parts of the world, there are found vaſt numbers of trees ſtanding with their ſtumps erect, and their roots piercing the ground in a natural poſture, as when growing. Many of thoſe trees are broken or cut off near the roots, and lie along, and this uſually in a north-eaſt direction. People who have been willing to account for this, have uſually reſolved it into the effect of the deluge in the days of Noah; but this is a very wild conjecture, and is proved falſe by many unanſwerable arguments. The waters of this deluge might indeed have waſhed together a great number of trees, and buried them under loads of earth; but then they would have lain irregularly and at random; whereas they all lie lengthway from ſouth-weſt to north-eaſt, and the roots all ſtand in their natural perpendicular poſture, as cloſe as the roots of trees in a foreſt.

Beſide, theſe trees are not all in their natural ſtate, but many of them have the evident marks of human workmanſhip upon them, ſome being cut down with an ax, ſome ſplit, and the wedges ſtill remaining in them; ſome burnt in different parts, and ſome bored through with holes. Theſe things are alſo proved to be of a later date than the deluge, by other matters found among them, ſuch as utenſils of antient people, and coins of the Roman emperors.

It appears from the whole, that all the trees which we find in this foſſile ſtate, originally grew in the very places where we now find them, and have only been thrown down and buried there, not brought from elſewhere. It may appear indeed an objection to this opinion, that moſt of theſe foſſile trees are of the fir kind; and that Cæſar ſays expreſly, that no firs grew in Britain in his time; but this is eaſily anſwered by obſerving, that theſe trees, though of the fir kind, yet are not the ſpecies uſually called the fir, but pitch-tree; and Cæſar has no where ſaid that pitch-trees did not grow in England. Norway and Sweden yet abound with theſe trees, and there are at this time whole foreſts of them in many parts of Scotland, and a large number of them wild upon a hill at Wareton in Staffordſhire to this day.

In Hatfield marſh, where ſuch vaſt numbers of the foſſile trees are now found, there has evidently once been a whole foreſt of them growing. The laſt of theſe was found alive, and growing in that place within ſeventy years laſt paſt, and cut down for ſome common uſe.

It is alſo objected by ſome to the ſyſtem of the firs growing where they are found foſſile, that theſe countries are all bogs and moors, whereas theſe ſorts of trees grow only in mountainous places: But this is founded on an error, for though in Norway and Sweden, and ſome other cold countries, the fir-kinds all grow upon barren and dry rocky mountains, yet in warmer places they are found to thrive as well on wet plains. Such are found plentifully in Pomerania, Livonia, and Courland, *&c.* and in the weſt parts of New England there are vaſt numbers of fine ſtately trees of them in low grounds. The whole truth ſeems, that theſe trees love a ſandy ſoil; and ſuch is found at the bottoms of all the *Moſſes* where theſe trees are found foſſile. The roots of the fir-kind are always found fixed in theſe, and thoſe of oaks, where they are found foſſile in this manner, are uſually found fixed in clay, ſo that each kind of tree is always found rooted in the places where they ſtand in their proper ſoil; and there is no doubt to be made, but that they originally grew there. When we have thus found that all the foſſile trees we meet with once grew in the places where they are now buried, it is plain that in theſe places there were once noble foreſts, which have been deſtroyed at ſome time; and the queſtion only remains how and by whom they were deſtroyed. This we have reaſon to believe, by the Roman coins found among them, was done by the people of that empire, and that at the time when they were eſtabliſhed, or eſtabliſhing themſelves here.

Their own Hiſtorians tell us, that when their armies purſued the wild Britons, theſe people always ſheltered themſelves in the miry woods, and low watery foreſts. Cæſar expreſly ſays this, and obſerves, that Caſſibelan and his Britons, after their defeat paſſed the Thames, and fled into ſuch low moraſſes and woods, that there was no purſuing them; and we find that the Silures ſecured themſelves in the ſame manner when attacked by Oſtorius and Agricola. The ſame thing is recorded of Venutius, king of the Brigantes, who fled to ſecure himſelf into the boggy foreſts of the midland part of this kingdom: And Herodian expreſsly ſays, that in the time of the Romans puſhing their conqueſts in theſe iſlands, it was the cuſtom of the Britons to ſecure themſelves in the thick foreſts which grew in their boggy and wet places, and when opportunity offered, to iſſue out thence and fall upon the Romans. The conſequence of all this, was the deſtroying all theſe foreſts, the Romans finding themſelves ſo plagued with parties of the natives iſſuing out upon them at times from theſe foreſts, that they gave orders for the cutting down and deſtroying all the foreſts in Britain which grew on boggy and wet grounds. Theſe orders were punctually executed; and to this it is owing that at this day we can hardly be brought to believe that ſuch foreſts ever grew with us as are now found buried.

The Roman hiſtories all join in telling us, that when Suetonius Paulinus conquered Angleſea, he ordered all the woods to be cut down there, in the manner of the Roman generals in England: And Galen tells us, that the Romans, after their Conqueſt in Britain, kept their ſoldiers conſtantly employed in cutting down foreſts, draining of marſhes, and paving of bogs. Not only the Roman ſoldiers were employed in this manner, but all the native Britons made captives in the wars, were obliged to aſſiſt in it: And Dion Caſſius tells us, that the emperor Severus loſt no leſs than fifty thouſand men in a few years time, in cutting down the woods, and draining the bogs of this iſland. It is not to be wondered at, that ſuch numbers executed the immenſe deſtruction which we find in theſe buried foreſts. One of the greateſt ſubterranean treaſures of wood is that near Hatfield; and it is eaſy to prove that theſe people to whom this havock is thus attributed, were upon the ſpot where theſe trees now lie buried. The common road of the Romans out of the ſouth into the north, was formerly from Lindum (Lincoln) to Segelochum (Little-Burrow upon Trent), and from thence to Danum (Doncaſter), where they kept a ſtanding garriſon of Criſpinian horſe. A little off on the eaſt, and north-eaſt of their road, between the two laſt named towns, lay the borders of the greateſt foreſt, which ſwarmed with wild Britons, who were continually making their ſallies out, and their retreats into it again, intercepting their proviſions, taking and deſtroying their carriages, killing their allies and paſſengers, and diſturbing their garriſons. This at length ſo exaſperated the Romans, that they were determined to deſtroy it; and to do this ſafely and effectual-

ly, they marched againſt it with a great army, and encamped on a great moor not far from Finningly: This is evident from their fortifications, yet remaining.

There is a ſmall town in the neighbourhood called *Oſterfield*, and as the termination field ſeems to have been given only in remembrance of battles fought near the towns whoſe names ended with it, it is not improbable that a battle was fought here, between all the Britons who inhabited this foreſt, and the Roman troops under Oſtorius. The Romans ſlew many of the Britons, and drove the reſt back into this foreſt, which at that time overſpread all this low country. On this the conquerors taking advantage of a ſtrong ſouth-weſt wind ſet fire to the pitch trees, of which this foreſt was principally compoſed; and when the greater part of the trees were thus deſtroyed, the Roman ſoldiers and captive Britons, cut down the remainder, except a few large ones which they left ſtanding, as remembrances of the deſtruction of the reſt. Theſe ſingle trees however could not ſtand long againſt the winds, and theſe falling into the rivers which ran through the country, interrupted their currents, and the water then overſpreading the level country made one great lake, and gave origin to the *Moſſes* or moory bogs, which were afterwards formed there, by the workings of the waters, the precipitation of earthy matter from them, and the putrefaction of rotten boughs and branches of trees, and the vaſt increaſe of water *Moſs*, and other ſuch plants which grow in prodigious abundance in all theſe ſort of places. Thus were theſe burnt and felled trees buried under a new-formed ſpungy and watery earth, and afterwards found on the draining and digging through this earth again.

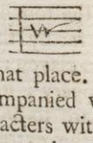
Hence it is not ſtrange that Roman weapons and Roman coins are found among theſe buried trees; and hence it is that among the buried trees ſome are found burnt, ſome chopped and hewn; and hence it is that the bodies of the trees all lie by their proper roots, and with their tops lying north-eaſt, that is, in that direction in which a ſouth-weſt wind would have blown them down: Hence alſo it is, that ſome of the trees are found with their roots lying flat, theſe being not cut or burned down, but blown up by the roots afterwards when left ſingle; and it is not wonderful, that ſuch trees as theſe ſhould have continued to grow even after their fall, and ſhoot up branches from their ſides which might eaſily grow into high trees. Philoſ. Tranſ. N°. 275.

By this ſyſtem it is alſo eaſily explained why the moor ſoil in the country is in ſome places two or three yards thicker than in others, or higher than it was formerly, ſince the growing up of peat-earth or bog-ground is well known, and the ſoil added by overflowing of waters is not a little.

As the Romans were the deſtroyers of this great and noble foreſt, ſo they probably were alſo of the ſeveral other antient foreſts; the ruins of which furniſh us with the bog-wood of Staffordſhire, Lancaſhire, Yorkſhire, and other counties. But as the Romans were not much in Wales, in the iſle of Man, or in Ireland; it is not to be ſuppoſed, that foreſts cut down by theſe people gave origin to the foſſile wood found there; but though they did not cut down theſe foreſts, others did; and the origin of the bog-wood is the ſame with them and with us. Holingſhead informs us, that Edward the Firſt being not able to get at the Welch, becauſe of their hiding themſelves in boggy woods, gave orders at length that they ſhould all be deſtroyed by fire and by the ax; and doubtleſs the roots and bodies of trees found in Pembrokeſhire under ground, are the remains of the execution of this order. The foſſile wood in the bogs of the iſlands of Man and Angleſea, is doubtleſs of the ſame origin; though we have not any accounts extant of the time or occaſion of the foreſts there being deſtroyed; but as to the foſſile trees of the bogs of Ireland we are expreſsly told, that Henry the Second, when he conquered that country, ordered all the woods to be cut down that grew in the low parts of it, to ſecure his conqueſts by cutting away the places of reſort of rebels.

Moving-Moss. We have an account in the Philoſophical Tranſactions, of a moving-*Moſs* near Church-town in Lancaſhire, which greatly alarmed the neighbourhood as miraculous. The *Moſs* was obſerved to riſe to a ſurprizing height, and ſoon after ſunk as much below the level, and moved ſlowly towards the ſouth.

Wall-Moss. See the article Wall-*Moſs*.

MOSTRA, in the Italian muſic, a little mark ſet at the end of each line of a tune, thus  to ſhew that the firſt note of the next line is in that place.

If this firſt note be accompanied with a ♯ or flat *b*, it is right to place thoſe characters with the *Moſtra*. Alſo if in a thorough baſs this firſt note have any cyphers, it would be of uſe to put the ſame cyphers with the character, at the end of the preceding ſtaff. Again, if the part change its cleff with the firſt note, the cleff ought to be marked with the *Moſtra* in the ſame manner. The *Moſtra* is of great uſe, eſpecially in quick motions, as it prepares the player for what is to come. Vid. *Broſſ.* Muſ. Dict. in voc.

MOSYNÆCUM *Æs*, in metallurgy, a name given by the antients to a white metal made of copper, in great eſteem among them.

Ariſtotle tells us, that it was extremely bright and of a perfect fine white colour; and adds, that it was made of copper by melting it with an admixture of a peculiar kind of earth. Strabo alſo mentions this; and Theopompus tells us, that it was made of copper and an earth, and that it looked ſo like ſilver, that it was generally called *Pſeudoargyron*.

Virgil mentions it under the name of *Aurichalcum album*, and ſeems to give it great praiſes. We are not able at preſent to ſay what it was they uſed in making it. We know ſeveral things that will render copper white, as arſenic, and the like; but none of theſe can well be ſuppoſed to be the thing. For arſenic, and all the things we uſe to make our factitious metal, debaſe the copper, and render it brittle; whereas by the accounts of Strabo, and others, their white metal ſeems to have been better for all uſes than the copper itſelf. As to their telling us that it was a ſort of earth which they uſed on this occaſion, very little regard is to be paid to the terms; for they had an inaccuracy of ſpeaking that leaves us much in the dark, in many other things beſide this. They called the *calaminaris* ſtone, which is an ore of zink, by the name of *Cadmian* earth, in their deſcription of the manner of making braſs.

It has ſeemed abſurd to ſome to call this white metal *aurichalcum album*, becauſe they ſuppoſe the word *auricalchum* to ſignify gold-coloured copper; but this is an error. The *aurichalcum* is but a falſe ſpelling of *orichalcum*. See the article Orichalcum.

MOTACILLA, the *Waterwagtail*, in the Linnæan ſyſtem of zoology, the name of a large genus of birds, of the order of the paſſeres; the diſtinguiſhing characters of which are theſe: The tongue is jagged, and has a rim or margin round it; the beak is ſtrait, and pointed, and the hinder claw is of the ſame length with the reſt, by which alone it is ſufficiently diſtinguiſhed from the lark kind. Of this genus are the wagtail, the red-breaſt, wren, nightingale, &c. *Linnæi* Syſt. Nat. p. 49.

Mr. Ray enumerates three ſpecies of *Waterwagtail*, the white, the yellow, and the grey. The firſt is the moſt common, and well-known kind. The yellow one is of the ſame ſhape and ſize with that, but is beautifully variegated with yellow and green: this builds among the corn. The third or grey one is of the ſame ſize with the others, and is the moſt clamorous and noiſy of them all. It is principally variegated with black and grey, but has ſome yellowneſs, eſpecially about the rump. *Ray*'s Ornithol. p. 171, 172.

MOTETTO, in the Italian muſic, a kind of church-muſic, compoſed with much art and ingenuity from one to eight parts, with or without inſtruments, uſually accompanied with a thorough baſs. When the compoſer gives a looſe to his fancy, without confining himſelf to any rules, ſubjects, or paſſions, it is called *Fantaſia*, or *Ricercata*. See the articles Fantasia, and Ricercata.

The word is ſometimes uſed for pieces made to hymns to ſaints, &c. and whole pſalms are often thus called. Vid. *Broſſ.* Muſ. Dict. in voc.

Field-MOTH. See the article Tinea *Campeſtris*.

MOTHER-*Wort*, *Cardiaca*, in medicine, is only uſed in the ſhops as an ingredient in ſome of the compound waters, intended againſt hyſteric complaints; and the country people frequently make an infuſion of it in the manner of tea, for the ſame purpoſe. It is alſo ſaid to be good in flatulencies, and colics, to give great relief in epileptic caſes, and to deſtroy worms. It promotes urine, and the menſes; but its power this way is greatly inferior to that of penny-royal. See the article Penny-*Royal*.

The name *Cardiaca*, improperly given to this plant, has led many into an opinion of its being a cordial; but experience does not ſhew any ſuch thing. See the artiele Cardiaca.

Mother *of Vitriol*. See the article Vitriol.

MOTION (*Cycl.*)—*Laws of* Motion. Of three laws of *Motion*, which conſiſt in the preſervation of 1°. *The relative velocity* in the colliſion of elaſtic bodies, that is the difference of the velocities of thoſe bodies moving the ſame way, and the ſum when they move in contrary directions. 2°. The quantity of direction; ſee the article Direction. 3°. The ſum of the product of the maſſes by the ſquares of the velocities. Two of theſe laws being granted, the third follows neceſſarily. Thus, let A and B be two bodies, their velocities before the ſhock *a* and *b*, and after the ſhock *x* and *y*. Suppoſe firſt that before and after the ſhock the bodies move the ſame way, the firſt law of conſervation gives $a-b=y-x$; the ſecond $Aa+Bb=Ax+By$: Hence by tranſpoſition $a+x=y+b$ and $Aa-Ax=By-Bb$; and theſe two equations multiplied together give this new one, $Aaa-Axx=Byy-Bbb$, or by tranſpoſition, $Aaa+Bbb=Axx+Byy$. And it is plain, that if *a* or *b*, as well as *x* or *y*, be taken negatively to ſignify that the bodies A and B move in contrary directions before and after the ſhock, this ſuppoſition will not alter the ſigns of the equation $Aaa+Bbb=Axx+Byy$. *Bernoulli* Oper. Tom. 3. p. 57.

The preſervation of the ſame quantity of *motion* in the univerſe, was a principle laid down univerſally by Deſcartes; but has been found falſe, and holds true only in the ſame direction, which is thus expreſſed by Sir Iſaac Newton: "The "quantity

" quantity of *motion*, which is collected by taking the ſum " of the *motions* directed towards the ſame parts, and the " difference of thoſe that are directed to contrary parts, ſuf- " fers no change from the action of bodies among them- " ſelves." *Newt.* Princip. lib. 1.

Some philoſophers, after Deſcartes, have ſuppoſed the preſervation of the ſame force or *vis viva*. See the articles FORCE, and VIS *Viva*.

But this holds only in elaſtic bodies, when there is a ſhock; and hence thoſe philoſophers have been led to maintain, that all bodies were elaſtic, at leaſt in their elements, and that an inflexible body was impoſſible, being repugnant to the law of continuity. See the article CONTINUITY.

MOTION *of the Limbs*. See the article LIMB.

MOTION, in the antient muſic, was uſed to ſignify the tranſition of the voice, from an acute to a grave ſound; or the contrary. This they expreſſed by κατα τοπον κινεισθαι. *Wallis*'s Append. ad Ptolem. Harmonic. p. 153. See the article LOCUS.

Meibomius tranſlates it, *moveri in loco*.

MOTION, in the manege. A horſe is ſaid to have a pretty *Motion*, when he moves and bends his fore-legs with great eaſe and freedom upon the manege. But if a horſe trots right out, and keeps his body ſtraight, and his head high, and bends his fore-legs handſomely, then to ſay he has a pretty *Motion* with him, implies the liberty of action of the forehead.

Muſcular MOTION. Dr. Browne Langriſh endeavours to prove that the blood has no immediate effect in *muſcular Motion*, by experiments of tying the crural and carotid arteries of dogs, who did not thereby loſe the action of any muſcles. He grants however, that when all the blood is intercepted, *muſcular Motion* ceaſes in a few minutes. The chief uſe of the blood towards *muſcular Motion*, is to keep the fibres warm, ſupple, diſtended, and ready for the influx of animal ſpirits into them, and by its *Motion* to aſſiſt theirs.

The muſcular fibres are little hollow cylinders, not divided into cells; the animal ſpirits are near a-kin, or analogous to ſpirit of ſal ammoniac, &c. and therefore, whenever they fly from the nerves into the muſcular fibres, they will increaſe the attractive quality of their component particles towards each other, ſo as to make them run nearer together, which will occaſion the coats of the fibres to be both thicker and ſhorter, and the muſcle will be contracted in all its dimenſions. The animal ſpirits are too ſubtile to be fixed, and therefore immediately make their eſcape through the fibres, and leave them in the ſame ſtate they found them in, as ſoon as the ſupply by the nerves is diſcontinued. There is a difference in the mechaniſm of the nerves ſent to the muſcles, which act by the influence of the mind, from thoſe of the muſcles which are ſaid to perform involuntary motions, the latter having no hindrance to the courſe of the animal ſpirits, unleſs ſometimes the parts through which they paſs have influence on them; whereas the nerves, which ſerve the muſcles of voluntary motion, have ſome little conſtrictions at their extremities, or elſewhere, which hinders the courſe of their fluids, except when their reſiſtance is overcome by the momentum of the ſpirits being increaſed by the will. The uſe of the ganglions is to prevent any communication of *motion* from one nerve to another, whereby in a ſtate of health, ſenſation is always performed diſtinctly. Eſſ. on Muſc. Motion.

Dr. Stuart having cut off the head of a frog, obſerved, that upon thruſting a probe into the *medulla ſpinalis*, the muſcles of the body were brought into convulſive contractions. And that the ſame happened to the muſcles of the head, when the probe was thruſt into the brain. From which he concludes, that the brain and nerves contribute to *muſcular Motion* in a high degree. Next he laid bare the crural artery, vein, and nerve of a dog, and placing a thread parallel to them, made two ligatures on them, at four inches diſtance from each other; then cutting the veſſels through, beyond the ligatures, he took them out, and obſerved, that the nerve did not contract, though the blood-veſſels loſt three eighth parts of their length. From whence he infers, that what the nerves contribute in *muſcular Motion*, cannot ariſe from, or be owing to elaſticity, but to the fluid they contain, which can be no other than a pure elementary water. Phil. Tranſ. N°. 424. §. 5.

Rythmical MOTIONS, a phraſe uſed by Voſſius, and other writers on the antient rythm, to expreſs thoſe *motions* which were made uſe of in the Greek and Roman entertainments to convey the ideas of the poet, or to aſſiſt muſic in rouzing the paſſions. Theſe not only had great force when joined with ſounds, but even without any voice or ſound they could move the paſſions in the ſpectators, more than many of the beſt orators of the times could do with their moſt laboured diſcourſes.

Roſcius, the ſtage-player ſo famous in their pantomimes which were all dumb ſhew, was ſo excellent at expreſſion by theſe *rythmical Motions*, or geſtures, that Cicero and he being cotemporaries there were many diſputes between them, which could vary the ſame ſentence moſt; the one uſing all the power of words, the other being confined to geſtures alone.

MOTION, *Moto*, or *Movimento*, in the Italian muſic, has many ſignifications; ſometimes it means only a *Motion* or paſſage from one note to another, at whatſoever diſtance, as a ſecond, third, or any other interval; and is the ſame whether the intermediate degrees (if there are any) be ſounded or only the extremes of them, as the firſt and laſt ſound of any given interval. Sometimes it regards the quickneſs and ſlowneſs of ſuch *motions*, as a briſk, ſlow, lively, or languid *motion*; and in this ſenſe it is uſed with regard to minuets, gavots, ſarabands, &c. See each article in its proper place, and MOTION, *Cycl.*

But the moſt common, and indeed the moſt important acceptation of the word, is with reſpect to harmony; thoſe above deſcribed only regarding melody. See the articles MELODY, and HARMONY, *Cycl.*

With regard to harmony, it is the comparing the manner wherein an upper or treble part moves from one ſound to another, with that wherein a lower or baſs-part moves; this is to be done three ways. The firſt is when the upper and lower parts move both the ſame way, either upwards or downwards, and is called *Moto retto*. The ſecond is when in comparing the upper with the lower part, the one aſcends while the other deſcends, or *è contra*, and hence called *Moto contrario*. The laſt is when one of the parts holds out, or continues a ſound, while the other riſes or falls on any note whatſoever; and this is called *Moto obliquo*. Vid. *Braſſ.* Muſ. Dict. in voc.

MOTIVE is ſometimes applied to that faculty of the human mind, by which we purſue good and avoid evil. Thus Hobbes diſtinguiſhes the faculties of the mind into two ſorts, the *cognitive*, and *motive*. Human Nat. p. 4. edit. 1651. See the article COGNITIVE.

MOTOS, (*Cycl.*) in the materia medica of the antients, a name given by Galen and others to a kind of Caſſia bark, the beſt and fineſt that has been uſed at any time. The antients were very fond of this drug, and ranged it according to its different goodneſs into ſeveral ſorts.

MOUCHEROLLE, in zoology, the name of a ſmall bird of the ſize of the ſparrow, and of the ſame colour, but longer bodied; its wings are of a duſkier colour than the reſt of its body; and its head is variegated with very ſmall blackiſh ſpots. Its throat and belly are white, but the throat and the ſides of the breaſt and belly have a faint reddiſhneſs; the beak is black, ſtrait and ridged, ſo as to appear triangular. It feeds on flies and other inſects, and is common in gardens and orchards in many parts of England, though it has no Engliſh name. It is confounded by the common people with the common white throat, but differs from it in that its tail is all of one colour, whereas the white-throat's is variegated. It ſomewhat reſembles alſo the *beccifago*, or petty-chaps, but differs from it in having no greeniſh colour, and in its bill being ridged and triangular. *Ray*'s Ornithol. p. 159. See the article BECCIFAGO.

MOVING *Force*. See the articles FORCE, and VIS *Viva*.

MOULD (*Cycl.*)—MOULDS, in natural hiſtory, are defined to be foſſile bodies compoſed of diſſimilar particles of a looſe ſoft texture, ſomewhat ductile while moiſt, compoſed of argilaceous particles ſeparated by ſand or the gritt of ſtone, and uſually found mixed with the putrified remains of vegetable and animal ſubſtances.

Of this claſs of bodies there are two genera: 1. The thruptomichthes or *Moulds* of a lax friable texture. And, 2. The gloromichthes, which are of a more tough and viſcid texture. *Hill*'s Hiſt. of Foſſ. For the ſeveral ſpecies of vegetable *Moulds*, ſee the articles THRUPTOMICHTHES, and GLOROMICHTHES.

The goodneſs of *Mould*, for the gardeners purpoſes, is known by the ſight, ſmell, and touch.

Thoſe *Moulds* are accounted beſt which are of a bright brown or hazily colour. This is always the colour of the beſt loams, and other natural earths; and this is judged the better, if the earth cut tolerably eaſily, and does not ſtick and cling to the ſpade, but is light, friable, and falls in ſmall clods; and is ſuch as naturally neither chaps and cracks in dry weather, nor turns to mortar in wet. Next to theſe the dark grey and ruſſet *Moulds* are accounted beſt; and the worſt of all are the light and dark aſh-colour; theſe are uſually found on heaths and commons. The clear tawny *Mould* is neither by any means to be preferred; but that of a yellowiſh red is accounted the worſt of all; this is commonly found in wild and waſte places, and ſeldom produces any thing naturally but furz and fern. *Miller*'s Gardeners Dict.

All that lands give us to judge of them by from the ſmell, is, that the beſt after rain, and after digging up, emit a good and pleaſing ſcent: But by the touch they may be judged of with conſiderable accuracy; for by this may be known whether they are too ſandy or too clayey; and whether they be tender, fatty, deterſive, and ſlippery; or more harſh, gritty, porous and friable. What we are to judge beſt by the touch, is the middle nature between the extremes on either ſide, ſuch as will eaſily diſſolve and break, and being made of a juſt proportion of ſand and clay, will not ſtick to the ſpade or fingers after every light ſhower of rain.

To analize *Mould* by means of water, waſh it thoroughly in warm water in large quantities, and filtrate the liquor. Evaporate this to a conſiderable degree of concentration, and it is manifeſtly of a ſaline taſte, but making no alteration in ſyrup of violets; therefore the ſalt it contains is neither acid nor alkaline, but neutral. This analyſis purſued farther, the parti-

cles

cles may be diſunited and kept ſeparate, and will be found to be a large proportion of ſand, a quantity of a light mud, capable of remaining a long time ſuſpended in water, a heavier mud ſinking immediately in water. By an analyſis of any particular *Mould* by this means, we may find its true conſtituent particles, and be able to mix up and compound a ſimilar one for the growth of any peculiar plant it produces: But plants have the aſſiſtance of heat as well as moiſture, in the draining their juices from the earth; therefore it may not be improper to try the effect of fire on the ſame ſubject. The common garden *Mould* diſtilled in a retort in a naked fire, managed in its various degrees, affords a water, and oil and ſpirit like thoſe yielded by animal ſubjects, and poſſibly ariſing from ſome extraneous particles mixed with the earth, and a dry *caput mortuum*, or indolent earth remains in the retort.

The particles of animal, vegetable, and mineral ſubſtances, floating in the atmoſphere, and thence precipitated on the earth, may give ſome of the properties to garden *Mould*, and thoſe different in different places; as is evident about London, where the *mould* is ſo impregnated with ſmoak, precipitated on it from the atmoſphere, that it differs much from that of open countries. *Shaw*'s Lectures, p. 64.

MOULDS *of Coins*, a ſort of concave *Moulds* made of clay, having within them the figures and inſcriptions of antient Roman coins found in many parts of England, and ſuppoſed to have been uſed for the caſting of money.

Mr. Baker having been favoured with a ſight of ſome of theſe *Moulds* found in Shropſhire, bearing the ſame types and inſcriptions with ſome of the Roman coins, gave an account of them to the Royal Society.

They were found in digging of ſand, at a place called Ryton in Shropſhire, about a mile from the great Watling-ſtreet road. They are all of the ſize of the Roman denarius, and of little more than the thickneſs of our halfpenny. They are made of a ſmooth pot or brick clay, which ſeems to have been firſt well cleanſed from dirt and ſand, and well beat or kneaded, to render it fit for taking a fair impreſſion. There were a great many of them found together, and there are of them not unfrequently found in Yorkſhire; but they do not ſeem to have been met with in any other kingdom, except that ſome have been ſaid to be once found at Lyons. They have been ſometimes found in great numbers joined together ſide by ſide, on one flat piece of clay, as if intended for the caſting a great number of coins at once; and both theſe, and all the others that have been found, ſeem to have been of the emperor Severus. They are ſometimes found impreſſed on both ſides, and ſome have the head of Severus on one ſide, and ſome well known reverſe of his on the other. They ſeem plainly to have been intended for the coinage of money, though it is not eaſy to ſay in what manner they can have been employed to that purpoſe, eſpecially thoſe which have impreſſions on both ſides, unleſs it may be ſuppoſed that they coined two pieces at the ſame time by the help of three *Moulds*, of which this was to be the middle one.

If by diſpoſing theſe into ſome ſort of iron frame or caſe, as our letter-founders do the braſs *Moulds* for caſting their types, the melted metal could be eaſily poured into them, it would certainly be a very eaſy method of coining; as ſuch *Moulds* require little time or expence to make, and therefore might be ſupplied with new ones as often as they happen to break.

Theſe *Moulds* ſeem to have been burnt or baked ſufficiently to make them hard; but not ſo as to render them porous like our bricks, whereby they would have loſt their ſmooth and even ſurface, which in theſe is plainly ſo cloſe, that whatever metal ſhould be formed in them would have no appearance like the ſand holes by which counterfeit coins and medals are uſually detected.

MOULD-*Warp*, a name given by the people in many parts of England to the mole. See the article TALPA.

MOULDER, in brick-making. See the article BRICK-*Making*.

MOUNT (*Cycl.*)—MOUNT-*Egg*. In the tin-works, after that tin from the burnt ore is melted down, and re-melted, there will ſometimes remain a different ſlug in the bottom of the float; this they call *Mount-egg*; and though of a tin colour, yet is of an iron nature, as hath been found by applying a magnet to it.

MOUNTAIN (*Cycl.*)—The origin of *Mountains* ſeems to have been from exploſions by means of ſubterranean fires; and it is very probable that they have all vaſt hollows beneath them; that this might have been the means uſed at the creation, to make the dry land appear, is no way diſſonant to reaſon, ſince hiſtory proves, that fires have raged in ſubterranean caverns under the ſeas, and there is no natural impoſſibility in fire's ſubſiſting in ſuch caverns, even when the earth was all over covered with water, as at the firſt creation.

Mountains appear, to many, defects and blemiſhes in the earth; but they are truly of the utmoſt uſe and neceſſity to the well-being both of man and other animals. Many creatures cannot live but in particular ſituations, and even the tops of the higheſt and the coldeſt *Mountains* are the only places where ſome creatures as well birds as quadrupeds, will live; of this kind are the ibex and chamois among beaſts, and the lagopus among birds.

The *Mountains* alone are able to furniſh man with the ſeveral metals of ſo many uſes in life; for if theſe were produced in level ground, it ſeems very evident that no art could ever keep the mines dry, by which we ſhould get at them; nor could we have ſprings and fountains, but for the advantage of the height of hills. This ſeems indeed to be the great deſign of *mountains*, that their ridges being placed through the midſt of continents, might ſerve to diſtil freſh water for the uſe of man and beaſt; and their heights to give a deſcent to thoſe ſtreams to run gently down, and be of more benefit to the creation. Thus the more we conſider nature, the more we muſt admire its works; and what ſeems defect or blemiſh in them, on a ſlight view, often proves, on more juſt obſervation, a great benefit and beauty. *Ray*'s Phyſico-Theological Diſcourſe, c. 3.

The difficulty of breathing at the tops of high *Mountains* is a thing ſo plainly felt, that none who has ever been in the way of making the experiment, but is well convinced of the certainty of the fact. Acoſta deſcribes what he felt on the tops of the high *Mountains* of Pariacaca very judiciouſly.

The *Mountains* of Armenia, and particularly that on which Noah's ark is ſuppoſed to have reſted, have been alſo made famous by the like accounts; though the ſnows that lie on the tops of theſe *Mountains* make it impracticable to aſcend their tops; the people who climb as high as they can, always find that they breathe with more difficulty, and are compelled to fetch their breath oftener than when on the plains; and on travellers complaining of this, their guides always tell them, that it is a known thing, and is what every body ſuffers there.

The *Mountains* in Languedoc and the Pyreneans have the ſame effect. People of curioſity have ſometimes remained hours on the ſummit of theſe mountains, and always found the ſame ſort of difficulty in breathing; but it is poſſible that this may be owing to the exhalations of certain ſteams from the earth in theſe places, leſs loaded with a weight of air than below; and this appears the more probable, as in going up the mountain Teneriffe, if many people are in company, and aſcend different ways, ſome uſually bear it better than others; and the very complexions of ſome are turned yellow by the exhalations which are very plainly perceived by their ſmell and ſharpneſs, while others who aſcend to the ſame height by different tracts, eſcape.

The moſt remarkable *Mountain* in the world in ſhape, is that called the *needle Mountain*, or the *inacceſſible Mountain*, in Dauphiny.

This is a vaſt hill, placed as it were bottom upwards, or ſet on its ſummit on the earth with its broad baſe elevated in the air; it is but about a thouſand paces in circumference at the bottom, and is above two thouſand at the top. On the center of the plain at the top there ſtands another ſmall and very narrow, but very high hill.

It obtained the name of the *needle* as it got the other, by its being ſuppoſed impracticable to the aſcent of any one, by reaſon of its projecting ſo greatly outwards. Some hardy perſons however once ventured to climb it, and found at the top a number of the chamois, animals by no means qualified for climbing, and which doubtleſs had never either aſcended or deſcended the *Mountain*, and which muſt be ſuppoſed to have bred there for many ages, though it be very difficult to account for their firſt getting to the place. Hiſt. Acad. Par. 1700.

Chains of MOUNTAINS, a term uſed by geographers to expreſs thoſe continuations of *Mountains* which run in ſtrait ridges along whole countries, and appear diſpoſed in uninterrupted orders wherever they are found. Kircher labours to prove, that theſe chains are annular, and reach abſolutely round the globe of the earth, encompaſſing it from north to ſouth, and thence to the north again; and in the ſame manner from eaſt to weſt, and from thence to the eaſt again; their courſe only diſappearing, by the wiſe providence of nature, in the bottoms of the ſea, that the immenſe body of waters treaſured there might have its motion free and unimpeded in its channel, but appearing again in the ſame line in every the ſmalleſt iſland that ſhews itſelf in the way of their ſtrait courſe, from the country where the laſt link of the chain was ſeen, to that where their firſt link appears again. He ſays that theſe vaſt hills of earth and ſtone, ſerve not only to ſtrengthen and ſupport the fabric of this vaſt globe of earth, but they have another very great uſe, not only to man, but to all animals, and even vegetables; which is, that they are the ſtorehouſes where the grand reſervoirs of freſh water, ſo neceſſary to all life, are treaſured up, and from whence it is eaſily poured down upon the lower parts of the globe. In Europe, the great reſervoirs of water, that ſupply whole countries of immenſe extent, are placed in that vaſt chain of *Mountains* called the Alps, from which, as from an inexhauſtible ſtore, the vaſt tracts of fruitful land that lie below them are ſufficiently watered.

The *Mountains* which compoſe this part of the great annular chain running north and ſouth round the globe, are called by three different names; the *Cottiæ*, the *Rhætian hills* with the *Vogeſus*, and the *Appennines*; from theſe are poured out the immenſe rivers which water this fruitful part of the world, the Danube, the Rhine, the Rhone, the Moſelle, and an

almoſt

almoſt infinite number of others, every one of which, after it has ſupplied the inhabitants of a whole tract of vaſt extent, diſcharges ſo much water hourly into the ſea,, that the mind is aſtoniſhed at the account, and would wonder whence only one of them could be ſupplied. Theſe rivers, and a multitude of other ſmaller ones, and beſide theſe a great number of lakes of vaſt extent are all ſupplied by the hydrophylacia or reſervoirs of water treaſured up in the boſoms of theſe hills, and could not have performed their office of watering theſe extenſive countries, had thoſe reſervoirs been placed any where except in ſuch a lofty ſituation in theſe *Mountains*. *Kircher*'s Mund. Subter.

The Alps, though they all ſupply more or leſs of this profuſion of water, yet they are not all equally hollowed for the reception of it, and conſequently do not all contain ſupplies for an equal tract of land; this is provided for by nature by a vaſt number of other ſmaller *Mountains*, which in ſeveral parts of the countries through which this chain paſſes, run from its ſides like leſſer knots, and extend over ſome ſmaller or greater part of the country.

Theſe are a ſort of auxiliary ſupplies, and ſerve for many countries in the place of the original heads; but the rivers propagated from theſe, though ſufficient for the occaſions of the inhabitants of the lower country, yet do not diſcharge thoſe vaſt quantities of waſte water into the ſea that thoſe which derive their origin from the greater *Mountains* do. The Noric *Mountains* in Germany, the Vogeſus, many mountains in Dauphiny, and thoſe in Italy, which run from the ſides of that long chain, which reaches like a ſpine all along that country, are all of this kind, and all leave this benefit to the lower countries. The Pyrenean and Carpathian *Mountains* alſo yield a vaſt number of rivers from their ſides; and the rivers of Spain, of Poland, and of Hungary, all have evidently the ſame origin from theſe high-ſeated reſervoirs, in the chains of *Mountains* which paſs through them. The countries where extended plains are found for vaſt tracts uninterrupted by any of the links or knots of theſe vaſt chains of *Mountains*, are the only places where thirſt and drought are the deſtruction both of animals and plants; and, in general, that country which has moſt and higheſt *Mountains*, is the moſt plentifully, moſt regularly, and moſt conſtantly watered by ſmaller as well as larger ſtreams.

The diſpoſition of *Mountains* on the ſurface of the globe ſeems more regular than is generally ſuppoſed by thoſe who ſee but a few of them in particular countries at a time; they are diſpoſed in reality in ranges or chains, reaching to vaſt extents, and in ſome from pole to pole from north to ſouth.

One grand chain of *Mountains* reaches from Iceland through Scotland, England, and Germany, with a ſtrait courſe to the Alps, which are as it were a vaſt knot in this chain, more cloſely diſpoſed, and more eminent than the others.

Theſe are ſucceeded in the ſame ſeries by the Appennines, which run through the whole kingdom of Italy in the manner of the ſpine of the back in animals, and are continued on in the ſame ſeries by thoſe of Sicily; and from theſe the ſame chain is carried on to Africa, and continues in what are called the *Mountains of the Moon*. From hence another vaſt knot or link of this extenſive chain is carried on to the utmoſt part of Africa, and terminates, as to our view, at the Cape of Good Hope; and there is no reaſon to doubt but that the chain is continued in the oppoſite land, and ſo on to the utmoſt limits of the ſouthern pole. From hence the ſame ſeries makes its way again, and beginning anew as it were from the ſouth pole, is carried on through the little known ſouthern regions to the Magellanic Streights. Here the famous Andes *Mountains* of South America take it up, and along this vaſt tract it is carried through this part of the new world into North America, and thence to the northern pole again, terminating where it began, or joining the other part of the chain where we took up the beginning of our account; ſo that the whole ſeries making a vaſt belt or circle round the globe, has no beginning nor end, but in our imagination, or in our ignorance of the parts of the world through which it is carried in the ſame regularity as in thoſe countries whither commerce has led us, and where maps have ſheen them.

Another vaſt chain of *Mountains* running with the ſame regularity, and in the ſame manner forming a belt round the whole globe of the earth, cuts this at right angles, and is continued in its courſe. This goes through Tartary from a beginning far beyond our reſearches up behind that vaſt country, and continuing itſelf through the middle of Scythia, forms a ſeries that appears in the Eaſt Indies, running along the middle of that vaſt region to Cape Comorin; here the chain dips into the ſea; but if its courſe is exactly marked, it will be found to be continued in the ſame rout through the iſland of Ceylon; hence it is carried under water to its oppoſite point on the limits of the earth, and hence through ſeas and lands not yet known to us, is carried on to the place in the back of Tartary, and from which we have begun the account. We have but very ſmall proofs indeed of its continuation through a vaſt tract of this its courſe; but we are to accuſe for this defect not nature in her diſpoſal, but our own ignorance, whatever little we do know plainly pointing out, that the chain is continued in the ſame regular manner as the other, and placed exactly at right angles with it.

As the continual flux and reflux of that vaſt body of ſeas from the eaſt weſtward, might by its force do ſome miſchief to the compages of the earth, provident nature has contrived for the ſtrengthening the great frame of this globe, certain tranſverſe chains or belts of mountains, which are ſo diſpoſed as to ſtrengthen and keep together the whole machine in the moſt ſtrong and laſting manner. One ſeries of theſe runs directly from the eaſt weſtward from the utmoſt limits of the Chineſe empire, through that whole vaſt country, and where theſe are ſtopped by the boundaries of that country, they are continued through the weſt of Scythia, India, and the Caſpian Sea, America, Aſia Minor, Macedonia, and to the Rhætian *Mountains*, which carry on the chain to the *Mountains* of Narbon, Gaul, and theſe to the Pyreneans; and theſe are carried on weſtward in the ſame direct chain, ſo far as we are able to trace them, and apparently run on toward the point from which the account began, ſo as to form as regular a circle as the others, were every link of it expoſed to our ſight, by our knowledge of the regions through which it paſſes, and many of which are yet left to future diſcoveries.

The haſty judgers of this ſyſtem may ſuppoſe, that it wants due weight, becauſe the chains of *Mountains* here deſcribed do not appear to be regularly carried on through the bottom of the ſea from the laſt link on one land to the firſt on the oppoſite land to it; but the whole chain ſeems broken abruptly at either promontory, and only to be renewed, not continued, at the other; but it is very probable, that though not ſo evident to our eyes, theſe chains of *Mountains* are continued under the bottoms of the deepeſt ſeas in the ſame regular manner as on the openeſt land, though their heads do not appear above the ſurface of the water, but are only ſeen at thoſe places where the ſcattered iſlands happen in their courſe, till they arrive at the main land again. This diſpoſition is not to be ſuppoſed owing to chance or irregularity, but appears contrived by the wiſdom of the great Creator.

The vaſt body of ſeas that ſurrounds the globe with its neceſſary and perpetual flux, required a clear and free bed to roll its immenſe congeries of waters in; and the tops of the *Mountains* appear to have been diſcontinued in the courſe of this fluid, that it might have a free channel, and no ſtops or hindrances in its courſe, to ſpread its waters over the whole earth.

Cock of the MOUNTAIN, *Urogallus*, in zoology. See the article UROGALLUS.

MOURNING, (*Cycl.*) among the antients, was expreſſed various ways, as by tearing their clothes, by wearing ſackcloth, laying aſide crowns, and every other mark of joy. Plutarch, in his life of Cato, relates, that from the time of his leaving the city with Pompey, he neither ſhaved his head, nor, as uſual, wore the crown or garland. Sometimes public grief was teſtified by a general faſt. *Hofm.* Lex. in voc. *Moeſtitia*. See the article FASTING.

Among the Romans a year of *Mourning* was ordained by law for women who had loſt their huſbands.

In public *Mournings* at Rome the ſhops were ſhut up, the women laid aſide all their ornaments, the ſenators their laticlavian robes, and the conſuls ſat in a lower ſeat than uſual. See *Pitiſc.* in voc.

The antients had a remarkable way of *Mourning* for ſoldiers, ſlain in battle. The whole army attended the funeral ſolemnities with their arms turned upſide down, it being cuſtomary for *Mourners*, in moſt of their actions, to behave themſelves in a manner contrary to what was uſual at other times. In thoſe places where it was the faſhion to wear long hair, *Mourners* were ſhaved; and where others ſhaved, *Mourners* wore long hair. Their conjecture therefore is frivolous, who imagine that the ſoldiers turned the heads of their ſhields downwards, leſt the gods, whoſe images were engraven upon them, ſhould be polluted with the ſight of a corpſe; ſince not the gods only, but any other figures, were frequently repreſented on ſhields; nor did the few only near the corpſe, but the whole company held their ſhields in the ſame poſition: Not to mention that other arms were alſo pointed downwards. *Potter*, Archæol. Græc. T. 2. p. 103.

The *Mournings* of the Eaſtern nations of Indians are much more cloſely followed, though of much ſhorter duration than ours. After the death of a near relation they *mourn* fifteen days, during which time they eat nothing but rice and water. They are not to chew betle, or to uſe the common waſhings in this time; but they are to do acts of charity, ſuch as diſtributing food to the poor; and prayers are ſaid, intreating the Almighty to forgive the ſins of the dead perſon, and to aſſign him a good place in the other world. On the ſixteenth day, that is the day after the finiſhing of the time of *Mourning*, they make a ſolemn feaſt according to their abilities, and invite to it all their friends and neighbours. After this they annually, on this day, give food to the poor, and renew their prayers for the happineſs of the dead perſon. Phil. Tranſ. N°. 243.

MOUSE, *Mus*, in zoology. See the article MUS.

Sable-MOUSE. See the article SABLE.

MOUSE-*Ear*, in botany. See the article MYOSOTIS.

MOUSE-*Deer*. See the article MOOSE-*Deer*.

MOUTH (*Cycl.*)—Whether the *Mouth* of a fœtus be neceſ-

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ſary for its nutrition, has been controverted. The learned Mr. Monro is of opinion it is not: See his reaſons, and his anſwers to what has been advanced by many learned men in favour of the contrary opinion, in the Med. Eſſ. Edinb. Vol. 2. Art. 9. or the Abridgment, Vol. 1. p. 305.

Mr. Monro obſerves farther, that the opening of the *Mouth* does not only depend on the motion of the lower jaw downwards, but alſo on the ſuperior jaw being raiſed up by the muſcles, which extend the head back. He ſays any one may convince himſelf of the truth of this, by putting the blade of a knife oppoſite to the conjoined edges of the teeth, when the *Mouth* is ſhut; and the knife being held unmoved while the *Mouth* is opened, he may, by the help of a mirror, ſee the upper teeth raiſed remarkably at every aperture he performs. Medic. Eſſ. Edinb. vol. 1. art. 11.

In the fiſh kinds the *Mouth* is very different in the ſeveral genera and ſpecies in its ſituation, figure, and proportion, and is by the beſt naturaliſts made a mark of diſtinction among them. In regard to place or ſituation, it is, 1. in ſome placed in the front or tip of the head; and in this caſe both the jaws are ſometimes of the ſame length; ſometimes the one is conſiderably longer than the other. Examples of this ſituation occur in moſt fiſhes. 2. In ſome the *Mouth* is placed in the lower or under part of the head under the ſnout. Examples of this we have in the ray-fiſhes, the ſquatina, the petromyza, *&c.* 3. In ſome fiſhes it is placed tranſverſely to the body, that is, the opening of the *Mouth* cuts the ſite of the back and belly at right angles: But 4. In others it is oblique. The generality of fiſhes give us inſtances of the firſt ſituation; and the pleuronecti in general give us examples of the laſt.

As to figure, there are alſo very many differences. When the *Mouth* is opened, it is in ſome, 1. of an oblong, round, or roundiſh ſquare ſhape; this we ſee inſtances of in the cyprini, *&c.* 2. In others it is oblong and wide; of this we ſee inſtances in moſt fiſh. 3. It is ſpherical, as in the petromyzæ. Theſe are the general diſtinctions; but beſide theſe there are many leſſer diſtinctions, which are only degrees of theſe.

The proportion of the *Mouth* to the head is alſo very various; 1. In ſome it is much ſmaller than the breadth of the head; of this we ſee examples in the cyprini, cobites, pleuronecti, and many others. 2. In ſome it is equal to the width of the head, or very nearly ſo, as in the cotti, ſiluri, *&c.* *Artedi*, Ichthyol.

MOUTON *d'Or*, an old French coin. See the article AGNEL.

MOXA (*Cycl.*)—The antient phyſicians uſed flax, as the people of the eaſtern nations now do their *Moxa* for cauterizing in certain parts of the body. The method of uſing the *Moxa* is this: A ſmall cone of the down or *Moxa* is to be made up of about a thumb's breadth long, much after the manner they are for a ſuffitus. The baſis of this cone is to be ſtuck upon the part with a mucilage of gum arabic, and its top is then to be ſet on fire by a candle or burning coal. By this means the whole cone will be gradually conſumed, and the part by degrees cauterized. This is uſed in caſes of the gout; and if the pain does not ceaſe on the firſt operation, it is to be repeated till it does. *Heiſter*'s Surgery, p. 319.

MOYNAU, in fortification. See the article MOINEAU.

MUCILAGINOUS *Glands* (*Cycl.*)—The rough unequal depreſſion at the bottom of the cotyloide cavity of the oſſa innominata is filled by a broad flat *mucilaginous* gland, bordered with a fatty ſubſtance, and covered with a fine membrane. The *mucilaginous* glands of the bones of the leg lie in ſmall ſpaces, depreſſions, and ſuperficial notches, near the edges of the cartilages of each joint, and are all covered by the capſular ligaments. In the bones of the foot theſe glands anſwer in number and figure to the depreſſions between the *cartilaginous* edges and ligaments.

In the articulations of the ſternum, vertebræ, and ribs, the *mucilaginous* glands are very ſmall; but they are accompanied by many fatty moleculæ lying round each joint. The inner ſurface of the ligamentary tube which lines the bony canal of the ſpine, is lubricated alſo by an oily or adipoſe ſubſtance. And the true *mucilaginous* glands of the occipital and maxillary articulations in the bones of the head, are all proportioned to the joints to which they belong, and lie between the capſular ligaments and the circumferences of the cartilages. *Winſlow*'s Anatomy, p. 125, ſeq.

MUCILAGO, in botany, a name under which Micheli has comprized ſome ſpecies of that kind of fungus called *mucor*, conſiſting of ſmall bladders, or veſicles with ſeeds affixed to filaments on the inner part. See the article MUCOR.

MUCOCARNEOUS, an epithet uſed by authors for a ſort of abſceſſes, which are partly made up of fleſh and partly of a thick mucous matter.

MUCOR, in botany, a name given by Micheli, and continued by Linnæus, to a genus of muſhrooms, often comprized by authors among the moſſes, and called by the ſame Micheli under the ſmall varieties of ſome of the ſpecies, *mucilago* and *lycogala*. Their characters are theſe: They are funguſes conſiſting of roundiſh little bladders, in which are found numerous ſeeds affixed to hair-like receptacles, placed all over the inſide of the bladders.

MUCOSA, in ichthyology, a name given by the Italians to a ſpecies of the ray-fiſh, called by the old authors, *leioraia*, and *bos marinus*; and by the lather authors, *raja oxyrynchus* and *læviraia*. It is diſtinguiſhed by Artedi by the name of the variegated ray, with ten prickly tubercles on the middle of the back. See the article RAJA.

MUCOUS (*Cycl.*)—MUCOUS *Fevers*, a term uſed by medical writers to expreſs thoſe fevers in which nature is endeavouring to rid herſelf of an abundance of pituitous, mucous, and ſerous matter. The catarrhal fevers of all ſorts are expreſſed under this denomination. *Junker*'s Conſp. Med. p. 252. See the article FEVER.

MUCRONATED, whatever ends or terminates in a point, like that of a ſword, *&c.*

MUCU, in zoology, the name of a Braſilian fiſh of the lamprey kind. It is long and ſlender; its head is pointed; its eyes black and ſmall; and its mouth very ſmall; and it has no fins. It is brown all over, only of a duſkier colour on the back than on the belly, and has a number of obliquely tranſverſe lines on the ſides, which are black. It is an eatable fiſh, and is caught in lakes in Braſil. *Marggrave*, Hiſt. Braſ. p. 96.

MUCUS (*Cycl.*)—MUCUS *of Fiſhes*. The bodies of moſt of the fiſhes called *alepidotes* by authors, from their having either no ſcales at all, or only a few ſmall ones, are covered in the place of ſcales with this *Mucus*. It is a tough and thick viſcous liquor, and ſticks firmly to the body, defending the ſkin from injuries from ſtones, and the like. It is ſecreted from certain glands placed about the head, and on moſt parts of the body, but particularly in the linea lateralis. *Artedi* Ichthyology.

MUDD, in ichthyology, a name given by the Swedes to the fiſh called by Schonefeldt and others, *aphua* or *aphya*.

It is a ſpecies of the cyprinus, according to Artedi, and is diſtinguiſhed by that author by the name of the *red-eyed two-inch cyprinus*, with nine bones in the pinna ani. See the article CYPRINUS.

MUERDEM, among the Turks, an officer belonging to their moſques, who with his voice calls the people to prayers; thereby ſupplying the want of bells, which the Mahometans will not uſe. *Hofm.* Lex. in voc. See the articles BELL, and MOSQUE, *Cycl.*

MUFFLE, in metallurgy, is an arched cover, reſiſting the ſtrongeſt fire, and made to be placed over coppels and teſts in the operations of aſſaying, to preſerve them from the falling of coals or aſhes into them; though at the ſame time of ſuch a form, as not to hinder the action of the air and fire on the metal, nor prevent the inſpection of the aſſayer.

The *Muffles* may be made of any form, ſo they have theſe conditions; but thoſe uſed with coppels are commonly made ſemi-cylindrical, or when greater veſſels are employed, in form of a hollow hemiſphere.

The *Muffle* muſt have apertures, that the aſſayer may look in, and the fore part of it muſt be always quite open, that the air may act better in conjuction with the fire, and be inceſſantly renewed; for without this, ſcarce any fumes are to be produced, and without theſe, the vitrification of lead is ſcarce practicable; for when the air is once filled with a certain quantity of vapours, it ſcarce admits any more afterwards; and for this reaſon a conſtant ſucceſſion of freſh air is neceſſary.

The apertures in the *Muffle* ſerve alſo for the regimen of the fire; for the cold air ruſhing into the larger opening before, cools the bodies in the veſſel; but if ſome coals are put in it, and its aperture before be then ſhut with a door fitted to it, the fire will be increaſed to the higheſt degree, much more quickly than it can be by the breathing-holes of the furnace. Another uſe of theſe apertures is alſo, that the arſenical vapours of lead and antimony paſſing through the holes in the back part of the *Muffle*, may not be offenſive to the aſſayer, who ſtands before it.

As to the height, length, and depth of the *Muffles*, theſe muſt be proportioned to the ſize and number of the veſſels they are intended to cover; and care muſt be taken in this, that all parts of the inner ſurface of thoſe veſſels muſt be in the reach of the aſſayer's eye. The moſt frequent ſize of the *Muffle* however is four inches high, ſix or eight inches long, and four or ſix inches broad. The ſegments cut off at the baſes, for the leſſer holes muſt be of ſuch a proportioned height, that the leaſt veſſels put under it, may not be in the way of coals or aſhes falling into them, for that always hinders the vitrification of lead, and the deſtruction of the other metals and ſemi-metals, and will ſometimes entirely reduce them again when already deſtroyed; and the ſcoriæ, ſoftened by aſhes, ſoften and retard the operation.

Wooden moulds of a proper ſhape, are moſt convenient for the making theſe *Muffles* in, and the matter for making them of is the ſame with that of the German clay teſts; that is, either a pure native clay, of a condition to bear the fire, which will be known upon the trial; or ſuch clay, hardened by a mixture of the powder of ſtones: And in order to the forming of theſe, the maſs muſt be made tolerably ſoft and pliant. Knead a ſufficient quantity of this maſs with your hands upon a flat ſtone; ſpread it out evenly into a thin cake or plate, ſomewhat longer and broader than you intend the *Muffle* to be made; and ſo thick, that two or more thin plates or lamina, of about two lines thick each, may be cut off from it. This is eaſily done by rolling the maſs on the ſtone with

a rolling-pin, ſtrewed over lightly with aſhes, or powder of chalk.

When the cake is thus rolled out, with a thin, fine, and perfectly ſtrait braſs wire cut off from the cake one thin plate; this muſt be done with great caution, leſt it ſhould break; take this up, and rubbing it over with oil or fat, lay it over the mould; then cut out a ſemicircular piece from the maſs, of the ſame thickneſs with the former, and with this cover the back plane, or farther end of the mould, joining the edges of this plate to thoſe of the former, cloſely and perfectly, by wetting them well with water.

Next cut off from the cake another thin plate, to be the bottom of the *Muffle*; this may be either left looſe for the *Muffle* to be placed on it occaſionally, or the bottom edges of the already formed *Muffle* may be joined to it all round by means of water, as the back was before joined to the arched part of the *Muffle*. But whether it be intended that the bottom ſhall be thus fixed on, or left looſe, it muſt be half an inch broader every way than the bottom of the *Muffle*, that this may ſtand the more ſure and firm upon its baſis.

When the *Muffle* is thus made, wet your hand, and rub it carefully all over, that the ſmall and perhaps inviſible cracks and chinks in the plates may be cloſely joined, and the whole matter of it applied perfectly cloſe to the ſurface of the mould.

When the *Muffle* has been ſome time expoſed to the air, and is ſomewhat dried, and hardened on the mould, cut out two or three hemiſpherical pieces on each ſide, to make the holes before deſcribed, at the baſis and back, and then draw away the mould from within it; for if the *Muffle* is ſuffered to dry perfectly on the mould, it always cracks. When the whole is perfectly dry, let it be baked in a potter's kiln, or in the aſſayers oven; but without great care in the latter method, and lighting the fire at top firſt, it is apt to crack; ſo that the potters kiln, where at hand, is much the better way of baking it. See Tab. of Chemiſtry, N°. 1. 2.

If there be adapted to the formerly deſcribed convex mould, another concave one nearly fitting it, only leaving room for the thickneſs of the *Muffle* between, and the clay be placed between them, and formed by this means into its exact ſhape, by a ſtrong and every way equal preſſure, this will make *Muffles* not only with much leſs trouble, but they will be much ſtronger, leſs apt to crack, and more capable of reſiſting the fire, than thoſe made by the hand in the other way.

The only cautions neceſſary for the making theſe, are, that the clay be a little drier than when it is to be worked by the hand; that the ſides, both of the inner or convex mould, and of the outer concave one, be thoroughly oiled or greaſed, and the preſſure on the ſurface of the outer or concave mould, be as ſtrong and as equal as may be. There is no clay better for the making theſe *Muffles* than the *Windſor loam*, an earth well known among the chemiſts and glaſsmen, and always to be ſold in London; and the rubbing the inſides of the mould with black lead in fine powder, very well ſupplies the place of greaſing them, to prevent the matter from ſticking to them.

Theſe are the *Muffles* ordinarily uſed in aſſaying; but when very large teſts are to be covered, they uſe large ſpheroidal *Muffles*, made of caſt iron, or ſometimes of the ſame clay, and wrought in the ſame manner, only made upon proportionably larger moulds. The clay is uſually, for theſe large ones only, laid in a lump on the top of the mould, and with wet hands ſpread all over it to the bottom, and by this means a *Muffle* is made with little trouble. *Cramer's* Art Aſſ. p. 62.

MUGGENT, in zoology, the name of a ſpecies of freſh water wild duck, called by many authors the *muſcaria*, from its catching flies that play on the ſurface of the waters.

It is about the ſize of the common tame duck. The beak is ſhort and broad, and is of a ſaffron colour. It is all over of a mottled colour, like that of the partridge, made up of black, white, brown and grey, ſo oddly mixed together, as to ſhew neither ſeparate. The crown of the head is black, and the feet are yellow. *Geſner* de Avib.

Mr. Ray ſuſpects this not to be different from our common wild duck.

MUGWORT, *Artemiſia*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the floſculous kind, being compoſed of ſeveral floſcules, divided into many ſegments at their ends, ſtanding on the embryo ſeeds, and contained in a ſcaly cup. Among the flowers there alſo appear many naked embryos, which terminate in a fine ſmall filament, bifid at the end. Theſe, as well as the embryos of the flowers, finally become ſeeds, in ſhape reſembling thoſe of wormwood.

The ſpecies of *Artemiſia*, enumerated by Mr. Tournefort, are theſe: 1. The common *Artemiſia*, with a purple ſtalk, and purple flowers. 2. The larger *Artemiſia*, with greeniſh-white ſtalks. 3. The *Artemiſia* with leaves variegated with yellow. 4. The red ſea *Artemiſia*. *Tourn.* Inſt. p. 460.

Mugwort has long been famous as an uterine and antiſpaſmodic, and a medicine of great efficacy in all diſeaſes of the nerves. It is evidently aperient and abſtergent; it promotes the menſes, and cleanſes the womb. It is given in decoction, or much more agreeably in a light infuſion, in the manner of tea. The midwives uſe it alſo externally, boiling it, and applying it to the belly, to promote the menſtrual diſcharges, or the expulſion of the ſecundines. It is by ſome much recommended as a cure for the *ſciatica*; and it is to be taken for this purpoſe, either in powder, two drams for a doſe, or the expreſſed juice drank an ounce or two twice a day for ſome months. There uſed to be a diſtilled water, a ſyrup, a conſerve, and an extract of *Mugwort* in the ſhops, and the ſalt was made as that of wormwood; but at preſent theſe are diſuſed, and the dried herb only is kept there, as an ingredient in ſome of the compound waters. *Hill*, Hiſt. Mat. Med. p. 342, ſeq.

MUGIL, the *Mullet*, in ſome degree reſembles the dace or dare in ſhape. The noſe is ſharp; the belly a little bowed; the head plain and flatted. Its ſcales are very large, and cover not only the body, but the membranes of the gills, and a great part of the head. The back is of a duſky bluiſh or greeniſh brown; the belly white, and the ſides are variegated with longitudinal black and white lines running from the head to the tail. It has no teeth; but the tongue is ſomewhat rough. It is ſuppoſed to feed wholly on weeds, and the like; and ſeems indeed to eat no fiſh. It is moſt frequently caught at ſea; but at times comes up into rivers. *Willughby's* Hiſt. Piſc. p. 275.

The *Mullet* is a very well taſted fiſh; and of its ſpawn is made what we call *botargo*. See the article BOTARGO.

Rondeletius, and other authors, have deſcribed three or four different ſpecies of *Mugil*; but they ſeem rather varieties of the ſame fiſh, owing to age, place, and other accidents.

In the Artedian ſyſtem of ichthyology, the characters of the *Mugil* are theſe: The branchioſtege membrane on each ſide contains ſix crooked bones; the upper one being the broadeſt, and being hid under the covering of the gills, ſo that only five are diſcernible. The ſcales are large, and they cover the head; and the opercula of the gills, as well as the body of the fiſh. The head is of a depreſſed figure in its anterior part; and the body is oblong and compreſſed. According to theſe diſtinctions, there is only one known ſpecies of *Mugil*; this is the *Mugil* of Ovid and the antients. It reſembles the thymallus in its external figure. Its jaws are tender and thin, and have no teeth in them. The tail is forked. *Artedi* Gen. Piſc. p. 26.

MUGIL *Alatus*, the *winged Mullet*, a name given by ſome authors to the *hirundo piſcis*, or ſwallow-fiſh, as, excepting its wing-fins, it very much reſembles the *Mullet* in ſhape. *Geſner* de Piſc. See the article HIRUNDO *Piſcis*.

MUGIL *Niger*, the *black Mullet*, a name given by authors to a fiſh of the *Mullet* kind, but all over black, more uſually known by the name of the *portius piſcis*. *Ray's* Ichthyol. p. 276.

MULÆ, a word uſed by ſome medical writers to expreſs puſtules on the ſkin, which are owing to extreme heats, or to cold.

MULA *Herba*, in botany, a name uſed by ſome for the ceterach, or ſmooth ſpleenwort. *Ger.* Emac. Ind. 2.

MULBERRY, *Morus*, in botany, &c. See the article MORUS.

The common *Mulberry*-tree is to be propagated either by ſowing the ſeeds, or by laying down the tender branches, which in two years will be well rooted, and may be cut off from the tree, and tranſplanted into the places where they are to remain. But thoſe plants which are propagated from ſeeds, are uſually the moſt vigorous, and grow the moſt regularly, and with the ſtraiter ſtems; but then there is a great diſadvantage attending this propagation, which is, that the trees are frequently altogether male, producing only catkins, and no fruit; ſo that it is better to do it by layers from a tree, which is known to produce plenty of good fruit; the ſtraiteſt ſhoots ſhould be always choſen for layers; and when they are tranſplanted, they ſhould be tied up to ſtakes to keep them ſtrait. This tree ſhould not be often pruned; but only ſuch branches are to be cut off as croſs and bruiſe one another.

The *Mulberry*-tree thrives beſt in a light ſoil, which ſhould not be too wet, nor over dry; and it ſhould always have an open expoſure; for if planted too near trees or buildings, ſo as to be ſhaded thereby, the fruit ſeldoms ripens well; though it will be to great advantage to have them defended from the weſt and ſouth-weſt winds, by trees or buildings at a diſtance.

The ſoil under the *Mulberry*-tree ſhould always be well dug up every year, and manured, which proves of very great ſervice to the fruit.

The white *Mulberry* is cultivated in France and Italy for the ſake of its leaves, as there is an opinion, that the ſilk-worms ſhould be fed only with theſe; but it is affirmed by perſons who ſeem to know beſt, that the Perſians feed their worms only with the leaves of the black kind.

The trees intended for feeding ſilk-worms ſhould not be ſuffered to grow tall, but kept in a ſort of hedge; and inſtead of pulling off the leaves ſingly, they ſhould be cut off with ſheers together with the young branches; this is not only much ſooner and more eaſily done, but it is leſs injurious to the

the trees. The white ſort is propagated either by ſeeds or layers as the black, and is equally hardy. *Miller*'s Gardener's Dict.

MULBERRY-*Cyder*, a name given by the people of Devonſhire, and ſome other parts of England, to a ſort of cyder rendered very palatable by an admixture of *Mulberry* juice in the making: They chooſe for this purpoſe the ripeſt and blackeſt *Mulberries*, and preſſing out their juice and mixing it with a full-bodied cyder at the time of the grinding and preſſing, giving juſt ſo much of it as adds a perceptible flavour. It is very worthy the attention of people who live in other counties, where ſtrong and good cyder is made, that this renders it a ſort of wine much more agreeable than any other Engliſh liquor, and might be brought into general uſe, to the great advantage of the dealer. The colour of this liquor reſembles that of the brighteſt red wine, and the flavour of the *Mulberry* never goes off. Phil. Tranſ. N°. 133.

MULBERRY-*Shell*, a ſpecies of *Dolium*. See the article DOLIUM.

MULE (*Cycl.*)—*Mules* are chiefly uſed in countries where there are rocky and ſtony ways, as about the Alps and Pyrenees, *&c.* Great numbers of them are kept in theſe places; they are uſually black, and are ſtrong, well-limbed, and large, being moſtly bred out of the fine Spaniſh mares.

The *Mules* are ſometimes fifteen or ſixteen hands high, and the beſt of them are worth forty or fifty pounds a-piece. No creatures are ſo proper for large burdens, and none ſo ſure footed. They are much ſtronger for draught than our horſes, and are often as thick ſet as our dray-horſes, and will travel ſeveral months together, with ſix or eight hundred weight upon their backs. It is a wonder that theſe creatures are not more propagated in England, as they are ſo much hardier and ſtronger than horſes, and are leſs ſubject to diſeaſes, and will live and work to twice the age of a horſe.

Thoſe that are bred in cold countries, are more hardy and fit for labour than thoſe bred in hot; and thoſe which are light made are fitter for riding than horſes, as to the walk and trot; but they are apt to gallop rough, though theſe do it much leſs than the ſhort-made ones. *Mortimer*'s Huſbandry.

They take ſo much after the mare they are bred from, that they may be procured of any kind, light or ſtrong, as the owner pleaſes. The general complaint we make againſt them, is, that they kick, and are ſtubborn: But this is only owing to our neglect in the breeding them, for they are as gentle as our horſes in countries where they are bred with more care.

Mules are of two kinds; the one between the horſe and the ſhe-aſs, the other between the he-aſs and the mare. The firſt ſort are the leaſt valuable. They are commonly very dull, and take after the aſs, and are not large; the other breed is therefore what is propagated chiefly in all countries where mules are uſed. The largeſt and fineſt he-aſs muſt be procured for this breed; and in Spain, where *Mules* are greatly eſteemed, they will give fifty or ſixty pounds for a fine he-aſs, only to be kept as a ſtallion. They breed with this creature out of the fineſt and largeſt mares they have, giving the aſs an advantage of height of ground, and putting the mare into a narrow pit, railed on each ſide.

Some authors affirm, that in Syria there are a ſort of *Mules* which propagate their ſpecies; but this is a miſtake; for in all the countries where they are common of both kinds, no ſuch thing ever happens.

If the aſs deſigned to be bred on is ſuckled by a mare, or the mare ſuckled with an aſs, it makes them much more familiar than they would otherwiſe be; and this may always be done by taking away the colt that belongs to the dam, and putting the other in its place, keeping them in the dark ten days or a fortnight.

MULGRANOC, an Engliſh name for a ſmall ſea-fiſh caught in the Corniſh and other ſhores, the *alauda non criſtata* of Rondeletius, and the *galeetto* of other authors. *Willughby*'s Hiſt. Piſc. p. 133.

MULIERTY, the being or condition of a *Mulier*, or lawful iſſue. Co. Litt. 352. *Blount*.

MULLER, (*Cycl.*) in zoology, a name uſed by ſome for the fiſh called in Latin the *Cataphractus*, and in Engliſh the mailed fiſh, or pogge. *Willoughby*'s Hiſt. Piſc. p. 212. See the article CATAPHRACTUS.

MULLET, (*Cycl.*) in zoology, a name by which the people in ſome counties of England call the *Anas arctica Cluſii*. See the article DUCK.

MULLETT, in ichthyology, a name given in England indeterminately to ſeveral kinds of fiſh of different genera; but the proper ſenſe of the word is the ſame with that of the mugil or cephalus, of the generality of authors; the cephalus of Ariſtotle and the Greeks; and the ceſtreus or ceſtrea of Oppian and others. See the article MUGIL.

MULLUS, in zoology, the name of a fiſh properly of the cuculus kind, of which there are two ſpecies; the one called *Mullus imberbis*, the other *Mullus aſper*. The firſt is a very ſcarce ſea-fiſh, with a large head, ornamented with ſeveral ſmall figures of ſtars, large eyes, a ſmall mouth of a fine bright red within, and without teeth; the covering of the gills have ſeveral prickles pointing toward the tail; the whole body is of a reddiſh colour, and the gill-fins have near their end ſome filamentous-fingered appendages. Its belly is white, and there are two rows of pointed bones running from the head to the tail all along the back.

The other, or *Mullus aſper*, is a ſmall fiſh of about the length and thickneſs of a finger, and of a beautiful red or ſomewhat purpliſh colour; and is covered with ſcales ſerrated at their extremities, and placed obliquely. *Rondelet.* de Piſc. p. 640.

MULLUS *Barbatus*, in zoology, the name of a fiſh of the cuculus or the gurnard kind, caught in the Mediterranean, and reckoned an extremely delicate fiſh for the table. Its uſual ſize is about ſix or ſeven inches in length. Its head is flatted and its body conſiderably thick; and the back flat, not ridged. From the head all the way to the tail, it becomes gradually ſmaller, ſo as to reſemble an obeliſk in figure. Its ſcales are ſerrated at the edges, and are eaſily rubbed off; they are of a browniſh olive colour; but the ſides, when they are off, look as if tinged with red lead. The eyes ſtand very high in the head, and it has two very long beards under its chin. It has no teeth in the jaws, and its tail is very forked. *Geſner* de Piſc. p. 285.

MULLUS *Imberbis*, in zoology, the name of a ſmall fiſh caught in the Mediterranean and Archipelago, and called by many *rex mullorum* and *re de triglia*. Its uſual ſize is about four or five inches in length. It is all over of a reddiſh hue, and is covered with very large ſcales. Its belly is alſo ſomewhat prominent, by which it is diſtinguiſhed from all the other mullets. Its eyes are large, its mouth very wide, and its jaws rough like a file. Its tail is forked, and it has no beards. *Willughby*'s Hiſt. Piſc. p. 286.

MULTIBONA, in botany, a name given by ſome authors to parſley. *Ger.* Emac. Ind. 2.

MULTIFIDUS *Spinæ*, in anatomy, a name given by Albinus to a muſcle, the ſeveral parts of which he ſays have been called by ſeveral different names by the generality af anatomical writers.

That part of it which is ſituated in the region of the loins, is called by Veſalius, the *decimus tertius* and *decimus quartus dorſum moventium*, and by ſome the *tertius dorſi muſculus*. That which is ſituated in the back is called by Veſalius, *decimus quintus* and *decimus ſextus dorſum moventium*, and by others, *quintus dorſi muſculus*.

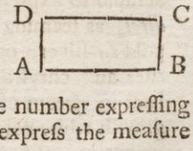
That part which is in the neck is called by Veſalius, the *ſeptimus* and *octavus dorſum moventium*, and by many the *quartus cervicis muſculus*; and by Fallopius, *pars tertii paris muſculorum dorſi*. That part of it which is in the loins and back is called by Fallopius the *quartum par muſculorum dorſi*, and ſeems to be the *ſacer* of Riolanus.

That part which is in the neck is called by Riolanus alſo a part of the ſpinatus, and by ſome the *tranſverſalis colli*: And its diſtinct portions in the neck are called by Douglaſs the *intervertebrales*.

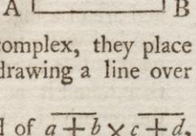
MULTIPLE (*Cycl.*)—MULTIPLE *ſuperparticular Proportion*, is when one number or quantity contains another more than once, and a certain aliquot part; as $3\frac{1}{3}$ to 1.

MULTIPLE *ſuperpartient Proportion*, is when one number or quantity contains another diverſe times, and ſome parts beſides; as $4\frac{5}{6}$ to 1.

MULTIPLICATION (*Cycl.*)—Accurately ſpeaking, in every *Multiplication*, the multiplicator muſt always be conſidered as a number; and it is eaſy to conceive a quantity of any kind multiplied by a number. But to talk of a pound multiplied by a pound, a debt by a debt, and a line by a line, *&c.* is unintelligible. However, by analogy, in the application of algebra to geometry, we meet with ſuch expreſſions, and nothing is more common than to find AB × BC, to denote the rectangle ABCD, the length of vhich is AB, and the breadth BC. But this is only to be underſtood by analogy; becauſe, if the number expreſſing the meaſure of the ſide AB was multiplied by the number expreſſing the meaſure of BC, the product would expreſs the meaſure of ABCD.



The ſign of *Multiplication* moſt commonly uſed among algebraiſts, is ×. But the Germans, after Leibnitz, only make uſe of a point placed between the quantities multiplying each other, thus: $a \cdot b$ is the ſame as $a \times b$ and AB . BC, the ſame as AB × BC, or the rectangle of AB into BC, that is the rectangle ABCD.



When the quantities to be multiplied are complex, they place them between a parentheſis, inſtead of drawing a line over them, as we commonly do.

Thus they write $(a+b) \cdot (c+d)$ inſtead of $\overline{a+b} \times \overline{c+d}$, for the product of $a+b$ into $c+d$. Sometimes the point is omitted, thus: $(a+b)\,(c+d) = \overline{a+b} \times \overline{c+d}$.

MULTIPLICATION, in algebra. To multiply algebraic quantities, we muſt attend not only to the quantities themſelves, but alſo to their ſigns.

The general rule for the ſigns is, that when the ſigns of the factors are like, (*i. e.* both + or both —) the ſign of the product

product is +; but when the signs of the factors are unlike, the sign of the product is —.

Then if the quantities to be multiplied be simple quantities, find the sign of the product by the last rule; after it place the product of the coefficients, and then set down all the letters after one another, as in one word.

If the factors be compound quantities, multiply every part of the multiplicand by all the parts of the multiplier, taken one after another, and then collect all the products into one sum; which will be the product required. See *Maclaurin*, *Saunderson*, or any other elementary writers.

The reason of the rule here given for the signs of the product, *viz.* That + by +, or — by — give +, and that + by —, or — by + give —, is apt to perplex beginners. But if it be considered, that in all *Multiplication* the multiplicator is, strictly speaking, a number, the difficulty soon vanishes; for, 1°. When any positive quantity $+a$ is multiplied by any positive number $+n$, the meaning is, that $+a$ is to be taken as many times as there are units in n, and therefore the product is evidently $+na$ or na, the positive sign being omitted.

2°. When $-a$ is multiplied by n, then $-a$ is taken as often as there are units in n, and the product must be $-na$.

3°. As *Multiplication* by a positive number implies a repeated addition, *Multiplication* by a negative implies repeated subtraction; so that when $+a$ is to be multiplid by $-n$, the meaning is, that $+a$ is to be subtracted as often as there are units in n; therefore the product must be negative, being $-na$.

4. When $-a$ is to be multipliied by $-n$, then $-a$ is to be subtracted as often as there are units in n; but by the rules of subtraction, to subtract $-a$ is equivalent to adding $+a$, and consequently the product is $+na$.

The 2*d* and 4*th* cases may be thus illustrated, by the import and meaning of the signs + and —, $+a-a$ must be $=o$. Therefore if we multiply $+a-a$ by n, the product must vanish, or be nothing; because the factor $a-a=o$. The first term of the product is $+na$ by case 1. therefore the second term of the product must be $-na$, which destroys $+na$; so that the whole product must be $+na-na=o$. Therefore $-a$ multiplied by $+n$ gives $-na$.

In like manner, if we multiply $+a-a$ by $-n$, the first term of the product being $-na$, the latter term of the product must $+na$, because the two together must destroy each other, or their amount be o, since one of the factor $a-a=o$. Therefore $-a$ multiplied by $-n$, must give $+na$. See *Maclaurin*'s Algebra, Part 1. chap 4. *Saunderson*'s Algebra, Vol. 1. p. 57. And *Barrow*'s Euclid, Schol. Prop. 1. Elem. 2.

MULTIPLIER, in arithmetic, the number multiplying. See the article MULTIPLICATOR, *Cycl.*

MULTIVALVES, in natural history, the name of a general class of shell-fish distinguished from the univalves, which consist of only one shell, and the bivalves, which consist of two, by their consisting of three or more shells.

Of these there are much fewer species than either of the univalve or bivalve class. A late accurate French author has ranked all the species under six genera, which are these: 1. The *echini* or sea-eggs. 2. The *vermiculi*, or sea-worms. 3. *Balani* or center-shells. 4. The *pollicipides* or thumb-shells. 5. The *conchæ anatiferæ* or goose-shells. And 6. The *pholades*. Hist. Nat. Eclairc. part 2. p. 235. All these see under their several heads.

MULTONES *Auri*, in our antient writers, an old coin of gold, having an *Agnus Dei*, sheep or lamb on the one side, and from that impression called *Multones*. This coin was most common in France, and sometimes current in England. Patent 33 Edw. 1. cited by the learned Spelman. *Blount.*

MULUD, in the materia medica, a word used by Avisenna and Serapio to express a sort of litharge, called by the Greeks *molybdites*, as seeming to partake of the nature of lead alone, not of gold or silver, or any other metal, as they thought the argyrites and chrysites did. This *Mulud* or molybdites was the least in esteem of all the kinds of litharge, and was of a dusky greyish white colour. It seems to be the same that Dioscorides means by *pelia* and *polia*, and sometimes by *lithargyrus Siculius*, from the place whence it was brought.

MUMMY (*Cycl.*)—There are found at this time in Poland a kind of natural *Mummies*, or human bodies, preserved without the assistance of art. These lie in considerable numbers in some of the vast caverns in that country. They are dried, with the flesh and skin shrunk up almost close to the bones, and are of a blackish colour. In the wars, which several ages ago laid waste that country, it was common for parties of the weaker side to retire into these caves, where their enemies, if they found it out, suffocated them by burning straw, &c. at the mouth of the cavern, and then left the bodies; which being out of the way of injuries from common accidents, have lain there ever since. *Rzaczinski* Hist. Pol.

MUMMY, among the gardeners, is the term used for a sort of waxey composition used in grafting. It is made of one pound of common black pitch, and a quarter of a pound of turpentine, put into an earthen pot with a cover fitted to it; this is to be set in the open air, and the cover being taken off, the matter is to be set on fire, and when it has burned a little while, it is to be quenched by putting on the cover. This is to be repeated till the mixture is of a proper consistence, which is known by pouring a little of it on a pewter plate, on which, when it is enough, it will coagulate immediately. When it is of this consistence, it is to be poured into another pot, and a little yellow wax is to be added to it, and then melting the whole together, it is to be kept for use. *Miller*'s Gardener's Dict.

MUNDUS *Patens*, among the Romans, a solemnity performed in a little temple of a round form; and dedicated to Dis, and the infernal gods.

It was opened only three times in a year, *viz.* on the day after the *Vulcanalia*, the 4*th* of October, and the 7*th* of the ides of November, during which days the Romans believed that hell was open; and therefore they never offered battle on those days, listed no soldiers, never put to sea, nor married. *Pitisc.* in voc. See the article VULCANALIA.

MUNDUYGUACU, in botany, a name of the *nux cathartica* of the West Indies, a kind of great ricinus, or palma Christi. *Piso*, 169.

MUNGATHIA, in zoology, the name given by some to a species of Indian ferret, of a reddish grey colour, called also *mungo*.

MUNGO, in zoology, the name of an American animal of the ferret kind, called by authors *viverra Indica ex griseo-rufescens*, or the reddish grey Indian ferret. Some call it also *mungathia*. *Mus.* Leyd. Cat.

MUNITION (*Cycl.*)—MUNITION-*Ships*, in the navy, those which have stores on board, to supply the necessaries to a fleet of men of war at sea.

In the time of an engagement, all the *Munition*-ships and victuallers attending the fleet are to take their places and proper stations in the rear of all the rest, and not engage in the fight, but attend such directions as shall be sent unto them, at all times, by the admiral.

MUNNY *Sheller*, in natural history, a name given by the natives of the East Indies to a species of red orpiment, which they have plentifully there. It is of a glowing colour, and has a great many shining spangles in it. They give this in fevers, after it has been calcined: It first melts in the fire, and then emits copious white fumes, smelling like those of arsenic. These are supppsed to contain the poisonous parts of it, and it then becomes a safe internal medicine, and is given with great success.

MUNTINGIA, in botany, the name of a genus of plants, the characters of which are these: The perianthium consists of one leaf, divided into large pointed segments. The flower consists of five roundish petals, of the length of the segments; of the cup. The stamina are numerous capillary filaments, they are very short; and the antheræ are simple. The germen of the pistil is globose, and is covered with hairs; there is nostyle, and the stigma is capitated and pentangular in figure. The fruit is a globose berry, with only one cell; it is umbilicated by the stigma. The seeds are very small and numerous, and are of a roundish figure. *Linnæi* Gen. Plant. p. 229. *Plumier*, Gen. 6.

MUNYCHIA, Μουνχια, in antiquity, an anniversary solemnity at Athens, upon the sixteenth of the month *munychion*, in honour of Diana, surnamed *Munychia*. For the origin and ceremonies observed in it, see *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 414. seq.

MUNYCHION, Μουνχιων, in chronology, the tenth month of the Athenian year. It contained twenty-nine days, and answered to the latter part of our March and beginning of April. See the article MONTH.

It had its name from the festival *munichia*, kept in it.

MURÆNA, in the Artedian system of ichthyology, the name of a genus of fishes, the characters of which are these: They are of the malacopterigious or soft-finned kind. The branchiostege membrane on each side contains ten slender and curved bones; but the skin is so thick, that these are not easily distinguished before that is pulled off. The foramina of the nostrils are two, and are placed in the very summit of the snout, one on each side. The body is long and cylindric; in some species there are three fins, in others two, in others only one.

The species of *Muræna* enumerated by Artedi, are these: 1. The simple-coloured *Muræna*, with the lower jaw longest. This is the common eel. 2. The *Muræna*, with the upper edge of the back fin black. This is the conger, or sea eel. The iris of this fish is white; that of the common eel is red. 3. The *Muræna* with a sharp snout, variegated with white spots, and with the edge of the back fin black. This is the myrus of the antients, and the flat-tailed sea serpent of the later writers. 4. The cylindric-bodied *Muræna*, with no fin at the tail. This is the common sea serpent of authors; it grows to five foot in length. 5. The cylindric, slender, and spotted *Muræna*, with a rounded cuspidated tail, with no fin to it, This is the spotted sea-serpent of authors. 6. The *Muræna* with no pectoral fins. This is the fish which all authors call the *Muræna*, Artedi only extending that word as a generical name to the other species. *Artedi*, Gen. Pisc. 19.

According to *Willughby*, the *Muræna* is a fish of the anguilliform or eel-like class. Its body is broad, and its snout pointed, and of a flatted figure. It is variegated in colour with a dusky

brown or tawny, a black, and a gold yellow. Its head is moderately large, and its mouth extremely wide, and has, in the rim of each jaw, a row of very ſmall teeth, and in the middle of its palate, two teeth much larger than the reſt, and moveable inwards. Sometimes there is only one of theſe. At the end of its ſnout there are two ſhort and hollow apophyſes, and over the eyes two more. The former of theſe ſeem to ſerve the creature for hearing, and the latter for ſmell; for the antients all agree, that this fiſh can hear. The eyes are very ſmall, and placed in the middle of the head. It has two round holes at the gills for throwing out the water. The gills are four, and it neither has any fins at the gills, nor on the belly. Near the back part of the head begins a fin, which runs downs the ridge of the back, and ſurrounding the tail, returns up to the anus, and there terminates. This, as in the eel, is covered with the common ſkin. It is caught on the ſhores of Italy, and in other parts of the Mediterranean. Its fleſh is white, tender, and of a fine flavour, and was highly valued by the antient Romans. But there is ſome danger in the eating them. Their bite alſo is very venomous, and often occaſions long pain, and many ill conſequences to people who ſuffer it. *Willughby*'s Hiſt. Piſc. p. 103.

It is to be obſerved, that the dictionaries uſually give us the word lamprey as the Engliſh of *Muræna*; but the *Muræna* and lamprey, called by the Latin authors, *lampetra*, are two very different fiſhes. See the article LAMPETRA.

Muræna is originally Greek, and is derived from the *verb*, μυρειν, to flow, or be ſlippery, and expreſſes the manner in which its ſlipperyneſs makes it roll about, and eſcape the catcher, by ſlipping through his fingers.

MURÆNA is uſed by Albertus for the common ſmall lampern, the *lampetra parva fluviatilis* of authors. This is one of the petromyza of Artedi, and is diſtinguiſhed by the having only one row of very ſmall teeth in the verge of the mouth, beſide the large lower ones.

MURELIA, in botany, a name by which Pliny, and ſome other authors, have called the *parietaria*, or pellitory of the wall. *Ger.* Emac. Ind. 2.

MUREX, in natural hiſtory, the name of a genus of ſhell-fiſh, the characters of which are theſe. It is an univalve ſhell, beſet with ſharp ſpines and tubercles, with a rough clavicle exerted near the ſummit in moſt ſpecies, but in ſome depreſſed. The mouth is always expanded, and ſometimes has teeth, ſometimes not; the lip is ſometimes digitated, ſometimes elated or folded, or jagged; and the columella is ſometimes rough, ſometimes ſmooth. See Tab. of Shells, N°. 13.

Notwithſtanding that this is the general character of the *Murex*, and that all the ſpecies have an oblong mouth, and the body covered with tubercles, there are, under this extenſive character, four ſpecific variations of figure, which are very obſervable. The firſt is ſeen in the alated *Murex*, which has no ſpines. The ſecond is in the ſpider ſhell, which has very remarkable ſeries of fingers or hooks. The third is the helmet-ſhell, which is a true triangular *Murex*. The laſt is a furrowed *Murex*, which has no wings, nor protuberances, nor ſpines; but has a flat head, and an oblong dentated mouth. Hiſt. Nat. Eclairc. p. 290. *Aldrovand. Rondelet. Rumphius.*

On the firſt examination of ſeveral of the ſpecies of helmet-ſhell, the outer coat of which is ſmooth, it would be natural to refuſe them any place among the *Murex* claſs; but when we ſee the oblong ſhape of the mouth, and find that it is furniſhed with teeth, and afterwards obſerve the rudiments of tubercles which are to be ſeen on the mouth ſide, we ſhall perceive that they are all true *Murices*, though leſs prickly than the others.

The antients were furniſhed with their fineſt purple dye from a fiſh of the *Murex* kind, and therefore expreſſed the purple colour by the word *Murex*. We find in Virgil, *Tyrio ardebat murice lana.* Plumier tells us, that in America the *Murex* is called *piſſeur*, from its readily ejecting the liquor, which gives the purple colour when it is taken from the rocks. And Fabius Columna diſtinguiſhes the *Murex* from the purpura and buccinum, but in a very injudicious manner. He ſays the purpura affords the fine purple colour: the *Murex* is covered wirh ſpines and tubercles; and the buccinum is known by its ſmooth and long wreath. But he ſhould have known that the affording the purple dye is common to the *Murex* and purpura, and even to ſome of the buccinum kind; and that there are *Murexes* with very few ſpines or tubercles, and buccina which are not ſmooth. The knowledge of the inſufficiency of theſe characters, would have engaged him in ſeeking others more eſſential; and a perſon of his great abilities would then perhaps have prevented half the confuſion that has happened ſince in the world, on occaſion of errors of this kind propagated from his writings, and thoſe of two or three others of his time. *Virg.* Æneid. L. 4. *Fabius Columna*, Aquat. & Terreſtr. Obſerv. p. 55.

The family of the *Murex* being very extenſive, it may be proper to divide them into ſome ſeparate ſeries from the general common marks of certain numbers of the ſpecies. 1. Some have remarkably eminent tubercles and ſpines. 2. Some are nearly ſmooth, but have a rough clavicle, and a crooked beak. 3. Some have digitated lips. And 4. Some have alated and laciniated lips. The ſpecies preſerved in the cabinets of the curious are theſe. Firſt, of the rough or prickly *Murices* we have the following:

1. The *Murex* with a compreſſed clavicle, and with obtuſe black ſpines. 2. The grey *Murex*, with an exerted clavicle, and rows of black ſpines. 3. The *Murex* with a compreſſed clavicle, ſurrounded with bluiſh ſpines. 4. The yellowiſh *Murex*, ſurrounded with four rows of obtuſe ſpines. 5. The whitiſh *Murex*, with two rows of ſpines. 6. The brown and blue *Murex*, with three rows of ſpines. 7. The yellowiſh *Murex*, every where regularly beſet with ſpines. 8. The whitiſh *Murex*, with a purple dentated mouth, and with yellow low tubercles or umbos. 9. The white hedgehog *Murex* with black ſpines, and with a dentated mouth. 10. The muſic *Murex*, with a rugoſe columella. 11. The ruſtic muſic *Murex*. 12. The lightening *Murex*, with a rugoſe columella. 13. The variegated *Murex* with a rough exerted clavicle. 14. The undulated, contabulated and tuberous *Murex*, with an exerted clavicle. 15. The whitiſh ſtriated *Murex*, with a clavicle furniſhed with long ſpines. 16. The yellow coſtated *Murex*, with furrows and tuberoſities on all parts of the ſhell. 17. The ſtriated umbilicated verrucoſe or warty *Murex*, with a reddiſh columella. Hiſt. Nat. Eclairc. p. 290.

Of the ſecond ſeries of the *Murex*, or thoſe which have a ſmooth body, a clavicle ſomewhat rough, and a crooked beak, we have the following ſpecies: 1. The triangular *Murex*, or helmet-ſhell of Rondeletius, with a dentated mouth and folded lip. 2. The red turban *Murex*, with ſeveral umbones, and with both lips folded back and expanded. 3. The helmet-ſhell of Bonani, or the agate helmet-ſhell, with a leſs dentated mouth. The laſt appearance is that under which we uſually ſee this ſhell, it having been commonly poliſhed, and its outer coat taken off, before it is admitted into a cabinet. 4. The yellow variegated helmet-ſhell. 5. The grey ſtriated helmet-ſhell, without umbos. 6. The whitiſh helmet-ſhell, variegated with yellow undulated lines. 7. The agate helmet-ſhell, with regular yellow ſpots. 8. The blue ſtriated helmet-ſhell, with yellow undulated lines. 9. The wavy helmet-ſhell.

Of the third kind, or thoſe which have digitated lips, we have the following: 1. The common ſpider-ſhell or *Murex*. 2. The ſpider-ſhell called by the French the *Murex lambis*. 3. The hooked-clawed or male ſpider-ſhell. 4. The female ſpider-ſhell. 5. The millipede ſpider-ſhell. 6. The cornuted ſpider ſhell of Rumphius. 7. The ſeven-fingered ſpider-ſhell. 8. The five-fingered ſpider-ſhell. 9. The four-fingered ſpider-ſhell. 10. The ſpider-ſhell, with ſix elegant furrows. 11. The ſcorpion-ſhell, with a radiated mouth. 12. The ſtrait-pointed red ſpider-ſhell. 13. The crow-billed ſpider-ſhell, or the blue, white and yellow ſpider-ſhell, with five appendages at the lip. This latter appearance is that under which we ſee the ſhell when it has been poliſhed.

Of the fourth ſeries of *Murexes*, or thoſe which have alated and laciniated lips, we have the following ſpecies: 1. The aſſes-ear *Murex*, with a crooked beak, and a lip red on the inſide. 2. The triangular *Murex* with large ſtriæ and tubercles, called the hogs-eared *Murex*. 3. The *Murex* with a red mouth and black columella. 4. The *Murex* with a ſtriated mouth, black on each ſide. 5. The white and brown-mouthed *Murex*. This, when poliſhed, is the ſpecies called the *turtle Murex* in cabinets. 6. The ear *Murex* of Rumphius. 7. The *Murex* with a reddiſh laciniated and very wide extended lip, and an aculeated clavicle. 8. The red *Murex*, with a laciniated lip and prickly clavicle. 9. The variegated and verrucoſe *Murex*, with a thick laciniated lip. 10. The variegated and verrucoſe *Murex*, with a jagged very thin lip. 11. The yellow *Murex*, with a laciniated lip and gibboſe clavicle. 12. The lead-coloured, bellied *Murex*, with a folded lip. 13. The ſmooth *Murex*, with a thick folded lip, and a dentated columella. 14. The yellow and tuberous *Murex*, with a folded lip, dentated on one part, and ſpotted on the other. 15. The yellow *Murex* with a regular rib, ſpotted, and running tranſverſely from the beak to the middle of the back. 16. The grey coſtated *Murex*, with a wide lip on the ſide of the columella. 17. The white coſtated and contabulated *Murex*. To theſe ſpecies is to be added one of a very ſingular kind, the mouth of which opens the contrary way to all the others. Hiſt. Nat. Eclairc. p. 288.

MUREX, among the antient Romans, a caltrap or iron inſtrument with ſharp points every way, uſed as a defence againſt the enemies horſe. *Pitiſc.* in voc.

MUREX *Mutiani*, a name given by ſome authors to the genus of ſhells, known at this time under the name of *porcelains* and *conchæ venereæ*. See the article PORCELLANA.

MURINA, or MURINES, μυρινης οινος, in antiquity, a delicious ſweet wine, medicated with ſpices. It was a kind of hippocras, and the uſual drink of the ladies. *Hofm.* Lex. in voc. See the article HIPPOCRAS, *Cycl.*

MURRA, among the antients, a foſſile ſubſtance found in Parthia and Carmania, of a fine ſmell, and beautiful variety of colours.

It was thought to be ſome humour condenſed in the earth by the heat of the ſun. *Pitiſc.* in voc. See the articles MURRINE and MORRHINA, *Cycl.* and *Suppl.*

MURRA was likewiſe a dry perfume, made of the *Murra* reduced to powder. *Pitiſc.* in voc.

MURRE, in zoology, a name given in ſome parts of England to the razor-bill. See the article ALKA.

MURRHINA, in antiquity, a kind of ſweet medicated wine. See the article MURINA.

MURRINE, in the writings of the antients, a name frequently given to cups uſed for drinking, and to veſſels of a ſmall ſize, uſed for the preſerving perfumes, *&c.* and called *Murrina* from *murrha* or *myrrha*, the name of the ſubſtance from which they were made.

There have been many errors among the critics and commentators about this *Murrha*; but the greateſt of all is that of Baronius, who ſuppoſes it to have been myrrh, the gum we now know under that name. The deſcriptions and uſe we hear theſe veſſels were put to, plainly proves the abſurdity of this opinion. Some have ſuppoſed theſe veſſels to be made of cryſtal, but this is contrary to the account of all the antients.

The Greeks had the words κρυσαλλος for cryſtal, and Σμυρνη for myrrh, very common among them, and therefore if theſe veſſels had been made of either of theſe ſubſtances, they would in ſome places have called them *Smyrnina* or *cryſtallina*. On the contrary, the moſt correct among them call them *murrhina* or *morrina*. The cups made of cryſtal, which were alſo in uſe at thoſe times, were called *cryſtallina*, and theſe *murrhina* or *murrhæa*, by way of keeping up the diſtinction: And Martial tells us, that the ſtone they were made of was ſpotted or variegated, calling them *pocula maculoſæ murræ*. And Statius mentions the cryſtalline and *murrhine* cups in the ſame ſentence, but as different things, not the ſame. Arrian mentions alſo the λιθος μορρια, which his interpreters cenſure as an error of the copies, and would alter into *myrrha*, the name of the gum *myrrh*. See the article MORRHINA.

MURROBATHRARII, among the Romans, a kind of perfumers. See the article MURRA.

MURUCUIA, in botany, the name of a genus of plants, the characters of which are theſe: The flower is roſaceous, or compoſed of ſeveral petals arranged in a circular form. The cup alſo is compoſed of many leaves or ſegments. The middle of the flower is occupied by a tube in the ſhape of a truncated cone; from this there ariſes a piſtil, which has a tender embryo fruit, ſurrounded by three club-faſhioned bodies, with numerous ſtamina underneath. The embryo finally becomes a fruit of an oval ſhape and fleſhy ſubſtance, unicapſular, and containing many ſeeds covered with a ſort of hoods. See Tab. 1. of botany, Claſs 6. *Tourn.* Inſt. p. 241.

The only known ſpecies of this plant is the *Murucuia*, with lunated leaves, called by others, the ſcarlet-flowered Indian climber, with lunated leaves.

MURZAROLT, in falconry. See the article FALCON.

MUS, the *Mouſe*, in the Linnæan ſyſtem of zoology, makes a diſtinct genus of animals, of the order of the glires, and taking in the whole family of the mouſe and rat kind. The generical characters are, the having four toes on the fore-feet, and five on the hinder, and their palms made and faſhioned for running. *Linnæi* Syſt. Nat. p. 39.

Of this genus there are ſeveral diſtinct kinds: 1. The *common Rat*. This is a too well known animal; its colour is a duſky browniſh grey; its tail is compoſed of a multitude of rings, not leſs than a hundred and ſixty.

2. The *water Rat*. This is much larger than the common *Rat*, and is of a ſomewhat reddiſh brown colour; its feet are webbed, or the toes connected by membranes like thoſe of a duck; it tail alſo is much ſhorter, and all the way of the ſame thickneſs, not tapering off, but ſeeming as if cut off in the middle; its teeth alſo are much longer, and of a pale yellowiſh colour.

3. The *muſk Rat*. This is about the ſize of our common *Rat*; its hair is long, and very thick ſet; its back black, and its ſides and belly grey. The head is ſmall, and the noſe long and ſharp, as if intended, like that of the hog, for digging up the earth. Its mouth does not open very wide; its eyes are extremely ſmall, and its jaws adorned with a number of long grey hairs all along the opening of the mouth. Its tail is as long as its body, and is flatted and beſet with a few ſcattered hairs. Its feet are divided into five toes, the larger ones connected by a membrane to aſſiſt the creature in ſwimming, and the hinder legs are ſomewhat longer than the fore ones. This creature is common in Ruſſia, and has a very ſtrongly perfumed ſmell like that of muſk. *Ray*'s Syn. Quad. p. 217.

4. The common *Mouſe*. This is too well known to need any deſcription; but it is diſtinguiſhed from the reſt of the genus by its ſmallneſs, and its prominent large eyes. Its colour is a duſky grey on the back, and a whiter grey on the belly.

5. The *larger Mouſe*. This is of twice the ſize of the common *Mouſe*, and is uſually found in caverns of the earth in the fields, though ſometimes alſo in houſes; its back is of a mixed colour of black and tawny; its belly very white; and there is an even line drawn along each ſide, which ſeparates the two colours; the head is longer than that of the common *Mouſe*, and the eyes larger and more prominent; the ears are rounder and wider; and the tail very long, and covered with ſhort hairs, black on the upper part, and white underneath. The legs alſo are longer than in the common *Mouſe*; and there are ſix tubercles in the bottom of the foot. *Ray*'s Syn. Quad. p. 218.

6. The *great-headed field Mouſe*. This is larger than the common *Mouſe*, and its head is remarkably large in proportion to its ſize. Its noſe is ſhort and blunt. Its eyes ſmall, and not prominent; and its ears, ſhort, broad, and roundiſh, and almoſt entirely hid in the furr, which is much deeper than that of the common *Mouſe*. This has alſo a much longer body, and its tail is remarkably ſhort, and is thinly covered with hairs; its legs alſo are very ſhort. Its back is of a very deep and duſky brown, with a mixture of yellow; and its belly is of a ſort of lead colour, the points of all the hairs being white, and their bottoms black. It is common in dry paſtures, and is abundantly diſtinguiſhed from all the other kinds by the the thickneſs of its neck and ſhoulders, and the ſhortneſs of its tail.

7. The *great long-tailed field Mouſe*. This is very nearly of the ſize of a rat; its tail is very long, and its ears ſhort and round; its head is thick, and the noſe not ſharp, as in moſt of theſe creatues, but ſhort and rounded, and is of a deep brown, with ſome mixture of red at the ſides; and it has a ſort of beard of long hairs between the mouth and the eyes.

8. The *Dormouſe*, or ſleeper, called *Mus avellanorum* by many authors, and *ſorex* by Pliny. Of this there are two diſtinct kinds, a greater and a ſmaller. See the article SOREX. The other kinds are, 9. *Citillus*. 10. The *Cricetus*. 11. The *Marmotta*. 12. The *Cavia Cobaya*. 13. The *Aguti*. 14. *Paca*. 15. The *Leming*. And 16. The *Glis*. All which ſee under their ſeveral heads. Beſide theſe there is alſo another variegated kind, known by the name of the *ſtriated indian-tree Mouſe*, which is very rare, but is ſometimes found in the cabinets of the curious. *Ray*'s Syn. Quad. p. 218.

MUS *Alpinus*, in zoology, a name given by many authors to the mountain rat, more commonly known by the name of the *marmott*. See the article MARMOTTA.

MUS *Araneus*, in zoology, the name of a creature called in Engliſh, the *ſhrew*, the *ſhrew-Mouſe*, or the *hardy-ſhrew*.

It is of mixt brown, and reddiſh tawny colour; the belly is white. Its tail is about two fingers breadth long, and covered with ſhort hairs. The whole body of the creature has a rank, offenſive, and poiſonous ſmell. It body is about three fingers breadth, and its eyes black and very ſmall; they are indeed little larger than thoſe of the mole, and do not exceed the ſize of the head of the ſmalleſt pin; it is no wonder therefore that the creature is almoſt blind. The teeth are very ſmall, and differ in their ſhape and ſituation from thoſe of all other creatures in the world; and ſeem as if nature had in one creature made a ſort of mixture of the teeth of the *Mouſe* and the ſnake kind.

It has two long fore teeth, as all the *Mouſe* kind have; but theſe are not ſingle, as in *Mice*, but have two or three other ſmall and ſharp teeth growing out of them: Theſe, to an inaccurate obſerver, might either be wholly unſeen, or taken for diſtinct teeth; and the anterior long teeth are not ſeparated from the reſt by any gap or ſpace, as in the *Mouſe* kind, but make one continued ſeries with the others. The upper jaw in this creature is longer than the under, and the teeth are ſharp and ſerrated, ſome with two, ſome with three points; and theſe ſo ſmall, that they might eaſily not be ſeen, but that the tips of them are reddiſh. *Ray*'s Syn. Quad. p. 240.

It is very common in many parts of the world, and is met with in almoſt all our dry grounds; the cats will kill it, but never attempt to eat it.

It is diſtinguiſhed at firſt ſight from the common *Mouſe*, in that it is ſmaller; its noſe longer, and like a hog's; it has five toes on the hinder as well as on the fore feet; its eyes are extremely ſmall; its ears very ſhort; its claws are long and whitiſh, and its feet ſhort.

MUS *Norwegicus*, in zoology, the name given by authors to the Norway rat, commonly called the *leming*. See the article LEMING.

MUS *Pharaonis*, *Pharaoh's Rat*, a name given by the people of Ægypt to the ichneumon, a creature of the weaſel kind, which they are very fond of for its deſtroying ſerpents, and keep tame about their houſes as we do cats. See the article ICHNEUMON.

MUS *Terræ*, in botany, a name given by ſome authors to the roots of the *bulbocaſtanum* or earth-nut; it was probably at firſt *muris terræ radix*, the earth mouſes root, and ſo called from the *earth-Mice* or *field-Mice* being very fond of them; but the word *radix* being left out, it ſtands only *Mus Terræ*.

MUSA, in botany, a large herbaceous plant, approaching to the growth of trees. Almoſt all the writers of botany have looked upon the *Muſa* as a tree, on account of its bigneſs; it is tender, ſucculent, and not at all woody; the ſtalk, though very thick, is ſo weak as to be unable to ſupport itſelf, were it not for a great number of dry caſes or huſks, which are membranous and thick, and defend it from bowing and from the weather. The *Muſa* alſo is an annual plant, which bears fruit only once, and then by degrees periſhes; whereas all trees are woody, perennial, and bear fruit a great many times. It has been by ſome writers enumerated among the palmaceous

ous claſs; but this ſeems very idle, as they are all trees, and have no reſemblance with the *Muſa*, except in their having naked ſtems. The leaves of the *Muſa* at firſt have no reſemblance to thoſe of the palms, but afterwards as they dry and wither they ſplit on each ſide into a vaſt number of fibres which have ſome ſort of reſemblance with the palm-leaves.

The Indians diſtinguiſh no leſs than twenty-five ſpecies of *Muſa*, which they know from one another principally by the fruit. Philoſ. Tranſ. N°. 410.

MUSADA, a name given by ſome chemical writers to ſal-armoniac. See the article SAL.

MUSCA, the *Fly*, in the hiſtory of inſects. See the article FLY.

MUSCA, in antiquity, a deſignation given to paraſites, buffoons, *&c.* who intruded themſelves into the company of thoſe that deſpiſed them, or found means to be admitted to entertainments where they were not welcome. *Hofm.* Lex. univ. in voc.

MUSCÆ is alſo uſed for officers of the popiſh inquiſition, who feign themſelves of the ſect of the priſoners, in order to draw a confeſſion of their opinion from them, and thereby betray them; there being perſons placed to overhear their converſation. *Hofm.* Lex. in voc.

MUSCÆ *Volitantes*, dark irregular veins and ſpots, ſeeming to fly before the eyes of many people, eſpecially on looking at bright objects, ſuch as white paper, the ſky-light, the candle, *&c.* Theſe have often the appearance of flies, ſpiders, cob-webs, ſometimes that of ſmoke, duſt, *&c.* The reſemblance of many of theſe ſpots to flies have given them the name of *Muſcæ Volitantes*, q. d. flies flying about.

This phænomenon is not eaſy to account for. Some will have its cauſe to lie in the aqueous humor; others in the retina. Monſ. de la Hire's account of them is this: They are of two ſorts, ſome permanent, which, in fixing the eye upon a point of an object, appear always fixed in the ſame ſituation to that point; others ſeem to fly about, and to change their ſituation, though the eye be fixed. The ſhapes of both ſorts are changeable. The firſt ſort are commonly like a dark ſpot upon a white ground; the ſecond ſort appear like the knots of a deal board; ſome parts of them being very clear and ſurrounded with dark threads; they are alſo attended with long fillets of irregular ſhapes, which are bright in the middle, and terminated on each ſide by parallel black threads. On fixing the eye upon an object, they appear to deſcend gradually; eſpecially after ſhaking the head ſuddenly.

The ſpots that appear fixed in reſpect to the axis of the eye, muſt, for that reaſon, be cauſed by ſome diſorder in a correſponding part of the retina, or in ſome part of the vitreous humour lying pretty cloſe to the retina. For an opacity of the coats or humours in any part remoter from the retina, by intercepting ſome part of the rays of every pencil, could only cauſe an uniform obſcurity or faintneſs of light in every place of the retina, and not a total defect of it in any particular place. Hence M. de la Hire attributes the cauſe of theſe permanent ſpots to ſmall drops of extravaſated blood upon the retina.

But he finds it more difficult to account for the moving ſpots. When the rays of the ſun are tranſmitted through a piece of bad glaſs, and fall upon white paper, the ſhadows of the little ſands, veins, and irregularities in it, appear not unlike thoſe ſpots. He therefore imagines the aqueous humour is ſometimes troubled with ſome little mothery, ropy ſubſtance; ſome parts of which, by the figures of their little ſurfaces, or by refractive powers, different from the humor itſelf, may caſt their diſtinct images upon the retina. He ſuppoſes them in the aqueous humour, rather than in the vitreous; becauſe of its greater fluidity for a freedom of deſcent, and becauſe they will then appear to deſcend, as being ſituated before the pupil, or at leaſt before the place of the interſection of the pencils. But if this heterogeneous mother be in the vitreous humor, it muſt be lighter than this humor, ſo that after a ſudden ſhake of the head, it may firſt deſcend a little, and then aſcend gradually, to cauſe the gradual apparent deſcent above-mentioned. La Hire *Diſſert. ſur les differ. accidens de la vue.*

Theſe ſpots are obſerved to change their figures, ſometimes in two or three hours, at other times not in two or three days; and to appear more numerous at one time than another. Id. ibid. and Dr. *Smith*'s Optics in the Remarks, Art. 27. ſeq.

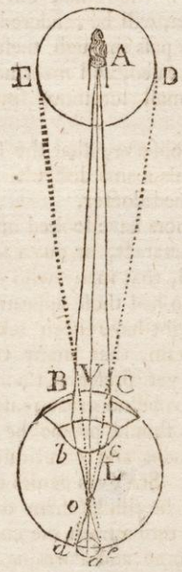
We have an inſtance in the Philoſophical Tranſactions, N°. 384. of thoſe fixed ſpots above-mentioned. A woman, who, in looking with the left eye only, at three ſhort words in print, could ſee the extremes, but not the middlemoſt; and, in looking with the right eye only, at the middle between four ſhort words, could ſee but three of them; one of the two middlemoſt being covered with a dark round ſpot; but in looking with both eyes ſhe could ſee them all.

Pitcairn denies the cauſe of the *Muſæ volitantes* to lie in the aqueous humour, and ſays it is owing to, and a ſign of, an internal inflammation of the veſſels of the retina. Heiſter thinks them owing to ſome obſtruction of thoſe veſſels; and both theſe authors, and many others, think them forerunners of a gutta ſerena, or a cataract; and propoſe a cure by mercurials and decoctions of guaicum. See *Pitcairn*'s Elem. Medic. & *Heiſter*'s Compend. Medic. Practic. Plempius has given a deſcription of the *Muſcæ volitantes*, in his Ophthalmographia.

Dr. Porterfield, in the Medical Eſſays of Edinburgh, obſerves, that theſe ſpots may proceed from ſome little extravaſations, verrucoſe ſwellings, or other defects in the retina, which by intercepting the rays will occaſion a defect in the picture; and by conſequence a ſimilar and correſponding defect or ſpot in the object. He obſerves alſo, that theſe ſpots commonly vaniſh, or at leaſt become leſs ſenſible, when the object is brought nearer the eye, and within the limits of diſtinct viſion. For, the rays which are now exactly united upon the retina, by being more crowded have their force augmented; by which means a ſenſible impreſſion is made upon the retina through theſe extravaſations. Hence theſe ſpots are moſt ſenſible to thoſe who have a ſmall pupil, and eſpecially to thoſe who are ſhort, or long-ſighted. Hence alſo, in a preſbytical eye, the ſpots which were formerly very ſenſible, become faint, when the object is viewed through a convex glaſs; for by means of this glaſs more rays enter the eye, which being united exactly at its bottom, muſt ſtrike the retina ſtrongly enough to make a ſenſible impreſſion through theſe extravaſations, which will render the ſpots obſcure.

The learned doctor farther obſerves, that what has been ſaid with reſpect to theſe ſpots, when occaſioned by extravaſations or the defects in the retina, will alſo hold when they are occaſioned by a calloſity, or any degree of paralyſis or inſenſibility in ſome parts of the retina by which the impulſe received from the rays is made leſs ſenſible.

But, beſides theſe defects in the retina, there is another cauſe which may give occaſion to theſe ſpots, both in the *myopia* and *viſus ſenilis*; and that is, certain ſmall opaque marks in the cornea itſelf, or any where within the eye, which, by intercepting ſome of the rays, muſt occaſion a defect in the picture, from which defect a kind of dark ſpot will be ſeen in the object. Thus, in the eye of a myops, if there be any opacity in the cornea, or within the eye which intercepts the rays B*be*, C*cd*, and V L *a*, there will be a defect in the



picture at *e*, *d*, and *a*; from whence alſo the external appearance will be deficient at the correſponding points E, D, and A; where, by conſequence, dark ſpots will be ſeen. For it is to be obſerved, that there is not one point in the picture which is formed by a plurality of rays which meet at the point, but every ray goes to a different point of the picture, both in myopical and preſbytical eyes; and therefore, when any of the rays are intercepted, that part of the picture to which ſuch rays belong will not be illuminated, which muſt occaſion a correſponding defect in the appearance of the object. But in the perfect ſight, where the rays which come from the ſeveral points of the object, are ſo refracted as to meet again at ſo many correſponding points in the retina, every point of the picture is formed by a cone of rays, whoſe baſe is the pupil; and therefore, though ſome of thoſe rays be intercepted, yet no part of the picture will be darkened, and conſequently no defect will be ſeen in the object from any ſuch opacity in the cornea, or humors of the eye, unleſs this opacity be in the back part of the vitreous humor, where the pencil is narrow, and intercepts the whole pencil. This may be proved from the Camera Obſcura, by ſticking ſome ſmall patches on the glaſs. Theſe will not be perceived if the paper is placed at the due focal diſtance; but if the diſtance be greater or ſmaller, the ſpots will appear.

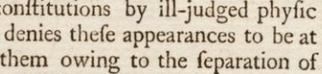
The doctor alſo obſerves, that theſe ſpots are not all of the ſame kind. He thinks that thoſe which change not their place with reſpect to the axis of viſion proceed from ſome defect either in the retina or cornea, or in the vitreous and cryſtalline humors. As for thoſe which are in conſtant motion, he ſuppoſes them to ariſe from ſome corpuſcles floating in the aqueous humor.

Beſides theſe dark ſpots, there is another kind often met with, more bright and luminous than the object itſelf before which they

they appear. These spots appear best by looking at distant bright objects, and are always of the same colour with the object. In the middle their colour is clear and strong, surrounded by a dark shady border. They are commonly accompanied with certain irregular veins, which proceed from each spot, and which as well as the spots themselves change their order and disposition. These veins are also of the same colour with the object, and being bright and luminous in the middle, are likewise terminated by a dark and obscure edge. These spots change their position with respect to the axes of vision, according as the eye is differently moved, being sometimes in the axis of vision itself, and at other times to the right or left of this same axis; but when the eye is kept fixed in the same direction, they, as well as the dark kind of spots first mentioned, commonly descend gradually.

As to the cause of these brighter spots and veins, it seems that, first, they must proceed from some corpuscles within the eye, which are at liberty to change their place, and which therefore must be supposed to float in the aqueous humor. Secondly, seeing these spots always descend when the eye is kept fixed, the corpuscles from which they arise must ascend; and are consequently lighter than the aqueous humor in which they swim. Thirdly, these spots being more bright and luminous than the object, they cannot be occasioned by any opaque corpuscles, which by intercepting the rays would cast a shade upon the retina. What therefore bids fairest for producing these brighter spots and veins, is some small, oily, diaphanous particles and filaments which swim in the aqueous humor before the crystalline; for such, by their lightness, will ascend, when left to themselves; and by their greater refractive power, produce these luminous spots terminated by dark lines. That oily and sulphureous substances, though less dense than water, have a stronger refractive power, is evident from the observations of Sir Isaac Newton. From which it follows, that the rays of light, which pass through these oily particles, will meet sooner behind the crystalline, than the other rays. Whence in a presbytical eye, the rays of light which come from the several points of the object will not converge to so many other points in the retina, but behind it, by which the picture in the retina, will be rendered more dark and obscure; but the rays which pass through these oily grains, by having their refraction increased, will meet nearly at the retina, where they will form small luminous spots, surrounded with dark borders.

But we must here observe, that the same appearances happen to myopes; and this seems difficult to account for from this theory of the learned doctor.

Many medical authors have looked on the *Muscæ volitantes* as forerunners of a cataract, or gutta serena. And we suppose it cannot be denied, that many who have fallen into those terrible disorders have had those appearances before their eyes; and hence they might have been taken for prognostics. But as it is no less certain, that many thousands have the same appearances, and yet preserve their sight very well to the last, there seems to be no great reason to be alarmed about them; and far less should people be running to quacks, and injuring their stomachs and constitutions by ill-judged physic on such occasions. St. Yves denies these appearances to be at all dangerous, and he thinks them owing to the separation of some parts of the retina from the choroid. However, as the disorder is troublesome and alarming to the patient, he advises purgatives from time to time, and millepedes. We can say, from experience, that neither mercurials, nor sea-water, nor other purgatives, nor millipedes, nor again Tunbridge or other chalybeate waters, have had any effect towards removing or diminishing these disorders. A greater dose of wine than usual has been known to increase it for a little time; and Plempius has made the like observation. We shall only add, that several of these flying appearances resemble little globules joined by threads, thus  and these globules appear in different numbers, and at different distances.

All authors agree, that these appearances change their figure; which is true, in some measure; but from our own observation we can say, that though they seem on a sudden looking to the sky, or other bright object, to vary in their figures; yet when they begin to descend, they return in one constant figure before we lose sight of them. On the whole it seems, this phænomenon is not yet fully accounted for. The vascular form of most of these appearances, their resemblances to small veins or arteries, makes it difficult to conceive them floating in the humors of the eye; and, on the other hand, their seeming contortions, and change of figure on suddenly looking up, or shaking the head, makes it no less difficult to conceive them fixed and obstructed capillaries, as many authors suppose.

MUSCARI, in botany, the name of a genus of plants; the characters of which are these: The flower is liliaceous, but consists only of one leaf, of a somewhat globular form, and divided into six segments at the edge; the pistil arises from the bottom of the flower, and finally becomes a fruit of a sort of triangular form, which is divided within into three cells, and usually contains a number of roundish seeds.

The species of *Muscari*, enumerated by Mr. Tournefort, are these: 1. The purple-flowered broad-leaved field *Muscari*, called by authors the great purple boytroide or fair-haired hyacinth. 2. The broad-leaved field *Muscari*, with white flowers. 3. The great blue-flowered *Muscari*. 4. The broad-leaved elegant *Muscari*. 5. The great white-flowered *Muscari*. 6. The *Muscari* with bluish green flowers. 7. The white-flowered byzantine *Muscari*. 8. The branched *Muscari*. 9. The smaller branched *Muscari*. 10. The smaller broad-leaved blue-flowered *Muscari*. 11. The lesser rushy-leaved blue field *Muscari*. 12. The lesser flesh-coloured flowered rush-leaved field *Muscari*. 13. The little rushy-leaved field *Muscari*, with white flowers. 14. The perfumed *Muscari*, with a dark greyish flower. 15. The sweet-scented *Muscari*, with a browniſh flower. 16. The blackish-flowered *Muscari*. 17. The yellow-flowered *Muscari*. 18. The early yellow-flowered *Muscari*. *Tourn.* Inst. p. 347. seq.

We have several species of this plant cultivated in gardens: Three or four for the beauty of their flowers, and one with a purplish green flower for the remarkable sweetness of its scent. In June, when the leaves of these plants are decayed, the roots should be taken up, and spread upon mats in a dry place for a fortnight, till the bulbs are dried; then they may be packed up, each sort by itself, till October, when they are to be planted in borders for flowering the following spring. They should never be suffered to remain in the ground more than two years unremoved; for they multiply so fast that the number of the off-sets greatly weakens the flowering roots, and the flowers are consequently small. They are easily propagated by these off-sets, which are so hardy as to grow even if buried a foot under ground; and the common kind propagates itself so fast this way, that when it has once got possession of a bed it is with great difficulty extirpated. *Miller*'s Gardener's Dict.

MUSCERDA, a name by which some authors have called mouse-dung, a thing recommended by many as a purge for infants; and said to be good in alopecias. Given in clysters it is said to be of service in many disorders of the bowels; and externally applied, to be of great use in condylomata of the anus.

MUSCICAPA, in zoology, a name by which Aldrovand and some others have called the *stone-chatter*, making that bird, which is properly an œnanthe, one of the species of that genus or the fly-catchers. *Aldrovand* de Avid. See the article STONE-CHATTER.

MUSCICAPA, the *Fly-Catcher*, is also the name of a small bird of the ficedula kind, and very nearly allied to the beccifago, or petty-chaps. It is called also in some places, *chivin* and *borin*. It is a little larger than the wren, and has a very sharp-pointed beak. Its head, neck, and back are of a pale grey, and its throat and belly of a yellowish white. Its rump is white; its wings grey; its tail, feet, and legs, are brown; and its claws very slender. *Ray*'s Ornithology, p. 158.

MUSCLE (*Cycl.*)—Mr. Winslow, in his treatise on the *Muscles* in his *Exposition anatomique de la Structure du Corps humain*, shews prodigious varieties in the actions of these organs of motion, which were never so much as hinted at before. Dr. Waltherus, after comparing the *Muscles* of the human body with the descriptions of them published by several authors, particularly by Mr. Winslow, has made several accurate remarks on them, which may serve as a supplement to his *Anatome teneriorum Musculorum repetita*. Nov. Act. Erud. June 1733.

The *Muscles* in fishes are not placed lancellatim, or one upon another in a longitudinal direction; but they are generally laid either transversely or somewhat obliquely one behind another, from the anterior part of the body to the origin of the tail. This structure is best seen in the spinose fishes.

These *Muscles* of the spinose fishes may be conveniently divided according to their situation into the dorsal, pectoral, and neutral. After these, the inferior ones of that part of the body near the tail, are to have their place; and finally, the cephalic, or those of the parts about the head.

The dorsal *Muscles* have an interstice in the middle of the length of the back, or are separated longitudinally from one another, and are terminated in the sides over-against the spina dorsalis. The pectoral and ventral *Muscles* take their origin from the basis of the ribs, and they meet in the middle of the breast and belly. The *Muscles* of the lower part of the body arise along the spina dorsi, and meet one another in the bottom of the belly. The cephalic *Muscles* serve to the moving the eyes and the jaws, and are principally four: one is placed on each side under the eyes, and one on each side in the lower jaw. The two former are called the hypophthalmic *Muscles*, and the two others the maxillary *Muscles*; they are most evident in the gadi, &c.

MUSCLES *of Vegetables*. The *Muscles* in animal bodies have been the subject of numerous dissertations; but those in vegetables have been less regarded. Mr. Tournefort, however, has plainly proved, that many of the vessels of plants become in the drying fibres capable of tension; that in many plants there are great numbers of these fibres which have all the same direction, and always act all together, and can only

ſhorten or contract themſelves in one particular direction; wherefore the parts compoſed of theſe fibres are very properly compared to the *Muſcles* of animals. By the word *Muſcle* we underſtand a part compoſed of fibres ſo determinately arranged, that by their contraction they can only move the part in ſome certain and determinate manner; and in this which ſeems the received ſenſe of the word, there are many inſtances in which it may be uſed to parts of plants, with the ſtricteſt juſtice.

All the pods of the leguminous plants, as peaſe, *&c.* are compoſed each of two valves, more or leſs convex on the outſide; theſe are placed evenly upon one another, and faſtened together by means of a great number of very fine veſſels; they are faſtned much more firmly together at the back, than at the fore-rim; and the large veſſels which carry nouriſhment both to the valves and ſeeds, are lodged there, and ſend many ramifications both to one and the other of the valves of the pod.

Each valve is formed of two ranges of fibres; the exterior arrangement is formed into a ſort of net-work, and the threads which compoſe it iſſue from the back of the pod, and are propagated longitudinally and ſomewhat obliquely through the ſurface of the valves, and finally terminate at the edge or fore-rim of the pod, after they have entered into the fleſhy part, with the net-like plexus of veſſels, of which they make frequent anaſtomoſes.

The interior plan or arrangement of fibres croſſes the exterior, in the ſame manner as the interior intercoſtal *Muſcles* in the human body croſs the exterior; and theſe form the inner membrane of the pod: Theſe fibres ariſe like the others from the back of the pod, and run obliquely to the edge. A neceſſary conſequence of this ſtructure is, that the arrangement of exterior fibres muſt become dry before the others, as muſt alſo the fleſhy ſubſtance in which they lie; and the conſequence of this is, that they muſt contract and draw the edge of the valve to which they belong at once upward and outward, and endeavour to ſeparate it from the edge of the other valve, drawing with it the interior arrangement of fibres; this therefore pulls open the pod, and the air which is very hot at the ſeaſon when the ſeeds of theſe plants ripen, inſinuating itſelf into the interſtices of the internal arrangement of fibres which are expoſed to it by the opening of the pod, ſoon acts upon them, and they begin to contract in their turn. Theſe fibres were once the veſſels which conveyed the nutritive juices to the pods and ſeeds; but when that uſe is no longer neceſſary for them, and when no more juices aſcend, after the ſeeds have arrived at their deſtined ſize, they then ſhrink up, and no more perform the office of veſſels, but become mere fibres. As theſe do not all dry up, and ſuffer this change together, but neceſſarily it happens firſt to thoſe which are ſituated at the greateſt diſtance from the pedicle, and conſequently thoſe are the firſt of the interior fibres which act by ſhortening themſelves; this therefore begins at the extremity of the pod, and is continued up to the pedicle, and the effect is that as theſe interior fibres are ſtronger and more numerous than the exterior, which are at this time as far ſhortned as they are capable of, they now draw backwards and inwards the lips of the edge of the pod toward the back. When the warm air acts upon theſe fibres to dry and contract them, it draws nearly equally at both their ends; and therefore if the two arrangements of fibres were regularly tranſverſe, each valve of the pod muſt be drawn by this action into a ſort of tube, or pipe; but as they are placed in an oblique direction, and parallel to one another, the natural effect of their contraction muſt be the drawing the valve into a ſpiral form, which we ſee is exactly the caſe. The lines which form the rim of each valve can make no reſiſtance to this contraction, becauſe they are ſo dried up by the warm air, and want of juices, that they may be crumbled to powder between the fingers, and eaſily break in any part with the ſmalleſt force. This claſs of plants gives numerous inſtances of this ſort of *Muſcles* in vegetables, and they are more obvious than moſt others, being not only common in the hedges but cultivated in gardens for the uſes of the kitchen, *&c.* The ingenious author of the ſyſtem gives many other inſtances in other plants. Mem. Acad. Par. 1693.

MUSCLE, in ichthyology, the Engliſh name of the *Mytulus*. See the article MYTULUS.

Horſe-MUSCLE. See the article HORSE-*Muſcle*.

MUSCULUS (*Cycl.*)—MUSCULI *capitis acceſſorii*. There is ſometimes found a ſmall *Muſcle* fixed by one end to the extremity of the firſt tranſverſe apophyſis of the neck near the inſertions of the two obliqui, from whence running up obliquely it is again inſerted behind the maſtoide apophyſis. This *Muſcle* is commonly thought to be a third ſmall tranſverſalis, on that ſide where it is found; but it ſeems rather to be an additional *Muſcle* to the obliquus ſuperior. The recti, and other obliqui are alſo found ſometimes double. *Winſlow*'s Anat. p. 238.

MUSCULUS *faſciæ latæ*, a ſmall and pretty long *Muſcle* ſituated a little obliquely upward, and downward on the forepart of the hip. It is fixed above to the outſide of the anterior ſuperior ſpine of the *os ilium*, between the inſertions of the *glutæus medius*, and *ſartorius*. From thence its fleſhy fibres run down a little obliquely backward, forming a very flat body four fingers breadth in length, and two in breadth. This body lies between two lamina of the *faſcia lata*, and is inſerted therein by ſhort tendinous fibres, which diſappear at that place where the *faſcia* adheres to the great trochanter, and tendon of the *glutæus maximus*. The *faſcia* is therefore by no means to be looked upon as a tendinous expanſion of this *Muſcle*. *Winſlow*'s Anatomy, p. 211.

MUSCULUS *Latus*. See the article LATUS *Muſculus*.

MUSCULUS, is alſo a name by which ſome call the common ſea *Muſcle*, more properly called *Mytulus*. See the article MYTULUS.

MUSCULUS *Myſticatus*, in ichthyology, a name given by Geſner and ſome other writers, to the common whale or *balæna edentula* of authors. This is diſtinguiſhed from all the other cetaceous fiſhes by Artedi, by the name of the whale with the fiſtule in the middle of the head, and with the back ſharp toward the tail. See the article BALÆNA.

MUSCULUS, among the Romans, a military machine, under cover of which the ſoldiers approached and undermined the walls of places beſieged, or filled the ditches. *Pitiſc.* Lex. Antiq. in voc.

MUSCUS *Arboreſcens Marinus*, in botany, a name given by Count Marſigli to a very elegant ſpecies of ſea-plant. It grows to the rocks at conſiderable depths under water, and is uſually of about three inches high; and is compoſed of ſeveral thick branches, furniſhed toward the tops with tranſparent leaves. The ſtalks are hollow, and it is all ſoft while in the ſea, but grows ſomewhat rigid when dried.

When examined by the microſcope, its ſurface appears to be granulated or covered with a ſort of ſmall glandules, which ſtand very near one another, and on cutting it tranſverſely the whole ſubſtance is ſeen to be hollow, and that general hollow to communicate with all theſe glandules, ſo that their office plainly is ſeverally to receive the ſea-water, and convey it into this general cavity, where it is diſtributed throughout the whole plant for its nouriſhment and ſupport. The leaves of this plant being rubbed on blue paper, give it a yellowiſh green colour.

Count Marſigli has gone through the analyſis of this plant, and as by it we may be informed of the principles and properties of many other ſea-plants of the ſame genus, it may not be improper to give an abſtract of his obſervations.

Four and twenty ounces of this plant being put into a retort, there came over five ounces of phlegm of a ſweetiſh taſte, and of the colour of oil of almonds. The ſpirit was of a duſky earth colour, of a fixed nature, of an unctuous yet ſomewhat acrid taſte, and leaving a bitterneſs behind it; of this there was twelve ounces, and the remainder in the retort was ſix ounces and three drams. So that the whole produce being twenty-three ounces and three drams, there was only five drams of the whole loſt in the operation. The water does not alter the colour of blue paper, on ſteeping in it; being mixed with the decoction of mallow flowers it turns it to an aſh-colour. The decoction of galls becomes of a bluiſh colour, and a ſolution of copperas of a greeniſh aſh-colour with it: The tincture of turnſol becomes of a bluiſh colour, tending to white. Spirit of nitre being added to it cauſes a ſlight fume, and the decoction of mallow flowers being after this added, a fine red colour is produced. Spirit of vinegar turns this green; and no change at all is produced by any of the following liquors, ſpirit of ſalt, ſpirit of ſal armoniac, lime-water, alum-water, oil of tartar: a ſolution of corroſive ſublimate collects a quantity of white and groſs particles, and precipitates them to the bottom. *Marſigli*, Hiſt. de la Mer. p. 73.

The ſpirit being examined with blue paper makes no change in its colour on being ſteeped in it; the decoction of mallow flowers mixed with it becomes of a pale yellowiſh green; the decoction of galls changes with it to a duſky red; a ſolution of copperas becomes of a dirty yellow, and thick; the tincture of turnſol changes to an aſh-colour. Spirit of nitre being mixed with it, cauſes a moderate fume without any ebullition, and the colour of the mixture is a reddiſh grey; on mixing the decoction of mallow flowers with this, it becomes of a yellowiſh red. Spirit of vinegar added, renders it more fluid and of a leſs duſky colour. Spirit of ſalt changes it to a reddiſh colour. Spirit of ſal armoniac, and oil of tartar, make no change at all; but lime-water renders it more clear and fluid. Alum-water collects a quantity of white matter, and precipitates it; and a ſolution of corroſive ſublimate, in like manner turns it white, and precipitates the groſs parts. The *caput mortuum* yielded one dram and ten grains of fixed lixivial ſalt; the taſte of this is but moderately acrid, and its colour a greyiſh white; being rubbed on blue paper it changes its colour to its own. The decoction of mallows on mixing this ſalt with it loſes its blue colour, and becomes grey; and on frequently ſhaking the veſſel, it finally becomes yellow. Spirit of nitre mixed with this ſalt does not ſo readily or violently efferveſce with it, as with moſt other lixivial ſalts; and if a little turnſol be added to this, it becomes of the colour of red wine. Spirit of vinegar diſſolves it very quickly, and becomes thick and turbid with it. Spirit of ſalt diſſolves it very readily, but makes no fume, though a very conſiderable ebullition.

ebullition. Lime-water diſſolves it ſlowly, and carries it to the ſurface; and alum-water, in like manner, on diſſolving it is covered with a thick ſcum at the top: Corroſive ſublimate added to this, precipitates the ſalt again, without altering its colour. Spirit of ſal armoniac, and oil of tartar, make no change upon it. It is remarkable, that this plant contains no volatile ſalt.

MUSCUS *Marinus latus*, the broad and flat ſea *Moſs*, a ſea-plant deſcribed by Count Marſigli. It is found in ſeveral places at different depths, growing to the rocks and ſtones. Its upper ſurface is compoſed of a ſeries of leaves of an auriculated figure, amaſſed together in an irregular manner; but its under-ſide is ſmooth and even, except that it is beſet with a number of ſoft points or eminences, which are not eaſily diſtinguiſhed by the naked eye. Theſe, when a microſcope is uſed, are found to be ſo many little white tubes of a cylindric figure; theſe are evidently the apertures by which the plant receives its nouriſhment; for in this, as in the other ſea-plants in general, when the root faſtens upon a rock or ſtone, it is not to extract nouriſhment from it, but only to fix itſelf firm in its place by it; for the whole ſurface of the plant takes in nouriſhment from the circumambient water, and every part acts as a root receiving ſupplies for the whole. *Marſigli*, Hiſt. Mer. p. 73. See the article Moss.

MUSEAU, in natural hiſtory, a term applied by Mr. de Reaumur to a ſort of bladder which the inſects of the fly claſs are provided with to make their way out of their ſhell, after their laſt transformation into the nymph ſtate.

The word is French, and literally ſignifies a ſnout or muzzle. The flies to whom nature has given this inſtrument, have it only during that ſhort ſtage of their lives which is between their being encloſed in the membrane which covers them in the nymph ſtate, and their firſt flying about at liberty. At this time, in order to their getting out of their ſhell, nature gives them a power of inflating and ſwelling out their head to a great ſize, and throwing out this ſort of bladder from its anterior part, by which means the cap of the caſe or ſhell is thrown off, and the end of it opened by the two longitudinal lines giving way. The creature, after this, as it has no uſe for this ſingular piece of mechaniſm, ſo it has no power to exert it during the remainder of its life. *Reaumur*, Hiſt. Inſ. vol. 4. p. 340. See the article Transformation.

MUSEBYTER, in zoology, a name given by ſome to the fiſh called by authors *Dobula*, a German fiſh, found in ſeveral parts of Germany; much approaching to our common dace. *Willughby*'s Hiſt. Piſc. p. 261.

MUSEIA, Μουσεια, in antiquity, feſtivals in honour of the muſes at ſeveral places of Greece, eſpecially among the Theſpians, where ſolemn games were celebrated every fifth year. *Potter* Archæol. Græc. l. 2. c. 20. T. 1. p. 415.

The Macedonians had alſo a feſtival in honour of Jupiter and the muſes, which was celebrated with ſtage-plays and games, and laſted nine days, according to the number of the muſes. *Potter*, ibid.

MUSHROOM, *Fungus*, in botany, the name of a genus of plants; the characters of which are theſe. It is a headed vegetable compoſed of a pedicle crowned with a broad head, which is convex and ſmooth at the top, and hollow, foliated, lamellated or fiſtulous on the other ſide. See Tab. 1. of Botany, Claſs 17.

The ſpecies of *Fungus*, enumerated by Mr. Tournefort, are theſe: 1. The common eſculent *Muſhroom*, with a broad round head. 2. The *Muſhroom* with broad and round livid heads. 3. The large ſweet-ſcented royal *Muſhroom*. 4. The white *Muſhroom*, with a broad orbiculated head. 5. The yellow *Fungus*, with a flat ſtalk, and rounded head. 6. The flatted round and hairy-headed *Fungus*. 7. The reddiſh brown ſmooth orbicular-headed *Fungus*. 8. The large flat orbiculated headed *Fungus*, with rough prominent veins. 9. The great *Fungus*, with a protuberant head variegated on the upper ſide, and hairy underneath. 10. The plain-headed brown *Fungus*, with lacerated edges. 11. The broad-headed *Fungus*, with a long variegated pedicle. 12. The round-headed ſpring *Muſhroom*. 13. The white-headed meadow *Muſhroom*. 14. The flat round-headed yellow *Muſhroom*. 15. The white and brown furrowed round-headed *Fungus*. 16. The brown bulboſe *Fungus*, with a double head. 17. The browniſh white *Fungus*, with pointed heads. 18. The ſmall umbilicated *Fungus*. 19. The variegated navel *Muſhroom*. 20. The orbicular *Fungus*, with the edges bent inwards. 21. The angular *Muſhroom*, with jagged edges. 22. The thick porous *Muſhroom*. 23. The white wood *Muſhroom*, with an acrid pepper-like milky juice. 24. The broad ſcarlet-headed *Muſhroom*, with a ſweet and well-taſted milky juice. 25. The little milk *Muſhroom*, with very long and ſlender pedicles. 26. The great all-white eſculent *Muſhroom*. 27. The white *Muſhroom*, called biſette. 28. The great-headed *Muſhroom*, with heads brown on the upper ſide, and white underneath, and with a ſpotted ſtalk. 29. The yellowiſh red *Fungus*, with greeniſh gills. 30. The great reddiſh *Muſhroom*, with a ſhort thick ſtalk, and white gills. 31. The lamellated *Muſhroom*, with a broad thin and membranaceous head. 32. The yellow and white ſmall viſcid meadow *Fungus*. 33. The red ſmall viſcid meadow *Muſhroom*. 34. The ſmall tender duſty *Muſhroom*, with heads grey on the upper ſide, and covered on the under ſide with thin black lamellæ. 35. The ſmall *Fungus*, with a long pedicle, and a half-round yellowiſh head. 36. The ſmall *Muſhroom*, with a long tough and firm ſtalk, and a head pointed at the top, and ſhewing the ſhell of the gills on the out-ſide. 37. The ſmall *Fungus*, with a long ſtalk, and a head ſtriated on both ſides. 38. The very ſmall *Fungus*, with a conic reddiſh brown head, and a few lamellæ. 39. The very ſmall whitiſh grey *Fungus*, with a long ſlender pedicle, and but few lamellæ. 40. The duſky brown *Muſhroom*, with heads pointed at the top. 41. The conic-headed orange-coloured *Fungus*. 42. The yellow *Fungus*, growing in cluſters about the roots of trees. 43. The browniſh *Fungus*, growing in cluſters on rotten wood. 44. The white ſhining *Fungus*, growing many together. 45. The larger ſhield-faſhioned *Fungus*. 46. The ſmaller ſhield-faſhioned *Fungus*. 47. The red orbiculated marſh *Muſhroom*. 48. The ſmall yellow funnel-faſhioned *Muſhroom*. 49. The white *Fungus*, with inverted heads. 50. The ſmall turbinated cluſter *Muſhroom*. 51. The velvety lamellated tree *Muſhroom*. 52. The ſmall lamellated *Muſhroom*, growing to alders in the ſhape of a comb. 53. The hard white tree-*Muſhroom*, with lamellæ reſembling the blood-ſtone. 54. The ſmall white lamellated *Muſhroom*, with a long ſlender pedicle. 55. The white hairy tree-*Muſhroom*, lamellated underneath. 56. The orbicular hazel *Muſhroom*. 57. The orbiculated *Muſhroom*, called the toad-ſtool. 58. The white inſipid *Muſhroom*, with conic heads. 59. The white orbiculated birch *Muſhroom*. 60. The reddiſh black orbiculated *Muſhroom*. 61. The flie *Muſhroom*, ſo called becauſe it is ſaid to kill flies. 62. The broad white orbicular *Fungus*. 63. The broad orbicular *Fungus*, with the edges turning inwards. 64. The bulbous-ſtalked *Fungus*. 65. The broad *Fungus*, with jagged edges. 66. The *Fungus*, with edges divided into five ſegments. 67. The orbiculated autumnal oak *Muſhroom*. 68. The truffle-like *Muſhroom*. 69. The *Muſhroom*, reſembling in colour and in ſmell the root of ſow-bread. 70. The thick conic-headed *Fungus*. 71. The red firr *Muſhroom*, with reflex edges. 72. The common greyiſh white cluſter *Muſhroom*. And, 73. The ſcaly and globoſe American ſcarlet *Muſhroom*. *Tourn.* Inſt. p. 556. ſeq.

Muſhrooms are plants more perfect than many people imagine; they have a regular root, a ſtalk conſiſting of ſeveral arrangements of fibres, the interſtices of which are filled up with a parenchymatous ſubſtance, leading from the root to the head or umbel; the under ſide of this umbel is full of lamellæ or chives, every one of which is a regular pod or ſeed-veſſel. If theſe lamellæ are examined in their ſeveral ſtates, the ſeeds in them may be eaſily diſcovered, and are always found to be of a ſize and degree of maturity proportioned to the ſtate of the plant at that time; they have each of them alſo a ſiliquaceous aperture lengthwiſe, the ſeeds lying in rows ready to fall through it. The plant is eaſily and regularly propagated through theſe, and not only may be raiſed from ſeed, but, like many other plants, may be propagated by roots. The ſeveral filaments at the root producing tubercles, in the manner of the potatoe; from each of which there will ariſe new roots, and a new plant. The periods of vegetation in this plant are alſo ſufficiently regular; and the common opinion of its ſpringing up in a night, and periſhing in a day, has no foundation in reality. For, in the common way of raiſing them on hot beds, it is eaſy to find, that they often ſtand a fortnight or longer from their firſt appearance, before they are fit for the table. Phil. Tranſ. N°. 472. p. 160.

Notwithſtanding that the ſeeds of ſome ſpecies of *Muſhrooms* have been diſcovered, the accurate Buxbaum is of opinion, that very many plants of this genus propagate themſelves greatly by root, and are truely perennial; and this he ſupports by many ſolid arguments, drawn from obſervations of the ſeveral ſpecies of *Muſhroom*, or *Fungus*, which are obvious and under the eye of every obſerver, at many times of the year.

1. There are ſome *Funguſes* which, while young, or when firſt appearing out of the earth, ſtand on a pedicle which is very lightly rooted, or does but penetrate a very little way into the earth; but after the head has expanded itſelf, and is withered, this bottom of the pedicle pierces deeper into the ground, and there acquires a greater thickneſs and becomes a ſort of bulb, remaining there in that ſtate till the next year, when it brings forth a new plant.

2. There are certain ſpecies of *Funguſes*, which grow on the old ſtumps of tree; theſe ſend their roots deep into the ſubſtance of the rotting wood, where they alſo remain many years, and annually produce new *Funguſes* at a proper ſeaſon. Of this ſort is the cluſter *Muſhroom* of old trees, deſcribed by Mr. Tournefort; the roots of this, as of the former kind, do not begin to deſcend or inlarge in length and thickneſs till the upper part of the plant withers; but they then begin to grow and often force themſelves into the crevices to a great length, and become ſtrangely divaricated: To this is owing the erroneous account of ſome authors of *Muſhrooms* or *Funguſes*, found ſpreading and branching between the bark and the wood of old trees, ſuch ſuppoſed *Funguſes* having been only

only the enlarged roots of ſome known ſpecies, whoſe upper part is decayed; but which, at a proper ſeaſon, will be received from theſe roots. The agarics always grow upon trees, and wherever they are fixed, there is always a callous tubercle in the wood under them, which denotes the paſſage of the root. Thus what Breynius calls the leather-like blood-red oak *Muſhroom*, is no other than the root of the common endive tree-*Muſhroom*; and the cylindric tree-*Fungus* or touchwood of Dillenius, is only the root of the common cluſter *Fungus* above deſcribed.

3. There is a ſpecies of *Fungus* which, while young, is round, and ſeems to have no fibres, or roots; but theſe at length decaying, become filled with a dry duſt or ſubtle powder, and then they puſh down very numerous roots into the earth; and among theſe roots there are placed ſeveral globules, which are no other than compleatly organized *Funguſes* of the ſame kind with the other, and ready to appear like it in a ſucceeding year. The common boletus, and ſeveral ſpecies of the lycoperdon, ſhew inſtances of this. Ray obſerves the ſame ſort of propagation by roots in that ſpecies called *fungus phalloides*, which, he ſays, creeps a long way under the ground, with white fibrous roots variouſly interwoven one with another; and to which there are affixed, at certain diſtances, little globules, which are ripened into more *Funguſes* of the ſame kind in a ſucceeding year. Acta *Petrop.* vol. 3. p. 265.

The violet-coloured *Fungus*, creeping on wood in manner of a herpes, deſcribed by Mr. Ray, is no other than the root of the violet-coloured meſenteric agaric, and the black compreſſed *Fungus* variouſly branching between the bark and the wood of trees, is the root of the black-fingered *Muſhroom* of Mentzelius, or the plant itſelf impeded in ſome accident in its growing.

4. There are *Funguſes* which creep with their pedicles, and ſhoot out roots from them; and now and then young plants, in the manner of the plants of the more perfect kind, which have creeping ſtalks; of this kind there are ſeveral ſpecies, which grow on the decayed fruits and leaves of trees, all of which plainly propagate themſelves by the root.

In ſeveral ſpecies of theſe plants there is placed round the ſtalk, at a ſmall diſtance from the head, a ſort of ring of a tough matter, reſembling the outer covering of the whole *fungus*; this uſually catches many of the ſeeds of the plant in their fall from the head when ripe, in order to the re-producing the ſpecies; and hence ſome have been of opinion, that it was placed there by the author of nature, in order to break the fall of the ſeeds, and preſerve them from the fury of the winds, in their falling from too great a height, in reſpect to their extreme lightneſs; but it rather appears, that the ſeeds often found on this ring, fall there only by accident, and are there detained by a viſcoſity with which that part of the plant abounds; and that the uſe of this ring is very different.

Linnæus has claſſed the *Funguſes* in general, together with the fig-tree, the ſeveral ſpecies of the ferns, the moſſes, and ſome others, under the character of *cryptogamia*; that is, ſuch plants as perform the great work of their fructification in ſecret, or at leaſt whoſe flowering and ſeeding are not obſerved ſo eaſily, as in thoſe plants which we uſually call the more perfect ones. In ſome of theſe the beſt microſcopes have not yet been able to inform us of the true manner in which this is performed, and many of the *Funguſes* or *Muſhrooms* are of this number.

Almoſt all the *Muſhrooms* which have thick and fleſhy umbels, and fleſhy ſtems, have this ſort of ring round their ſtalk, from which, when the plant is young, and not yet in a flowering ſtate, there ariſes a membrane which connects the rim of the umbel to the ſtem, and preſerves the under part while in this ſtate; but when this time is over, the umbel, which was before of an hemiſpherical figure, growing larger, and the membrane not giving way, it is torn off from the rim of the umbel, and adheres only to the ſtem. Soon after this the ſeeds ripen, and the umbel then loſing its former figure, commences almoſt a plane. This is the ſtate in which the plant is ſold in our markets under the name of *flaps*.

When the umbel is of this figure, the ſeeds being perfectly ripe, muſt fall upon the whole ſpace covered by the umbel, and as a part of this ſpace the ring muſt receive its ſhare of them; but there is no reaſon to believe that it receives more than are allotted to ſuch a part of the determinate ſpace on which they are to fall.

As to thoſe ſpecies of *Muſhrooms* whoſe ſtems are ſlender, and their umbels thin, ſoft, and ductile, they never have this ring at all, and yet their ſeeds have often farther to fall than thoſe of the other kinds which have it, as they are uſually taller plants. The rims of the tender umbels in theſe kinds clap themſelves quite cloſe to the ſtalks, in the form of a contracted umbrella, and expand as the others do when the ſeeds are ripe; and the ſpecies of *Funguſes* of this kind are much more numerous than thoſe of the former, and propagate themſelves full as regularly.

The poiſon of *Muſhrooms* has been much talked of by ſeveral perſons; but there ſeems to be no certain account of any body's ever having been injured by eating the common *Muſhroom*, unleſs by accident, as from the eating too many at once, and thereby over-loading the ſtomach; or by their being eaten by perſons who had a particular diſlike to them, as ſome perſons have to the moſt innocent aliments, particularly to cheſe. If theſe *Muſhrooms* had any poiſonous quality, it muſt have been often found out by the phyſicians in ſuch a place as London, where there are annually ſuch vaſt quantities of them conſumed, yet nothing of this kind is obſerved; and there ſeems, upon the whole, to be nothing hurtful in this ſpecies; though there may be many others which are truly poiſonous. Nor is it any more wonderful, that the different ſubjects of this claſs of vegetables ſhould differ in their virtues, than that thoſe of other kinds ſhould. The roots of carrots and parſnips are daily found a very wholeſome food, while thoſe of other plants of the ſame claſs, ſuch as the water-hemlock, the dropwort, and others of the umbelliferæ are known to be poiſonous.

The antients have taken great pains to diſtinguiſh the ſeveral kinds of *Muſhrooms*, that the world might know the hurtful from the ſafe. The boletus mentioned by Juvenal, on account of the death of the emperor Claudius, is ſufficiently deſcribed by Pliny. Cluſius, among the moderns, has deſcribed a vaſt number of different ſpecies, every where diſtinguiſhing the eſculent and wholeſome from the poiſonous or pernicious kinds. The ſeveral authors who have treated of them ſince the time of Cluſius, have all mentioned the effects of ſome or other of the poiſonous kinds; and there are numerous inſtances of the miſchief done by them at one time or other. Some have been willing to aſcribe this miſchief to animalcules inhabiting the plant; but this ſeems erroneous, and particularly from the following inſtance: We have one kind of *Muſhroom* growing in England, called the white acrid *Fungus*. This is ſo extremely ſharp, that it ſtimulates the tongue, as if it had been touched with ſpirit of nitre: And Tournefort obſerves, that if rubbed on blue paper, it turns it red in the ſame manner as that liquor, or any other of the violent acid ſpirits would; this cauſtic quality remains in the plant even after drying; and it is very evident, that we need look no farther than this for the origin of the poiſonous quality in this ſpecies. There is another kind which is obſerved to kill the very flies as they ſettle upon it. It is not probable that ſuch plants as theſe ſhould be inhabited by any kind of animalcules, nor is it neceſſary to have recourſe to ſuch cauſes of the miſchief which enſues from the eating them, when their own juices ſeem ſo very able to have occaſioned it. Philoſ. Tranſ. N°. 473. p. 54.

Mr. Miller ſays, that the true eatable *Muſhroom* is diſtinguiſhed from the poiſonous and unpleaſant kinds by theſe marks. When young it appears of a roundiſh form like a button, the ſtalk as well as the button being white, and the fleſhy part very white when broken, the gills within being livid. As they grow larger they expand their heads by degrees into a flat form, and the gills underneath are at firſt of a pale fleſh-colour; but as they ſtand long, become blackiſh.

In order to propagate *Muſhrooms*, the meadows and paſtures ſhould be ſearched for them in Auguſt and September; and wherever they are found, the ground ſhould be opened all about the roots, where there will be found abundance of ſmall white knobs. Theſe are to be taken up with lumps of earth about them. Then ſome new horſe-dung muſt be procured, and the litter being ſhaken out, the dung muſt be laid together on a heap to ferment for eight days. A trench muſt then be dug, and the dung laid in it a foot thick, and covered over ſix or eight inches thick with light rich earth; and into this, on each ſide, ſhould be put in the knobs of *Muſhroom* ſpawn, as it is called, at ſix inches diſtance. After this another layer of dung is to be made upon this earth, to ſix or eight inches thickneſs, or more, but obſerving to draw in the ſides, ſo as not to cover the knobs of *Muſhrooms* above half an inch; then another layer of earth is to be laid on this, and ſome more knobs of the *Muſhroom* ſpawn placed on this at the ſides, as in the former; then put on a third layer of dung, drawing it in ſtill narrower, that it may not cover the ſecond plantation; and cover this with another layer of earth, drawing this up into a ridge at the top, and planting more of the *Muſhroom* ſpawn in this; but ſtill laying it in ſideways as before. When all is thus finiſhed, the whole bed is to be covered half a foot thick with dry litter, to prevent the earth from drying too faſt. When the bed has been made a fortnight, it ſhould be carefully looked over, drawing away the litter with the hands, to ſee whether any young *Muſhrooms* appear; and they muſt be gathered as they grow large; for if ſuffered to remain, they will rot upon the bed, and deſtroy all the young ſpawn that is about them. And when they begin to produce, the bed muſt be ſearched every other day all the year round, and every day in Auguſt and September, which is the time of their principal increaſe, to gather ſuch as are fit for uſe. The manner of gathering them is, to pull them gently out of the ground, ſo that no part of their ſtalk may be left behind; but if any part of the ſpawn is pulled up with the ſtalk, that muſt be carefully returned into the bed. As the cold or wet weather comes on, the covering of dry litter over the whole bed muſt be increaſed. A bed thus managed, will remain good many months, and produce vaſt abundance of *Muſhrooms*; and the ſpawn may be at times taken out from it to ſupply other new beds.

beds. At whatever time of the year this is taken up, it ſhould be carefully laid up in a dry place till the month of July following, which is the proper time for planting it in new beds. *Miller*'s Gardener's Dict.

The vaſt variety of known *Funguſes* which are found regularly every ſeaſon in their proper ſoils, are not all that the naturaliſt has to enquire into the nature of; there are others whoſe productions are much more ſurprizing. Theſe are ſuch as are only ſeen once or twice in an age, and that in places where it is very difficult to account for the manner of their production. One of theſe we had ſome years ago, which appeared upon an old piece of wood in a blackſmith's cellar in the Hay-market, and grew to twelve inches or more in height; and, when cut down, appeared again at the ſame time the next year, and ſo on for ſeveral ſucceeding years, as if, contrary to the nature of the generality of theſe plants, it had a perennial root, and grew regularly from the old ſtock. This appeared to us a ſingular production, and a wholly new ſpecies; but ſo long ago as in the year 1692, Mr. Tournefort found ſuch a one growing on an old beam in the abbey at St. Germains. His deſcription of it is very accurate; and its reſemblance with ours as great as could be expected, in ſo looſe a growing plant as an irregular *Fungus*. It was compoſed of a cluſter of five large and thick leaves, and made ſomewhat of the appearance of the tympanum of the capital of a Corinthian pillar, but in a coarſe way; it was about ſix inches high, and nine inches wide; and each leaf or part was about half an inch in thickneſs. They were all very ſolid, and capable of continuing a long time without decay. They all aroſe from the ſame baſe, and forming pedicles ſeparately, they again united, and made a broad and beautiful aſſemblage of joined leaves to the top. They expanded a little above this joining, each into the figure of a deer's horn; and at the edges were ſo cut and ſinuated, that they not unaptly reſembled the leaves of certain cut and curled cabbages, common in our gardens; they were of a pale yellowiſh colour, like that of buff-leather, and had a border of a ſtronger yellow about their outer edge; the internal ſubſtance was white, and very hard and firm, though light, and was pierced in different places with a vaſt number of holes, many of which were large, and reſembled thoſe of a ſponge or pumice; theſe all had apertures on the ſurface of the leaves; and theſe apertures, when examined with a microſcope, were found to be ſurrounded with a wrinkled rim, covered with a very fine and ſubtil powder, the greater part of the grains of which hung to a fine filament, and might be taken for the ſeed of the plant. The back-ſide of the leaf was more ſmooth and gloſſy than the other. It had ſeveral ribs, which run out into ramifications, that might eaſily be traced by the eye to their extremities at the edges of the leaf; and this part of the leaf was in many places covered with a ſort of tartarous cruſt, which ſeemed to be a ſort of placenta or ovary; but on examination there appeared no rudiments of ſeeds in it. The beam on which this *Muſhroom* grew was very firm and ſound in all other places, but juſt where it was rooted there was a crack out of which moiſture ouzed; and probably the beam was in that part rotten, or worm-eaten within. The ſmell of the plant was like that of others of the ſame kind, and an infuſion of a piece of it turned an infuſion of turnſol to a bright red; ſo that it manifeſtly abounded in acids.

It is not eaſy to account for the appearance of theſe plants which are ſeen ſo rarely, and that in places where no plant could be expected to grow: the only probable ſolution of the point ſeems this, that as the ſeeds of the *Muſhroom* kind are all very minute, and generally in theſe ſpecies which have no lamellated heads, cover the whole ſurface of the leaves, the number of ſeeds produced by one ſuch plant muſt be numerous beyond all account, and at the ſame time light enough to float about in the air. Theſe muſt be at times thrown againſt a thouſand different bodies where there is no proper nouriſhment for them, and muſt therefore periſh; whereas if many accidents are required to concur, to make a ſoil proper for it to grow in, wherever ſuch ſoil happens to be produced, as the air has free acceſs every where, it is not impoſſible but that, at one time or other, one of theſe ſmall ſeeds may happen to be properly depoſited. Mem. Acad. Par. 1692.

The Laplanders have a way of uſing *Funguſes*, or common toadſtools, as we call them, as the Chineſe and Japoneſe do the moxa, to cure pains. They collect the large *Funguſes* which they find on the bark of beech and other large trees, and dry them for uſe. Whenever they have pains in their limbs, they bruiſe ſome of this dried matter, and pulling it to pieces with their fingers, they lay a ſmall heap of it on the part neareſt to where the pain is ſituated, and ſet it on fire. In burning away, it bliſters up the part, and the water, diſcharged by this means, generally carries off the pain. 'Tis a coarſe and rough method, but generally a very ſucceſsful one, eſpecially when the patient has prudence enough to apply it in time, and reſolution enough to bear the burning to a neceſſary degree.

MUSHROOMS *growing out of Flints*. Naturaliſts have of long time obſerved, that there are ſea *Funguſes* of a very different ſubſtance and ſtructure from any of the common kinds, growing on rocks, ſtones and corals, or other ſtrong ſea plants, which ſeem wholly incapable of ſupplying them with any vegetable nouriſhment. Theſe have been ſuppoſed to be as it were all root, and to take in their nouriſhment at every part of their ſurface from the circumambient water: But in the year 1739 Mr. Alefeld obſerved a like ſort of *Funguſes* growing in places where they had no ambient fluid to afford them nouriſhment, except the air, and yet were fixed upon as unpromiſing a baſis for the ſupplying them with any, as thoſe of the ſea. Theſe were found on common flints on the ſurface of the earth. This gentleman obſerved, that a great many various ſpecies of flints which lay in part buried in the earth, and in part lying above its ſurface, were on this open part covered with a ſort of white duſt. This was in July, and in hot dry weather. Having the curioſity to examine this duſt with a microſcope, every particle of it was found to be a compleat and perfect *Fungus*, all of the ſame determinate figure, and much reſembling the common earth *Muſhrooms*. They were white in colour, and had each a very ſhort pedicle, in many, ſcarce to be ſeen at all; their head was round and umbilicated, and very elegantly and evenly ſtriated on the upper part, the ſtriæ or furrows all running from the center to the circumference; and the rim of each head being a little elevated. Upon the whole, they not unaptly reſembled in miniature a common tea-cup inverted, and the ſaucer inverted alſo, and placed upon it. The ſubſtance of theſe *Funguſes* was of two kinds, the one furniſhed a cortical part or covering, and the other filled up the whole internal ſpace.

The internal part was ſoft and ſpongy, and much like what the inſide of the common *Muſhroom* is: this was white. The outer or cortical part was reddiſh, and rather repreſented a congeries of ſmall grains of ſand, collected into that form by ſome glutinous matter, than any ſolid or continuous body. The thin external coat of this being removed, there were ſeen within it a multitude of ſmall round globules of gloſſy ſurfaces, reflecting the light in manner of ſome of the ripe ſmooth ſummer fruits, ſuch as the cherry, and the like. This was their appearance when freſhly uncovered; but after they had been expoſed ſome time to the air, they became flaccid, fell almoſt flat together, and were umbilicated and marked with rays from a center like thoſe of a ſtar.

Theſe *Funguſes*, if not injured by accidents, remain in their perfect ſtate a long time upon the ſtones. Five months keeping produces no alteration in them; but at length they become flaccid and wither, and in this ſtate are not to be recovered by water, as many of the common land *Funguſes* will, which ſwell, and for a time appear plump on being wetted.

They grate harſhly like ſtony matter between the teeth, and reſiſt the force of acid menſtruums; they bear the great degrees of heat or cold without any injury; but if they are expoſed to a flame, the outer covering of the head burſts and flies off, and theſe red globules come in full ſight, while the reſt of the *Fungus* remains unaltered. The ſame effect is produced by plunging them into hot water; and if they be boiled in water, over a ſtrong fire, the globules are diſlodged and loſt in it. If the flints on which they are produced, are heated red hot, the *Funguſes* are deſtroyed, and wholly diſappear in the places where they were; only the fragments of the outer covering of the head remaining ſcattered, on different parts of the ſtone, like pieces of broken pots or glaſſes: theſe fragments loſe their red colour, and are found grey. On the whole, it appears from theſe experiments, that the cortical part of this *Fungus* is not of the nature of common vegetable matter, but is truly ſtony; ſo that the plant may be properly arranged among a ſet of *lythophyta*, or ſtone plants, properly ſo called. The author of this curious diſcovery obſerves, that he uſually found many ſmall red inſects running about upon theſe ſtones, and among the cluſters of *Funguſes*. Theſe afforded at leaſt a proper retreat or nidus for them, if not food; for it is poſſible the internal part of the *Funguſes* might be eaten by them. Act. Eruditor. Ann. 1739.

Baſtard MUSHROOM. See the article FUNGOIDES.

Pepper MUSHROOM. See the article PEPPER.

MUSHROOM *Galls*, in natural hiſtory, a name given by authors to a ſmall ſpecies of galls very common on the leaves of the oak in September and October, and reſembling the common eſculent *Muſhroom*. They are placed on the upper ſurface of the leaf, and are often in great numbers on the ſame leaf, ſome containing twenty or thirty, and others only three or four. The leaves which have conſiderable numbers upon them, make a very beautiful figure, and appear as if ornamented by art with a number of elegant figures. Theſe galls are uſually about a ſixteenth, though ſometimes a tenth of an inch in the diameter; they are compoſed of an orbicular head, which adheres to the leaf by a very ſhort pedicle, ſo that its edges, which droop a little in the manner of thoſe of the common *Muſhroom*, uſually touch the ſurface of the leaf all round. Theſe little galls are of various colours, according to their different degrees of maturity; they are of a greeniſh white at firſt, after that they become of a yellowiſh tinge, from which they paſs through all the ſhades of orange and flame colour, to a very beautiful red, which is always their colour when perfectly mature. When they are obſerved by the microſcope, their ſurface appears hairy, and the ſeveral

hairs all ſtand near one another at their baſes, and diverge at their points, as is the natural conſequence of their ſtanding on a convex body. *Reaumur*, Hiſt. Inſects. vol. 6. p. 194.

The uſe, as well as the figure of this gall is very ſingular. Malpighi and Mr. Reaumur have both deſcribed it, and the former of theſe authors deſcribes a cavity in the center of the head; but this ſeems to have been done at random, and rather ſuppoſed from analogy, than ſeen in fact; for the latter author, who is perhaps one of the moſt accurate obſervers that ever wrote, could never find any cavity in any one of the great numbers he diſſected; but he obſerved what was an uſe of the ſame kind with that of the other galls, in this, though performed in a different manner; they are plainly all deſtined for the lodgment and ſecurity of ſmall animals; and as, in the generality of them, theſe little creatures are contained in their ſubſtance, ſo in this they are ſheltered from injuries by it, though in another manner. For although there are not inſects lodged in the ſubſtance of it, there are always a great number found in the ſpace, encloſed within its circumference, as its edges every where touch the ſurface of the leaf, and the whole forms an arched dome with an upright pillar or pedicle in the middle. Theſe worms perfectly reſemble in figure thoſe of the lime galls, but they are of a yellow colour. There are uſually found a dozen or more of them under one gall, though ſometimes there are only two or three, or but a ſingle one. Theſe are ſo ſmall as not to be diſtinctly ſeen without the help of glaſſes; but they are of the nature of thoſe worms which turn into two-winged flies. Their manner of living is the ſame as that of thoſe contained in the ſubſtance of galls, for they continually ſuck and gnaw the inſide or under ſurface of the gall, and thence it increaſes in growth till they have done eating. *Reaumur*, Hiſt. Inſ. vol. 6. p. 19.

The flies into which theſe worms are finally transformed, have not yet been diſcovered; but this is no wonder, ſince the animals themſelves are ſo minute as to require glaſſes to view them. It is probable that they undergo their change into the chryſalis ſtate in ſome other place, for they are never found in it under the galls; but this is common alſo to many other ſpecies.

MUSHROOM *Worms*. The various ſpecies of *Muſhrooms* are ſubject to be eaten and deſtroyed by a great variety of inſects. There is however one ſpecies which is more frequent than all the reſt, and which has therefore obtained, among authors, the name of the *Muſhroom worm*. This is a white worm, with a hard ſcaly black head; it has ſome fleſhy tubercles, which it throws out at pleaſure from the under part of its ſeveral rings, and which ſerve it as legs. This is found indifferently in almoſt all the ſpecies of *Muſhrooms*; but in none ſo frequently as in the great wood-*Fungus*, which is porous and greeniſh underneath. Theſe worms have been watched in vain by ſeveral curious obſervers, to know what would be their laſt ſtate; but the difficulty was, that when the *Muſhrooms*, with the worms in them, were put into boxes for their transformation, they ſoon corrupted and ran into water, in which the worms were drowned. The putting earth in the box under the *Muſhrooms*, ſucceeded no better than this, the *Muſhroom* moiſtening all the earth about it too much by its decay, to ſuffer the worms to live in it: At length Mr. Reaumur found the proper method, which is, to put only ſmall fragments of the *Muſhroom* on large beds of earth in large boxes; and in this caſe the worm uſually lives to change into its nymph ſtate, and by this means at length acquires its perfect ſtate, and is found to be a tipula or long-legs of no great beauty, being of a duſky brown colour, and middling ſize.

The other ſpecies of *Funguſes* have alſo their worms; but there is one of a very ſingular nature, which is found frequently on the agaric which grows on the ſtumps of oak-trees, eſpecially near the roots. This is a long and ſlender worm, ſomewhat flatted, and reſembling a ſmall leech, but that it has a hard and ſcaly head of a blackiſh colour. The body is compoſed of many rings, in the manner of the earth worm, and looks very bright and gloſſy, being always covered with a viſcous liquor. This creature is eaſily found, for it never eats into the ſubſtance of the *Fungus* but only crawls about upon its ſurface; the traces, wherever it has been, are marked with a coat of a ſhining varniſh, and reſemble the places over which ſnails have crept. There is ſomething very ſingular however in this creature's uſe of the viſcous humour it is covered with, which is not obſervable in the ſnail kinds. It is an extremely tender creature; and nature ſeems to have given it this liquid covering as a defence againſt the injuries of the external air, which would otherwiſe ſoon dry it up and kill it. This it defends itſelf from in the following manner: It fixes upon a place where it deſigns to remain ſome time, and then begins to make itſelf an habitation, by extending this viſcous matter, by means of its mouth, over a ſpace of the ſurface of the *Fungus*, which is more than equal to the bigneſs of its body; it doubles the coat of matter ſeveral times, ſo as to form a ſoft bed, on which it lays itſelf down, and then, by drawing its head ſeveral times from the ſides upwards, it extends two other plates of this glutinous matter, which dries into a thin ſkin immediately on being expoſed to the air. Theſe meeting in an angle over the body, form a ſort of covering like the ridge of a houſe, under which the creature lies, and is by this means defended from the air, as much as neceſſary, and yet is at liberty to feed at pleaſure. This ſort of covering is perfectly tranſparent, and is yet ſtrong enough for all the purpoſes it is intended for. This worm has no legs, but its manner of marching forward is by applying its head to ſome diſtant part of the ſurface of the agaric; there it drops a large drop of this viſcous matter, which ſoon hardens, and retains the head ſo firmly, that it is able to draw all the body to it. This is a ſort of motion that anſwers all its purpoſes very well, as it has but a very ſmall ſurface to crawl upon, and needs make but very ſhort journeys even upon that. This creature ſeems never to corrode the ſubſtance, or even the outer ſkin of the *Fungus*, but to live entirely upon the clear and glutinous fluid that covers the ſurface of this kind of agaric.

This worm makes a very beautiful object for the microſcope. When young it is as tranſparent as glaſs, and the motion of its internal parts is very eaſily diſtinguiſhed. It has two brown ſpots near the head, which look very like eyes, and the aperture, out of which the glutinous matter with which it makes its habitation iſſues, is very large, and ſeems the mouth. When this little creature is taken out of its habitation, it very ſoon dies, the air drying up all its liquid covering. The ſpots which reſemble eyes are really the anterior ſtigmata, and there are two others behind. When this creature is to paſs into the chryſalis ſtate, it does not remove from the *Fungus*, but ſpins itſelf a web, and remains upon it. This web is compoſed of the ſame matter with the covering or habitation under which it uſually reſides, but it is thicker, more opake, and of a coarſer ſtructure. The creature begins it by drawing ſeveral longitudinal lines, and other tranſverſe ones, as thick and ſtrong as it can make them; theſe compoſe the beams and raftors, or the open ſhell of the edifice; over and under theſe its ſpreads ſeveral continued plates of this glutinous matter, and theſe all drying in a very little time upon one another, form a fine and ſtrong ſhell, which it makes rough and uneven by farther additions; and finally cloſing the orifice, it works within, and ſtrengthens it yet much more, ſo that it is liable to no injuries from the weather, or from the common deſtroyers of theſe things, which are a ſmall ſort of carnivorous worms, which never attempt to force this covering. The creature remains about a fortnight under this covering, and then comes forth in the form of a fly, which is evidently a ſpecies of tipula. It has very long legs, and a long and ſlender body; the body is brown, and the breaſt yelloviſh; the wings are long and ſlender, and the antennæ are of a very ſingular and remarkable figure; they are broad and flat, and yet terminate in a point. Theſe are compoſed of ſeveral articulations, and make a very beautiful figure when examined by the microſcope. Beſide theſe, this fly has, in the manner of the other tipulæ, a pair of beards placed on the anterior part of the head, which it at pleaſure bends down over the face, and compleatly covers with them the longitudinal fiſſure, which is the mouth, ſituated in this as in the other tipulæ. *Reaumur*, Hiſt. Inſ. vol. 9. p. 23. ſeq.

MUSIC (*Cycl.*)—*Muſic*, among the antients, was taken in a much more extenſive ſenſe than among the moderns. Meibomius [a] from Porphyry enumerates its parts by the names *harmonica*, *rythmica*, *metrica*, *organica*, *poëtica* and *hypocritica*. Alypius [b] alſo and Voſſius [c] make the *harmonica*, *rythmica* and *metrica* to be ſo many parts of *Muſic*. Ariſtoxenus [d] adds the *organica*. Voſſius alſo to the three ſpecies of practical *Muſic*, *harmonica*, *organica* and *hydraulica*, adds a fourth, *orcheſtria*, or dancing. Ariſtides Quinctilianus defines *Muſic*, the knowledge of what is graceful and becoming in ſounds and motions [d]. What we call the ſcience of *Muſic*, was by the antients rather called *harmonica*.—[[a] In. Not. ad *Euclid.* Introd. Muſic. p. 41. [b] Page 1. Edit. *Meibom.* [c] De Scient. Mathem. c. 22. [d] Γνῶσιν τε πρέπουσῶν ἐν φωναῖς καὶ κινήσεσι. V. *Wallis*'s Appendix ad Ptolem. Harm. p. 153.] See the article HARMONICA.

Chromatic MUSIC, *Muſica Chromatica*, among the Italians, is uſed to expreſs that kind of *Muſic* in which there are many chromatic ſigns, as flats or ſharps, and intervals, &c. See the article CHROMATIC.

Diatonic MUSIC. See the article DIATONIC.

Didactic MUSIC, *Muſica Didactica*, that part of ſpeculative *Muſic* which only conſiders the quantity, proportions, and different qualities of ſounds.

Dramatic MUSIC, *Muſica Dramatica*, *Scenica*, or *Theatrale*, among the Italians, is uſed to denote ſuch compoſitions of *Muſic* as are particularly made and fitted for theatres. See the article RECITATIVO.

Enharmonic MUSIC. See the article ENHARMONIC.

MUSICA *Ennunciativa*, or *Ennarrativa*, is uſed in much the ſame ſenſe as *Muſica ſignatoria*. See the article MUSICA *ſignatoria*, infra.

Figurate MUSIC, *Muſica Figuralis*, *Figurata*, or *Coloratu*. *Figurate Muſic*, that wherein the notes are of different values, and the motions various, now ſlow, then quick, &c.

Harmonic MUSIC, *Muſica Harmonica*, among the Italians, is uſed for pieces conſiſting of many parts, which, though very different, yet, when played together, make an agreeable whole. This we call *Muſic* in parts.

Hyporchematic, or *Choraic* MUSIC is uſed by ſome authors for a ſort of *Muſic* fit for ballads and dancing.

Inſtrumental MUSIC is uſed to denote muſical compoſitions made to be executed by inſtruments.

Meliſmatic, or *Melodic* MUSIC, is uſed to denote a ſong, or ſingle part, merely for a voice or for an inſtrument. *Broſſard.* See the article MELODY, *Cycl.*

Melopoëtic MUSIC is the ſcience or art of ranging and diſpoſing ſounds in ſucceſſion in an agreeable manner; or the art of making melody. See the articles MELODY and MELOPOEIA, *Cycl.*

Meaſured MUSIC, *Muſica Miſurata*, among the Italian authors, a kind of *Muſic* the notes of which are unequal. It is contrary to *Muſica Piena*, or *Chorale.*

Metabolic MUSIC, *Muſica Metabolica*, among the Italians, is properly *Muſic* tranſpoſed, as when the piece goes out of its natural mode into a tranſpoſed one, the better to expreſs the words, or to diſtinguiſh ſome change in the action, paſſion, motion, &c.

Metric MUSIC, *Muſica Metrica*, is uſed by Italian authors, to denote the harmonious cadence of the voice, heard when any one declaims, or repeats verſes; or it is an air compoſed to verſes.

Modern MUSIC. See the article MODERN.

Modulatory MUSIC, *Muſica Modulatoria*, among the Italians, that part of *Muſic* which teaches to compoſe or modulate, *i. e.* that fixes rules for the uſe of modes, and teaches either to ſing or play well. See the articles MODE, and MODULATION, *Cycl.*

Odic MUSIC, *Muſica Odica*, among the Italians, is the ſame with *hyporchematic*, or *choraic*. Vid. ſupra.

Organic MUSIC, *Muſica Organica*, among the Italians, is uſed to denote muſical compoſitions deſigned to be performed by inſtruments only.

Pathetic MUSIC, *Muſica Pathetica*, is a moving and affecting kind of *Muſic*, that cauſes emotions in the mind, either of love, grief, or pity.

Poetic MUSIC, *Muſica Poetica*, is ſometimes uſed for the art of inventing ſongs, of modulating concords and diſcords together agreeably, and making what we call compoſitions, &c.

Recitative MUSIC, *Muſica Recitativa*, *ſcenica* or *dramatica*, a ſort of *Muſic* uſed in operas, &c. irregular as to time, being a declamation in ſinging, to expreſs the paſſions: From its being thus irregular in its time, the Italians often place the phraſe *a tempo giuſto*, when the recitative ends, and an air, be it minuet, jigg, or any other, follows, to ſhew that the time is then ſtrictly to be obſerved.

Rhythmic MUSIC, *Muſica Rythmica*, is uſed for the harmony or cadence of the words in proſe; or a ſong compoſed to words in proſe. *Broſſard.*

Scenic MUSIC, the ſame with *Recitative.* See above.

Signatory MUSIC, *Muſica Signatoria*, is uſed for that part of *Muſic* which teaches the knowledge of the characters, notes, figures, pauſes, and all other ſigns and marks whatever, uſed in *Muſic.*

Vocal MUSIC, *Muſica Vocale*, or that compoſed for the voice, in oppoſition to organical or inſtrumental, which is intended to be played on inſtruments only.

MUSIC *Shell*, in natural hiſtory, the name of a ſpecies of ſhell-fiſh of the murex kind, remarkable for its variegations, which conſiſt of ſeveral ſeries of ſpots placed in rows of lines, like the notes of *Muſic.*

MUSICAL (*Cycl.*)—MUSICAL *Numbers* are 2, 3, and 5, together with their compoſites. They are ſo called becauſe all the intervals of muſic may be expreſſed by ſuch numbers. See the article INTERVAL.

This is now generally admitted by *muſical* theoriſts[a]. Mr. Euler ſeems to ſuppoſe, that 7 or other primes might be introduced; but he ſpeaks of this as a matter doubtful and difficult[b]. It is to be obſerved, that 2 correſponds to the octave, 3 to the fifth, or rather to the twelfth, and 5 to the third major, or rather the ſeventeenth[c]. From theſe three may all other intervals be found[d].—[[a] *Euler* Tentam. Nov. Theor. Muſ. p. 62, 163. Dr. *Pepuſch* in Phil. Tranſ. N°. 481. p. 267, ſeq. [b] *Euler*, ibid. p. 163. [c] Phil. Tranſ. ibid. [d] *Euler* & *Pepuſch.* loc. cit.]

MUSIMON, in natural hiſtory, the name of an animal eſteemed a ſpecies of ſheep, deſcribed by the antients as common in Corſica and Sardinia, and found in no other part of the world. It is much to be ſuſpected, whether the animal deſcribed under this name is now any where to be found in the world; not that it is to be ſuppoſed that any ſpecies of animal once created is become extinct, but that this probably was a ſpurious breed between two animals of different ſpecies, perhaps the ſheep and goat, which like the mule not being able to propagate its ſpecies, may have failed ever ſince. Theodore Beza, indeed, gives an account of an animal, which he received from an ignorant countryman of Sardinia; which, he ſaid, was peculiar to that place, and was called *muſlo*; that its hide and hair was like that of a deer, its horns wholly like thoſe of a ram, curling back to its ears, and its ſize that of a middling ſtag; and that it fed on vegetables, and lived among the rocks. The tragelaphus of Bellonius differs little from the *Muſimon*, according to the deſcriptions of both. *Ray's* Syn. Quad. p. 75.

MUSK (*Cycl.*)—*Muſk*, and other perfumes of the ſame tribe, have been long celebrated as antiſpaſmodics, but were formerly ordered in ſuch ſmall quantities as to have little effect. Practitioners thought four or five grains a large doſe. But the Chineſe have taught us to be more bold; the tenth part of an ounce is an uſual doſe among them. The remedy in the eaſt for the bite of the mad dog contains 16 grains of *Muſk*, and this they repeat frequently. See the article MADNESS.

The effects of *Muſk* are, eaſe from pain, quiet ſleep, and a copious diaphoreſis. Hence it has been found of great uſe in ſpaſmodic diſorders, petechial, malignant, putrid fevers, the goal diſtemper, hiccoughs, *ſubſultus tendinum*, &c. For the particular caſes we refer to the Philoſophical Tranſactions, N°. 474. §. 18.

It has alſo been found uſeful in ſpaſmodic diſorders, given by way of clyſter, as Dr. Wall obſerves, in that Tranſaction.

The operation of *Muſk*, in ſome reſpects, reſembles that of opium; but is in this much preferable, that it does not leave behind it any ſtupor or languidneſs, which the latter often does. *Muſk* therefore ſeems likely to anſwer in thoſe low caſes where ſleep is much wanted, and opiates are improper.

It is ſaid to be beſt given in a bolus, and that thoſe who are moſt averſe to perfumes, may take it in that form without inconvenience. For, as Etmuller and others, have long ago obſerved, the ſmell of the perfume is often found to be of diſſervice, where the ſubſtance inwardly taken produces good effects, Phil. Tranſ. ibid.

It is pity that a medicine of this conſequence ſhould be ſo liable to adulterations, and that the criteria of its genuineneſs are ill ſettled.

In a paper read before the Royal Society March 17, 174⅞, ſeveral cures performed by *Muſk* on diſtempered cows, were mentioned.

When *Muſk* begins to decay, it is a practice uſed in the Eaſt-Indies to put it into a bladder or bags, wherein many ſmall holes are made with a needle, and hang it in a neceſſary houſe, but not low enough to touch the filth. Others keep it wrapped up in linnen, well moiſtned with rank urine. *Boyle's* Works abr. Vol. 1. p. 146.

Mr. Boyle ſays of his own knowledge that *Muſk* has greatly contributed to the preſervation of fleſh. Works abr. Vol. 1. p. 30.

MUSK-*Ant*, the name given by Liſter and Ray, to a peculiar ſpecies of *ant*, which is of the number of the perfumed inſects. It is found on dry banks, and is ſo much ſmaller than the common ant, that it needs no other diſtinction. Thoſe of this ſpecies which are without wings are of a yellowiſh colour, and when bruiſed or cruſhed emit a ſharp and acid ſmell, as the common ant does; but thoſe which have wings are coal-black, and theſe, inſtead of the ſour ſmell of the others, emit a perfume not to be endured for its ſtrength. The ſmell of all the perfumed inſects goes off in keeping; and theſe little creatures, after they have been dead and dry ſome time, are found to ſmell leſs ſtrongly, but much more agreeably. Phil. Tranſ. N°. 76.

MUSK-*Inſect*, a term uſed by ſome to expreſs the capricorn, or *Muſk* beetle; but it is too looſe a phraſe for that animal, ſince there are other inſects which ſmell as ſtrongly of that perfume. There is a ſmall kind of bee very frequent in the paſtures of Lincolnſhire, and ſeveral other parts of England, in April. This frequents the ranunculus and dandelion flowers, and has a very ſtrong and fine ſcent of *Muſk*. There is alſo a hexapode worm, which feeds on the *gallium luteum*, or yellow ladies bedſtraw, which has the ſame perfumed ſcent in a no leſs degree. Both theſe inſects, and even the capricorn beetle, loſe their perfume when they have been ſome time dead. Phil. Tranſ. N°. 76. See the article CAPRICORN *Beetle.*

MUSK-*Rat*, an animal very common in ſeveral parts of America, and greatly reſembling the beaver in all reſpects, except ſize. A full grown *Muſk*-rat might very naturally be miſtaken for a beaver of about a month old. And Mr. Sarazin, of the Academy at Paris, obſerves, that the Indians call theſe the ſame animals, only diſtinguiſhing the beaver by the name of the elder, and the *Muſk*-rat of the younger brother. They live in ſummer on all ſorts of plants, and in winter on the great roots of the water-lilly. They live in communities, at leaſt they always do ſo in winter, and erect themſelves certain habitations of different ſizes, ſome ſuited for the reception of only one family, others for a great number of ſuch. Their great care is employed in the chuſing a proper place for theſe habitations; for it is neceſſary that they ſhould be not only defended from the injuries of weather, but freely open to the water, and that without fear of inundations; and they muſt alſo be in the neighbourhood of large plantations of the roots on which they are to feed. To have all theſe neceſſary conveniencies they always build in the ſteep banks of ſome river, which has a level bottom, and a wide bed without too much depth; and as ſuch rivers always abound with the roots they

want; they have thus always a dry home, plenty of provisions, and no danger of inundations; for they are prepared for little risings of the water, by having upper stories or rooms, into which they retire when the ground-floor is uninhabitable; and rivers of this great breadth and small current, are not subject to any very high floods. Mem. Acad. Par. 1732.

The size of the room is always well proportioned to the number of the intended family; if it be only for seven or eight, then a room of two foot square does, and it is made proportionably larger as the number is to be greater. When they have laid out the plan of their habitation, they plant a parcel of rushes all around it, which they surround in a very artful manner with clay, pressing it down with their feet, and working it even with their tail, which is like that of the beaver, and serves them for a trowel. They have a passage out of their house, which they go out at daily as long as the weather continues tolerably mild; but when it becomes very severe, they block up this passage, and the whole habitation afterwards often becomes covered many foot deep with snow; in this case they keep within doors, and have wells which supply them with water; other holes which serve to receive their excrements; and they burrow under ground to the river, and seek for the large roots they are to feed upon.

In this season, if they are at some difficulties to get food, they have the advantage however of being out of danger of the huntsmen, who know not where to seek them in the snow; but when the thaws come on, which is usually in March or April, they discover and take great numbers of them; if this season be slipped, however, they generally escape, for soon after this the melting of the snows cause inundations, which happen at no other times, and which drive them out of their habitations into the higher countries; in this time they single one another out for the propagation of the species, and even this is a scene of some danger to one sex, for the huntsmen find the way to imitate the courtship of the female, and will by that noise draw severally many males about them, which they shoot as they come in reach. After the time of copulation is over, and the waters are abated, the females return to their old lodgings, and there bring forth and nurse up their young; the males run about the country till winter, and then retire also to the waters for their winter life; but they usually make themselves new lodgings every season. Mem. Acad. Par. 1732.

MUSK-*Seed*, in the materia medica, the name of the seed of the *alcea Ægyptiaca villosa*, or hoary Egyptian vervain mallow. It is a small seed of about the bigness of a pin's-head, of a greyish brown in colour, and of the shape of a kidney, and when it is fresh has a perfumed smell. It is brought into Europe from Ægypt, and from Martinico. The Ægyptians use it internally as a cordial and provocative; but in Europe it is of very little use, we wholly neglect it in medicine; but the perfumers in France and Italy use it among their compositions. *Lemery*'s Dict. des Drog.

MUSKET (*Cycl.*)—MUSKET-*Baskets*, in fortification, baskets of about a foot and a half high, and eight or ten inches diameter at the bottom, and a full foot at the top. They are filled with earth, and set on low parapets or breast-works, or on such as are beaten down, that the musketeers may fire between them at the enemy, and yet be tolerably well secured against their fire.

MUSQUETEERS, *Mousquetaires*, in France, are troopers who fight sometimes on foot, sometimes on horseback; they are gentlemen of good families, and are divided into two troops, the one called the grey *Musqueteers*, because of the colour of their horses; the other the black *Musqueteers*, for the same reason.

MUSSAHIR, in ornithology, a bird mentioned by Arabian writers. It is said, that this creature after having employed the day in seeking its food, spends the whole night in singing; its notes are said to be so melodious, as to banish all thoughts of sleep from them that hear them. *Hofm.* Lex. Univ. in voc.

MUST (*Cycl.*)—MUST *of Rhenish wine*. This is a liquor that, though drank by some, is found extremely to affect the brain; for not having passed the natural effervescence which it would have been subject to, in the making of wine, its salts are locked up till the heat of the stomach setting them to work, they raise their effervescence there, and send up abundance of subtile vapours to the brain. The *Rhenish Must* is of two kinds, being made either with or without boiling. That made without boiling is only put up so close in the vessel, that it cannot work; this is called stumm-wine. That by boiling is thus prepared: they take strong vessels not quite filled, and putting them into a cellar they make a fire mild at first, but increased by degrees; and afterwards they gradually lessen it again, that the boiling may cease of itself. This operation is finished in thirty-six or forty hours, according to the size of the vessel; and the wine-boilers, instead of common candles which would melt by the heat, use thin pieces of split beach-wood. These also serve for a double purpose, not only lighting them, but giving them notice of the boiling being enough; before that time, the quantity of vapours thrown up make them burn dim; but as soon as it is finished, the vapours ascend in less quantity, and the lights burn brisk and clear. About seven or eight days after this boiling, the *Must* begins to work, and after this working it is called wine. They have also another kind of *Rhenish Must*, which is thus prepared: they boil the liquor to half the quantity, and put into it the medicinal ingredients they are most fond of; such as orange-peel, elecampane-root, and juniper-berries, or the like; being thus medicated, the whole works much more slowly, than it otherwise would. If the boiled *Must* by too violent an effervescence cast out its lees, it will on this become vapid and dead, unless this separation is stopped by some fatty substance, such as fresh butter, or the like: They put this in upon a vine-leaf, or else apply lard to the mouth of the vessel. *Portzius*, de Vin. Rhen.

MUSTACEUM, among the antient Romans, a kind of cheese-cake. It was composed of cheese, anniseed, cumin, and suet added to flour, moistened with *mustum*, or new wine. *Pitisc.* in voc. See the article MUST, *Cycl.* and *Suppl.*

MUSTARD, *Sinapi*, in botany. See the article SINAPI.

The common *Mustard* is cultivated in many places, both in gardens and fields, for its seeds. It is propagated by sowing the seeds in spring upon an open place, which has been well dug or ploughed. When the young plants are come up they must be cleared of weeds, and houghed up to about eight or ten inches asunder. They will then grow strong, and when the seeds ripen the whole plant is cut down, and the seeds thrashed out.

But besides this, there is another kind of *Mustard*, commonly known by the name of the white or garden *Mustard*, which is sown for a sallad-herb in spring: the seeds of this are to be sown very thick in drills on a warm border, or a moderate hot bed; they will be fit to cut for sallading in three weeks after the sowing. *Miller*'s Gardener's Dict.

Hedge-MUSTARD, *Erysimum*, in botany. See the article ERYSIMUM.

MUSTARD *Vomits*. The powder of *Mustard*-seed may be made into the consistence of a loch with warm water, in which a little sea-salt has been dissolved. Of this a common spoonful, sometimes two, diluted with tepid water, are given on an empty stomach; it operates well as an emetic, and proves an excellent remedy in most nervous disorders, according to Mr. Monro, in Med. Ess. Edinb. Vol. 2. Art. 19. p. 303. not.

MUSTELA, the *Weasel*, in the Linnæan system of zoology, is a distinct genus of quadrupeds, including the ferret, polecat, martin, ermin, *&c.* The characters of the genus are, that the creatures of it have a considerable number of paps situated on the belly, feet adapted to climbing, and four *dentes molares* or grinders, on each side of the mouth. See Tab. of Quadrupeds, N°. 24. and *Linnæi* Syst. Nat. p. 36.

The *Weasel*, in some parts of England, is called the *foumart*, or *fitchet*. It is a little creature, smaller than the *pole-cat*; its back and sides are reddish, and its throat and belly white, the whiteness reaching perfectly from the angle of the chin to the insertion of the tail: Its head is something like a dog's, the upper jaw reaches beyond the lower, and is ornamented with some bristles by way of whiskers. Its fore-teeth are six in number in each jaw, and are small and set very close together, like the teeth of a comb; those of the under jaw are much smaller than the others; the dog-teeth are long, large, and strong; the eyes are small and black, the ears short and broad, and covered with very thick-set hairs; and, which is a very remarkable circumstance, they are doubled in their lower part. The inner cavity of the ear is very large, and full of tubercles. The feet are small, but broad, and each divided into five toes; the legs are short. The heart and liver are, in dissecting this creature, found remarkably large. *Ray*'s Syn. Quad. p. 195.

MUSTELA *Africana*, in zoology, a name by which Clusius has called an animal, properly of the squirrel kind, and known among others by the name of the Barbary squirrel. *Ray*'s Syn. Quad. p. 218. See the article SCIURUS.

MUSTELA, in ichthyology, the name of a genus of fishes, of which there are several species; the most common of which is that called the *Sea-loche*, or whistle-fish. This resembles the common eel in figure, colour, and slipperyness to the touch; but it is not half so long, in proportion to its thickness; and is something flatter, and has a turgid belly. It is covered with extremely minute scales, and its mouth is large, and furnished with sharp teeth, and has several series of very small teeth in many parts of its mouth. At the angle of the lower jaw it has one beard, and at the upper part of the nostrils in the upper jaw it has two. It has two pair of fins under its belly, and on the back, beside the common fin reaching half the length and almost to the tail, it has at some small distance from the head a cavity in which is a membrane edged with filaments.

The different species of this fish are of three colours; one is not spotted, and of the colour of a tench; another is spotted with white; and the third with reddish black spots; and beside these there are the *Mustela vivipara* of Schonfeldt, commonly known by the name of *Aelquappe*, and the *Mustela fossilis*, called *Peisker*, and the *Eel-pout*. *Willughby*'s Hist. Pisc. p. 121. All which see under their several heads.

MUSTELA *Fluviatilis*, in ichthyology, a name by which ſeveral authors have called the common *lampetra* or *lamprey*. *Bellon.* de Piſc. 1. p. 91. *Geſner*, de Piſc. p. 696.

MUSTELA *Lumpen*, in ichthyology, a name given by Artedi, from Ray and others, to that ſpecies of blennus called ſimply *lumpen* at Antwerp; and by Geſner *galea*.

It is diſtinguiſhed by Artedi from the other blenni, by a ſpecific name expreſſing that it has four bifid cirri or beards growing under the throat, and tranſverſe areolæ or ſtreaks on the back. See the article BLENNUS.

MUSTELA *Marina*, in ichthyology, a name given by Bellonius and others to that fiſh which we call in Engliſh the *ſheat-fiſh*, the *glanus* and *glanis* of Pliny and the old authors.

It is diſtinguiſhed by Artedi by the name of the *ſilurus*, with four beards near the mouth. By this character it is evidently diſtinguiſhed from the fiſh called the *lake*, which, though a genuine ſpecies of ſilurus, has only one beard.

MUSTELINUM *Genus*, in zoology, the name of a claſs of animals, ſo called from their general likeneſs to the weaſel in ſhape; they are all carnivorous animals, and are diſtinguiſhed from the other quadrupeds of that ſort by their ſmallneſs, the length of their bodies, and the ſmallneſs and narrowneſs of their heads. Their feet are ſmall, and their legs ſhort, whence they are calculated for running into holes and crannies; their teeth are leſs numerous than in many quadrupeds; in the dog kind there are forty, and in theſe but thirty-two. Their inteſtines are ſhort and ſimple; they have no colon nor cæcum, nor any diſtinction of great and ſmall guts. *Ray*'s Syn. Quad. p. 195.

MUSTELUS, in ichthyology, a name given by Gaza and ſome other writers, to the fiſh called *galeus aſterias*, and *ſtellatus* by modern authors. This only accidentally differs from the common *galeus lævis*, the ſmooth or unprickly hound. Both are accounted the ſame ſpecies by Artedi, and are expreſſed by the ſame name, the *ſqualus* with obtuſe or granulous teeth. See the article SQUALUS.

MUSTELUS *Lævis*, a name by which Aldrovandus and ſome others have called the fiſh, diſtinguiſhed by others by the name of *galeus lævis*, the ſmooth hound-fiſh. *Aldrov.* de Piſc. p. 393. See the article GALEUS.

MUSTELUS *Lævis*, in zoology, the name of a kind of ſhark, called alſo the *canis galeus*, and *canoſa*. *Willughby*'s Hiſt. Piſc. p. 51. See the article CANIS *Galeus*.

MUSTUS *Fluviatilis*, in ichthyology, a name given by Bellonius to that ſpecies of cyprinus which we know by the name of the barbel. See the article CYPRINUS.

MUSTUS is alſo a word uſed by ſome authors to expreſs the white calx of urine.

MUTABILIS *Lapis*, in natural hiſtory, a name given by ſome to the ſemi-pellucid gem, more commonly called *oculus mundi*. See the article OCULUS *Mundi*.

MUTATIONES, among the Romans, poſt ſtages, or places where the public couriers were ſupplied with freſh horſes.

The *Mutationes* were wholly deſigned for the uſe of theſe couriers, or meſſengers of ſtate; in which reſpect they differed from *manſiones*. See the article MANSIONES.

MUTCHKIN, a liquid meaſure uſed in Scotland; it contains four gills, and is the fourth part of the Scotch pint. See the articles PINT, MEASURE, *&c.*

MUTEFERRIRA, a body of horſe kept up in Egypt, in the ſervice of the Grand Seignior; theſe, with the chaouſes, were originally the guards of the ſultans of Egypt. This is a body of the greateſt dignity, as is expreſſed by the word, which ſignifies a choſen people. *Pocock*'s Egypt, p. 166.

MUTILUS, in natural hiſtory, the name given by ſome to the common muſcle. See the article MYTULUS.

MUTU, in zoology, a name by which ſome call a large Braſilian bird, of the gallinaceous kind, more uſually called *mitu*. *Marggrave*'s Hiſt. Braſ. See the article MITU.

MUZZLE (*Cycl.*)—MUZZLE *of a Gun or Mortar*, the extremity of the cylinder, where the powder and ball is put in. The metal which ſurrounds the extremity of the cylinder, is likewiſe called the *Muzzle*.

MYAGRUM, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of four leaves, and is of the cruciform kind; and the piſtil which ariſes from the cup, becomes finally a fruit of a turbinated form, unicapſular, and containing one oblong ſeed, and having two empty cells at the apex.

The ſpecies of *Myagrum*, enumerated by Mr. Tournefort, are theſe: 1. The broad-leaved ſingle-ſeeded *Myagrum*. And 2. The leſſer ſingle-ſeeded *Myagrum*. *Tourn.* Inſt. p. 211.

MYAGRUS *Deus*, in the antient mythology, a name given to Jupiter on certain occaſions, as when they ſacrificed to him at the olympic games, to drive away the vaſt quantities of flies which uſually infeſted thoſe rites. The word, though it ſtands thus in Pliny, and many of the old authors, is yet falſely printed, for this *Myagrus* ſignifies the mouſe-deſtroyer, not the fly-deſtroyer, which is properly ſignified by *Myiagrus*. V. *Apomyos*, ſupr. and *Myiagrus*, inf.

MYCETITES, in natural hiſtory, the name of a ſpecies of ſea-coral, which is uſually of a conic ſhape and ſtriated texture; always ſmall, and uſually found adhering to ſea-ſhells, or large corals. See the article FUNGITÆ.

MYCETITES *Diſcoides*, in natural hiſtory, a name given by Dr. Woodward to thoſe kinds of foſſile coralloide bodies which the generality of writers had called, after Dr. Plot, *porpitæ*. Theſe are uſually ſmall, and of a roundiſh, but flatted figure. They are hollowed on one ſide with a ſort of umbilicus, and ſtriated on the other. They are found on the ploughed lands in Oxfordſhire, and ſome other of our midland counties, and in other places buried in the ſolid ſtrata of ſtone. They are ſometimes yelloviſh, ſometimes browniſh, and are from the breadth of an inch to a fourth part or leſs of that ſize. When broken, they are uſually found to conſiſt of a kind of ſpar, not unlike that of which the ſhelly coats of the echinitæ, or the lapides indici, and other ſpines of echini conſiſt in their foſſile ſtate. And in ſome of them the ridges and ſtriæ are thick ſet with little knobs and tubercles. The baſis in ſome of theſe is flat, as it is in others riſing in form of a circular elevation from the umbilicus, and others have a circular cavity in the ſame place. See Tab. of Foſſils, Claſſ. 7. *Woodward*, Cat. Foſſ. vol. 1. p. 114.

MYCONOIDE, an epithet uſed by ſome chirurgical writers for ſome ulcers which are found continually filled with a thick mucous matter.

MYDESIS, a word uſed by the antient phyſicians to expreſs a general corruption of any part, from a great redundance of moiſture. Galen has appropriated it to the eye-lids.

MYDRIASIS, a name uſed by authors to expreſs a diſeaſe of the eye, conſiſting in a dilatation of the pupil, and a conſequent dimneſs of ſight.

MYDROS, a word uſed by Hippocrates to expreſs a ball of iron or ſtone, which was uſed to be heated in the fire, and thrown into urine, intended as a fomentation.

MYGBAOTH, in the Jewiſh antiquities, a kind of mitre worn by the prieſts. See the article CIDARIS.

MYGDONIUM *Marmor*, a name given by the antients to a ſpecies of marble much uſed in their larger buildings. It was white, variegated with black; but that black rather diſpoſed in clouds and ſpots than veins. It is confounded with the *docimenum marmor* by ſome writers; but that was always of a pure white, without the leaſt variegation.

MYIAGRUS *Deus*, in the heathen mythology, a name given ſometimes to Jupiter, and ſometimes to Hercules, on occaſion of their being ſacrificed to for the driving away the vaſt numbers of flies which infeſted the ſacrifices on certain public occaſions. The word is generally ſpelt *Myagrus*; but this muſt be an error, as this word does not expreſs the fly-deſtroyer, but the mouſe-deſtroyer; and we have it ſufficiently teſtified by the antients, that flies were the only creatures againſt whom this deity was invoked. Pliny calls this deity alſo *Myiodes*, and tells us, that the flies which uſed to peſter the Olympic rites went away in whole clouds, on the ſacrificing a bull to this god. We find in Athenæus alſo, that this ſacrificing to the god of flies, at the Olympic games, was a conſtant cuſtom. Some diſtinguiſh theſe two deities, and tell us, that the latter, or *Myiodes*, uſed to viſit the nations in vengeance with a vaſt multitude of flies; and that, on paying him the due honours of a ſacrifice, they all went away again; and this ſeems to agree with what Pliny tells us in ſome places. See the article MYIODES.

At the time of the Olympic games, Jupiter was worſhipped under the name of the *Apomyos*, or *Myiagrus Deus*, to ſupplicate the deſtruction of thoſe troubleſome creatures. This happened only once in many years, when the ſacrifices were performed there; but the Elians worſhipped him continually under this name, to deprecate the vengeance of heaven, which uſually ſent, as they expreſſed it, an army of flies, and other inſects, toward the latter end of the ſummer, that infeſted the whole country with ſickneſs and peſtilence.

MYIODES *Deus*, in the heathen mythology, a name given ſometimes to Hercules, but more frequently to Jupiter, to whom a bull was ſacrificed, in order to make him propitious in driving away the flies that infeſted the Olympic games. See the article MYIAGRUS *Deus*, ſupra.

MYLASSENSE *Marmar*, in the works of the antients, a name uſed for a ſpecies of marble, dug near a city of that name in Caria. It was of a black colour, but with an admixture of purple; the purple not diſpoſed in veins, but diffuſed through the whole maſs. It was much uſed in building among the Romans.

MYLE, a word uſed by ſome authors as a name for the *patella* or *limpit*, and by others to expreſs what we call a mole, or falſe conception in the uterus.

MYLO-HYOIDÆUS, a broad thin penniform muſcle, ſituated tranſverſely between the internal lateral parts of the baſis of the lower jaw, and lying on the anterior portions of the two digaſtric muſcles. It is made up of two equal fleſhy portions, one lying on the right ſide, the other on the left, both on the ſame plane, and joined to a ſmall middle tendon, which is inſerted anteriorly in the middle of the baſis of the os hyoides, and from thence runs directly forward, diminiſhing gradually in its courſe. This is therefore a true digaſtric muſcle, and cannot be divided into two. Each portion is fixed by

by fleſhy fibres to the internal lateral part of the lower jaw, between the oblique prominent line and the baſis under the firſt four *dentes molares* and the *caninus*; the anterior and greateſt part of the other fibres of each portion run obliquely from before, backward to the middle tendon, in which they are regularly fixed, the anterior fibres being the ſhorteſt, and a ſmall triangular void ſpace being formed between them and the ſymphyſis of the chin. The poſterior fibres of each portion, which make about a fourth part of the whole, run likewiſe on each ſide of the os hyoides, and are inſerted along the lower edge of its anterior or convex ſide, and from thence a little upward. *Winſlow*'s Anatomy, p. 254.

It has its name from the os hyoides, and the Greek μύλη, the dentes molares.

MYLON, in ſurgery, is uſed for the largeſt tumours of the ſtaphylomatous kind in the cornea and uvea of the eyes. *Heiſter*'s Surgery, p. 423. See the article STAPHYLOMA.

MYOCEPHALUS, a name given by ſome authors to the diſtemperature of the eyes, commonly known by the name of a ſtaphyloma. *Heiſter*'s Surgery, p. 423.

MYODES *Platyſma*, a name given by ſome anatomical writers to what is called by others the quadratus genæ; it is a muſcular expanſion in the neck.

MYOPARO, among the Romans, a kind of ſhip, which partly reſembled a merchant-ſhip, and partly a ſhip of war, and was that which pirates moſtly uſed. *Pitiſc.* in voc.

MYOPIA. See the article SHORT-SIGHTEDNESS.

MYOPS, *Fly-eyed*, a word uſed to expreſs a perſon who is ſhort-ſighted or pore-blind.

MYOPS, in natural hiſtory, the *Ox Fly*, an inſect uſually confounded with the breeze fly, but really differing very much from it. This is common in woods and about path-ways, and never fixes on any other creatures except oxen. It has a long and ſomewhat flat body, and is of a blackiſh grey in colour.

MYOSOTIS, *Mouſe-Ear*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the roſaceous kind, conſiſting of ſeveral leaves ranged in a circular order. The piſtil, which ariſes from the cup, becomes at length a ſeed-veſſel, of the ſhape of a bull's horn, open at the end, and containing ſmall roundiſh ſeeds affixed to a placenta.

The ſpecies of *Myoſotis*, enumerated by Mr. Tournefort, are theſe: 1. The broad-leaved Alpine *Myoſotis*. 2. The woolly *Myoſotis*, with broad leaves, reſembling thoſe of toad-flax. 3. The woolly *Myoſotis*, with narrower toad-flax leaves. 4. The hoary creeping *Myoſotis*. 5. The Spaniſh corn *Myoſotis*. 6. The hairy field *Myoſotis*, with large flowers. 7. The hairy field *Myoſotis* with ſmall flowers. 8. The clammy and hairy field *Myoſotis*. 9. The ſmaller hairy *Myoſotis*. 10. The knot-graſs-leaved field *Myoſotis*. 11. The narrow-leaved woolly and viſcous Alpine *Myoſotis*. 12. The low myrtle-leaved Alpine *Myoſotis*. 13. The *Myoſotis* with very fine ridged leaves. 14. The large-flowered Portugal *Myoſotis*, with toad-flax leaves. *Tourn.* Inſt. p. 244.

In the Linnæan ſyſtem of botany, the characters of the *Myoſotis* are theſe: The cup is an oblong erect perianthium, ſlightly divided into five ſegments at the extremity, and remaining when the flower is fallen. The flower is compoſed of only one petal, in form of a cylindric tube, ſhort, and ſlightly divided into five at the extremity; the jags being rimmed round, and obtuſe; and the opening of the flower cloſed by five convex prominent ſcales. The ſtamina are five very ſhort filaments, placed in the neck of the tube. The antheræ are ſmall, and covered. The piſtil has four germina. The ſtyle is ſlender, and of the length of the tube of the flower. The ſtigma is obtuſe. The cup remains, and holds four oval ſeeds. *Linnæi* Gen. Plant. p. 56.

MYRACOPON, a name uſed by ſome authors for an ointment intended to be uſed to the whole body to prevent laſſitude. It is deſcribed by Galen.

MYRICA, in botany, a name by which ſome authors call the plant tamariſk. *Chabræus*, p. 75.

MYRINX, a word uſed by ſome to expreſs the membrane of the tympanum in the ear.

MYRIOPHYLLUM, in botany, the name of a genus of plants, called by others, *pentapterophyllum*. The characters are theſe: It produces both male and female flowers diſtinct on the ſame plant. In the male flower the perianthium is compoſed of four oblong and erect leaves; the exterior one being large, the interior one much ſmaller. There is no corolla. The ſtamina are eight capillary filaments, which are longer than the cup. Theſe are of a looſe flaccid ſtructure. The antheræ are oblong. The female flowers always ſtand below the male. The perianthium is divided into a number of ſegments. The piſtil has four germina of an oblong figure. There are no ſtyles; but the ſtigmata are hoary. The ſeeds are placed four together, and are of an oblong figure. *Linnæi* Gen. Plant. p. 459. *Ponteder.* Anth. 18. *Vaillant*, Act. Germ. 1719. *Dillen.* Gen. 7.

MYRMECIAS *Lapis*, the *Wart Stone*, a name given by ſome authors to a ſtone covered on the ſurface with wart-like excreſcences. It is a name of a very vague ſignification, ſome of the ſtones called by it being mere flints, and others owing their protuberances to coralloide bodies, the wires of aſteriæ, or other of the extraneous foſſils contained in them, and ſo lodged, that their ends juſt ſtand out.

MYRMECITES, in natural hiſtory, a name given by ſome authors to a ſmall ſtone, with ſome imaginary reſemblance of an ant in its ſhape. Others have alſo made it the name of ſuch pieces of amber as contain an ant, or the legs, wings, or other fragment or remains of that little animal.

MYRMECOPHAGA, the *Ant-Eater*, the name given by Linnæus to the creature called by others, the *tamandua-guacu*, or ant-bear.

The name is derived from the Greek μυρμηξ, an ant, and φαγω, to eat. The creature is ſo called becauſe his food is ants, which he eats by thruſting his long tongue into their neſts, and drawing it back into his mouth when covered with them.

This, in the Linnæan ſyſtem of zoology, is a diſtinct genus of animals, the characters of which are, that they have no teeth; have feet formed not for climbing, but walking, and have eight abdominal paps, ſix on the belly, and two on the breaſt. *Linnæi* Syſt. Nat. p. 34.

MYRMILLO, among the Romans, a kind of gallic armour uſed in theatrical ſhews. But ſome will have it to be the ſame that Achilles's *myrmidones* wore; whence it had this name. *Pitiſc.* in voc.

MYROBALANS (*Cycl.*)—It is very evident from the writings of the antient Greeks, that what we at this time call the *Myrobalan* was not known to them under that name, and perhaps what they called ſo is not known to us at this time; our *Myrobalans* being a ſort of plums, and theirs being a dry fruit, rather of the nut-kind, and uſed in perfumed unguents, and other compoſitions of that kind, to give them a ſcent. This variation from the original ſenſe of the word is not new, however, and the authors who began it are ſo far back, that it ſeems to have been an error of as old a date as any of this kind.

MYROBATINDUM, in botany, a name given by Vaillant to a genus of plants, which, with the *camara* of Plumier, and and the *pſeudoviburnum* of Rivinus, is included by Linnæus under one general character, by the name *lantana*. *Vaillant*, Act. Germ. 1722. See the article LANTANA.

MYRRH (*Cycl.*)—It is an apophthegm of chemiſts, derived from Van Helmont, that whoever can make *Myrrh* ſoluble by the human body, has the ſecret of prolonging his days. And Boerhaave owns there ſeems to be truth in this from its reſiſting putrefaction. He himſelf, and other chemiſts before him, have given methods for making ſolutions of *Myrrh*, but only by means of alcohol. It ſeems not a little ſurprizing that ſuch great chemiſts ſhould never find out that *Myrrh* is ſoluble in common water. *Pemberton*, Lond. Diſp.

MYRRHINA *Vaſa*, in antiquity. See the articles MURRINE, and MORRHINA.

MYRRHIS, in botany, the name of a genus of umbelliferous plants, the characters of which are theſe: The flower is of the roſaceous kind, compoſed of ſeveral unequal petals, which are arranged in a circular order, on a cup which afterwards becomes a fruit, compoſed of two long ſeeds, reſembling the beak of a bird, which are ſtriated and gibboſe on one ſide, and ſmooth and plain on the other.

The ſpecies of *Myrrhis*, enumerated by Mr. Tournefort, are theſe: 1. The greater *Myrrhis*, or ſweet cicutaria. 2. The annual *Myrrhis*, with ſmooth ſtriated ſeeds. 3. The little white-flowered perennial *Myrrhis*, with hairy leaves, and gold-coloured ſeeds. 4. The yellow perennial *Myrrhis* with daucus leaves. 5. The tuberous or knotty *Myrrhis*. 6. The hoary annual *Myrrhis*, with ſtriated hairy ſeeds. 7. The broad-leaved white flowered marſh *Myrrhis*. 8. The broad-leaved red-flowered marſh *Myrrhis*. 9. The long-ſeeded daucus-like mountain *Myrrhis*. 10. The hairy-ſeeded annual Portugal *Myrrhis*, with parſnep leaves. 11. The trifoliate Canada *Myrrhis*, looking like angelica, and called by ſome the trifoliate American angelica. *Tourn.* Inſt. p. 315.

The ſeeds of the common ſweet cicely, or wild chervil, are a very powerful diuretic and promoter of the menſes. They are good in jaundices, and beginning dropſies, and in the gravel and ſtone.

MYRRHITES *Lapis*, in natural hiſtory, a name uſed by many of the antient authors for a ſemi-pellucid ſtone of the nature of the agates; and ſeeming to have been the yellow cornelian of the moderns.

MYRTIDANON, a word uſed by the old Greek writers on medicine, but in a different ſenſe by different authors.

Hippocrates calls it a round fruit, which the Perſians in his time called pepper, and which probably had all the heating qualities of that fruit. Dioſcorides expreſſes it by an excreſcence common on the trunk of the myrtle, and which, as he obſerves, is more aſtringent than the myrtle itſelf. *Myrtidanum vinum* alſo ſignified wine impregnated with myrtle.

MYRTIFORMIS *Naſi*, (*Cycl.*) in anatomy, a name given by Santorini, and ſome others, to one of the muſcles of the face, called by Albinus, *depreſſor alæ naſi*, and by Cowper and others, *depreſſor labii ſuperioris*, *conſtrictor alæ naſi*.

MYRTITES, the name of a compoſition in the antient pharmacy, made of fine honey, and the depurated juice of myrtle berries boiled up together to a conſiſtence.

MYRTLE, *Myrtus*, in botany. See the articles MYRTUS, *infra*, and MYRTLE, *Cycl.*

There are ſeveral ſpecies of this plant preſerved in our gardens; they are all eaſily propagated from cuttings. The beſt ſeaſon for this is July; and the ſtraiteſt and youngeſt vigorous ſhoots are to be choſen. Theſe ſhould be cut off about eight inches long, and the leaves of the lower part ſtripped off to two inches high, and that part of the ſtalk twiſted which is to be placed in the ground; they are to be planted in pots of light rich earth, at about two inches diſtance from each other, obſerving to cloſe the earth very well about them, and give them a gentle watering. They are then to be removed into a moderate hot-bed, and ſhaded and watered once in two or three days till they have taken root. In about a month's time they will be rooted, and will begin to ſhoot, and muſt then be inured by degrees, to the air; and in Auguſt they ſhould be removed into the open air, but placed in a warm ſituation, and ſheltered from the winds; they ſhould ſtand here till October, and then be removed into a green-houſe, where they ſhould be placed ſo as to have as much air as poſſible. In the March following they ſhould be removed into ſeparate pots of rich earth, and in May ſet out to the open air in a warm and well defended place. They will require in the ſummer frequent waterings, and the dead leaves ſhould be carefully picked off. As they advance in growth, they are to be ſhifted at times into pots of a larger ſize; and this ſhould be done either in April or in Auguſt; and toward the end of October, they ſhould always be removed into the green-houſe.

MYRTILLUS, in botany, a name by which ſome authors have called the black whortle berries. The *vitis idæa anguloſa* of other authors. *Dale*, Pharm. p. 294.

MYRTOCHEILIDES, a name given by ſome authors to the nymphæ in the female pudenda.

MYRTUS, the *Myrtle*, in botany, the name of a genus of trees, the characters of which are theſe: The flower is of the roſaceous kind, and is compoſed of ſeveral petals arranged in a circular form. The cup finally becomes a fruit or berry of the ſhape of an olive, coronated at the end, divided into three cells, and containing kidney-ſhaped ſeeds.

The ſpecies of *Myrtle*, enumerated by Mr. Tournefort, are theſe: 1. The broad-leaved Roman *Myrtle*. 2. The broad-leaved Bœtic *Myrtle*, or the bay-leaved *Myrtle*. 3. The bay-leaved *Myrtles*, with leaves growing in cluſters. 4. The broad-leaved Belgic *Myrtle*. 5. The common Italian *Myrtle*. 6. The common Italian *Myrtle* with white berries. 7. The narrow-leaved Bœtic *Myrtle*. 8. The wild *Myrtle* with very ſharp-pointed leaves. 9. The *Myrtle* with very ſmall ſharp-pointed leaves. 10. The common ſmall *Myrtle*. 11. The common ſmall *Myrtle*, with leaves variegated with yellow. 12. The broad-leaved white-berried Spaniſh *Myrtle*. *Tourn.* Inſt. p. 640.

Myrtle-berries are eſteemed cooling and aſtringent. They are recommended in gonorrhœas, diarrhœas, dyſenteries, and hæmorrhages of all kinds; but ſeldom uſed by the faculty.

MYRTUS *Sylveſtris*, the *wild Myrtle*, in botany, a name given by ſome authors to the *ruſcus*, or butcher's broom, from ſome faint reſemblance of its leaves to thoſe of the *Myrtle*. *Ger.* Emac. Ind. 2. See the article RUSCUS.

MYRUS, in zoology, a kind of ſea-ſerpent, a fiſh of the eel claſs, ſuppoſed by ſome to be the male muræna, but erroneouſly. Its ſnout is very long and ſharp-pointed; its body black, ſlender, and round, without ſcales, and free from ſpots. The cavity for the gills is only one on each ſide. Near the neck there are ſome ſmall yellow dots to be ſeen, while the creature is alive; but theſe are ſcarce viſible after it is dead. Its fleſh is tender and delicate. *Rondelet.* de Piſc. vol. 1. p. 340.

MYS, in ichthyology, a name given by Ælian, Appian, and many others, to the fiſh called *capriſcus* by the later writers; the *capros* and *chærus* of others of the antients. See the article GOAT-*Fiſh*.

MYSIA, Μυσια, in antiquity, a feſtival in honour of Ceres. For the origin and ceremonies obſerved in it, ſee *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 415.

MYSTERY (*Cycl.*)—Mathematicians have been accuſed of introducing *myſteries* into geometry, which ought to have none. See the Analiſt; and Mr. *Maclaurin*'s Fluxions in the Introduction, and in other places. See alſo the article PARADOX.

MYSTOCEROS, in ichthyology, a name given by Geſner and ſome others to that ſpecies of the ſilurus which we call the ſheat-fiſh. It is the glanus of Pliny, and the reſt of the old authors; the ſilurus of Rondeletius and others. It is diſtinguiſhed by Artedi by the name of the ſilurus with four beards under the chin. It is plainly to be known from the fiſh called the *lake*, by this character; that having only one beard, it is a genuine ſpecies of ſilurus. See the article SILURUS.

MYSTRUM, among the antients, a liquid meaſure, which was the fourth part of the cyathus.

It weighed about two drams and an half of oil; and of water or wine, two drams two ſcruples. It was much about our ſmall ſpoonful. *Danet.* and *Pitiſc.* in voc.

MYSTUS *Fluviatilis*, in zoology, a name by which ſome writers, particularly Bellonius, have called the common *barbel*. *Willughby*, Hiſt. Piſc. p. 259. See the article BARBUS.

MYSTUS *Marinus*, the *Sea Barbel*, the name of a fiſh caught in the Adriatic, and common in the markets of Venice.

It is of an oblong figure, and in colour of a ſilvery white, variegated on each ſide with ten obliquely tranſverſe black lines. Its belly is very white. Its tail is forked, and its head long. Its back fin has part of its rays prickly, part ſoft to the touch. Its eyes are not large, and their iriſes are yellow. Its lips are prominent, thick, and ſoft, and only ſerrated in the place of teeth; but in the hinder part of its mouth it has ſeveral rows of ſhort and large *molares* or grinders. Its ſcales are large, and adhere firmly to the fleſh. It is a very well taſted fiſh. *Geſner*, de Piſc. p. 144.

MYSTUS *Niloticus*, in zoology, a name given by Bellonius to a fiſh of the barbel kind, caught in the Nile. Its body is thick and ſhort, and its belly very broad. It grows to ſo large a ſize as to weigh twenty pounds. Probably this may be no other than the common barbel growing to a larger ſize, as we ſee many fiſh will in ſome places more than others. *Bellonius*, de Piſc.

MYTACISM, Μυταχισμος, in rhetoric, the too frequent repetition of the letter M, thus *mammam ipſam amo, quaſi meam animam*. *Voſſ.* Rhet. l. 4. p. 46.

MYTIS, a name uſed by ſome writers to expreſs the black juice found in the mouth of the ſepia or cuttle-fiſh, with which it colours the water when in danger of being taken, and by this means often makes its eſcape. It is alſo uſed by Hippocrates as the name of a ſea-fiſh different from the ſepia.

MYTTOTON, a word uſed by the antients to expreſs a mixt ſort of country food, made of garlic, onions, eggs, cheeſe, oil, and vinegar. It was much eaten by the labouring people among the antients, and accounted a very wholeſome diſh.

MYTULUS, the *Muſcle*, in natural hiſtory, the name of a genus of ſhell-fiſh, the characters of which are theſe: It is a bivalve ſhell, of an oblong form, ending in a point, and having its two extremities equal. It is ſometimes ſmooth, ſometimes rough. In ſome ſpecies flat; in others elate; and in ſome has the beak elate. The *Tellina* and *Pinna marina*, of each of which there are ſeveral ſpecies, are properly of this genus.

The three words of *Mytulus*, *Muſculus*, and *Tellina*, may however be made of great uſe in the ſubdiſtinctions of the genus into certain ſeries.

In this ſenſe the word *Mytulus* may expreſs all the large *Muſcles*, ſuch as the *pinna marina*, and other *Muſcles*, which are remarkably much elevated in their ſhape, and have pointed beaks. The word *Muſculus* may be uſed to ſignify ſuch *Muſcles* as are ſmaller and more flat; and *Tellina* to expreſs, as it uſually does with authors, a bivalve ſhell of the *Muſcle* kind, but thinner and tenderer, and of an oblong figure, but not pointed.

The hinge of theſe ſhells is not in the center of the ſhells, but toward one end, and they have uſually a kind of little beak at that part.

The *Tellinæ* are attached to the ſhell by two ligaments; the *Muſcles* only by one.

The largeſt kind of *Mytulus* we know, is the *Pinna marina*; of which ſhell we have three kinds, one larger than the reſt, which is red within; this often produces pearls, but they are nearly of the ſame reddiſh colour with the lining of the ſhell. There have been found ſhells of this ſpecies ſo large as that the pair have weighed fifteen pounds. The ſmall *Pinna*, and the rough echinated *Pinna*, have their ſhells thicker near the edge where they open, than at the cardo. Theſe *Pinnæ marinæ* have a ſort of filaments iſſuing from the body of the fiſh, and faſtening it to ſtones, or any other ſubſtances. This the antients called *byſſus*, and wrought it into gloves and other things of that kind; and in ſome places it is to this day put to the ſame uſe. The common *Muſcles* have the ſame property of forming theſe threads; and Liſter has thence called them *ſetiferæ*. The ſilk of theſe common *Muſcles* is greatly inferior to that of the *Pinna marina* in fineneſs and beauty. The *Muſcles* hold themſelves in the ſame place, by means of their threads. The *Pinna marina* ſticks its ſharp end into the mud or ſand, and all the reſt of the ſhell remains at liberty to open in the water. Its filaments, which are propagated from the middle of its body, ſerve to draw up the mud and ſand about it, on occaſion, to defend it againſt the motion of the water in tempeſts.

The ſpecies of *Muſcles*, known at preſent, are theſe: Of the flat kind, which terminate in a point at one end, we have the following: 1. The great ſtriated magellanic *Muſcle*. 2. The ſmaller ſtriated magellanic *Muſcle*. 3. The ſmaller variegated magellanic *Muſcle*. 4. The ſmooth *Muſcle*. 5. The mouſe-throat *Muſcle*. 6. The date *Muſcle*. 7. The large rough *Muſcle*; this is commonly found covered with balani or center-ſhells. 8. The ſmaller rough *Muſcle*; this is frequently found covered with ſea-worms. 9. The blue *Muſcle*, ſtriated near the bottom; this is a very rare ſhell. 10. The roſe-coloured

loured variegated *Muſcle*. 11. The grey ſtriated *Muſcle*. 12. The great Newfoundland *Muſcle*. 13. The great Canada *Muſcle*.

Of thoſe uſually known in cabinets, under the name of *Pinnæ marinæ*, we have the following: 1. The common great *pinna*, variegated with grey and red. 2. The ſmaller whitiſh aculeated *Pinna marina*. 3. The ſmall reddiſh aculeated *Pinna*. 4. The *Pinna* of the ſhape of a ham, commonly called the *ham Pinna*. 5. The larger ſpinning *Pinna*, called the *ſilk Pinna*, becauſe of the great quantity of ſilk which it ſpins. 6. The ſmaller *Pinna marina*, called *Pinna tridacna* by Rondeletius. 7. The *Pinnophylax*; this is a large ſpecies, ſo called by Rumphius, from its often affording a lodging to a ſmall crab. 8. The duck-bill *Pinna*.

Of thoſe *Mytuli*, which are of a more elate figure and equilateral, we have the following: 1. The white tender *Muſcle*; this, when poliſhed, is kept in cabinets under the name of the ſilver ſhell. 2. The black *Pholas Muſcle*. 3. The yellow *Pholas Muſcle*. 4. The light and thin *Muſcle*, open in every part with a trunk. 5. The leſs open *Muſcle*, with a trunk. 6. The duſky-coloured *Muſcle*, from the iſle of Papous; this, when its outer coat is poliſhed off, makes a very beautiful figure, and is found to be liniated within the ſhell with brown and bluiſh faſciæ, and in this ſtate is a remarkably elegant ſhell. See Tab. of Shells, N°. 19.

Of the *Tellinæ*, which are oblong and flat ſhells with equal extremities, we have the following ſpecies: 1. The violet-coloured *Tellina*. 2. The violet *Tellina*, with four white zones. 3. The ſmooth *Tellina*, elegantly variegated with pale red and white faſciæ. 4. The hairy *Tellina*, of the Mediterranean ſea. 5. The larger hairy *Tellina*, of the ocean. 6. The Canada *Tellina*. 7. The *Tellina* of the Azores iſlands. 8. The great Newfoundland *Tellina*. 9. The ſmall Canada *Tellina*. 10. The Saint Savinian *Tellina*. This laſt is often found poliſhed in our cabinets, and then is very elegantly variegated with roſe-colour and a ſilvery white. Theſe are all the known *Tellinæ*, with equal extremities.

But of thoſe which have the two ends unlike, we have the following ſpecies: 1. The reddiſh-beaked *Tellina*, reſembling a ſurgeon's forceps. 2. The yellowiſh forceps *Tellina*. 3. The *Tellina* of the ſhape of a knife. 4. The long-beaked *Tellina*. 5. The rough *Tellina*, called the cat's-tongue *Tellina*. 6. The faſciated and radiated roſe-coloured *Tellina*. 7. The orange-coloured *Tellina*, doubled on one ſide, and dentated at the edge. 8. The leaf *Tellina*; this greatly reſembles the leaf of a tree. 9. The white granulated *Tellina*. 10. The reddiſh tranſverſely ſtriated *Tellina*. 11. The flatted and truncated *Tellina*. 12. The violet *Tellina*, with a ſtriated apex. 13. The yellowiſh *Tellina*, with a ſtriated apex. 14. The reddiſh *Tellina*; this is an elegant ſhell, though little variegated. Hiſt. Nat. Eclair. p. 326.

The common ſea *Muſcle* has, from its being always found faſtened to the rocks, been ſuppoſed by many wholly incapable of progreſſive motion; but this is an erroneous opinion. It is a common practice in France at ſuch ſeaſons of the year as do not afford ſun enough to make ſalt, to throw the common ſea *Muſcles*, which the fiſhermen catch about the coaſts, into the brine-pits. They have an opinion that this renders their fleſh the more tender and delicate, as the rain which falls at theſe ſeaſons makes the water of the pits much leſs ſalt than the common ſea-water. The *Muſcles* are on this occaſion thrown careleſsly in, in ſeveral different parts of the pits; yet, at whatever diſtances they have been thrown in, the fiſhermen when they go to take them out, always find them in a cluſter together; and as there is no current of water in theſe places, nor any other power of motion which can have brought the *Muſcles* together, it ſeems very evident that they muſt voluntarily have marched from the places where they were at firſt, to have met thus together. This progreſſive motion is wholly performed by means of what we call the tongue of the *Muſcle*, from its ſhape; but, from its uſe in this caſe, appears rather to merit the name of a leg, or an arm, as by laying hold of any diſtant ſubſtance, and then forcibly contracting itſelf again, it draws along the whole body of the fiſh; the ſame part, when it has moved the animal to a proper place, ſerves alſo to fix it there, being the organ by which it ſpins the threads which we call its beard, by which it is held to a rock, or to another *Muſcle*. The motion of the *Muſcle*, by means of this part, is juſt the ſame with that of a man laid flat on his belly, who would draw himſelf along by laying hold of any thing with one hand, and then drawing himſelf to it. Mem. Acad. Par. 1710.

Muſcles are well known to have a power of faſtening themſelves very firmly either to ſtones, or to one another's ſhells, in a very ſtrong and firm manner; but the method of doing this was not well underſtood, till the obſervations of the accurate Mr. Reaumur explained it.

Every one who opens and examines a common *Muſcle* will find, that in the middle of the fiſh there is placed a little blackiſh or browniſh body reſembling a tongue; this in large *Muſcles* is near half an inch long, and a little more than a ſixth of an inch in breadth, and is narrower at the origin than at the extremity; from the root of this tongue, or that part of it which is faſtened to the body of the fiſh, there are produced a great number of threads, which when fixed to any ſolid ſubſtance hold the *Muſcle* firmly in its place: Theſe threads are uſually from an inch to two inches in length, and in thickneſs from that of a hair to that of a hog's briſtle. They iſſue out of the ſhell in that part where it naturally opens, and fix themſelves to any thing that lies in their way, to ſtones, to fragments of ſhells, or, which is the moſt common caſe, to the ſhells of other *Muſcles*; whence it happens that there are uſually ſuch large parcels of *Muſcles* found together. Theſe threads are expanded on every ſide, and are uſually very numerous, an hundred and fifty having been found iſſuing from one ſhell; they ſerve the office of ſo many cables, and each pulling in its proper direction, they keep the *Muſcle* fixed againſt any force that can be offered from whatever part it come. The filaments are well known to all who eat *Muſcles*, who ever carefully ſeparate them under the name of the beard; and Mr. Reaumur has found, that while the animal is living in the ſea, if they are all torn away by any accident the creature has a power of ſubſtituting others in their room: He found that if a quantity of *Muſcles* were detached from one another and put into a veſſel of any kind, and in that plunged into the ſea, they in a little time there faſtened themſelves both to the ſides of the veſſel and to one another's ſhells; the extremity of each thread ſeemed in this caſe to ſerve in the manner of a hand to ſeize upon any thing that it would fix to, and the other part which was ſlenderer and ſmaller to do the office of an arm in conducting it.

To know the manner of the *Muſcle*'s performing this operation, this diligent obſerver put ſome *Muſcles* into a veſſel in his chamber, and covered them with ſea-water; he there ſaw that they ſoon began to open their ſhells, and each put forth that little body before deſcribed by its reſemblance to a tongue, and at the root of which theſe threads grow; they extended and ſhortned this part ſeveral times, and thruſt it out every way, often giving it not leſs than two inches in length, and trying before, behind, and on every ſide with it, what were the proper places to fix their threads at: At the end of theſe trials they let it remain fixed for ſome time on the ſpot which they choſe for that purpoſe, and then drawing it back into the ſhell with great quickneſs, it was eaſy to ſee that they were then faſtened by one of theſe threads to the ſpot where it had before touched and remained fixed for a few minutes; and in repeating this workmanſhip the threads are increaſed in number one at every time, and being fixed in different places they ſuſtain the fiſh at reſt againſt any common force.

The ſeveral threads were found to be very different from one another, the new formed ones being ever whiter, more gloſſy, and more tranſparent than the others; and it appeared on a cloſe examination, that it was not as might have been moſt naturally ſuppoſed, the office of the tongue to convey the old threads one by one to the new places where they were now to be fixed, but that theſe in reality were now become uſeleſs; and that every thread we ſee now formed, is a new one made at this time; and in fine, that nature has given to ſome ſea-fiſhes, as well as to many land-inſects, a power of ſpinning theſe threads for their neceſſary uſes. And that *Muſcles* and the like fiſh are under water, what caterpillars and ſpiders are at land. To be well aſſured of this, however, Mr. Reaumur cut off all the beard or old threads of a *Muſcle* as cloſe as he could, without injuring the part, and the proof of the opinion of their ſpinning new ones at pleaſure was now brought to this eaſy trial, whether theſe *Muſcles* ſo deprived of their old ones could fix themſelves as ſoon as others which were poſſeſſed of theirs, and could throw out their threads to as conſiderable diſtances. The experiment proved the truth of the conjecture, for thoſe whoſe beards or old threads were cut off, fixed themſelves as ſoon as thoſe in which they were left, and ſpread their threads to as great a diſtance every way.

When the mechaniſm of this manufacture was thus far underſtood, it became a natural deſire to enquire into the nature of the part by which it was performed: This has hitherto been mentioned under the name of the tongue, from its ſhape; but it is truly the arm of the fiſh, and whenever it happens to be looſened from its company, or fixed in a wrong place, it ſerves the animal to drag its whole body ſhell and all along, and to perform its ſeveral motions. It fixes itſelf to ſome ſolid body, and then ſtrongly contracting its length, the whole fiſh muſt neceſſarily follow it, and be pulled toward the place where it is fixed. This is an uſe however that this part is ſo rarely put to, that it is not properly to be eſteemed a leg or an arm, for this; but, according to its more frequent employment, may much better be denominated the organ by which the threads are ſpun.

Though this body is flat in the manner of a tongue for the greater part of its length, it is however rounded or cylindric about the baſe or inſertion, and it is much ſmaller there than in any other part; there are ſeveral muſcular ligaments faſtned to it about the root or baſe, which hold it firmly againſt the middle of the back of the ſhell; of theſe ligaments there are four, which are particularly obſervable, and which ſerve to move the body in any direction. There runs all along this body a ſlit or crack, which pierces very deeply into its ſubſtance,

ſtance, and divides it as it were into two longitudinal ſections; this is properly a canal, and along this is thrown the liquor which ſerves to form the threads; and it is in this canal or ſlit that theſe threads are moulded into their form. Externally, this appears only a ſmall crack or ſlit, becauſe the two fleſhy ſections of the parts almoſt meet and cover it, but it is rounded and deep within, and is ſurrounded with circular fibres. This canal is carried regularly on from the tip of the tongue, as it is called, to its baſe, where it becomes cylindric; the cylinder in this part being no other than a cloſe tube or pipe, in which this open canal terminates. The cylindric tube contains a round oblong body, of the nature of the threads, except that it is much larger; and from the extremity of this all the threads are produced, this ſerving as a great cable to which all the other little cordages diſperſed towards different parts, are fixed. The tube or pipe in which this large thread is lodged, ſeems the reſervoir of the liquor of which the other threads are formed; all its internal ſurface being furniſhed with glands for its ſecretion. Mem. Acad. Par. 1711.

The *Muſcle*, like many other ſea-fiſhes, abounds in this liquor; and if at any time one touch with a finger the baſe of this ſpinning organ, one draws away with it a viſcous liquor in form of ſeveral threads, like thoſe of the caterpillar, ſpider, and the other ſpinning land-animals. The threads fix themſelves with equal eaſe to the moſt ſmooth and gloſſy, as to rougher bodies; if the *Muſcles* are kept in glaſs-jars of ſea-water, they as firmly faſten themſelves to the glaſs as to any other body.

Muſcles, be they ever ſo young, have this property of ſpinning; and by this means they faſten themſelves in vaſt numbers to any thing which they find in the ſea. Mr. Reaumur has ſeen them when as ſmall as millet-ſeeds, ſpin plentifully, though their threads proportioned to their own weight, are much finer and ſmaller than thoſe of larger *Muſcles*.

It is a queſtion yet undetermined whether the *Muſcle* has a power of breaking, or otherwiſe getting rid of its threads, in order to its removing from the place where it is once fixed; but it appears probable that they have not, and that they muſt remain where they have once faſtened themſelves, though their deſtruction be the conſequence of it. Mr. Reaumur tried this experiment in his jars, when they had well fixed themſelves to the ſides of them, he poured off part of the ſalt-water, ſo that it became the intereſt of the fiſh to leave their hold and go lower down, but they ſeemed to have no power to effect this. Mem. Acad. Par. 1711.

The common *Muſcle* affords the curious obſerver a very pleaſing object of examination by the microſcope. The tranſparent membrane, which immediately appears on opening the ſhell, ſhews the circulation of the blood for a long time together through an amazing number of veſſels. And Mr. Lewenhoek, in ſeveral which he diſſected, diſcovered numbers of eggs or embryo *Muſcles* in the ovarium, appearing as plainly as if he had ſeen them by the naked eye, and all lying with their ſharp ends faſtened to the ſtring of veſſels by which they received nouriſhment. The minute eggs, or embryos, are by the parent placed in due order, and in a very cloſe arrangement on the outſide of the ſhell, where by means of a gluey matter they adhere very faſt, and continually increaſe in ſize and ſtrength, till becoming perfect *Muſcles* they fall off and ſhift for themſelves, leaving the holes where they were placed behind them. *Baker*'s Microſcope, p. 242.

This abundance of *Muſcle* ſhells very plainly ſhew when examined by the microſcope, and ſometimes they are in the number of two or three thouſand on one ſhell; but it is not certain that theſe have been all fixed there by the *Muſcle* within; for theſe fiſh uſually lying in great numbers near one another the embryos of one are often affixed to the ſhell of another. The fringed edge of the *Muſcle*, which Mr. Lewenhoek calls the beard, has in every the minuteſt part of it ſuch variety of motions as is unconcievable; for being compoſed of longiſh fibres, each fibre has on both ſides a vaſt many moving particles. *Lewenhoek*'s Arcan. Nat.

MYUTES *Lapis*, in natural hiſtory, a name given by ſome authors to a foſſile body, part of an aſteropodium which they have thought in ſingle joints ſomewhat reſembled the ears of a mouſe. See the article ASTEROPODIUM.

MYXA, or MYXARIA, in the materia medica, a name uſed by ſome authors for the ſebeſtens, a ſort of plum of Ægypt and Aſia. *J. Bauhin*, V. 1. p. 198. See the article SEBESTEN, *Cycl.*

MYXOLYDIAN, in antient muſic, the firſt ſpecies of the diapaſon. See the article DIAPASON.

MYXON, in zoology, the name of a fiſh of the mullet kind, called by others, *Bacchus*.

It much reſembles the common mullet; but its head is leſs pointed, and its body is covered beſide the ſcales with a mucous matter. It has a remarkable irregularity in the manner of its ſwimming, and looks red about the lips and covering of the gills. *Rondelet*. de Piſc. p. 683. See the article MUGIL.



N.

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NABATHÆA *ſiliqua*, in the materia medica, a name given by the interpreters of Aviſenna, and other of the Arabian phyſicians, to the *jembut*, or *aljembut*, of thoſe authors.

It appears, from the accounts they have given us of this drug, that it was a long and ſlender pod, produced on a thorny tree. It has been generally ſuppoſed to be the ſame wirh the *carob*, or *ſiliqua dulcis*, but very erroneouſly. The ſame authors who mention this *aljembut*, or *Nabathæa ſiliqua*, mention that alſo under the name of the *alnabati*, or *Syrian ſiliqua*, as it is interpreted.

The *Syrian ſiliqua*, they ſay, purges, and is good in colics. The *Nabathæan* they recommend to us, as an aſtringent in hæmorrhages. It is plainly to be inferred from this, that the *Nabathæa ſiliqua* is different, in the greateſt degree, from the Syrian pod, or *carob* fruit; and by its virtues, and the deſcription they give us of the thorny tree which produces it, it ſeems very probable that it was the pod of ſome ſpecies of the *acacia*.

What gives the greateſt probability to this opinion is, that the ſame authors have plainly, in other places, called the *acacia* by the common name of *ſiliqua*. Iſidore, explaining ſome paſſages of the old Roman authors on this ſubject, ſays, that the ſhrub *ſilicon*, which the Latins had improperly called *ſiliqua*, yields a fruit, the expreſſed juice of which is the drug called *acacia* in the ſhops.

The Arabian authors who mention this *ſiliqua Nabathæa*, and call it alſo *ſeuchi*, and *charnub ſeuchi*, deſcribe the ſhrub which produces it, as being prickly, and riſing but a cubit high from the ground; and, they add, that it had crooked, or falcated pods, which contained ſeeds, and a pulp very much reſembling the other *ſiliqua*, which is the *carob*. Neophytus, and others, tell us, that the pods of the *acacia* were called by the Greeks *ceration*, as well as thoſe of the *carob*; and the Arabians call the *acacia*, *alcarad*, a name plainly derived from this *ceration* of the Greeks.

As therefore both the pods of the *carob*, or *ſiliqua edulis*, and thoſe of the *acacia* were called by the ſame names *ceratia*, &c. it is plain that when the authors before-mentioned deſcribe two kinds of *carob*, or as they expreſs it *ceratia*, differing from one another, and poſſeſſing, the one the virtues of the *carob* fruit, and the other of the *acacia*, they mean the *carob* by the purging fruit, and the *acacia* by the aſtringent.

NABCA, in botany, a name by which ſome authors have called the tree more uſually deſcribed under the name of *ænoplia*, or the great jujube tree. *Chabræus*, p. 51.

NABECH, in botany, the name given by the Arabian writers to the fruit of the tree *ſadar*, which is the *lotus* of Dioſcorides, and the *acanthus* of Virgil. The fruit of this, which is round, and like a cherry, only ſmaller, was firſt called by this name *nabech*, or *nabac*, but afterwards the tree was alſo called by it. See the article SADAR.

NABLUM, in Hebrew, *nebel*, an inſtrument of muſic among the Hebrews. The Seventy, and the Vulgate, tranſlate it ſometimes by *nablum*, and at other times by *pſalterion*, or *lyra*, or even *cithara*.

The *nablum* was a ſtringed inſtrument, very near of the form of a Δ, which was played upon by both hands, and with a kind of bow. See Calmet's diſſertation concerning the inſtruments of muſic of the antient Hebrews, prefixed to the ſecond volume of his commentary upon the pſalms. *Calmet*, Dict. Bibl.

NADIR-*il-kiſne*, in the Turkiſh offices, the ſuperintendant over the wardrobe. *Pocock*'s Egypt, p. 188.

NÆVI (*Cycl.*) are excreſcences of fleſh in various parts of the body, ſuppoſed to have been occaſioned by frights, diſappointments, &c. of the mother, while the infant was in the womb. Theſe tumors ariſe in all parts of the body; they are of all figures, and of all ſizes, and are ſometimes of the common colour of the ſkin, ſometimes black, red, &c. Many of them, both in ſhape and colour, reſemble fruits of ſeveral kinds, as mulberries, ſtrawberries, and the like; or animals, as mice, or ſpiders.

They are to be removed, as warts, by ligature, cautery, or extirpation with the knife. But if they have large veſſels near their roots, if they are ſtrongly fixed to the bone, or if they ſeem to have a cancerous diſpoſition, it is much beſt for the ſurgeon to let them wholly alone; and where they are ſeated in the neighbourhood of arteries, or large veins, if preſſed to extirpate them, he ſhould never be without cauteries, ſtyptics, bandages, and other neceſſary apparatus, in caſe of hæmorrhages. *Heiſter*'s Surgery. p. 323.

NAGEMULUS, in ichthyology, a name given by ſome of the German authors to the fiſh called by Willughby and others, the *lucioperca*, or *pike-pearch*. It is truly a ſpecies of pearch, and is diſtinguiſhed from the common pearch, principally by having two long teeth on each ſide of the mouth. See PERCA.

NAJAS, in botany, the name given by Linnæus to a genus of plants called by Vaillant and Micheli *fluvialis*. The characters are theſe: it produces male and female flowers diſtinct. In the male flowers, the perianthium is compoſed of one leaf of a cylindric figure, and truncated at the baſe, growing ſmaller at the top, and having at the mouth two oppoſite ſegments which bend backwards. The flower is compoſed of only one petal, and is a tube of the length of the cup; its verge is divided into four ſegments, which are rolled backwards. There are no ſtamina, but the middle of the flower produces one, oblong, erect anthera. In the female flower there is no cup, nor any petal, but a piſtil whoſe germen is of an oval figure, and terminates in a ſlender ſtyle; the ſtigmata are ſimple; the fruit is an oval capſule, containing one oblong oval ſeed. *Linnæi* Gen. Pl. 443. *Vaill.* A. G. 1719. T. 1. T. 2. *Michel.* 8.

NAIL, (*Cycl.*) in the manege. The different poſition of the *nails* of the bridle, or left hand of the horſeman, gives the horſe a facility of changing hands, and forming his departure, and ſtop; by reaſon that the motion of the bridle follows ſuch a poſition of the *nails*. To give a horſe head, you muſt turn the *nails* downwards. To turn the horſe to the right, you muſt turn them upwards, moving your hand to the right. To change to the left you muſt turn the *nails* down, and bear to the left. To ſtop the horſe you muſt turn them upwards, and lift up, or raiſe your hand.

NAILS *of the human body*. Dr. Pozzi endeavours to prove, that the *nails* grow out of the tendons, which are ſpread upon the laſt phalanx of the fingers and toes. See UNGUIS.

NAKED *ſtalk*, or *leaf*, among botaniſts. See the articles STALK, and LEAF.

NAKIB, in the Oriental dignities, the name of an officer who is a deputy to the cadiliſkier, or, as he may be called, the lord high chancellor of Egypt, appointed by the grand ſignior. *Pocock*'s Egypt, p. 170.

NAKIR, a word uſed by ſome medical writers to expreſs a violent flatulence which paſſes from one limb to another, and is always attended with pain.

NAKOUS, an Egyptian muſical inſtrument, made like two plates of braſs, and of all ſizes, from two inches to a foot in diameter; they hold them by ſtrings faſtened to their middles, and ſtrike them together ſo as to beat time. They are uſed in the Coptic churches, and in the Mahometan proceſſions. *Pocock*'s Egypt, p. 186.

NAL *la appella*, in botany, a name uſed in the Hortus Malabaricus to expreſs an Indian ſhrub, or tree, from the roots of which they obtain an oil of a gold yellow colour, and very agreeable ſmell, called *appel* oil. It is of a bitteriſh and ſharp taſte, and is in great eſteem among them in pains of the head. Hort. Malab.

NAMANTIA, in ichthyology, a name given by the French to the *manati*, or *ſea cow*.

NAME (*Cycl.*) — *Generical* NAME. See GENERICAL.

NAMUR *marble*, a name given by our artificers to a ſpecies of black marble, which is very hard, and capable of a good poliſh, but has no variegations of any other colour. It is common in Italy, France, and Germany, and is the ſpecies called the *Lucullean marble* by the Romans. *Hill*'s Hiſt. Foſſ. p. 466. See LUCULLEUM *marmor*.

NAPELLUS (*Cycl.*) — This plant is poiſonous in ſome places, and innocent in others. Its mortal quality increaſes with the heat of the climate, and goes off where that is ſmall. In the ſouth of France, it is a fatal poiſon; in Bretany, they find the roots inoffenſive to the moſt tender conſtitutions; and farther north, they eat the leaves among their ſallad herbs, to get them an appetite, and find them a ſafe and wholeſome food. *Deſlandes* Tr. Phyſ.

It is ſaid the *napellus* may be ſo corrected by volatile ſalt of tartar, as to become innocent. *Boyle*'s Works, Abr. Vol. 1. p. 60. Dr. Hill makes the *napellus* a ſpecies of aconite. *Hill*'s Nat. Hiſt. Vol. 2. p. 483.

NAPESCA, a name given by ſome to a ſpecies of *jujube*.

NAPHA, a name given by many of the writers in pharmacy to *orange-flower water*.

NAPHTHA, (*Cycl.*) in natural hiſtory, the name of a genus of fluid foſſils, the characters of which are, that they are of a thin conſiſtence, bright and pellucid, of a ſtrong ſmell, very readily inflammable, and, when pure, burning away, without leaving any reſiduum.

Of this genus there are only two ſpecies, the one commonly known by the name of *naphtha*, the other by that of *petroleum*. The firſt is a pure and clear mineral fluid, of a much thinner conſiſtence than any of the expreſſed oils of vegetables; and

ſomething thicker than the finer of the diſtilled ones; it is of a pale yellow, with a faint caſt of brown among it, and is, indeed, of the very colour of the common brown amber uſed by the apothecaries. It is of a briſk, penetrating ſmell, ſomething like that of the chemical oil of amber, but not ſo offenſive. It is extremely inflammable, and is found floating on the waters of certain ſprings which break out at the ſides of hills in Perſia, Tartary, China, and other parts of the eaſt. It ſeems very practicable, by means of this mineral fluid, and a proper acid, to make a ſort of artificial amber, this being only a ſort of fluid amber.

The ſecond kind, commonly known by the name of *petroleum*, is a thin, ſubtle, and penetrating fluid, much thinner than the yellow *naphtha*, and as fine as the cleareſt diſtilled oils of vegetables. It is of a very ſtrong and penetrating ſmell; and is of various colours. It is naturally of a clear, fine, and bright white, and nearly as pellucid as the pureſt ſpring water; but it is more frequently found brown, rediſh, or blackiſh. It is produced in almoſt all parts of the world: England, France, and Germany, afford it in many places, but it is moſt plentifully found in Italy. *Hill*'s Hiſt. of Foſſ. p. 419, ſeq.

Naphtha has much the ſame medical virtues with *petroleum*, only in a more remiſs degree. In Perſia, it is uſed externally on many occaſions, and alſo given inwardly in colics, a few drops being the doſe. See PETROLEUM.

NAPLES *yellow*, the common name in the colour ſhops of London, and among our painters, for the ochre called *giallolino*. See GIALLOLINO.

NAPUS, *navew*, in botany, the name of a genus of plants, the characters of which are the ſame with thoſe of the turnep, and which ſcarce deſerves to be made a different genus from it, differing only in its general figure.

The ſpecies of *navew* enumerated by Mr. Tournefort are theſe: 1. The white-rooted, manured *navew*. 2. The yellow-rooted, manured *navew*. 3. The black-rooted, manured *navew*. 4. The largeſt-rooted, manured *navew*. And, 5. The wild *navew*. *Tourn.* Inſt. p. 229.

The ſeeds of *napus* are roundiſh, of a blackiſh colour, and of an acrid and biting taſte. They are accounted deterſive, inciſive, aperitive, and digeſtive, and ſaid to be good in malignant fevers, and the ſmall pox, and are an ingredient in the Venice treacle. The root of the plant is ſaid to be alſo good in coughs, aſthmas, and conſumptions.

Nape oil is made from the ſeed of the *napus ſylveſtris Lobelii*, often called *navette*, and the oil *navetta oil*. *Lemery*'s Hiſt. of Drugs. See NAVETTE.

NAPUS, in natural hiſtory, a name given to a ſpecies of *voluta*, approaching to the nature of the famous admiral ſhell, and more commonly known by the name of the *falſe admiral*, or *baſtard admiral*. See ADMIRAL.

NAPUT, in botany, the name given by the Norwegians to a plant whoſe root is an excellent remedy for the colic. It grows plentifully in the northern parts of Norway, and is the conſtant remedy uſed by the miners for their colics, which are particularly ſevere. The taſte is ſaid to be agreeable, being at firſt chewing ſomewhat like a radiſh, but afterwards having the flavour of the garden angelica. Phil. Tranſ N° 114.

NARCAPHTHON, in the materia medica, the name given by many to the bark called *caſcarilla*.

NARCE, νάρκη, a torpor, ſtupor, or dullneſs of ſenſation; uſed either for a natural ſtupidity, or for that ſtupefaction of the ſenſes brought on by medicines, to alleviate the violence of pains.

NARCISSITES, in natural hiſtory, a name given by ſome authors to a ſpecies of *aſteropodium* from its ſuppoſed reſemblance to the flowers of the narciſſus; others have called ſome of the coralloide funguſes by that name, and others a ſpecies of echinites of the pileated kind.

It is, however, a name that none of them have any title to, ſince the reſemblance will appear very ſmall when nicely conſidered.

NARCISSOLEUCOIUM, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the liliaceous kind, and is compoſed of ſix petals, ſometimes equal, ſometimes irregular in ſize, and is pendulous, and of a ſomewhat bell-faſhioned form. The cup of the flower becomes finally a fruit of a roundiſh figure, divided into three cells, and containing roundiſh ſeeds; to this alſo it is to be added, that the root is bulbous.

The ſpecies of *narciſſoleucoium* enumerated by Mr. Tournefort, are theſe: 1. The common *narciſſoleucoium*. 2. The *narciſſoleucoium* with a white expanded flower. 3. The many-flowered, late, meadow *narciſſoleucoium*. 4. The double, many-flowered, meadow *narciſſoleucoium*. 5. The greater, trifoliate *narciſſoleucoium*. 6. The leſſer, trifoliate *narciſſoleucoium*. 7. The blue-flowered, trifoliate *narciſſoleucoium*. 8. The broad leaved, autumnal *narciſſoleucoium*. 9. The capillaceous-leaved, autumnal *narciſſoleucoium*. 10. The capillaceous-leaved, vernal *narciſſoleucoium*. *Tourn.* Inſt. p. 387.

NARCISSUS, in botany, the name of a genus of plants, the characters of which are theſe: the flower is liliaceous, conſiſting of one leaf made in a bell-like ſhape, and divided at the edge into ſix ſegments, ſurrounding its middle in manner of a crown. The cup grows out of a membranaceous huſk, and becomes at length a longiſh, or roundiſh fruit, ſomewhat approaching to a trigonal form; and opening, ſhews itſelf to be compoſed of three cells, which uſually contain roundiſh ſeeds. See Tab. 1. of Botany, Claſs 9.

The ſpecies of *narciſſus* enumerated by Mr. Tournefort are theſe: 1. The great, pale-flowered *narciſſus*, with hoary leaves. 2. The great, blueiſh, white-flowered *narciſſus*, with a deep, yellow, circle. 3. The white-flowered, ſcented *narciſſus*, with the circle of the flower yellow. 4. The ſnow white, ſweet-ſcented *narciſſus*, with a red circle. 5. The white *narciſſus*, with a yellow circle. 6. The great, white, ſweet-ſcented *narciſſus*. 7. The great, white, oriental *narciſſus*. 8. The middle, white, oriental *narciſſus*. 9. The white, oriental *narciſſus*, with a ſtarry cup. 10. The great, plain, white *narciſſus*. 11. The leſſer, plain, white *narciſſus*. 12. The ſnow-white *narciſſus*. 13. The ſmall-flowered, white *narciſſus*, with the ſmell of jaſmine. 14. The great, white, oriental *narciſſus*, with a yellow cup. 15. The middle, white, oriental *narciſſus*, with a yellow cup. 16. The leſſer, white, oriental *narciſſus*, with a yellow cup. 17. The white, oriental *narciſſus*, with a yellow, double cup. 18. The oriental *narciſſus*, with a round, gold, yellow cup. 19. The pale-flowered *narciſſus*, with a ſaffron-coloured middle. 20. The pale-flowered *narciſſus*, with a gold, yellow middle. 21. The many-flowered, white *narciſſus*, with a deep, yellow circle. 22. The *narciſſus*, with a purple middle. 23. The pale-flowered *narciſſus*, with a ſaffron-coloured middle. 24. The pale-flowered *narciſſus*, with a gold, yellow circle. 25. The white *narciſſus*, with reflex leaves, and a ſhort, gold yellow cup. 26. The elegant *narciſſus*, with double flowers, variegated with yellow, and ſaffron colour. 27. The ſtrong-ſcented, full-flowered *narciſſus*, with a yellow middle. 28. The very large flowered *narciſſus*, with a yellow middle. 29. The ſnow white, fine ſcented *narciſſus*, with a yellow cup. 30. The many-flowered, African, yellow *narciſſus*. 31. The many-flowered, Portugal, yellow *narciſſus*. 32. The great, many-flowered, Conſtantinople *narciſſus*, with double, greyiſh, white flowers. 33. The yellow, Conſtantinople *narciſſus*. 34. The narrow-leaved, all-yellow *narciſſus*. 35. The narrow-leaved, yellow *narciſſus*, with a large cup. 36. The great, white-flowered, narrow-leaved *narciſſus*. 37. The ſmaller, white-flowered, narrow-leaved *narciſſus*. 38. The pale-flowered, narrow-leaved *narciſſus*, with a deep, yellow cup. 39. The little, white *narciſſus*, with a beautiful, purple border. 40. The graſſy-leaved *narciſſus*, with a deep yellow middle. 41. The ruſh-leaved *narciſſus*, with yellow flowers, and long cups. 42. The ſmaller, yellow-flowered, ruſh-leaved *narciſſus*. 43. The ruſh-leaved *narciſſus*, with yellow, variegated flowers. 44. The ruſh-leaved *narciſſus*, with a pale flower, and a deep yellow cup. 45. The ruſh-leaved *narciſſus*, with a round, roſe-like flower. 46. The plain, white flowered, ruſh-leaved *narciſſus*. 47. The ruſh-leaved *narciſſus*, with twiſted leaves, and with white flowers, and yellow cups. 48. The white, autumnal *narciſſus*. 49. The ſmalleſt, white, autumnal *narciſſus*. 50. The great, white flowered, broad-leaved *narciſſus*, with a ſhort, yellow cup. 51. The broad-leaved, pale-flowered *narciſſus*, with a large, gold-coloured cup, and a ſtriated ſtalk. 52. The broad-leaved *narciſſus*, with large, pale-coloured flowers, and a yellow cup. 53. The middle, white *narciſſus*, with a ſhort, yellow cup. 54. The great, pale, yellow *narciſſus*. 55. The yellowiſh *narciſſus*, with an hexangular tube. 56. The yellow *narciſſus*, with a round tube. 57. The white *narciſſus*, with a yellow tube. 58. The white *narciſſus*, with a yellow cup, and with the ſmell of the muſcari. 59. The white *narciſſus*, with an oblong, yellow cup. 60. The wild, pale-flowered *narciſſus*, with a yellow cup. 61. The great, all-yellow *narciſſus*, with a very long cup. 62. The plain, yellow *narciſſus*, with the leaves of the flower bent back. 63. The ſmall, plain, yellow *narciſſus*. 64. The white *narciſſus*, with a yellow cup. 65. The white *narciſſus*, with a yellow fimbria. 66. The ſmall, creeping, yellow *narciſſus*. 67. The white, narrow-leaved *narciſſus*, with an oblong cup, and a depending flower. 68. The mountain, ruſh-leaved *narciſſus*, with a yellow cup. 69. The mountain *narciſſus*, with a fimbriated flower. 70. The ſmalleſt, white, mountain, ruſhy-leaved *narciſſus*. 71. The mountain, ruſhy-leaved *narciſſus*, with a gold, yellow cup. 72. The coronated, mountain *narciſſus*. 73. The double-flowered, oriental *narciſſus*, with yellowiſh, white flowers. 74. The broad-leaved, white *narciſſus*, with the yellow middle. 75. The white *narciſſus*, with a double yellow corona. 76. The double, plain, yellow *narciſſus*. 77. The double, purple-middled *narciſſus*. 78. The double, ſnow-white *narciſſus*. 79. The Virginian, double, white *narciſſus*. 80. The double, yellow, wild *narciſſus*, without a cup. 81. The double *narciſſus*, with variegated flowers. 82. The yellow, wild *narciſſus*, with a double, or triple, yellow tube. 83. The paler, yellow, wild *narciſſus*, with a triple tube. 84. The yellow *narciſſus*, with a divided tube. 85. The double, yellow, broad-leaved *narciſſus*. 86. The double, anemone-like, gold-yellow, ruſh-leaved *narciſſus*. 87. The gold-yellow, double *narciſſus*. 88. The ſea *narciſſus*, called by many the little, white *ſquill*. 89. The purple-flowered, ſea *narciſſus*, 90. The liliaceous *narciſſus*. 91. The white-flowered, ſpring, American *narciſſus*. 92. The American *narciſſus*,

narciſſus, with double white flowers, ſmelling like ba'ſam of Peru. 93. The white *narciſſus* of Ceylon, with a hexangular ſweet-ſcented flower. *Tourn.* Inſt. p. 353, ſeq.

NARCOS, in ichthyology, a name given by Joannes Cuba, and other writers, to the *torpedo* or cramp-fiſh; a ſpecies of raia, diſtinguiſhed by Artedi by the name of the *raia tota lævis*, the wholly ſmooth raia.

NARCOSIS, a ſtupefaction or inſenſible ſtate, whether brought on by medicines, or happening from natural cauſes.

NARDINUM *unguentum, ointment of ſpikenard*, an ointment greatly celebrated among the antient writers in medicine. It ſeems to have been variouſly prepared, but always with a great number of aromatic ingredients, and always with *ſpikenard* for the baſis.

Dioſcorides ſays, that the *malabathrum*, or Indian leaf, was ſometimes an ingredient in it, but that it was alſo ſometimes made without it. It was generally, however, mix'd with the *oleum balaninum*, or *amphacinum*, inſpiſſated with an addition of ſchænanth; and to increaſe its fragrancy there were added, coſtus, amomum, myrrh, and balm of Gilead.

The fineſt was accounted that which was of a thin conſiſtence, and very fragrant ſmell. It was ſaid to be attenuating and deterſive, but ſomewhat acrimonious; and was ſometimes, for particular uſes, reduced to a ſolid conſiſtence with reſin. *Dioſcorides*, l. 1. c. 35.

NARDUS, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants of the graſs kind, the diſtinguiſhing characters of which are, that there is no calyx; that the flower is compoſed of two valves; the exterior is very ſlender, oblong, and ends in a beard or awn, and in ſome ſort receives the other into a cavity in its fore part: the interior is ſmall and ſtrait, and is terminated by a much ſhorter awn. The ſtamina are three capillary filaments, ſhorter than the flower: the antheræ are oblong: the germen of the piſtillum is oblong: the ſtyles are two in number, capillary, and reflex and downy: the ſtigmata are ſimple. The flower continues firmly attached to the ſeed. The ſeed is ſingle, long, ſtrait, pointed at both ends, and narrower in its upper than in its under part. *Linnæi* Gen. Plant. p. 19. See SPIKENARD, *Cycl.*

NARDUS *ruſtica*, in botany, a name attributed by ſome authors to the *aſarabacca*, and by others to the *baccharis monſpelienſium*. *Dale*, Pharm. p. 79.

NARES *piſcium*. The *noſtrils* in fiſh are placed ſo very variouſly, and have ſo many differences in number, figure, ſituation and proportion, that they make a very eſſential ſeries of characters, for the diſtinguiſhing the genera and ſpecies one from another. In regard to number; 1. Some fiſh have them not at all, as the petromyzum. 2. Many fiſh have one *noſtril* on each ſide, placed in the manner of thoſe of birds and quadrupeds, as the chonepterus, &c. 3. Many have them placed two on each ſide, as the cyprini, percæ, &c.

In regard to figure, they are, 1. In ſome round, as all four are in the gadi, and the two anterior ones in the conger, mackrell, &c. 2. Some are oval, as the poſterior pair in the conger, &c. and, 3. Many are oblong.

As to their ſituation, they alſo differ much: 1. Some are placed very near the ſnout or roſtrum, as the clupeæ; and the anterior tubuloſe foramina, in the conger or ſea eel, are alſo of this kind. 2. In many kinds of fiſh they are placed near the eyes, as in the pike, the pearch, and the like: and, 3. In ſome they are placed as it were at a middle diſtance between the eyes and the end of the ſnout, as in the ammodytæ or ſand eels, &c. The *nares* of fiſh differ alſo in proportion: in thoſe fiſhes which have two pairs of theſe holes, they are, 1. In ſome very near one another, ſo as almoſt to touch: they are thus placed in the cyprinus and clupeæ, &c. 2. They are placed at great diſtances, which is the caſe in the conger, the pearch, and many others. According to theſe variations, the *noſtrils*, tho' a part in general very little attended to, yet become of notable uſe in the diſtinguiſhing the ſpecies. *Artedi*'s Ichthyol.

NARIFUSORIA, a name given by authors to ſuch medicines as were meant to be inſtilled into the noſtrils, for diſorders of the head and eyes.

NARINARI, the Braſilian name of a fiſh of the *aquila marina* kind, called by the Dutch *piilſtert* and *ſcicle*.

It is very large and flat, and the figure of its body is nearly triangular, its ſides or wings being very broad, and larger. The head is very large, and has a furrow down its middle: the mouth is ſomewhat triangular, but rounded at the corners. It has no teeth; but in the place of them, has a bone in the under part of its mouth, in the ſhape of a tongue, of four fingers long, and a finger and half broad, and a ſmaller bone of the ſame ſhape in the upper part: between theſe it cruſhes its prey. The under bone conſiſts of ſeventeen ſmall pieces, of the figure of the letter V. Theſe are hard and firm, and are held together by cartilages, and under them are the ſame number of others, much more ſoft and ſpungy. The upper bone conſiſts of fourteen pieces, which are each in like manner double, and joined to one another by cartilages. The body is uſually a foot and a half long, and the tail four foot. Its fleſh is finely flavoured. *Marggrave* Hiſt. Braſ. p. 119.

The bones of this and the like fiſh's mouths, are the foſſile *ſiliqueſtra*.

NARIS *externus alius*, in anatomy, a name given by Riolanus to one of the muſcles of the noſe, the uſe of which, he ſays, is to dilate the ala of the noſe, without any elevation of the noſe itſelf. It is called by Albinus the *compreſſor naris*, and by Winſlow the *tranſverſalis*, or *inferior naſi*. Cowper calls it the *elevator alæ naſi*, and Santorini the *tranſverſus naſi*.

NARONICÆ *radix*, in the materia medica, a name given by ſome authors to the iris root. *Ger.* Emac Ind. 2. See IRIS.

NARROW, in the manege. A horſe is ſaid to *narrow*, when he does not take ground enough, or does not bear far enough out to the one hand or to the other. If your horſe *narrows*, you muſt aſſiſt him with the inſide rein, that is, you muſt carry your hand to the outſide, and preſs him forward upon ſtraight lines with the calves of your legs.

NARROW is alſo a term among bowlers. See BOWLING.

NARWAL, a name given to a fiſh of the whale kind, more frequently called the *ſea-unicorn*. See UNICORN.

NASAMMONITES, in natural hiſtory, a name given by the antients to a ſtone, which Pliny deſcribes to have been of a blood colour, variegated with veins of black. We know no ſtone which anſwers to this character at preſent, unleſs it be ſome of the agates, in a variegated ſtate.

NASCALE, a ſort of peſſary, made of woo', cotton, or the like, and introduced into the vagina, after being impregnated with proper ingredients.

NASDA, a word uſed by ſome medical writers for *naphtha*, and ſeemingly a corruption of that word.

NASITAS, a word uſed by ſome authors to expreſs a ſpeaking thro' the noſe.

NASTOS, in botany, a name by which Cluſius and ſome other authors have called the reed, of which the common walking canes are made, which is the *arundo ſarcta* of other writers. *Ger.* Herb. p. 34.

NASTURTIUM, *creſſes*, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts of four leaves, and is of the cruciform kind: the piſtil ariſes from the cup, and becomes a roundiſh flatted fruit, divided by an intermediate membrane into two cells, and containing uſually a number of flat ſeeds. To theſe marks it is to be added, that the leaves of the *naſturtiums* are divided and cut into ſegments, by which it is at ſight diſtinguiſhed from the thlaſpi. The ſpecies of *naſturtium* enumerated by Mr. Tournefort, are theſe: 1. The common garden *creſs*. 2. The curled-leav'd garden *creſs*. 3. The narrow-leav'd garden *creſs*, with more curled leaves. 4. The broad-leav'd garden *creſs*. 5. The wild *creſs*, called by ſome the umbellated *thlaſpi*. 6. The leſſer-podded wild *creſs*, with finely-divided leaves. 7. The wild *creſs*, with extremely fine divided leaves. 8. The oriental *naſturtium*, with the lower leaves like thoſe of yarrow, and the upper ones like thoſe of thorough wax. 9. The wild *creſs*, with criſtated pods. 10. The alpine *creſs*, with finely-divided leaves. 11. The little ſpring *creſs*, called by ſome the rock *cardamine*. 12. The little rock *creſs*, with leaves like thoſe of ſhepherd's purſe. 13. The ſmall procumbent ſpring *naſturtium*: and, 14. The little ſpring *naſturtium*, with leaves only at the root. *Tourn.* Inſt. p. 213.

Water-creſſes are frequently eaten in ſpring as a ſallad. The whole plant is of a very acrid taſte, and is a powerful attenuant and reſolvent. It is recommended as a kind of ſpecific in the ſcurvy, and is eaten in great quantities by many with that intent. It is good againſt all obſtructions of the viſcera, and conſequently in jaundices, and other chronic diſeaſes. It is alſo a powerful diuretic and promoter of the menſes. People have pretended to preſerve the virtues of this plant in waters, ſyrups, and conſerves; but the beſt way of taking it is either to eat it as a ſallad, or to drink its expreſſed juice ſingly, or mixed with that of the other antiſcorbutic plants, as brook-lime, &c. which is often done.

NASUS, in zoology, the name of a freſh-water fiſh, common in the Rhine, the Danube, and moſt of the large rivers in Germany, tho' unknown in England, and called by different authors the *ſimus*, *ſavetta*, and *platyrynchos*.

Its general ſize is between ſix and twelve inches in length. In ſhape and colour it much reſembles our chub. Its belly and ſides are of a ſilvery white, and the belly fins and the lower half of the tail are often a little reddiſh: its head is ſmall, and has a black ſpot on its hinder part; its belly is flat, and ſomewhat broad, and its ſcales large; and its ſnout or noſe ſtand out beyond the mouth, which is a ſingularity, and from which it had its name. Its mouth is very ſmall; it has no teeth, and its ſkull is pellucid. It is a looſe and inſipid-taſted fiſh, and very full of bones. They ſpawn in May, at which time the males are rougher than at any other ſeaſon, and have their heads ſpeckled with white ſpots, like the Engliſh rudd. At this time alſo they ſwim together in immenſe ſhoals, and the fiſhermen have ſometimes caught two or three thouſand of them in one night. *Willughby*'s Hiſt. Piſc. p. 254.

NATANT *leaf*, among botaniſts. See LEAF.

NATATIO, *ſwimming*, in ichthyology. The *ſwimming* of fiſhes in general is greatly aſſiſted by their air bladder. Thoſe kinds which have not this bladder, either have regular lungs, and contain air in them, as is the caſe in the cetaceous fiſhes; or they have remarkably thin and flat bodies, as the rays and thornbacks, and the pleuronecti; or remarkably long and flexous ones, as the petromyza; and by theſe means are capable of eaſy flexuous motions, which, with the help of the fins, thruſt them any way at pleaſure; tho' their bodies are not ſo nicely pois'd, as to the

weight

weight of the water, as thoſe of ſuch fiſh as have the aſſiſtance of theſe air-veſſels. It has been ſuppoſed by ſome, that the motion of fiſh in the water depended principally upon the pectoral fins, but this is eaſily proved falſe by experiment; for if the pectoral fins of a fiſh are cut off, and it be again put into the water, it will be found to move forward or ſideways, upward or downward, as well as it did when it had them on. If a fiſh be carefully obſerv'd, while *ſwimming* in a baſin of clear water, it will be found not to keep theſe pectoral fins conſtantly expanded, but only to open them at ſuch times as it would ſtop or change its courſe, this ſeeming to be their principal, if not their only uſe. The pectoral and ventral fins, in the common fiſhes of the cathetoplateous or compreſſed form, ſerve in the ſame manner in the keeping the fiſh ſtill, and ſerve in ſcarce any other motion than that toward the bottom: ſo that this motion of the fiſh, which has been generally attributed to their fins, is almoſt wholly owing to their muſcles, and to the equipoiſe of their air-bladder. That the uſe of the pectoral and ventral fins is to keep the fiſh ſteady and upright in the water, is evident from the conſequences of their loſs: if they are cut off, and the fiſh put again into the water, it cannot continue in its erect natural poſture, but ſtaggers about, and rolls from ſide to ſide. The fins of the back and anus are alſo of great uſe to the keeping the creature in its natural poſition, as is eaſily ſeen by cutting them off, and obſerving the motions of the fiſh afterwards.

Tho' a great deal depends on the motion of the muſcles of the ſeveral parts of the body in the *ſwimming* of the fiſh, yet the tail, and thoſe muſcles which move the lower part of the body, to which it is affixed, are the great inſtruments by which their ſwift motions in the water are performed. The moving the tail, and that part of the body to which it adheres, backward and forward, or ſideways any one way, throws the whole body of the fiſh ſtrongly the contrary way; and even in *ſwimming* ſtrait forward, the motion and direction are both greatly aſſiſted by the vibrations of this part, as may be experienced in the motion of a boat, which when impelled forward, may be firmly guided by means of an oar held out at its ſtern, and moved in the water as occaſion directs. The dorſal muſcles, and thoſe of the lower part of the body between the anus and tail, are the principal that are uſed in the motion of this part, and theſe are therefore the moſt uſeful to the fiſh in *ſwimming*. The muſcles of the belly ſeem to have their principal uſe in the contracting the belly and the air-bladder. They have been ſuppoſed of uſe to move the belly fins; but there are too many of them for ſuch a purpoſe, and theſe fins have each its peculiar muſcle fully ſufficient to the buſineſs. The uſe of the tail in *ſwimming* is eaſily ſeen, by cutting it off, and committing the fiſh to the water without it, in which caſe it is a moſt helpleſs creature. See AIR-*bladder*.

NATIVO *habendo*, in law, a writ directed to the ſheriff, for a lord who claimed inheritance in any villain, when his villain was run away from him, for the apprehending and reſtoring him to the lord. Terms of Law.

NATIX, in natural hiſtory, a name given by ſome old writers to the *nerita*.

NATRIX, in botany, the name given by Rivinus to a genus of plants, nearly allied to the anonis, and comprehended with it in one genus by Linnæus, under the name of *anonis*. *Rivin.* vol. 4. p. 82. See REST-*harrow*.

NATRIX, in zoology, the name of the common or water ſnake, called alſo *torquata*, from the ring about its neck. It is much longer and larger than the viper, and is no water animal, properly ſpeaking, but a land one, which being able to ſwim very well, often takes the water to hunt about for frogs, which are its principal food. It grows to be much longer and larger than the viper, and does not bring forth live young ones, but great numbers of eggs, which it lays in dunghills, to be hatched by the warmth of the place, or by the heat of the ſun.

It is very common in buſhy places, and near waters, and in winter finds holes in the banks of ditches, or about the roots of trees, where it lies torpid the whole winter. It has no poiſon, and may be ſafely taken up and played with, never ſo much as attempting to bite. It feeds on many ſmall inſects, ſometimes on vegetable ſubſtances, and oftener on frogs, mice, &c.

Its back is of a ſort of duſky earth colour, and its belly variegated with black and a bluiſh white, but near the head almoſt wholly white, having only a few ſmall ſpots of black at the ſides, the colour growing darker toward the end of the tail; and near the end, the middle part of all the ſcales are black, and their extremities only of a bluiſh white: the whole belly is covered with long parallel ſcales, placed tranſverſely. The back and ſides are covered with ſmall ſcales, and are variegated with ſeveral ſtreaks and ſpots of black: there are more than eighty tranſverſe black lines running from the back to the ſides; and beſide theſe, two other rows of ſmaller, in form of ſpots, near the middle of the back. The head is covered with large ſcales of a duſkier colour than thoſe of the reſt of the body, and the upper jaw is white on each ſide, with four or five ſlight lines of black running acroſs it. Its chain is yellow, and is compoſed of two large ſpots of that colour, placed one on each ſide of the neck, or at each angle of the jaws, between which is placed a large triangular ſpot of a deep black, with its top directed toward the tail. It has none of thoſe long canine teeth of the viper and other poiſonous ſerpents, by means of which the poiſon is conveyed into the wound, but only two rows of ſmall ſerrated teeth, deſtined by nature for no other uſe than eating its food.

It may not be judged improper to have been thus particular in the deſcription of this ſpecies, as it is well to know what of the ſnake kind are, and what are not to be feared; and as the apothecaries and others, for want of theſe characters, often buy this common ſnake under the name of the viper. *Ray's* Syn. Anim. p. 335, 336.

NATRUM, or NATRON, (*Cycl.*) in natural hiſtory, the name of the *nitre* of the antients.

There have been various opinions about the *natrum* of the antients, and ſome have been of opinion, that our ſalt petre or nitre was the ſame ſubſtance; but this has been always diſcountenanced by the more judicious. Dr Hill, who had met with a ſalt from the ſame part of the world whence the antients had their *natrum*, and which anſwered to all the characters they have given of it, defines it to be a ſalt found ſometimes pure, and ſometimes fouled with earth, fermenting with acids, and forming flat oblong cryſtallizations, with four unequal ſides, and two truncated ends. Theſe were the characters of that ſalt, and theſe perfectly agree with the accounts we have of *nitre* in the earlieſt ages, tho' we have none ſufficiently accurate to take them all in. And whatever may have been the opinion of ſome, that the *natrum* or *nitre* of the Hebrews was very early loſt, a careful examination of the antients proves the contrary, and that this very ſalt was the *nitre* both of the Greeks and Romans, the *nitrum* and *aphronitrum* of Dioſcorides, and the *nitrum* of Pliny. It is found in broad and flat maſſes of various ſizes, but uſually ſmall, and when broken, are found to be compoſed of faſciculi or bundles of ſmall fibres, of an oblong and flatted figure, and laid but looſely together.

It is naturally of a duſky white; but is ſometimes found of a brown colour, and ſometimes of a fine deep red. This is its pureſt ſtate; but beſide this, it is frequently found in form of powder mixed with dirt, and riſing in little hillocks on the ſurface of the ground. It is of an acrimonious pungent taſte, and is more like the alkaline ſalts produced by burning vegetables, than any of the native ſalts. It diſſolves in a very ſmall quantity of water, and ferments violently with aqua-fortis, or any other weaker acid menſtruum.

It is found in great plenty in Sindy, a province in the inner part of Aſia, and in many other parts of the eaſt, and might be had in any quantities. Perhaps it would be worth conſidering as a branch of commerce, as it would ſupply the place of pot-aſhes in the making ſoap and glaſs, as the ſame author has tried.

The characters recorded of the *nitre* of the antients are, 1. That it would ferment with vinegar; and, 2. That it had an abſterſive quality. Theſe we have from the ſcriptures: and the reſt were, that it was of an acid taſte; that it was found native in the eaſtern parts of the world; that it ſerved in the place of ſoap, and that with ſand it would make glaſs. All theſe properties this ſalt has; and it may be added, that no other native ſalt has them *Hill's* Hiſt. of Foſſ. p. 386 to 389.

It is a very remarkable property of this ſalt, that tho' in itſelf an alkali, and fermenting very violently with acids in its native dry ſtate, yet in ſolution it does not ferment with them at all. If indeed oil of vitriol, or ſome other acid, be added to the ſolution of *natrum* while turbid, that is, while ſome of the particles of the ſalt remain yet whole in it, the two liquors will ferment violently; but if the ſolution be ſet by till wholly clear, the ſame acid will cauſe no effervescence in it; but the ſame ſolution, evaporated to a third part, will again ferment with that or any other acid, the particles of the ſalt at that time being got together again, and meeting the acid as in their ſolid form.

This ſalt contains a volatile alkali, abſorbed from the air, and embodied in it. Its other principle ſeems a marine ſalt, which it may receive either from the earth, or from ſalt ſprings or ſea water, according to the different places where it is found.

Pliny tells us, that the *natrum* of Egypt was only found to be produced at thoſe times of the year when the dews fell. And M. de la Chambre affirms, that in Egypt, three or four days before the Nile begins to overflow, there always falls a certain dew, which has a fermenting quality, and will leaven dough expoſed to the air. At the time of the falling of this dew, the *natrum* pits grow full of that ſalt: and Vanſlebius, Sands, and many others, join in affirming, that at this time the air becomes greatly more healthy; and tho' before the falling of this dew, or the inundation of the Nile, people die of the plague to the number of five hundred in a day in Grand Cairo, after this not one dies of that diſeaſe. It is eaſily ſeen, that the overflowing of the Nile does not produce this effect, but the dews and air, which at that time are full of that volatile alkali, which is one of the principles of the *natrum*. People who have preſerved ſpecimens of the *natrum* have alſo obſerved, that they would grow much heavier on being expoſed to the air at the time of the overflowing of the Nile. Phil. Tranſ. N° 160.

NATURAL *(Cycl.)* — NATURAL *history.* The *natural history* only of any one particular place, is a ſubject very extenſive in its materials, and to be ſet about without great care and circumſpection. Mr. Boyle has favoured the world with a liſt of the heads under which to arrange things, and what to enquire after on ſuch an occaſion.

The general heads under which he comprehends the articles of this hiſtory, are four; the things which regard the heavens, the air, the waters, and the earth.

Of the firſt claſs are the longitude and latitude of the place; the length of the longeſt and ſhorteſt days and nights; the climates, parallels, &c. what fixed ſtars are ſeen, and what are not ſeen there.

About the air may be obſerv'd, its temperature, as to the firſt four qualities, and the meaſure of them; its weight, clearneſs, refractive power; its ſubtlety or coarſeneſs; its abounding with or wanting an eſurine ſalt: its variations according to the ſeaſons of the year, and the times of the day: what duration the ſeveral kinds of weather uſually have: what meteors it is moſt or leaſt apt to breed; and in what order they are generated, and how long they generally laſt: what winds it is moſt ſubject to; whether any of them be ſtated or ordinary: what diſeaſes are ſaid to be epidemical, or depending on the ſtate and condition of the air: what other diſeaſe it is ſubject to, wherein the air may be ſuppoſed to have ſome ſhare: what is the uſual ſalubrity and inſalubrity of it, and what ſorts of conſtitutions it agrees with, what it does not.

About the waters, it may be proper to obſerve the ſea, its depth, tides, currents, ſaltneſs, and other qualities: next, the rivers will come under conſideration, their depth, length, courſe, inundation, and the goodneſs or badneſs of their waters, with their gravity, and other peculiar qualities. After theſe, the lakes, ſprings, ponds, &c. are to be conſidered, eſpecially the mineral waters, their kinds, qualities and virtues, and the manner of trying them. The inhabitants of the waters may follow here; and the particular kinds of fiſh that are found there, whether of the ſea or rivers, are to be mentioned, with an account of their ſtores, bigneſs, goodneſs, ſeaſons of perfection, haunts, peculiarities of any kind relating to them, and the manner of taking them, eſpecially when there is any thing ſingular in it.

The things relating to the earth, are laſt to be examined: theſe are, firſt the earth itſelf, then its inhabitants, and its various productions, whether external or internal. In the earth itſelf may be obſerved, its dimenſions, ſituation eaſt, weſt, north and ſouth; its figure; its plains and valleys, their extent; its hills and mountains, and the height of the talleſt, both in reference to the neighbouring valleys and plains, and to the level of the ſea; as alſo whether the mountains lie ſcattered, or are diſpoſed in ridges; and if of the latter kind, whether they run eaſt, weſt, north, or ſouth. What promontories alſo, and what firey or ſmoaking hills it has, if any: whether the country be coherent, or much broken into iſlands: what the magnetical declination is in ſeveral places, and the variation of that declination in the ſame place, and if thoſe be conſiderable; what may be conjectured as the occaſions of them, whether the vicinity of iron-mines, of ſubterranean fires, or what elſe. What the nature of the ſoil is, whether clayey, ſandy, or of good mold; and what vegetables, plants and trees beſt agree with it and ſucceed in it, what worſt. By what particular contrivances the inhabitants improve the advantages, or remedy the diſadvantages of the ſoil; and what hidden qualities the ſoil may have. The inhabitants of the earth are then to be conſidered, both natives, and ſtrangers that have been long ſettled there; and in particular, their ſtature, colour, features, ſtrength, agility, or defects of theſe; and their complexions, hair, beauty, and the like; their diet, inclinations and cuſtoms, ſo far as they are not owing to education: the fruitfulneſs or barrenneſs of the women; their hard or eaſy labours: the diſeaſes they are moſt ſubject to, and any remarkable ſymptoms attending them.

As to the external productions of the earth, the enquiries are to be theſe: what graſſes, grains and fruit it beſt produces: the herbs, flowers, and timber trees; and the coppices, groves, foreſts and woods the country has or wants: what peculiarities are obſervable in any of them; what ſoils they moſt like or diſlike, and with what culture they thrive beſt. Then what animals the country has or wants, both as to wild beaſts and birds of prey, and as to poultry and cattle of all ſorts; and particularly, if they have any animals that are not common, or any thing particular in thoſe that have. After thoſe, the ſubterranean ſtores are to be examined; what minerals the earth affords, and what it wants: then what quarries of ſtone, and in what manner they lie: what clays and earths are found there; as, clays, marles, fuller's-earths, earths for tobacco-pipes, earth for potter's wares, medicinal earths: what other mineral productions it yields, whether coals, ſalt mines, or ſalt ſprings, alum, vitriol, ſulphur, &c. What metals the country yields, with a deſcription of the mines of them; their depths, numbers, ſituations, ſigns, waters, damps, quantities of ores, goodneſs of the ores, and the ways in uſe for the reducing them to metals.

To theſe general heads ſhould be added, inquiries into traditions in the country, of any thing relating to it, whether peculiar to it, or only more common there than elſewhere; and where theſe require learning or ſkill in the anſwerer; the utmoſt care is to be taken to put the people in a way to give their accounts in a ſatisfactory manner; for a falſe or bad account of any thing is always much worſe than no account at all. Phil. Tranſ. N° 11.

NATURAL, in muſic, is applied to a ſong, the notes whereof move eaſily and gracefully, giving the performer as little trouble as poſſible; as when it is not carried too high, or ſunk too low, whereby the voice or inſtrument is in no wiſe forced or ſtrained. Vid. *Broſſ.* Muſ. Dict. in voc.

NATURAL *harmony*, is that produced by the *natural* and eſſential chords of the mode. See MODE.

NATURAL *note*, is uſed in oppoſition to ſharp and flat notes, which are called artificial. See NOTE and SCALE.

The *natural note* ♮, is uſed to contradict thoſe flats and ſharps that are ſet at the beginning of a ſtaff; and, in ſuch caſe, you muſt take the *natural note* as it is in the gamut.

NATURAL *muſic*, *muſica naturale*, among the Italians, is uſed to ſignify muſic formed by the organs of the human voice, unaſſiſted by inſtruments or other artifices.

Natural muſic is more peculiarly uſed to denote a ſong that proceeds in the *natural* order of the notes, without flats or ſharps.

NATURALIZATION *(Cycl.)* — By our ſtatutes, foreign proteſtants are *naturalized* by reſiding ſeven years in the Britiſh colonies in America. 13 Geo. II. c. 7.

NAVAGIUM, in our old writers, a duty incumbent on tenants to carry their lord's goods in a ſhip. *Liberi ſint ab omni carriagio*, navagio, &c. *Blount.*

NAVALIA, among the Romans, were docks or ports where ſhips uſed to be laid up after building.

NAVALIA likewiſe ſignified the wharfs or keys at Rome, where the ſhips uſed to load and unload their goods, all which were near the Sublician bridge. *Pitiſc.* in voc.

NAUCRARI, Ναυκραροι, among the Athenians, a deſignation given to the chief magiſtrates of the δημοι, boroughs or townſhips, which were likewiſe called ναυκραριαι, becauſe each of them were obliged, beſides two horſemen, to furniſh out one ſhip for the public ſervice. *Pott.* Archæol. Græc. l. 1. c. 13. T. 1. p. 78.

NAVE *(Cycl.)* — NAVE *of a wheel* is that ſhort thick piece in the center of the wheel, which receives the end of the axle-tree, and in which the ends of the ſpokes are fixed; it is bound at each end with hoops of iron, called the *nave-bands*: it has likewiſe in each end of the hole, thro' which the end of the axletree goes, a ring of iron called the *wiſher*, which ſaves the hole of the *nave* from wearing too big.

NAVEL *(Cycl.)* — NAVEL-*ſtring.* It is a method univerſally received by prudent ſurgeons and midwives, to make an exact ligature upon the umbilical cord or *navel-ſtring* of the new-born infant, leſt it ſhould bleed to death thro' the veſſels which compoſe it. This ligature is to be made, as ſoon as the infant and after-burthen are delivered, with a ſtrong thread of about an ell long, folded together four times; and having made a knot at one end, it is then to be paſſed twice round the *navel-ſtring*, at about two or three fingers breadth from the abdomen, and afterwards tied with a double knot: this done, the cord leading to the placenta may be divided with a pair of ſciſſars below the ligature, and the wounded part belonging to the infant dreſſed with lint, after which it may be left to the nurſe till it becomes dry, and falls off of itſelf.

There have been inſtances of ſome children receiving no harm from the cutting the *navel-ſtring*, without the ceremony of the ligature; but as there have alſo been too many inſtances of their dying by the omiſſion, and as the operation is ſo eaſy, the midwife is unpardonable who omits it. *Heiſter's* Surgery, p. 22.

Dr. Schulze contradicts the common opinion concerning the umbilical veſſels: he endeavours to prove, that the *navel* is not formed by the ligature which the midwives make, or by animals gnawing the *navel-ſtring* of their young with their teeth, but by nature; and that the umbilical veſſels ſeparate ſpontaneouſly, or with very little force, from the interior ſurface of the ſkin; after which, the umbilical veſſels within the young creature's body contract and ſhrivel, their extremity by which they adhered to the *navel* becoming black and pointed, as if they had been burnt, and at laſt diſappear altogether: for, ſays he, what are commonly deſcribed as theſe veſſels changed into ligaments, are no other than the ſheaths in which they were formerly contained. From this doctrine he concludes, that it is unneceſſary to make any ligature upon the *navel-ſtring* after birth.

In confirmation of this, Dr. Eller relates ſeveral inſtances of the *navel ſtrings* of children being left untied after they were cut, without being attended with any hæmorrhage, or other bad conſequence. Commerc. Norimb. 1733. Hebd. 48. §. 2.

Mr. Monro is of opinion, that the fœtus in viviparous animals receives its nutrition from the umbilical veſſels alone. See FOETUS.

It has been obſerved, that in blowing into the placenta by the umbilical veſſels, the air and the blood were eaſily forced out of it, by that ſurface of the placenta which is affixed to the uterus; but that they could by no means be driven out at the other

other ſurface which is toward the fœtus. Hence it is to be obſerved, that the uterus appears not to be covered by any membrane within, and that the placenta alſo has none on that ſide where it adheres to the womb, ſo that there is nothing to prevent the blood from readily flowing from the uterus into the placenta, and thence to the child. What we uſually underſtand by the word membrane is a covering of ſo cloſe a texture, as to keep out air, or fluids; and it is very evident to reaſon, that the placenta ought to have none ſuch on that part where it is to communicate with the uterus; neither can the eye diſcover any ſuch there, though on the other ſide it is eaſy to diſtinguiſh one.

The *navel-ſtring*, beſide its vein, and its two arteries, is compoſed of a ſpongy ſubſtance, in which theſe blood veſſels are lodged; this ſpongy ſubſtance is compoſed of a number of cellules which communicate with one another, and contain a glutinous liquor, which is uſually found in them in great abundance: if we conſider the *navel-ſtring* as a cylinder, the blood veſſels run in a ſpiral round its axis, and are laid one over another, but that differently in different ſubjects; hence it is that the *navel-ſtring* is tortuous.

When the veſſels have run through the whole length of the *navel-ſtring* in the ſame diameter, they break into a number of branches, and enter the placenta, where they afterwards divide themſelves into capillary ramifications. The diameter of the vein is all the way double to that of both the arteries; ſo that it contains twice as much blood as the two arteries togegether. If the *navel-ſtring* were only compoſed of theſe three veſſels, the fœtus, in moving, might eaſily compreſs them in ſuch manner, as to ſtop the current of the blood, and its inevitable death muſt be the conſequence of this; but nature having provided this ſpongy, or cellular ſubſtance, for their lodgement, this is able to give way to them, when preſſed in any direction, and enables them, therefore, to bear a conſiderable force, without the current of the blood being ſtopped by them in it; nor is the glutinous liquor, of which thoſe cells are full, of little uſe in lubricating theſe veſſels. Mem. Acad. Par. 1714.

NAVEL-*wort*, *cotyledon*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is compoſed of one leaf, faſhioned into a bell-ſhape, with a long tube, and divided into ſeveral ſegments at the end: from the center of the cup there ariſes a piſtil, which perforates the bottom of the flower, and ripens afterwards into a fruit compoſed of ſeveral ſmall ſheaths of capſules, collected into a ſort of head, and all opening at their tops, and uſually containing an extremely minute ſeed.

The ſpecies of *cotyledon* enumerated by Mr. Tournefort are theſe: 1. The common kind called wall *navel-wort*, and *umbilicus veneris*. 2. The great Portugal kind. 3. The yellow-flowered kind, with a long, tuberoſe, and creeping root. 4. The middle-ſized *cotyledon*, with a yellow flower. 5. The ſhrub, African *cotyledon*, with round leaves, bordered with an edge of purple, uſually called the round-leaved, hoary, African *ſedum*, or *houſeleek*. 6. The thick, or cylindric-leaved, African *cotyledon*, with beautiful purple flowers, known alſo to many under the name of a *ſedum*, or *houſeleek*. 7. The long-leaved, African *cotyledon*, with fibroſe roots, and umbellated flowers. 8. The fibroſe-rooted, ſea *cotyledon*, with houſeleek leaves, and fleſh-coloured flowers. Theſe are the genuine ſpecies of *cotyledon*, but authors who have leſs accurately examined plants, have ranked under this name ſeveral which are ſpecies of houſeleek, of geum, and of ſaxifrage. *Tourn.* Inſt. p. 90.

The *cotyledons*, when not in flower, may uſually be known by having thick, tuberoſe roots, and thick or fatty roundiſh leaves. Theſe, however, are found to be no certain characters, as there are plants truly of this genus, which have long leaves, and fibroſe roots.

NAVETTE, the name by which moſt of the European nations call the *napus*, or *bunias ſylveſtris* of Lobel, the plant from the ſeeds of which the oil which we call rape oil, and the French and others *navette* oil, is expreſſed. The plant is cultivated in many parts of England, and in other countries, for the ſake of the ſeed; the oil drawn from this is uſed by many artificers, and is of a fine yellow colour, and the ſmell is not offenſive. *Lemery* Dict. of Drugs.

NAVICULA, in natural hiſtory, a name given by a late French author to the claſs of ſhells called by us the *nautili*. See NAUTILUS.

NAVIGATION (*Cycl.*) — *Sub marine* NAVIGATION, or the art of ſailing under water, is mentioned by Mr. Boyle as the deſideratum of the art of *navigation*. This was attempted, and ſucceſsfully, according to him, by Cornelius Drebbel; ſeveral perſons who were in the boat breathing freely all the time. *Boyle's* Works, abr. Vol. 1. p. 130.

NAVIGATOR, in the ſea language, uſually denotes a perſon capable of carrying, or guiding a ſhip to any place deſired.

NAULIUM, in antiquity, a muſical inſtrument otherwiſe called *nablum*. See NABLUM.

NAULUM, among the Romans, properly ſignified freight; whence it is uſed to denote a piece of money put into the mouth of a perſon deceaſed, to pay Charon the ferry-man for his paſſage: this piece was to be of the current coin of the emperor then reigning; ſo that from it the time of the perſon's death may be known. *Danet.* in voc.

NAUPLIUS, in natural hiſtory, a name by which ſome authors have called the *nautilus*, as well the papyraceous, as the chambered kind. See NAUTILUS.

NAUTICUS (*Cycl.*) — NAUTICUS, in natural hiſtory, a name given by ſome to the *nautilus*. See NAUTILUS.

NAUTILUS, (*Cycl.*) in natural hiſtory, the name of a genus of ſhell-fiſh, the characters of which are theſe: it expreſſes, in general, in every ſpecies, the figure of a boat, or veſſel, made for ſwimming on the water; but in the different ſpecies, it is of very different figures, roundiſh, or oblong, thin, or thick, furrowed, or ſmooth, and ſometimes is auriculated, ſometimes not. Bonani obſerves that this genus of ſhell-fiſh is very well named from the Greek ναυτίλος, which ſignifies both a fiſh, and a ſailor, for that the ſhells of all the *nautili* carry the appearance of a boat, or ſhip, with a very high poop.

Different authors, among the antients and moderns, have called the *nautilus* by the names of *pompilus*, *nauplius*, *nauticus*, *ovum polypi*, *polypus teſtaceus*, and the French call it *le voilier*. It is ſuppoſed that men firſt learned the method of ſailing in veſſels, from what they ſaw practiſed by this creature.

We at preſent know two diſtinct genera of *nautilus*, the thin and the thick-ſhelled *nautilus*. The firſt is called *nautilus papyraceus*, and its ſhell ſeems indeed no thicker, or ſtronger, than a piece of paper, when out of the water. This ſpecies is not at all faſtened to its ſhell, but there is an opinion as old as the days of Pliny, that this creature creeps out of its ſhell, and goes on ſhore to feed. When this ſpecies is to ſail, it extends two of its arms on high, and between theſe, ſupports a membrane, which it throws out on this occaſion; this ſerves for its ſail, and the two other arms it hangs out of the ſhell, to ſerve occaſionally either as oars, or as a ſteerage; but this laſt office is generally ſerved by the tail. When the ſea is calm, it is frequent to ſee numbers of theſe creatures diverting themſelves with ſailing about in this manner; but as ſoon as a ſtorm riſes, or any thing gives them diſturbance, they draw in their legs, and take in as much water as makes them ſomewhat heavier than the ſea water in which they ſwim, and they then ſink to the bottom. The manner of their voiding this abundant water when they would riſe again, is by a number of holes, of which their legs are full. Hiſtoir. Natur. Eclair. Part. 2. p. 248.

The other *nautilus*, whoſe ſhell is thick, never quits that habitation. This ſhell is divided into forty, or more partitions, which grow ſmaller and ſmaller as they approach the extremity, or center of the ſhell: between every one of theſe cells, and the adjoining ones, there is a communication, by means of a hole in the center of every one of the partitions. Through this hole there runs a pipe, which is of the whole length of the ſhell. It is ſuppoſed by many that the fiſh occaſionally changes the place of its reſidence, by removing from one to another of theſe cells, through this pipe in the little hole; but this is by no means probable, as the body of the fiſh muſt neceſſarily be cruſhed to death, if it were poſſible to make it paſs through ſuch a hole. It ſeems, therefore, much more probable, that the fiſh occupies always the largeſt chamber in its ſhell, that is, it lives in the cavity between the mouth and the firſt partition; and that it never removes out of this, but that all the apparatus of cells, and a pipe of communication which we ſo much admire, ſerves only to admit occaſionally air, or water, into the ſhell, in ſuch proportion as may ſerve the creature in its intentions of ſinking or ſwimming. *Rumphius*, p. 17. fig. b.

Ariſtotle has evidently deſcribed two ſpecies of *nautili*, and ſome authors have thought he deſcribed three; of this number is Bellonius, whom Rondeletius treats very ſeverely for the error of this opinion; but it is cuſtomary with Rondeletius to be ſevere upon Bellonius. *Bonani*, p. 89.

Some authors call this ſhell *concha margaritifera*; but this can be only on occaſion of the fine colour of its inſide, which is more beautiful than any other mother of pearl; for it has not been obſerved that this ſpecies of fiſh ever produced pearls.

It muſt be obſerved that the polypus is by no means to be confounded with the paper-ſhelled *nautilus*, notwithſtanding the great reſemblance in the arms and body of the encloſed fiſh; nor is the cornu ammonis, ſo frequently found foſſile, to be confounded with the thick-ſhelled *nautilus*, though the concamerations, and general ſtructure of the ſhell is alike in both, for there are great and eſſential differences between all theſe genera. See the article CORNU *Ammonis*, &c.

The three principal differences of the *nautilus* claſs are, that ſome are papyraceous, ſome are auriculated, and ſome are umbilicated. *Rondelet.* p. 98.

The ſeveral known ſpecies of *nautilus* are theſe: 1. The great, ſmooth, and thick *nautilus*. 2. The little *nautilus*, with a ſmooth and thick ſhell. 3. The ſmooth, and thick, umbilicated *nautilus*. 4. The common, concamerated *nautilus*. 5. The furrowed, and empty *nautilus*, with no diaphragms, or ſeparation within. 6. The thin, and flatted, papyraceous *nautilus*. 7. The auriculated *nautilus*, with a wider ſhell. 8. The undulated, and furrowed *nautilus*, with dents on each ſide the edge. 9. The *nautilus* with a ridged and ſerrated back. This laſt ſpecies is often found in the cabinets without

out its outer coat, and the ſhell then looks all over like the moſt beautiful mother of pearl. Hiſt. Natur. Eclair. Part. 2. p. 249. See Tab. of Foſſils, Claſs 9. and Tab. of Shells, N° 8.

NEALED, at ſea, is uſed when the ſounding is deep water cloſe to the ſhore: it is then ſaid to be *nealed to*; as alſo when the ſhore is ſandy, clayey, ooſy, or foul and rocky.

NEAPOLITAN *diſeaſe*, a name given by many authors to the venereal diſeaſe; and from hence came the name of the *Neapolitan* ointment, which is a mixture of quickſilver, and other things into an ointment, intended as a cure for it.

NEAR, or *No* NEAR, at ſea, a word of command from him that conds the ſhip, to the man at the helm, requiring him to let her fall to the leeward.

NEBEL, in the Jewiſh antiquities, a kind of muſical inſtrument See NABLUM.

NEBRITES, in natural hiſtory, a name given by the antients to a ſtone held ſacred to Bacchus. It was of the browniſh yellow colour of the ſkin of the young fawn, with ſome variegations, and was ſemi-pellucid: it ſeems to have been the ſame with ſome of our agates, with a yellow ground; the antients, however, do not appear to have been very determinate in their accounts of it, for Pliny mentions another kind of it, which was black.

NEBRUS, in natural hiſtory, a name given by the antients to the *hinnuleus*, a deer of one year old. In the next year it is called *pattalia*; in the third *dicrota*; and in the fourth *cladii*; the word *ceraſtæ* was uſed as the name of this animal when of a greater age than this.

NEBULGEN, a word uſed by ſome of the chemical writers to expreſs what they call a ſalt generated by the moiſture of the air falling upon ſtones in the fields, and there indurated by the heat of the ſun into the form of a dry ſalt.

NECESSARIO, in the Italian muſic. This word is prefixed to certain parts in muſic, as *a doi violini neceſſario*, i. e. that muſt be played by two violins; *canto neceſſario* is uſed to ſignify much the ſame as *concertante*. See CONCERTANTE.

Every mode has certain chords, which may be called its neceſſary, or eſſential chords. Vid. *Broſſ.* Dict. Muſ. in voc.

NECHIASECH, an obſcure word coined by Paracelſus, and very frequently uſed by him, and his followers; he ſeems to underſtand by it ſaline, corroſive, and corroding particles.

NECK (*Cycl.*) — There are ſeveral ſorts of wounds in the *neck*; ſometimes the ſeat of the wound is only in the common integuments, and muſcular fleſh; this is attended with very little danger: but the moſt dangerous, and, indeed, generally incurable wounds, are thoſe of the larger blood veſſels in theſe parts: ſuch are thoſe of the jugular veins, and carotid and vertebral arteries; or where the aſpera arteria is wounded, or the gula, the medulla ſpinalis, the nerves that deſcend by the *neck*, or when ſeveral of theſe parts are wounded at the ſame time.

Wounds of the arteries of the *neck* are ſcarce ever to be remedied. The patient uſually bleeds to death, before a ſurgeon can be had in theſe caſes; but even if the ſurgeon were preſent at the inſtant the wound was inflicted, the largeneſs of the arteries, their vicinity to the heart, and the impoſſibility of making a ſufficient preſſure upon the wounded veſſel in this part, give but little hope of relief.

Wounds in the external jugular veins are not of great danger, if a ſurgeon be applied to in time; but wounds in the internal jugulars are very dangerous, partly from their ſize, which is of the thickneſs of one's finger, and, partly from their ſituation, which is ſo deep that no proper application can reach them to any advantage. Wounds in this vein are uſually eſteemed mortal, but it is ſometimes poſſible to ſave life in this caſe.

Wounds of the aſpera arteria, or windpipe, are uſually deemed mortal, where the windpipe is entirely divided, or is wounded in its lower part, within the cavity of the thorax, or joined with a wound of the carotid arteries, or internal jugulars, which is frequently the caſe: but if the windpipe is only wounded in its fore-part, and the neighbouring veſſels remain unhurt, it is uſually found curable.

Wounds of the gula, or œſophagus, afford very little hopes of recovery, where it is much wounded, or entirely divided, becauſe, in this caſe, not only the office of deglutition is cut off; but the part is ſo ſituated that it is impoſſible almoſt to wound it, without injuring, at the ſame time, ſome of the neighbouring nerves, and blood veſſels. But when the gula only is wounded, and the wound ſmall, there is ſome hope of a recovery.

Wounds in the medulla ſpinalis, in one part, are very dangerous, but more particularly ſo when inflicted on that part of it which preſſes through the neck. It is no wonder, therefore, that ſcarce any recover after a conſiderable wound of this kind; which it is impoſſible ſhould happen without wounding the vertebral veins and arteries at the ſame time; and the ſituation of the part is ſuch that it is impoſſible to convey proper remedies to them. Nor are wounds of the large nerves of the neck leſs dangerous than theſe; for, if they are divided, the parts of the thorax and abdomen to which nature has determined them, immediately loſe their aſſiſtance, and of conſequence become unequal to the offices for which they were intended.

For the cure of wounds in the *neck*, the method is as different as the nature of thoſe wounds. Where the integuments, and muſcular fleſh alone are wounded, the common method of curing ſlight wounds takes place. Where the external jugular is hurt, the ſame methods uſed after bleeding in that vein prove ſufficient. When the internal jugular has received a ſmall wound, the hæmorrhage will be eaſily ſtopped by filling the wound well with dry lint; or with the puft ball, or duſty muſhroom; lodging, over theſe applications, ſquare bolſters, and ſecuring all with a bandage, drawn as tight as the nature of the part will admit. Where this method does not take place, the ſurgeon ſhould make a proper preſſure on the wounded part with his finger, till the hæmorrhage is entirely ſtopped. The ſame methods muſt be uſed to the wounds of the vertebral veins; and when the hæmorrhage is once ſtopped, the dreſſings applied are not to be removed for three days, and then a vulnerary balſam and plaiſter applied to heal the wound. In large wounds, or an entire diviſion of the internal jugular, the ſurgeon, if preſent in time, ſhould make a firm preſſure with his finger on the wounded part, and make inciſions, lengthways, above the wound, till he can get at the veſſel, and then make a firm ligature upon it, by the aſſiſtance of a crooked needle.

In caſe of a wound of the carotid artery, a ſurgeon, if preſent in time, ſhould uſe the ſame method as in thoſe of the internal jugular vein. This method is more likely to have ſucceſs in wounds of the upper and middle part of that veſſel, than in thoſe of the lower part of it; and where the wound is not in the trunk of the artery, but in one of its branches near the head, you ſhould fill up the wound with lint dipt in ſome ſtyptic liquor, and then cover it up with thick compreſſes, ſecuring all with a tight bandage, and ordering an aſſiſtant to make a preſſure upon the part with his hand, for ſome time after: and, in theſe caſes, the dreſſings are not to be removed till the third or fourth day.

In curing the wounds of the aſpera arteria, the ſurgeon ought to clean the wound, and then endeavour to unite the parts by the help of ſticking plaiſters; or where the wound is large, by making two ſtitches with a crooked needle, dreſſing up the wound afterwards in the uſual manner, and enjoining the patient to keep his head in a proper ſituation, that is, ſomewhat bending downwards. The wound, thus treated, if it has been made either by puncture, or by the cutting of a ſharp inſtrument, will eaſily heal; but if it has been made by a bullet, and any part of the aſpera arteria is carried away, the ſuture is to no purpoſe; wounds of this kind are only to be dreſſed with the vulnerary balſams. If the aſpera arteria is entirely divided, and the lower end of it has ſhrunk into the cavity of the thorax, ſo that it cannot be laid hold on, there can be no remedy.

When the œſophagus is wounded, what is taken in at the mouth comes out through the wound, and the patient is uſually affected with hiccoughs and vomitings. Where this is entirely divided, there is no remedy; but where it is only perforated or wounded in part, the cure may be attempted by dreſſing it with the vulnerary balſams, endeavouring to unite it by means of ſticking plaiſters, and enjoining the patient a ſtrict abſtinence for ſome days, and giving nouriſhing glyſters of broth, milk, &c. If nouriſhment muſt be taken at length by the mouth, the wound muſt be perfectly cleaned every time afterwards, and be dreſſed daily till it heals. Wounds of the medulla ſpinalis are beſt dreſſed with balſam of Peru, or medicines of a like nature, mixed with a ſmall quantity of honey of roſes, and ſpread upon pledgits, and applied moderately warm. Slight wounds of this kind are ſometimes healed by this means; but large ones in this part always bring on certain death. *Heiſter* Surg. p. 74.

In the Memoires de l' Acad. royale des Sciences, Ann. 1730. we have ſome curious obſervations by Mr. Winſlow on the motions of the *neck*, as alſo on thoſe of the head and ſpine.

NECK, in the manege. See CARRYING.

NECK *of the caſcabel*, in artillery, is that part betwixt the breech mouldings, and the *caſcabel*.

NECK *of a gun* is that part betwixt the muzzle mouldings, and the Corniſh ring.

NECOPHORON, in botany, a name uſed by Pliny, and other authors for the *ſmilax aſpera*, or *rough bindweed*. *Ger.* Emac. Ind. 2.

NECROLIUM, a word uſed by ſome of the alchemical writers to expreſs a remedy almoſt always capable of averting death, and continuing life to its utmoſt period.

NECROSIS is uſed by many of the medical writers for a mortification.

NECTAR (*Cycl.*) is uſed by ſome of the antients to expreſs honey. This ſignification of the word was owing to the ſuppoſition that honey was the drink of the bees, as they eſteemed the yellow matter collected on their thighs to be their food. They called the latter ambroſia. It ſeems that the antients have been more in the right as to their opinion of the ambroſia than other authors, who have uſually eſteemed that yellow ſubſtance to be true wax. But it appears from experiments that it is not really ſo; nor can wax be ſeparated from it by any of the known proceſſes of chemiſtry. It ſeems rather that the bees eat it, agreeably to the opinion of the antients, and that after having ſerved them as nouriſhmment, it is converted

in their bowels into the ſubſtance we call wax. *Reaumur*'s Hiſt. Inſ. Vol. 10. p. 50. See HONEY.

NECTARINE, a fruit greatly eſteemed for its delicious flavour, and ſuppoſed to have its name from the nectar of the Gods, in heathen ſtories.

It differs in nothing from the peach, but in having a ſmoother ſkin, and a firmer pulp. See PEACH.

We have ten kinds of *nectarine* cultivated by the curious in gardening.

1. *Fairchild's early nectarine*; this is a ſmall fruit of a red colour, and very well taſted, and ripens in July, the earlieſt of all this kind

2. The *Elruge nectarine*; this is a larger fruit, of a purple colour on that ſide which was toward the ſun, and of a greeniſh yellow on the other parts. This is a very well flavoured *nectarine*, of a ſoft, melting juice, and parts from the ſtone: it ripens toward the end of July.

3. The *Newington nectarine*; this is a fair large fruit, of a fine red toward the ſun, and of a yellowiſh green toward the wall. It has a very rich juice, but the pulp adheres to the ſtone: this ripens in Auguſt.

4. The *ſcarlet nectarine*; this is of a fine glowing red toward the ſun, and of a pale red toward the wall; it ripens in the end of July.

5. The *Brugnon*, or *Italian nectarine*; this is a fair, large fruit, of a deep red next the ſun, but of a ſoft yellow next the wall. The pulp is firm, and of a rich flavour, but cloſely adheres to the ſtone, and is red in that part: this ripens in the middle of Auguſt.

6. The *Roman red nectarine*; this is a very fair large fruit, of a deep purple toward the ſun, and of a greeniſh yellow next the wall. The pulp is very firm and well taſted, but it is red about the ſtone, and adheres firmly to it: this is ripe in the middle of Auguſt.

7. The *Murry nectarine*; this is a middle-ſized fruit, of a dirty red next the ſun, and of a greeniſh yellow next the wall. The pulp is tolerably well flavoured: this ripens in the middle of Auguſt.

8. The *golden nectarine*; this is a fair handſome fruit, of a ſoft red next the ſun, but of a gold yellow next the wall, and its pulp is very yellow, but of a faint red about the ſtone to which it adheres: it is a very well-flavoured kind, and ripens at the end of September.

9. *Temple's nectarine*; this is a very fine kind: it is of a ſoft red toward the ſun, and of a yellowiſh green next the wall. It parts from the ſtone, and is of a very rich flavour; the pulp is white in other parts, but yellowiſh about the ſtone: this ripens in the middle of September.

10. The *Peterborough nectarine*, called by ſome the late, green *nectarine*; this is a middle-ſized fruit, of a pale green colour toward the ſun, and of a whitiſh green toward the wall; the pulp is firm, and well-flavoured: it ripens toward the end of September.

The pruning, planting, and whole culture of this plant is the ſame with that of the peach. *Miller*'s Gard. Dict. See the article PEACH.

NECTARIUM, among botaniſts, expreſſes what is only a part of the corolla, ſometimes, though more rarely the whole. It is a part deſtined for the reception of the honey juice of the plant; and is very various in its figure. Sometimes, it is only a hollow in a petal; ſometimes, it is a little ſquamma; ſometimes a tubercle; and ſometimes a plain tube.

NECUIA, in botany, a name given by the antient Greeks to a ſpecies of *mullein*. See MULLEIN.

The Greeks and Romans both uſed the ſtalks of a peculiar kind of *mullein*, called *thryallis* by Nicander. For the making the wicks of lamps, we have a kind of *mullein* called *lychnites*, and candle-wick *mullein*, from the λυχνίτες of Dioſcorides; but it is not certain that ours is the ſame plant.

The antients uſed the ſtalks of many different plants for the wicks of their candles, and lamps. The ruſh ſtripped of its bark was as commonly in uſe with them, as with us, for this purpoſe; and they alſo uſed the nettle, this *mullein*, and many other plants, whoſe ſtalks were compoſed of tough filaments, for the ſame purpoſe; beating them out like hemp, and when dry, dipping them in melted reſin, and other ſuch inflammable ſubſtances. When thus prepared, they were readily inflammable, like our flambeaux, and this *mullein* having ſtalks more long, and large, and more firm than all the others, was uſed to make thoſe lights with which they ſet fire to the funeral pile for conſuming the aſhes of their dead friends.

NEEDLE (*Cycl.*) — NEEDLE, in ſurgery. It is to be obſerved, that *needles* of ſilver pierce more eaſily in ſtitching arteries after an amputation, than thoſe made of ſteel. *Monro*, in Med. Eſſ. Edinb. Vol. 5. Art. 41.

NEGATIVE (*Cycl.*) — NEGATIVE *power*, in algebra, is uſed for thoſe powers of a quantity which have a negative ſign. Thus a^{-m} is called a negative power. *Negative* powers ariſe from the diviſion of any power of a quantity, by a greater power of the ſame quantity. Thus, $\frac{a^4}{a^6} = a^{4-6} = a^{-2}$; and in general, $\frac{a^m}{a^{m+n}} = a^{-n} = \frac{1}{a^n}$ for $\frac{a^m}{a^{m+n}} = \frac{1}{a^n}$. See POWER, *Cycl.* and *Suppl.*

NEGATIVE *ſign*. The uſe of the *negative ſign*, in algebra, is attended with ſeveral conſequences that at firſt ſight are admitted with difficulty, and has ſometimes given occaſion to notions that ſeem to have no real foundation. This ſign implies that the real value of the quantity repreſented by the letter to which it is prefixed, is to be ſubſtracted; and it ſerves with the poſitive ſign, to keep in view what elements or parts enter into the compoſition of quantities, and in what manner, whether as increments, or decrements, (that is, whether by addition or ſubſtraction) which is of the greateſt uſe in this art.

In conſequence of this, it ſerves to expreſs a quantity of an oppoſite quality to the poſitive, as a line in a contrary poſition; a motion with an oppoſite direction; or a centrifugal force in oppoſition to gravity; and thus often ſaves the trouble of diſtinguiſhing, and demonſtrating ſeparately, the various caſes of proportions, and preſerves their analogy in view. But as the proportions of lines depends on their magnitude only, without regard to their poſition; and motions, and forces, are ſaid to be equal, or unequal, in any given ratio, without regard to their directions; and, in general, the proportion of quantities relates to their magnitude only, without determining whether they are to be conſidered as increments or decrements; ſo there is no ground to imagine any other proportion of $-b$ and $+a$, (or of -1 and 1) than that of the real magnitudes of the quantities repreſented by b and a, whether theſe quantities are, in any particular caſe, to be added, or ſubſtracted. It is the ſame thing to ſubſtract a decrement as to add an equal increment, or to ſubſtract $-b$ from $a-b$, as to add $+b$ to it: and becauſe multiplying a quantity by a *negative* number implies only a repeated ſubſtraction of it, the multiplying $-b$ by $-n$, is ſubſtracting $-b$ as often as there are units in n; and is therefore equivalent to adding $+b$ ſo many times, or the ſame as adding $+nb$. But if we infer from this, that 1 is to $-n$ as $-b$ to nb, according to the rule, that unit is to one of the factors as the other factor is to the product, there is no ground to imagine that there is any myſtery in this, or any other meaning than that the real magnitudes repreſented by 1, n, b, and nb are proportional. For that rule relates only to the magnitude of the factors and product, without determining whether any factor, or the product, is to be added, or ſubtracted. But this likewiſe muſt be determined in algebraic computations; and this is the proper uſe of the rules concerning the ſigns, without which the operation could not proceed. Becauſe a quantity to be ſubſtracted is never produced in compoſition, by any repeated addition of a poſitive, or repeated ſubſtraction of a *negative*, a *negative* ſquare number is never produced by compoſition from the root. Hence $\sqrt{-1}$, or the ſquare root of a *negative*, implies an imaginary quantity; and, in reſolution, is a mark or character of the impoſſible caſes of a problem, unleſs it is compenſated by another imaginary ſymbol, or ſuppoſition, when the whole expreſſion may have a real ſignification. Thus $1+\sqrt{-1}$, and $1-\sqrt{-1}$ taken ſeparately, are imaginary, but their ſum is 2; as the conditions that ſeparately would render the ſolution of a problem impoſſible, in ſome caſes deſtroy each other's effect, when conjoined. In the purſuit of general concluſions, and of ſimple forms for repreſenting them, expreſſions of this kind muſt ſometimes ariſe where the imaginary ſymbol is compenſated in a manner that is not always ſo obvious.

By proper ſubſtitutions, however, the expreſſion may be tranſformed into another, wherein each particular term may have a real ſignification, as well as the whole expreſſion. The theorems that are ſometimes briefly diſcovered by the uſe of this ſymbol, may be demonſtrated without it, by the inverſe operation, or ſome other way; and though ſuch ſymbols are of ſome uſe in the computations by the method of fluxions, its evidence cannot be ſaid to depend upon arts of this kind. See *MacLaurin*'s Fluxions, B. 2. ch. 1.

NEGRO (*Cycl.*) — Mr. Boyle has obſerved, that the heat of climates cannot be the true cauſe of the colour of *negroes*. For though the heat of the ſun may darken the colour of the ſkin, yet experience does not ſhew that heat is ſufficient to produce a true blackneſs, like that of *negroes*. In Africa itſelf many nations of Æthiopia are not *negroes*, nor were there any blacks originally in the Weſt Indies. In many parts of Aſia, under the ſame parallel with the African regions, inhabited by blacks, the people are but tawny. He adds, that there are *negroes* in Africa, beyond the ſouthern tropic, and that a river ſometimes parts nations, one of which is black, and the other but tawny. *Boyle*'s Works abr. Vol. 2. p. 42, 44.

Dr. Barrere alledges that the gall of *negroes* is black, and being mixed with their blood, is depoſited between their ſkin, and ſcarf ſkin. Diſſ. on the phyſ. cauſe of the colour of *negroes*.

We have a diſſertation on this head by Dr. John Mitchell of Virginia, in the Philoſophical Tranſactions, N° 476. Sect. 4. where he advances theſe propoſitions, and enters into a learned detail to ſupport them.

1°. The colour of white people proceeds from the colour which the epidermis tranſmits; that is, from the colour of the parts under the epidermis, rather than from any colour of its own.

2°. The ſkins of *negroes* are of a thicker ſubſtance, and denſer texture, than thoſe of white people, and tranſmit no colour through them.

3°. The part of the skin which appears black in *negroes*, is the *corpus reticulare cutis*, and external lamella of the epidermis: all other parts are of the same colour in them with those of other people, except the fibres which pass between those two parts.

4°. The colour of *negroes* does not proceed from any black humour, or fluid parts contained in their skins; there being none such in any part of their bodies, more than in white people.

5°. The epidermis, especially its external lamella, is divided into two parts by its pores and scales, two hundred times less than the particles of bodies on which their colours depend.

This is founded on Leuwenhoek's observation that a portion of the epidermis no bigger than what can be discerned by the naked eye, is divided into 125000 pores, and these pores must divide such a portion of the skin into as many particles. But the particles of bodies on which their colours depend, are, by Sir Isaac Newton's Optics, Lib. 2. P. 3. Prop. 7. 600 times less than these which can be discerned by the naked eye. Therefore the particles of the skin must be about 200 times less than these; since $\frac{125000}{600} = 208\frac{1}{3}$. It may also be observed that such a small portion of the epidermis is divisible into 250 scales, which must encrease the number of its parts.

6°. From these propositions, and from Sir Isaac Newton's theory of light and colours, the doctor thinks he may conclude, that the proximate cause of the colour of *negroes* is threefold; *viz.* The opacity of their skin, proceeding from the thickness and density of its texture, which obstructs the transmission of the rays of light, from the white and red parts under the skin, together with its greater refractive power, which absorbs these rays; and the smallness of the particles of this skin, which hinders it from reflecting any light.

7°. The influence of the sun, in hot countries, and the manner of life of their inhabitants, are the remote causes of the colour of *negroes*, Indians, &c. And the ways of living in use amongst most nations of white people, make their colours whiter than they were originally, or would be naturally.

In support of this proposition, the doctor observes, that the skin is deprived of its white colour, by the force and influence of the sun, four ways. 1st. By being rendered opaque, from a dissipation of its more aqueous, and pellucid juices. 2dly. By a concretion of its vessels and glandules, from this dissipation of their aqueous contents, which renders the skin both thicker and denser, or more callous and rigid. 3dly. By a new accretion of many new membranes, which render it thick and opaque. 4thly. By encreasing those parts or principles, in the composition of the epidermis, which have the greatest refractive power; as the terrestrial and fixed saline; but especially the tenaceous sulphureous, which refract and absorb light more strongly than any other substances; while the more transparent and pellucid principles, as the aqueous, spirituous, and volatile saline, are evaporated by the heat, which causes the other more fixed principles to be accumulated; and these particles being likewise more comminuted by the sun, will, on this account, be black; as happens to oil when well boiled. These causes, with those first-mentioned, may, the doctor thinks, by conspiring make the skin quite black; especially if we add another effect of the sun's power, a peculiar necrosis of the epidermis, occasioned by the forcible vibrations, contractions, and exsiccations of its fibres by the sun beams which cause it to turn black, as these, or other parts do, by the heat of an inflammation, or a fever, in gangrenes, black tongues, &c.

We cannot pretend to follow the author in all the detail of his observations on this subject, nor of his answer to a material objection already mentioned from Mr. Boyle, that the sun cannot be the cause of the colour of *negroes*, because several nations, in the same latitude with those *negroes*, are not made black by it. He seems to think the heat of Africa greater than that of other parts of the world. Whether it be so, or not, is we doubt, not easy to determine; but it would be a strong confirmation of his doctrine, if we could see any people, originally white, become black and woolly by transplantation, or vice versa.

NEGRO, in zoology, the name of a large bird approaching to the crane kind, and more usually known among authors by its Brasilian name *jabiru*. See JABIRU.

NELANJENUM, in natural history, the name of a curious and peculiar fossile substance found in the East-Indies.

It has much the appearance of some of our steel-grained lead ores, and is very ponderous, but it does not contain any lead; in this it approaches to the nature of that substance common in Europe, and called blende, or mock lead; but this last is foliated, and resembles the plated lead ores, whereas this resembles the close ground ores. It is found in the beds of rivers in many places; they calcine it, and, reducing it to powder, mix it with the juice of herbs, and use it in ulcers.

NELLA *corvindum*, in natural history, a name given by the people of the East-Indies to a very hard stone which they use as we do emery.

It is of a talcky nature, being composed of flaky spangles, and a coarser matter intermixed. They dig it at the foot of some mountains, and in some other places. It lies so near the surface that the rice-fields abound with it; and it is seen on stirring the ground. It is always found in nodules, or detached masses, and is usually of a sort of iron colour, though subject to some variations. It is used by the common people to scower arms, and other iron works; and by the lapidaries, among them, to polish rubies, and other stones. For this last purpose they grind it with stick lack, and make it into a sort of cement, with which they daub over the face of the polishing machine.

NELLON, in botany, a name given by some to rice. It is an Indian word, and properly signifies the grain of rice taken off from the stalks, but covered with its proper pellicle. The first operation to be performed upon this, is the beating it with large stones, or other more manageable tools, till this skin flies off. Then it is to be dried in the sun, and, after that beat a second time, to get off its thin, internal, redish coat: when this is done, it is in a state to be used, and it is then only that the Indians call it *arisi*, the word from which we formed our word rice. Observations sur les Coutumes de l'Asie.

NELUMBO, in botany, the name of a genus of plants, usually confounded with the nymphæa.

The characters of the *nelumbo* are these: The flower is like that of the nymphæa, but the fruit wholly different, not only in shape, but in structure, being not divided into several cells, but having the seeds placed irregularly, at distances from one another in it.

There is only one known species of this genus, which is the *nelumbo* of the Ceyloneſe, called by others the *Indian nymphæa*, and *faba Ægyptiaca*, the *Ægyptian bean*. *Tourn.* Inst. p. 261.

NENUPHAR. The antient writers on the materia medica, have all mentioned a peculiar species of this plant, under the name of *nenuphar indicum*. The roots of this they call *fel*, and Avisenna says, that they have the same virtues with the mandrake. *Fel* is also the name of another very different medicine used in those times; a fruit of a climbing plant, of the size and figure of a cucumber, as to stalks and leaves, but bearing for fruit this *fel*, which was a sort of nut of the size of a pistachea nut, and covered with a thick shell.

This *fel* was of the nature of the *bel* and *fel*, two other fruits of a like sort, all heating and drying. These were qualities altogether opposite to those of the mandrake; and the synonymous use of the word *fel* for these two things not having been observed, the author is accused of contradicting himself in different parts of his works, when, in reality, he is treating of contrary things, tho' unluckily called by the same name; the one a cold root, the other a hot fruit.

NENUPHAR, in botany, is also a name used by some authors for the *water-lilly*. *Ger.* Emac. Ind. 2.

NENUFARINI, a name given by the adepts to a kind of imaginary spirits which they suppose to inhabit the air, and to direct and govern many things on earth.

NEOCORI, Νεοκοροι, among the antients, persons whose business it was to take care of temples, and other consecrated places. They were otherwise called *æditui*. *Pitisc.* in voc. See the article ÆDITUUS.

NECŒNIA, Νεοινια, in antiquity, a festival celebrated in honour of Bacchus, when the new wine was first tasted. *Pott.* Archæol. T. 1. p. 416.

NEOMENIA, Νεομενια, in antiquity. See NUMENIA.

NEOPTOLEMIA, Νεοπτολεμεια, in antiquity, a festival celebrated by the Delphians with much pomp and splendor, in memory of Neoptolemus, the son of Achilles, who was slain in an attempt to sack Apollo's temple, which he undertook in revenge of his father's death, to which that god was accessary. *Pot.* Archæol. Græc. T. 1. p. 416.

NEOTTIA, in botany, the name given by Linnæus to the plant called by Tournefort and others *nidus avis*, and by Ruppius *corallorhiza*. *Linnæi* Gen. Pl. p. 434. See NIDUS *avis*.

NEPA, a word used by naturalists sometimes to express a *crab*, sometimes for a *scorpion*, and sometimes for a plant, called by the botanists *genista Spartium*.

NEPENTHES, in botany, the name of a genus of plants, the characters of which are these: the perianthium is divided into four roundish segments; there are no petals, and scarce any stamina; but four antheræ are affixed to the stylus near its top; the pistil has an extremely slender germen; the style is pointed, and of the length of the cup; and the stigma is obtuse; the fruit is an oblong, columnar, truncated capsule, faintly quadrangular, consisting of four cells, and made up of four valves. The seeds are numerous, pointed, and of a chaffy structure, and are shorter than the capsule. *Linnæi* Gen. Pl. p. 437.

NEPETA, *catmint*, in medicine. See CATMINT.

NEPHALIA, among the Greeks, a festival called the feast of sober men, at which the Athenians offered to the sun and moon, to Aurora and Venus, a drink made of water and honey. They burnt all sorts of wood on the occasion, except the vine and fig-tree. *Danet.* in voc.

NEPHRITICUM *lignum*, or NEPHRITIC *wood*. See TRANSMUTATION *of colours*.

NEPHRITIS, (*Cycl.*) in medicine, is used for an inflammatory affection of the kidneys, owing its origin to a stagnatory congestion of blood in them, which nature seems to have intended to direct to the internal, hæmorrhoidal vessels, thence to be discharged to ease her of the load of a plethora.

The simple *nephritis* is thus carefully to be distinguished from the

the calculoſe one; for the former may, for a long time, affect a patient without any thing of a ſtone being in the caſe; and, on the contrary, a ſtone may be long lodged in the kidneys, without its bringing on any ſuch complaint as the *nephritis*.

In the ſimple *nephritis* there is always a ſenſation of pain and heat about the loins, which is plainly perceived to lie deep within the fleſh, but is never very acute. On the contrary, in the calculoſe *nephritis*, the pain is violently ſharp.

In the ſimple *nephritis*, the urine, after it has ſtood ſome time, ſhoots to the ſides of the pot pellucid cryſtals of a rediſh colour. But, in the calculoſe, the heavy matter immediately precipitates itſelf to the bottom, and is ſabulous and gritty; and the ſimple *nephritis* is always greatly relieved by a gentle motion of the body, as walking, or the like; whereas all motion of the body exaſperates the calculoſe *nephritis*.

The *nephritis* is diſtinguiſhed alſo from the iſchiatic pains, which ſometimes run up to the ſame parts, by its being evidently perceived to lie deep within the fleſh, whereas thoſe pains affect the external muſcles; yet there is ſuch a connection and conſent of parts in theſe caſes, that not unfrequently the one is taken for the other.

Signs of it. Theſe are a pain in the region of the loins, which does not uſually affect both, but only, or, at leaſt, principally, one ſide, uſually the left. The pain is at firſt tenſive and dull, but afterwards becomes more acute; in the beginning it is often attended with a chillneſs, and general trembling, which is ſucceeded by a heat, and acrid gnawing, ſcarce to be ſupported; and this is uſually attended with a want of appetite, and loſs of ſtrength, and a continual, though not violent, thirſt. The ſleep is unſound, and there uſually is either a dull pain in the head, or a vertiginous complaint, more or leſs violent; and very frequently nauſeas, and reachings to vomit, attend the fits, or prognoſticate the acceſs of them.

The pain never extends itſelf down the whole thigh, nor is that ever wholly numb'd, or rendered torpid by it; and the diſorder does not ſeem continual, but attacks the patient at different times, and theſe after conſiderably long intervals, if he live regularly. The bowels are uſually coſtive at the time of the fits, and there is a frequent want of making water, though very little is voided at a time, and that thin, when the pain is violent; when it is more obtuſe, the urine is commonly thick, and has, as it were, threads in it, of a ſort of mucilaginous matter; and to this it is to be added, that ſometimes the ſpermatic veſſels which run to the teſtes become hard and tumid.

Men are more ſubject to this diſeaſe than women, and of thoſe, ſuch principally as are plethoric; and people in the middle and later periods of life, are, in general, more ſubject to it than thoſe who are younger. In general, young people are not ſubject to this diſeaſe, unleſs it be from an hereditary diſpoſition, or ſome very powerful, and violent, external cauſes. Men are much oftener tormented with the *nephritis* than women, and none ſo often fall into it as thoſe who have omitted the uſual evacuations, and afterwards fall into violent exerciſes; and finally, people who have the gout and the ſciatica, are uſually alſo *nephritic*.

Cauſes of it. Theſe are principally the ſuppreſſion of natural evacuations; or the omiſſion of habitual artificial ones; the abuſe of hot medicines of the diuretic kind, ſuch as the oils of turpentine, and juniper, and the balſam of ſulphur; as alſo the over frequent uſe of venery, and the taking medicines to provoke to it; violent paſſions, or great and fatiguing exerciſes; external injuries by blows, falls, or the like; and the uſe of a too hot diet, and too much of ſtrong liquors.

Prognoſtics. The ſimple *nephritis* may uſually be cured, if properly treated, but the calculous one ſcarce ever can; and tho' all inflammations of the internal parts are juſtly accounted very dangerous, yet this is the leaſt ſo of all others, becauſe the urine continually paſſing through the part, abſterges and cleanſes it, and prevents corruption, or gatherings of matter. The greateſt danger is in ſuch as have a diſpoſition to generate calculous matter, and to hectics. In theſe caſes the diſeaſe is apt ſoon to change from its ſimple nature.

It is very rare that both kidneys are ſeized with this diſtemper, but uſually the left alone ſuffers by it: the more inflammatory the ſtate of the body is, the worſe it is with perſons afflicted with this diſeaſe, and the more they are ſubject to it: thus young people who have often a turgeſcence of blood, are more frequently ſubject to this diſeaſe than old perſons, and are with more difficulty cured of it: and it is an obſervation as old as Hippocrates, that the coming on of hæmorrhages from the internal hæmorrhoids cures this diſeaſe.

Method of cure. In the time of the fit, the firſt thing to be done is the opening the belly by a clyſter of the emollient kind, prepared of milk or broth. Simon Pauli expreſly directs, from repeated experience of its good effects, a decoction of the herb veronica, or ſpeedwell, with ſome oil, and a little ſalt. After this, powders of nitre, cinnabar, and tartarum vitriolatum, ſhould be taken every three hours; and, towards the evening, there ſhould be mixed with one of theſe doſes, eight grains of diaphoretic antimony, and four of crab's eyes. Emulſions of the cold ſeeds in the cooling ſimple waters, are alſo of great uſe; and to the common ſeeds uſed on this occaſion, may be added thoſe of poppies, and of carduus mariæ. In the mean time external applications may alſo be uſed with ſome ſucceſs; ſuch as bags of chamomile, melilot, and fenugreek ſeed dry, and heated at the fire; as alſo the ſpirits of ſerpyllum, and the like, and the ſoap plaiſter: to all theſe may be added the uſe of leeches, which are, indeed, a great relief in all the diſtemperatures of the urinary parts; and, finally, during the whole courſe of the cure, refrigerating and diluting liquors are to be drank in large quantities, as barley water, tea, and the like.

After the fit, the neceſſary treatment to prevent a return, is to bleed regularly, ſpring and autumn; to take, at times, gentle purges of rhubarb, ſena, and the like; to keep the hæmorrhoidal diſcharges in their proper ſtate; and the habitual coſtiveneſs which uſually attends people in this diſeaſe is to be taken off by a moiſt aud lubricating diet; and wine, and ſtrong liquors, are to be avoided. *Junker's* Conſp. Med. p. 216, ſeq.

NEPHROMETRÆ, a name given by ſome authors to the muſcles of the loins, called by the generality of medical authors *pſoæ*.

NEPHROTOMY, in ſurgery, the cutting into the kidneys, in caſe of the ſtone being lodged there, and taking it out in the ſame way as from the bladder.

This is an operation which has been very little practiſed, and uſually ſuppoſed to be attended with very great danger: few authors who have treated of theſe diſeaſes have ſo much as mentioned this operation, and the few that have named it, have generally condemned it. Sinibaldus fancying that it was an operation antiently practiſed, ſtrove very earneſtly, indeed, to have it revived. He has called in the opinion of Hippocrates to ſupport his account of its having been done with ſafety, and adviſes the ſurgeons to try their hand on brutes firſt, and accuſtom themſelves to the operation, and then not to fear it in regard to men.

It is certain that a ſtone in the kidney is ſo terrible a diſeaſe, that it is very much to be wiſhed that ſome ſafe operation could be invented to cure it; but it is making too free with Hippocrates, to ſay that he countenances or directs ſuch an operation in general. His words ſeem to expreſs only the making an inciſion near the kidney; but even if they are to be underſtood as directing the cutting into it, it is under ſuch reſtrictions, that opportunities will very ſeldom offer; and, when they do, a common ſurgeon would not ſcruple performing all that is directed, without either conſulting Hippocrates, or trying his ſkill upon brutes. Hippocrates only adviſes it in caſe of a ſwelling and impoſthumation, where there is matter formed, and the tumor manifeſts itſelf upon the ſurface. In this caſe every ſurgeon would know it was his buſineſs to make an inciſion. Phil. Tranſ. N° 223. p. 334.

Caſes requiring this are frequent, and that even without a ſtone. An inflammation in a kidney degenerates into an abſceſs, and when matter is formed, the ſurgeon opens the tumor, and the matter is diſcharged. Sometimes ſtones bred in the kidneys cauſe impoſthumations; the ſurgeon opens theſe, and the ſtones are brought away together with the matter. Nay, nature herſelf has done the whole for ſome people, and the ſtones have made their way through the kidney, and through the integuments, &c.

Tulpius gives an account, from his own obſervation, of a man who had a ſtone in his kidney, which, after many years, diſcharged itſelf through the loins, and occaſioned a fiſtula in the part, through which the urine was long voided, together with the matter. The attempts of many ſurgeons to heal this fiſtula proved vain, and, at length, one ſucceeding ſo far as to ſtop up the mouth of the ulcer, the matter which uſed to be diſcharged from it was thrown into the abdomen, and the man died of a fever. Tulpius gives the death of this perſon as an objection againſt the operation of *nephrotomy* in general, as he ſuppoſes a ſimilar fate might attend the wounds made in theſe parts by the ſurgeon.

From an impartial examination of the works of Hippocrates, it does not appear that the cutting for the ſtone in the kidneys was regularly practiſed in his time, nor, indeed, for many ages after; for Celſus makes no mention of it, although he is very particular upon the operation of cutting for the ſtone in the bladder. Galen is ſo copious a writer, that he never miſſes any thing practiſed either in his own time, or before it, in his accounts of diſeaſes, yet he mentions nothing of this operation, though he is very long upon the article of the diſeaſes of the kidneys. Cardan, indeed, mentions this operation as one of thoſe of the antients which were practiſed in his time. His haſty reading the words of Hippocrates has led him into this error, and he lays the fault of its being now loſt, in a great meaſure, on Galen's omitting to mention it. It is wrong to accuſe Galen of this omiſſion, ſince neither Celſus, nor Ruffus, who preceded him, nor Aretæus who was his cotemporary, nor, indeed, any of the Greek or Latin phyſicians, have named it, though they, as well as the moderns, mention occaſionally an abſceſs in the kidneys, and the manner of curing it.

The Arabians, indeed, mention the operation as practiſed and countenanced by ſome perſons before their time; but they all join in condemning it as a bold and hazardous operation, from which very little good is to be expected, and which ſets the life of the patient in the moſt imminent danger. Aviſenna ſpeaks of it as the act of a madman, and, it ſeems, that it was ſometimes

ſometimes practiſed in his time, but by his manner of naming it, ſeems to have been only done by ſome mountebanks, who having no reputation to loſe, ventured boldly, and ſometimes had ſucceſs. The reſt of the Arabians are ſilent about the operation, and it ſeems to have been only practiſed by a few people in the days of this author, and wholly diſcountenanced afterwards, from its bad ſucceſs.

Among the moderns, the firſt who has named it is Rouſſet, in his treatiſe on the Cæſarian ſection. In order to invite men to countenance the Cæſarian operation, he recommends ſeveral other deſperate ones, and among the reſt, this of *nephrotomy*: but he is not able to produce one inſtance of its having been practiſed either in his own, or earlier times, but when there was an abſceſs and an external tumor. Cælius Rodeginus gives indeed a very remarkable inſtance of an operation of this kind being performed by chance, by a woman who, in the agony of her pain from the ſtone in the kidney, ſcratched with her own nails, till ſhe tore thro' the fleſh ſo deep, that eighteen ſtones were diſcharged at the wound.

The general opinion of authors is thus againſt the operation; and the moſt famed among thoſe who have treated of wounds of the kidneys ſay, that any wound which enters into the pelvis is mortal. Yet this opinion, tho' general, is not certain or determinate; and we have an account in the Philoſophical tranſactions of the operation of *nephrotomy* being performed with ſucceſs, by Marchetti of Padua, on Mr. Hobſon the Engliſh conſul at Venice. Phil. Tranſ. N° 223. p. 337.

NEPTA, a name uſed by ſome authors for the *aſphaltum*. It ſeems a corruption of *naphtha*.

NEPTUNE'S *cap*, a name given by naturaliſts to a remarkable ſpecies of marine fungus, which is never found affixed to any ſolid body, but always looſe, and rolling about at the bottom of the ſea. Its uſual ſize is about five inches in height, and ſix or ſeven in diameter at the baſe. It gradually becomes narrower from the baſe to the ſummit, where it terminates in a round end, ornamented with cluſters of a foliaceous ſort of ſubſtances, reſembling a cock's comb, but of the ſame matter with the reſt of the plant.

Its internal ſurface is very different from this: it is lightly furrowed down the ſides, and beſet with a number of ſmall protuberances, with obtuſe points. Some of theſe, when ſmall, are found with a pedicle growing to them. This is always of a very brittle ſubſtance, and it is probable that all thoſe found looſe had originally ſuch pedicles, by which they adhered to ſome ſolid body, in the manner of the corals, and other ſea plants; but that its extreme brittleneſs occaſions it to be ſoon broken off, by the motion of the water, after which the plant rolls looſe about, and takes in its nouriſhment at its ſeveral pores, by means of the water which every way ſurrounds it.

It is not probable that theſe and the like ſea plants are nouriſhed only by ſea water; but that there is in the ſea a ſort of mud continually formed out of the decayed particles of animals, and the ſofter vegetables, which may be ſuppoſed much to reſemble the common vegetable mold in its uſes, as it has much the ſame origin; and this, or at leaſt its finer and lighter parts, may be conveyed by water into the pores of theſe plants, and nouriſh them. Mem. Acad. Par. 1700.

NERANTZIUM, in botany, a name given by ſome of the Greek writers to the citron tree. The antient Greeks were not acquainted with the word, and it ſeems to have been formed in the barbarous ages from the word *narange*, the name by which the Arabian phyſicians called the ſame fruit.

NERFLING, in zoology, the name of a freſh water fiſh of the leather-mouth'd kind, common in ſome of the lakes in Germany, and there called alſo the *orff* or *oorve*, and ſeeming to be the ſame with the common Engliſh rudd. See RUBELLIO. There are two kinds of this fiſh, the fleſh of the one of which, when dreſſed, is white, and that of the other yelloviſh or redifh. The latter kind is moſt valued. *Willughby*'s Hiſt. Piſc. p. 252. *Geſner* de Piſc.

NERION, *oleander*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is compoſed of only one leaf, and is of the funnel-faſhion'd kind, and divided into many ſegments at the edge. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower: this finally becomes a fruit of a cylindric ſhape, compoſed of two pods, which contain ſeeds winged with down. See Tab. 1. of Botany, Claſs 20.

The ſpecies of *nerion* enumerated by Mr. Tournefort, are theſe: 1. The red-flowered *nerion*. 2. The white-flowered *nerion*. 3. The narrow-leav'd Indian *nerion*, with ſingle ſweet-ſcented flowers. 4. The broad-leaved Indian *nerion*, with ſweet-ſcented double flowers. 5. The broad-leaved Indian *nerion*, with ſweet-ſcented, double, variegated flowers: and, 6. The climbing American *nerion*, with tuberoſe briony-like roots. *Tourn.* Inſt. p. 654.

NERITA, a genus of ſhell fiſh, of the nature of the ſemicircular-mouth'd cochleæ, and comprehended under the general term *cochlea ſemilunaris*. See Tab. of Foſſils, Claſs 9. and SEMILUNARIS *cochlea*.

NEROPHIDION, in ichthyology, a name given by Schoneveldt, and ſome others, to that ſpecies of the *acus* or *ſyngnathus* of Artedi, which is called by that author the hexagonal-bodied *ſyngnathus* with the pinnated tail; and by others, the *acus Ariſtotelis*, and *acus ſecunda ſpecies*, and *typhle*; by ſome alſo, *blennus*.

NERVE (*Cycl.*) — The antients found, that by cutting, tying or compreſſing any *nerve*, or any other way intercepting its communication with the brain, the parts to which it belonged were immediately deprived of all ſenſe and motion. One remarkable inſtance of this is, the making an animal dumb by tying the *nerves* near the wind-pipe. We read in Galen, of a boy who became quite dumb by having both the recurrent *nerves* divided.

The experiment of cutting theſe *nerves* in brute animals, was repeated and confirmed by Veſalius; and Dr. Martin aſſures us, he tried it ſucceſsfully on a pig; nor did the animal recover its voice, as ſome have ſuſpected it might. As the voice depends on a proper aperture of the glottis, it ſeems likely that when the recurrent *nerves* are cut, the glottis will always ſtand open, and be incapacitated from being ſhut at the will of the animal. See Med. Eſſ. Edinb. Vol. 2. Art. 8.

An anonymous phyſician offers what he calls an *experimentum crucis*, in proof of the *nerves* being compoſed of cylindrical canals, containing a fluid: it is the demonſtration of the optic *nerve* inflated and dried, which appears canular to the naked eye. See Preſent State of Rep. Let. Vol. 12. Art. 16.

Wounds of the NERVES. Upon the diviſion of a *nerve*, the limb to which that *nerve* was extended becomes inſtantly rigid, void of ſenſation, and withers: ſo that it is no wonder that a man inſtantly expires, upon the diviſion of thoſe nerves which are ſent to the heart or diaphragm: a wound alſo is attended with great danger where the *nerve* is only partially wounded, and not entirely divided; for the wounded fibres contract themſelves, and thoſe which remain undivided ſuffer too great extenſion, which will bring on moſt violent pain, ſpaſms, convulſions, inflammations, and gangrenes, and ſometimes death itſelf. *Heiſter*'s Surg. p. 27.

NERVES *microſcopically examined*. Mr. Leuwenhoek endeavoured by his microſcope, to diſcover the ſtructure of the *nerves* in the ſpinal marrow of an ox: he ſaw there with great delight, minute hollow veſſels of an inconceivable firmneſs, inveſted with their proper membrane, and running out in length parallel to one another, and making up their compoſition: and tho' ſome hundreds of theſe veſſels go to the formation of the leaſt *nerve* that can be examined, he not only diſcerned the cavities in them, which he computed to be three times leſs than their diameters, but in ſome perceived the orifices as plainly as the holes in a pricked paper are to be ſeen when looked at againſt the ſun. It requires, however, great dexterity and expedition to make this examination with ſucceſs; for after a thin ſlice of the ſpinal marrow is placed before the microſcope, in leſs than a minute's time it becomes dry, and the whole appearance vaniſhes. *Baker*'s Microſcope, p. 145.

NERVOSE *leaf*, *nervoſum folium*, among botaniſts. See LEAF.

NESTLINGS, a name given to Canary birds brought up by hand. See CANARY and PASSERES *Canarienſes*.

NET (*Cycl.*) — The taking fowls by *nets* is the readieſt and moſt advantageous of all others, where numbers are to be taken.

The making the *nets* is very eaſy, and what every true ſportſman ought to be able to do for himſelf. All the tools neceſſary to it are wooden needles, of which there ſhould be ſeveral of different ſizes, ſome round, and others flat; a pair of round-pointed flat ſciſſars, and a wheel to wind off the thread. The packthread is to be of different ſtrength and thickneſs, according to the ſort of birds that are to be taken; and the general ſize of the meſhes, if not for very ſmall birds, is two inches from point to point.

The *nets* ſhould be made neither too deep nor too long, for they are then difficult to manage; and they muſt be verged on each ſide with twiſted thread. The natural colour of the thread is too bright and pale, and is therefore to be altered in many caſes, according to the occaſion.

The moſt uſual colour is the ruſſet: this is to be obtained by plunging the *net*, after it is made, into a tanner's pit, and letting it lie there till it be ſufficiently tinged; this is of a double ſervice to the *net*, preſerving the thread very greatly, as well as altering the colour. The green colour is given by chopping ſome green wheat, and boiling it in water, then ſoaking the net in this green tincture till it have ſufficient colour. The yellow colour is given in the ſame manner, with the decoction of celandine: this gives a pale and faint ſtraw colour, which is the colour of ſtubble in the harveſt time, and is juſt what is wanted. The brown *nets* are intended to be uſed on ploughed fields; the green on graſs grounds, and the yellow on ſtubble lands.

Great care is neceſſary in the preſerving of *nets*; and the principal thing to be conſidered in regard to this is, that all wet rots the threads: whenever they have been uſed in dew or rain, they muſt be hung up to dry in the ſun; and if there is any rent or breach made, it muſt be mended as ſoon as it is diſcovered. In the drying, they muſt be hung as far as may be from the walls, that they may be out of the way of mice and rats, which are very apt to deſtroy them. The utmoſt depth that ſhould be allowed to a *net* for fowl, is two fathom, and the utmoſt length ſix fathom.

The places for uſing fowling *nets* to moſt advantage, are the morning and evening haunts where the birds come to feed. The ſportſman is to be at the place at leaſt two hours before the time of their coming, and the *net* muſt immediately be

ſpread

ſpread flat and even upon the ground, and the two ends faſtened down with ſtakes. At the lower part there is to be a long cord fixed to the upper edge of the *net*, by means of which it may be immediately raiſed, and pulled over. The ſportſman is to hide himſelf behind ſome natural or artificial ſhelter, at the extremity of this line, and ſome cut graſs muſt be ſtrewed all over the *net* as it lies on the ground, to hide it from the fowl; and ſome live bird, that has been taken before, ſhould be ſtaked down before the *net*, by way of a ſtall, to draw in the others.

As ſoon as a ſufficient number of birds are within the compaſs of the *net*, it is to be pulled ſwiftly over them, and the fowler having taken thoſe that are under it, may ſtake down two or three more live ones, and ſpread the *net*, covering it with graſs as before. This ſort of ſport may be continued from as ſoon as it is light in the morning till an hour after ſun-riſe; but after that time, the birds have done feeding ravenouſly, and the ſport is over for that day.

Cinque-port NET, in fiſhery, a name given to a ſort of ſquare *net*, reſembling a cage, and having five entrances into it, from whence it has the name.

It is a very ſerviceable *net* in any pond or river, and is equally good in ſwift or ſtanding water. In order to make this *net*, there muſt be provided four large and ſtrait poles, anſwerable in length to the depth of the water. The ends of theſe muſt be ſharpened in the manner of ſtakes, and there muſt be notches within a foot of the ſharp part to faſten the *net* to, and at a convenient diſtance, on the poles, there muſt be another ſet of notches, for the faſtening the other ends of the *net*.

The bottom of this *net* is four-ſquare, without any entrance. A boat muſt be taken out with this *net*, to place it properly. The four poles muſt be fixed in the bottom in ſuch a manner, that each may anſwer to the other in a direct line; and they muſt ſtand at ſuch diſtances, that the *net* may be drawn out as ſtiff as poſſible between them. If the *net* is to be fixed in a ſtanding water, this method alone will do very well; but if it be a ſmooth ſtream, ſomething more is neceſſary, otherwiſe the motion of the water will keep the *net* playing about, and this will frighten away the fiſh. To prevent this, four ſtrong ſticks are in this caſe to be faſtened along the tops of the others, ſo as to make a ſort of frame, to ſtreighten and ſtrengthen the others, and keep all tight.

When the *net* is perfectly fixed, it repreſents a cage, and the ſides, top, and bottom are kept ſo firm, that the fiſh do not regard them, but ſeem to take them for weeds; but going in at the entrances, there is no returning, and in rich places great numbers are taken.

Crow NET, in birding, a name given to a ſort of *net* contrived for the catching of wild fowl in the winter ſeaſon.

This *net* may be uſed in the day-time, and is to be made of double thread, or of fine packthread, and the meſhes are to be two inches wide. The length of the whole ſhould be about ten yards, and the depth about three. It ſhould be verged on the ſides with a ſtrong cord, and ſtretched out in length very ſtiff upon long poles, prepared for that purpoſe. When this *net* is brought to the place where it is to be uſed, it muſt be opened, and ſpread at full length and breadth: then its lower end is to be faſtened all along the whole length to the ground, ſo that it only can be moved up and down. The upper end of the *net* muſt ſtand extended on the long cord, the farther end of it being firſt ſtaked to the earth by a ſtrong cord, about five yards diſtant from the *net*, and ſtanding in an even line with the bottom of the *net*. The other end of the cord muſt reach at leaſt five and twenty yards, to ſome natural or artificial ſhelter, by means of which the ſportſman is to lie concealed from his prey. The *net* muſt be placed in ſuch exact order, that it will play upon the leaſt jerk of the cord, and that muſt always be given ſuddenly, leſt the prey eſcape. This *net* is principally uſed for crows and pigeons, on new-ſown corn fields, and it may alſo be uſed in ſtubble fields, where the ſtubble will hide the *net* from the fowl. If the meſhes are made ſmaller, it may be uſed at barn-doors and the like for ſmall birds, and a bait of chaff will bring them together under it. But the great uſe of the *crow-net*, is to ſpread it in mornings and evenings where the haunts of wild fowl are, which in hard weather fly in great flocks to and from land, with and againſt the wind, and then fly cloſe to the ground, in open countries and low lands, where there are few hedges. When a whole covey of theſe are within the reach of the *net*, it is to be let go over them, and they will be taken in great numbers at one caſt.

Tunnel NET. See the article TUNNEL.

Wolf NET. See the article WOLF.

NETE, *(Cycl.)* in the antient muſic, was a general name for one of the extreme chords of a tetrachord. Some ſay it was the higheſt, and others the loweſt ſound. But perhaps the truth of the matter is, that it was the higheſt or loweſt ſound, according as the aſcending or deſcending ſcales were conſidered. Vid. Phil. Tranſ. N° 481. p. 269. See HYPATE.

When the *nete* is ſaid to be one of the extremes of a tetrachord, it is to be underſtood of a tetrachord conſidered by itſelf: for, when tetrachords were combined, the *nete* ſometimes took another name, as appears from the Greek ſcale inſerted under the article DIAGRAM. Vid. *Wallis* App. ad Ptol. Harm. p. 158.

NETHINIMS, among the Jews, the poſterity of the Gibeonites, who were condemned by Joſhua to be hewers of wood and drawers of water for the houſe of God. *Hoſm.* Lex. in voc. *nethinæi*. *Joſ.* ix. 22.

NETOPION, ΝΗΤΟΠΙΟΝ, a name given by the antients to a very fragrant and coſtly ointment, conſiſting of a great number of the fineſt ſpicy ingredients. Hippocrates, in his treatiſe of the diſeaſes of women, frequently preſcribes the *netopion* in diſeaſes of the uterus; and in other places he ſpeaks of its being poured into the ears as a remedy for deafneſs, theſe compoſitions, by their attenuating qualities, dividing the viſcous and thick humors. The word *netopion* is alſo ſometimes uſed to expreſs the *unguentum Ægyptiacum*, and ſometimes ſimply for oil of almonds.

NETTINGS, in a ſhip, are a ſort of grates made with ſmall ropes, and ſeized together with rope-yarn, and are laid in the waſte of a ſhip, ſometimes, to ſerve inſtead of gratings. See GRATINGS.

NETTING-*ſail*, in a ſhip. See the article SAIL.

NETTLE, in botany. See the article URTICA.

Dead NETTLE. See the article LAMIUM.

NETTLE-*tree*. See the article CELTIS.

NEURADE, in botany, a name given by Linnæus to a genus of plants, called by Juſſieu *tribulaſtrum*. The characters are theſe: the perianthium is very ſmall, and ſtands upon the germen of the piſtil: it is compoſed of one leaf, divided into five ſegments. The flower conſiſts of five equal petals, larger than the leaves of the cup: the ſtamina are ten filaments, of the length of the cup: the antheræ are ſimple: the germen of the piſtil ſtands under the cup, and is of a gibbous figure: the ſtiles are ten in number, and are of the length of the ſtigmata: the ſtigmata are ſimple. The fruit is an orbicular capſule, of a depreſſed figure on the ſurface, and convex underneath, and is every way ſurrounded with prickles. The inner part is divided into ten cells, in every one of which is lodged a ſingle ſeed. *Linnæi* Gen. Plant. p. 185.

NEURIS, in the writings of the antients, the name given to a ſpecies of marble, otherwiſe called *elaphoneſum*, and *proconneſium*. It was much uſed by the Roman ſtatuaries, and was dug in a ſmall iſland that lay between Paros and Cyzicus. It was of a duſky or blueiſh white, and was variegated with fine and ſlender veins of black, often beautifully diſpoſed, and in the bodies of the naked ſtatues reſembling the courſe of the veins.

NEUROBATES, in antiquity, a rope-dancer. See the article DANCE, *Cycl.*

NEUROPHYLLON, in natural hiſtory, a name given by Mr. Lhuyd to a ſpecies of foſſile plant, remarkable for the ridges on the leaf. See *foſſile* PLANT.

NEUTHA, a name given by authors to a pellicle covering the eyes or the ears of a child in the birth, and ſometimes the whole face.

NEVEW, in botany, &c. See NAPUS.

NEWT, or EFT, in zoology. See the article EFT.

The land *newt*, or as naturaliſts often call it, the land *ſalamander*, has ſomething very remarkable in its outer coat. Its ſkin often appears dry, like that of the lizard kind, but often alſo it appears wetted, and as if covered with a fine ſhining varniſh: the change from one to the other of theſe ſtates is uſually performed in an inſtant, and it frequently becomes immediately wet all over on the touching it. It alſo contains, under the ſkin, a ſort of milky liquor, which ſpurts out to a diſtance on preſſing the body of the animal.

The paſſages for this milk are a vaſt number of pores or holes, many of which are plainly viſible to the naked eye; and very probably the firſt-mentioned liquor, which covers the ſkin in manner of a varniſh, may be the ſame with this, its white colour not being diſtinguiſhable when it is ſpread ſo thin over the ſurface of the animal. This milk reſembles very much the milky juice which the tithymals, and many other of the ſucculent plants, afford on being cut or broken. It is of an inſupportably acrid and ſtyptic taſte; and tho' the tongue receives no injury from touching it, yet the ſenſation is ſo violent, that one is apt to imagine there muſt be a wound made in it. This animal, when bruiſed, yields alſo a very diſagreeable ſmell.

It has generally been ſuppoſed, that this animal is of a poiſonous nature; and the famous ſalamander of the old writers ſeems to be of the ſame genus, if not the ſame animal. Mr. Maupertuis, determined to inform the world of the truth in regard to theſe remarkable particulars, cauſed a large number of theſe animals to be brought to him, which the country people, who had caught them about the bottoms of old walls, brought to him with as much caution as if they had been vipers.

The firſt experiment he made, was that of the incombuſtible quality of this animal: to this purpoſe he threw ſeveral of them into a common fire; moſt of them periſhed immediately, but a few made ſhift to crawl out; but theſe could not get away on a ſecond trial, but periſhed like the reſt. It was obſerved, however, that the moment they were thrown into the

fire,

fire, the whole quantity of milky juice they contained was driven out at all the pores, and drying in an inſtant, ſtood in round globules, like ſo many pearls, till wholly conſumed by the heat.

It is poſſible that the obſerving this creature to have a power of throwing out theſe juices, and covering itſelf at pleaſure with wet, might give riſe to the imaginary property of its ſubſiſting by the ſame means unhurt in the fire.

This trial being made, the next was to be certainly determined whether the creature were poiſonous, or not. This Mr. Maupertuis propoſed to try two ways; the firſt by making the creature bite ſome animal; the other by making ſome other creature eat the *newt*. But theſe experiments were attended with more difficulties than might have been imagined, for it was neither eaſy to make it bite any thing, nor to make any creature eat it. No provocation could make the *newt* bite, and when its jaws were opened by force, its teeth were found ſo ſmall, and ſo placed, that they ſeemed rather intended to ſaw, or cut things to pieces, than to bite with; and when a chicken was brought to be bit, and the feathers removed from the part, the jaws had no force to make the teeth penetrate, and, when preſſed together, the teeth rather broke, or were put out of their places, than entered the animal, ſo that it was neceſſary to take off the ſkin, and the chicken then received ſeveral wounds, by forcibly preſſing the jaws of the *newt*, together with parts of the raw fleſh between: after this the lips, and tongue, of a dog, and the tongue of a turkey, were bitten in the ſame manner by other *newts*. The animals were let looſe, and not one of them received the leaſt injury from the bite.

The following trial was made, whether the fleſh of the creature, or its milky juice were poiſonous, when received into the ſtomach. Several animals were kept hungry a conſiderable time, on purpoſe to make them eat the animal, but none of them would touch it, ſo well has nature defended this little creature by the acrid juice under its ſkin, of which other animals are warned, as by inſtinct, and refuſe to ſwallow ſo diſagreeable a repaſt. A dog was at length compelled to ſwallow a *newt* cut into ſeveral pieces, while alive, and a turkey was forced to ſwallow, in like manner, a ſmall one. The dog's mouth was tied up for half an hour, and half an hour after they were untied, he vomited up the tail and the feet of the animal, and received no injury; nor did the turkey which ſwallowed the young one. After this, pieces of bread were ſoaked in the milky juice alone, and chickens were made to ſwallow them, and wounds inflicted with weapons dipt in the ſame juice, but no harm ever enſued to the creature from either.

From all theſe tryals, it appears very evident, that the ſtories of this creature's being poiſonous, are as idle, and groundleſs, as thoſe of its living in the fire.

One thing remarkable this gentleman obſerved in his diſſections of the animal, which was, that he found in ſeveral of the females, at once cluſters of eggs, and living young ones. The eggs formed cluſters reſembling thoſe of the ovaries of birds, and the young ones were contained in two tubes, or long pipes, the coats of which were perfectly tranſparent, and the young ones were eaſily diſtinguiſhed through them, and there were counted in one female fifty-four of theſe, all living and vigorous. Mem. Acad. Par. 1727.

NEXI, among the Romans, perſons free-born, who, for debt, were delivered bound to their creditor, and obliged to ſerve him, till they could pay the debt. *Hofm.* Lex. in voc.

NEXT *taker*, among miners, is he that hath the next meer in poſſeſſion. *Houghton's* compl. Miner in the Explan. of the Terms.

NHAMBUGUACU, in botany, a name of the great American *ricinus*, or *palma Chriſti*. *Marggr.* p. 77. *Piſo*, p. 180.

NHAMDIA, in zoology, the name of a fiſh caught in the rivers of many parts of America, and of a fine taſte. It is of the anguilliform kind, and has a long and fat body, becoming ſmaller toward the tail; its belly is ſoft; its head flat; and its mouth of a parabolic figure, and armed with ſmall teeth. It is uſually of about eight or ten inches long; its eyes are ſmall and prominent; and it has a beard compoſed of ſix filaments, four placed below, and two above; the laſt are much longer and thicker than the other four, and have a long furrow behind each. It has ſeven fins beſide the tail; one of the back fins is thorny; the reſt are covered with the common ſkin of the body, which is ſoft, and free from ſcales. Its tail is forked, and its head is covered with a ſtrong ſhelly coat; this is of a duſky brown. Its back and ſides are of a bluiſh grey; the larger back fin is of the ſame colour; all the reſt are black; and, on each ſide, there is a red line reaching lengthways from the gills to the tail. *Willughby's* Hiſt. Piſc. p. 140.

NHANDIROBA, in botany, a name given by Plumier to a genus of plants, the ſame with the *ſevillea* of Linnæus. *Plumier*, Nov. Gen. 27. See the article FEVILLEA.

NHANDUAPOA, the name of a Braſilian bird, called alſo *jabiruguacu*, but more frequently known by its Dutch name *ſcurvogel*. See SCURVOGEL.

NHANDUGUACU, in zoology, the name of a Braſilian bird of the emeu, or caſſowary kind, but ſmaller than the common, or African caſſowary. Its body is conſiderably large; its neck long and ſtrong; its legs very long and thick; its wings extremely ſhort, and unfit for flying, but aſſiſting it in running; its feathers are grey, and, on the back, are conſiderably long. It commonly carries its neck bent like a ſwan; its head is ſhaped like that of a gooſe; its back feathers cover the rump, and make a ſort of tail; it runs as ſwift as a greyhound, and feeds on fleſh and fruits. *Marggrave's* Hiſt. Braſ.

NHAQUUNDA, in zoology, the name of a ſmall fiſh caught in the American rivers. Its body is oblong, and every where nearly of the ſame thickneſs; its head and mouth are like thoſe of the pike; and its uſual length is about four inches. It can extend its upper lip, and round the opening of its mouth. It has no regular teeth, but its jaws are rough like a file. It has two fins at the gills, two on the belly, one long one on the back, but not reaching from head to tail, and one ſhort, and almoſt ſquare one, behind the anus. Its tail is covered with a hard ſhelly cruſt; its body is covered with moderately large ſcales; and its back and ſides are of a ſilvery grey; its belly white It has on each ſide a ſingle row of round black ſpots, of the bigneſs of a pea, and among theſe a number of ſmall blue ones. The fins alſo are all variegated with blue ſpots, and it has a long ſtreak reaching from the gills almoſt to the tail, and under the end of that another ſhort one which runs into the ſubſtance of the tail; theſe are both raiſed above the ſurface of the reſt of the body, and are of a fine gold colour. It is a very well taſted fiſh. *Marggrave's* Hiſt. Braſ.

NICETERIA *Athenas*, Νικητηρια Αθηνας, in antiquity, an Athenian ſolemnity in memory of Minerva's victory over Neptune, when they contended which of them ſhould have the honour of giving a name to the city afterwards called Athens. *Potter*, Archæol. T. 1. p. 416.

NICHILIANISTÆ, in church hiſtory, heretics who maintained that Chriſt had no being. *Hofm.* Lex. in voc.

NICOL, in natural hiſtory, a word uſed by the miners in Germany to expreſs a greeniſh cruſt, covering ſeveral of the ſpecies of marcaſites and cobalt; it emits fumes that ſmell of garlick in the calcination, and is very injurious to the workmen, cauſing contractions of their limbs, and other diſorders. It is ſometimes found in maſſes alone, but that more rarely.

NICOMIA, in natural hiſtory, a name given by ſome to a ſtone called by others *chert* and *ubern*. It is of a greyiſh, horny conſtitution, and has veins of red on it. It is very hard and ſemipellucid, much reſembling the common agates, and it gives fire readily with ſteel. It lies in ſtrata in Yorkſhire, and many other parts of England: theſe ſtrata are about three foot thick, and run a vaſt way among the rocks. It uſually lies among lime ſtone, and is not regular in colour, being ſometimes of a duſky or blackiſh hue, like the common flint. It is ſo hard that no common tool will touch it, and it breaks irregularly, and without any grain, in the manner of the common flint. *Woodw.* Cat. Foſſ. Vol. 1. p. 22. See CHERT.

NICOTIANA, *tobacco*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the infundibuli form kind, conſiſting of one leaf divided into ſeveral ſegments at the edges; the piſtill ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower; this afterwards becomes a membranaceous fruit, of a roundiſh or oblong figure, divided by an intermediate membrane into two cells, which contain a large number of ſeeds fixed to a placenta. *Tourn.* Inſt. p. 117.

The ſpecies of *tobacco* enumerated by Mr. Tournefort are theſe: 1. The great, broad-leaved *tobacco*. 2. The great, narrow-leaved *tobacco*. 3. The great broad, and round-leaved *tobacco*. 4. The ſmall *tobacco*, called *priapeia* by ſome writers. 5. The white-flowered, thorny, tree *tobacco*.

NIDDUI, in the Jewiſh cuſtoms, is uſed to ſignify, ſeparated, or excommunicated. This, according to ſome, was to be underſtood of the leſſer ſort of excommunication in uſe among the Hebrews. He that had incurred it was to withdraw himſelf from his relations, at leaſt to the diſtance of four cubits: it commonly continued a month. If it was not taken off in that time, it might be prolonged for ſixty, or even ninety, days. But if, within this term, the excommunicated perſon did not give ſatisfaction, he fell into the *cherem*, which was a ſecond ſort of excommunication; and thence into the third ſort called *ſcammatha*, the moſt terrible of all. *Calmet* Dict. Bibl. in voc.

NIDUS *avis*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the polypetalous, anomalous kind, and is compoſed of ſix diſſimilar leaves, the five upper of which are ſo diſpoſed, as, in ſome meaſure to reſemble an helmet; the lower one is headed, and bifid at the end. The cup finally becomes a ſeed veſſel, containing ſeeds of a very remarkable ſmallneſs, and appearing only as duſt. The roots are fibrous, and ſo interwoven together as to reſemble a bird's neſt.

There is only one known ſpecies of this genus, which is the plant called by many *orchis abortiva fuſca*, the brown, abortive orchis. *Tourn.* Inſt. p. 137.

NIEKE *corondi*, in the language of the Ceyloneſe, the name of a ſpecies of cinnamon. The tree which produces it reſembles the *nieke*, another tree very common there. This is

a very bad kind of cinnamon, and has very little taſte or ſmell. It is very ſeldom ſold as cinnamon, but is much in eſteem among the natives for its medicinal virtues. They obtain a water, and an oil from it, by roaſting, which they anoint themſelves with, to preſerve them from noxious fumes, and infections of any kind; and uſe the expreſſed juice of the leaves to cool the head, and ſtrengthen the brain, rubbing it on externally. Phil. Tranſ. N° 409.

NIGELLA, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the roſaceous kind, conſiſting of ſeveral petals arranged in a circular form, and ornamented with a ſort of corolla between theſe and the ſtamina, made up of a ſort of horn-like bodies. The piſtil ariſes from the center of the flower, and finally becomes a membranaceous fruit, of a roundiſh, or oblong, form, and often divided into ſeveral parts.

The ſpecies of *nigella* enumerated by Mr. Tournefort are theſe: 1. The horned, field *nigella*, called by many authors *melanthium*. 2. The horned, field *nigella*, with blue double flowers. 3. The horned, field *nigella*, with white flowers. 4. The broad-leaved *nigella*, with large, ſingle, blue flowers. 5. The narrow-leaved *nigella*, with large, ſingle, blue flowers. 6. The narrow-leaved *nigella*, with large, ſingle, white flowers. 7. The great, double, blue-flowered *nigella*. 8. The *nigella* with ſmall, ſingle, white flowers. 9. The *nigella* with ſmall, double, white flowers. 10. The Cretic *nigella*. 11. The broad-leaved, ſweet-ſcented, Cretic *nigella*. And, 12. The *nigella* with ſingle, pale, red flowers. *Tourn.* Inſt. p. 258.

We have ſeveral ſpecies of this plant propagated in the gardens about London: they are all raiſed by ſowing the ſeeds in the ſpring, on a bed of light earth, where they are to remain; and, when they come up, they are to be thinned to proper diſtances, and kept clear from weeds. *Miller*'s Gard. Dict.

NIGHT (*Cycl.*) — NIGHT *angling*, a method of catching large and ſhy fiſh in the night. Trout, and many other of the better ſorts of fiſh, are naturally ſhy, and fearful; they therefore prey in the night, as the ſecureſt time.

The method of taking them on this plan is thus: the tackle muſt be ſtrong, and need not be ſo fine as for day-fiſhing, when every thing is ſeen; the hook muſt be baited with a large earthworm, or a black ſnail, and thrown out into the river; there muſt be no lead to the line, ſo that the bait may not ſink, but be kept drawling along, upon, or near, the ſurface.

Whatever trout is near the place will be brought thither by the noiſe, and motion of the water, and will ſeize the worm, or ſnail. The angler will be alarmed by the noiſe which the fiſh makes in riſing, and is to give him line, and time to ſwallow the hook; then a ſlight twitch ſecures him. The beſt and largeſt trouts are found to bite thus in the night, and they riſe moſtly in the ſtill and clear deeps, not in the ſhallow ſwift currents. Sometimes though there are fiſh about the place, they will not riſe at the bait; in this caſe, the angler muſt put on ſome lead to his line, and ſink it to the bottom. Dict. Ruſt. in voc.

NIGHT-*ſhade*, in botany. See SOLANUM.

NIGHT-*walkers*. See NOCTAMBULATIO, and NOCTAMBULI.

NIGHTINGALE, *philomela*, in zoology. See PHILOMELA.

Virginian NIGHTINGALE, in zoology, the common, but improper, name of a bird of the groſs-beaked kind, called by authors the *coccothrauſtes Indica criſtata*.

It is a little ſmaller than our blackbird; it has a black ring ſurrounding the eyes, and noſtrils; the beak is very large and thick, but not altogether ſo large as in the common groſs-beak; and its head is ornamented with a very high, and beautiful creſt, which it moves about very frequently. It is all over of a very fine, and lively red, but paler on the head and tail than elſewhere. It is brought to us from Virginia, and is much valued in England, for its beauty, and delicate manner of ſinging. It is very fond of almonds, and the like fruits. *Ray*'s Ornithol. p. 179.

NIGRITIES *oſſium*, among the antients. See CARIES.

NIL, in botany, a name given by the Arabians to two very different ſeeds, which are often, by this means, miſtaken in their writings, one for the other. Aviſenna tells us firſt that *nil* is the ſeed of a creeping plant, of the bindweed kind, and that this plant had blue flowers, like the campanulas, or bell-flowers. But, in another place, he tells us that *nil* is the name of a plant uſed in dying, which ſeems to be the ſame with our *iſatis*, or woad. They ſometimes call this plant, and ſometimes the paint prepared from it, by the name *nil*. The old interpreters of Dioſcorides into the Arabic have every where tranſlated the word *iſatis*, or woad, by the word *nil*, or the vegetable of which *nil* was made. The interpreters of the Arabians have been all miſled into errors by the double ſenſe of the word *nil*, and have too often tranſlated what is ſaid of the *nil*, as a dye, or paint, to belong to the ſeed; and what is ſaid of the ſeed by authors, is, by them, interpreted ſo as to be expreſſed of the *iſatis*.

Aviſenna uſes the word *uſme*, as a name of the leaf of *nil*: this is to be always underſtood as meaning that *nil* which is uſed in dying; and, after this, he has a ſelect chapter on the *iſatis*, under this name *nil*. It is probable that the convolvulus, or bindweed, called *nil*, obtained this name only from its flowers being of the ſame colour with the fine blue pigment obtained from the other *nil*, or woad.

NILACUNDI, in natural hiſtory, a name given to a ſtone of the gem kind, which is half a ſapphire, and half a ruby. See SAPPHIRE, and RUBY.

The word *nilaa* is the Indian name for the ſapphire, derived from the word *nil*, the name of indigo, and given to this gem becauſe of its fine blue colour, which approached to the tinge of that pigment. The latter part of the word is not eaſily accounted for, without making a little variation in the ſpelling, but, with that, is very clear and eaſy. *Jacut*, or *jacuti*, and, as ſome ſpeak it, *jacuhti*, is the name given by the Indians to the ruby, and it is only ſuppoſing the word to be properly *nilajacuti*, and it expreſſes in their own language, exactly what we underſtand by it, a ſtone, part ſapphire, and part ruby.

NILAHUMATU, in botany, a name given by ſeveral authors to the ſmooth fruited *ſtramonium* of Malabar. See the article STRAMONIUM.

NILIACUM *mel*, a name by which the antients expreſſed the very fineſt honey.

NILICANARAM, in botany, the name by which ſome authors call the tree whoſe fruit is the myrabolan uſed in medicine. Hort. Mal. Vol. 1. p. 69.

NILUFAR, in botany, a name given by the antient writers to the common *water-lilly*. They diſtinguiſhed this plant by that name from the Indian *nymphæa*, whoſe root was of a cold and ſoporific virtue, like that of the mandrake. This they call always *nenufar*. The word *nilufar* afterwards gave riſe to another name *linufar*: this was only formed of the ſame letters a little tranſpoſed, and was uſed to expreſs all the kinds of the *water-lilly*. The Greeks borrowed the word *nilufar* of the Arabians, and, at firſt, wrote it *nilafaran*, but afterwards it became contracted into *noufaran*, and ſo it ſtands, at this time, in moſt of the works of the modern authors of that nation. Neophytus runs into great errors on this account, and confounds together the trifoliate lotus, with the lotus of Ægypt, the leaves of which are like thoſe of the *nymphæa*, or the *arum*.

Some writers have ſuppoſed the *and oſace* to be a kind of *nilufar*, and to have been deſcribed as ſuch by the antients, and others have thought the ſame of the *ſtratiotes*; but all this is without foundation. Theſe plants are wholly unlike both to the *nymphæa*, and to one another, and were never confounded, either together, or with that plant, except in the brain of ſuch authors.

NIMBUS, among the Romans, a ſcarf embroidered with gold, which women wore on their foreheads.

NIMBUS was likewiſe uſed for the money thrown among the people, upon any public occaſion. *Pitiſc.* Lex. Ant. in voc.

NINTIPOLONG, in zoology, the Ceylonneſe name of a ſpecies of ſerpent called alſo *ſerpens hypnoticus*. It is a very poiſonous ſpecies, and its bite brings on a ſleep upon the perſon, which terminates in death. It is of a deep, blackiſh brown, variegated with ſmall ſpecks of white. *Ray*'s Syn. Anim. p. 332.

NINZIN, in the materia medica, a name uſed by ſome authors for the famous Chineſe root, commonly called *ginſeng*. See GINSENG, *Cycl.*

NIPPERS, in the manege, are four teeth in the forepart of a horſe's mouth, two in the upper, and two in the lower jaw. A horſe puts them forth between the ſecond and third year. See TEETH.

NIPPERS is alſo an inſtrument in uſe among ſmiths, and farriers, being a kind of pincers, wherewith, in ſhoeing an horſe, they cut the nails before they rivet them. It is alſo uſed in taking off a ſhoe.

NIPPERS, in a ſhip, are ſmall ropes about a fathom, or two, long, with a little truck at one end, and ſometimes only a wale-knot. Their uſe is to help to hold off the cable from the main, or jeer capſtan, when the cable is ſo ſlimy, ſo wet, or ſo great, that they cannot ſtrain it to hold it off with their bare hands.

NIPPLES (*Cycl.*) — The *nipples* of women, in their firſt lying in, are frequently ſo ſmall, and ſunk into their breaſts, that the infant cannot get at them to ſuck its nouriſhment. The readieſt method in this caſe is to apply an infant ſomewhat older, and which can draw ſtronger; or, if this does not ſucceed, to let a woman who has been practiſed in the art, attempt to ſuck.

When theſe do not ſucceed, it is common to have recourſe to a glaſs pipe, and the poorer people in ſome places uſually make a tobacco pipe ſerve the turn. Others apply a ſmall cucurbite made of ivory in the form of a hat, which they ſuck ſtrongly in their mouth. The common ſucking-glaſs is alſo, when properly applied, of very ſignal ſervice. To do this, the ſmall hole at the ſide is to be ſtopped with wax, and the glaſs heated with warm water; or, by holding it before the fire, ſo as to rarify, and in part, expel the air. It is then to be applied to the *nipple*, which, in this caſe, will not only be pulled

out, but will discharge a large quantity of milk, so as to take down the inflammation and tumor in the breast. When the sucking power of the glass is grown weak, the hole at the side is to be opened, and the milk poured out; the glass is then to be heated again, and the hole being stopped again, is to be a second time applied, and so on, till the intention is fully answered. *Heister*'s Surgery, P. 2. p. 11.

NIPPLE-*wort*, in botany, &c. See LAMPSANA.

NIQUI, in zoology, the name of a fish of the cucullus kind, approaching to the figure of that species commonly called *draco*, and *araneus marinus*, and in English the *weever*. Its head is large and thick, and its mouth large and without teeth. The under jaw is longer than the upper, and the anterior part of the body is somewhat broad, and flatted; the hinder part, especially toward the tail, is rounded Its usual length is four or five inches; the eyes are small, but they are placed, like those of the crab, out of the head. It is covered with a mixt colour of brown, black, and yellow on the back and sides, and is white on the belly; it is spotted all over the head, back, and sides, with small black spots as big as poppy seeds. It is common about the American shores, and is eatable when the liver and gall are taken out, otherwise it is said to be poisonous. *Marggrave*'s Hist. Bras. See Tab. of Fishes, N° 49.

NIR, in the materia medica, a name given by the Arabian physicians to the pigment, or colour, made from the *isatis*, or woad. The word is derived from the Latin *nigrum*, black. The colour of this pigment is, indeed, not black, but a deep blue; but we find numerous instances of the Greeks and Latins, both using the proper appellatives of black for the same colour, a deep blue. We find Theophrastus calls the fine deep blue oriental sapphires black, μελανας, and Virgil expresses the deep blue of the violet by the word *nigra*. Many of the Arabians call this plant, and the pigment, or colour, made from it, by the name *nil*, but that is a less determinate name, as they call also the seed of a kind of bindweed with blue flowers by the same name. See NIL.

NISAN, a month of the Hebrews, answering to our March, and which sometimes takes from February, or April, according to the course of the moon. It was made the first month of the sacred year at the coming out of Egypt. *This month shall be unto you the beginning of months, it shall be the first month of the year to you.* Exod. xii. 2.

It was the seventh month of the civil year. Moses calls it *abib*. The name *nisan* is only since the time of Ezra, and the return from the captivity of Babylon. *Calmet* Dict. Bibl.

NISSOLIA, in botany, the name of a genus of plants, the characters of which are these: the flowers, and fruit, are the same with those of the lathyrus, but the leaves stand single, and the stalks have no claspers, or tendrils at their ends. There is only one known species of *nissolia*, which is the plant called by some the small, one-leaved *lathyrus*. *Tourn.* Inst. p. 656.

NISUS, in zoology, a name by which many authors call the *accipiter fringillarius*, or sparrow-hawk. *Ray*'s Ornithol p. 51. See the article FRINGILLARIUS *accipiter*.

NISUS is also a name used by some old naturalists for the *haliaëtus*, or *aquila marina*, called in English the *sea eagle*, or *osprey*. *Willughby*, Ornithol. p. 29.

NISUS is likewise a name given by the barbarous writers of the middle ages to *alabaster*.

NITEDULA, in zoology, the field mouse. See MUS.

NITIDUM *folium*, among botanists. See LEAF.

NITRE (*Chem.*) — NITRE is a salt found immersed in imperceptible particles, in earthy substances, as the particles of metals in their ores, and is discoverable in these bodies by an acrid and pungent taste, and a sensation of coldness with which it affects the tongue: sometimes also it is found native, and pure, in form of an efflorescence, or shapeless salt, either on its ore, or on old walls, and yields, after solution, hexaëdral prismatic crystals.

Many have been of opinion that *nitre* was, in part at least, an animal salt, and that where it was found on old walls, it was owing to the effluvia of animal bodies once inhabiting the place; but we find it now in vast quantities in several of the marly earths of the East-Indies, and some other places, which, however, though they abound with it, when they are in the naked cliffs, exposed to the air in a proper situation, yet when dug up from any depths in the earth, the same substances are not found to contain any of this salt.

This marly earth is frequent in China, Persia, and many parts of the east, and is chosen for working from places where it stands in barren cliffs, on hills facing the northern, or eastern winds. The manner of their separating *nitre* from this earth, is as follows; they dig large pits, which they coat over on the inside with a stiff and firm clay; this they fill half full of water, and into it throw the earth. When the water has stood some days to imbibe the salt, they draw it off into other pits, defended by slight walls on all but the north-east side. Here the sun exhaling the water, the salt which it had imbibed, affixes itself to the sides of the pit in small, brownish, white, hexaëdral, but very imperfect crystals, which are what we receive from the East-Indies, under the name of rough *nitre*.

This is the way the greatest quantity of this salt is made, but it is also procured from divers other materials, and by many other methods. In many of the eastern nations, the ruins of old buildings exposed to the north-east winds, and sheltered from rain, have their walls covered with efflorescences of a nitrous salt, which is usually thrown with the earth into the *nitre* pit. Earths moistened with the excrements of animals as the earths of pigeon-houses, and the like, all afford more or less *nitre*, and, in France, vast quantities are annually made from lime rubbish, and the ruins of old buildings.

By which ever of these methods *nitre* is procured, it is ever in all respects the same salt. Its crystals are of a hexaëdral prismatic form, terminated by hexaëdral pyramids. It dissolves in a moderate fire, and does not flame, unless a coal, or some other sulphureous body fall in. It requires near seven times its own weight of water to dissolve it perfectly. *Hill*'s Hist. of Foss. p. 393, 394, 395.

This salt gives the greatest of all proofs of the effects of synthetical, or recomposing chemistry. It is first separated, or analysed, in the following manner: take two pounds of refined saltpetre in fine powder; pour upon it one third of its weight of oil of vitriol, and distill it in a glass retort, in a strong sand heat, there will be produced a strong acid spirit of *nitre*, which cannot, by any experiment, be found to participate at all of the nature of the oil of vitriol used in its preparation. Then take a pound of fresh *nitre*, melt it in a crucible, and throw into it, at times, pieces of charcoal, till it will no longer keep in fusion with the same degree of fire; then encrease the fire, and melt it, and then pour it into a proper vessel; leave it to cool of itself. This is fixed *nitre*, and is an alkali: now dissolve this fixed *nitre* in water, and exactly saturate that water with the acid spirit of *nitre* before distilled, this compound liquor will, by standing, shoot into true and perfect crystals of *nitre*. And the experiment succeeds as well, if a solution of pot ashes, or any other fixed alkali, be used instead of that of fixed *nitre*. *Shaw*'s Lectures, p. 170.

Of all the salts which afford us those strong liquors commonly known by the name of the mineral dissolvents, salt petre, or *nitre*, is the only one which yields red vapours, or whose spirit rises in form of red vapours, as soon as it is separated by means of fire; but the reason of this fact has never been accounted for, till Mr. Hellot explained it to the Academy at Paris, in one of his memoirs.

Of the chemists who have before treated of it, some imagined that the redness of the vapours was owing to some part of the sulphureous substances which the salt had imbibed from the urine and dung of animals where it was formed; others that this colour was owing to particles of fire carried up with the vapours in their ascent. But these are weak conjectures, since, if the first were the case, the mixtures of sal armoniac with common salt of vitriol, ought to yield red vapours in distillation, which never is the case; and, if the latter be supposed, it is not easy to say, why oil of vitriol does not arise in the same coloured vapours; since it requires a more violent, and longer continued fire to raise it.

Vitriol is added to *nitre* in the distillations which yield these red vapours, and it is the first point to be determined in the investigating this phænomenon, whether the vapours owe their colour truly to the *nitre*, or whether they borrow it from the additional vitriol. Baldwin, Stahl, and many others are of opinion indeed, that the red vapours are owing to the vitriol, and essential to it, and call them the *anima nitri*; and they prove the assertion by the known observation that *nitre* melted with a tender white glass, turns it to purple, or some shade of red; whereas neither alum, common salt, nor the fixed alkalis give this colour; and it is probably some portion of an ammoniacal urinous salt, mixed in the *nitre* which gives the colour, since sal armoniac will give the same colour when fused with glass. What is it, however, in the sal armoniac which has this effect? not its volatile alkali, for that is dissipated in the mixture by the first efforts of the fire; neither can it be the acid spirit of sea salt, since experiment proves that it can have no such effect, when employed alone.

A little crocus martis, or any calx of iron, does the same thing to glass, and sometimes even the smoak of the furnace will do it, when woods of too resinous a kind are employed as fuel; many a large quantity of what was meant for pure crystalline glass having been tinged red, or purple, in this manner, and wholly spoiled; and all that we can judge on the whole, as to *nitre*, or sal armoniac tinging them, is, that it is a fatty, or unctuous matter in those salts which produces the colour: and, in all probability, *nitre* contains, beside a quantity of an urinous, or ammoniacal salt, a small quantity of a ferrugineous matter, in extremely minute and imperceptible particles.

Mr. Lemery has proved that all the salt petre made in Europe has been originally an ammoniacal salt; and, indeed, if *nitre* be rubbed for a considerable time in a glass mortar made warm, with a quantity of a fixed alkali salt, it will afford an urinous smell. It is not easy to prove that all sal armoniac contains ferrugineous matter; but when we consider

ſider that iron is always found in the aſhes of vegetables, and that it, therefore, evidently aſcends in extremely minute particles, with the juices of plants; and that ſal armoniac is prepared from a ſoot made of the excrements of thoſe animals which feed on plants, we ſhall find it no impoſſibility that iron ſhould be there; and we well know that iron, in any ſtate, cannot but give that colour to glaſs, which *nitre*, in a ſmaller quantity, and ſal armoniac, in a larger, are able alſo to give. Memoirs Acad. Scienc. Paris. 1736.

All obſervations and experiments would ſeem to prove that the red colour given to glaſs by *nitre*, can only be owing to ferrugineous, or ammoniacal matter contained in it; and it is no very raſh conjecture, to ſuppoſe that the ammoniacal matter contained in the ſalt-petre, rarifying, and extremely dividing the ferrugineous matter, during the time of the diſtillation, may diſtribute them in their diſjunct moleculæ, to all that matter, or thoſe particles, which form thoſe vapours, and tinge them red by its diſtribution of them.

It is to be obſerved, however, that the vapour of ſpirit of *nitre*, or of aqua fortis, are not always red, but only are ſo when the fire is great enough to raiſe with the vapours the matter which colours them; for if ſpirit of *nitre* be made with the addition of alum calcined, with dry ſalt-petre, and with filings of zink mixed together, there will be obtained with a ſmall degree of fire, a ſpirit of *nitre*, which does not come over in red fumes.

If the fire be raiſed to a greater degree of violence, there will afterwards be obtained a ſecond ſpirit of *nitre*, which will come over in red fumes; but the firſt of theſe will ſhew the great experiment of taking fire on mixture with oil of turpentine, or the European oils of vegetables, better and more readily than the other.

It is therefore no eſſential character of ſpirit of *nitre* to riſe in red vapours, ſince the firſt riſes without; and this is truly the pure ſpirit of *nitre*; while the ſecond, which riſes in red fumes, is impure, being coloured by ferrugineous, or other foreign matter raiſed in vapour with the reſt, by the great violence of the heat.

It is obſervable, that if vitriol calcined to a redneſs be uſed with the *nitre*, for drawing the ſpirit, the vapours riſe of a perfect blood red. In the common way of diſtilling what is called ſimply ſpirit of *nitre*, the cuſtom is to put into the retort with the ſalt-petre, a very large quantity of a vitriolic earth; and in the making that ſpirit called aqua fortis, green vitriol, or Engliſh copperas is mixed with the *nitre*. This is abundantly known to contain a great deal of iron. Here, therefore, is in each caſe a quantity of ferrugineous matter added; and we well know that this can give a red colour to the vapours, with which it is by violence of fire compelled to riſe. Repeated trials of ſpirit of *nitre*, with mercurial preparations alſo, prove beyond contradiction, that there is ferrugineous matter in that ſpirit. Many of the common mercurial precipitates, when made with aqua fortis, or with plain ſpirit of *nitre*, may have abſolute plain iron ſeparated from them; and the chemiſts know well that this is not to be ſuppoſed to have been lodged in the mercury, ſince it is very difficult to conceive how that metal ſhould become amalgamated with it; but there can be no difficulty of ſuppoſing it ſeparated from the menſtruum, ſince it is evident that there is iron contained in the matters uſed in the diſtillation of it, and even in the ſalt itſelf from which it is originally drawn.

It would be very natural to ſuppoſe that the ferrugineous matter was raiſed only from the additions of pure vitriol or a vitriolic earth; but it is evident from the experiment of *nitre* alone turning glaſs red, that there is certainly alſo ferrugineous matter in that ſalt itſelf; nor is it at all difficult to conceive how iron comes to enter the body of that ſalt; ſince, if we conſider it as made in Europe, from the rubbiſh of old buildings, and the cleanſings of ſtables, &c. it is eaſy to conceive that pieces of iron of ſeveral kinds may have been ruſted away, and conſumed there, and ſo mixed among the matter from which the ſalt was afterwards made. The addition of wood aſhes always uſed alſo in the making it, may have lodged ferrugineous matter among it, ſince it has been often proved that the aſhes of all vegetables contain true iron. Memoirs Acad. Scienc. Par. 1736.

It may ſeem a difficult thing to conceive, however, in what manner ſo ſmall a quantity of iron as there can be ſuppoſed to be in *nitre*, is able to colour ſo large a body of vapours as are ſeen to riſe in the diſtillation. But if we conſider the extreme diviſibility of the particles of metals into colouring matter, and the vaſt quantity of water that a ſingle grain of copper is capable of tinging blue, when diſſolved in an alkali, we ſhall be the leſs ſurpriſed at it; eſpecially if it be conſidered alſo that it has been proved already that there is true ſal armoniac in all *nitre*, and it is well known that this ſalt is capable of rarifying, and extremely dividing the particles of that, or any other metal; and if as much ſal armoniac as can be diſſolved in aqua fortis be added to that ſpirit, it is well known alſo that it will make it ſend up vapours much redder than before, which can only be owing to the ſal armoniac raiſing a larger quantity than ordinary of the ferrugineous matter contained in the aqua fortis than would naturally have been raiſed from it.

The moſt ready way of reducing *nitre* to powder, is to diſſolve a quantity of it in as little water as may be, and evaporate the water over a gentle fire, continually ſtirring it till dry, by which means the *nitre* will be found in form of a very dry white powder. This is the method uſed by the gunpowder-makers. *Shaw's* Lectures, p. 389.

The curious, in the hiſtory of *nitre*, and its preparation from vegetables, &c. and the purifying it for gunpowder, and other uſes, may conſult the works of Glauber, Stahl, and Clark, on the ſubject of this ſalt, and compare them with the diſcourſe of the younger Lemery on the origin of *nitre*.

Purified NITRE. See NITRUM *purificatum*.

Spirit of NITRE. See SPIRITUS *nitri*

NITRIUM *ſal*, in natural hiſtory, a name given by many writers to the ſalt ſeparated from the water of the lake Natron in Ægypt, which is the *natrum*, or *nitre* of the antients.

This lake is ſituated in the Nitrian deſart, ſo called from *Nitria*, a very large town there. It is ſix or ſeven acres in extent, and lies about thirty miles weſt and by ſouth from Terana, and about the ſame diſtance north from the pyramids: from the bottom of this lake the ſalt called *natrum* ariſes to the ſurface of the water, and is there condenſed, by the heat of the ſun, into the hard and dry form in which it is ſold.

Four ounces of the water of the Natron being examined by evaporation in a glaſs veſſel, placed in a ſand heat, there will ariſe, as ſoon as it becomes warm, a ſort of ſcum to the top; this being taken off, another inſtantly ſucceeds, and ſo on, ſo long as any water remains in the glaſs.

This ſalt, thus ſcummed off, is the ſame in all reſpects with the *natrum*, or the Smyrna ſoap earth; being a fixed alkali, fermenting with acids, and boiling into ſoap with oil. This icy ſcum is the ſame as that called by Pliny *flos ſalis*, and ſeems to be the ſame with that which Herodotus ſays the Ægyptians made uſe of in the preparation of their mummies. It is ſaid that the water of this lake, though it contains ever ſo large a quantity of this ſalt, will not ferment with any acids, tho' the leaſt particle of the ſalt ſeparated either by a natural, or artificial heat, will ferment violently with any acid. What the heat of the ſand furnace does in this experiment, the heat of the ſun does in the lake itſelf; and the ſingular circumſtance of the water of the lake not fermenting with acids, is confirmed by this, that a clear ſolution of the ſalt in common water will not ferment with them.

The antients have attributed great virtues to the ſalt of this lake; and this being called *nitrum*, as a ſhort name for *nitrium ſal*, we have had ſome who have ſuppoſed the ſalt which we call *nitre*, to be the ſame, and theſe people have wondered that they did not find the ſame virtues in our *nitre*.

The mineral waters of all parts of the world ſeem to contain more or leſs of this ſalt, and to owe their virtues in a great degree to it; and, probably, it might be no ſmall improvement to phyſic, to bring it more into the preſent practice. Molenbroch recommends it greatly in the ſtone; and it may be the more probably uſed, as all alkali ſalts are known to be good in that diſtemper. Some add to this, that it ſeems qualified to diſſolve ſtony ſubſtances, it being of ſo piercing and penetrating a ſpirit, that no rock, or ſtone is found about the lake from the waters of which it is procured. Phil. Tranſ. N° 160.

NITRO AERIAL *ſpirit*, a term invented by Mayow, and ſince uſed by many others, to expreſs a very active principle in the air, cauſing great changes in the bodies abſorbing it and expoſed to it.

The acid ſpirit of nitre is produced partly by the air, and partly by a terreſtrial matter making up the reſt of the body of that ſalt. Mr. Boyle, in his experiments on flame and air, has abundantly proved this; and that igneous particles of the air reſide in nitre, is as certain a concluſion from the ſame principles: theſe conſtitute its moſt active part, and by theſe the flame of kindled nitre is produced.

The aërial particles of nitre are truly no other than the igneo-aërial matter of it, and this aërial matter is evidently lodged in the acid ſpirit of it, not in the fixed ſalt. This acid ſpirit is, according to Mayow, compoſed of a terrene matter, which is flexile and humid, and of etherial particles, which are rigid and dry, active and igneous, and proceeding from the air.

Theſe igneous particles are common to nitre and to air, and are therefore called *nitro-aërial*; and the ſpirit of nitre derives, according to this ſyſtem, from theſe particles its active and corroſive quality, which makes it a ſort of potential fire; and on this the form of nitre chiefly, if not only depends.

Now as this *nitro-aërial* or igneous ſpirit reſides in the acid ſpirit of nitre, it is thence inferred, that the *nitro-aërial* ſpirit is of a nitro-ſaline nature, obtaining rather the nature of an acid than a fixed ſalt; conſidering alſo, that the effects of fire in general anſwer to thoſe of a very ſubtle and corroſive ſalt. Fire in general, on theſe principles, is eaſily proved to depend principally upon the ſaid *nitro-aërial* principle put into motion.

This *nitro aërial* ſpirit makes the moſt active, and, indeed, the principal part of the ſalt which we call *nitre*. Its terreſtrial and acid parts make up the reſt of the maſs; and theſe are rather of uſe

uſe to form the whole into a body, and give it form and conſiſtence, than to add to any of its fat.

NITRUM, is uſed by the poet Martial to expreſs that ſort of foulneſs in cryſtal, which Pliny, and other of the antient Roman authors, diſtinguiſh by the name of *ſal*. See the article SAL.

NITRUM *antimoniatum*, in chemiſtry, the name of a ſalt procured by evaporating the filtrated waters uſed in making the *antimonium diaphoreticum* to a dryneſs, continually ſtirring them towards the end of the operation. There, at length, remains from theſe a white ſaline matter, of a particular taſte, not ungrateful, nor nitrous, but perfectly mild.

Hence we ſee that *nitre* is changed into a new ſalt by detonation with antimony.

This ſalt is gently aperitive, and, in denſe, inflammatory blood, excellently reſolves without violence. It ſucceſsfully promotes perſpiration, ſweat, and urine; hence it cools, and becomes greatly ſerviceable in the ſmall pox, meaſles, pleuriſy, and peripneumony. We ſee how erroneous has been the opinion of this water being noxious, and how valuable a medicine that opinion had led people for a long time to throw away.

NITRUM *calcarium*, in natural hiſtory, a name given by Dr. Liſter to a peculiar ſpecies of neutral ſalt, which he firſt publickly deſcribed in his book on the medicinal waters of England. He very improperly calls it *nitre*; becauſe it has none of the properties or qualities of *nitre*, but only a ſort of general reſemblance in its external form. He obſerves that this ſalt, tho' very little known, was abundantly the moſt copious of all the ſorts afforded by the mineral waters in general; and ſays its cryſtals were long and ſlender, and conſiſted of four ſides, and were terminated by a point compoſed of two triangular planes. He adds, that this ſalt doubtleſs had its origin from a mixture of the acid of ſulphur, and a calcarious earth of an alkaline nature.

This ſalt is found *in* almoſt all the mineral waters of Germany, and is very juſtly obſerved by Hoffman to be of the nature of Glauber's ſalt: that it is not *nitre* is evident from this, that it is not inflammable, nor will yield aqua fortis by diſtillation. It ſeems, indeed, true Glauber's ſalt, compoſed of the acid of vitriol, or ſulphur, for this is in both the ſame, and of that alkaline earth which is the baſis of ſea ſalt: this is its origin, in the veſſels of the chemiſt, as well as in the bowels of the earth, and probably the figure of the cryſtals of that obſerved by Dr. Liſter, was the ſame in the point, as well as in the body, both being quadrilateral columns terminated by pyramids compoſed of a number of triangular planes. *Hoffman* Opera, T. 5. p. 139.

This number in Glauber's ſalt is four, though Dr. Liſter obſerved only two in the ſalt he examined; but it is frequently ſeen in the factitious, or common Glauber's ſalt, which naturally has four planes in the pyramid, that two of them are ſo ſmall, as ſcarce to appear more than flat ſparks at the verge of the point; in almoſt all the cryſtals, one of the four is thus ſmall, ſo that they ſeem to conſiſt only of three, while the whole four are truly there. The ſame is the caſe frequently in the common rock cryſtal, whoſe pyramid ought to conſiſt of ſix planes, and, in truth, always does ſo, but one or more of them are frequently ſo ſmall, that a haſty obſerver would ſay it conſiſted only of four or of five planes.

If this may be allowed to be the caſe, in regard to Dr. Liſter's obſervation of his cryſtals, there ſeems no doubt but that his *nitrum calcarium* is true and genuine Glauber's ſalt, as much as that of the chemiſt's laboratory; and, according to his own juſt obſervation, it is compoſed of the very ſame principles with that chemical ſalt. The mineral waters of Egra abound with this ſalt, which Hoffman alſo has called, for that reaſon, *ſal Egranum*, when ſeparated from them by evaporation; but none contains ſo great a proportion of it as the Sedelitz waters, a pint of which, on evaporation, leaves two drams of it.

The medicinal waters in the neighbourhood of Paris contain it alſo in a very conſiderable quantity, though leſs than this. It is the opinion of Hoffman, that when any water before impregnated with a vitriolic acid, in its current under ground, paſſes over this calcarious earth, it as readily joins a part of it with it, as the vitriolic acid does with the ſea ſalt, or its baſis, in the making the common Glauber's ſalt, and thence produces a bitter purging ſalt, of the ſame nature with that; and, indeed, if the acid of ſulphur be mixed with any alkaline ſubſtance, a bitter neutral ſalt is produced, ſomewhat analogous to this, and to the Glauber's ſalt.

NITRUM *nitratum*, in chemiſtry, the name of a preparation of *nitre*, made by adding a ſufficient quantity of ſpirit of *nitre* to a lixivium of pure *nitre*, and afterwards evaporating it to a pellicle, and ſetting it by to ſhoot. The cryſtals formed by this liquor are perfectly nitrous in their figure, but they will be of an acid taſte

We ſee, by this, that it is poſſible to alter a ſalt, and to reduce it into the appearance of a different body, by means of ſubſtances before ſeparated from itſelf; and, in this caſe, the alteration is made, in almoſt any degree, at pleaſure; the ſalt produced being more or leſs acid, as more or leſs of the acid ſpirit is uſed: but it is to be obſerved, that the more acid there is uſed, the more difficultly the ſalt dries, and the more difficultly it is kept dry, it being always ſubject to run in the air. This preparation of *nitre* is a good medicine in burning fevers. *Boerhaave*'s Chem. Part 2. p. 176.

NITRUM *purificatum*, *purified nitre*, is thus prepared: take *nitre*, or common ſalt-petre, one pound; pure water three quarts and a pint; ſet them on the fire together, and diſſolve the ſalt perfectly by boiling: then ſtrain the hot lixivium through a double flannel, and ſet it over the fire again in an earthern veſſel. Evaporate it gently, till on taking out a little of the liquor in a ſpoon as it cools, there are ſeen threads as it were ſhooting in it; in this ſtate the ſalt is ready to concrete. Set it in a cool place, putting clean ſticks acroſs the veſſel, and the ſalt will form itſelf into extremely pure and beautiful cryſtals on the ſide of the veſſel, but principally on the ſticks. Theſe dried in a colander are fit for uſe.

This is the beſt of all the preparations of *nitre*, for medicinal uſe, in its native form. It diſſolves immediately on entering the body, where it wonderfully cools, and thins the blood, giving it a fine florid colour. In all inflammatory diſeaſes attended with condenſations of the blood, this ſalt proves excellently cooling and attenuating. It is given from four or five grains to ten, twelve, or fifteen at a doſe. Some give more at a time, but it is more adviſeable to have the doſes ſmaller, and oftener repeated. It is alſo good in the ſmall-pox, and ſuppreſſions of urine. It is alſo ſaid to be given by many in hæmorrhages with ſucceſs. If there be any caſe in which caution is required, it is in a conſumption where the lungs are ulcerated.

NITRUM *vegetans*, a name given by the chemiſts to a preparation of *nitre*, which very readily ſhoots out into beautiful cryſtallizations. If, in the making Glauber's ſpirit of *nitre*, there are uſed four parts of *nitre*, and one of oil of vitriol, and the ſpirit be entirely driven off, the white ſalt remaining dry in the retort, on being expoſed to the open air, will ſoon be covered with a thick and long down, as if it grew; but if this ſalt be diſſolved in water, and there ſtrained, and evaporated to a dryneſs, in a cylindrical glaſs, and kept expoſed to the open air, its upper ſurface will often appear covered with beautiful branching little plants, all which will diſſolve away upon the application of heat, and leave the ſurface even; but upon expoſing the veſſel again to the open air, in a quiet place, they will grow again as before, thus ſeveral times exhibiting the reſuſcitation of plants, as it were, from their own aſhes.

Some chemiſts have formed ſeveral fables upon ſome ſuch baſis as this; and, very probably, the whole ſecret of their operations was no more than a concealed fraud of this kind, this having nothing to do with vegetation.

NITRUM *vitriolatum*, a preparation of *nitre* made as follows: Diſſolve the maſs left in the retort after diſtillation of a ſpirit of *nitre*, in about eight times its weight of water; filtrate the ſolution, and, when perfectly clear, evaporate the liquor to ſuch a ſtandard, that the ſalt will no longer be ſuſtained in it; then ſet it in a cool place, and collect the ſalt as it ſhoots, laying it in an earthen colander to dry. This is of much the ſame virtues with *tartarum vitriolatum*, and is frequently ſold under its name. See TARTARUM *vitriolatum*.

NIVALIS *avis*, the *ſnow-bird*, a name given by authors to a bird common in Poland in the ſevereſt months of the winter, and at no other time. The country people call it *ſniegu'ka*, which ſignifies *ſnow-bird* alſo: it is obſerved to come with the ſnows, and go away again with them. The country people uſe to preſage the mildneſs, or the ſeverity of the ſucceeding winter from their flights in greater or in ſmaller numbers, or earlier, or later, in the ſeaſon.

NIURI, in botany, the name of a genus of plants, called by Linnæus *phyllanthus*. Hort. Mal. 10. 27. See the article PHYLLANTHUS.

NOAH's *ark ſhell*, in natural hiſtory, the name of a kind of ſea ſhell, which authors were always puzzled about referring to any genus, till a late French author has referred it to a new genus he has made under the title *cordiformis*, taking in the bucardia, and triangular heart-ſhells. The cabinets of the curious afford us three ſpecies of this ſhell; the common kind, a yellow and white kind, with broad irregular lines, and a variegated kind. Hiſt. Nat. Eclair. p. 333.

Mathiolus and Rondeletius have called the *noah's ark ſhell*, *rhomboides*, and *muſculus ſtriatus*; and Liſter, who has followed theſe authors, has placed it among the muſcles. Rumphius has placed it among the pectens, and ſome have made it a ſpecies of oyſter. The impropriety of its arrangement under any of theſe genera is very obvious from the characters of each. It is indeed of a ſomewhat different figure from the generality of heart-ſhells, as it is from all the other ſhells in the world, but it agrees with them in its general character, for it is deeply ſtriated, as they all are; and it is of a figure, in ſome meaſure, reſembling that of a heart, though running out into an irregular length at the point.

We have another ſhell of this genus which no one ever doubted to belong to it, which yet is of an oblong figure, and ſo much reſembles the *Noah's ark*, as to plainly ſhew they ought both to be reckoned ſpecies of the ſame genus. This is the oblong bucardium, or ox heart ſhell, commonly called the *baſtard Noah's ark*.

NOCERIANA *terra*, *earth of Nocera*, in the materia medica, a white

white earth uſed in medicine in Germany, Italy, and ſome other parts of the world, but not known in the Engliſh ſhops. It is now dug principally about Macerata, a city in the marquiſate of Ancona, in the pope's territories, and is in great eſteem in malignant fevers, and againſt the bites of venomous animals.

It is a denſe earth, of a greyiſh white, very hard, and of an inſipid taſte, and does not effervеſce with acid menſtruums. *Hill*'s Hiſt. of Foſſ. p. 3.

NOCTAMBULATIO, *walking in the ſleep*. This is a very remarkable diſtemperature of the imagination, and, in different perſons, differs greatly in degree. Thoſe who are but moderately affected with it, only repeat their actions of the day, and getting out of the bed, go quietly to the places they frequent at other times; but thoſe who are afflicted with it in the moſt violent degree, go up to dangerous places, and do things that would terrify them to think of, when awake: theſe are by ſome called lunatic *night-walkers*, becauſe fits are obſerved to return with moſt frequency, and violence, at the changes of the moon.

Cauſes of it. The only material cauſe that can be aſſigned in this caſe, is a plethora, or over-fullneſs of blood, but this is influenced by an immaterial one, that is, by the fancy, which is buſily employed in dreams about particular objects.

Method of cure. The primæ viæ are firſt to be cleared of all their foulneſſes by a ſtrong purge; after this it is proper to bleed in the foot, taking away eight or ten ounces; then powders compoſed of nitre, cinnabar, and crab's eyes, ſhould be taken three or four times a day, and particular regard ſhould be had to the changes of the moon. It will be proper to ſet a veſſel of water by the bed-ſide, in ſuch a manner that the perſon will naturally ſtep into it on getting out, and be awaked by that means; and if theſe things fail, a perſon ſhould be ſet up to watch him, and beat him, every time it happens. *Junker*'s Conſp. Med. p. 698.

NOCTIBO, in zoology, the name given by the Portugueſe to a ſmall Braſilian bird, a ſpecies of the *goat-ſucker*, or *churn-owl*, more known among naturaliſts by its Braſilian name *ibijau*. *Marggr*. Hiſt. Braſil. See the article IBIJAU.

NOCTUA *aurita*, in zoology, a name by which ſome have called the ſmaller ſpecies of the *horn owl*, more uſually diſtinguiſhed by the name *otus*. *Ray*'s Ornithol. p. 63. See the article OTUS.

NOCTUA *canora*, in zoology, a name given by Nieremberg to a bird of the Spaniſh Weſt-Indies, called by the natives *chicantli*, and ſometimes kept by the Spaniards in cages. See CHICANTLI.

NOCTUA *minor*, in zoology, the name given by Mr. Ray to the *keutzlin*, or, as others call it, the *ſchaffilt*, a very beautiful little bird of the owl kind, and not exceeding the ſize of the common thruſh. *Ray*'s Ornithol. p. 69. See SCHAFFILT.

NOCTUINI *oculi*, a name given by ſome to grey eyes, from their reſembling thoſe of the *noctua*, or *owl*.

NOCTUOLENT, among botaniſts, a name given to ſuch plants as ſmell ſtrongeſt in the night time. See DOG-*roſe*.

NODULUS, a word uſed in pharmacy for a knot tied in a rag, and including ſome medicinal ingredients to be ſuſpended in any liquor. See NODULE, *Cycl*.

NOERA, a word uſed by ſome chemiſts for the head of an alembick, or the cover of a cucurbit, or any other veſſel uſed in diſtillation. *Caſtell*. Lex. in voc.

NOFESCH, in natural hiſtory, a word of Hebrew origin, uſed as the name of a precious ſtone. There has been much diſpute among the commentators on the old teſtament, what ſtone it was. It ſeems derived from the root *ſuch*, which ſignifies the ruby, or carbuncle, and, as a derivative of that word, it muſt be ſuppoſed to expreſs a red ſtone, not one of any other colour. As the ruby is ſignified by *ſuch*, this cannot mean the ſame ſtone, and therefore probably meant the garnet, they having no other name, that we known of, for that ſtone, and it being very like the ruby.

NOCHETZLINOPALLI, or NOCHEZNOPATLI, in botany, a name by which ſome authors have called the *opuntia*, on which the cochineal inſect loves to feed. *Jonſ*. Dend. p. 56. See OPUNTIA.

NOISETIER, in botany, the name by which the French call the ſeveral ſpecies of hazel, and filbert-trees. See HAZEL.

NOLA, in botany, a name uſed by ſome authors for the *anemone*. *Ger*. Emac. Ind. 2.

NOME (*Cycl*.) — NOME, Νομη, in medical writers, is uſed for an eating, or corroding ulcer, and is much the ſame with *phagedæna*. See PHAGEDÆNA, *Cycl*.

The word is Greek νομη: it occurs in Galen. Some later writers, as Foreſtus, call it *ulcus obambulans*, and *obambulativum*. *Caſtellus*.

NOME, among the antient Egyptians, a diviſion, or province, into which the whole kingdom was divided. The origin of the *nomes*, according to Diodorus Siculus, was this: the inhabitants being refractory, and much inclined to inſurrections, in order to prevent theſe, the kings divided the whole country into different provinces, or *nomes*, and eſtabliſhed the worſhip of ſome particular animal in each of them, prohibiting at the ſame time ſuch animal to be eaten within the bounds where it was worſhipped.

Hence, as every province was intoxicated with its own particular form, and object of worſhip; it entertained the higheſt contempt for that of its neighbours, and took a pleaſure in profaning the animal, which among them had divine honours paid it. This religious oppoſition had the deſired effect; for, all mutual confidence being thereby cut off, there were no more inſurrections againſt the government. Mem. Acad. Inſcrip. Vol. 13. p. 52.

NOME is alſo uſed for a kind of ſong, or hymn, in honour of the gods, ſaid to have been invented by Terpander. For a further deſcription of which, ſee Mem. Acad. Inſcrip. Vol. 14. p. 342, ſeq.

NOMENCLATORES, (*Cycl*.) among the botanical authors, are thoſe who have employed their labours about ſettling and adjuſting the right names, ſynonyms, and etymologies of names, in regard to the whole vegetable world. *Linnæi* Fund. Bot. p. 2.

NOMOPHYLACES, Νομοφυλακες, among the Athenians, magiſtrates who were to ſee the laws executed, being not unlike to our ſheriffs. They had the execution of criminals committed to their care, as alſo the charge of ſuch as were confined priſoners. They had alſo power to ſeize thieves, kidnappers, and highwaymen, upon ſuſpicion; and, if they confeſſed the fact, to put them to death; if not, they were obliged to proſecute them in a judicial way. *Potter*, Archæol. Græc. T. 1. p. 78.

NOMOPHYLACES were likewiſe officers belonging to the Olympic games, whoſe buſineſs it was to inſtruct thoſe who were to contend, in all the laws of the games. See HELLENODICÆ.

NOMOTHETÆ, Νομοθεται, among the Athenians, were a thouſand in number, and choſen by lot out of ſuch as had been judges in the court *Heliæa*. Their office was not (as their name ſeems to imply) to enact new laws by their own authority, for that could not be done without the approbation of the ſenate, and the people's ratification; but to inſpect the old, and, if they found any of them uſeleſs, or prejudicial, as the ſtate of affairs then ſtood, or contradictory to others, they cauſed them to be abrogated by an act of the people. Beſide this, they were to take care that no man ſhould plough, or dig deep ditches within the Pelaſgian wall; to apprehend the offenders, and ſend them to the archon. *Potter*, Archæol. Græc. l. 1. c. 13. T. 1. p. 79.

NON (*Cycl*.) — NON *aſſumpſit*, in law, a plea in perſonal actions, whereby a man denies any promiſe made, &c.

NON *diſtringendo*, a writ not to diſtrain, uſed in divers caſes. *Blount*, *Cowel*.

NON *implacitando aliquem de libero tenemento ſine brevi*, a writ to prohibit bailiffs, &c. from diſtraining any man touching his freedom, without the king's writ. Reg. Orig. 171. *Blount*, *Cowel*.

NON *intromittendo quando breve præcipe in capite ſubdole impetratur*, a writ directed to the juſtices of the bench, or in eyre, commanding them not to give one that had, under colour of intitling the king to land, &c. as holding of him *in capite*, deceitfully obtained the writ called *præcipe in capite*, any benefit thereof, but to put him to this writ of right. Reg. Orig. 4. This writ having dependance on the *court of wards*, ſince taken away, is now diſuſed. *Blount*, *Cowel*.

NON *merchandizando victualia*, a writ to juſtices of aſſize to enquire whether the magiſtrates of ſuch a town do ſell victuals in groſs, or by retail, during the time of their being in office, which is contrary to an antient ſtatute, and to puniſh them if they do. Reg. Orig. 184. *Blount*, *Cowel*.

NON-*ſi iſſum*, in the antient muſic. See APYCNON.

NON-*ſuch clay*, a particular ſort of earth, which, mixed with another clay brought from Worceſterſhire, makes a compoſition very uſeful for the making the melting-pots uſed in the green glaſs making. *Neri*'s Art of Glaſs, p. 246.

NONUPLA, in the Italian muſic, denotes a quick time, peculiar to jigs. This ſpecies of time is otherwiſe called *the meaſure of nine times*, which requires two falls of the hand, and one riſe. There are three ſorts of *nonupla*. 1. *Nonupla di ſemi-minime*, or *dupla ſeſqui quarta*, thus marked $\frac{9}{4}$, where nine crochets are to be in the bar, of which four make a ſemibreve in common time, i. e. in the down ſtroke, ſix, and but three up; it is uſually beat *adagio*. 2. *Nonupla di crome*, or *ſeſqui ottava*, marked thus $\frac{9}{8}$, wherein nine quavers make a bar, inſtead of eight in common time, i. e. ſix down, and three up: 'tis beat *preſto*. 3. *Nonupla di ſemi-crome*, or *ſuper ſetti partiente nona*, thus diſtinguiſhed $\frac{9}{16}$, in which nine ſemi-quavers are contained in a bar, whereof ſixteen are required in common time, ſix down, and three up: 'tis ordinarily beat *preſtiſſimo*. See ADAGIO, PRESTO, and PRESTISSIMO.

Beſide theſe, there are two other ſpecies of *nonupla*, for which ſee TRIPLE, *Cycl*.

NOOZE, a name given by ſportſmen to a ſort of horſe-hair ſpringe made to take woodcocks, and very ſucceſsful, when the proper precautions are taken. The *nooze* is made of ſeveral long and ſtrong hairs twiſted together, with a running *nooze*

at

at one end, and a large knot at the other, which is to be paſſed through the ſlit of a cleft ſtick, to prevent the *nooze* from being pulled away when the bird is caught in it.

The ſportſman, when he knows his buſineſs, does not ſtay to watch theſe ſnares, but ſets them in the morning, and returns again to them at four in the afternoon, when he ſeldom fails of meeting with a ſufficient number taken. The ſticks are to be about the bigneſs of a man's little finger, and are to be made ſharp at one end, that they may fix the better in the ground: to each of theſe is to be fixed one *nooze*. The ſportſman is to take out with him ſeveral dozens of theſe bundled up together, and going into the coppice woods where there lie many leaves upon the ground, he is to ſearch among theſe for the marks of woodcocks frequenting the place; if there come any there, it will be ſoon found out by the leaves, which are ſpread about from ſide to ſide by thoſe birds, in ſearching under them for worms. Their dung alſo, which is of a dark grey colour, being found about the place, is a proof of their frequenting it.

When the place is thus pitched upon, the ſportſman is to take a large circle at ſome diſtance from it, on each ſide, in the way where the woodcocks are ſuppoſed to come to the place; he is here to plant a ſmall hedge row of furze, or other buſhes, of a conſiderable extent, and pretty thick, leaving gaps in it here and there. The woodcocks, in making up to their place of feeding, when they come to this hedge, will run along by the ſide of it, till they come to one of the gaps, and then go through, for they hate to take wing, and will run, at any time, a long way under a hedge, rather than fly over it. On this depends the ſucceſs of the ſport.

The *noozes* are to be fixed one in each of theſe gaps thro' which it is known the woodcocks will paſs; the ſtick to which it is faſtened is to be ſtuck firmly in the ground, and the *nooze* to be ſpread wide open on the ground, leaving only ſome dry leaves to ſupport it. The whole gap being occupied by this *nooze*, the woodcock, when he comes, cannot eaſily eſcape being taken by the legs in it, and when once caught he will lie till the ſportſman comes. While a ſportſman is walking about a wood in this view, it is very common for him to find ſpringes, or *noozes*, of horſe-hair, fixed at ſix inches high, in ſeveral places. This may be looked on as a proof that there are partridges in the wood, and theſe are the means uſed by the country people to take them. The woodcocks, though in the day they lie in woods, yet, in the night, they go out, and frequent rivers and brooks, and, in the froſty nights, ſuch ſprings as do not freeze are particularly reſorted to by them.

The ſportſman, when he has ſet his *noozes* in the woods for the day-time, ſhould retire to the watery places near them, and ſearch for the marks of theſe birds coming to them by their dung, and other tokens. As ſoon as a place is found which they frequent, there muſt be a ſmall hedge row built there alſo in the ſame manner as in the woods; and in the gaps, which are to be made at the diſtance of about ſix foot one from another, there are to be placed either the ſame ſort of *noozes* as thoſe in the woods, or the ſpringes made with hazel boughs, and the horſe-hair tied to a packthread. In either caſe, there is no doubt of ſucceſs, for the birds which have once frequented a place, will come to it every night, as long as they remain any where near it; but particularly, if there be any ſpring near a wood, the water not freezing when other waters are iced over, will be ſure to bring the woodcocks together at it, and *noozes* planted properly about this place, will ſeldom fail of ſucceſs. If they have been left a night or two without ſucceſs, the ſportſman is not to deſpair; for though there ſhould happen to be no woodcocks there when they are firſt ſet, theſe birds change place ſo often, that it need not be doubted but ſo proper a rendezvous will be ſoon reſorted to by them.

NOPE, in zoology, an Engliſh name uſed by ſome for the *bull-finch*. See BULL-*finch*.

NORA, a word uſed by ſome of the chemical writers for *lime*, by others for *nitre*, and by others for all ſalts in general, as the word *ſal*.

NORTH (*Cycl.*) — NORTH-*weſt paſſage*. A *north-weſt paſſage* by Hudſon's bay, into the pacific ocean has been more than once attempted of late years, but, hitherto, without ſucceſs. Some greatly doubt of the practicableneſs of ſuch an enterprize, and think the obſervations made by the Ruſſians give us ſmall hopes. But, as they have not yet publiſhed the particulars of their diſcoveries, little can be ſaid about them. Some general things may be ſeen in the Phil. Tranſ. N° 482. Sect. 14. It appears from thence, that the Ruſſians have paſſed between the land of Nova Zembla, and the coaſt of Aſia, and, as the Dutch did formerly diſcover the northern coaſts of Nova Zembla, we may now be well aſſured, that that country is really an iſland.

NOSE (*Cycl.*) — *Bleeding at the* NOSE. An hæmorrhage of the *noſe* is an uſual remedy of nature to relieve herſelf, in caſes of a plethora, and a difficult circulation. It is often wholly ſalutary, and comes on, in ſuch caſes, leiſurely; proceeds without violence, and ſtops at a proper time. But it is ſometimes to be looked on as a diſeaſe coming on haſtily, continuing with violence, and bringing on very bad ſymptoms. Bleedings at the *noſe*, in acute diſeaſes, are ſometimes critical, happening on the days of the criſes, and theſe are uſually copious: ſometimes they are merely ſymptomatic, happening at indeterminate and uncertain times; ſuch are the bleedings from this part in the ſmall-pox, and in petechial fevers: the firſt are ſalutary, theſe rather of bad conſequence.

The lighter hæmorrhages of the *noſe* are often preceded by no ſymptoms, but break out placidly, and go off in the ſame manner. The more violent ones are uſually preceded by a congeſtion of blood about the head, a redneſs of the cheeks, an inflation of the face, a turgeſcence of the veſſels of the temples, and the neck, a noiſe and ringing in the ears, a heavineſs of the eyes, and often a ſparkling of light in them; a vertiginous diſorder of the head, a binding of the bowels, a thinneſs and diminution of quantity of urine, tenſions in the hypochondria, a ſuppreſſion of cuſtomary ſweats, and a coldneſs of the lower parts.

Perſons ſubject to it. Theſe are young people, principally thoſe between the age of fourteen, and one and twenty; and thoſe of plethoric habits. Women are leſs ſubject to them than men. Scorbutic habits uſually throw people into bleedings at the *noſe*; which is not wonderful, ſince the ſcurvy principally owes its riſe to a plethora. Theſe bleedings are brought on by violent emotions either of the mind, or body, by blows on the part, by a too copious uſe of wine, or hot foods, and ſpicey things; by great heat of the weather, or of the room where a perſon remains ſome time; and ſometimes by much lighter cauſes, as barely the waſhing the face, or bending the head too much toward the earth.

Prognoſtics. It is commonly known, that moderate bleedings at the *noſe* relieve people in heavineſſes of the head, and pains and numbneſs in the limbs, and occaſion a more chearful turn of mind. But when this diſcharge is injudiciouſly treated, or raſhly ſtopped by aſtringents, there often ſucceed violent fullneſs and inflations of the veſſels of the head, and dangerous inflammations of the eyes, and other parts. Too frequent bleedings at the *noſe* in young perſons ſometimes preſage conſumptions, for the congeſtions which occaſioned them turning upon the breaſt as the perſon grows up, occaſion ſpitting of blood, and finally a phthiſis. A critical bleeding at the *noſe*, if ſufficient in quantity, often happily carries off a fever. In petechial fevers, ſymptomatic hæmorrhages at the *noſe* are very bad ſymptoms; and, in the ſmall-pox dangerous, though leſs fatal than in this diſeaſe. An habitual hæmorrhage from the *noſe* in grown perſons, is often a ſymptom of ſome diſtemperature in the abdominal viſcera; and, in old people, they often preſage apoplexies, and vertigoes; for when there is a conſtant congeſtion of blood about the head, and this accuſtomed diſcharge is any way impeded, it is often ſeen that theſe diſeaſes are the effect.

Method of treatment. In all bleeding at the *noſe*, if the blood flows moderately, if it ſhews by its fluid ſtate, that it reſults from a plethora; if it is not too great for the age and ſtate of the patient, and if it be habitual, and uſe to be attended with good conſequences, nothing is to be done to impede or ſtop it. But if they be violent, and return often, or if the quantity of blood diſcharged be too great for the ſtrength of the patient to bear, and they are uſually attended with bad conſequences, then the aſſiſtance of medicine is neceſſary. Nitre, mother of pearl, cinnabar are to be given in powder, and decoctions of daiſy roots, comfrey, and poppy flowers in large draughts, with jellies of hartſhorn and ivory; and, if neceſſary, ſome gentle opiate, and a proper diet muſt be preſcribed; the abſtaining from ſpirituous liquors, and high-ſeaſoned foods being abſolutely neceſſary, and the keeping out of great heats, and avoiding violent paſſions, being equally neceſſary. Bleeding and purging are proper after the fit is over, to prevent a return; and to theſe may be added warm baths for the feet, and the common diaphoretics. *Junck.* Conſp. Med. p. 20.

Fracture of the NOSE. In the *noſe* both bone and cartilage are ſubject to fractures, which happen ſometimes on either ſide, and ſometimes in the middle from blows or falls; if either of the bones in the front of the *noſe* are fractured, it produces a flatneſs in the *noſe*, and the air meets with obſtructions in its paſſage through the noſtrils; and if the bone, on either ſide, is fractured, the part becomes hollow. When the cartilage is diſturbed, the *noſe* inclines too much on one ſide. Theſe fractures ſometimes happen without a wound, but more uſually they are attended with a wound of the common integuments. If the injury of the *noſe* is very great, the fracture can never be ſo perfectly cured, but that ſome deformity will remain. The vicinity of this part to the brain alſo, which is frequently injured at the ſame time, renders caſes of this kind often dangerous. A caries alſo, or an ozæna, or polypus, are no uncommon attendants on this diſorder. In order to reſtore the bones of the *noſe* to their proper ſituation, the patient is to be placed in a ſeat oppoſite to the light, and his head held back by an aſſiſtant. The ſurgeon is to raiſe the depreſſed parts with a ſpatula, a probe, or a quill, applying externally the thumb of one hand, and the fore finger of the other. If the bones of the *noſe* are fractured on both ſides,

they

they are to be raiſed on each in this manner, and the cavity of the noſtrils is to be filled up with long doſſils, to prevent the bones from collapſing; covering the part alſo for this end with ſome plaiſter, and applying firſt the dreſſings common in recent wounds. If the bone is fractured into ſeveral ſplinters, they are to be reduced into their proper places by the fingers; but if a ſplinter is ſo entirely ſeparated from the bone, that it will not eaſily unite with it again, it is to be taken out with the forceps. The bones will unite, when properly replaced, in about fourteen days, if no caries, or abſceſs intervene. If the bone ſhould require a ſtronger ſupport than what has been hitherto mentioned, one may be formed out of ſtrong paper, either ſingle, or double, and adapted to each ſide of the *noſe*, and ſupported by bolſters, and the whole muſt be kept in its place by a four headed bandage not tied too tight. *Heiſter*, Surg. p. 117.

Luxated NOSE. It ſometimes happens, though not often, that the bones of the *noſe* are ſeparated from each other, or diſtorted out of their natural places, without a fracture. When this caſe happens, the patient is to be ſpeedily placed in a high chair, and an aſſiſtant muſt ſtand behind, and hold his head firm in a proper poſture: the ſurgeon is then to introduce with one hand a thick probe, a gooſe quill, or a ſmall ſtick ſhaped for that purpoſe up the noſtril internally, by which means the depreſſed parts of the *noſe* may be thruſt out into their places: in the mean time he is to apply his other hand externally, to guide, and direct the parts which are thus moved from within. This being done, and the bones properly replaced, there is ſcarce any thing elſe to be done, but to let a piece of ſticking plaiſter lie upon the *noſe* for ſome time. *Heiſter*, Surg. p. 151.

Wounds of the NOSE. Wounds of the *noſe* are generally cured by the dry ſuture; but, where the wound divides the cartilage, and penetrates ſo deep that the lips of it cannot be kept in contact by the application of ſticking plaiſters, the true ſuture muſt be made through the ſkin, on each ſide of the wound; and Bleyny affirms that when a part of the *noſe* has been actually cut off, and ſeparated from the reſt, it has been afterwards united, by means of ſutures. When the naſal bones have been fractured, it is uſual to place ſmall tubes of lead, or ſilver, under them for ſome time, leſt the paſſage of the *noſe* ſhould be ſtopped up by the ſhooting of new fleſh. Externally ſome vulnerary balſam, or glutinous powder, is to be uſed, and covered with ſticking plaiſters, which muſt be kept on by the four-headed bandage. *Heiſter*, p. 81.

NOSE-*band*, in the manege, called in French *muſerolle*, is that part of the head-ſtall of a bridle that comes over a horſe's noſe.

NOSTOCH, the name of a vegetable ſubſtance which ſeems to differ from moſt of the other bodies of that kind, in ſeveral particulars.

It is a ſubſtance of an irregular figure, of a greeniſh brown colour, and ſomewhat tranſparent. It trembles at the touch, in the manner of a jelly, but it does not melt when held in the hand. It has therefore ſomewhat of the character of a vegetable leaf, but it has neither veins nor fibres.

It is found in all ſorts of ſoils, but moſt frequently in ſandy ones, ſometimes on the gravel of garden walks, and moſt uſually makes its appearance after rain. It is found only in the ſummer months, and retains its humidity and perfect figure ſo long as it is a moiſt ſeaſon, but immediately dries up, and withers away, on the ſun, or winds affecting it.

Many people have ſuppoſed this not to be a plant; it appears all on a ſudden, and, as it were, by a ſort of miracle, either from the earth or clouds, and ſome have called it *flower of earth*; others *flower of heaven*; and the obſcurity of its origin has occaſioned its being held in great eſteem among the chemiſts, who ſuppoſe that it contains an univerſal ſpirit capable of converting other metals into gold. Memoirs Acad. Par. 1722.

Mr. Magnol, and Mr. Tournefort, were the firſt authors who aſſerted its true origin, and ranged it among the plants. Its nature, however, was never perfectly diſcovered till Mr. Reaumur took it under conſideration. This accurate obſerver ſoon found that it was a leaf which naturally imbibed water in a very particular manner; that when it had enough of this liquor in it, it then appeared in its natural flouriſhing ſtate; and when it loſt this again, it became thin, and wrinkled, and was not to be known for the ſame ſubſtance, or, indeed, ſcarce to be ſeen at all. Hence appears the reaſon of its ſuppoſed ſudden production, and decay. If it has, ever ſo long, lain in the walks of a garden in its empty wrinkled ſtate, it is never taken notice of; but, on a ſhower of rain, it imbibes the water, and immediately ſwells out into this jelly-like ſtate, and, on the ſun's evaporating that moiſture, it falls into its undiſtinguiſhable ſtate again; and theſe changes may affect the ſame plant alternately for many days together.

Mr. Geoffroy imagined that he had found roots to the *noſtoch*; but Mr. Reaumur poſitively aſſerts that it has none. He obſerved, indeed, at certain times, on the ſurface of ſome ſpecimens of this, a vaſt number of round tubercles of different ſizes, which appeared to be the ſeeds of the plant: theſe he regularly ſowed in earthen pots of mould, and theſe produced young plants like the parent *noſtoch*, but even theſe were never diſcovered to have any appearance of roots; and, to try farther whether they had any, Mr. Reaumur turned all the plants bottom upwards, and they received no harm from it, but grew juſt as vigorouſly as before.

If the *noſtoch* has truly no roots, as appears to be very evidently the caſe, it follows that it imbibes its nouriſhment in the manner of the ſea plants, which imbibe the water by which they are nouriſhed at all their pores.

It ſhould ſeem that there are two ſpecies of this *noſtoch*, the one only a plain flat leaf; the other curled, wrinkled, and variouſly undulated: and it is on this laſt, that the fruits which produce the young plants are principally found. It may be, however, that the one of theſe may be the male, and the other the female of the ſame ſpecies, as in many larger plants; or poſſibly the being in the ſtate of fructification alone may make the difference.

NOSTRILS (*Cycl.*) — The *noſtrils* are ſometimes ſubject to be preternaturally cloſed; though this is a caſe that but rarely happens. It is ſometimes owing to a careleſs treatment in the ſmall pox, in the bad kinds of which the *noſtrils* have been known to cloſe, and adhere ſo ſtrongly to the upper lip, which is found turned back at the ſame time, as to leave no poſſibility of ſhutting the mouth. In this unhappy caſe, the only relief is by the knife, ſeparating the lip from the noſe, and then opening a paſſage through each of the *noſtrils*. Theſe are to be kept open, either with tents, or leaden pipes, and the lip preſſed downward into its natural poſition by a compreſs and bandage, and this continued till the wounds are ſiccatrized. *Heiſter*'s Surgery, p. 447.

NOSTRILS *of fiſh*. See NARES *piſcium*.

NOSUS, a name by which ſome of the barbarous writers of the middle ages have called *alabaſter*: others alſo have called it *niſus*.

NOTHING (*Cycl.*) — Some modern mathematicians have diſtinguiſhed *nothing* into two kinds. They talk of *abſolute nothing*, and of *relative nothing*; but all this jargon is the reſult of confuſed notions, and ought to be baniſhed out of geometry. See INFINITESIMAL.

NOTION (*Cycl.*) — This term, and the word *idea*, are often taken in the ſame ſenſe; but an ingenious author obſerves, that we cannot ſtrictly be ſaid to have an *idea* of an active being, or of an action, although we may be ſaid to have a *notion* of them. I have ſome knowledge, or *notion*, of my mind, and its acts about *ideas*, inaſmuch as I know, or underſtand what is meant by thoſe words. What I know, that I have ſome *notion* of.

However, if the world will have it ſo, the terms *idea* and *notion* may be uſed convertibly. But yet it conduces to clearneſs and propriety, that we diſtinguiſh things very different by different names. It is alſo to be remarked, that all relations including an act of the mind, we cannot ſo properly be ſaid to have an *idea*, but rather a *notion* of the relations or habitudes between things; but, if in the modern way, the word *idea* is extended to ſpirits, relations, and acts, this is, after all, an affair of verbal concern. *Berkeley*, Princip. of Hum. Knowl. Sect. 142. p. 160, 161. See IDEA.

NOTONECTA, in natural hiſtory, the name of a ſpecies of water-inſect, approaching to the nature of the cimex. It always ſwims upon its back, and is very ſwift in its motions. Its belly, which it ſhews while in the water, is of a yellowiſh white; its legs are long; when taken out of the water it hops. It is indeed a very beautiful, and very nimble little creature; and is common in the ponds of water in Hyde park, and in ſeveral other places about London. It has four wings, ſix legs, and no antennæ; it is eight inches long, three broad, and two and a half thick. The body is black, and of a very particular form, being flattiſh at the belly, and riſing to a ridge on the middle of the back; ſo that when it ſwims, which is almoſt always on the back, its body reſembles a boat in figure.

The belly is jointed, ſtriated, and hairy, and has a large opening at the tail, out of which, when hurt, it thruſts forth ſomething reſembling a ſting. The head and ſhoulders are large, hard, and yellow, without any ſpots; the eyes are large and red, and are of a ſomewhat triangular form. The noſe is a long, green, hollow proboſcis, terminating in a hard and ſharp brown point; this, in its natural poſture, is kept under the belly, and reaches to the middle pair of legs. The outer pair of wings are of a pale fleſh-colour, with ſpots of a dead white; theſe are long, narrow, and ſomewhat tranſparent: they terminate in a roundiſh point, and perfectly cover the whole body. The triangular piece which ſtands between the top of the wings, is hard and perfectly black; the inner wings are broader and ſhorter than the outer ones; they are thin, and perfectly tranſparent, and are of a pale pearl colour. The legs are green and hairy; the foremoſt pair are ſhorteſt; the middle ones longer than theſe; but the hinder pair are greatly longer than all the reſt, ſo that they ſerve as oars, and are tufted with hair at the end to that purpoſe. This creature moſtly lives in the water, where it preys on ſmall inſects, killing them, and ſucking their juices with its proboſcis, in the manner of the water ſcorpion, and many other aquatic inſects; and it ſeizes its prey violently, and darts with incredible ſwiftneſs to a conſiderable diſtance after it.

Though it generally lives in the water, it ſometimes, however crawls out in good weather, and drying its wings by expanding them in the ſun, takes flight, and becomes an inhabitant of the air not to be known for the ſame creature, unleſs to thoſe who had accurately obſerved it before; when tired of flying, or in danger of an enemy, it immediately plunges into the water. If taken into the hand, it ſtings, and gives an intolerable pain, but this goes off in a very few minutes. This is the ſpecies moſt frequently met with, but it is not the only *notonecta* we have, three or four other kinds, different in ſize, and colour, being found not unfrequently in large waters.

NOVACULA *piſcis*, the *raſor-fiſh*, in zoology, the name of a ſea-fiſh caught in the Mediterranean, and ſome other ſeas, and much eſteemed at the tables of the great.

It is of a very ſingular ſhape, having a large and flatted head with no ſnout, or noſe; but its mouth, which is very ſmall, is no more than a ſimple gap, or ſlit, in the lower part of the head; there are four long teeth in the fore-part of it, and all the reſt is furniſhed with very ſmall, but very ſharp ones. The eyes are ſmall, and ſituated in the upper part of the head. It has two large fins at the gills, and two ſmall ones on the belly. Its back is furniſhed with one long fin, not very high, but reaching from the beginning of the back to the tail. The anus is placed nearer the head than the tail; and, from this to the tail, there is another long fin: its tail is large and broad. It is altogether of a flatted form, and is covered with large ſcales of very beautiful colours; the head and gills have ſeveral ſtreaks of a fine blue; the belly-fins, and the tail, are of a cancellated work of green and yellow; the back fin is red ſpotted with black; and the body of the fiſh of a fine yellowiſh red.

It is a ſmall fiſh, ſeldom exceeding three or four inches in length, and, in its flat ſhape, ſomewhat reſembles the faber. It keeps about the ſhores, particularly ſuch as are ſtony, and ſeems never to go into deep water; and is caught on the ſhores of Majorca Minorca, the iſland of Malta, and elſewhere, and lives on ſmall fiſh. *Salvian.* de Aquat.

NOVACULARUM *lapis*, in natural hiſtory, the name given by De Laet to a ſtone which he deſcribes from Ximenes, who has it under the American name *iztli*.

It is the ſtone out of which the natives of America made their weapons of war, and tools for other uſes of life, before they knew the uſe of iron.

There are three ſpecies of this ſtone, the one blue, the other white, and the other black; they are all capable of a very high poliſh, and, when ſet in gold, or ſilver, are very highly eſteemed by the natives: they reflect the images of things, in the manner of all other highly poliſhed bodies, and the two firſt are conſiderably tranſparent.

There are ſeveral quarries of theſe ſtones in the neighbourhood of Mexico, whence the Indians uſed to get them; they naturally ſplit, in the getting out, into angular, and edged figures, and theſe they afterwards faſhioned to the purpoſes they wanted them for, and poliſhed with the powder of a harder ſtone.

They ſtill make knives of them, in a very expeditious, and very remarkable manner. They hold the maſs of ſtone between their feet, and, with an inſtrument prepared on purpoſe, they cut off pieces of four or five inches long, and about one inch broad, riſing to a prominence on each ſide in the middle, and growing very thin toward the edges: it is wonderful to ſee with what expedition they finiſh this odd workmanſhip. The knives, when made, are ſharper than any other inſtrument in the world; but they are very tender, eaſily broken, and more eaſily battered, and notched at the edges. They make alſo longer weapons of the ſame ſhape out of this ſtone, which they fix into wooden handles, with a ſort of gum, and theſe ſerve them as ſwords. They are very terrible weapons for one blow, but they ſeldom hold together ſo as to bear a ſecond. They make alſo the heads of their arrows of them, and when theſe were firſt found by our travellers they were not ſuppoſed to be of human workmanſhip, but to have fallen from heaven in thunder, and were called by many authors *ceraunia*. *Ximenes* Hiſt. Ind. Occid. l. 10. c. 13. See CERAUNIA.

NOVENSILES, among the Romans, heroes newly received into the number of the gods, or the gods of the provinces and kingdoms which the Romans had conquered, and to which they ſacrificed under the name of *dii novenſiles*. *Danet.* Dict. in voc.

NOUER *l' eguillette*, in the manege. See YERK.

NOURISHMENT (*Cycl.*) — NOURISHMENT *of plants*. The antients in general gave to the earth the power of producing plants and animals, and whatever elſe lives upon, or exiſts in it; and for this reaſon they gave it the general title of parent earth, and mother of all things. They ſuppoſed that into this common parent all returned again at laſt; and that after a time of diſſolution in its bowels, they returned back again into the formation of more bodies of the ſame kind. Even thoſe among them who aſſerted the doctrine of the four elements, yet allowed that the earth was the matter which conſtituted thoſe bodies, and that the other three, that is, fire, air, and water, ſerved only to convey, and diſtribute this, as there was occaſion; and Thales is only miſunderſtood, when he is ſuppoſed to think differently from this general ſyſtem of the antients.

But though the antients all gave earth the power of producing animals, and other bodies, the moderns have gone into an opinion that water is the origin of all. Lord Bacon was one of the firſt who argued on this principle: he ſays, that for the *nouriſhment* of plants water is almoſt all in all; and that the earth only ſerves to keep the ſtalk upright, and to defend the root from over-heat, and over-cold. Since the time of this great author many have been yet more expreſs in this opinion, and have aſſerted that water is the only principle of all natural things, ſuppoſing that by ſome ſecret proceſs of nature water is tranſmuted into ſtones, plants, and other things. Phil. Tranſ. N° 253. p. 193.

Helmont attempted to prove this doctrine by many experiments; and Mr. Boyle who followed him through the whole courſe of his experiments, ſeems to aſſent to his opinion, that water is tranſmuted by nature into wood and ſtone, though, in his uſual way, he delivers his thoughts with great modeſty, and candour. The two principal experiments they build their opinions upon, are, that of mint, and ſome other plants growing in water; and that of a tree being planted in a ſmall quantity of earth, which being baked to a dryneſs, and weighed before the tree was ſet in it, and again baked, and weighed afterwards, will be found to have loſt nothing of its own weight, though the tree has encreaſed to a very great degree, only from the water with which they have wetted this earth from time to time.

It might be objected to the laſt experiment, that it is not eaſy to bake earth to the ſame degrees of dryneſs twice over, ſo as to have any hopes of being exact in the weight; but allowing ever ſo great an exactneſs in that, the experiment brings no proof with it, unleſs they can prove that the water which was uſed in the wetting it was pure and homogeneous, and not charged with any tereſtrial matter; for, if it were, the plant may, after all, owe its encreaſe entirely to that earth alone, and the water may only ſerve, according to the doctrine of the antients, to convey and diſtribute this grand *nouriſhing* element, in a neceſſary and proper manner.

It is true that water often appears ſo clear and pellucid, that one would ſcarce ſuppoſe any portion of ſo opake a matter as earth could be contained in it; but we find by chemical experiments, that ſo opake a body as ſilver may be diſſolved in aqua fortis, ſo as to give it no colour, nor render it in the leaſt degree leſs pellucid than before. Our water, however, is not ſo pure in any caſe, as is vulgarly imagined. The naked eye will often diſcover particles of earthy matter, though very ſmall, floating in the very cleareſt we have: and experiment ſhews, that, when evaporated, all water leaves behind it a large quantity of opake, earthy matter, which we could not ſee in it by the naked eye.

This remainder of evaporated water, generally conſiſts of particles of two kinds: the one part are found to be earthy, and ſuch as are fit for the *nouriſhment* of plants, and theſe ſeem ſo different among themſelves, on a nice examination, that they ſeem fitted either for the *nouriſhment* of different plants, or for that of the different parts of the ſame plant; the other particles are of a ſparry and cryſtalline nature, and ſeem calculated for the production of ſtones, &c. In ſome ſprings, we alſo meet with many other principles ſuſpended, ſuch as alum, vitriol, nitre, ochre, and other things, and often many of them in the ſame ſpring; the water, as it paſſes through the ſtrata of ſtone, earth, &c. often waſhing off, and carrying away, in a ſtate of ſolution with it, the particles of thoſe bodies in conſiderably large quantities. Theſe are carried ſuſpended in the water to the mouths of the ſprings, but they are not ſo well ſuſpended afterwards. Phil. Tranſ. N° 253 p. 196.

Vegetable earth, or that kind of mould which is neceſſary for the *nouriſhment* of plants, is more light than ſpar and other minerals, and is both more readily diſſolved, and more eaſily ſuſpended in water than theſe. Hence the waters of all rivers contain a great quantity of this, though very little of the other particles, they being always found moſt plentifully in water near its ſource, and leſs and leſs ſo the farther it has run in the open air. River water contains alſo more of this terreſtrial matter than rain water, as is proved by eaſy experiments, though that contains ſome: and it is evident from the whole, that earth is contained in all water, and, therefore, that all water whatever is capable of conveying it into the bodies of plants, and diſtributing it through their ſeveral parts, for their *nouriſhment* and encreaſe.

If the cleareſt water be put into a clean vial, and ſtopped ſo as to keep out duſt, the earth in it will ſoon be diſcovered: the motion of the water, while in its natural ſtate, keeps this earth in ſmall particles, and, therefore, they are leſs diſcernible; but, on being ſet to reſt in this manner, theſe particles get together, and form larger combinations, which become more viſible, and finally ſo many of them will join together, that they will become apparent, in form of ſmall clouds of opake matter floating in the water; and theſe will become larger and larger, as they have yet more and more freſh matter added to them.

If this earthy matter be of a vegetable nature, it will remain ſuſpended in the water by means of its lightneſs, and will by degrees acquire a green colour, and this will become every day more and more green, as it acquires more and more matter to it. This colour is not to be wondered at, ſince we find how very great a ſhare of it is deſtined to appear of the ſame colour in plants.

When the water ſuſtains a large quantity of mineral, or ſparry matter, this forms its concretions in the ſame manner as the vegetable; and being heavier than this light vegetable earth, it ſubſides to the bottom, and ſometimes not alone, but entangling its particles among thoſe of the vegetable kind, it carries them down along with it. It is palpable from theſe, and from a great number of other the like obſervations, that water of whatever kind does ſuſtain in it the matter of earth, ſuch as is neceſſary for the encreaſe and *nouriſhment* of vegetables; and it appears very conſonant to reaſon, that, in paſſing through the ſeveral ſmall veſſels of the plants into which it is received, it depoſites, and leaves behind it, this earth arranged into a proper form. This the ingenious Dr. Woodward has proved by the experiments of plants growing in glaſſes of water; an accurate liſt of each of which is given at large in the tranſaction referred to in this article.

NOVUS *auris muſculus*, in anatomy, a name given by Fabricius to the muſcle called by Albinus *laxator tympani*, and by others *externus auris*, and *exterior*.

NUAYHAS, the *ague tree*, a name given by the Indians to a ſort of bamboe cane, the leaves of which falling into the water, are ſaid to impregnate it with ſuch virtue that the bathing in it afterwards will cure the ague.

They uſe alſo a decoction of the leaves to diſſolve coagulated blood, giving it internally, and, at the ſame time, rubbing the bruiſed part externally with it. It is ſaid that this plant bears its flowers only once in its life; that it lives ſixty years before theſe appear, but that when they begin to ſhew themſelves, it dies away in about a month afterwards, that is, as ſoon as it has ripened the ſeed.

There ſeems ſomething of fiction in the account of many other particulars of this tree, in the hortus Malabaricus, but it ſeems certain that the length of the ſtalks, or trunk, muſt be very great; for, in the gallery of Leyden, there is preſerved a cane of it of twenty-eight foot long, and another but little ſhorter in the Aſhmolæan muſæum at Oxford, which is more than eight inches in diameter; yet both theſe appear to be only parts of the whole trunk, they being nearly as large at one end as at the other.

NUBA, a word uſed by ſome writers to expreſs a peculiar ſort of manna, or honey-dew, of a roſe-colour. Some chemiſts alſo uſe it as a name for *copper*.

NUBECULA, a name uſed by ſome authors for the diſtemperature in the eye called *albugo*, and *leucoma*, by moſt writers, being ſpots in the cornea of the eye. *Heiſter*'s Surgery, p. 421. See ALBUGO.

NUBELOSA *linea*, a term uſed by the Latin writers on heraldry, to expreſs a ſort of clouded line in certain coats of arms. Our heralds call it *nebule*, and the French *nuance*. It is figured ſo as to repreſent clouds at the edge, and was given to the firſt of the families who bear it, as a token of their ſkill in aſtronomy and navigation.

NUBES, in natural hiſtory, a word uſed by the antients to expreſs that whitiſh foulneſs which we frequently ſee in the bottom of the fineſt columns of cryſtal; we expreſs this by the ſame word *cloud*.

The columnar emeralds are ſubject to the ſame ſort of foulneſs at their bottom, and this part was called the root of the emerald properly enough, as it was that end of the column where it grew to the ſtone; but the word root of emerald has been ſince applied to ſeveral very different ſubſtances of a green colour, and ſome degree of tranſparence.

NUBIGENUM *æs*, a term uſed by ſome hiſtorians to ſignify copper generated in the clouds, and falling from thence with rain, or in ſtorms. They talk alſo of iron, and of ſtones produced the ſame way, and call them *ferrum nubigenum*, and *lapides nubigeni*.

Many of the German hiſtorians mention the falling of iron in duſt, and in large pieces; and Aviſenna tells us ſuch things of Italy. Julius Scaliger ſays that he had by him a piece of iron which came down in rain in Savoy; and Cardan tells us of twelve hundred ſtones falling from heaven, one of which was of an hundred and twenty pound weight, and others thirty or forty pounds apiece; they were all, he ſays, of the colour of iron. Dr. Liſter is for ſuppoſing them to be genuine pyritæ, which, he ſays, is ſoluble into vapour, and thus raiſed into the air may there concrete again into its own form, or that copper and iron may concrete from it. Phil. Tranſ. N° 156. See *præternatural* RAINS.

NUCIFRAGA, in zoology, a name given by many to the *coccothrauſtes*, or *groſs beak*, from its breaking nuts, and the ſtones of fruits. See COCCOTHRAUSTES.

NUCULA *terreſtris*, in botany, a name given by ſome to the *bulbocaſtanum*. See BULBOCASTANUM.

NUDIPEDALIA, among the antients, a feſtival in which all were obliged to walk bare-footed.

This was done on account of ſome public calamity, as the plague, famine, an intenſe drought, and the like.

It was likewiſe uſual for the Roman matrons, when any ſupplication and vows were to be made to the goddeſs Veſta, to walk in proceſſion to her temple bare-footed. *Pitiſc.* Lex. Ant. in voc.

NUFAR, in botany, the name of the *water-lilly*. This was the original name, and was firſt uſed by the Arabians; from them the Greeks borrowed it, and variouſly changed it. The Arabians themſelves added the prefix *nil* to it, to expreſs one particular kind of *water-lilly* of Ægypt; this they called *nil nufar*, or, for a ſofter way of ſpeaking, *ninufar*, and *nenufar*.

The Greeks borrowed this word, and wrote it firſt *ninufarium*, and afterwards, for ſhortneſs, *nuphar*ium. The afterwriters tranſpoſed the letters, and made out of it, *nilufar*, *linufar*, a word wholly unintelligible, but by their tracing it back to its original. See NILUFAR.

NUHAR, a name uſed by ſome chemical writers for *copper*.

NUMERAL (*Cycl.*) — NUMERAL *figures*. The antiquity of theſe in England has been ſuppoſed as high as the eleventh century, from an antient date found at Colcheſter, at firſt thought to expreſs 1090; the figure in the place of hundreds being taken for a cypher, by not attending to the inſide ſtrokes, which were pretty near defaced; but upon a more accurate view that miſtake was diſcovered, and the date found to be 1400. See Phil. Tranſ. N° 439 and 475.

NUMELLA, among the Romans, an engine of wood uſed in puniſhing offenders, whoſe necks and feet were made faſt in it. *Pitiſc.* Lex. Ant. in voc.

NUMELLA was likewiſe uſed to denote a rope or cord made of raw ox-hides to bind beaſts with. *Pitiſc.* in voc.

NUMENIA, Νεμηνια, or Νεομηνια, in antiquity, a feſtival obſerved at the beginning of every lunar month, in honour of all the gods, but eſpecially Apollo, who was called Νεομηνιος, becauſe the ſun is the author of all lights; for whatever diſtinction of times and ſeaſons may be taken from other planets, yet they are all owing to him, as the original and fountain of all thoſe borrowed rays, which the reſt have only by participation from him. For the ceremonies of this ſolemnity, ſee *Potter*, Archæol. T. 1. p. 416.

NUMENIASTÆ, Νεμηνιαϛαι, among the antients, a deſignation given to thoſe who kept a feſtival on every new moon. See the article NUMENIA.

NUMENIUS, in the Linnæan ſyſtem of zoology, the name of a diſtinct genus of birds, of the order of the *ſcolopaces*. The diſtinguiſhing characters of this genus are, that the feet have each four toes, and the beak is longer than the toes. *Linnæi* Syſt. Nat. p. 47.

NUMENIUS is alſo a name uſed by many authors for the curlew, a bird more uſually known by the name of *arquata*. See the article ARQUATA.

NUMENIUS *Indicus*, the *Indian curlew*, the name given by Cluſius to the *guara* of the Braſilians, a very beautiful large bird, of the nature of the curlew, but of the ſize of the *platea* or ſpoonbill. *Ray's* Ornithol. p. 219. See GUARA.

NUMIDICA *avis*, in zoology, a name given by many to the common turkey.

NUMIDICUM *marmor*, in the natural hiſtory of the antients, the name of a peculiar ſpecies of marble, which was of no great beauty, but ſingular in its remarkable hardneſs, and capable of a very elegant poliſh.

It ſeems to have been one of the firſt marbles the Romans brought into uſe in pavements. It is a very firm, hard and ſtrong kind, of a cloſe texture, and in colour of a pale aſh-coloured blue. It is found in Italy, Spain, France and Germany, but no where ſo plentifully as in the laſt country. It is a very durable and ſtrong kind; but its want of variety in colour, makes it but little eſteemed. *Hill*'s Hiſt. of Foſſ. p. 465.

NUMMULARIUS, among the Romans, was uſed to ſignify a *banker*, or perſon who deals in money.

It likewiſe denoted an aſſayer, or one who eſtimated the goodneſs and value of money, as to its weight and fineneſs of metal. *Pitiſc.* Lex. Ant. in voc.

NUN (*Cycl.*) — NUN, in zoology, the common Engliſh name for the *parus cæruleus*, or blue titmouſe, diſtinguiſhed from the common titmouſe by its ſmallneſs, and by its having a blue head, ſurrounded by a white line. *Ray's* Ornithol. p. 176. See PARUS.

NUN is alſo the name of a peculiar ſpecies of pigeon, called by Moore the *columba veſtalis*. It is but a ſmall pigeon, but ſomething larger than the jacobine, and has a very particular plumage, from which it has taken its name, its head being as it were covered with a veil.

The body of this ſpecies is all white, the head, tail, and ſix of the flight feathers black, red or yellow; the eyes are pearl-coloured, and the hood white: this is a large tuft of feathers on the hinder part of the head, and the more numerous they are, the more the bird is eſteemed.

This is a very beautiful ſpecies of pigeon, and is very much eſteemed. Some of its feathers, however, will vary ſometimes

times from their true colour. These birds are called foul feathered. But it is a mere accidental variety, the young of such being often as perfect and beautiful as of any others. *Moore*'s Columbarium. p. 47.

NUNCIATION, *nunciatio*, among the Romans, was particularly used to signify the report which the augur made concerning what he had seen.

This he did to the chief magistrate present, and the magistrate communicated the same to the people, and so dismissed the assembly, which was called *obnunciation*. *Pitisc.* in voc.

NUSIADAT, a name given by some of the chemical writers to sal armoniac.

NUSTAM, a word used by Paracelsus and his followers to express the cream of milk, or the pellicle which in some cases swims upon the surface of wine.

NUT, among botanists, a pericarpium of an extraordinary hardness. See the article PERICARPIUM.

NUT-*hatch*, in zoology, the English name of a bird, known among authors by that of *sitta*; and from its climbing trees in the manner of the wood-pecker, called by some, tho' improperly, *picus cinereus*, the grey wood-pecker. *Ray*'s Ornithol. See SITTA.

NUT-*jobber*, in zoology, an English name for the *sitta*, more commonly known among us by the name of the *nut-hatch*. See the article SITTA.

NUTRITION (*Cycl.*) — *Defect of* NUTRITION, or ATROPHY. This takes its origin from the infarctions of the glands of the mesentery, and evidently manifests itself in the patient by a successive decay and attenuation of the parts.

An *atrophy* differs from a hectic in this, that there is in it only an infarction of the mensenteric glands, whereas in the other case they are generally ulcerated: and in degree the difference also is manifest, all the symptoms being more violent in the hectic than in the simple *atrophy*.

Signs of it. An *atrophy* is known by a general languor both of body and mind; a depraved and unhealthy look of the face; a light and unsettled sleep; an uncertain appetite, sometimes voracious, sometimes nauseating all things, but usually most desirous of cold foods; a straitness of the breast, and an uneasiness after eating; great internal heat, and dryness of the tongue. The bowels are usually lubricous and moist, and throw out the food half undigested: in some cases, however, they are observed to be dry and costive. The urine often appears to be a chylous matter: the abdomen is tumid and hard in the first stages of the disease, but afterwards it becomes more flaccid, and then on feeling it there may be several nodes and lumps perceived. The body by degrees wastes away, and there is a continual feverishness and thirst, and that especially in the night-time: and these symptoms often increase to that violence, as plainly to resemble a hectic, and bring on an equal loss of strength and spirits.

Sometimes the *atrophy* arises from worms, and then the whole face is always pale; the nostrils are full of a mucous matter, and sometimes become excoriated: the appetite is voracious, and the patient feels an insufferable restlessness when hungry, which goes off, and they generally become inclined to sleep after a full meal. When this is the case in young subjects, the rickets and swellings about the joints usually succeed the other symptoms, and crookedness of the legs, gibbosity of the back, and various distortions of the spine follow it: these often put an end to the *atrophy*; but as they continue, and become lasting deformities, they are a very unhappy remedy.

Persons subject to atrophies. Children, while very young, are most of all subject to this disease, and often fall into it from improper food: the use of heavy and fæculent malt liquors, and of acids, which coagulate the milk, that usually makes a large part of their nutriment. The suppression of their sweats is another frequent cause of *atrophies*, especially when occasioned by large draughts of cold liquors when they are hot in the night, and sometimes by an improper use of astringents to stop those diarrhœas to which they are frequently subject. Youths more grown up are often thrown into an *atrophy* by eating voraciously of crude, thick, heavy and obstruent diet, or from the drinking spirituous liquors: sometimes from their having been injudiciously treated in fevers, and sometimes from their being violently infested with worms in their bowels. Men grown up usually fall into it after being debilitated by other illnesses, and by the remains of the causes of those illnesses being left in the body; and by nothing oftener are reduced to this distempered state than by inordinate hæmorrhages. Persons who are scrophulous, or have infarctions of the external glands, usually also are at one time or other afflicted with this infarction of the internal ones, and few escape it that labour under any other violent concretions of the internal parts.

Prognostics. A recent *atrophy* is not difficult of cure; and even the most inveterate one, tho' stubborn enough, is always much less dangerous and difficult of cure than an hectic. The more complicated this disease is, the more difficult it always is in the cure; and it is hence that grown persons are not so easily or so often cured as children, because with them it is usually complicated with many other disorders; and, in general, that *atrophy* which is brought on by hæmorrhages, or by ill-treated illnesses, is much more difficult of cure than that which arises from a wrong diet. And, finally, in *atrophies* arising from worms, when they are destroyed, the disease usually ceases.

Method of cure. The first thing to be done in this case is, to thoroughly abstergе and cleanse the primæ viæ by gentle purges, among which nothing is so proper as calomel, assisted by syrup of rhubarb, or the like, and these purgatives are afterwards to be repeated at different intervals, during the course of the cure. After the first purges, resolvent and attenuating medicines are to be given; and finally, the preparations of steel, decoctions of arum and pimpernel root, with ground-ivy, are very beneficial, as is also the juice of ground-ivy given alone; and the resolvent salts, as tartar of vitriol, nitre, and the like, with some of the aperient tinctures of steel. *Junker*'s Consp. Med. p. 112, 214.

NUX (*Cycl.*) — NUX, the *wallnut-tree*, in botany, the name of a genus of trees, the characters of which are these: the flower is of the amentaceous or catkin kind, and is composed of a great number of leaves affixed to an axis, and disposed in a squammose manner: under each of these there is placed a large cluster of apices. These flowers, however, are barren, and the embryo fruit appear in other parts of the tree. These finally become a hard shell, covered by a soft or fleshy one, and easily dividing into two halves, having within it a kernel usually consisting of four lobes, divided by a sort of woody septa.

The species of *wall-nut* enumerated by Mr. Tournefort, are these: 1. The common *wall-nut*. 2. The great *wall-nut*, called the French and horse *wall-nut*. 3. The tender-fruited, or brittle-shell'd *wall-nut*. 4. The double-bearing *wall-nut*. 5. The harder fruited *wall-nut*. 6. The jagged-leav'd *wall-nut*. 7. The late ripening *wall-nut*. 8. The *wall-nut tree* with very small fruit. 9. The *wall-nut tree* with plain, not serrated leaves. *Tourn.* Inst. p. 581.

NUX *maris*, in natural history, a name given by many writers to a peculiar species of sea shell. It is one of the *dolium*, or *concha globosa* kind, and of that genus called *gondola*, and is the first species mentioned under that word. See GONDOLA.

NUX *regia*, the *royal nut*, a name given by some authors to the *wal'nut*. *C. Bauhin*, Pin. p. 417.

NYCTICORAX, in zoology, the name of a bird called in English the *night raven*. It is of the heron kind, and is called by Mr. Ray *ardea cinerea minor*, or the small grey heron. It is much smaller, and shorter-neck'd, than the common heron; its head and back are black; its neck grey, and its throat and belly yellowish; it has on each side of the head a white streak from the angle of the beak to the eyes; and on the hinder part of its head has a crest made of three feathers, or hairy substances of five fingers breadth long: its wings and tail are grey: it flies principally by night, and makes a very hoarse and disagreeable croaking. *Ray*'s Ornithol. p. 204.

NYCTOSTRATEGI, Νυκτοστρατεγοι, among the antients, officers appointed to prevent fires in the night time.

At Rome, they had the command of the watch, and, from their number, and office, were called *nocturni triumviri*. *Pitisc.* in voc.

NYGMA, a word used by some of the medical writers to express a wound by puncture.

NYMPHAGOGI, Νυμφαγογοι, among the antients, an appellation given to those who led the bride from her father's house, to that of the bridegroom. Vid. *Pitisc.* in voc. See BRIDE.

NYMPH (*Cycl.*) — NYMPHS *of flys*, in natural history, is that state of the fly class, which is between their living in the form of a worm, and their leaving that form for that of their parent fly. See Tab. of Insects, N° 29, seq.

In this state, in many genera of the flys, the worm, or maggot, makes a shell of its own skin, which hardens, and becomes brown, or reddish, while the whole of its body becomes detached from it; and, after having lain some time in form of an oblong ball, without any visible parts of the creature that is to be produced from it, acquires, by degrees, the form of the fly, and all its limbs, and appears an embryo fly wrapped up in an extremely thin, and fine membrane. This is properly the *nymph* state, and, in these flys, when the parts of this *nymph* are more confirmed, and hardened, it is, in reality, no other than the fly wrapped up in this bag, which is so very transparent that every lineament of the insect it contains may be clearly discerned through it. The wings, however, in this state, appear as if they were not yet perfectly formed, but the truth is, that they are only very nicely, and regularly folded together. The creature, however, in this state, though ever so perfect, seems quite inanimate. When all the parts, however, have acquired their due strength, the creature puts itself into motion, and gets loose from its covering, which is no small difficulty; for though the skin of this is very fine and thin, yet as it serves as a nice case to every part of the animal, the effects by which it is to get rid of it must be somewhat difficult to the creature. A much greater difficulty, however, it will necessarily be imagined to be for the embryo fly to get out of the outer shell, or case, which is usually firm, hard, and rigid; but nature has so ordered it, that no more force shall be required for this great work than the creature is able to exert.

Out of the two ſorts of ſhells of theſe inſects, the one in form of an egg, and the other of the worm itſelf, there are two ways for the fly's egreſs.

For the firſt of theſe, it is always from the ſame end of the ſhell, in form of an egg, that the embryo fly is ſeen to make its way out. This is always that end which is near the head of the fly, and which was, originally, the head of the worm.

The head of the fly, however, is provided with no inſtrument to make this great opening. The point of the trunk is yet very ſoft, and, even when at its utmoſt hardneſs, it could only make a very ſmall, and, in a manner, imperceptible hole. Nature has furniſhed the creature with another means of freeing itſelf from this ſhell. The cap at the top of this is made, as it were, of two halves, and they ſo looſely attached both to one another, and to the other part of the ſhell, that they very readily ſeparate with a ſmall force, and fall off from it. But this is not all; for in every one of theſe ſhells, toward the joining on of the cap to the head part, there are two ribs, or prominent lines, diametrically oppoſite to one another, and reaching to ſome diſtance in the ſhell. Theſe ſeem formed to ſtrengthen the ſhell, but they are, in reality, intended to weaken it, and are the places at which it not only eaſieſt breaks, but even ſplits, and opens, with a ſmall force. This, with the falling off of the cap gives ſufficient room of egreſs to the fly, and may be eaſily diſcovered to be intended ſo to ſeparate by nature itſelf; ſince in breaking any other part of the ſhell, it cracks irregularly, and indeterminately; but here it ſeparates only at theſe lines.

It is eaſy, indeed, for us by a ſlight force to ſeparate the two pieces of the cap of the ſhell in theſe caſes, and a ſmall force does it; but this, though ſmall to us, is great in proportion to the ſtrength and circumſtances of the *nymph*, encloſed as it is on all ſides.

The ſkull of the fly, it is to be conſidered, however, is ſolid and cruſtaceous, and of a conſtant and regular figure, as in other larger animals; yet the fly, in this ſtate, is able to inflate and contract its head alternately, and, by that means effects much of the great buſineſs of its liberty. This extending the bulk of the head, is aſſiſted by a ſort of bladder which the creature, at each of theſe inflations, puſhes out to ſome diſtance from its head, and which, ſometimes, even equals the head itſelf in ſize. The air is the only means by which the fly can, in this manner, inflate and ſwell its head; and, when neceſſary, it ſwells its whole body in the ſame manner. The inflation of the head, and the throwing out this ſort of bladder, which is an operation the fly is never able to do afterwards through its whole life, are evidently meant to diſlodge and throw off the cap, and open the ſide lines of the ſhell. *Reaumur*, Hiſt. Inſect. Vol. 4. p. 332, ſeq.

NYMPH-*animal*, in natural hiſtory, one of the terms uſed by Swammerdam, in his claſſing the inſects according to their ſtates and productions. It expreſſes thoſe creatures which are produced in their perfect form from the egg, and are ſubject to no changes of any kind afterwards. See TRANSFORMATION *of inſects*.

NYMPH-*chryſalis*, or NYMPH-*aurelia*, a name given by Swammerdam in his hiſtory of inſects, to one of the four general claſſes into which he has reduced all thoſe animals in regard to their changes.

The creatures of this claſs are not hatched from the egg in their proper form, but in that of a worm, or caterpillar, and, after hatching, they obtain their perfection by ſlow degrees, not as the *nymph* vermicles of the graſhopper do, in a manner obvious to the eye, but under the covert of their ſkin, and muſt appear chryſalis's before they are perfect flies. The common day and night butterflies, and many other inſects are of this claſs. *Swammerd.* Hiſt. Inſect.

NYMPHA *vermiculus*, in natural hiſtory, a term uſed by Swammerdam to expreſs one of the four general claſſes of the tranſmutations of inſects, or, as he more properly ſtiles them, their manner of growth.

The animals of this claſs are not produced from the egg in their perfect figure, nor yet in the worm ſhape, as the caterpillar of the butterfly, and maggot of the fly, but the parts of the inſect are imperfectly ſhaped in the egg, and, after hatching, it does not appear properly itſelf, but acquires its perfection viſibly by means of outward food. The locuſt, graſhopper, &c. are of this claſs. *Swammerd.* Hiſt. Inſect.

NYMPHA *vermiformis*, in natural hiſtory, a word deviſed by Swammerdam, and by him uſed to expreſs one of his four great claſſes on inſects, according to their production.

Thoſe of this claſs are not hatched from the egg in their own form, but in the ſhape of worms, and differ from the caterpillar kind in this, that they always remain ſhut up in the ſkin of the worm, till they throw off both ſkins at once, and appear in their winged ſtate. The common flies, &c. are of this claſs. *Swammerd.* Hiſt. Inſect

NYMPHÆA, the *water lilly*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the roſaceous kind, conſiſting of ſeveral petals arranged in a circular form; the ſeed veſſel ariſes from the cup of the flower, and is, when ripe, of a globoſe or conic figure, multicapſular, and filled with oblong ſeeds. See Tab. 1. of Botany, Claſs 6.

The ſpecies of *nymphæa* enumerated by authors are theſe: 1. The great white *nymphæa*, or *water lilly*. 2. The great American *water lilly*, with very large rounded leaves, beautifully crenated, and purple underneath, and with large white flowers. 3. The American *nymphæa*, with ſmaller rounded leaves, obtuſely crenated, green underneath, and with white flowers. 4. The ſame ſpecies of *water lilly* are known when not in flower, by their large leaves, which float upon the ſurface of the water. *Tourn.* Inſt. p. 260.

NYMPHARENA, in natural hiſtory, the name of a ſtone found in the beds of ſome rivers, and having the appearance of a ſea horſe's tooth. Doubtleſs it was a petrified tooth of that or ſome other ſuch animal, ſuch things being often found now, though in theſe early ages they were little known or regarded.

NYMPHARIUM, in botany, a name given by the Greek writers of the later ages to the *water lilly*.

The word is formed of *nymphæa*, and is of the ſame kind with many other names of plants deviſed about the ſame time, which ſeem a ſort of diminutives formed on the before received names of the ſame plants. Thus *ſcillarium* is a name given by Aëtius to the *ſquill*, when the roots were ſmall. Moſt of theſe words were formed of the Arabian names of the things thoſe new ones expreſſed.

NYMPHARUM *oculi*, in natural hiſtory, a name given by ſome of the antient writers to the ſtone we call *oculus Beli*, and ſometimes to the operculum of a ſhell-fiſh, common on the ſea ſhores in many places, and called *umbilicus veneris*. We are told of Caligula that he carried his ſoldiers armed to the ſea ſide, to pick up the *nympharum oculi*, and ſhells. It is certain in this place, the word only means the *umbilicus veneris*, for the other *oculi nympharum* are found only on the ſhores, and in the beds of ſome particular rivers, not on the ſea ſhores among ſhells.

NYMPHOIDES, in botany, the name of a genus of plants, approaching to the nature of the water lilly, or *nymphæa*, in external appearance, and thence uſually eſteemed ſpecies of that genus, but improperly.

The characters of this genus of plants are theſe: the flower conſiſts of one leaf, uſually of a rotated form, and divided into ſeveral ſegments at the edge. The piſtil ariſes from the cup, and perforates the bottom of the flower, and finally ripens into a ſoft fruit, or capſule, of an oblong, compreſſed figure, having only one cell, and containing many ſeeds wrapt up in a calyptra. See Tab. 1. of Botany, Claſs 2.

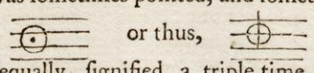
The ſpecies of *nymphoides* enumerated by Mr. Tournefort are theſe: 1. The common *nymphoides*, which ſwims on waters: this is called by moſt other authors the *yellow water lilly*, with fimbriated flowers. 2. The *nymphoides* with leaves beautifully ſtained with purple ſpots. 3. The Indian *nymphoides*, with white fimbriated flowers, called by authors *nadil ambel*. *Tourn.* Inſt. p. 153.

NYSSA, in botany, the name of a plant deſcribed by Gronovius, and made by Linnæus a diſtinct genus of plants, under the ſame name. The characters are theſe: it produces male and female flowers; in the male flower the cup is a five-leaved, expanded perianthium. The flower is monopetalous, but divided into five ſegments, of the ſhape and ſize of thoſe of the cup. The ſtamina are ten pointed filaments, longer than the flower. The antheræ are double.

In the female flower the cup is of the ſame figure as in the male, but it remains upon the fruit. The flower is the ſame as in the male; the piſtil has an oval germen under the cup; the ſtyle is ſingle, and ſlender, and is longer than the flower. The ſtigma is oblong, compreſſed, and bent. The fruit is a drupa of an oval figure, containing one cell, in which is contained an oval nut, ſharp pointed at the ends, and rib'd with longitudinal lines. *Linnæi* Gen. Pl. p. 482. *Gronov.* Virgin. p. 121.

O.

O *(Cycl.)* — It was not, ſtrictly ſpeaking, the letter O, but the figure of a circle O, or double CO, by which the modern antients, in muſic, uſed to expreſs what they called *tempo perfetto*, or triple time. Hence the Italians call it *circolo*. This circle was ſometimes pointed, and ſometimes barred, thus

 or thus,

But theſe equally ſignified a triple time. *Broſſard.*

The ſeven antiphones, or alternate hymns of ſeven verſes, &c. ſung by the choir in the time of Advent, was formerly called *O*, from their beginning with ſuch an exclamation.

OAK, *quercus*, in botany. See the article QUERCUS.

Holm-OAK. See the article ILEX.

OAK-*apples*, a name given to the common galls, uſed in dying. See the article GALL.

OAK-*leaf galls*. Theſe are of ſeveral kinds; the remarkable ſpecies called the muſhroom gall, is never found on any other vegetable ſubſtance but theſe leaves; and, beſide this, there are a great number of other kinds.

The double gall of theſe leaves is very ſingular in that, as the generality of productions of this kind affect only one ſide of a leaf, or branch, and grow all one way; this kind of gall extends itſelf both ways, and is ſeen on each ſide of the leaf, in form of two protuberances, oppoſite the one to the other. Theſe are of differently irregular ſhapes, but their natural figure ſeems that of two cones, with broad baſes, and very obtuſe points, though ſometimes they are round, or very nearly ſo. See Tab. of Inſects, N° 25.

Theſe make their firſt appearance on the leaf in April, and remain on it till June, or longer. They are at firſt green, but afterwards yelloviſh, and are ſofter to the touch than many other of the productions of this kind: they are uſually about the ſize of a large pea, but ſometimes they grow to the bigneſs of a nut. When opened, they are found to be of that kind, which are inhabited each by one inſect only, and each contain one cavity. The cavity in this is, however, larger than in any other gall of the ſize, or even in many others of three times the ſize; the ſides of it being very little thicker than the ſubſtance of the leaf.

It would be natural to expect, in this large lodgment, a large inſect, but what is uſually found is only a ſmall browniſh ſubſtance, of a kidney-like ſhape, looking like the ſeed of ſome plant. This is hard and motionleſs; but is, however, the chryſalis of an inſect which may be found living in the gall, when opened in an earlier ſeaſon, and is a ſmall white worm, owing its origin to the egg of a fly. This creature has a method of depoſiting its eggs within the ſubſtance of the leaf, and the young ones, when hatched, eating on each ſide, form the double tumor.

The life of the creature in this ſtate is but ſhort, and its duration in the chryſalis conſiderably long. The ſhell under which it paſſes this ſtate is not made in the manner of that of moſt other worms, of its own ſkin, but is formed of the woody fibres of the ribs of the leaf, which it gnaws into ſmall pieces, and forms into that ſhape by means of a viſcous humour, ſecreted from its own pores. At length the fly makes its way out of this caſe by breaking off one end of it, and then eats itſelf a paſſage through the gall, and flies at large. The flies hatched of theſe inſects are very ſmall, yet Mr. Reaumur has obſerved them ſo carefully, as to be able to diſtinguiſh three or four kinds of them.

The moſt common fly produced of theſe galls, is a very beautiful ſmall one, of the four-winged kind. Its body and breaſt are black; its wings gawſy, and colourleſs; and its antennæ conſiderably long, and of the conic, granulated kind. The body of this fly is very ſhort. A ſecond ſpecies is very different from this firſt; it is of a brown colour, much longer bodied, and has antennæ of the club kind. There is another which reſembles this in ſhape, but its body is of a fine ſhining green, with an admixture of a gold colour; the wings of this exhibit all the rainbow colours in the manner in which they are ſeen on a bubble of ſoap ſuds.

It is not eaſy to aſcertain the origin of the ſeveral ſpecies of flies, which are, at times, ſeen in this manner to come out of the ſame ſpecies of galls. It ſeems the common courſe of nature, that only one ſpecies of inſect forms one kind of *gall*; yet it may be, that two or three kinds may give origin to the ſame kind. There is, however, another occaſion of our ſeeing different ſpecies come out of different *galls* of the ſame kind; and this is the effect of the enemies of the proper inhabitants.

It might appear that the parent fly, when ſhe had formed a *gall* for the habitation of her worm offſpring, had placed it in an impregnable fortreſs: but this is not the caſe; for it frequently happens that a fly as ſmall, perhaps, as that which gave origin to the *gall*, produces a worm which is of the carnivorous kind, as the other feeds on vegetable juices. This little fly, well knowing that where there is one of theſe protuberances on a leaf, there is a tender and defenceleſs inſect within, pierces the ſides of the *gall*, and depoſits her egg within it. This, when it hatches into a worm, feeds upon the proper inhabitant, and, finally, after devouring it, paſſes into the chryſalis ſtate, and thence appears in the form of its parent fly, and is ſeen making its way out of the *gall*, in the place of the proper inhabitant.

On opening theſe *leaf galls*, which are properly the habitation only of one animal, it is common to find two, the ſtronger preying upon the body of the other, and ſucking its juices as it does thoſe of the leaf; often it is found wholly employed in devouring its unoffending neighbour at once: this is probably the caſe when its time of eating is nearly over; and, in fine, when we find the *gall* inhabited by only one inſect, or containing only one chryſalis, as it ought in its natural ſtate to do, we are never certain that this is the proper inhabitant, as it may be one of theſe deſtroyers who has eaten up the other, and ſupplied its place. *Reaumur*'s Hiſt. Inſ. Vol. 6. p. 197, ſeq.

OAK *puceron*, a name given by naturaliſts to a very remarkable ſpecies of animal of the *puceron* kind. The generality of ſuch animals live on the ſurface of the branches and leaves of trees, and plants; but theſe bury themſelves in the clefts of the *oak*, and ſome other trees, and getting into the crevices, where the bark is a little ſeparated from the wood, they there live at eaſe, and feed to their fill, without being expoſed to their common enemies.

Theſe are the largeſt of all the ſpecies of *pucerons*; the winged ones are nearly of the ſize of a common houſe fly, and the naked, or ſuch as have no wings, though leſs than theſe, are yet greatly larger than any other ſpecies of *pucerons*; the winged and naked kinds in theſe, as well as in the other ſpecies of *pucerons*, are all mothers, and great number of young ones may be preſſed out of the body of either kind, when gently ſqueezed. The winged ones are black, and the others of a deep brown, or coffee-colour; they have the moſt remarkable trunk of any animal in the world; it is more than twice the length of their bodies, and has not its origin at the extremity of the head, as in other inſects, but is fixed into the breaſt near the origin of the firſt pair of legs. When the creature is walking, it carries this ſtrait along the belly, and trailing a conſiderable length behind it, but with the point turned up, that it may be out of the way of accidents, and be ready to ſuck. When the creature has a mind to ſuck a part of the tree that is juſt before it, it draws up, and ſhortens the trunk, till it brings it to a proper length, and direction; but when it ſucks in the common way, it crawls upon the inner ſurface of the bark, and the turned up end of the trunk, which reſembles a tail, fixes itſelf againſt the wood that is behind it, or contiguous to its back, and ſucks there. The extremity of this trunk holds ſo faſt by the wood, that when it is pulled away, it frequently brings a ſmall piece of the wood away with it.

The ants are as fond of theſe as of the other ſpecies of *pucerons*, and that for the ſame reaſon, not feeding upon them, but on their dung, which is a liquid matter of a ſweet taſte, and is the natural juice of the tree, very little altered. Theſe creatures are the ſureſt guides where to find this ſpecies of *puceron*; for if we at any time ſee a number of theſe crawling up an *oak* to a certain part, and there creeping into the clefts of the bark, we may be aſſured that in that place there are quantities of theſe *oak pucerons*.

The mechaniſm by which this trunk of the *oak puceron* is ſhortened, is like that by which we alter at pleaſure the length of our teleſcopes which are compoſed of ſeveral parts running one into another. This trunk is, in the ſame manner, compoſed of three joints, which, at the pleaſure of the animal, are received more or leſs into one another's cavities, and, in all ſtates, are ſo flexile, that the animal can bend, and direct them to any part at pleaſure.

The laſt joint of the trunk, or that which is fartheſt from the body is terminated by a very hard and ſharp point; it is made only to pierce into the ſubſtance of the hard wood, and as, if this had been hollow, it muſt have been both weaker, and thicker, both which are great diſadvantages in regard to its uſe, nature has made it ſolid. In this it departs from the general nature of other trunks of inſects, which are always open at the end: but inſtead of that, this has an oblong ſlit on its upper part, a little above the end; by this means, it is able at once forcibly to enter the wood, and to imbibe its juices. This ſlit is not to be perceived without the largeſt magnifiers, but there is always to be ſeen a drop of tranſparent liquor on the place where it is, if the creature be a little ſqueezed when newly taken off from the wood. This whole trunk is beautifully tranſparent, and there are two long bodies like hairs ſeen within it. It is hard to gueſs at

the uſes of ſo minute parts, but, probably, theſe ſerve either to aſſiſt the motions of that trunk in lengthening, or ſhortening, or elſe as piſtons, in drawing up the juices for food.

Though the trunk already deſcribed appear very ſingular in this inſect, there is ſomething in the mechaniſm of the parts by which it receives its nouriſhment ſtill more wonderful, more out of the common method of nature than that: this is, that the creature has, properly ſpeaking, a double trunk, for it has, beſide this long one, another which is ſhorter, being about the lengthened diameter of thoſe of the other inſects of this kind, and placed, as they are, at the extremity of the head. The creature can elevate, and protend, this leſſer trunk at pleaſure, but, in its natural ſtate, it is lodged in a ſmall channel, in the long and large trunk before deſcribed, made to receive it. The uſe of this ſeems very plain, though very ſingular; as the creature was to feed upon the juices of a hard and ſolid wood, it required an organ of peculiar ſtrength to enter its ſubſtance; this nature has provided it with in its long trunk, but, as the uſes that was deſtined for required its being placed on the breaſt, this was a part too far diſtant from the head to be proper for the receiving the juices. This ſcheme of nature for the nouriſhment of the animal, ſeems therefore to have been this; the larger trunk is to receive, and convey to its upper part, the juices of the tree, and the ſmaller trunk is there to be inſerted at pleaſure into it, and to ſuck up from thence the juice into the body, as, in common caſes, its office is to do it immediately from the plant itſelf. *Reaumur*'s Hiſt. Inſ. Vol. 6. p. 64, 78.

The ants are ſo extremely fond of the juices of the tree, when prepared for them by paſſing through the body of this animal, that when the *puceron* has a drop not yet evacuated, but hanging only in part out at the paſſage, an ant will often ſeize on it there.

The diſtinguiſhing characters of the *pucerons* of all kinds, is their having two paſſages for the excrements on the hinder part of the body, beſide what reſembles the anus in larger animals; theſe paſſages, in moſt ſpecies, are formed into a ſort of horns, or ſhort hollow tubes, ſticking out from the body of the creature, and ſerving as a very obvious diſtinction of it from all other animals: in this, however, and in ſome other ſpecies, theſe paſſages are not formed into horns, but are only two round tubercles a little more elevated than the reſt of the ſurface of the body, and placed where the horns in others ſtand. *Reaumur*'s Hiſt. Inſ. Vol. 6. p. 78.

OAK *ſnake*, in zoology. See DRYINUS.

OAT, *avena*, in botany. See the article AVENA.

Some phyſicians have greatly recommended a diet drink made of *oats*, in various diſtempers. The method of preparing the drink is as follows: take of recent *oats* entire, and well waſhed, one pound and an half; of the freſh root of ſuccory, cut into ſlices, one handfull; ſpring water twelve pints; boil all together in a clean earthen veſſel to the conſumption of half, and then ſtrain the liquor through a linnen cloth, and add to it ſix ounces of coarſe ſugar, and half an ounce of ſal prunellæ; let it boil again, and afterwards be taken off the fire, and ſet by, for a day and a night, in a cool place; then pour off the clear liquor, and keep it in a cellar in veſſels cloſe ſtopped.

Two ordinary cup-fulls of this liquor given twice a day, three hours before, and as many after dinner, are ſaid to do wonders in the cure of all kinds of fevers, colic pains, pleuriſies, itches, cutaneous tumors, and hypocondriacal diſorders; as alſo in cleanſing the kidnies from ſand, and opening the obſtructed viſcera. The uſe of it is ordered to be continued thirteen days, and, if the patient be cacochymic, a gentle purge is to be given before it is taken. It is accounted a great preſervative againſt illneſs, if taken thrice a year, in ſpring, in autumn, and in the dog days; and the inventor of it, Joannes de St. Catharina, is ſaid to have kept himſelf alive by it to the age of an hundred and twenty years, without any diſeaſe.

Dr. Lower having tried it, and found its good effects, by repeated experience, made it public, and the celebrated Hoffman has written an expreſs treatiſe about it, in which he recommends it both in intermittent and continued fevers, but adviſes purified nitre to be uſed inſtead of the ſal prunellæ, and obſerves that the two boilings ordered by Dr. Lower are not neceſſary, but that the ſugar and nitre may be added at firſt. It muſt be kept carefully in ſummer, otherwiſe it ſoon becomes ſour, and unfit for uſe.

Thoſe who deſire to have it coloured may boil in it an ounce of alkanet root, and two ounces of red ſaunders, which will give it a fine red colour, without at all affecting its virtues.

It is, unqueſtionably, a very valuable medicine, affording ſingular relief wherever obſtructions of the veſſels are to be removed, or ſalts to be waſhed out of the habit; where the viſcid juices are to be diluted, or a due degree of moiſture, and humidity reſtored. It is alſo excellent for allaying thirſt in fevers, and for ſtopping hæmorrhages.

Black OATS. Theſe are commonly ſown upon an etch crop, or on a lay, which they plough up in January, when the earth is moiſt, taking care to turn the turf well, and to lay it even and flat. *Oats* are to be ſown earlier in the northern parts of England than in the ſouthern.

Oats are ſown with a broad caſt at twice as they do barley, harrowing it well in; but this muſt always be harrowed the ſame way that the furrows lie of a lay, or but very little croſs, for fear of raiſing the turf, but upon an etch, as ſoon as the land is ploughed on an edge, they ſow and harrow it in once; then ſow it a ſecond time, the full quantity, and harrow it five or ſix times over, obſerving to harrow once or twice acroſs, which breaks the clods, and covers the ſeed better than harrowing all one way. They commonly ſow them upon a broad ridge, which they give the land but one ploughing for.

The uſual time of ſowing black *oats* is in the beginning of February, or a very few weeks later, ſometimes not till the beginning of March: they are a hardy grain, and will bear any thing of wet or cold. Four buſhels of ſeed is the quantity for an acre; but they grow beſt on a moiſt land, though they will not miſs any where. The farmer knows that his *oats* are ripe when the ſtalk turns yellow, the grain feels hard and the huſk begins to open, and ſhew the ſeed. After they are cut, they ſhould lie for the dew and the rain to plump them, and make them thraſh well; and, if weedy, to kill the weeds: but, if there happen much rain, they muſt be got in again as ſoon as dry, otherwiſe the *oats* will ſoon fall out of the huſks, and great part of the crop be loſt.

Red OATS. The red *oat* is a kind of corn very common in Staffordſhire, and ſome of the northern counties; it is a ſort of naked *oat*, and is very proper for making oatmeal, becauſe the kernel thraſhes out of the hull, without carrying it to the mill, or drying of it. This *oat* is cultivated in the ſame manner as barley.

White OATS. This kind of *oat* is commonly ſown upon an etch, after wheat, rye, or barley: they only give the land one ploughing, and ſow them, and harrow them, as they do the black *oats*, except the land is ſubject to weeds; in that caſe it is good to plough up the wheat, or rye ſtubble, in November, which will make it rot the better, and be a kind of winter fallowing. Only if you have a very dry burning ground, which black *oats* will not delight in, in that caſe, they often ſow them upon a lay. March and April are the uſual time of ſowing white *oats*, and the drier the weather is when they are ſown, the better; they grow beſt upon a dry, gravelly, or ſandy land, and they are the beſt of all to be ſowed upon a land very ſubject to weeds, becauſe, being ſowed late, they allow a very late ploughing, and growing very quick after this, they over-top the weeds ſooner than any other plant. The reaping of white *oats* is the ſame with that of the black, and they generally yield about the ſame quantity, that is, twenty buſhels, or thereabouts, from an acre. *Mortimer*'s Huſbandry, p. 134.

Wild OAT, in huſbandry, a kind of *oat*, or *oat* graſs, which comes up of itſelf, without ſowing, and is much hated, and dreaded by the farmers. This, in many counties of England, is the greateſt of all hinderances of the good crops of barley, and often of other grain. It is a rough and hairy *oat*, and uſually black. In the wetter years, and after much froſt, this is found to be moſt troubleſome.

The beſt remedy the farmer has againſt this, is to ſow the land moſt apt to produce it with beans, and when they are come up to about three inches high, to turn in ſheep upon the ground, about twenty ſheep to an acre; theſe will eat up all the ſhoots of the wild *oat*, and not touch the beans ſo long as there is any of the *oat* ſhoots left. *Mereton*'s Northampt. p. 480.

OAT-*ſnail*. See the article SNAIL.

OBELISCUS *marmoreus*, in natural hiſtory, the name of a very remarkable ſpecies of ſhell-fiſh, unknown to us in its recent ſtate, but met with very frequently foſſile in the Swediſh ſtone uſed for pavements, and in ſome other kinds, and more accurately named by late authors *polythalamium*, and *orthoceratites*, and by Klein *tubulus marinus concameratus*. *Klein*. de tubul. p. 7. See TUBULUS *concameratus*.

OBELISK (*Cycl.*) — One of the uſes of *obeliſks* among the antients, was to find the meridian attitudes of the ſun, at different times of the year. Hence they ſerved inſtead of very large gnomons. One of the *obeliſks* now ſtanding at Rome, that of St. John's Lateran, is, in height, 108 Engliſh feet, without the pedeſtal; and the other *obeliſk*, buried under the *campo Marzo*, wants but little of the ſame height. Pliny gives us a deſcription of this gnomon, lib. 36. §. 15. From him it appears that there was laid down, from the foot of the *obeliſk* northward, a level pavement of ſtone, equal in breadth to the breadth of the *obeliſk* itſelf, and equal in length to its ſhadow at noon, upon the ſhorteſt day; that is to ſay, that its length was to the height of the *obeliſk*, almoſt as 22 to 10, and that, under this pavement, there were properly let in parallel rulers of braſs, whoſe diſtances from the point, directly under the apex of the *obeliſk*, were reſpectively equal to the lengths of the ſhadow thereof at noon, on the ſeveral days of the year, as the ſame lengths decreaſed from the ſhorteſt day to the longeſt, and again increaſed from the longeſt day to the ſhorteſt. Vid. Phil. Tranſ. N° 482. Lect. 5. where we alſo find ſome remarks by Mr. Folkes on Hardouin's amendment of a paſſage in Pliny's natural hiſtory, lib. 2. §. 74. Edit. Pariſ. 1723. fol. about the length of the ſhadows of gnomons in different latitudes.

OBEY, in the manege. A horſe is ſaid to *obey* the hand and heels, to *obey* the aids, or helps, when he knows and anſwers them according to demand.

OBLADA, in ichthyology, a name given by ſome to the *melanurus* of authors, a fiſh of the *ſparus* kind, diſtinguiſhed by Artedi by the name of the *ſparus variegated with longitudinal lines, and with a large black ſpot on each ſide near the tail.*

OBLATÆ (*Cycl.*)—OBLATA is alſo a word uſed by ſome authors to expreſs a ſort of purging tablet, made of fine flower and ſugar, with ſome purging ingredients.

OBLATÆ is alſo uſed to ſignify the conſecrated wafers, or hoſts, diſtributed to the communicants in the maſs or ſacrament of the altar; and ſometimes the cuſtomary treats in religious houſes have been called by the name of *oblatæ*.

OBLIGATO, in the Italian muſic, ſignifies *for, on purpoſe for*, or *neceſſary*, as *doi violini obligato*, on purpoſe for two violins; and ſo of other things, as *conſagotto obligato*, that muſt be played with a baſſoon, &c.

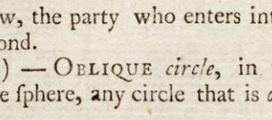
Sometimes it ſignifies confined, or reſtrained, by certain rules, ſubjected to certain limits or laws, in order to perform ſome particular thing, to give ſome particular expreſſion of a paſſion, action, &c. In this ſenſe we ſay, *contrapunto obligato*, *fuga obligata*, &c. We alſo ſay, the baſs is *obligato*, when it is only a ground of a certain number of bars, which are to be repeated over and over; ſuch is the baſs to chacones, &c. and every baſs wherein one is obliged to keep a certain movement, and to perform only certain notes, &c.

OBLIGEE, in law, is the party to whom an obligation, or bond is made. *Blount.*

OBLIGOR, in law, the party who enters into, or executes, an obligation, or bond.

OBLIQUE (*Cycl.*) — OBLIQUE *circle*, in the ſtereographical projection of the ſphere, any circle that is *oblique* to the plane of projection.

OBLIQUO, in the Italian muſic, ſignifies two breves tied together, which make but one body, whence it is named in Italian *nota d' un corpo ſolo*; ſometimes there is a tail, or the right, or left ſide, either aſcending, or deſcending. (See NOTE, LIGATURE, and VIRGULA.) However it be, the two extremes mark the ſound, the middle ſerves only to tie them, thus:



OBLIQUUS *brevis*, in anatomy, a name given by ſome authors to the muſcle uſually called the *obliquus inferior occuli*, the *ſextus occuli* of Fallopius.

OBLIQUUS *externus*, in anatomy, the name of a muſcle of the abdomen, which is broad and thin, fleſhy on its upper and back part, and tendinous on the anterior, and greateſt portion of the lower part. It reaches from half the lateral and inferior part of the thorax, to almoſt half the lateral and ſuperior part of the pelvis: and from the back part of the regio lumbaris to the linea alba. It is fixed by its upper part to the ribs, by its lower to the os ilium, ligamentum Fallopii, and os pubis, and by the fore-part to the linea alba; the poſterior portion next the vertebræ of the loins has commonly no true muſcular inſertions. It is called alſo the *obliquus deſcendens*, *obliquus ſuperior*, and *obliquus major*.

It is fixed to eight ribs by the ſame number of angles, the inſertions in the bony extremities of the ribs are at different diſtances from the cartilages, and the name of digitations, or indentations, have been given to theſe angular inſertions, becauſe they join a like number of the ſame kind belonging to other muſcles, as the fingers of the hands may be locked between each other; theſe digitations appear to be entirely fleſhy, but they are almoſt all truly a little tendinous in their back part; they ſeem to encreaſe in breadth alſo as they deſcend, and often unite with the intercoſtal muſcles, as they paſs over them; there are in theſe muſcles other internal inſertions, covered and hid by thoſe which appear outwardly. The firſt digitation is longer than the reſt, and has about the breadth of two fingers; the ſecond is about an inch in breadth; the third is about three fingers broad; the fourth mixes, by ſome of its anterior fibres, with the ſerratus major, as the firſt does with the pectoralis major, and the ſecond with the ſerratus major; the fifth mixes both with the foregoing, and with the firſt digitation of the latiſſimus dorſi; the ſixth is about two fingers broad, and ſends off a faſciculus of fibres to the ſerratus major; and the ſeventh is of the ſame breadth with the former, and ſome of its fibres are ſent off to the ſerratus poſterius inferior. *Winſlow*'s Anatomy, p. 163.

OBLIQUUS *internus*. This is another name for the *obliquus aſcendens*. It is a broad thin muſcle like the former, with nearly the ſame extent and inſertions, that is in the lower ribs above, in the criſta of the os ilium, and ligamentum Fallopii below, and in the linea alba before; but it differs from it in this, that the lower part of it is more fleſhy than the upper. One portion of its lower extremity, which is intirely fleſhy, is fixed by very ſhort tendinous fibres in the middle ſpace between the two labia of the criſta of the os ilium, from the back part of the tuberoſity of that criſta, near the ſymphyſis of the os ſacrum, almoſt all the way to the ſuperior, and anterior ſpine of the os ilium; ſo that its inſertion reaches farther back than that of the obliquus externus. The fleſhy fibres thus fixed run up firſt from behind, obliquely forward, and then this obliquity encreaſes proportionably, as the fibres lie more anteriorly, and they croſs thoſe of the fleſhy portion of the external obliquus, being afterwards inſerted exteriorly in the lower edges of the cartilages of all the falſe ribs, and thoſe of the two loweſt true ribs, reaching to the extremity of the cartilago enſiformis. *Winſlow*'s Anatomy, p. 165.

OBLIQUUS *capitis ſuperior*, a muſcle ſituated laterally between the occiput, and firſt vertebra, and nearly of the ſame figure with the two recti. It is fixed to the end of the tranſverſe apophyſis of the firſt vertebra, from whence it runs upward, and very obliquely backward, and is inſerted in the tranſverſe line of the os occipitis, almoſt at an equal diſtance from the criſta, and the maſtoide apophyſis between the rectus major and the complexus minor, which it covers a little. *Winſlow*'s Anatomy, p. 237.

OBLIQUUS *capitis inferior*, a muſcle ſituated in a contrary direction to the obliquus ſuperior, between the firſt and ſecond vertebræ of the neck, and reſembles the ſuperior in every thing but ſize. It is fixed below to one branch of the bifurcated ſpinal apophyſis of the ſecond vertebra, near the inſertion of the rectus major, from whence it runs obliquely, upward and outward, and is inſerted in the end of the tranſverſe apophyſis of the firſt vertebra, under the lower inſertion of the obliquus ſuperior. *Winſlow*'s Anatomy, p. 237.

OBLIQUUS *capitis inferior* is alſo the name given by Albinus to a muſcle called by Winſlow *obliquus major*; and, by Veſalius, and the old authors, *ſextus capitis moventium*. Fallopius makes it the *ſeptimus capitis*, and Euſtachius, in his treatiſe, *De motu capitis*, calls it *parvus muſculus a ſecundæ vertebræ ſpina in proceſſum tranſverſum ſpinæ ejusque infixus*.

OBLIQUUS *ſuperior oculi*, in anatomy, a name given by Albinus, and others, to the muſcle called *obliquus major*, and *tertius palpebrarum*, by others.

OBLIQUUS *naris muſculus*, in anatomy, a name given by Winſlow to the muſcle ſince called by Albinus the *levator labii ſuperioris alæque naſi*.

OBLONG *leaf*, among botaniſts. See LEAF.

OBNUNCIATION, *obnunciatio*, in Roman antiquity. See NUNCIATION.

OBOE, or OBOI, in the Italian muſic, is uſed to ſignify an *hautboy* or *hoboy*, or that a part is to be played on that inſtrument.

OBRANG, in botany, the name given by the people of Guinea to a very ſingular and remarkable plant, the virtues of which they greatly praiſe. They boil it in water, and uſe the decoction by way of a fomentation to take down ſwellings of the teſticles. Its leaves have ſome faint reſemblance to thoſe of our liquorice, whence Petiver has called it *glycyrrhizæ folio ſingulari frutex Guineenſis ſpinis gemellis*. Phil. Tranſ. N° 232.

OBRIZUM, in antiquity, a kind of gold. Pliny ſays [a], that they call the gold that has been ſeveral times purified in the fire, *obrizum*. *Auri experimento ignis eſt ut ſimili colore rubeat quo ignis*; *atque ipſum* obrizum *vocant*. *Abriz* in Arabic, or Perſian, ſignifies fine gold without mixture, which the Greeks and Latins call *obrizum* [b]. — [a *Plin.* l. xxxiii. c. 23. b *Calmet*, Dict. Bibl.]

OBSIDIANUS *lapis*, in the natural hiſtory of the antients, the name of a ſtone which they have alſo deſcribed under the name of the *Chian marble*. It is a very ſmooth and hard marble, extremely difficult to cut, but capable of a fine poliſh, and was uſed among the antient Greeks for the making reflecting mirrors. See the article CHIUM *marmor*.

The later writers have ſuppoſed the name *obſidianus* derived from ſomebody of the name of *Obſidius*, who was the inventor of this uſe of it; but it ſeems only a falſe ſpelling of the word *obſianus*, απο της οψεως, from ſeeing the images of things in it. *Hill*'s Hiſt. of Foſſ. p. 460.

OBSTITA, among the Romans, a term uſed to ſignify places that had been thunder-ſtruck, which were otherwiſe called *bidentalia*. *Hofm* Lex. Univ. in voc. See BIDENTAL.

OBSTRUCTION *of the bowels*, *obſtructio alvi*, in medicine, the name by which authors expreſs what we call *coſtiveneſs*, that is, a retention of the ſtools a longer time in the bowels than they ſhould be kept there, from whatever cauſe that retention happens.

An *obſtructio alvi* is ſometimes idiopathic, where there is no other diſeaſe concurring to it; ſometimes it is ſymptomatic, and depends entirely on other diſeaſes, as on fevers, congeſtions, and the like.

Signs of COSTIVENESS. The firſt, and moſt obvious, of theſe is, the not going to ſtool in the ſpace of twenty-four hours; this is uſually ſucceeded by a dizzyneſs, and vertiginous diſorder of the head, painful congeſtions of blood about the head, flatulencies, oppreſſions of the ſtomach, and ſtraitneſs and anxiety about the præcordia. *Junker*'s Conſp. Med. p. 590.

Perſons ſubject to COSTIVENESS. Men of ſedentary, and idle lives, are more ſubject than others to this complaint, eſpecially when ſubject to commotions of the blood, and of a dry choleric temperament, and ſuch as are ſubject to hypo-

condriac affections, and to the gout, or to nephritic complaints, and to acute fevers.

Cauſes of COSTIVENESS. Theſe are obſerved by writers to be of two kinds, the active, and the paſſive. The active cauſe is a certain ſtricture which comes on in the rectum in many different diſorders; as in the ſtone, in nephritic complaints, and in general, in all the congeſtions of blood toward the upper parts of the body. What is called the paſſive cauſe of *coſtiveneſs*, is that occaſioned by a ſort of ſluggiſhneſs in nature, which leaves the periſtaltic motion of the guts too languid, on occaſion of which the fæces are eaſily indurated in the bowels. The occaſional and accidental cauſes which contribute to this induration of the fæces are the following: a neglecting the uſual time of going to ſtool; and checking the natural tendencies, and motions toward it; an extraordinary heat of the body, and copious ſweats; a larger quantity of ſolid food taken into the ſtomach than is proper for the quantity of fluids ſwallowed, and a common uſe of ſuch food as is dry and hard of digeſtion.

Prognoſtics in COSTIVENESS. It is the origin of a great many diſorders; and, in particular caſes, is often attended with imminent danger. In choleric habits, in which perſons are ſubject to large quantities of bilious matter being lodged in the primæ viæ, *coſtiveneſs* is uſually attended with colics, and violent heats. The indurated excrements alſo, when they preſs upon the veins in the guts, very often prevent the circulation, and, by that means, bring on dangerous inflammations in the parts; and, in general, whatever diſeaſe is attended with *coſtiveneſs* is rendered worſe and more violent by it.

Method of treatment in COSTIVENESS. An idiopathic *coſtiveneſs*, when grown into a habit by long ſufferance, is beſt cured by means of drinking more liquids than uſual, and giving the body a greater ſhare of motion; but this motion muſt, by no means, be violent, for that always encreaſes the diſeaſe, but when placid and eaſy, it tends greatly to the reſtoring the periſtaltic motion of the bowels to its proper ſtate. To this it is to be added, that many people have reſtored themſelves from this diſtemperature to a good ſtate, only by going to the cloſe-ſtool every day, at a certain hour, and only endeavouring for ſome time, but without great violence, to force a ſtool; the conſequence of a continual practice of this, for ſome weeks together, has brought nature to expect it, and, in fine, to be prepared for it, and always to have fæces at the time ready to be diſcharged The eating a ſmall piece of bread with a large quantity of butter ſpread over it every day before dinner and ſupper is alſo a good cuſtom; and purges taken every ſpring and autumn are a method of bringing nature into a proper courſe. When the caſe is violent, and calls for the aſſiſtance of medicine, there is always more benefit obtained from clyſters, than from purging medicines given internally. Theſe laſt, when given, muſt never be violent.

In a ſymptomatic *coſtiveneſs*, the primary diſeaſe is always to be firſt regarded, and this is, generally, not a little relieved by a proper removal of the *coſtiveneſs*. In chronic caſes, the ſame rules are to obſerved as in the cure of the idiopathic *coſtiveneſs*; but, in acute caſes, recourſe is to be had to clyſters, and large draughts of warm, and weak fluids, ſuch as barley water, and the like.

When *coſtiveneſs* is attended with no other complaint, but people enjoy their perfect health with it, there is no occaſion for medicines, nature being in ſome conſtitutions habituated to it, and doing well with it. There are many perſons who, in general, do not go to ſtool oftener than once in three days; ſome once in a week; and there have been inſtances of people, who, while they have enjoyed a perfect health, and eat very heartily, have not gone above once in three or four weeks. When habitual *coſtiveneſs* is to be cured by motion, and drinking more fluids, theſe muſt be always uſed together; for otherwiſe drink alone more relaxes the bowels, and motion alone diſſipates the already too little humidity. Thus either of them alone muſt add to the diſeaſe, which, when given together, they cure. The common method of attempting to cure *coſtiveneſs* by repeated doſes of purges, brings on a great many inconveniencies, particularly they always leave the bowels more bound than before, and by that means add to the complaint they were meant to relieve, and even the gentleſt purging medicines have this effect. *Junker*'s Conſp. Med. p. 391.

In caſes of this kind, Dr. Huxham recommends a medicine prepared with ſalt of hartſhorn, ſaturated with ſpirit of vinegar, which not only takes away the fœtid ſmell of the oil of the ſalt, but changes it into an agreeable aromatic. Obſ. de aere, et morb. epid.

OBTUNDENTIA, a word uſed by ſome authors to expreſs ſuch medicines as are given to obtund, or edulcorate the acrimony of the humors.

OBTURATOR (*Cycl.*) — OBTURATOR *externus*, a ſmall flat muſcle, which fills up the foramen ovale of the os innominatum exteriorly, and reaches from thence to the great trochanter of the os femoris behind the neck of that bone. It is fixed by fleſhy fibres to the outer, or anterior ſide of the os pubis, all the way to the foramen ovale, to the edge of that hole next the ſmall ramus of the iſchium, under the acetabulum, where a tendon is formed, which continues its courſe behind the neck of the os femoris toward the great trochanter, and is inſerted between the gemelli, and quadratus, in a ſmall foſſula, between the apex of the great trochanter, and the baſis of the collum femoris. *Winſlow*'s Anatomy, p. 211.

OBTURATOR *internus*, a flat muſcle, almoſt triangular, ſituated in the bottom of the pelvis; it covers the foramen ovale, and almoſt all the inſide of the os pubis and iſchium. It is fixed to the internal labium of all the anterior half of the foramen ovale, a little to the neighbouring part of the *obturator ligament*, and alſo both above and below the foramen. It is likewiſe fixed to the upper half of the inſide of the os iſchium, from the upper oblique notch in the foramen ovale, to the ſuperior part of the great poſterior ſinus of the os ilium.

From all this extent, the fleſhy fibres contracting in breadth, run down below the ſpine of the iſchium, where they go out of the pelvis through the poſterior notch in the iſchium. The inſide of the body of this muſcle, or that turned to the cavity of the pelvis, is pretty uniform; but the outſide, or that turned toward the foramen ovale, and which touches the bone, has four middle radiated tendons, which uniting at the poſterior notch of the iſchium, run over it from behind forward, as over a pulley, each tendon ſliding in a particular cartilaginous channel. Afterwards the four tendons having got out of the pelvis, are pretty ſtrictly united in one large flat tendon, which, croſſing over that of the pyriformis, unites with it, having firſt received on each ſide, ſome additional fleſhy fibres from the two gemelli. The great tendon ſlides freely, in a ſort of membranous vagina, formed by theſe muſcles, and is inſerted in the middle of the ſuperior part of the cavity of the great trochanter, adhering cloſely to the capſular ligament of the joint, and being united to the tendons of the glutæus minimus, and pyriformis. *Winſlow*'s Anatomy, p. 209.

OBTURATOR *ligament*. This is one of the proper ligaments of the oſſa innominata, and fills up all the great foramen ovale, except the oblique notch at its upper part. It is faſtened preciſely to the edge of the circumference of that hole, from the anterior part of the oblique notch, all the way to the ſymphyſis between the os pubis, and os iſchium. From thence to the poſterior part of the inferior notch, it is fixed to the internal labium of the edge of the circumference, forming a kind of ſmall channel with the external labium; and afterwards it is fixed to the common edge of the foramen ovale, and cotyloide notch. By this diſpoſition, an opening is left between this ligament, and the ſuperior oblique notch, and immediately below this common opening, there are two ſmall perforations in the ligament alone. *Winſlow*'s Anatomy, p. 124.

OBULARIA, in botany, the name given by Linnæus to a genus of plants, the characters of which are theſe: there is no cup to the flower, but, in the place of one, there ſtand two leaves of the plant. The flower is compoſed of only one leaf; the tube is of a bell ſhape, inflated, and pervious, and the edge is divided into four ſegments, which are ſhorter than the tube, and are of a bifid figure. The ſtamina are four ſubulated filaments, ariſing from the ſegments of the flower, and two of them are ſomewhat ſmaller than the others. The antheræ are ſmall. The germen of the piſtil is oval, and compreſſed. The ſtyle is cylindric, and of the length of the ſtamina; and the ſtigma is oblong, bifid, and remaining. The capſule is of an oval, compreſſed figure, and contains numerous ſeeds, in form of a fine powder. *Linnæi* Gen. Plant. p. 297.

OCCATION, a term in the antient huſbandry, by which they expreſſed what we do by harrowing, though they performed it with a different inſtrument, a kind of rake.

With the teeth of this inſtrument, they levelled the ground, and broke the clods, and, with the hand, ſtrewed the corn over this level ground. Then they brought on the plough, and ploughed it in; ſo that the grain was ſown in furrows, as we expreſs it, and uſually came up, as we ſee it does at this time with us, in the ſame caſe, in the lower parts only. After it had got a few leaves, they went over the ground again with the ſame inſtrument a ſecond time, to clear away the weeds, and move the earth about the roots of the young plants. If they did this lengthways of the furrows, the earth being ſomewhat hardened, there fell but little of it among the corn; but if they did it croſſways of the furrows, a great deal fell down upon, and among, the young plants, and, in a manner, buried them; they were uſually obſerved to grow the better for this croſs harrowing, except in cold places; and the huſbandmen thought the vigour of the plants was owing to the burying them with new earth; but this was really rather prejudicial to them, and the advantage they had aroſe from the more deep ſtirring of the ground. *Tull*'s Huſbandry.

OCCHIO, in glaſs-making, the hole in the floor of the tower of the leer. *Neri*'s Art. of Glaſs. p. 243.

OCCIDENS, an affected name given by ſome of the chemical writers to *vinegar*.

OCCIDENT, in geography, the weſtward quarter of the horizon, or that part of the horizon where the ecliptic, or the ſun therein, deſcends into the lower hemiſphere.

Equinoctial

Equinoctial OCCIDENT, that point of the horizon where the sun sets, when entering *aries*, or *libra*.

Estival OCCIDENT, that point of the horizon where the sun sets at his entrance into the sign *cancer*, when the days are longest.

Hybernal OCCIDENT, that point of the horizon where the sun sets, when entering the sign of *capricorn*; at which time, the days, with us, are shortest.

OCCIPITAL *(Cycl.)* — The *os occipitis*, or *occipital bone*, is situated in the posterior and lower part of the cranium; it represents a kind of lozenge, irregularly indented, and is convex without, and concave within. It sometimes, but very rarely, is found to consist of two pieces, being divided, in that case, by the continuation of the coronal suture. It consists of an external, and internal side, of the upper, lower, lateral, and middle parts; the first four of which may be looked upon as so many angles; and has four edges, the two superior of which are indented, the two inferior are more or less unequal in different subjects. Near the middle of the convex outside of this bone, the *occipital* protuberance, or rising, is observable; under this protuberance are two superficial transverse arches; these are more remarkable in some subjects, than in others, one superior, and larger, the other inferior, and less, and both reaching to the mastoide process on each side: the inferior arch is cut at right angles by a perpendicular line, called the external, *occipital* spine, or crista. Under the superior arch are two rough planes, one on each side of the spine; and between the extremities of the two arches are two other such planes, one on the right hand, and the other on the left. We see likewise two condyles, or condyloide apophyses, crusted over with cartilages, gently convex, of an oblong oval figure, and situated obliquely; their posterior extremities being at a greater distance from one another than their anterior. Also a large, cuneiform, production, which, from the condyles, is directed upwards, and, in adults, is often joined inseparably to the os sphenoides. This may be termed the apophysis basilaris, or the great apophysis of the *occipital* bone. Lastly, there are some unequal tubercles on the lower part of this apophysis, and two little angular productions in the edge of the bone, over against the condyles.

There are likewise in this bone two large notches under the lateral angles, which receive the posterior apophyses of the ossa temporum, two small notches, or portions of the jugular fossæ, and of the foramina lacera; each of these is often divided by a small bony production: also the great *occipital* hole, on the anterior edge of which there is an impression for the insertion of a ligament, two anterior, and two posterior condyloide fossulæ, two anterior condyloide holes for the ninth pair of nerves, which are sometimes double, and two posteior condyloide holes for small veins, which are sometimes wanting. The upper part of this bone is thick, as being much exposed to blows, and other injuries: the lower part is thinner, but is well guarded by muscles. It forms the back part of the head; serves for the articulation of the head with the trunk; contains a part of the brain, and almost all the cerebellum; and gives passage to the medulla oblongata, and a great many of the nerves, and vessels; and insertion to a great many of the muscles. *Winslow's* Anatomy, p. 25.

OCCUPIERS *of walling*, a term in the salt works for the persons who are the sworn officers, that allot, in particular places, what quantity of salt is to be made, that the markets may not be over-stocked, and see that all is carried fairly and equally between the lord and tenant. These persons always appoint how many houses shall work at a time; and, when, there is salt to be made, these appoint a cryer to proclaim it to all the workers, that they may put to their fires at the same time; and a like proclaiming of the time when they shall leave off; and those who continue to work after this prohibition, are to have their salt spoiled, or destroyed. *Ray's* English Words, p. 173.

OCELLATI *lapides*, in natural history, a name given by the antients sometimes to express certain stones, found on the shores, and in the beds of rivers, and naturally marked with the figure of an eye; and sometimes for small round stones of the shape of the grove of the eye, made by art for children to play with, and of the nature of what we call marbles. Suetonius tells us, that Augustus Cæsar used to divert himself sometimes with playing *nucibus et ocellatis*.

The word *lapidibus* is understood after the last word, and the meaning of the author plainly is, that he played, like a boy, with nuts and marbles. The word *ocellatus*, therefore, here, as in many other passages of the antients, plainly expresses those little round stones, formed by art, of little or no value, and intended only for boys to play with. But we have abundant testimony among the antient naturalists of the word having been used also as the name of the gem which we now call *oculus beli*, and all those other stones of the agate, or other semi-pellucid kinds, which had the figure of an eye naturally impressed upon them, that is, a round spot of a different colour, in the center of a small roundish stone. These were scarce among the antients, because they had none but the true *oculi beli*, or such stones as were of a particular species, and were found naturally of the shape and size of an eye; but we have them much more common, because our jewellers, whenever they find a natural spot in an agate, surrounded with a white circle, cut it out from the rest of the stone, and sell it as a natural *oculus beli*.

The name *ocellati lapides*, is not, by any means, a strange, or unnatural one for the genuine stones thus shaped, and marked with the resemblance of a pupil; for the antients used the name of the eye in a much larger sense, expressing by it any thing that appeared rounded and protuberant. Pliny, speaking of the Callais, or Turquoise stone, says, that it protuberated from the rocks in the form of an eye, and means no more by it, than that the masses of it were round, and prominent, as we see those of copper ore-turquoise at this day.

OCHNA, in botany, the name of a genus of plants, the characters of which are these: the cup is a perianthium, composed of five small leaves, of an oval, but pointed shape, standing expanded, and falling with the flower. The flower is composed of two roundish petals, with very obtuse ends, and with ungulæ of the length of the leaves of the cup. The stamina are a number of fine slender filaments, converging at the ends. The germen of the pistil is oval, and terminates in a pointed style, which is erect, and longer than the stamina. The fruit is a very large, and fleshy receptacle, of a roundish, truncated form, in either side of which there is lodged a single berry, of an oval figure. The seeds are single, and of an oval figure also. *Plumier*, 32. *Linnæi* Gen. Pl. p. 819.

OCHRA, or *gallinula* OCHRA, in zoology, the name of a species of moorhen. It is all over of a dusky, and obscure, yellowish green, and is browner on the breast, and belly, than on the back, yet with the same yellowish green predominant. The head, neck, breast, and wings, have several white spots; and the face is in part white; the beak is part black, and part red; and the legs are of a yellowish colour. *Aldrovand.* de Avib. l. 20. c. 48.

OCHRA *vitrioli*, in natural history, a name given to that yellow earth, or *ochre*, which is one of the principles, or constituent parts of all vitriol. This is separated from it by solution in water, and falls to the bottom of the vessel; and the yellow substance that tinges the sides of fountains, and springs of chalybeat waters, in many places, is the same substance, and shews that they are only solutions of vitriol, which, as such, must needs deposit that earth, which, though retained imperceptibly in the vitriol, yet cannot be sustained in water so well as while that salt was solid.

Basil Valentine tells us, that repeated solutions of the same quantity of vitriol, will, at length free it from all its earth; and that then it will be found a very different substance from what it was before, and fit for several wonderful experiments, which he describes. This separation of the earth of vitriol has been tried in vain, by twenty repeated solutions; but there is a much shorter way of effecting it, which is this: Powder a good quantity of Dantzick, or Hungarian vitriol; put it into a high and narrow cucurbit, and add to it a considerable quantity of water; keep a fire under it for four days, and the earth will, in a very great quantity, subside from it, when cold, in much greater quantity from this one operation, than from several repeated ones of the common kind.

Another method, which separates more than its earth from it, is this: Let the vessel containing the powdered vitriol, without any addition of water, be placed in a balneum Mariæ, and kept hot in the same manner for four days; the vitriol will, in this case, melt as if water were put to it. While it continues in this fluid state, the *ochre*, or earth, and not only that, but with it, the metalline parts, and the gross sulphur, will in a great measure subside, and become a hard cake, the vitriol continuing fluid about it. Let this be poured off, and when cold, it will crystallize, leaving only a small quantity of a liquamen behind. This operation may be repeated two or three times, and the vitriol then becomes a very different substance from what it was before, and is fitted for several operations, which it would not otherwise succeed in. Many have tried to effect this separation by liquation, by means of a dry heat, placing the vessel in sand, in filings of iron, or over the flame of a lamp, burning spirit of wine, or oil; but it never will succeed this way, though the vitriol be ever so long kept in a state of liquation. Phil. Trans. N° 103.

The *ochra vitrioli* may be obtained also in a great proportion, though in another form, if, after a long, and intense calcination, the vitriol is freed from its salt by an ablution of warm water often repeated. The far greater part of the remaining colcothar, thus dulcified, is earth, with an admixture only of a small quantity of some metalline parts.

Another way of obtaining it, is dissolving vitriol in common water, and adding to the solution filings of zink, or salts of tartar, or some other alkali. See the article VITRIOL.

A great proof of the earth called *ochra vitrioli* being contained in large quantity in that salt is, that it requires no earth beside to be mixed with it in distillation: whereas common salt, nitre, and the other salts, require a great quantity of common earth to be added to them, to prevent their fusion.

Alum, and vitriol alone, require no ſuch additions, the firſt of theſe containing a very large quantity of an alkalious, white earth, as the other does of an ochreous yellow one.

OCHRES, in natural hiſtory, the name of a large genus of earths, uſed principally by the painters. The moſt common kinds are either yellow, or red, though there are brown, blue, and green *ochres*, and a number of diſtinct ſpecies of all theſe colours. Of the yellow *ochres*, Dr. Hill, in his hiſtory of foſſils, deſcribes eleven ſpecies. Of the red, the ſame number. Of the brown two. Of the blue, and green, one ſpecies each; and of the black, two.

The greater number of theſe are, or have been, at one time, or other, in uſe in painting, in different parts of the world. Some, however, there are, eſpecially of the yellow and red kinds, which that author has, himſelf, diſcovered in different parts of our own, and other kingdoms, which are worthy the tryals of the perſons concerned in that branch of trade, as they have already been proved, at his requeſt, in ſmall quantities, and found to anſwer very well. *Hill*'s Hiſt. of Foſſ. p. 51.

The ſpecies of the yellow *ochres* are theſe: 1. The *ochra leviſſima, friabilis, pallidiſſime flaveſcens*; or very light friable pale yellow *ochre*. An earth found of late years in Penſylvania, Virginia, and ſome other of our American plantations, which has been tried both in water, and oil, and makes a very pale ſtraw colour in the former, and a fine yellow, though ſomewhat deeper, in the latter; but making no good colour, when burnt.

2. The *ochra ponderoſa, dura, pallide flaveſcens*; the hard, heavy, pale, yellow *ochre*. This is found in Germany, Saxony, France, and England, and is well known to the painters, and much uſed by them for a pale yellow. They call this French *ochre*; but it is dug in conſiderable quantities in Dorſetſhire. This makes but a dull colour, when burnt, and is, in its native ſtate, much inferior to the common kind.

3. The *ochra leviſſima, flava, friabilis*; the light, crumbly, yellow *ochre*. This is frequently thrown out at the mouths of chalybeate ſprings, and, ſometimes, from ſuch as are not manifeſtly impregnated with the particles of that metal; and is found in great abundance on Hampſtead heath. This is not uſed by the painters, but is a bright yellow, and very fine, and is, therefore, worth trying.

4. The *ochra levis, aurea, friabilis*; the light, friable, gold-coloured *ochre*. This was the *ochre* of Theophraſtus, and of the earlieſt ages we have accounts of. It is common in our gravel pits, in large looſe lumps. The painters of the preſent age are not acquainted with this; but it is a very valuable ſubſtance, making a fine ſtrong yellow in its native ſtate, and a very bright, and beautiful red, when burnt. *Hill*'s Hiſt. of Foſſ. p. 52.

5. The *ochra crocea, laminata, levis*; the light, plated, ſaffron-coloured *ochre*. This was alſo well known to the antient painters, though not ſo early as the former, and is the Attic, or Athenian, *ochre* of Dioſcorides. It is, like the former, common in ſmall plated maſſes, in our gravel pits, and, though not known to our preſent painters, has been tried, and proves a very fine yellow, both in water, and oil, in its native ſtate, but does not make a bright red, on burning. *Hill*'s Hiſt. of Foſſ. p. 53.

6. The *ochra ponderoſa, flava, friabilis*; the heavy, friable, yellow *ochre*. This is common in England, and is well known, and very much uſed in its native ſtate among the painters. It is dug in Buckinghamſhire, Somerſetſhire, and Oxfordſhire, but is greatly inferior to the two former kinds. *Hill*'s Hiſt. of Foſſ. p. 54.

7. The *ochra argillacea, ponderoſa, lutea, dura*; the hard, heavy, clayey, yellow *ochre*. This is dug in Buckinghamſhire, Yorkſhire, and ſome other counties, and is ſent up to London, and uſed by the painters, making a very lively yellow in its native ſtate, and a pleaſant, though not a ſtrong red, when burnt. *Hill*'s Hiſt. of Foſſ. p. 55.

8. The *ochra duriſſima, ponderoſa, flava*; the ſtony, hard, and heavy, yellow *ochre*. This is well known to the painters, and much valued by them. It is dug in Buckinghamſhire, Staffordſhire, and Yorkſhire, but moſt plentifully in Oxfordſhire, whence it is continually ſent up in great quantities to London. It makes, in its native ſtate, a fine yellow, and, when burnt, a very beautiful red, and is the ſort uſed for burning into red *ochre* in the colour-ſhops.

9. The *ochra argillacea, ſordide flaveſcens*; the dull, duſky, yellow, clayey *ochre*. This is dug in Buckinghamſhire, Staffordſhire, and Oxfordſhire, and is ſent up to London, and uſed in the coarſer mixtures at the colour-ſhops, in its native ſtate, but, when rightly managed, it burns to a very fine valuable red. This, and the former, and ſome other of the before-mentioned, contain in them a conſiderable quantity of a genuine clay, and thence are more compact and ſtiff than the more pure kinds.

10. The *ochra argillacea, luteo-fuſca levis*; the browniſh, yellow, light, clayey *ochre*. This is common in Buckinghamſhire, Northamptonſhire, and many other counties, and though not ſo florid in its colour as many other *ochres*, yet makes a very pleaſing paint, and has what the painters call a good body. This is not yet known among the painters, but is worth their being acquainted with. *Hill*'s Hiſt. of Foſſ. p. 56.

11. The laſt is the *ochra ponderoſa, friabilis, aureo-crocea*, commonly called *giallolino*, and by our painters *Naples yellow*. See the article GIALLOLINO.

The ſpecies of the red *ochres* are the following: 1. The *ochra rubra friabilis ponderoſa, quæ ſil Syricum antiquorum*; the red, heavy, friable *ochre*, the Syrian *ſil* of the antients. See the article SIL.

2. The *ochra purpurea friabilis alkalina, quæ almagra recentiorum, ſil Atticum antiquorum*; the friable, purple, alkaline *ochre*, the *almagra* of the moderns, and Attic *ſil* of the antients. See the artcles SIL, and ALMAGRA.

Theſe are both uſed at this time in painting, and the latter alſo in medicine. The firſt of them is common in many parts of England; the latter ſeems peculiar to Spain.

3. The *ochra purpurea ponderoſiſſima dura*; the hard, heavy, purple *ochre*. This is well known among the painters, and called by them *Indian red*, and by Lemery *terra perſica*. It is dug in the iſland of Ormuz, in the Perſian gulph, and thence is diſperſed over all the Eaſt-Indies. There is alſo ſome of it dug about Bombay. It is uſed both there, and with us, as a fine red in painting. *Hill*'s Hiſt. of Foſſ. p. 58.

4. *Ochra friabilis floride rubeſcens*; the bright red, friable *ochre*. This is much eſteemed in painting in many parts of the world, but is leſs known in England than in any other of the European nations. It is dug in vaſt quantities in the country above Bengall, and is uſed by the painters in France and Germany, as a fine red. It would be worthy our traders in theſe commodities better acquaintance. *Hill*'s Hiſt. of Foſſ. p. 59.

5. The *ochra friabilis pallide rubeſcens, quæ bolus Veneta vulgo*; the pale red friable *ochre*, commonly called *Venetian bole*. See the article VENETA *bolus*.

6. The *ochra friabilis levis, pallide rubeſcens, alkalina*; the light, friable, alkaline, pale, red *ochre*. This is a very fine, and valuable earth, at preſent unknown in painting, but very eaſy to be had, and worthy the bringing into uſe. It is thrown up in digging in our American plantations, and proves, on tryal, to be a bright and fine colour in oil. *Hill*'s Hiſt. of Foſſ. p. 60.

7. The *ochra argillacea palliditſime rubeſcens*; the pale red, clayey, *ochre*. This is a ſubſtance yet unknown to the world, but produced in great plenty in Penſylvania, and Virginia, and will, at leaſt, ſupply to thoſe countries all the purpoſes of the Engliſh reddle.

8. The *ochra puriſſima levis purpuraſcens*; the fine, light, purple *ochre*. This is a ſubſtance common in many parts of England, but not yet univerſally known among our painters. They often uſe it, indeed, without knowing what, or whence, it is; ſome conſiderable quantities of it having, at times, been ſent to London, from the foreſt of Dean in Glouceſterſhire, and one or two of the colour-men engroſſing it to themſelves, and ſelling it, when prepared, under the name of *Indian red*, the third ſpecies of red *ochre*, to which it is, at leaſt, equal in beauty of colour.

9. The *ochra purpurea ponderoſa puriſſima, quæ rubrica ſinopica antiquorum*; the fine, heavy, purple *ochre*, the *rubrica ſinopica* of the antients. See SINOPICA *rubrica*.

10. The *Ochra argillacea indurata rubra, quæ Creta rubra auctorum*; the indurated, clayey *ochre*, called *red chalk*. See the article CHALK.

And the 11th, and laſt, the *ochra ſaxea rubra, quæ ſil marmoroſum antiquorum*; the red, ſtony *ochre*, the marbly *ſil* of the antients. *Hill*'s Hiſt. of Foſſ. p. 62. See the article SIL.

The ſpecies of brown *ochres* are only two; the firſt is, what the painters call *umber*; and the ſecond what they call *Cologn earth*. See the articles UMBER, and COLOGN *earth*.

The blue, and green, are the ſubſtances called *lapis armenus*, and *bergruen*, which ſee under the articles ARMENUS *lapis*, and BERGRUEN.

Of the black *ochres* there are, laſtly, two ſpecies; the firſt of theſe is the *ochra friabilis, ponderoſa, nigreſcens*; the heavy, friable, black *ochre*. A very fine, and valuable earth, worthy to be brought into uſe among the painters, though, at preſent, unknown to them. It is found in perpendicular fiſſures of the ſtrata of ſtone in Leiceſterſhire, and ſome other counties of England, and would make a very fine black, either in water, or oil. *Hill*'s Hiſt. of Foſſ. p. 65.

The ſecond is the *pſeudo ochra levis, nigreſcens, quæ Creta nigra pictorum*; the light, black, baſtard *ochre*, called *black chalk*. See the article CHALK.

Theſe are the ſeveral ſpecies of *ochres* at preſent known; and it is very plain, from this ſhort account of them, that both our own country, and our plantations abroad, contain many treaſures of them, the value of which is yet unknown.

Dr. Liſter obſerves, that ochreous earths are ſeparated in greater or leſs quantities, from all the medicinal ſprings of England, and it is to theſe, and the nitrous and muriatic ſalts, that they all owe their virtues. The *ochre* they contain is uſually of the nature of that which our painters, to diſtinguiſh it from the yellower kind, call *brown ochre*. This is produced from the iron ores that are met with in the way of the current of

theſe

theſe waters; and, among the reſt, the pyrites affords a great deal of them. All kinds of the pyrites, and all the limeſtones of England, when they are ſubject to be much moiſtened under ground, will, in time ſhoot out their ſalts, and part with their earths. *Liſter* de Font Med. Angl.

The earth of the pyrites is *ochre*, and the ſalt of the limeſtone is the calcarious nitre, an alkaline ſalt of the nature of the natrum of Ægypt; and from theſe two ſubſtances, and a ſmall portion of common ſalt, which the waters take up in their paſſage through the earths that contain it, all the virtues of them are owing. The ſalt of the pyrites being green vitriol, it might be expected that this ſhould be found in the waters impregnated by that ſubſtance; but Dr. Liſter obſerves that though there are many ſprings in England which are well known to receive their virtues from this foſſile, yet there is no ſuch thing as vitriol to be obtained from any of them; and this is not wonderful, ſince we know that the pyrites will not yield its vitriol when newly taken out of the earth, but muſt be expoſed a conſiderable time firſt to the air; ſo that the *ochre* only is the ſenſible thing that it receives from this ſubſtance, and, perhaps, with it ſome ſaline matter which is the baſis of vitriol, and would be vitriol in time, on a due expoſition to the air.

OCHROPUS *gallinula*, in zoology, a name by which many authors have called a bird more uſually known by the name of *tringa*. *Geſner* de Avib. See the article TRINGA.

OCHROPUS, or *gallinula* OCHROPUS, the *yellow-legg'd moorhen*, a ſpecies of the *gallinula*, or *moorhen*. It is of the ſize of the common kind; its beak, as well as its legs, is yellow, or of a ſulphur colour; its back is of a rediſh brown; the tips of its wings of a very fine red; it has white variegations on its head, and in the middle of its wings, and on its belly; the longeſt feathers of its wings are black; and there are alſo ſpots of black on the back in ſeveral places. The edges of its eyebrows are of a deep ſaffron colour; and it has, beſide all theſe colours, a great deal of grey in the wings. It has no hinder toe. It builds in thickets, in watery places, among ruſhes and high graſs. *Aldrovand.* de Avibus, l. 20. c. 48. *Geſner* de Avib.

OCHRUS, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the papilionaceous kind. The piſtil ariſes from the cup, and finally becomes a pod, which is uſually of a rounded, or cylindric form, and contains a number of roundiſh ſeeds. To this it is to be added, that the leaves are ſometimes ſingle, ſometimes of the conjugated kind, and terminating in tendrils.

The ſpecies of *ochrus* enumerated by Mr. Tournefort, are theſe: 1. The *ochrus* with undivided leaves, ſending out tendrils from their ends, and with yellowiſh ſeeds, called *ervillia* by ſome authors. 2. The *ochrus* with undivided leaves, terminated by tendrils with brown ſeeds. 3. The *ochrus* with undivided leaves terminated by tendrils, with black ſeeds. And 4. The yellow-flowered, woolly, American *ochrus*. *Tourn.* Inſt. p. 396.

OCIMUM, in botany. See OCYMUM.

OCNUS, in zoology, a name by which Ariſtotle, and other of the antients have called the *bittern*, or *butter bump*. See the article BITTERN.

OCOB, a name given by ſome chemiſts to *ſal armoniac.*

OCREA, (*Cycl.*) among the antients, a kind of military ſhoe, or ſhort boot, which was made of white tin, and ornamented with gold, or ſilver, about the ankles. Its uſe was very antient, the Greeks were ſo well provided with them in Homer's time, that he thence gives them the appellation of ἐυκνήμιδες Ἀχαιοι. Among the Romans, none were allowed to wear the *ocreæ*, but the two upper claſſes of the people, or ſuch whoſe eſtate exceeded 7500 drachms. See *Hofm.* Lex. Univ. in voc.

OCTAETERIS, Ὀκταετηρις, in antiquity, a cycle, or term, of eight years, at the end of which three entire lunar months were added. This cycle was in uſe till Meton, the Athenian, reformed the calendar, by finding out the golden number, or cycle of nineteen years. *Potter*, Archæol. Græc. T. 1. p. 460. See CYCLE, and CALENDAR, *Cycl.*

OCTANDRIA, in botany, a claſs of plants with hermaphrodite flowers, and eight ſtamina, or male parts in each. See Tab. 1. of Botany, Claſs 1.

The word is formed of the Greek ὀκτω eight, and ἀνὴρ male. The plants of this claſs are the maple tree, heath, &c.

OCTAVE (*Cycl.*) — *Diminiſhed* OCTAVE, in muſic. See DIMINISHED *octave.*

OCTAVINA, in the Italian muſic, a kind of ſmall ſpinnet, eaſily moved, having only one row of keys, and thoſe not to the uſual number, perhaps not to above three octaves, the common ones going to four, or more. See SPINET, *Cycl.*

OCTOPHORUM, among the antients, a carriage with eight wheels.

It alſo ſignified a chair, or litter, *lectica*, carried by eight chair-men, which kind of chair was moſtly uſed by the women. *Piſc.* in voc.

OCTUNX, a word uſed by ſome diſpenſatory writers to ſignify eight ounces.

OCULATA, in zoology, a name given by many to the fiſh more uſually called *melanurus*. It has the name *oculata* from the remarkable largeneſs, and fine golden iris of its eyes. *Willughby's* Hiſt. Piſc. p. 310. See MELANURUS.

OCULATUS *lapis*, the *eyed ſtone*, a name given by Mercatus, in his Metallotheca Vaticana, and by many other writers, to what we call the *pudding ſtone*, a ſtone formed of a great number of pebbles, of a ſmall ſize, immerſed, and formerly bedded, in a flinty cement, little leſs hard than the ſtones themſelves, and in ſome ſpecies not at all ſo. The reſemblance of theſe round pebbles, when the maſs was cut, to the eyes of animals, probably gave origin to this name. It is eaſy to conceive that at the time when theſe ſtones were formed the matter of the cement was ſoft as mud, while the ſtones which are bedded in it were hard, and perfectly formed, otherwiſe they could never have had admiſſion into it. It is alſo natural to ſuppoſe, that as theſe ſtones are placed very irregularly in the maſs, the ends and ſides of many of them muſt be prominent above the reſt, and above the ſurface of the cement; and this we uſually find to be the caſe: but in ſome places we find large lumps of this ſtone, whoſe ſurfaces are naturally ſmooth, as if wrought by art; the external pebbles being thus cut off, as it were, down to the level of the ſurface, and their internal lineations appearing. We find ſeveral ſtones rounded and ſmoothed on the ſurface in this manner, by long lying on the ſhores of the ſea, and being there waſhed about among other hard bodies by the tides. But theſe maſſes are alſo found in gravel pits, and thoſe ſuch as have evidently been ſo ever ſince the formation of the cruſt of the earth after the deluge, and have never been diſturbed, or removed, ſince that time. As a hurry, and violent motion of the water, alone can have occaſioned the wearing down of theſe pebbles on the ſurface of the *pudding ſtone*, and as they have never been in the way of ſuch a motion of water ſince the time of their ſubſiding from among the waters of the deluge, it muſt have been at that time that they were thus rolled about, and rounded; and this is one great proof of the Woodwardian ſyſtem of things at that time; and that the waters, in departing from off the ſurface of the earth, ran with great violence, and carried ſtones, &c. a long way in their current, in which courſe they ſuffered all that the daſhing, and rolling about in the waters of the ſea, could do to ſuch ſtones in a long period of time. See Tab. of Foſſils, Claſs 5. *Mercati* Metall. Vat. p. 139. *Woodw.* Cat. Foſſ. Vol. 1. p. 46.

This *pudding ſtone* is not the only inſtance of this effect of the rapidity of the waters of the deluge in running off from the face of the earth, for there are found in many places great numbers of ſtones which have been parts of ſtrata, or larger maſſes, and which have been broken off, and rolled into the form of pebbles at that time. And among what we commonly underſtand by the name pebbles, we find many which have prominent ridges running round them, which have been veins harder in their matter than the reſt of the ſtone; and therefore, while the reſt has been worn away, theſe have remained leſs worn, and conſequently ſtanding higher than the other parts.

OCULIPETA, in zoology, a ſpecies of ſerpents. See the article TEXMINANI.

OCULUM *aperiens*, in anatomy, a name given by ſeveral authors to a muſcle of the face, called by the generality of writers *aperiens palpebram*, and *aperiens palpebram rectus*; by Albinus, *levator palpebræ ſuperioris.*

OCULUS *beli*, in natural hiſtory, the name of one of the ſemipellucid gems of the genus of the *hydrophanæ*, and called by Dr. Hill *hydrophanes albido-cinereus, flavo-variegatus, nucleo centrali nigerrimo*, or the greyiſh white *hydrophanes*, variegated with yellow, and with a black, central, nucleus. See Tab. of Foſſils, Claſs 5.

It is a very elegant, and beautiful gem. Its baſis, or ground, is a whitiſh grey, variegated with yellow, and ſometimes with red, and a little black, but that more rarely, and is found in ſmall maſſes from half an inch to an inch in diameter; of a rounded figure, and thickeſt in the middle, tapering away gradually to the ſides. The outer part of the ſtone, or that toward the edges all round, is ever of a whitiſh grey, more or leſs variegated with yellow, &c. and its central nucleus is always of a deep and fine black, ſurrounded by a broad circle, of a pale yellow, and repreſenting very beautifully the pupil and iris of the eye; theſe are incloſed in the matter of the ſtone, and are often ſurrounded by other very fine concentric circles, of a pale flame colour; but more frequently there is only the black pupil, ſurrounded by the yellow iris, and that placed in the body of the ſtone which repreſents the white of the eye: the ſhape of the ſtone alſo favours its reſemblance of an eye, and the whole is very elegant. It is of the hardneſs of the agate, and takes a tolerable poliſh; when thrown into water, it has, in a great meaſure, the property of the oculus mundi, the whole ſtone becomes greatly more bright, and lucid, and the grey part becomes of a plainly yellowiſh caſt.

There are many things improperly called *oculus beli* by our jewellers, but the genuine ſpecies is very rare. Nothing is more common than to find in the agates little circular veins of different colours round a central ſpot; theſe the lapidaries frequently cut out, with a proper quantity of the ſtone about them, and call them *oculus beli*. They are not peculiar to the agate, but are common alſo in the cornelian, and ſtand ſometimes,

times ſingle, ſometimes two or three together, and according to the colours of the circles, repreſent the eyes of various animals. *Hill*'s Hiſt. of Foſſ. p. 470.

OCULUS *cati*. See the article ASTERIA.

OCULUS *leporinus*, a diſtemperature of the eyes, called alſo *ectropium*. *Heiſter*'s Surgery, p. 432. See ECTROPIUM.

OCULUS *marinus*, the *ſea eye*, a name given by ſome authors to the *umbilicus marinus*, from its reſemblance to the ſhape of an eye. See UMBILICUS *marinus*.

OCULUS *mundi*, in natural hiſtory, the name of one of the ſemi-pellucid gems of the genus of the *hydrophanæ*. It is of one plain and uniform colour, which is a whitiſh grey, and has no veins, or other variegations. It is found in ſmall maſſes, of the ſhape of our common flints, and pebbles. It has but a very obſcure degree of tranſparence, and is not capable of a fine poliſh. This ſtone, however, though of little beauty, has this very ſingular property, that, when thrown into a baſon of water, in the ſpace of half a minute, it begins to change its appearance, and, very ſoon, inſtead of a pale grey, becomes of a very bright, and conſiderably pellucid, pale yellow, like that of amber, or the yellow cornelian; this it retains as long as it remains in the water, but as ſoon as taken out, and dried, it reſumes its grey colour, and becomes as opake as before, It is found ſo far as is yet known, only in China; but the ſhores of ſome of our own rivers afford us ſtones coming up to its qualities in ſome degree, though not ſo beautifully tranſparent in water as the oriental *Hill*'s Hiſt. of Foſſ. p. 468.

OCULUS *Veneris*, a name given by ſome to the *umbilicus marinus*.

OCYMOPHYLLON, in botany a name given by Buxbaum to a new genus of plants, the characters of which are theſe: the flower is of the ſtamineous kind, having no petals; this ſtands upon the embryo fruit, which afterwards becomes an oblong quadrangular ſeed veſſel, divided into four cells, and containing roundiſh, and very ſmall, ſeeds. Its leaves are like thoſe of the common ocymum, or baſil, whence its name; and its place of growth is in damp marſhes. Boccone has deſcribed it under the improper name of *glaux*, calling it the great, green-flowered, *marſh glaux*. Act. Petropol. Vol. 4. p. 421.

OCYMUM, *baſil*, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, and is of the labiated kind. The upper lip is erect, roundiſh, and crenated, and is larger than the under one, which is curled up, and lightly indented. The piſtil ariſes from the cup, and is fixed, in the manner of a nail, to the hinder part of the flower, and ſurrounded by four embryos, which afterwards become as many ſeeds, of an oblong figure, to which the cup of the flower ſerves as a capſule. This cup is divided into two lips, the upper of which is erect and bifid, and the other divided into ſeveral ſegments, by ſlight notches.

The ſpecies of *baſil* enumerated by Mr. Tournefort are theſe: 1. The clove *baſil*, or *acinos*, of Columna. 2. The great *baſil*, with fimbriated leaves, reſembling thoſe of endive. 3. The broad-leaved, ſpotted, and curled *baſil*. 4. The green *baſil*, with bullated leaves. 5. The green-leaved, fimbriated *baſil*. 6. The common large clove *baſil*. 7. The largeſt clove *baſil*. 8. The large black *baſil*, with a ſtrong ſmell of rue. 9. The citron-ſcented *baſil*. 10. The aniſe-ſcented *baſil*. 11. The common, or middle *baſil*. 12. The white-flowered, common *baſil*, with deep, blackiſh green, leaves. 13. The blue-flowered, common *baſil*, with deep, blackiſh-green leaves. 14. The middle-ſized, curled *baſil*, with a ſhort, conglomerated ſpike. 14. The ſmall, ſerrated, narrow-leaved *baſil*. 16. The ſmall, narrow-leaved *baſil*, with bullated leaves. 17. The three coloured *baſil*. 18. The ſmalleſt *baſil*. 19. The leaſt *baſil*, with purpliſh black leaves. *Tourn.* Inſt. p. 203.

OECOMENIUM, in botany, a name given by the antient Greeks to a plant called alſo *thapſia*, and *cymene*. See THAPSIA and CYMENE.

OECONOMICAL *chemiſtry*. See CHEMISTRY.

OEDEMA (*Cycl.*) — The perſons moſt ſubject to *œdematous* tumors, are people of a phlegmatic habit, and ſuch as have had ſuppreſſions of ſome natural evacuations. Men who have had the hæmorrhoidal diſcharges ſtopped upon them, and women labouring under ſuppreſſions of the menſes, are more than all others ſubject to them. Perſons ſomewhat advanced in age, are, in general, more ſubject than young ones, and women with child, particularly during the more advanced ſtate of their pregnancy, are often afflicted with them. The long holding the legs in cold water, will ſometimes alone occaſion them, and, among the poorer country people, the women who make a cuſtom of ſtanding in the water to waſh their cloaths are often affected with theſe ſwellings in one or both knees. People who have received large wounds, and have had them treated raſhly, with cold applications, are alſo ſometimes thrown into danger of theſe ſwellings. The repelling tumors of other kinds, and ſometimes the ſtriking in an eriſipelas, or other cutaneous eruption, will alſo occaſion them; and ſometimes people who have been treated with too hot a regimen in acute fevers are ſubject to ſwellings in their feet, which though they appear red, and are hot at times, yet, when ſtrictly examined, appear to be truly *œdematous*.

Prognoſtics in this caſe. *Oedematous* ſwellings are always very obſtinate, and tedious in their cure; but they are the more ſo when their cauſes are the more complicated, and more things than one conſpire to their origin. None of theſe ſwellings are ſo eaſily cured, as thoſe which ariſe from external injuries, or ſimple refrigeration; and thoſe which ariſe from cutaneous humors ſtruck in, are often found very eaſy of cure, provided that they are not of very long ſtanding: and, in general, ſuch as are very cold when out of bed, and always very hot when in it, are more difficult of cure than others. But this is to be obſerved, that there is great difference between a cure of theſe tumors, and the only ſtriking them in; the latter caſe being very often attended with much worſe complaints than the tumors themſelves, the too frequent conſequences of ſuch retropulſions being inflammations of the abdomen, and præcordia, and abſolute dropſies.

Method of cure. The firſt ſtep towards a cure muſt be the correcting the mucous and viſcid ſtate of the humors: this is beſt done by the neutral ſalts, as tartarum vitriolatum, and the like; and by gum ammoniacum, the roots of pimpernel, and woods of ſaſſafraſs, guaiacum, and the like, with the warm aromatics, as ginger, and the ſpices, and carminative ſeeds. The matter, when thus attenuated, is to be evacuated by purges of a ſtrength proportioned to the conſtitution of the patient, and, after this, the true tone of the parts is to be re-eſtabliſhed by chalybeates, and the part to be ſecured from a relapſe with a large bandage, and with warm and ſtrengthening fomentations. It rarely happens that theſe ſwellings ulcerate, but when they do, there is no application ſo proper as the liquor of myrrh. *Junker*'s Conſp. Med. p. 410.

The method of treating *œdematous* tumors is very different according to the different cauſes to which they owe their riſe. The external method of treating theſe tumors in the legs and feet is uſually to have recourſe to frequent frictions with warm cloths; theſe are to be repeated every night and morning, and the parts to be rubbed each time till they appear very red, and are hot; the limb is then carefully to be preſerved from the injuries of the cold air, and it is a very proper method to wear ſtockings made of ſome warm furr, and to lie with hot bricks, wrapped up in cloths, near the legs and feet, to divide, and attenuate the blood: a proper bandage is, after theſe methods, to be applied, which is to aſcend gradually from the feet up to the knees; this ſtrengthens the limb, and prevents a ſtagnation, and collection, of the blood in any part of it. Proper ſtrengthening internal medicines muſt be given during all this time; and, after the trying what has been already directed, ſtrengthening remedies are to be attempted externally alſo: to this end the limb may be placed over burning rectified ſpirit of wine, wrapping it up in cloths in ſuch manner that it may receive the ſteam; this will encline the ſtagnating fluids to eſcape through the ſkin, or elſe render them fit to return into the circulation, and at the ſame time will do much toward reſtoring the proper tone of the limb. In many families it is a ſecret to apply the herb great celandine, bruiſed in manner of a pultice, either alone, or mixed with the perſicaria acris or water pepper, and great benefit is ſometimes obtained by theſe herbs, for they are very active medicines, and powerful reſolvents. Others apply alſo for the ſame purpoſe, the lepidium, or pepper-wort, and horſe-radiſh root, ſcraped, and moiſtened with white wine; but the moſt excellent remedy of this kind is the cataplaſm made of pidgeon's dung, mixt with common ſalt and vinegar, and applied warm, and often removed. A fomentation of no ſmall uſe is made alſo of a lee made of oak aſhes, mixed with ſmith's forge water, adding a little ſpirit of wine, and a ſmall quantity of alum. This may be applied with ſtuphs or the legs may be bathed in the liquor, as warm as it can well be borne, twice a day. Spirit of wine alſo, either alone, or mixed with lime water and alum, or lime water alone, are good fomentations; and another from which great benefit has been received is this: take ſpirit of wine, and common vinegar, of each a pint; crude alum an ounce and half; vitriol an ounce; mix all together, and uſe it as the foregoing. Great care muſt always be taken after the uſing theſe, or the like fomentations, that the limb be well covered with bandages and ſtockings; the patient muſt alſo, during the time, drink ſparingly, and uſe moderate exerciſe frequently. The medicinal waters, eſpecially the ſulphureous, often do ſervice in theſe caſes, but they do not always ſucceed. Dr. Harris relates, that he has cured the moſt dangerous of theſe caſes, with a mixture of the aperient ſaffron of ſteel, and the bark. Others ſpeak of having performed cures with the bark alone; but there are not wanting ſome who declare this to be a very dangerous method. *Heiſter*'s Surgery. p. 232.

OEDICNEMUS, in zoology, the name of a bird called alſo *charadrius* by Geſner and Aldrovand, and in Engliſh the *ſtone curlew*. It is a conſiderably large bird, weighing eighteen ounces. Its beak is about two fingers breadth long, and is ſtrait, pointed at the end, and partly black, partly yellow. It has a naked, yellowiſh, green membrane under its eyes; its legs are long, and yellow; and it has only three toes, having no hinder one. Its thighs are naked half the way up, as

in other water birds. Its breaſt and thighs are white. Its throat, back, and neck, of a mixture of reddiſh brown and black, much like the colour of the curlew; whence the Engliſh have very improperly called it the *ſtone curlew*. The under part of its tail is reddiſh. It breeds very late, the young being often found callow at the latter end of October. It lives principally in watery places, and flies in the night, making at that time a very remarkable ſhrill noiſe. *Ray*'s Ornithol. p. 227.

OENANTHE, *water dropwort*, in botany, the name of a genus of umbelliferous plants, the characters of which are theſe: the flower is of the roſaceous kind, compoſed of ſeveral heart-ſhaped petals, which are irregular in ſize, and are diſpoſed in a circular form, on a cup, which afterwards becomes a fruit compoſed of two oblong gibboſe ſtriated ſeeds, which are flatted and ſmooth on their inner ſide, and end in a ſort of prickles, the middle one of which is longer and ſtronger than the others. The ſpecies of *œnanthe* enumerated by Mr. Tournefort, are theſe. 1. The parſley-leaved *œnanthe*. 2. The ſea *œnanthe*, with blackiſh-coloured, parſley-like leaves. 3. The Portugal *œnanthe*, with the leaf and the ſmell of parſley. 4. The chervill like *œnanthe*, or poiſonous, hemlock *dropwort*. 5. The ſtaphylinus-leaved *œnanthe*. 6. The common water *œnanthe*. 7. The rue-leaved, water *œnanthe*. 8. The proliferous, water *œnanthe*. 9. The *œnanthe* with black and long roots. And, 10. The Portugal *œnanthe*, with a thick globoſe ſeed. *Tourn.* Inſt p. 312.

One of the ſpecies of this plant, diſtinguiſhed by its yellow juice, and by its growing near waters, is a very terrible poiſon. Many accounts have been given of people dying by it, but none which ſets its terrible effects in ſo juſt a light, as one which happened very lately to ſome French priſoners with us, and which is recorded in the Philoſophical Tranſactions. Eleven French priſoners had the liberty of walking in, and about, the town of Pembroke; three of them being in the fields a little before noon, found, and dug up, a large quantity of this fatal plant, with its roots, taking it to be wild celeri, in order to eat it with their bread and butter, after dinner; and, when they had waſhed it, they all three taſted, or eat a ſmall quantity of it, in the fields.

As they were entering the town, one of them, without any previous notice of ſickneſs at the ſtomach, or diſorder in the head, was immediately ſeized with convulſions; the other two ran home, and ſent a ſurgeon to him, who attempted to relieve him by bleeding, but in vain, for he died in a very little time. The other two priſoners, wholly ignorant of the cauſe of their comrade's death, and of their own danger, gave the roots they had brought in to the other eight priſoners, who all eat more or leſs of them with their dinner. A little while after dinner, the two remaining perſons who had gathered the roots, were ſeized in the ſame manner as the firſt, and one of them died, but the other recovered, having been blooded, and a vomit having been, with great difficulty, forced down his throat, as his jaws were, in a manner locked together. The other eight were all immediataly bled, and vomited, and all recovered.

It is obſervable that none of theſe perſons had thoſe comatoſe ſymptoms which are well known to attend thoſe who have eaten the common cicuta, or hemlock.

This root is well known in all that part of England under the name of the *five-fingered root*, and is in frequent uſe externally with the common people, for the felon, or worſt ſort of whitloe. The Frenchmen eat only the root, and none of the leaves, or ſtalk.

It is extremely neceſſary that this dangerous plant ſhould be well known, as it grows very plentifully with us all about the banks of the Thames; and Mr. Watſon has cauſed a fine drawing, both of this, and of another poiſonous plant which it is often confounded with, the cicuta aquatica, or water hemlock of Wepfer, to be prefixed to that number of the tranſactions where this account is given: and this ſeems the more neceſſary, as the plant ſeems to have been miſtaken in a manner by all the world, not only the common people, but the more verſed in plants, having miſtaken it at times for ſeveral very different things. The ſame gentleman informs us from various authors, that eight lads in Ireland had been poiſoned by it, miſtaking it for the root of the water parſnip; two men died by miſtaking it for the Macedonian parſley; and Wepfer, who wrote an expreſs treatiſe on the poiſonous nature of the water hemlock, has confounded this plant with it, ſaying, that Lobel had deſcribed the water hemlock, under the name of this *œnanthe*, or *dropwort*; and the generally accurate Hoffman, when treating of the vegetable poiſons, makes no mention of the difference between theſe two plants.

Neither the roots of this *œnanthe*, or thoſe of the cicuta aquatica, or water hemlock of Wepfer, have any diſagreeable flavour to deter thoſe who taſte of them from eating, and they both occaſion violent convulſions, and death, if not timely prevented. The intention of cure ſeems in both the ſame; firſt by emptying the ſtomach and inteſtines as ſoon as poſſible, and then cauſing the patient to drink largely of oleaginous fluids; there is great difficulty, however, of getting the patient to ſwallow any thing, the jaws being faſtened together by the ſpaſm; after the ſtomach has been freed from this pernicious vegetable, the ſymptoms have generally abated by degrees, and the patient has recovered.

Threlkeld mentions this plant as growing in Cumberland, where the people call it *dead tongue*, and uſe it as a pultice to the galled backs of their horſes. The German botaniſts do not mention it as growing among them, nor Haller in his *Enumeratio ſtirpium Helvetiæ*, whence it ſeems to be ſeldom met with, except in England, Holland, and ſome parts of France. Phil. Tranſ. N° 481.

OENANTHE, or *dropwort*, in botany, is alſo a name originally given by the antient Greeks to the flowers of the wild vine. It was afterwards made to expreſs alſo the flowers of the common manured vine, and the young grapes while ſmall, and juſt appearing from the flowers. Theſe, with the tendrils, and ſmall leaves of the vines, were ſometimes uſed for the making garlands, and ornamenting other things; and after this, another plant of a very different nature became uſed on the ſame occaſions, and called by the ſame name.

Pliny ſuppoſes that the umbelliferous plant *œnanthe*, was ſo called from its flowers having the ſmell of grapes; but we find this to be a mere imaginary notion, for Meander, and many other of the Greek writers, declare the flowers of the *œnanthe* to have no ſmell at all; but ſuppoſe that they were called *œnanthe* from their growing in cluſters like thoſe of the vine.

The herb *œnanthe* became famous in the ointments of the Greeks, which were intended to rub the body with, to give ſtrength, and to take off laſſitude, or wearineſs. Many have doubted whether the *œnanthe* uſed in theſe compoſitions was the flower of the vine, or the plant *œnanthe*; but Theophraſtus clearly decides this in favour of the plant, and ſays, that not only the flowers, but the leaves of it, were uſed for this purpoſe; but then he diſtinguiſhes the plant into two kinds. His account is, that the Cyprian *œnanthe* was very ſweet-ſcented, and grew upon the mountains, and in other dry and barren places; and that the *œnanthine* ointment was made with its leaves and flowers, but that this could not be made with the Grecian *œnanthe*, becauſe that had no ſmell. Dioſcorides runs counter to this; and ſays, that the *œnanthine* ointment was made of the flowers of the wild vine, and that that was always eſteemed the beſt which ſmelt moſt ſtrongly of the flowers of that ſhrub. It appears therefore that there were two different ointments of this name in uſe among the Greeks.

Pliny, that he may loſe nothing in his deſcription of the *œnanthe*, copies both Theophraſtus and Dioſcorides in their accounts of this plant; and, in conſequence, has put together a wholly confuſed, and unintelligible relation of the nature and virtues of this plant.

OENANTHE, in zoology, the name of a genus of birds of the ſmaller ſize, of which there are four ſpecies: 1. The common *œnanthe*, called the *fallow-finch*, or *wheat ear*. 2. The *œnanthe* called *anthus*, and *ſterus*; and in Engliſh, the *whinchat*. 3. The *œnanthe* called *rubetra*, and in Engliſh the *ſtone-chatter*, or *moortitling*. 4. The American *œnanthe*, or *guirarhu nheengeta*. *Ray*'s Ornithol. p. 169, 170. See the articles WHEAT-*ear*, WHINCHAT, &c.

OENARIA, a name given by the antients to aſhes prepared from the leaves, tendrils, and young ſtalks of the vine. They were accounted highly diuretic.

OENOGALA, a word uſed by Hippocrates, and other of the Greek authors to expreſs a mixture of milk and wine for immediate drinking. Others have uſed it to expreſs wine alone heated, ſo as to be juſt as warm as new milk.

OENOMANTIA, Οινομαντια, in antiquity, a ſpecies of divination by wine, which is done by making conjectures from the colour, motion, noiſe, and other accidents of the wine of libations. *Potter*, Archæol. T. 1. p. 319.

OENOS, in zoology, the name uſed by authors for the *ſtock-dove*, or *wood pigeon*, called alſo by ſome *vinago*, ſomewhat larger than the common pigeon, but of the ſame ſhape and general colour. Its neck is of a fine changeable hue, as differently oppoſed to the light; and its breaſt, ſhoulders, and wings are of a fine purpliſh hue, or red wine colour, from whence it has its name *vinago*. Its legs are red, and feathered a little below the joint. *Ray*'s Ornithol. p. 136.

OENOSTAGMA, a name given by ſome of the chemical writers to *ſpirit of wine*.

OEPATA, in botany, a name by which ſome authors have called the tree which produces the fruit called *anacardium orientale*, or the Malacca bean. Hort. Mal. Vol. 4. p. 95.

OESTROMANIA, a name given by ſome authors to the uterine diſorders which ſometimes affect young women, and is commonly called *furor uterinus*.

OESTRUM (*Cycl.*) — OESTRUM, in zoology, the name of a ſpecies of fly, called alſo ſometimes the *gad-fly*, *breeze-fly*, and *aſylum*. It is a very troubleſome creature to oxen, but is not ſo common as ſome ſuppoſe. It is never found, except in the neighbourhood of waters: the head is green; the body yelloviſh; the eyes are very large; and the trunk long, and remarkably ſtrong. It flies very ſwiftly, and without noiſe. Mouffet mentions, beſide our Engliſh kind, two others, the one from Virginia, the other from Muſcovy; the firſt very large, having a great head, and a white ſtreak down the ſhoulders; the latter remarkable for having wings of a ſilvery colour, reaching beyond the body.

OESTUM *Veneris*, a name given by ſome anatomical authors to the *clitoris*.

OETHODES *ulcus*, a term uſed by the Greek writers for ſuch ulcers as had tumid, and callous lips; and as ſuch ulcers are uſually very difficult to heal, the word became afterwards appropriated to all ſorts of ulcers difficult to cure.

OFF-*ſet-ſtaff*, in ſurveying, a rod, or ſtaff, of any convenient length; for inſtance, of 10 links of the chain. This ſtaff is divided into 10 equal parts. Its uſe is for the ready meaſuring the diſtances from the ſtation line of things proper to be repreſented in a plan. See CHAIN.

OFF-*ward*, in the ſea language, the ſame with contrary to the ſhore; thus they ſay, *the ſhip heels off-ward*, when, being aground, ſhe heels towards the water ſide; *the ſhip lies with her ſtern to the off-ward, and head to the ſhore-ward*, when her ſtern is towards the ſea, and head to the ſhore.

OFFA *alba*, (*Cycl.*) in chemiſtry, a concretion produced by a due mixture of ſpirit of urine, or ſpirit of ſal armoniac with the ſpirit of wine. Some call it the *offa alba* of Paracelſus [a], others of Van Helmont, whence it is ſometimes called *offa Helmontiana*; but Van Helmont was not the inventor of it, but Raim. Lully, ſays [b] Boerhaave.

The manner of making the *offa alba* is deſcribed in this laſt author [c], who obſerves it to be difficult, as it requires both liquors to be perfect, and ſome nice circumſtances to be obſerved. — [a *Boyle*'s Works, abridg. Vol. 1. p. 32. b *Boerh.* Chem. Vol. 2. proc. 122. c Id. ibid.]

Van Helmont [a] endeavours to account for the formation of the ſtone in the bladder, from this experiment; but, as Boerhaave [b] obſerves, the *offa alba* has nothing in common with the ſtone. — [a *Boyle*, loc. cit. b Ibid.]

Boerhaave recommends this mixture as a good deobſtruent, taken in Canary faſting. Ibid.

OFFENCE, *delictum*, in law, an act committed againſt the law, or omitted where the law requires it. *Weſt*, Symbol.

Offences are diſtinguiſhed into two kinds, viz. ſuch as are capital, and ſuch as are not. Capital *offences* are thoſe for which the offender is to loſe his life. Thoſe not capital, where the offender may forfeit his lands, and goods; be fined, or ſuffer corporal puniſhment, or both, but not loſe his life. *Hale*, P. C. 2. 126, 134. Under capital offences are comprehended high treaſon, petit treaſon, and felony: and offences not capital include the remaining part of the pleas of the crown, and come under the title of miſdemeanours.

Some *offences* are puniſhable by the common law, but moſt of them by ſtatutes.

OFFICIARIIS *non faciendis, vel amovendis*, a writ directed to the magiſtrates of a corporation, requiring them not to make ſuch a man an *officer*, or to put one out of the *office* he hath, until enquiry is made of his manners, &c. Reg. Orig. 126. *Blount*, *Cowel*.

OFFION, a name uſed by ſome of the medical writers for *opium*.

OIL (*Cycl.*) — The uſe of *oil* in ſtopping the violent ebullition of various ſubſtances, may be very great in many occaſions of life. It is well known that if a mixture of ſugar, honey, or the like, be boiling on the fire, and in danger of riſing over the ſides of the veſſel, the pouring in a little *oil* immediately makes it ſubſide. In many caſes the marking a circle round the inſide of a veſſel, in which a liquor of this kind is to be boiled, with a piece of hard ſoap, ſhall, like a magic ring, confine the ebullition to that height, and not ſuffer it to ſtir any farther. This is wholly owing to the *oil*, or fat contained in the ſoap: but there is, beſide theſe, another very important uſe of *oil*, on a like occaſion, which is the pouring a little of it on any metallic ſolution, while making; this reſtrains the aſcent of the noxious vapours; preſerves the operator from danger; and, at the ſame time, by keeping down the evaporating matter, gives redoubled ſtrength to the menſtruum.

Animal OIL, *oleum animale*, in medicine, the name of an eſſential *oil* diſtilled by a retort from blood, and recommended as a powerful remedy in epilepſies, the gout, and other obſtinate diſeaſes.

It was originally uſed in Germany in theſe intentions, and has become of late much uſed in England, but ſhould not be given too freely as an internal. As an external, it may probably be of good ſervice in removing fixed pains, removing hard tumors, &c. for it is extremely penetrating. *Shaw's* Lectures, p. 147.

OIL *of camphor*, a name given by the chemiſts to a ſolution of camphor in ſpirit of nitre. It is uſed to exfoliate carious bones, and on other the like occaſions It is obſervable, that camphor, which is ſoluble in this acid, in the proportion of one half its quantity, is not at all ſoluble in ſpirit of vitriol, ſpirit of alum, or diſtilled vinegar; and that it is the only known vegetable reſin that is ſoluble in this menſtruum. See CAMPHOR

Chemical OILS, a name given by ſome to the eſſential *oils* of plants, and other ſubſtances ſeparated in diſtillation, and ſwimming on the ſurface of the water, where the alembic is employed. They are diſtinguiſhed by this title from the expreſſed *oils*, ſuch as thoſe of almonds, linſeed, olives, and the like, which are made by ſo ſimple a proceſs as mere ſqueezing. See *eſſential* OILS, infra.

To procure this chemical principle pure and unmixed from the matter diſtilled from a vegetable body, the unctuous matter obtained from the proceſs, may be waſhed from its adhering ſalts, and groſſer earth, in warm water, barely by ſhaking them in a glaſs together, then ſeparating the *oil* from the water by means of the common ſeparating glaſs; in which, if the *oil* be ſpecifically heavier than the water, it ſinks to the bottom, and may be ſuffered to run out firſt, by means of the pipe of that glaſs which has its inſertion at the bottom; if ſpecifically lighter than the water, it may be kept behind, as it floats on the top of the water, while all that is poured off, and has carried the groſs fæculent parts with it. *Shaw's* Lectures, p. 150.

Connecting OIL, in chemiſtry, a term uſed by Boerhaave, and his followers, to expreſs a certain *oil*, found in all vegetable ſubſtances, but wholly differing from, and independent of, their eſſential *oil*. This is not poſſeſſed of any of their virtues, or qualities, but ſeems the ſame in all plants, and is the means of their conſiſtence and ſolidity, giving tenacity to their earth, which, without it, falls to duſt, and the plant exiſts no more.

This *oil* is not ſeparable by boiling water, as the eſſential *oil* is, but only by fire: when a plant has been boiled, and diſtilled, its eſſential *oil*, ſalt, &c. are all carried off, and what remains is only the earth connected by this *oil*. This being expoſed to the fire, the *oil* diſcovers itſelf in a thick, black, ſtinking ſmoak, and finally, taking fire, it burns away, and leaves only the earth which was the baſis of the plant, retaining its form, indeed, if the proceſs have been carefully made, but falling into a ſhapeleſs powder only on being roughly breathed upon.

This great author, therefore, eſtabliſhes it as a rule, that there are three ſorts of *oils* in plants. 1. An *oily* froth. 2. The *eſſential oil*, diſſolved in decoction. And, 3. This *connecting*, or *conſolidating oil*, ſeparable only by a naked fire. *Boer.* Chem. Part 2. p. 20.

Eſſential OIL. There is found in every plant analyſed by diſtillation, an *eſſential oil*; but this is very different from the ſame plant, both in its quantity and in its qualities, as it is managed in the operation.

If a plant be thrown into a retort, and diſtilled with a violent fire, it is known to yield leſs *oil*, than if the fire were more moderate: if the plant be fermented, eſpecially if it be of the aromatic kind, it always yields much more *oil* after this operation, than it does without it.

It is plain from hence, that there are methods of obtaining more *oil* from the ſame plant, than would be yielded by it in the common way; and it is as certain, that according to all the methods in common uſe, there is ever left a large quantity of the *oil* behind; and therefore, that a way may poſſibly be invented of drawing yet more from the ſame plant than is yet known to be done. We all know, that when the reſiduum in the retort, after the diſtillation of the plant, is burnt in the open air, it loſes half, or often three fourths of its weight, and the matter evaporated in this burning to cauſe this great diminution can be only the remainder of the *oil* of the plant, which would not be ſeparated from its earth in a cloſe veſſel.

It may be obſerved alſo, that the *oil* of a plant, in the diſtillation by the retort, never comes over till toward the end of the proceſs, and drops from the neck of the veſſel at the ſame time with the acid ſpirit of the plant, and while the urinous volatile ſalt is alſo riſing; ſo that the three principles are, in a manner, all ſeparated from the plant together: when there is a large portion of acidity in the plant, and but a ſmall quantity of urinous ſalt, it is alſo conſtantly obſerved, that there is a larger quantity of *oil*, and that this *oil* is more fluid, and that the caput mortuum diminiſhes leſs in burning. This particular is remarkably obſervable in the analyſes of mallows, prunella, melilot, and ſouthernwood. On the contrary, ſuch plants as yield but a ſmall quantity of acid ſpirit, or volatile ſalt, always afford but little *oil*, and that *oil* is always thick, and the caput mortuum of theſe plants diminiſhes greatly in burning; that is, a great quantity of the *oil* was entangled in the earthy matter, and could not get looſe, otherwiſe than by burning the plant in the open air. Inſtances of this ſort are found in the analyſes of the *caltha paluſtris*, &c.

Hence it appears, that the acid and volatile ſalt in plants are greatly inſtrumental to the diſengaging their *oil*, and giving it ſeparate in diſtillation. Hence when a plant does not contain acid enough in itſelf to diſengage its *oil*, it appears no ill method to try to aſſiſt the ſeparation by the addition of another acid of the vegetable kind.

To try this, Mr. Homberg firſt diſtilled a certain quantity of fennel-ſeed in the common way, and afterwards diſtilled the ſame quantity of the ſame ſeed, in the ſame manner, except that he added for every pound of the ſeed four ounces of ſpirit of ſalt to the water in which it was put for diſtillation This laſt diſtillation yielded one third more *oil* than the firſt Both the *oils* were equally clear, and ſtrong-ſcented of the ſeeds, but the laſt ſeemed to ſmell leſs of the fire than that obtained by the ſimple diſtillation in the common way. There is no doubt but that the ſpi-

rit of ſalt in this proceſs not only encreaſed the natural ferment in the liquor, which is neceſſary to the ſeparation of the *oil*, but that it alſo attenuated the particles of the *oil* in the ſeed, and made them much more eaſily ſeparate themſelves, and riſe with the heat, than they would otherwiſe have done. What not a little confirms this opinion alſo, is the known experiment of rendering camphor liquid by means of acid ſpirits. Mem. Acad. Par. 1700.

The modern chemiſts have not looked upon the *oil* as one of the genuine principles of the plant it is drawn from, as has been the cuſtom among writers of earlier date. They know that theſe *oils* are themſelves mixed bodies, and capable of another analyſis, by which they are ſeparated into ſalt, phlegm, and earth. Theſe three principles conſtitute all *oils*; but theſe differ greatly in different plants, and that perhaps, more from their manner of admixture than from their different quantities. That bodies of the ſame kinds, variouſly mixed, may have theſe different appearances, is in nothing more evident, than in the mixture of quickſilver, and ſulphur; if this be done only by grinding, the reſult is a black powder; but, if they are ſublimed together, they form a red, bright, compact body, formed of ſeveral congeries of ſtriæ, called cinnabar. And, in the ſame manner, the ſame principles, phlegm, ſalt, and earth, may, according to the different manner of their mixture, form *oils* of very different natures one from another: nor is this all the ſource of their difference, for, by our own management of them, we make them appear in very different forms, in the ſame ſpecies. Thus the *oil* naturally contained in a ſeed is produced from it, according to our different management, in three different forms. To inſtance this: in the *oil* of aniſeed if we heat and preſs this ſeed, we draw what is called an *oil* by expreſſion, a fattiſh ſubſtance, of the nature of *oil* of olives, almonds, and the like, and with only a moderately acrid taſte; if we diſtil it with water in an alembic, we obtain the *eſſential oil*, or common *oil* of aniſeed; and if we diſtil it dry by the retort, we obtain a fetid, thick, and empyreumatic *oil*. The *oil* in the ſeed is evidently the ſame, but it puts on theſe forms according to our pleaſure. Mem. Acad. Par. 1707.

Expreſſed oils, as well as balſams, and reſins, when applied to the animal bodies, increaſe putrefaction, and are the moſt effectual ſuppurants and incarners. *Monro*, in Med. Eſſ. Ed. Vol. 5. Art. 24.

It may be eaſily ſeen from this, that little knowledge of the nature of the *oils* of plants is to be obtained from the common analyſes; the way to truly underſtand them, is to mix them with different ſubſtances, and to digeſt them alone, and, in mixture with thoſe ſubſtances, to try the different events.

Mr. Geoffroy made a multitude of experiments on the *oil* of thyme with this view, and, from the events of theſe, has made ſeveral very fair deductions as to the cauſes of the different colours of the flowers of plants.

A large quantity of dried thyme being diſtilled with water, in earthen cucurbits, yielded him a pure deep yellow *oil*; this he rectified by diſtilling it again, with a great quantity of water; and, by this means, obtained a pale yellow *oil*, which he uſed for all his experiments.

He divided the *oil* into ſeveral parcels, and with one he mixed diſtilled vinegar; with others the acid ſpirits of nitre, vitriol, and ſea ſalt, ſeverally reduced by a mixture of water to the ſtrength of common vinegar, which is about the ſtandard of the acidity found in the juices of plants. All theſe mixtures were ſet in digeſtion, and the *oil* became of a deep ſaffron colour. If the acid ſpirits had been uſed in their native ſtrength, they would have immediately burnt up the *oil*. Another parcel of the *oil* was digeſted with ſpirit of ſal armoniac made with lime. This paſſed all the degrees of yellow, of red, and of purple; and finally became of a true violet-blue. Spirit of urine, and that of ſal armoniac with ſalt of tartar, produced alſo the ſame changes, except that the degrees of colour differed.

On the contrary, the fixed alkali of *oil* of tartar digeſted with the ſame *oil*, only changed it to a deep brown. *Oil* of tartar added to the *oil* with ſpiris of ſal armoniac, when it is yet only of a fine purple, turns it to a deep blue; and diſtilled vinegar mixed with it in the ſame ſtate, turns it to a deep blackiſh colour; this mixed with ſpirit of wine, tinges it to a greyiſh colour; and a little *oil* of tartar being then added, it becomes green, and that colour does not go off. If diſtilled vinegar be added to this mixture, it deſtroys at once the alkali, and the green colour which was owing to it, and gives the *oil* its original yellowiſh hue.

Oil of thyme which has been made blue by means of *oil* of tartar, being mixed with ſpirit of wine, the whole appears grey, and, on adding more *oil* of tartar, it becomes blue; diſtilled vinegar takes off this blue colour, leaving the liquor rediſh; and more *oil* of tartar makes it blue again.

It appears from theſe laſt experiments, that *oil* of tartar acts differently on the *oil* of thyme, according to its different ſtate; turning it blue or green, according as it is rarified, or concentrated. It ſhould ſeem alſo, that the ſpirit of wine contained a latent acid, ſince all its effects on the *oil* of thyme are overpowered by a mixture of *oil* of tartar.

Mr. Geoffroy was at the pains of trying this whole courſe of experiments on ſeveral other *eſſential oils*, as thoſe of lavender, juniper, turpentine, and others, but they did not produce the ſame effect on all. Hence it appears that there is great difference between the *eſſential oils* of different plants, in regard to the effects of other bodies on them.

The ſame courſe of experiments he tried on other *oils*, not of the vegetable kingdom, and, among theſe, he found none, except that of yellow amber, which at all approached to the nature of *oil* of thyme.

This *oil*, mixed and digeſted with ſpirit of ſal armoniac, acquires a purple colour; *oil* of tartar mixed with this, does not change its colour, but when ſpirit of wine is added to this mixture, the *oil* of tartar becomes blue, while the *oil* of amber continues of its purple colour.

There ſeems to be a certain degree of denſity neceſſary in an *oil* to render it capable of all the changes of colours; this denſity ſeems perfectly hit in the *oils* of thyme and amber, and all the changes of the colours that are given to them, ſeem only the effect of rarifying, or condenſing them. If they are rarified to the utmoſt, by being mixed with ſpirit of wine, they become colourleſs and tranſparent; and, if condenſed in the higheſt degree, as in the experiment with the diſtilled vinegar, they become blackiſh. Theſe are the two extremes, and all the other colours are but degrees and ſhades approaching to, or receding from, one or the other of theſe. The *oils* naturally more rarified, ſuch as *oil* of turpentine, and the like, have naturally no colour, nor can receive any from theſe proceſſes; only if the mineral acids be mixed with them in their full ſtrength, they burn them up to a ſort of reſin, and, finally, to a black maſs, reſembling charcoal. But, perhaps, future attempts may teach us an art of ſo modifying the particles of theſe *oils* as to render them ſuſceptible of all the changes that *oil* of thyme is.

The colours of the leaves and flowers of plants are of the ſame nature with thoſe produced in the *oil* of thyme, in thoſe proceſſes; and, as chemiſts, in general, agree that all colours are the reſult of ſulphurs differently acted upon by ſalts, perhaps, great light may be given into their nature and origin from theſe experiments. Mem. Acad. Par. 1707. See the article *Colours of* FLOWERS.

The *eſſential oils* of vegetables may be divided into two claſſes, according to their different ſpecific gravities, ſome floating upon water, and others readily ſinking to the bottom thereof. Thus the *eſſential oils* of cloves, cinnamon, and ſaſſafras, readily ſink, but the *oils* of lavender, marjoram, mint, &c. ſwim upon the water. The lighteſt of all the *eſſential oils*, is, perhaps, that of citron peels, which even floats on ſpirit of wine; and the heavieſt of them ſeems the *oil* of ſaſſafras.

For the obtaining the full quantity of the more ponderous *oils* from cinnamon, cloves, ſaſſafras, &c. it is proper, 1. To reduce the ſubjects to fine powder. 2. To digeſt this powder for ſome days in a warm place, with thrice its quantity of ſoft river water made very ſaline with the addition of ſea ſalt, or ſharp with *oil* of vitriol. 3. To uſe the decoction left in the ſtill, inſtead of common water, for a freſh digeſtion. 4. To uſe alſo, for the ſame purpoſe, the water of the ſecond running, after it has been cleared of its *oil*. 5. Not to diſtil from too large a quantity of the ſubject at once. 6. To leave a conſiderable part of the ſtill empty. 7. To uſe a briſk fire, or a ſtrong boiling heat at firſt, but to ſlacken it a little afterwards. 8. To have a low ſtill-head, with a proper internal lodge, and current, leading to the noſe of the worm. And, 9. To cohobate the water, or pour it back upon the matter in the ſtill, after ſeparating its *oil*, and repeating this once or twice more. *Shaw*'s Lectures, p. 141.

Eſſential oils, when applied to the human body, ſtimulate, exode, reſiſt putrefaction; and, mixed with the blood, raiſe ſome degree of fever. Med. Eſſ. Edinb. Vol. 5. Art. 24.

The vegetable world affords vaſt variety of *eſſential oils*, moſt of them very odorous, and of great virtues.

The *eſſential oils* of many of the plants uſually diſtilled have their peculiar reſervoirs in the plant. Mr. Geoffroy perceiving this, determined to ſearch for them through the different parts of the plants, and enquire into the reaſon of ſeveral precautions which are always found neceſſary, in order to ſucceed in the diſtillation of them. See OIL-*bladders*, infra.

From what has been ſaid above, it appears, that the *oils* in common uſe are of three different kinds. The firſt are mere *oily*, or fatty bodies, extracted either by expreſſion, or by decoction: of the firſt kind are thoſe of almonds, linſeed, nuts, olives, and the like; and of the other, that of bay berries, and the like, which are procured by boiling the ſubſtance, on which the *oil* collects itſelf on the top of the water.

The ſecond kind of *oils* are thoſe extracted from vegetables, by common diſtillation by the alembic, with the help of water; theſe contain the *oily* and volatile part of the plant, and carry, by way of pre-eminence the name of *eſſential*, or *ætherial oil*

The third ſort of *oils* are the fetid ones, which are, in like manner, produced by diſtillation, but by means of a different diſtillation in a naked fire, and without the aſſiſtance of water.

It ſeems to follow from this account, that the *ethereal*, or *eſſential oils* are the volatile exalted ſulphurs of thoſe plants; and as ſulphurs are the baſis of all ſmells, it is eaſy to be preſumed, that all ſweet-ſcented plants have an *eſſential oil* in ſome of their parts. The balſams, and reſins, which we find in many vegetables, ſeem to have their origin from the *eſſential oils* of the trees or plants they belong to, and which are uſually found greatly to abound with them. Indeed, in the balſamiferous trees, the liquor which flows out on wounding the trunk, may very properly be eſteemed a ſort of *eſſential oil* of a harder conſiſtence than the common ones. Of this nature are the balſam of Capivi, of Gilead, and the reſt; and theſe very *oils*, farther indurated, furniſh us alſo with the ſcented reſins, ſuch as benjamin, myrrh, and the like.

All *eſſential oils* become thick and reſinous on being mixed with any foreign acid; they alſo acquire the ſame conſiſtence of themſelves in long keeping, and that partly from the ſame principle; their ſubtler parts evaporating give room for the acid ſalt, which they naturally contain, to diſplay its power; and being then in an over-proportion to the reſt, it does not fail to act upon the whole in the ſame manner that any other acid would. Thus the *oil* remains no longer what it was, but becomes a reſinous ſubſtance, of a ſmell reſembling turpentine.

Chemiſtry is not, however, without its reſource on this occaſion; for this thickened *oil* being mixed with a large quantity of water, and diſtilled in a balneum mariæ, a great part of it will come over with all its wonted fluidity, limpidity, and odour; but even this new diſtilled *oil* is not exempted from the ſame change again. This diſadvantage in the keeping the *eſſential oils* diſtilled in the common way, has occaſioned Mr. Geoffroy to contrive another method of making them. This renders them more limpid and fluid than in the common way, and they are never ſubject to grow thick; but the medium not being water, ſo much of the *oil* cannot be procured from the ſubject, becauſe ſome is abſorbed and ſtained in the medium. The inſtance this gentleman gives of his new method is in the eſſence of citron, and is this:

A common alembic is to be filled with the thin pared, external rinds of the fruit; a ſufficient quantity of ſpirit of wine is to be poured on theſe, and the veſſel being well cloſed, the whole is to ſtand ſome time in digeſtion; during this time, the ſpirit charges itſelf with a vaſt quantity of the *eſſential oil* of the bark, and being carefully diſtilled in balneo mariæ, it brings over with it a great deal incorporated in itſelf, but, beſide that, there is a large portion ſwimming on the ſurface of the ſpirit, and eaſily ſeparable from it in the common way: this is as clear, pellucid, and thin, as the ſpirit itſelf, and is, in all reſpects, ſuperior to the eſſence made by any other means. The ſpirit of wine may be ſaved for a ſecond operation of the ſame kind, and there will then be no loſs from it; for being already ſated with as much of the *oil* as it naturally abſorbs, it will take in no more by the ſame means, and therefore may ſerve for ever ſo many new diſtillations, without loſs. If all the *oil* be finally deſired to be ſeparated from the ſpirit, it may eaſily be obtained by mixing the ſpirit with a large quantity of water, as is done in making the *oil* of ſpike. The *oil* will then ſwim at top, and the ſpirit may be ſeparated again from the water by diſtillation.

Some of the *eſſential oils* are ſo abundantly charged with ſalts, that, in long keeping, they will actually depoſit plain concretions of the ſaline kind. This is frequently obſerved in *oil* of turpentine, which, though ever ſo well rectified, will yet affix long cryſtals like needles to the ſides of any veſſel in which it has been long kept; the *oils* of marjoram, and feverfew, do the ſame; as alſo ſeveral of the others. All the other *oils* alſo ſuffer great changes in keeping; that of juniper becomes thick like turpentine, in a ſhort time; and thoſe of ſage, and of roſemary, after ſome keeping, are not diſtinguiſhable from one another. The age and ſtate of the plant may alſo make great difference in the ſmell of the *oil*, and there have been many inſtances of the *oil* of ſage becoming wholly like camphor in keeping. The diſtilled *oils* of ſome plants vary alſo at times in their colour. The *oil* of rue, and that of wormwood, ſometimes come over green, and ſometimes brown; the *oil* of chamæmile in Italy is always blue, but Mr. Geoffroy ſays, that he could never get a blue *oil* from the chamæmile of France by a ſimple diſtillation; and as to thoſe *oils* which ſometimes are green, they all become of the common clear yellowiſh colour of the other *oils*, if rectified by diſtilling them over again in a balneum mariæ.

In dry ſeaſons wormwood affords but little *oil*, accompanied with a bituminous matter, or a genuine reſin; and, in theſe ſeaſons, if the young ſhoots only are diſtilled, the *oil* is almoſt conſtantly found to come over green; but in moiſt years the wormwood yields a much larger quantity of *oil*, and it is then always brown. Wormwood which has grown on dry ſandy ſoils is always more white, and woolly, on the leaves, and always affords an *oil* of ſome tendency to a greeniſh colour; while, on the contrary, ſuch as grows in rich moiſt ground, has larger, and leſs woolly leaves, and yields a brown *oil*. The ſeaſon, and degree of heat, added to this difference of ſoil, may alſo make greater changes than could be imagined in the *oils* of plants. Mr. Geoffroy aſſures us, that he once made, in a dry ſeaſon, from a quantity of thyme which had grown in a dry ſoil, an *oil* as pure, as limpid, and as ſweet and high-ſcented, as that of the hotter countries, whereas the *oil* of thyme made in France is uſually much poorer, and of an obſcure colour, and coarſe earthy ſcent.

The *oils* of plants have not always the ſame taſtes with the plant they are diſtilled from, or, at leaſt, not in the ſame degree. Nothing is more bitter than wormwood, yet the *oil* of wormwood has no remarkable bitterneſs. Aniſe, which is of a ſweet taſte, yields, on the contrary, an *oil* infinitely more ſweet than the ſeed; and pepper, which is ſo remarkably hot and acrid, affords an *oil* no way remarkable for its pungency. Thyme, which is in itſelf very acrid and pungent, conveys that property, in a yet greater degree, to its *oil*; there is, indeed, no *eſſential oil* ſo acrid and firey as that of this plant. The fetid *oils* drawn in dry diſtillation by the retort, in an open fire, no way differ from theſe but by the damage the fire has done them, and may always be converted into theſe by repeated diſtillations. Nay, the very fat *oils*, ſuch as that of almonds, may be attenuated ſo far as to become as fine, and as ſubtile, as the *eſſential oils*. This is to be done by means of quick lime; and ſeveral repeated diſtillations of this *oil*, or any other of a like kind, with freſh lime to every diſtillation, will reduce it to be volatile, penetrating, and capable of being raiſed, and diſtilled, by means of water, which is the great teſt of the *eſſential oils*. The bituminous, and fetid *oils*, may alſo, in the ſame manner, be reduced by repeated diſtillations, to the ſtate of the *eſſential* ones, and to be equally fluid, and limpid, and equally penetrating. Memoirs Acad. Par. 1721.

Adulterations of eſſential OILS. Many of the *eſſential oils* being dear, it is a very common practice to adulterate, or debaſe them, ſeveral ways, ſo as to render them cheaper both to the ſeller and the buyer. Theſe ſeveral ways ſeem reducible to three general kinds, each of which has its proper method of detection. Theſe three ways are, 1. To adulterate them with *expreſſed oils*. 2. With alcohol. And, 3. With cheaper *eſſential oils*.

If any *eſſential oil* be adulterated with an expreſſed *oil*, it is eaſy to diſcover the fraud by adding a little ſpirit of wine to a few drops of the ſuſpected *eſſential oil*, and ſhaking them together; for the ſpirit will diſſolve all the *oil* that is *eſſential*, or procured by diſtillation, and leave all the expreſſed *oil* that was mixed with it untouched.

If an *eſſential oil* be adulterated with alcohol, or rectified ſpirit of wine, it may be done in any proportion, up to that of an equal quantity, without being eaſily diſcoverable either by the ſmell, or taſte. The way to diſcover this fraud is to drop a few drops of the *oil* into a glaſs of fair water, and if the *oil* be adulterated with ſpirit, the water will immediately turn milky, and by continuing to ſhake the glaſs, the whole quantity of ſpirit will be abſorbed by the water, and leave the *oil* pure at top. *Shaw*'s Lectures, p. 145.

Finally if an *eſſential oil* be adulterated by a cheaper *eſſential oil*, this is commonly done very artfully: the method is to put fir-wood, turpentine, or *oil* of turpentine, into the ſtill, along with the herbs to be diſtilled for their *oil*, ſuch as roſemary, lavender, origanum, &c. and, by this means, the *oil* of turpentine diſtilled from theſe ingredients comes over in great quantity, and is intimately blended with the *oil* of the genuine ingredient. The *oils* thus adulterated always diſcover themſelves in time, by their own flavour being over-powered by the turpentine ſmell; but the ready way to detect the fraud, is to drench a piece of rag, or paper, in the *oil*, and hold it before the fire; for thus the grateful flavour of the plant will fly off, and leave the naked turpentine ſcent behind.

Fern OIL. See the article FERN.

Green OIL, *oleum viride*, a form of medicine preſcribed in the late London pharmacopœia, and made in the following manner. Take leaves of bay, rue, marjoram, ſea wormwood, and chamæmile, each three ounces; *oil* of olives a quart. Boil the herbs in the *oil* till they are criſp, and then ſtrain off the *oil*, and when it has ſtood for the fæces to ſubſide, put it up for uſe. *Pemberton*'s London Diſp. p 350.

Red OIL, in the porcelain manufacture, a name given to a peculiar colour uſed on the China ware, or to thoſe pieces of the ware which are coloured with it. It is a very elegant ornament, and would be worthy our attempting to imitate in England, on our better ſorts of wares. They do it in the following manner: they mix the red colour called *tam-lan-hum*, or the copperas red, before deſcribed under the article of COLOURING *of china*; this they mix with *oil* of ſtone, (ſee OIL *of ſtone*.) and with another *oil*, as they expreſs it, of the ſame kind, made of a whitiſh ſort of pebble, or agate, found on the ſhores of their rivers, and the place of which might probably be ſupplied with us by common chryſtal. The powder is to be thoroughly mixed with theſe liquors, and the veſſel dipt carefully into the mixture, or ſome parts of it only covered with it in figures: after this, it is to be ſet by to dry, and, when thoroughly dried, it is to be baked in the common way. The general method is that of covering the veſſel all over, both inſide and out with this red; and it comes out of the moſt bright and brilliant colour imaginable, but it will

not

not ring when ſtruck upon, as our common china ware does. We ſeldom ſee this in any degree of perfection, but it is very elegant when fine. Obſerv. de l' Aſie.

OIL *of the earth*, *oleum terræ*, in the materia medica, the name of a thick mineral fluid of a duſky browniſh black, with a faint caſt of purple, and of the conſiſtence of a thin ſyrup, very little tranſparent, and of a ſtrong penetrating ſmell, like that of common *oil* of amber. It ouzes out of the cracks of rocks, in ſeveral parts of the iſland of Sumatra, and ſome other parts of the Eaſt Indies, and is much eſteemed there in paralytic diſorders; but it is ſeldom imported into England, what our Eaſt India ſurgeons and captains uſually bring over under this name, being only a vegetable *oil* impregnated with the virtues of certain of their foſſils by boiling. *Hill*'s Hiſt. of Foſſ. 420.

OILS *inflammable with acids*. See INFLAMMABILITY.

OIL *of olives*. The *oil of olives* having been publickly declared in England to be a certain remedy for the bite of a viper, the perſon who made the diſcovery having ſuffered himſelf to be dangerouſly bitten, and recovered not only himſelf, but ſeveral animals bitten at the ſame time, by this remedy alone, and that before a number of perſons of the greateſt eminence in medicine, the royal academy at Paris were determined to give the *oil* a number of fair trials, and determine, beyond controverſy, a point of ſo great importance, as whether this *oil* was, or was not, a remedy for this terrible poiſon.

Theſe experiments they have related in their memoirs; to theſe they have added the ſtate of the bodies of animals, when opened, after they had died of theſe bites; and to theſe they have ſubjoined ſome very uſeful reflexions. They occaſioned ſeveral pigeons, ſome young chickens, two cocks, a gooſe, a turkey, two cats, and eight dogs, to be bitten by vipers; in examining the wounded part, there uſually appeared at firſt only two little red ſpots, though ſometimes a ſmall quantity of blood, and very ſoon afterwards there began to appear a tumor, which, by degrees, encreaſed and extended over the neighbouring parts. The creatures were bit in the thigh, or leg, and the whole limb ſoon after became livid, and the ſwelling, and colour, extended thence over the lower part of the belly; and this was commonly followed by vomiting, and convulſions. The birds often bent their necks forward as if to vomit, and threw up only a quantity of phlegm, and death uſually ſoon followed theſe ſymptoms.

Of four pigeons which were bitten by four different vipers at the ſame time, and to which nothing was done to prevent the effect of the poiſon, they all died in a quarter of an hour, half an hour, or at the utmoſt, a little more than an hour. Two other pigeons were bitten, and about three minutes afterwards the parts wounded were rubbed with *oil of olives* warmed; but notwithſtanding this, they both died, the one in twenty-five minutes, the other in an hour and half. Two other pigeons were bitten after this, and the wounded parts immediately rub'd with *oil of olives*, made very hot, without heating the part; the one of theſe died in fifteen minutes, and the other in an hour and half. Theſe had all been bitten on the thigh. They next cauſed a pigeon to be bitten on the wing, and applied the *oil* immediately, but the bird died in five minutes.

After this, eight pullets were bitten on the thigh. No application was made to any of theſe, they all ſhewed the marks of being bitten, yet two of them eſcaped alive. Of the others, one lived an hour; two that had been bitten, both by the ſame viper, periſhed; that which was firſt bitten, in an hour, the other in an hour and a quarter; and the other three, which were bitten by a viper which had, before that, bitten another animal, periſhed; the firſt in an hour, the ſecond in about ſeven hours, and the third in an hour and half.

Eight other pullets were afterwards bitten by vipers, and the hot *oil* was applied to the wounded part at different times afterwards, but none were ſuffered to remain longer than ten minutes without it. Of theſe animals, three were ſaved; the others died in a very little time: notwithſtanding the application of the *oil*, one of them only excepted, which lived to the day after, but then died.

Six other pullets were firſt rub'd over with *oil* on the part intended to be bitten; and, after the bite, the *oil* was carefully applied hot to the part ſeveral times; but notwithſtanding this, they all died. One of them lived ſix hours, but the others all periſhed in a very ſhort time after they received the poiſon.

Two large cocks were next bitten; to one of them the *oil* was applied ſoon after he received the wound; but he, notwithſtanding, died in three hours. The other cock had not the *oil* applied, but an actual cautery was brought near the wound, and held there about three minutes; this creature periſhed alſo in about two hours.

A gooſe was next bit by a viper, and the bite ſeeming doubtful whether it had penetrated farther than the ſkin, another viper was made to bite it a ſecond time; the *oil* was applied immediately afterwards to the wound, and the application continued a long time with frequent repetitions; but, notwithſtanding this, the uſual ſymptoms appeared, and the creature died in two hours and a quarter. A large turkey was next bitten, and the two firſt bites appearing dubious, he was wounded a third time; the *oil* was applied in time, and repeated many times; but, notwithſtanding this, the uſual ſymptoms appeared, but after about three hours they abated, and the creature continued out of order for three days, and finally recovered. Eleven days afterwards the ſame turkey was again bitten by a viper, and no application was made; he was ſick again for about two days, but at the end of that time he recovered.

A young kitten was bit on the noſe by a viper; the *oil* was applied, and the creature was well the next day. A grown cat was bitten by four vipers, and the *oil* was applied; the creature made her eſcape, but ſhe was ſeen alive afterwards. Eight dogs were bitten, ſome on the thigh, ſome on the noſe, and others under the belly. Three of theſe had no application made to them; a tumor, and lividneſs ſucceeded the bite, but they all recovered, as well as the other dogs who were rub'd with the *oil*; one of theſe was a young puppy. The laſt dog that was bitten was of the Daniſh breed, and was very large, though but two months old; he was bitten by ſeveral vipers, and that in ſeveral parts, and the application of the *oil* was not made till after an hour and half. The tumors on the bitten parts growing very large, there were ſcarifications made in them, and hot *oil* poured into them. The creature ſhewed many ſigns of convulſions; his breath grew hard, his limbs failed him, he vomited, and purged, and, in fine, he died about eight-and-forty hours after the biting, notwithſtanding this cloſe application of the *oil*.

From theſe experiments, there is little credit to be given to this boaſted remedy. The pigeons which were bitten by vipers all died, notwithſtanding all that could be done by it; the article of the pullets is not at all more favourable to it; ſome having eſcaped to which it was applied, and others died; and of thoſe which were bitten, and had no application made to them, ſome alſo lived; and the *oil* was found to produce no good effect in a great many others in the ſame circumſtances. The turkey which lived with the application of the *oil*, we find could live alſo without it; and though ſome dogs lived which were bathed with *oil* after the bite, ſome alſo lived to which nothing was applied, and the *oil*, with all favourable circumſtances, we ſee, could not cure the Daniſh dog: ſo that, upon the whole, if the *oil* be a remedy for the bite of a viper, it is, at leaſt, a doubtful one, and far from the infallible cure it was ſuppoſed to be.

The great inſtance of the man's being recovered who was bitten on purpoſe to try the experiment, is far from proving the *oil* an infallible remedy, ſince he had other remedies adminiſtered to him, and there have been ſeveral inſtances of men being cured by theſe without the application of the *oil*. And it is to be obſerved, that the bite of a viper is not always certain death to a man, if he uſe no remedies at all, but that many have recovered, notwithſtanding that the ſymptoms which affected that perſon have appeared upon them. We ſee very plainly by the before recited trials, that of ſeveral animals of the ſame kind, bitten at the ſame time by vipers, ſome have recovered, and others have died, and this equally when this ſuppoſed remedy was, or was not, applied to them. And, in the ſame manner, it may happen to men, that of numbers who have been bitten, ſome would recover, and others die, whether any means were uſed, or not. Memoires Acad. Scienc. Par. 1737. See the article POISON.

OIL *of ſaſſafras*. Many of the vegetable *oils* obtained by diſtillation, will be found, under certain circumſtances, to approach to camphor. The *oil* of thyme may be cryſtallized, according to a proceſs of Mr. Newman's, who calls it, in that, *camphora thymi*. Phil. Tranſ. N° 479. p. 379.

The *oil* of ſaſſafras is peculiarly liable to cryſtallization in certain circumſtances, and that into the moſt beautiful forms. Mr. Maud gives an account of a quantity of this *oil*, which having ſtood expoſed to the air in a very froſty night in an open veſſel, was in the morning found changed three parts in four of it into very beautiful and large cryſtals: they were of an hexagonal form, very tranſparent, and of three or four inches in length, and half an inch in thickneſs. Theſe cryſtals ſubſided in water, and were indiſſoluble in it; they were readily inflammable at the fire, and were reduced by heat to their priſtine fluid ſtate: hence it is evident that they ſtill retain the natural qualities of an *oil*, though they appear under ſo very different a modification of their parts. What is moſt remarkable in this change, is, the metamorphoſis of a fluid to a ſolid body, of ſo determinate and regular a figure, and that theſe cryſtals ſhould be perfectly clear and colourleſs, though the liquor from which they froze, was of a yellowiſh colour, not unlike that of Madeira wine.

This ſeems to afford a new inſtance of cryſtallization, which is generally accounted for by the particles of a fluid, or thoſe of any other body ſuſpended in a fluid, being brought nearer by cold, and, at length, coming within the ſphere of each other's attraction, unite together into an immediate contact. This *oil* being a very heavy fluid, much heavier than water, is the more likely thus to unite, as its parts are nearer together. This may be a hint to the curious to diſcover wherein conſiſts the difference of ſolidity and fluidity; and it likewiſe ſhews how

how much the colour of bodies depends upon the mechanical ſituation of their parts.

OIL *of ſtone.* In the manufacture of the Chineſe porcelain, they uſe a liquid matter of a white colour, which they call by this name, on which their great myſtery of finiſhing their work depends; yet this has been leſs enquired into by the imitators of that ware in Europe, than many other articles of leſs conſequence. The ſtone of which this *oil* is made, is of the ſame degree of hardneſs with that which the petunſe is prepared of. They procure it from quarries, and chuſe ſuch as is of a good white colour, and has many dark green ſpots in it.

Theſe ſpots are of the colour of the leaves of cypreſs. Sometimes a ſtone is choſen which has a brown ground, variegated with ſpots and blotches of a reddiſh colour. They firſt carefully waſh this ſtone; then laying it in a clean place, they break it to pieces with iron inſtruments, and afterwards grind theſe to a perfectly fine, and impalpable powder, by rubbing them in large mortars, with peſtles of ſtone faced with iron, and turned either by the labourers, or by water. When the whole is thus reduced to a fine powder, they throw it into a veſſel of water, and ſtirring it briſkly about, they let the coarſer part ſubſide to the bottom, and there ſwims a fine thick matter like cream, for two or three inches depth, on the ſurface. This they carefully ſcum off, and putting it into another veſſel of clear water, they let it throw down any coarſe matter it may yet contain; and, finally, taking off the thick ſurface again, they mix this with ſome freſh water in another veſſel, and leave it to ſubſide; then pouring off the clear water, they take out the remainder at the bottom of the veſſel, which is perfectly fine, and reſembles a thick cream. To every hundred pounds of this, they add one pound of a ſubſtance of the nature of which we are not yet perfectly informed. It is ſaid to be a mineral reſembling alum. They calcine this firſt, and then beat it to a fine powder, and this being added to the cream, or *oil*, as it is called, ſerves to keep it always in the ſame liquid ſtate. This ſubſtance, when finiſhed in this manner, has very little title to the name of an *oil*; it is rather a varniſh, and is always uſed in mixture with another varniſh, which is called at this time fern *oil*, and uſed to be called lime *oil*; it is prepared in the ſame manner with the other after burning. See FERN-*oil*.

OIL *of vitriol.* See the article VITRIOL.

OIL *of wax.* See the article WAX.

OIL *bladders*, in plants. — It is a diſcovery, partly of Mr. Tournefort, and partly of Mr. Geoffroy, that the eſſential *oils* of all plants are contained in their perfect and pure ſtate, in the plants themſelves, while growing; they have, in different vegetables, different parts aſſigned for their reception; in ſome the flower; in others, the flower cup only, as in roſemary, and the like; in others the bark; in ſome, the parenchyma of the root; and in others, the wood.

Wherever they are lodged, they are always contained in theſe veſicles, or capſules, which require only to be broken, or burſt open, in order to ſet them looſe; this is effected by the boiling water in the common diſtillations, and the natural ſubtilty and lightneſs of the *oil* then makes it eaſily riſe in vapour, and its oleaginous quality rendering it incapable of mixing with the water, it ſwims at the top, and is eaſily ſeparated.

Theſe veſicles are moſt uſually placed in, or about, the flower, and it is in many plants a very eaſy matter to trace them to their ſeveral places of principal reſidence. Mr. Tournefort has obſerved that theſe *oil bladders* in the fraxinella taking their origin at the root, thence aſcended to the fruit or covering of the ſeeds. This plant has a very remarkable variety in its *oil* in the different parts. The flower is ſweet-ſcented; the veſicles placed along the ſtalk contain a very ſharp and acrid *oil*, ſomewhat reſembling the eſſence of lemons, when kept a long time. The leaves have ſcarce any ſenſible odour, but the root has a ſcent peculiar to itſelf, and different from that of all the reſt of the plant. *Geoffroy*, ap. Memoires Acad. Paris 1721.

The eſſential *oil* of cinnamon has alſo a difference of the ſame kind, which is owing to the different fluid contained in the veſicles in different parts; the bark of the root yields an *oil*, which, after keeping ſome time, always yields a pure and genuine camphor; whereas the *oil* of the bark from other parts of the tree has nothing of this property.

It is alſo eaſy to obſerve, that the capſules of certain fruits have more odour than the fruits themſelves. The coat which covers the piſtachia nut, contains much more eſſential *oil* than its kernel; and the bark which ſurrounds the amomum, and cardamoms, has much more ſmell than the kernel of the ſeed. The firſt bark of the nutmeg is well known to have a more fragrant ſmell than the nutmeg itſelf, being the mace; yet there is, within this, another covering of that fruit, which has no ſcent at all.

Moſt of the ſeeds of the umbelliferous plants, which uſually paſs for aromatics of the firſt and moſt eminent kind, have, in reality, no ſmell at all in themſelves; the *oil bladders* which yield their virtues being placed in their outer covering, the kernel within the ſeed uſually containing a fat *oil* of the olive or almond kind, and wholly different from the eſſential. The *oil* of aniſeed made by expreſſion is fluid, of a green colour, and of a fatty nature, but is highly ſcented with the *oil* which it has taken with it from the covering; on the contrary, the eſſential *oil* procured from the ſame ſeed by diſtillation, is thin, not fatty, of a much more clear and penetrating ſcent, of a pale colour, with no admixture of greenneſs, and readily concretes into a maſs like butter on external cold. In coriander ſeed, the kernel carefully ſeparated from its membranes has no ſmell, and contains only a fatty *oil*, like that of the olive, while the veſicles are all ranged in the rind, and therefore in that alone is the aromatic ſmell. Theſe veſicles in the ſkin of fruits are the occaſion of the ſweet flavour of many; as of the ſtrawberry, raſpberry, and the like; in theſe they are too ſmall to be diſtinguiſhable, while, in the thicker rinds of the orange and lemon kind they are eaſily diſcerned, and, on the leaſt preſſure, burſt, and throw out their contents, which make what we call the *zeſt*, and which is ſeparated in this manner in greateſt quantity in hot countries, and where there are plenty of the fruit, is preſerved under the name of *bergamot*, and other eſſences of a like kind.

There is, however, no ſubject in the vegetable world in which theſe veſicles are more plainly perceived than in the berries of the juniper, a fruit very well known, and in conſtant uſe with us. Theſe berries are at firſt green, afterwards of a reddiſh brown, and finally black, and they are two years in coming to maturity. The berry is formed at the top, in the manner of a bud of the roſe, or piony, which is juſt ready to open; and it ſometimes does open into four or five parts, according to the number of ſeeds it contains. It contains, beſide theſe, an acrid, a ſweet, and an aromatic juice, which leaves a ſenſible bitterneſs behind it in the mouth.

In order to account for theſe ſo different taſtes in the ſame fruit, Mr. Geoffroy attributes its acrid quality to the ſkin, or huſk, and in ſome berries, indeed, to the unripeneſs of the whole, for want of a due heat of the weather; the ſweet taſte is from the juice of the fruits which is properly a ſaccharine or melleous liquor, and the aromatic flavour is wholly owing to the *oil* which is lodged in the veſicles expanded over the whole inner ſubſtance of the fruit. Theſe ſubſtances are indeed ſo determinately marked in the berry, that it is poſſible to ſeparate them; but theſe are not all the differences of taſte and matter in this little fruit, every kernel of which has in it five or ſix veſicles, lodged each in a peculiar, and appropriated cavity, in the external part of the ſeed. Theſe are eaſily ſeparated from the reſt of the fruit, and, when that is dry, are found to contain an abſolute reſin; they are of a duſky colour, and each drop of reſin in them is of an oval figure, and is very bitter to the taſte; hence therefore is the remarkable bitterneſs that affects the mouth, when the berry is thoroughly broken by the teeth.

The knowledge of this may be of great uſe to the apothecary in his medicinal preparations of juniper berries of ſeveral kinds. When he wants only the extract, which is the melleous juice of the berries alone, they ought not to be ſtamped or bruiſed, to diſlodge this reſin, which has no buſineſs there, but ſhould be only boiled, and the decoction inſpiſſated. But when the eſſential *oil* is required, the whole berry muſt be bruiſed, and that in a thorough manner, that all its kernels be broken. The cells, or veſicles of *oil*, now indurated into a reſin, burſt open, and the whole diſperſed in ſuch a manner that water may affect it. Memoires Acad. Par. 1721.

In order to diſcover what are the parts of a plant in which the *eſſential oil* moſt abounds, it will be proper to examine what part yields the moſt ſmell; and this will be found different in different plants. In ſome the ſeat of odour occupies the whole body of the flower; in others only ſome particular part of the flower has it, and in ſome; it is principally lodged in the covering; and in ſome it is diſperſed every way, thro' the body of the fruit. In ſome inſtances it is found lodged in other parts of the plant, and ſometimes it is equally ſtrong in every part of it.

This principle of the *eſſential oils* varies alſo not only in regard to the place where it reſides, but in the different ſcents it yields in different places; or in the ſame parts of the plant in different ſeaſons. Thus the leaves, ſtalks, and roots of the violet have no ſmell, while the flowers have a great deal. All parts of the jaſmine tree are without ſcent in like manner, except the flowers, which are very ſweet. And the caſe is the ſame in the tuberoſe, the jonquille, &c. in all theſe plants the *eſſential oil* is very volatile, and in very little quantity; their reſervoirs are ſo obſcure, that we cannot find the leaſt trace of them; and, inſtead of an *eſſential oil*, all that can be obtained from them by diſtillation, is a ſweet-ſcented water, and even this loſes its ſmell in a very little time. Of this ſort alſo are the flowers of the lime tree, the lilly, and the clove julyflower; in theſe there is no part ſcented but the extremities of the flowers, and then not till they are thoroughly opened; and, for this reaſon, if we would obtain a ſweet ſcented water from theſe, we are to uſe no part but the flower, and that not till perfectly expanded on the extremities

tremities of the petals; and, with all the caution that can be taken, the water diſtilled from theſe will have but very little ſmell, if the ſeaſon chance to prove rainy.

This is not the caſe in the wallnut tree flowers; theſe contain a large quantity of *eſſential oil*, and, conſequently give a very ſtrong-ſcented water; but this water very often varies from the ſmell of the flower, acquiring in the diſtillation the ſmell of the bitter almond: the reaſon of this is, that the embryo fruit is contained in the flowers, and it is that which is the principal ſource of the *oil*, and the *oil* it yields is wholly analogous to the fruit of the bitter almond.

Peach bloſſoms afford a very ſweet-ſcented water, and their young leaves have a ſmell like that of bitter almonds, and in general, the ſame obſervation may be extended to all thoſe plants which have bitter kernels in the fruit. It is obſervable, that among the radiated flowers, ſuch as that of colts foot, and the like, the flower itſelf has little or no ſmell, but whatever ſcent we perceive in it, ariſes from the cup, whoſe ſcales, or conſtituent leaves, have either a velvety down, or a ſeries of veſicles which contain all the *eſſential oil*, and, conſequently, all the odour. When flowers of this kind are to be diſtilled for their *oil*, they muſt, therefore, be uſed before they are blown open, as the veſicles are then in their fineſt ſtate. Theſe veſicles are ſo large and numerous in hot ſeaſons, in the cup of the marygold, the ſun-flower, and ſome other ſuch plants, that they are eaſily diſtinguiſhed by the naked eye.

Balm has very little *eſſential oil*, and if it be not choſen for diſtillation in a very favourable time, its water will have ſcarce any ſcent at all. The moſt favourable time is, when the plant is fulleſt of veſicles, and that uſually is when it is about ſix or eight inches high; its leaves appearing ſomewhat reddiſh, and being but of about half the bigneſs they are to grow to. This obſervation extends alſo to moſt of the plants of the ſame claſs, nay even to the woody ones, except that they are more aromatic; that is, that they contain a number of veſicles of an odorous reſin, which is wholly owing to the cloſer and firmer texture of the wood.

Sage, while young, when its ſtalks are not yet grown woody, is all over odorous, even its ſtalks, as well as every other part, being full of theſe veſicles of ſweet-ſcented matter, which may be expreſſed on preſſing them. When the *eſſential oil* of ſage is to be drawn, the plant is always to be choſen in this ſtate, and the more woody ones which have ſtood through a whole ſeaſon, are always found to have loſt the greateſt part of their odour in diſtillation. The woody part of this plant has no ſmell; the outer bark, indeed, has ſome ſcent, but that very little.

The flowers of roſemary, ſage, and lavender, and others of the ſame kind, though in the whole they yield a very ſweet ſcent, yet the aromatic eſſence is not lodged in them where it might moſt naturally be ſuppoſed; that is, in the petals, for if we pull theſe clean out of the cup, as in the violet and clove we ought to do, the ſeparated petals have very little ſmell, and that little is not eſſential to the petals, but is wholly owing to the breaking of ſome of the veſicles which are placed in the furrows of the cup, in which all the ſmell is contained, and which, being burſt in the violently drawing away the flower, leave a little of their contents on it. Indeed, if theſe cups are obſerved with a microſcope, or, but attentively, by the naked eye, they will all be found full of ſmall bladders, which contain a pure *eſſential oil*, of a very high and aromatic ſcent.

Thyme and lavender ſhould either have their tops cut off, and thoſe diſtilled immediately, or elſe they ſhould be gently dried, and both flowers, tops, and young leaves, be diſtilled, ſince thoſe are endued with a very aromatic ſcent at their firſt ſhooting.

Among the trees, very many have ſweet-ſcented leaves and flowers, while the wood has not the leaſt odour; to draw the *oil* from theſe the young ſhoots are to be taken, ſince the veſicles which contain the *eſſential oil* are all lodged in theſe, and are at this time in their beſt ſtate, the heat of the ſun exhaleing afterwards their moſt volatile parts. Even the young wood of theſe ſhoots is capable of affording ſome *oil*, ſince in it, theſe veſicles are placed between the outer and the inner bark, but theſe are all perfectly deſtroyed before the wood hardens: this is the caſe in the orange tree, the myrtle, the bay, ſavin, and the like.

It is to be obſerved in the ſweet-ſcented woods, that the place where the reſin is collected in greateſt quantities, is in the knots from which young branches are to riſe; this is very eaſily obſervable in the firs and juniper. This is not, however, the caſe in all the reſinous woods; for ſome of theſe abound ſo in reſin, that their ſeveral woody beds, or layers, are all connected to one another by beds of reſin; as is the caſe in guaiacum, in the calambac wood, and that of aloes. And this is more peculiarly remarkable in the laſt; for in the fineſt wood of this kind ſent from the Eaſt-Indies, the woody parts are ſtript away, and only theſe reſinous beds are left remaining; and, conſequently, while the coarſer and cheaper ſorts burn like our woods to a charcoal, this precious kind melts upon the fire like a true reſin, and is the fineſt-ſcented ſubſtance imaginable.

In all the reſinous woods, the young ſhoots of the tree are to be preferred for the extraction of the *eſſential oil*. This is well known to thoſe who traffick largely in this way: And even the liquid balſams, of which enough cannot be obtained by inciſion, may be thus procured: they boil the tops of the branches, and the young ſhoots, in water, and collect from the ſurface of that liquor, the fluid balſam which the boiling has ſeparated from the ſhoots, and which cannot mix with it.

Beſide the parts of trees, and plants, already mentioned, as containing their *eſſential oils*, it is to be obſerved that nature has enveloped the young eyes, or buds, with numerous coverings, thick ſpread with the ſame reſinous matter, the uſe of which is to defend them from the injuries of the air, and from the ſeverities in particular of the winter. Some of theſe are filled with a ſoft and fine cottony down which encloſes both the young leaves, and young flowers, as is the caſe in the horſe cheſnut; theſe are all externally covered with a number of thick and ſtrong ſcales, laid cloſely one over another, and cemented down, as it were, with this reſinous matter. Theſe make a covering which ſpirit of wine eaſily breaks open, by diſſolving the reſin, but which water cannot affect, and which, therefore, is impenetrable to rains. This reſin has its particular reſervoirs alſo in the bark of the tree into which it riſes with the ſap. The young buds, or eyes, in the black poplar are of the ſame kind; they have the ſame downy ſubſtance for their lodgment, and the ſame natural balſam, as it may well be called from its ſweet ſcent, for their defence. When the leaves of this tree grow larger, theſe ſcales fall off, and the leaves have then no more ſmell. The reſin, or balſam, mixing itſelf with the ſap which ſtill remains ſomewhat aromatic.

It is not only the ſtalks, the cups, and the ſcaly eyes of plants, which contain their *eſſential oils*; for even the aromatic roots are not without their ſhare of it. Rhubarb is no aromatic root, and yet the aſſiſtance of glaſſes will ſhew many lucid ſpecks in it, which are truly ſmall parcels of reſin; and the florentine iris, and calamus aromaticus, contain great numbers of ſuch lucid ſpecks, or parcels of pure reſin.

The ſtalk of angelica has a very aromatic ſmell, and the ſeeds have a very different one; the root alſo is very aromatic, its parenchyma being all filled with the veſicles which contain the balſamic eſſence. The plant of the elecampane has ſcarce any ſmell, while the root is very aromatic, almoſt all the veſicles of balſam being contained there. The ſeat of theſe reſinous, or oily particles, is uſually the whole parenchymatous ſubſtance of the root, eſpecially in thoſe roots which have no woody ſubſtance in the middle; ſuch as rhubarb, and the like; and thoſe which have woody matter in their middle, contain this aromatic ſubſtance in their bark; ſuch are the roots of fraxinella, and the like, of which we therefore uſe in medicine, only the outer bark.

Thus we have traced the ſeveral reſervoirs of the *eſſential oils* in plants, and, as for the manner of ſeparating them from the ſubjects, it has been delivered above. See *Eſſential* OIL.

OIL *dregs*. See the article DREGS.

OISEAU, in conchyliology, the name of a peculiar ſpecies of oiſter, of ſo remarkable a figure, that it repreſents a bird with its wings expanded, and has a ſmall protuberance at the hinge, repreſenting a head, and a long proceſs at the oppoſite end, which very well repreſents a tail. It is of a duſky reddiſh colour on the outſide, and of a fine pearly hue within. When the outſide of this ſhell is taken off, and it is nicely coloured, by cutting it down to a proper depth in every part, it is of a fine reddiſh yellow, and is the aurora ſhell of collectors.

OISTER, in zoology. See OYSTER.

OKE, an Egyptian weight, conſiſting of three rotolos, each of twelve ounces, at twelve drachms to the ounce, and ſixteen carrats to the drachm. *Pocock*'s Egypt, p. 178.

OKELA'S, in Ægypt, and ſome other of the Eaſtern countries, are a ſort of indifferent buildings round a court, and commonly appropriated to the merchants of ſome particular country with their goods; as at Cairo, there is one for the merchants of Nubia, and the black ſlaves, and other goods they bring with them; and another for white ſlaves from Georgia. *Pocock*'s Egypt, Vol. 1. p. 37.

OKER, in natural hiſtory. See OCHRE.

OLD (*Cycl.*) — OLD-*works*, in mining, are ſuch that are either fallen in, or ſtand unwrought. *Houghton*'s compleat Miner, in the Explanation of the Terms.

OLDENLANDIA, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: The cup is a perianthium divided into four pointed ſegments, which are inſerted on the germen of the piſtil, and remain when the flower is fallen. The flower is compoſed of four petals of an oval figure, ſpread wide open, and twice as long as the ſegments of the cup. The ſtamina are four ſimple filaments. The antheræ are ſmall. The germen of the piſtil is roundiſh, and placed below the receptacle of the flower. The ſtyle is ſimple, and of the length of the ſtamina. The ſtigma has a rim round it. The fruit is a

globoſe

globoſe ſkinny capſule, compoſed of two cells, each containing a number of ſmall ſeeds. *Linnæi* Gen. Plant. p. 49.

OLEA, *oils.* See the article OIL.

OLEA, the *olive tree*, in the Linnæan ſyſtem of botany, makes a ſeparate genus of plants, the character of which is, that they have a perianthium compoſed of one ſingle leaf, ſmall, and tubular; indented at the extremity into four diviſions, placed erect, and falling with the flower. The flower is compoſed of one ſingle petal, which is a cylindraceous tube, of the ſame length with the perianthium; its margin equal, but divided into four ſegments, each of them ſomething indented in the middle. The ſtamina are two filaments, ſhort, pointed, placed oppoſite to one another, and terminated by erect antheræ. The piſtil is compoſed of a roundiſh germen, with a ſingle ſtylus, which is very ſhort, and terminated by a thick ſtigma, which is biſid, and has fringed edges. The fruit is ſmooth, and ſomewhat oval, having but one cell, and containing for its ſeed, one longiſh, oval, ſcabrous, and ſtriated nut. *Linnæi* Gen. Plant. p. 2.

The characters of this genus, according to Mr. Tournefort, are theſe: the flower is of one leaf, and of the funnel-faſhioned kind, and uſually divided into four ſegments at the edges. The piſtil ariſes from the cup, and is fixed, in the manner of a nail, into the hinder part of the flower. This finally becomes a ſoft and juicy fruit, of an oval figure, containing an oblong ſtone, in which there is a kernel of the ſame ſhape.

The ſpecies of *olive* enumerated by Mr. Tournefort are theſe: 1. The large-fruited *olive*. 2. The *olive* with ſmaller oblong fruit. 3. The *olive* with oblong, blackiſh-green fruit. 4. The white fruited *olive*. 5. The *olive* with ſmall, roundiſh fruit. 6. The *olive* with larger, oblong, fruit. 7. The large-fruited *olive*, with a very thick pulp. 8. The great *olive*, with oblong, and angular, almond-ſhaped fruit. 9. The *olive* with oblong fruit, of the ſhape of the cornel-berry. 10. The great, round-fruited *olive*. 11. The green, middle-ſized, round-fruited, *olive*. 12. The early, middle-ſized, round fruited *olive*. 13. The cluſtered, ſmall-fruited, round *olive*. 14. The ſmall-fruited, blackiſh-red, round *olive*. 15. The ſmall, round *olive*, with fruit variegated with black and red. 16. The ſmall, Lucca *olive*, with ſweet-ſcented fruit. 17. The wild *olive* tree, with hard leaves, hairy underneath. 18. The Spaniſh wild *olive*, with hard leaves, hairy underneath, and with obtuſe, pointed fruit. *Tourn.* Inſt. p. 599.

OLEA is alſo the name of a ſtone deſcribed by Ludovicus Dulcis, and ſome other ſuch authors, who attribute great virtues to it, and ſay it was variegated with ſeveral colours, as yellow, black, white, green, &c. It ſeems to have been ſome one of the common agates, to which their ignorance had prompted them to give a new name

OLEA *Bohemica*, in botany, a name by which ſome authors have called the *zizypha* or *zizyphus*, the wild *jujube* tree. *I. Bauhin*, Vol. 1. p. 27.

OLEANDER, in botany. See NERION.

OLEARIA, in natural hiſtory, the name of a genus of round-mouthed ſea ſnail, or *cochlea lunaris*. It is of a very large ſize, capable of holding two quarts, and had its name *olearia* from its being antiently uſed in families, as the veſſel in which they kept *oil*.

OLEASTER, in the materia medica, the name of the *ſallow thorn*, or *ſea buckthorn*, the *rhamnoides ſalicis folio* of botanical authors. *Dale*, Pharm. p. 282.

OLEUM, *oil.* See the article OIL.

OLEUM *medicum*, in the writings of the antients, a name given to a famous *oil* which had a quality of burning under water, in ſpite of all that could be done to quench it. It was called *Medicum*, becauſe of its being produced among the Medes, and ſome have called it *oleum Medeæ*, becauſe it was ſuppoſed to be that ſubſtance with which Medæa anointed the crown of her rival. Ammianus Marcellinus tells us, that if an arrow was anointed with this *oil*, and ſhot out of a bow againſt any inflammable ſubſtance, the whole immediately took fire, and, if any one attempted to quench the flames by water, they only burnt the more fiercely for it. The *venenum Pharicum* of Nicander is ſuppoſed to be the ſame thing with this *oil*, and to have been ſo called from Pharai, a town, not the name of a man, whom ſome imagine the inventor of it. Pharai is a town in Crete mentioned by Stephanus, and we find by the antients, that this poiſon was ſometimes had from Crete. Nicander and Procopius are of the number of thoſe who mention the violent and terrible effects of the *oleum Medeæ*, and all that they ſay is equally applicable to the *oleum Medicum* of others; ſo that they ſeem the ſame liquor. Some tell us of a plant that produces this *oil*, but Pliny ſays that it was a liquid mineral bitumen, of the nature of naphtha, which is very probable; for ſome of theſe mineral *oils* are the moſt inflammable of any ſubſtances that we are acquainted with. Babylon is celebrated by many authors as the country which produced this terrible liquor, and all agree that Babylon is a place where naphtha is more common than in any other part of the world. Strabo tells us, that there is a white kind common there, as well as the foul or black ſort. This white one may probably be the ſame with the *oleum Medicum*, and *oleum Medeæ*; but then it is to be obſerved, that the virtues attributed to it are too far exaggerated, as is very common with the antients in their accounts of ſtrange things.

OLEUM *Medeæ*, a name given by the antients to the mineral fluid, more generally known by that of *naphtha*. See OLEUM *Medicum*, ſupr. and NAPHTHA.

OLEUM *vitri antimonii*, in medicine, a name given by Baſil Valentine, and others, to a famous preparation of antimony, which they keep as a ſecret, or, at leaſt, declare in ſuch terms as are unintelligible, and boaſt of, as the univerſal medicine. The learned Kerkring has given the proceſs for making this red *oil* of the glaſs of antimony, but that in ſo enigmatical a manner, that he ſeems himſelf not to expect any body to underſtand him; and only ſays, in his own juſtification, that he has given it in plainer terms than any body had done before him. The author relates many wonderful things of this diaphoretic *oil*, on his own experience; particularly, the curing a confirmed dropſy, by throwing off the water by ſweat; ſo that the patient, in a manner, ſwam in it, and the drops run through the bed, in all parts, to the floor. It were well if we could underſtand the proceſs. *Kerkring* on Baſil. Valent.

OLIGACTIS, in natural hiſtory, a name given by Linkius, and others, to a genus of ſtar fiſh, conſiſting of thoſe which have fewer than five rays.

OLIGAEDRA, in natural hiſtory, the name of a genus of cryſtals. See CRYSTAL.

The word is derived from the Greek ὀλιγὸς, a few, and ἕδρα, a plane, or ſide; and expreſſes a cryſtal which is compoſed of only a few planes.

The bodies of this claſs are cryſtals of the imperfect kind, being compoſed of columns affixed irregularly to ſome ſolid body at one end, and, at the other, terminated by a pyramid; but the column and pyramid being both pentangular, the whole conſiſts only of ten planes, not, as the common kind, of twelve. See Tab. of Foſſils, Claſs 3.

Of this genus there are only three known ſpecies. 1. A whitiſh one, with a ſhort pyramid, found principally in Germany, and ſometimes brought over to us, among parcels of common cryſtal. 2. A bright and colourleſs one, with a longer pyramid. This is found in Germany, and in ſome parts of England, as in the tin mines of Cornwal, and on Mendip hills. And, 3. A brown one, with a ſcabrous cruſt. This is produced only in the Eaſt Indies, and is well known by our lapidaries by its rough coat, and is eſteemed the fineſt of all brown cryſtals. *Hill's* Hiſt. of Foſſ. p. 184.

OLIGOTROPHEROS, among the Greeks, a name given to the finer ſort of bread made of the fineſt flower. They called it by this name becauſe of the little ſhare of nouriſhment it conveyed; and, by way of diſtinction from it, called the brown bread *polytropheros*, or much nouriſhing.

OLIVARIA *corpora*, a name given by ſome anatomical writers to two oblong pro eſſes of the medulla oblongata, thus called from their reſembling an olive in ſhape.

OLIVE, *olea*, in botany. See OLEA.

OLIVE-*oil.* See OIL *of olives.*

OLIVE-*gum.* See the article GUM.

OLOC, in natural hiſtory, a name given by the people of the Philippine iſlands, to their *quail*. It is like ours in all reſpects, but much ſmaller.

OLOCENTROS, in natural hiſtory, a name given by the old Greeks to a ſmall animal of the ſpider kind, whoſe bite was accounted mortal. It is the ſame with the *ſolipuga*, ſo called from its ſtinging, or biting moſt violently, in places, or ſeaſons, where the ſun had the moſt power, as Africa, &c. The name *ſolifuga* was a corrupt way of writing that word, and this ſeems alſo a falſe way of writing the word *heliocentros*, which ſignifies the ſame as *ſolipuga*. See HELIOCENTROS.

OVALIDIA, in botany, a name given by ſome authors to *chamæmile*. *Ger.* Emac. Ind. 2.

OLY, a word uſed by ſome chemical writers to expreſs the oily part of metals, ſeen, in ſome circumſtances, ſwiming upon the ſurface of their ſolutions.

OLYRA, a name given by many botanical writers to the *ſprat corn*, the *zea*, and *triticum amylæum*, or *ſtarch corn* of other authors. This is a ſort of grain cultivated in many parts of Germany. It comes to a ripeneſs toward the latter end of autumn, and is uſed for the common food of the poorer ſort of people. It is like the ſpelt wheat, but is ſomewhat leſs nutritive. Vid. *Dale*, Pharmac.

OMAGRA, a name given by ſome medical writers to the *gout*, when ſeated in the articulation of the humerus with the ſcapula.

OMBRIA. See the articles BRONTIA, and CERAUNIA.

OMBROMETER, a machine to meaſure the quantity of rain that falls. We have the deſcription and figure of one in Phil. Tranſ. N° 473. p. 12. It conſiſts of a tin funnel, whoſe ſurface is an inch ſquare, a flat board, and a glaſs tube ſet into the middle of it in a groove. The riſe of the water in the tube, whoſe capacity, at different times, muſt be meaſured, and marked, ſhews the quantity of rain that has fallen.

OMELYSIS, a word uſed by Hippocrates, and others of the antients, to expreſs the meal of barley, crude, or not parched. It is recommended, when reduced to the form of a pultice, by boiling in wine and oil, for curing all tumors of the tonſils. It is alſo recommended, mixt in water, to be drank in hæmorrhages of the uterus. Authors of later date have made the word *omelyſis* ſtand for all ſorts of meal, or flower, and ſome for an equal mixture of the meal of barley, linſeed, and fænugreek ſeed, in equal quantities; a medicine uſed for horſes. And Cœlius Aurelianus uſes it frequently for a cataplaſm made either of meal, or bread and water.

OMENTA, a word uſed by ſome anatomical writers to expreſs the membranes of the brain.

OMENTUM (*Cycl.*) — *Falling down of the* OMENTUM. On large wounds of the abdomen, the *omentum* will frequently protrude itſelf through the wound, either alone, or with ſome portion of the inteſtines. When this is the caſe, the firſt buſineſs is to enquire whether the protruded part preſerves its heat, moiſture, and natural colour: if it is not found faulty in any of theſe circumſtances, it muſt be gently returned, but when the ſtraitneſs of the wound forbids this, the protruded part muſt be taken off cloſe to the wound, and the wound healed according to the common form. The *omentum* in this caſe will adhere to the internal part of the wound, without bringing on any diſorder, or inconvenience to the patient. But where the inteſtines fall out at the ſame time, the *omentum* is to be fomented by an aſſiſtant with warm milk and water, till the inteſtines are returned.

If any part of the protruded *omentum* be cold, dry, livid, putrid, or corrupted, the mortified part muſt be entirely cut off before the reſt is returned, leſt the neighbouring parts ſhould be brought into conſent, which would inevitaby prove fatal to the patient. The corrupted part is to be taken off in this manner: paſs a waxed thread two or three times round the ſound part of the *omentum*, near the place where it is injured, and faſten it with a knot, to prevent any hæmorrhage from enſuing after the reduction of it; when you have made a ſecure ligature, take off the corrupted part with the knife, or ſciſſars, and return what is ſound, leaving, at leaſt, the length of a foot of the ligature hanging out of the wound of the abdomen, till it ſlips off from the ſound part of the *omentum*. The wound muſt be dreſſed in the common way, the depending part of it being kept open by a large tent: and, at every dreſſing, the ligature muſt be pulled a little gently forward, till it has, at length, entirely ſlipped off from the ſound part of the *omentum*. *Heiſter*'s Surg. p. 66.

OMER, in the Jewiſh antiquity. See CORUS.

OMNES, in the Italian muſic, a Latin term which we ſometimes find uſed for *tutti*, all, or altogether. See TUTTI.

OMOPLATO-HYOIDÆUS, a muſcle called alſo *coracohyoidæus*, and *ornohyoidæus*. It is a very long and ſlender muſcle, much narrower than the ſterno-hyoidæus, and ſituated obliquely on the ſide of the neck, or throat, between the ſcapula, and the os hyoides; it is a digraſtic muſcle, being divided into two fleſhy portions, joined endwiſe to a ſhort, middle tendon. It is commonly fixed in the lower extremity to the ſuperior coſta of the ſcapula, between the ſmall notch, and the angle, and ſometimes very near the angle, and, from thence, ſome anatomiſts have called it the *coſtohyoidæus*; from thence it paſſes over the coracoide apophyſis, adhering ſometimes to it by a kind of aponeuroſis, or membranous ligament; and, from this adheſion, the name *coracohyoidæus* was given it before its main inſertion was diſcovered. It is alſo very often fixed to the clavicula by ligamentary, or fleſhy fibres, and ſometimes inſerted in the whole middle portion of that bone, being inſeparably united with the ſterno-hyoidæus: having paſt the clavicle, it is bent forward, and runs between the ſterno-maſtoidæus, and internal jugular vein, the ſmall middle tendon being ſituated in this place; from thence it runs up to its inſertion in the inferior lateral part of the baſis of the os hyoides near the corner, and inſertion of the ſterno-hyoidæus, which it covers a little. *Winſlow*'s Anatomy, p. 255.

OMPHACITIS, a name given by naturaliſts to a ſmall ſort of gall of the oak.

OMPHACIUM. See OMPHACION, *Cycl.*

OMPHACOMELI, a ſort of *oxymel* made of the juice of unripe grapes, and honey.

OMPHALODES, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts of one leaf, and is rotated, and divided into ſegments at the edge. The piſtil ariſes from the cup, and is fixed, in the manner of a nail, into the middle of the flower, and afterwards changes into a fruit compoſed of four capſules, containing flattiſh ſeeds affixed to a placenta, which forms a quadrilateral pyramid.

The ſpecies of *omphalodes*, enumerated by Mr. Tournefort, are theſe: 1. The Portugal *omphalodes*, with leaves like thoſe of flax. 2. The taller, Portugal *omphalodes*, with hound's-tongue leaves. 3. The little, ſpring, comfrey-leaved *omphalodes*, called by ſome *borrage-comfrey*, and *creeping*, *dwarf comfrey*. *Tourn.* Inſt. p. 140.

OMPHALOMANTIA, a word uſed by ſome authors to expreſs a ſort of divination pretended to by the midwives and old women, of telling how many more children a woman is to have, by examining the number of knots on the umbilical cord.

OMPHALOTOMY, Ὀμφαλοτομια, the operation of cutting the navel-ſtring of new-born infants. See UMBILICAL, *Cycl.*

OMPHALUS, (*Cycl.*) in natural hiſtory, a term uſed by the antients to expreſs what they at other times called *umbunculus* in ſtones; that is, a ſmall round and prominent ſpot, in the center of the ſtone.

The *zmilampis*, which was a kind of oculus beli found in the Euphrates, had uſually a blue prominent pupil, and this was called *omphalus*, and *umbunculus*, indifferently, and ſo in other ſtones. The words have both the ſame origin, and are uſed to expreſs its being like the button, or prominent piece, in the middle of a ſhield, called by the Greeks *omphalos*, and by the Latins *umbo*. See the articles ZMILAMPIS, and UMBUNCULUS.

OMPHAX, in the natural hiſtory of the antients, the name they gave to a gem of the pellucid kind, and of a diſagreeable greeniſh colour, with a mixture of yellow. Pliny and ſome other old writers, make this a kind of the aqua marine, calling it the *beryllus oleaginus*; but the earlier writers very juſtly determined it not to be of the beryll kind, but properly a diſtinct ſpecies of gem; and, therefore, very properly called it by a peculiar generical name. *Hill*'s Theophraſtus, p. 80.

OMOPLATÆ *octavus*, in anatomy, a name given by Spigelius, and others, to a muſcle called by Winſlow *the upper portion of the rhomboidalis*, but by Albinus, the *rhomboides minor*. What Winſlow calls the lower portion of the rhomboidalis, he calls the rhomboidæus major.

ONAGER, in natural hiſtory, the name given by authors to the *wild aſs*, a creature common in Syria, and ſome other places, and differing very little more from the common aſs, than as creatures in their native wildneſs do from thoſe of the ſame ſpecies kept in ſtables, and brought up to be domeſtic animals. The ſkin of this creature is very robuſt, and durable, and makes the common chagrin leather uſed by our caſe-makers, &c. its ſurface being rough with ſmall tubercles. *Ray*'s Synop Quad. p. 63.

ONAGRA, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the roſaceous kind, conſiſting of four leaves, diſpoſed into a circular form, and ſtanding on a cup; from the upper part alſo of this cup, which is hollow, there ariſes a piſtil which finally becomes a cylindric fruit, which, when ripe, ſplits open in four places, and is compoſed of four cells, each containing a number of angular ſeeds, which are affixed to a placenta.

The ſpecies of *onagra*, enumerated by Mr. Tournefort, are theſe: 1. The broad-leaved, yellow-flowered, American *onagra*, called by authors the *yellow*, *podded willow-herb*. 2. The broad-leaved, American *onagra*, with paler, yellow flowers. 3. The large-flowered, broad-leaved, American *onagra*. 4. The ſmall, narrow-leaved, Canada *onagra*. 5. The red-ſtalked, ſmall-flowered, narrow-leaved *onagra*. 6. The betony-leaved, American *onagra*, with rough fruit. 7. The American *onagra*, with large leaves, like thoſe of arſmart, and with ſmall yellow flowers. 8. The American *onagra*, with narrower, arſmart leaves, and large yellow flowers. 9. The ſhrubby, American *onagra*, with large yellow flowers, and leaves like the oleander. *Tourn.* Inſt. p. 302.

ONAGRIUS *lapis*, a name by which ſome call the *aſinius lapis*. See ASINIUS *lapis*.

ONCOS, Ογκος, in antiquity, was uſed to ſignify an ornament for the head, peculiar to thoſe who offered ſacrifice. Mem. Acad. Inſcrip. Vol. 3. p. 134.

ONDEGGIARE, in the Italian muſic, ſignifies to return the hand beating time, not directly, but by degrees; as *ondeggiare la mano*, to keep it wavering in the air, or giving it two motions, before it is quite lifted up to end the bar, and thence to fall it to beat a firſt, ſecond, or third time, of that, or another meaſure.

ONEIROGMOS, a word uſed by the antients to expreſs *venereal dreams*.

ONEIROPOLI, Ονειροπολοι, in antiquity, perſons whoſe buſineſs it was to make predictions from *dreams*. *Potter*, Archæol. T. 1. p. 304.

ONEIROSCOPI, Ονειροσκοποι, in antiquity. See ONEIROPOLI.

ONION, *ceſa*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the liliaceous kind, and compoſed of ſix leaves; in the center of it there ſtands a piſtil which finally becomes a roundiſh fruit, divided into three cells, and containing roundiſh ſeeds. To this it is to be added, that the flowers are placed in ſpherical heads, and that the leaves, as well as ſtalks are tubular.

The ſpecies of *onion* enumerated by Mr. Tournefort, are theſe: 1. The common, red-flowered *onion*, with red coats to the root. 2. The common, white-flowered *onion*, with white coats to the roots. 3. The *onion* with a turbinated root. 4. The oblong-rooted *onion*. 5. The ſcallion *onion*. 6. The fiſſile *onion*, or *cibule*. 7. The great African ſweet-rooted *onion*. 8. The perennial, ruſh leaved, ſectile *onion*. 9. The fine-leaved, Alpine, marſh *onion*. 10. The ſmalleſt, Portugal *onion*, with capillaceous leaves, and purple flowers. 11. The

11. The fine-leav'd, bicomated *onion*, with duſky colour'd flowers. 12. The little ruſh-leav'd, purple flowered *onion* 13. The purple-flower'd, globular-headed, fine-leaved *onion*. *Tourn.* Inſt. p. 382.

Onions are much eaten, and it would be well if they were yet more ſo; they attenuate tough humours, cleanſe the ſtomach, and excite appetite, and in ſome degree promote the menſes. But they are apt to breed flatulencies, and, if eaten too largely, to affect the head and diſturb the ſleep afterwards. An *onion* boiled to a perfect ſoftneſs, is recommended by many as a cataplaſm for ripening peſtilential buboes. A freſh cut *onion* rubbed on the part till it become red, and itch, is ſaid to be a cure for baldneſs. A mixture of equal parts of juice of onions and ſpirit of wine, is eſteemed a cure for deafneſs, a few drops being put at times into the ears: An *onion* cut in two, and macerated an hour in the ſame ſpirit, is a good application for the head-ach. A cataplaſm of roaſted *onions* and butter is an excellent application for the piles.

The three ſorts of *onions* propagated for the ſake of their roots for winter uſe, are the Straſburg onion, the red Spaniſh *onion*, and the white. Theſe are to be propagated by ſowing their ſeeds in the latter end of February, in a dry, and ſomewhat ſandy ſoil, yet rich: in about a month's time the plants will appear, and, in a fortnight after that, they will be forward enough for hoeing, which muſt be done with a very ſmall hoe, cutting up all the weeds, and leaving the *onions* two inches aſunder; this ſhould be done in a dry ſeaſon, and the ground will then be clear of weeds for a month. At the end of this time, they muſt be hoed again, and cut to three inches apart; and a month after this, to four inches, at which diſtance they will thrive well, and grow very large. Toward the latter end of July, the *onions* will have arrived at their full growth, which is known by their leaves hanging down, and ſhriveling; and they muſt at this time be pulled up, and ſpread on a dry place, and turned every day, to prevent their ſtriking freſh roots; in a fortnight's time they will be dry enough to houſe, and ſhould be wiped clean, and ſpread thin in an upper loft, or garret.

The differences between theſe ſpecies are not eſſential, they often degenerating into one another; and even the large Portugal *onion*, after a few years, with us, will loſe itſelf ſo far that no one would imagine it came of that race. *Miller*'s Gardener's Dict.

Welch ONIONS, a ſort of *onions* propagated by gardeners, for the uſe of the table in ſpring; they never make any bulb, and are therefore only to be eaten green in ſallads. They are propagated by ſowing their ſeeds toward the end of July in beds of a dry, but rich ſoil; and in three weeks after ſowing, they will appear above ground: they muſt be kept carefully cleared from weeds. About October all their leaves die away, which has occaſioned ſome to think the whole plantation loſt, and to dig up the ground for ſome other uſe; but if they are ſuffered to ſtand, they will ſhoot up again very ſtrong in January, and from that time will grow very vigorouſly, and reſiſt all weathers, and will be fit to draw for young *onions* in March, and are extremely green and fine, and more valued at market at that ſeaſon than any other kind; but they are much ſtronger than any other *onions*, and have very much of the taſte of garlick. Id. ibid.

ONION-*ſhell*, in natural hiſtory, a name given by authors to a peculiar kind of *oyſter*, which is of a roundiſh figure, and very thin, and tranſparent, and repreſents very exactly a piece of the peel of an *onion*. See OSTREA.

ONISCUS, in ichthyology, a name given by Athæneus, and others of the Greek writers, to the *accipenſer*, or *ſturgeon*. See ACCIPENSER.

ONISCUS is alſo the officinal name of the *whiting*. *Dale*, Pharm. p. 372.

ONISCUS, in zoology, is alſo a name uſed by ſome to expreſs the common *millepedes*, called in Engliſh *wood lice*, and *ſows*. *Aldrov.* de Inſ. p. 632.

ONOBRYCHIS, *cock's-head*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the papilionaceous kind, and its piſtil finally becomes a ſhort pod, of a creſted form, and in ſome ſpecies echinated; this contains a kidney ſhaped ſeed. To this it is to be added, that the flowers grow in a denſe ſpike.

The ſpecies of *onobrychis* enumerated by Mr. Tournefort, are theſe: 1. The great, vetch-leaved *onobrychis*, with bright red flowers, and an echinated fruit. 2. The great, vetch-leaved *onobrychis*, with pale red flowers, and echinated fruit. 3. The great, vetch-leaved *onobrychis*, with echinated fruit, and with white flowers. 4. The ſtone *onobrychis*, with long, and narrow, vetch-like leaves. 5. The leſſer *onobrychis*, with echinated fruit. 6. The leſſer *onobrychis*, with a very large, and remarkably echinated fruit. *Tourn.* Inſt.

ONOCENTAURUS, a fabulous animal, ſuppoſed to be a compound of a man and an aſs. Ælian[a] ſpeaks of *onocentaurs*. It was half man, and half aſs, as the centaur was half man, and half horſe[b]. — [[a] Lib. 7. cap. 9. [b] *Calmet*, Dict. Bibl.]

ONOCROTALUS, in zoology, the name of a very remarkable bird, commonly known among us by the name of the *Pelican*. It is of the ſize of a gooſe, or larger; and is of a greyiſh white all over, except that the neck looks a little yellowiſh, and the middles of the back feathers are blackiſh. The bill is remarkably long, and hooked at the end, and has under it a lax membrane extended alſo to the throat, and makes a bag or ſack capable of holding a very large quantity. Its feet are web'd, as in the duck, and gooſe, all the toes being joined by the membrane. There is one very ſingular thing in this bird, which is, that its bones are ſolid, containing no marrow, and are all pellucid. *Ray*'s Ornithol. p. 246.

ONOS, in ichthyography, a name given by ſome authors to the *æglefinus*, or common *haddock*. *Willughby*'s Hiſt. Piſc. p. 170. See the article ÆGLEFINUS.

ONOS is uſed by Athæneus, and many other of the Greek writers, to the fiſh which we call the *hake*, the *aſellus minor* of authors; called by Bellonius, Geſner, and ſome others, the *merlucius*.

ONYX, *(Cycl.)* in natural hiſtory, the name of a genus of the ſemipellucid gems; the characters of which are, that they have variouſly coloured zones, but none of red, theſe making them ſardonyxes; and that they are formed of chryſtal debaſed, but by a very ſmall admixture of earth, and compoſed either of a number of flat plates, or of a ſeries of coats made by incruſtation round a central nucleus; the different coloured ones being covered with a coat of the baſis or common matter of the ſtone, and ſeparated from one another by, and alternately variegated with, thin veins of that matter, in form of other zones.

As there have been many diſputes about what were properly the gems of the antients, the *onyx* has not been leſs perplexed than the reſt. The characters here aſſigned them will diſtinguiſh them, however, from all other ſtones; and will not let the careful obſerver eaſily be deceived, when he ſees a ſtone in its rough and native ſtate; but they will not ſo well ſerve the leſs nice enquirer from being impoſed upon in purchaſing *onyxes* when cut and wrought. Our lapidaries ſeem to have had a deſign of baniſhing the diſtinctions of the agate and *onyx* out of the world; for as the zones are the moſt obvious character of the *onyx*, they have found an eaſy way to make pieces cut properly out of maſſes of agates reſemble them. Agates, though never plated or formed of regular zones, are frequently veined in ſtrait narrow lines, and a piece of one of theſe agates cut perpendicularly to the ſite of theſe veins, gives the very figure of the zones of an *onyx*. The white Gambay agate is what they uſually chooſe for this purpoſe; ſuch pieces of this ſtone as have the black dendritæ in them, when properly cut out from the reſt of the maſs, are their Mocoa ſtones; but other parts of the ſame ſtone, which have not theſe delineations, but have ſtrait cloſe veins are cut out in a proper direction, and ſold for *onyxes*. Theſe may always, however, be diſtinguiſhed by their wanting the proper degree, purity, and tranſparence; and by this, that the common pale auricular *onyxes*, which are the kind theſe moſt reſemble, have always a peculiar blueiſh caſt, which is not found in theſe counterfeits.

We have four ſpecies of the *onyx* now in uſe among our lapidaries. The firſt is a blueiſh white one, with broad white zones. This was the true *onyx* of the antients, and is compoſed of a blueiſh white *onyx*, variegated with white and brown zones. It is ſometimes found compoſed of flat and even plates of theſe, laid cloſely on one another, and ſometimes is in form of a pebble, compoſed of a central nucleus of pure chryſtal, or nearly pure, ſurrounded with thoſe cruſts which form the zones. It is very common in the Eaſt-Indies, and is found alſo in New Spain, and ſometimes in Germany and Italy, tho' of much ſmaller value, and leſs brightneſs, hardneſs, and tranſparence.

The ſecond is a very pure *onyx*, with ſnow white veins, which is exceeding bright and tranſparent, and tho' compoſed only of two colours, is inferior to very few of the *onyxes* in beauty. It is always found in the form of a roundiſh pebble, uſually about the ſize of an egg, and compoſed of ſeveral coats of a blueiſh white, and a fine and pure white, laid evenly round a central neuleus of pure, but ſhattery chryſtal; the whole is very bright, and the blueiſh part very little leſs tranſparent than pure chryſtal; the nucleus is generally of an angular form, and the coats or zones being all exactly of the ſame ſhape, make a very beautiful appearance. It is found only in the Eaſt-Indies, and is very much eſteemed in Italy, but with us is not ſo much regarded as it deſerves.

The third ſpecies is the *jaſponix*, which, ſee under its proper head.

The fourth is the brown *onyx*, with blueiſh white zones. This is a very clear and pure ſtone, but is ſo much leſs beautiful than the other kinds, that tho' very common in the Eaſt Indies, it is very ſeldom ſeen or regarded among us. *Hill*'s Hiſt. of Foſ. p. 490.

ONYX, in conchyliology, the name given by the curious to a ſpecies of voluta, found in cabinets, but never met with in that ſtate on the ſea-ſhores. The true account of this is, that the ſhell in this elegant form owes its appearance to art, having been poliſhed, and having had its outer coat taken off. With this outer coat which is of a duſky yellow, it is often kept in the ſame cabinet under another name, being then

then called by the French, the cierge, or wax-ſhell. See VOLUTA.

ONYX, in zoology, a name by which Pliny, and many other of the antient writers, have called the *ſolen*. See SOLEN.

ONYX *indicus*, in the materia medica of the antients, a term uſed by the Greek writers to expreſs what is uſually called *unguis odoratus*, or the ſweet hoof. Some call it *onychus indicus*, as particularly Myrepſus in his antidote of fifty ſpecies. The ſame author mentions the *blatta bizantia*, and tells us that it is not the ſame thing with the *onyx indicus*, but that the Italians called by this name the *os naſi* or bone of the noſe of the purple fiſh. What he means by this is probably the bony tongue of that animal, nature having given it ſuch a weapon to pierce the ſhells of thoſe fiſh on which it is to feed. We frequently find the chamæ, and other ſhell-fiſh, with holes bored through the upper ſhell as exact as if it were done with an inſtrument: this has been done by the purple fiſh, to get at the fleſh of the animal within for food; and the bony tongue with which this fiſh performs this, is called by the Italians of thoſe times *blatta Byzantia*. Actuarius tranſlates the blatta Byzantia of all the earlier writers by the phraſe *os naſi purpuræ*; and the interpreters of the Arabian writers give the ſame name to what they call *unguis odoratus*, or *onyx indicus*, for the Arabian name exactly expreſſes this.

The word *blatta* among the earlieſt Latin writers, means a bubble of mud. Paulus Ægineta quotes Feſtus for many inſtances of the word being uſed originally in this ſenſe: after this, it became uſed for the grumes, or clots, into which the red part of the blood concretes, after it is out of the veſſels; and, after this, it became a name for the ſanies, or foul matter, concreting in lumps, when the purpura, or purple-fiſh, was expoſed to the air. The purple colour was finally called by the ſame name, and from this, any thing dyed purple was ſaid to be dyed with blatta. The blattæ of the Turkiſh dominions were the purple fiſh of that part of the world: theſe were more excellent than thoſe of any other known part, and were therefore moſt employed. The word blatta Byzantia ſignifies no more than purpura Byzantina, and when the purple colour had been taken out, the tongues, or other parts of the ſhells of theſe fiſh, were uſed in medicine, under the ſame name of blatta Byzantia. Thus Myrepſus is found to be in the right. The *onyx indicus* of the Greeks was, however, very different. This, though it was alſo a ſhell, or part of a ſhell, was collected not at Conſtantinople, but in the lakes of the Eaſt-Indies. Dioſcorides plainly makes it different from the purpura, by comparing the ſhell to that; he ſays, it is part of a ſhell-fiſh, in many reſpects reſembling the purpura. Some have ſuppoſed that Dioſcorides underſtood the whole ſhell of the fiſh by the word *pama*, which he has uſed on this occaſion; but this is not the caſe, for the Greeks had many other words to expreſs a ſhell by, and no other author countenances the uſe of *pama* in that ſenſe. Beſides, Dioſcorides ſays afterwards, that the whole ſhell of the fiſh which produced the *onyx* being burnt, had the ſame virtues with the ſhell of the purpura, and other the like fiſh. The Arabians ſeeing by this, that Dioſcorides did not mean the whole ſhell by this word, have expreſſed his meaning by a phraſe which ſignifies not a whole ſhell, but a fragment, or part of one. The word *pama* properly ſignifies operculum, and, as all the ſhell-fiſh of the buccinum kind, to which this purpura belongs, have opercula, or thin ſhells, to cover the orifice when the fiſh is retracted in, it is plain enough that the antients meant this by the word *pama*; and this they might very well call *onyx*, or *unguis*, from its being thin, and flat, and not unaptly reſembling in ſize and ſhape, the human nail. This operculum, when taken from the purpura, as it ſeems to have been among the Romans, who had that fiſh from Conſtantinople, was properly called blatta Byzantia, being the only part of the fiſh uſed in medicine; but whether this, or the bony tongue, were ſo called, it is certain that this is no proper name for the true *onyx indicus* of the Greeks, which was not any part of the blatta, or purple fiſh; but, as Dioſcorides expreſly ſays, of another ſpecies of ſhell-fiſh, ſomewhat like it.

OOSCOPIA, Ωοσκοπια, in antiquity, a ſpecies of divination, wherein predictions were made from eggs. *Potter*, Archæol. Græc. l. 2. c. 14. T. 1. p. 319.

OOST, in huſbandry, a name given by the people who manure hops, for the kiln in which they dry them after they are picked from the ſtalks. This is a ſquare room, built up of brick, or ſtone, ten foot wide, more or leſs, and having a door on one ſide. In the midſt of this room is a fire-place, about thirteen inches wide, and as much high; and, in length, reaching from the mouth ſo nearly to the back part of the kiln, that a man has juſt room to go round it. This fire-place is called a *herſe*, and the fire is let out into the room by ſeveral holes in the ſides, in the ſame manner as in malt-kilns. Five feet above this, is laid the floor on which the hops are to be laid to dry, and this muſt have a wall round it of four feet high, to keep the hops from falling out. At one ſide of the upper bed muſt be made a window by which to puſh out the hops as they are dried into a room prepared for them. The beds muſt be made of laths an inch ſquare, placed at a quarter of an inch diſtance from one another, and ſupported by beams underneath. The hops are to be poured on this bed with a baſket, till the whole is covered half a yard thick with them; when this is done, lay them even with a rake, and let a fire be made in the fire-place below. Some recommend a wood-fire, but experience ſhews that nothing does ſo well as charcoal; let the fire be kept at the mouth of the furnace, for the air will be carried all the way through; and thus let the hops lie, never ſtirring them till they are thoroughly dry; when they rattle under the rake, and the inner ſtalks are brittle, they are ſufficiently dried, and are to be puſhed out, and a freſh parcel laid in the *ooſt* in their place.

Some people dry their hops in a common malt-kiln, ſpreading them on a hair-cloth about ſix inches thick, and now and then turning them till they are all thoroughly dried, then laying them in a heap, till they are to be put in the bags. But both theſe ways are liable to ſome inconveniencies; the *ooſt* generally over-drys the under ones, by the time that the per ones are dry enough; and the hair-cloth, and the turning in the other way breaks and ſhatters them, and ſpills many of the ſeeds. See TIN-*floor*.

OPAL (*Cycl.*) — The *opal* is a gem of a very peculiar kind, and has been eſteemed by many, in all ages, of very great value; though, at preſent, it is of leſs price, in proportion to its ſize, than any other of the finer gems. The Romans eſteemed it the fourth gem in value; and its ſingularity, as well as beauty, ſeem very well to entitle it to at leaſt that rank; it is ſofter than any other of the gems, and is with difficulty poliſhed to any degree of nicety. Its moſt frequent ſize is between that of a pea, and a horſe-bean, but it is found as ſmall as the head of a large pin, and up to the ſize of a wallnut. Its figure is very various, and uncertain, but it is never found in a columnar, or cryſtalliform ſtate. Its moſt uſual figure is an irregularly oblong, flatted at the bottom, and convex at the top, and dented with various ſinuoſities on the ſides. There have been found ſome of the regular ſhape of a kidney, and others almoſt perfectly round, and, not unfrequently, it is met with in thin flat pieces. It is often found looſe among the earth of mountains, ſometimes on the ſhores of rivers, and not unfrequently bedded in the coarſer kinds of jaſper, ten or twenty *opals*, of different ſizes and colours, being frequently found in one ſtone.

It is naturally of a ſmooth ſurface, and fine gloſs, and many of the fineſt *opals* that have been ſeen, have been worn with their native poliſh. Its colour, as it appears in a fine ſpecimen, is of ſo mixt a nature as not to be eaſily deſcribed, but is beſt expreſſed by comparing it to the fineſt ſort of mother of pearl. It differs, however, greatly from that in its ſuperior luſtre and brightneſs, and in being ſo pellucid that one may ſee deep into the ſtone. As it is variouſly turned about, it ſhews the colours of all the other gems, yellow, red, blue, green, purple, and a milky grey. The laſt of theſe colours is the native dye of the ſtone, and it has many of the others in a ſuperior beauty even to the gems to which they naturally belong, particularly the fire-colour of the carbuncle, which ſeems in the *opal* to lie deep in the body of the ſtone. It is the moſt difficult to counterfeit of all the gems; and this is done by a very fine, and well choſen piece of ſome pearly ſhell. It is ſometimes found wanting one or more of the colours, and ſometimes of a deep blueiſh black, with no other colour viſible on changing the light, but a deep red, which is very ſtrong and glowing, and makes it a very beautiful ſtone; ſometimes it has alſo a general yellowiſh caſt, and ſometimes a greyiſh one, which greatly impair the reflexions of the other colours, and injure the ſtone.

It is found in Ægypt, and Arabia, and in ſoms parts of the Eaſt-Indies, and in Europe. The oriental ones are the fineſt, but thoſe of Bohemia are often very beautiful. *Hill*'s Hiſt of Foſſ. p. 600.

Counterfeit OPAL. To imitate this gem in natural cryſtal, uſe the following method: take yellow orpiment, and white arſenic, of each two ounces, crude antimony, and ſal armoniac, of each one ounce; powder all theſe, and mix them well together; put this powder into a large crucible, and lay upon it ſmall fragments of cryſtal, and, upon theſe, other larger pieces of cryſtal; fill up the crucible with theſe, and lute on to it another crucible inverted, with a hole at the bottom as big as a ſmall pea; when the lute is dry, ſet the veſſels in a quantity of charcoal in a large chimney, covering them up with coals to the middle of the upper crucible; ſo long as the materials fume out at the hole, keep up a ſtrong fire; when that is over, let the fire go out of itſelf; and then unlute the crucibles; the greateſt part of the cryſtal will be found tinged to the colours of various gems; not only the *opal*, which will be very fair, and beautiful, but the topaz, and ruby colour will be ſeen in others. *Neri*'s Art of Glaſs, p. 119.

OPEN (*Cycl.*) — *Self*-OPENS. See SELF-*opens*.

OPERATION (*Cycl.*) — *Hermit*-OPERATION. See the article STONE.

OPHICARDELON, in natural hiſtory, the name of a gem mentioned by Pliny, which, he ſays, was a black ſtone covered at top and bottom with white: this ſeems, without all doubt, to have been the *camea* of our jewellers.

OPHIDION, in ichthyology, the name of a fiſh of the eel kind, and reſembling the common eel, and conger, in ſhape, but that it is ſhorter in proportion to its thickneſs, and more flatted, and of a paler colour. It ſeldom exceeds eight inches in length, and the back is grey, and the ſides of a bright ſilver colour. It is cloathed with ſmall ſcales, which are long and narrow, and are not placed like tiles hanging over one another, as in other fiſhes, but only ſcattered here and there, and laid in no order. The mouth is large, and the jaws are furniſhed with very ſmall teeth, and, beſide theſe, with three ſmall eminences ſet with the like teeth; the one on the roof of the palate, the others lower on each ſide. The eyes are large, and it has one pair of fins near the gills. It is a very delicate fiſh, and is caught in great plenty in the Mediterranean, and ſold at Venice, and other places. *Willughby*'s Hiſt. Piſc. p. 112. *Aldrov.* l. 3. c. 26. *Geſner*, p. 104.

The name *ophidion* is given by Artedi to a genus of fiſhes, the characters of which are theſe: they are of the malacopterygious, or ſoft-finned kind; the body is oblong, and of a cylindric figure, and has three fins. The ſpecies of this genus are properly only two, diſtinguiſhed by the cirri, or beards. The firſt is the *ophidion* with four cirri growing from the lower jaw: this is the *ophidion* of authors. The ſecond is the *ophidion* without cirri: this is found in the Baltic. *Artedi*, Gen. Piſc. 20.

OPHIOBORUS, in natural hiſtory, a name given by the antients to a ſpecies of carnivorous fly, which feeds on the bodies of beetles, or other flies, or on the fleſh of dead ſerpents. Its wings are of the colour of poliſhed braſs, whence it was alſo called by the Greeks *chalcomuca*, the *braſs fly*.

OPHIOGLOSSUM, *adder's tongue*, in botany, a genus of plants, no part of the fructification of which is viſible, except the fruit. This is an oblong, double, or diſtichous capſule, divided by a great number of tranſverſe articulations, into many cells, each of which, when mature, opens tranſverſely, and is found to contain a great number of ſmall ſeeds of a ſubovate figure.

Caſpar Bauhine deſcribes what he calls three ſpecies of this plant. 1. The common *ophioglo ſſum*, with a ſingle leaf, of an ovated figure, having no viſible nerves, or veins in it, very thick and fleſhy, and of a beautiful bright green. This ſpecies is a native of England, and common in deep paſtures. 2. The angular-leaved *ophioglo ſſum*. And, 3. The roundiſh-leaved *ophioglo ſſum*. Mentzal deſcribes three ſpecies alſo beſide the common one; but all theſe are only varieties of the common *ophioglo ſſum*, the capſule or ſpike of which is often bifid, and the leaves vary greatly in length and breadth.

All Europe, ſo far as yet known, affords only one ſpecies of *ophioglo ſſum*; but, in America, are found two diſtinct ſpecies, beſide the common European ſort. 1. The reticulated, heart-ſhaped-leaved, *ophioglo ſſum*. And, 2. The palmated *ophioglo ſſum*.

Tournefort makes eight ſpecies of *ophioglo ſſum*, which are only the varieties of the common European kind, mentioned above. Vid. *Hill*'s Hiſt. Plant. p. 134, ſeq.

This is a ſpring plant, and is only to be found in April, and May. It is not uncommon in wet meadows, and is eaſily diſtinguiſhed among the other ſpring plants by its ſpike, or tongue.

It is eſteemed one of the beſt vulnerary herbs this nation produces; but it is more in uſe among the common people than in the ſhops. They gives its juice internally, and uſe the herb bruiſed, or an ointment prepared from it, with lard, or May butter externally at the ſame time. *Dale*'s Pharmac.

OPHIOMANCY, Ὀφιομαντεία, in antiquity, the art of making predictions from ſerpents. Thus Calchas, on ſeeing a ſerpent devour eight ſparrows with their dam, foretold the duration of the ſiege of Troy. And the ſeven quoils of a ſerpent that was ſeen on Anchiſes's tomb, were interpeted to mean the ſeven years that Æneas wandered from place to place before he arrived in Latium. Thus, Virgil. Æn. l. 5. v. 85.

Septem enim gyros, ſeptena volumina traxit.

The word is Greek, compounded of ὄφις, a ſerpent, and μαντεία, divination. *Hofm.* Lex. in voc.

OPHIOMORPHITES, in natural hiſtory, the name given by ſome authors to the foſſils called more uſually *cornua ammonis*; which are compoſed of ſeveral wreaths, rolled in a ſpiral form over one another, and reſemble a ſnake when rolled up. Theſe are found of prodigious ſizes, ſome not leſs than the fore-wheel of a chariot. They are evidently formed from ſome ſea-ſhell, the ſhelly matter remaining on ſome of them, and all being compoſed of ſeveral cells, communicating with one another by means of a ſiphunculus, in the manner of thoſe of the nautilus. See CORNU *ammonis*.

OPHIOPHAGI, in natural hiſtory, a name given by ſome to the *eagle vulture*, and ſome other birds of prey which are ſometimes ſeen to feed on ſerpents.

Pliny gives the name *ophiophagi* to a certain people of Æthiopia, whom he deſcribes as very barbarous and ſavage, going always naked, and feeding on ſerpents, whence the appellation. Solinus, who generally copies Pliny, but imperfectly, has perverted his meaning ſtrangely in this paſſage, having placed the *ophiophagi* in Arabia Felix, inſtead of Æthiopia.

OPHITES, the *ſerpentine marble*, in the natural hiſtory of the antients, a name given to ſuch of the marbles as had their variegations not in form of veins, but of ſmall ſpots uſually of an oblong figure, and thence imitating in ſome degree, ſpots on the back of a ſerpent.

The antients knew three ſpecies of this kind, which they called the black, the white, and the grey *ophites*, and this laſt alſo frequently *tephria*; and allowing theſe ſpotted variegations to be the characters of an *ophites*, we have, beſide theſe, two others known at this time.

As to the *ophitæ* of the antients, the uncertain accounts they have given us of them have been the occaſion of many unlucky miſtakes, about what they meant by the names. Some have imagined that they meant a black, others a white marble. A more accurate ſurvey of their works together, will ſhew, however, that they, in reality, were very diſtinct in their meaning, though they ſeem obſcure, becauſe ſhort; but they ever diſtinguiſhed between their three *ophitæ*; and it is plain from them, that the black and white *ophitæ*, as they call them, were both marbles whoſe ground was green, and only were diſtinguiſhed by their variegations, and their different degrees of hardneſs; and what they mean by the black and white, was only the black ſpotted, and the white ſpotted *ophites*. *Hill*'s Hiſt. of Foſſ. p. 483.

Black OPHITES is a very beautiful, and conſiderably hard marble, of a very fine green, aad elegantly variegated with ſmall black ſpots and irregular lines, and ſometimes with an admixture alſo of white ones. Theſe are frequently ſeen together in the ſame block, and make a ſort of white ſpotted, and black ſpotted kinds; but the diſtinctions of the antients were not founded only on theſe, but on the eſſential character, the hardneſs of the ſtone, the white kind being greatly ſofter, as we find by all their accounts.

The antients found this ſpecies in Ægypt, and knew of it in no other place. We have it now in many parts of the world: the deſarts of Arabia abound with it; it is common in the iſlands of the Archipelago; and has often been found in Wales. *Hill*'s Hiſt. of Foſſ. p. 484.

White OPHITES is alſo a very beautifully variegated maſs, of a fine and even texture, moderately heavy, and, when pure, is of a very elegant pale green, not unlike that of the malachites, and elegantly variegated with ſpots, clouds, and lines, of a fine deep black, an extremely pale green, and often with very large variegations of pure white. It is very ſoft, and eaſily ſcratched, even with a pin, but is capable of a good poliſh, and looks very beautiful and bright, when wrought.

The antients had it in great repute; it cut eaſily, and without much trouble, was made into elegant veſſels for their tables; and in Germany, it is ſtill in common uſe on the ſame occaſions, and is by ſome recommended as a medicine againſt venemous bites. The antient writers have well diſtinguiſhed this from the black kind, not by its whiter ſpots, which were common to both, though more frequent and numerous in this, but by its ſoftneſs. They had it only from Ægypt, but we find it in France, Italy, Germany, and ſome other places.

Grey OPHITES, called alſo *tephria*, was not, like the other ſpecies, diſtinguiſhed by its ſpots, but by its ground colour, which is a very lively and beautiful aſh-colour, or pale grey. It is a very fine, even, and ſmooth marble, and is variegated with a multitude of black ſpots of irregular figures; but, in general, all much of the ſame ſize, and that not exceeding the ſixth part of an inch in length: it is conſiderably hard, and takes an elegant poliſh. The antients had this with their baſaltes from Æthiopia. Ægypt alſo afforded it, and does ſo to this day: in Germany alſo we find it in large quantities. It has been celebrated from the earlieſt times for its virtues againſt venomous bites, and is in many parts of the world worn as an amulet, to this day.

The other two *ophitæ*, which ſeem not to have been known to the antients, are 1. A greyiſh brown one, with green ſpots. The ground of this is of a duſky aſh-coloured brown, and the ſpots are of a lively and beautiful green, uſually ſmall, and of an oblong figure; and the whole is very hard, of an even ſtructure, and capable of a fine poliſh. It is frequent in Ægypt, and Arabia, and is ſaid to have been dug in England. The 2. is a pale grey one, with green ſpots and veins. This is a ſmooth and fine marble; its ground is a beautiful pale grey, in ſome places ſlightly tinged with red, and in others approaching to white. Its ground has all theſe varieties in colour, ſometimes in the ſame, ſometimes in different blacks, and it is variegated with a very beautiful pale green, diſpoſed with not much leſs variety, for it is ſometimes in ſmall ſpots, ſometimes in thin uneven veins, and ſometimes in thicker. It is very hard, and capable of an elegant poliſh. It is frequent in Germany, and tables are made of the larger pieces, and vaſes of the ſmaller ones. It is ſaid alſo to be found in England. *Hill*'s Hiſt. of Foſſ. p. 486, ſeq.

OPHRIS, or OPHRYS, in botany, the name of a genus of plants, called in Engliſh *twyblade*, the characters of which are theſe: the flower, which has no perianthium, conſiſts of five oblong petals. The nectarium is dependent, longer than the petals, biſid, and marked with a deticulation on each ſide of its baſe. The ſtamina are two very ſhort filaments. The antheræ are erect, and covered by the inner margin of the nectarium. The germen of the piſtil is oblong and contorted. The ſtyle adheres to the inner ſide of the nectarium. The fruit is an oval capſule, containing a multitude of duſt-like ſeeds. Vid. *Linnæi*, Gen. Plant. p 434.

The ſpecies of *ophris* are, 1. The ovated-leaved *ophris*, or the common *twyblade*. 2. The bulbous-rooted *ophris*. 3. The creeping-rooted marſh *ophris*. 4. The leaſt, or triangular-leaved *ophris*. Vid. *Hill*'s Hiſt. of Plants, p 592.

OPILIO, in natural hiſtory, the name given to a peculiar genus of ſpiders. The diſtinguiſhing character of which is, that they have but two eyes. Their legs are uſually very long, and their skin hard and firm. They do not ſpin webs like the common ſpiders, for the catching their prey. Their head ſeems to grow to the middle of their ſhoulders: their forceps is terminated by two claws like thoſe of the leg of a crab. They differ from the common ſpider alſo, in the nature of their excrements; thoſe of this kind being hard and ſolid, the others liquid.

Of theſe there are four principal kinds: 1. The grey creſted *opilio*. This is the largeſt ſpider of this kind. Its body is greyiſh or browniſh, and its legs very long and ſlender; and it has on the back part of the head, a ſort of creſt formed of a double row of ſpines, and there is a rhomboidal crown ſpot on the middle of the back. This ſpecies is common in the fields about Auguſt. 2. The rediſh brown not creſted *opilio*. This is of a middling ſize, and has the longeſt legs of any kind. 3. The ſmall wood *opilio*, variegated with black and white ſpots, with a very elegant creſt. This is very ſmall, and has a remarkably little head. Its legs are remarkably long. It is found in woods in April. 4. The ſmall ſcarlet ſpiders, commonly called the *tant*, or *taint*. This is ſuppoſed to be very poiſonous. *Ray*'s Hiſt. of Inſects, p. 29. See the article TANT.

OPIMATORES, among the Romans, military men, who had the direction and management of the proviſions, and were to take care that the army wanted nothing. *Pitiſc.* Lex. Ant. in voc.

OPISTHODOMUS, ὀπισθοδομος, among the Athenians, the public treaſury, ſo called from its being ſituated on the back-ſide of Minerva's temple. Here, beſides other public money, a thouſand talents were laid in ſtore, againſt any very urgent occaſion; but if any man expended them upon a trivial account, he was to put to death. Alſo the names of all that were indebted to the commonwealth, were entered in a regiſter in this place. The tutelar gods of this treaſury, were Jupiter Σωτηρ, or the Saviour, and Plutus, the god of riches, whom they repreſented with wings, and placed next to the ſtatue of Jupiter the Saviour; which was unuſual in other places. *Potter*, Archæol. Græc. l. 1. c. 8. T. 1. p 31.

OPISTHOGRAPHUM, οπισθογραφον, among the antients, a waſte book, or ſchedule, on which were writ, extemporary things that wanted to be reviſed and corrected afterwards. *Pitiſc.* in voc.

The word is compounded of οπισθεν, *i. e.* afterwards, or on the backſide, and γραφω, I write; becauſe it was writ over again on the backſide of every page, which was left blank for that purpoſe.

OPIUM *(Cycl.)* — Dr. Charles Alſton, profeſſor of botany and the materia medica, in the univerſity of Edinburgh, has given us a diſſertation on *opium* in the medical eſſays of that place, vol. 5. art. 12. This gentleman is of opinion, that notwithſtanding the authorities of Lemery, Savary, Monſieur de la Condamine, in the Mem. de L'Acad. des Sciences for 1732, mentioned in the Cyclopædia, all which would lead us to conclude we have nothing but the meconium, or the expreſſed juice or decoction of the plant, our *opium* is neither an extract, nor an inſpiſſated expreſſed juice of poppies, but the milky juice drawn by inciſion from poppy heads. To ſhew this, the doctor, according to the directions of Dioſcorides, on a dry day before noon, cut off the crown of white poppy heads, ſo as to avoid penetrating into the cavity of the fruit, and collected the milk with a ſilver ſpoon in a China cup. The juice being expoſed to the open air, in a few days thickened to the conſiſtence of *opium*, and was of a fiery, hot, bitter taſte, and ſoporiferous ſmell, and more ſo than the common *opium*, of a dark yelloviſh brown colour on the outſide, ſomewhat higher within, and appeared as if compoſed of drops: after ten years keeping, its colour and taſte remained. This agreed with the account Bellonius, lib. 3. obſ. 15. gives of the beſt *opium*. That which was gathered from the papaver vulgare, or wild poppy, was ſomewhat of a lighter colour; but Dr Alſton thinks this but accidental, as the milk ſoon turns black on the knife. He alſo ſlightly ſcarified ſome poppy heads after the Perſian manner. When the juice was thickened, he ſcraped off the *opium*, and obtained more of it than by the other method. To procure the tear in its utmoſt perfection, he cut off the ſtar from ſeveral heads, and bending them down, let the milk drop into a cup. It grew ſolid as *opium*, and being formed into a lump, appeared uniformly white; nor was there any difference in the juices of different poppies.

Secondly, the Doctor obſerves, that the extract and inſpiſſated juice ſcarce any way reſemble *opium*; nor is their taſte and ſmell like it. The extract appears black when dried, and ſo does the juice, but when diluted, the firſt is brown, and the latter green. The extract is tough and adheſive, the juice rough and friable, and grows mouldy a day or too after expreſſion. *Opium* may poſſibly be mixed with either of theſe; and the greeniſh brown *opium* may have ſome ſmall portion of the juice in it. Its penetrating ſmell is certainly owing to the mixture of ſome aromatic ſubſtance.

Thirdly, *opium* contains more roſin than either the inſpiſſated juice, or extract. One third of *opium* appears to be roſin, while the juice and extract ſcarce yield one tenth part.

Fourthly, if *opium* was not the tear of the poppy, there would be no occaſion for ſowing ſo many fields with poppies in Egypt, and other places. Nor would it be ſo powerful a medicine, for its anodyne virtues depend chiefly on the milky juice.

The objection drawn from the low price of *opium*, is of no force; for even in this climate, where the heads are ſmall, the Doctor obſerves he could, in an hour, collect a dram of *opium* without the Perſian knife, or that dexterity which is acquired by practice. From all theſe conſiderations he concludes, that the greateſt part of *opium* is the tear of the poppy.

It has been controverted whether *opium* be got from the white or black poppy. Dr. Alſton thinks it of no conſequence, with reſpect to the medicine, which be choſen; the juice of both having the ſame effects.

As to the ſophiſtication of *opium*, the Doctor is of opinion, that only an innocent liquid is mixed with it, or a milky juice of the ſame nature with that of poppies, otherwiſe it would not be ſo ſtrong as what is made here. As the wild lettice, or *lactreca ſilveſtris odore viroſo*, C. B. *Pin.* 123. abounds with a milk of the ſame taſte and ſmell with *opium*; it may poſſibly be mixed with it, and without detriment; ſince the milk of the common lettices is anodyne and ſomniferous.

Many learned men among the moderns, have been of opinion, that *opium* was the nepenthes of Homer. Dr. Alſton forms ſome objections againſt this, and thinks that ſome of the antient phyſicians, who were neither ſtrangers to Egypt nor Homer's works, would have made the diſcovery long before the ſixteenth century.

Opium is acrid, bitter, and ſtrongly odoriferous. On attentively taſting it, a naſeous bitterneſs is firſt perceived; then a pungent heat affects the tongue, next the palate, and laſt of all the lips. The heat continues ſome time, the bitterneſs longer, provoking a plentiful diſcharge of ſaliva. It alſo heats the noſe, and produces an inclination to ſneeze.

Opium is certainly diaphoretic, and has ſtimulating qualities, which ſtrongly refute the notion of its being refrigerating; it is certainly a hot medicine, tho' in many caſes it diminiſhes preternatural heat.

Opium conſiſts of five parts of gum, four of reſin, and three of earth, not diſſolvable either in watry or ſpiritous menſtruums. Suppoſing that the reſin of *opium* is as good, or as much wanted as the gum, or the mucilaginous part, brandy will be found the beſt menſtruum.

Frider. Hoffman thinks the narcotic virtue of *opium* depends on its volatile ſulphur, (*vaporoſum ſulphur.*) Geoffroy in his *Materia Medica*, will have this virtue owing to a thick rareſiable ſulphur, (*ſulphur craſſum ad modum rareſcibile*) a kin to that of ſaffron, caſtor, &c. But Dr. Alſton thinks both theſe opinions inſufficiently ſupported. *Opium* is rather alcaleſcent than aceſcent, yet it is not an alcali. From the abovementioned gentleman's experiments, it ſeems that the ſolution of *opium* gave more appearances of an alcali, than of an acid; contrary to the account given by Geoffroy, Mat. Med. Tom. 2. p. 697. From theſe experiments it alſo appears, Firſt, that the eſſential ſalt of *opium* is ammoniacal; Secondly, that *opium* contains a very ſmall proportion of an acid; Thirdly, that it is aſtringent, or makes the ſame change on Chalybeats which vegetable aſtringents do.

The moſt active principles of *opium* are very fixed; for it keeps well, and, when forty years old, remains hard, ſolid, and retains its taſte; and it ſeems that the practice of toaſting *opium*, in order to correct it, by diveſting it of its narcotic part, is of no ſervice; and *opium* affords little or nothing by diſtillation.

Upon a chemical analyſis *opium* yields phlegm, urinous ſpirit, oil, a volatile and a fixed ſalt, and ſome earth; but little of the virtues of *opium* can be inveſtigated, or explained, from its analyſis, ſince ſimples extremely different as to their effects on human bodies, afford the ſame principles on diſtillation, as Homberg has ſhewn by the analyſis of the deadly night-ſhade, and cabbage. See Mem. de l' Acad. des Sciences. An. 1701. The curious may find the analyſis of *opium* in the abovementioned diſſertation by Dr. Alſton.

The effects of *opium* on other animals are not much different from its effects on men. Dr. Alſton put a few drops of a ſo-

lution of *opium* into a frog's ſtomach, and the circulation of the blood of the animal being examined by a microſcope, no alteration was perceived in the blood, as to its conſiſtence, colour of the ſerum, magnitude, figure, or colour of the red globules, but its velocity was ſurprizingly diminiſhed. In about half an hour, the blood regained its common celerity, and the frog its vigour. On giving the creature a ſecond doſe, the blood moved ſlower than it did the firſt time, and its velocity gradually decreaſing, ſtagnated firſt in the ſmaller, then in the larger veſſels, and in a quarter of an hour the frog expired. It is remarkable, that, notwithſtanding the diminution of the velocity of the blood, the pulſe was not leſs frequent, and that even when the circulation ſtopt in the foot, the pulſe remained viſible by an undulatory motion. On opening the frog, its ſtomach was found full of a clear mucus, tinged with the *opium*, and every thing alſo ſeemed perfectly natural. This experiment was repeated ſeveral times, with the ſame appearances.

A dog being killed by an injection of a ſolution of *opium* into his crural vein, on opening his thorax, the lungs were found ſound, but very ſmall, and white, without any blood in them. The heart was big, and all its great veſſels diſtended with blood; but nothing preternatural was obſerved in the brain or abdomen.

Opium, externally applied, is diſcutient, anodyne, and ſoporiferous, and has almoſt the ſame effects as when taken inwardly; but, that it can make any part inſenſible of pain is not evident. Wedelius declares he never could obſerve any ſuch effects. One inconvenience following the immoderate application of *opium*, mandragora, and hyoſciamus for pains of the eyes, taken notice of by Galen, is the mydriaſis, or a preternatural dilatation of the pupils. Mr. Ray gives a notable inſtance of this kind, ariſing from the application of a leaf of the deadly night-ſhade to a cancerous ulcer a little below the eye. The uvea, in a night's time, entirely loſt its muſcular force, and was ſo relaxed, that the pupil, in the cleareſt light, remained four times bigger than that of the other eye.

Opium rather coagulates, than attenuates the blood. See Dr. Friend's Emmenolog. cap. 14. This favours what is affirmed by ſome authors, that the blood has been found congealed, or frozen, as they expreſs it, about the heart of thoſe who have been killed by *opium*. See Wedel. Opiolog. l. 1. §. 1. c. 5. Uſe makes the quantity of *opium* ſafe, and even beneficial, which would otherwiſe prove poiſonous. Daily experience confirms this; and they who habituate themſelves to *opium*, find it as neceſſary as ſpirituous liquors to tipplers. A few grains will deſtroy a perſon unaccuſtomed to it, but ſome diſorders, as madneſs, enervate its force. Among the Eaſtern nations, a dram of *opium* is but a moderate doſe. Garcias mentions one who took ten drams every day, and tho' ſhe appeared ſtupid and ſleepy, yet ſhe diſputed very readily and learnedly on any ſubject. It is remarkable that, notwithſtanding this exceſſive uſe of *opium*, the Turks are generally long liv'd, if we credit Bellonius, lib. 3. obſ. 14, 15.

The action of *opium* is very analogous to that of wine or vinous ſpirits; the good and ill effects of both differ little. See Wedelius in his *Opiologia*, and Geoffroy's materia medica. Platerus affirms that wine is narcotic, and Sydenham that *opium* is the moſt excellent cordial in nature.

The virtues of *opium*, internally taken, depend chiefly on its action on the ſtomach. There are many inſtances of terrible ſymptoms, and death itſelf cauſed by narcotics, before they went out of the ſtomach, and without inflaming it, or cauſing any viſible change in it, far leſs vitiating the maſs of blood; and alſo of the ſame ſymptoms being removed, and death prevented by vomiting. Dr. Alſton is alſo of opinion; 1mo. That the anodyne and hypnotic virtues of *opium* do not depend on its action on the brain or on the blood. 2do. That it affects firſt and principally the nerves to which it is applied; next ſuch as more immediately communicate with them; then thoſe which ſerve for ſenſation and voluntary motion; and laſt of all, by conſent the whole nervous ſyſtem. 3tio. That this impreſſion on the nerves differently affects the ſenſorium commune and the mind according to its degree, and the nature and function of the nerves primarily acted upon. 4to. That the primary or firſt obſervable effect of the mechanical impreſſion of the narcotic part of *opium* on the nerves, is the relaxation of their fibres. Now as this relaxation of the nerves, and conſequently of the moving fibres, demonſtrates *opium* to be more than a palliative remedy in a great many diſeaſes; ſo it is not difficult by it to account for its bad as well as good effects. For by relaxing to a certain degree, it may prove anodyne, cordial, diaphoretic, hypnotic, &c. or cauſe ſtagnations, deliriums, lethargies, apoplexies, and death.

It does not appear that *opium* rarefies the blood, or that the operation of this medicine depends on ſuch a rarefaction. If it were, it ſeems likely that bleeding might be a remedy for the ſymptoms occaſioned by the abuſe of *opium*; but ſome authors affirm that veneſection is mortal even the day after a narcotic has been taken. See Dr. *Alſton*, loc. cit.

We have an account in the Memoirs of the Academy of Sciences at Paris, of the death of a young man at Cairo, from his being decoyed into taking a very large doſe of this medicine. Among a number of young people in that city, who frequently drank together, there was one who always boaſted of his ſuperior power to bear a large quantity of liquor, and his companions, determined to get the better of him for once, diſſolved, without his knowing of it, a dram of liquor in the liquor he was to drink; the conſequence was, that, inſtead of falling aſleep, as they expected he would, he fell into violent deliriums, and afterwards into a profound and dead ſleep.

The next morning his comrades went to ſee him, and triumph in their victory, but found him dying, looking livid, without pulſe, and with his mouth cloſed. They ſent for aſſiſtance, but in vain. After the death of the perſon, the body, arms, and thighs, became covered with livid tumors as big as the head of a young child, and theſe emitted an intolerable ſtench, almoſt as ſoon as the corpſe was cold. There is one very ſingular accident in regard to this caſe, which is, that this ſtench allured all the cats from the neighbouring houſes, who came with great eagerneſs, and were hardly prevented from devouring the body.

Dr. Smyth, while at Smyrna, took pains to obſerve, what the doſes of *opium* taken by the Turks, in general, were. He found that three drams in a day was a common quantity among the larger takers of it, but that they could take ſix drams a day without miſchief. A Turk eat this quantity before him, three drams in the morning, and three in the evening, with no other effect than its giving him great cheerfulneſs. But the taking it thus habitually greatly impairs the conſtitution; the perſons who accuſtom themſelves to it, can by no means live without it, and are feeble and weak; their legs are uſually thin, and their gums eaten away, ſo that the teeth ſtand bare to the roots; they are often alſo of a yellow complexion, and look much older than they really are. The Turkiſh meſſengers, when ſent upon buſineſs of haſte, always carry *opium* with them, and take largely of it when tired; they ſay it immediately gives them ſtrength and ſpirits to proceed, taken with proper precaution. Phil. Tranſ. N°. 223.

When *opium* affects the head, or lungs, by its volatile æthereal oil, or ſpirit, acids, eſpecially foſſile acids, are the proper correctors. And, when it produces ſickneſs, nauſeas, vomitings, ſpaſms, flatulent colic pains, and ſuch like ſymptoms, by the action of its ponderous, ſtimulating, and adheſive oil, the warmeſt alexipharmics muſt be uſed. *Morgan*, Mecan. Prac. Phyſ. p. 271.

Opium given too ſoon, to ſtop the operation of emetics, has been known to produce dangerous effects. See Medic. Eſſ. Edinb. Vol. 4. Art. 6. or its Abridgment, Vol. 1. p. 160.

The reſinous part of *opium* being noxious in Mr. Godfrey's opinion, he propoſes to make liquid laudanum, by digeſting an ounce and a quarter of *opium*, in half a pint of diſtilled water twenty-four hours, ſhaking the veſſel frequently; then filtres it, and adds three ounces of ſpirit of wine; after which, the other ingredients may be added at pleaſure. Miſc. vere util. p. 59.

OPIUM *Cyreniacum*, in the materia medica, a name given by ſome of the writers of the middle ages to *aſſa fœtida*. This was the *ſcordolaſaron* of the Greek writers of thoſe times, and was called *Cyreniacum* from the place whence it was principally brought. Aviſenna tells us, that, in his time, it was brought principally from Kirvan, and that is Cyrene.

OPLITODROMI, Οπλιτοδρομοι, among the Greeks, a deſignation given to thoſe who run in armour, at the Olympic, and other games. *Potter*, Archæol. Græc l. 2. c. 21. T. 1. p. 442. The word comes from the Greek οπλον, *armour*, and δρομος, a *race*.

OPOBALSAMUM, (*Cycl.*) in the materia medica, a name given by ſome authors to the true *balſamum judaicum*, or *balm of Gilead*. *Dale*, Pharm. p. 282.

OPOPIA, a name given by ſome anatomical writers to the bones which form the receptacle of the eyes.

OPORICE, a name given by the antients to a medicine compoſed of the autumnal fruits, and extolled for its great virtues againſt weakneſſes of the ſtomach and dyſenteries.

It was compoſed of five quinces with their ſeeds, as many pomegranates, a pint of ſervices, a pint of Syrian ſumach, and half an ounce of ſaffron; all theſe were put together into a gallon of muſt, and boiled over a very gentle fire to the conſiſtence of honey, with great care to avoid burning. Vid. *James* Med. Dict. in voc. & *Pliny*, l. 24. c. 14.

OPOS, a word uſed by the old medical writers, to expreſs the juices of plants, whether flowing ſpontaneouſly, or by means of inciſions. It is uſed by Hippocrates to expreſs the juice of ſilphium, which was called ſimply the juice, by way of eminence, as we call the quinquina bark ſimply the bark. Others have made it ſignify the juice of the fig-tree, and the caprificus, which they had in frequent uſe to curdle their milk.

OPOSSUM, or POSSUM, in zoology, the name of a very remarkable American animal, deſcribed by various authors, under the names of *maritacaca*, *carigoi*, *ropoza*, *caregueya*, *jupatuma*, *tlaquatzin*, *ſarigoi*, and *ſemivulpa*.

It is a creature of the ſize of a large cat. Its head is ſhaped like that of the fox; its noſe ſharp, and its upper jaw longer than the under; its teeth are ſmall, but like thoſe of the fox and,

and it has two long ones, like the hare, in the front of the mouth; its eyes are very beautiful, ſmall, round, and vivid; its ears long, ſmooth, and very ſoft, placed erect, like thoſe of the fox, and very thin and tranſparent. It has black whiskers, like thoſe of a cat; and has other hairs of the ſame kind on the other parts of its face, and over its eyes; its tail is round, and a foot long, and is of great ſervice to it, as it uſes it to twiſt round the branches of trees, hanging itſelf to them by that means. The tail is hairy near the inſertion, but naked all the other part, and is partly black, partly of a brownish white; its hinder feet are conſiderably longer than the fore ones, and each has five toes; they much reſemble hands, and the nails are white and crooked, the hinder one being as in the monkey kind, the longeſt. Its head, and legs, as Hernandez obſerves, ſomething reſemble thoſe of the badger. It has a broad, longitudinal, black ſtreak, on the face; it is of a blackiſh colour with a mixture of a brown and grey on the back and ſides, and has ſomewhat of a faint yellowiſh caſt on the belly. *Ray*'s Syn. Quad. p. 183.

What diſtinguiſhes this creature, however, from all the other animals of the world, is, that it has a bag or pouch into which it receives its young as ſoon as deliver'd; this is a ſort of open uterus, and is placed under the belly near the hinder legs; in this the young are ſhelter'd till they are able to ſhift for themſelves, and when they begin to be ſtrong enough they frequently run out and return in again. The creature is of a ſtinking ſmell like our fox or martin. It feeds on ſugar canes, and ſome other vegetables; but not wholly on theſe, for it frequently preys on birds which it catches on the trees, and often plays the fox's trick of ſtealing poultry.

The *Opoſſum* has been called *Marſupiale* by ſome authors, from the *Marſupium* or pouch for the receiving its young. This pouch is a membranous body, not very thick, though conſiſting of ſeveral coats. It has four pair of muſcles, ſerving to contract and diſtend, as alſo to open and ſhut it at the mouth, and there are two bones in this part of the body peculiar to this animal, and ſerving only for the inſertion of theſe muſcles. The pouch itſelf is to be rang'd among the veſiculous parts of the body, which ſeem to be part muſcles, part glands, and to perform the office of both motion and ſecretion. The hollow part of this pouch is lightly colour'd with hairs, but theſe are not placed ſo thick but that the ſkin is ſeen between them. Theſe hairs are uſually matted together in ſeveral places with a tough, yellow, and glutinous matter ariſing out of ſeveral glands there. This ſubſtance is of a very nauſeous and offenſive ſmell. Mr. Ray, and others, have obſerved that this animal, while alive, ſtinks like a pole-cat, or even worſe than that animal. This ſtink is principally owing to the matter contain'd in this bag; and yet ſo nearly is this matter ally'd to that contain'd in the ſcent-bag of the civet-cat, and other animals, that when expoſed to the air for ſome days, it loſes its offenſive ſmell, and becomes a very grateful perfume like them. The ſame obſervation holds good of the ſcent bag of our weazel, and pole-cat, which (particularly in the laſt animal) are very offenſive while freſh, but when expoſed to the air and dry'd, become only a perfume reſembling that of civet.

John Faber relates out of Lerius, that the *opoſſum* or *ſerigni* ſtinks ſo that the barbarous Indians refuſe to eat it; but that if the kidneys be taken out, the ſtink goes off in a great meaſure, and the creature becomes eatable, and his fleſh very well taſted; but it is very probable that Lerius, who had ſeen the operation performed, but examined only in a curſory manner, miſtook the ſeat of the offenſive ſmell, and that the perſon who performed it, cut deeper than he was aware, and took out this bag or pouch as well as the kidneys. The kidneys, and the fat about them, have no ill ſmell at all.

The pouch of the *opoſſum* has, beſide its glandular coat, a muſcular one, which ſerv'd to contract or diſtend the whole ſubſtance of it together, as its muſcles did its particular parts; beſide this, alſo, it has a vaſcular coat, in which the blood veſſels are diſpoſed in very great abundance.

The male *opoſſum*, as well as the female, has this kind of pouch under its belly, and takes upon himſelf, at times, the care of carrying and preſerving the young in caſe of any impending danger. Phil. Tranſ. N°. 239. p. 123.

OPTIO, among the Romans, an aſſiſtant or lieutenant belonging to every centurion.

They were called *optiones* from *opto*, I chooſe; becauſe it was in the option of the centurion to chooſe whom he pleaſed for this employment; though at firſt it was otherwiſe, the *optio* being choſen by the tribune or chief commander of the legion. *Pitiſc.* in voc.

The *optiones* were not peculiar to the camp, but were uſed alſo in many other offices of life. id. ibid.

OPULUS, the *water-elder*, in botany, the name of a genus of trees, the characters of which are theſe: The flower conſiſts of only one leaf, but puts on a various form in the different ones. Some are rotated and pierced at the bottom by a piſtil; theſe are barren. Others are hollowed into the ſhape of a baſin, and pierced in the ſame manner at their bottom by the pointall of the cup: In theſe the cup finally becomes a ſoft juicy berry, containing a flatted and heart-faſhion'd ſeed. See Tab. 1. of Botany, Claſs 20.

The ſpecies of *opulus* enumerated by Mr. Tournefort, are theſe: 1. The common *opulus* or *water-elder*. 2. The *opulus* with globoſe flowers. *Tourn.* inſt. p. 607.

OPUNTIA, in botany, the name of a large genus of plants, the characters of which are theſe: the flower is of the roſaceous kind, or conſiſts of ſeveral leaves diſpoſed in a circular form. The cup, after the flower is fallen, becomes a ſeed-veſſel of a fleſhy ſubſtance, umbilicated, and unicapſular, fill'd with ſeeds uſually of an annulated appearance.

The ſpecies of *opuntia* enumerated by Mr. Tournefort, are theſe: 1. The common *opuntia* or Indian fig. 2. The middle ſeed *opuntia*, with oblong leaves. 3. The *opuntia* with ſmall roundiſh and compreſſed leaves. 4. The largeſt *opuntia* with long, broad, and thick leaves. 5. The ſmalleſt, round-leaved, Indian *opuntia*. 6. The ſmall American *opuntia* with long and very ſlender ſpines. 7. The little, narrow-leaved, American *opuntia*. 8. The tall tree *opuntia* of America, with cereus leaves, and white flowers. 9. The tall tree *opuntia* of America, with articulated leaves and yellowiſh flowers. See Tab. 1. of Botany, Claſs 6.

We have ſeveral ſpecies of this plant, propagated in the gardens of the curious; they are all early raiſed by cutting off their branches at the joints during any of the ſummer months; theſe cuttings are to be laid by for a fortnight, in a dry, warm place, that the wound may heal up, otherwiſe they are very ſubject to rot, as are alſo all the other ſucculent plants. The proper place for planting theſe, is one third part common paſture land, one third ſea land, and one third more of an equal mixture of lime rubbiſh and rotten tanner's bark. This mixture ſhould be made three or four months before it is to be uſed, and the larger ſtones and clods ſeparated, and laid at the bottoms of the pots, and the reſt filled up with the finer part; the cuttings are to be planted in theſe pots, which are then to be plunged into a hot bed of tanner's bark, where they muſt be gently watered, and when they begin to ſhoot they muſt have as much air as poſſible; and, finally, removing them into the ſtove, they muſt be placed near the glaſſes, and have as much air as may be: they may be expoſed to the open air in the ſummer months, but they ſucceed much better when they are kept continually in the ſtove. *Miller*'s Gard. Dict.

ORACH, *atriplex*, in botany. See ATRIPLEX.

Stinking *orach* is a powerful medicine. The very ſmell of it will ſometimes recover patients out of hyſteric fits, when all the common means fail; and a decoction of the plant is an excellent medicine in the ſame caſes. A decoction of it, made very ſtrong, and given in a glyſter, in hyſteric caſes, is alſo excellent; and a conſerve of the leaves, one of the beſt forms it can be given in, has the ſame virtues in a very high degree, alone; and is a good medium to bring other medicines into the form of an electuary for the ſame purpoſes. A ſyrup of it is ſometimes kept in the ſhops, and is not without its merit, though a great deal of the virtue of the plant be loſt in ſuch a form.

ORANGE, *aurantium*, in botany, the name of a genus of trees, the characters of which are theſe: the flower is of the roſaceous kind, being compoſed of ſeveral petals, arranged in a circular form; the piſtil ariſes from the cup, and is ſurrounded by a number of little leaves, which terminate in the ſtamina. This piſtil finally becomes a fruit of a roundiſh figure, covered with a thick and fleſhy rind, and divided within into ſeveral cells, which are full of juice and veſicules, and contain ſeveral callous ſeeds. To this is to be added, that the leaves are heart-faſhioned at the bottoms.

The ſpecies of *orange*, enumerated by Mr. Tournefort, are theſe: 1. The common ſweet *orange*. 2. The common-ſharp-taſted *orange*. 3. The winter *orange*, with a leſs juicy fruit. 4. The ſharp-taſted wild *orange*. 5. The *orange*-tree with curled leaves. 6. The ſtellated roſe-*orange*. 7. The variegated *orange*. 8. The variegated, narrow-leaved *orange*. 9. The corniculate *orange*. 10. The narrow-leaved corniculate *orange*, with ſmaller fruit. 11. The ſtriated *orange*. 12. The fœtiferous *orange*. 13. The manyfold fœtiferous *orange*, with one fruit, including two or three others. 14. The Lisbon *orange*. 15. The China *orange*. 16. The large-fruited *orange*. 17. The manyfruited *orange*. 18. The *orange* with very narrow ſpear-pointed leaves. *Tourn.* Inſt. p. 620.

ORANGE-*flowers*. Theſe flowers are very juſtly eſteemed one of the fineſt perfumes. The water diſtilled from them is accounted ſtomachic, cordial, and carminative. Some alſo ſpeak of it as a ſudorific.

There are a very great variety of *orange*-trees in the gardens of the curious. The manner of raiſing them from ſeeds is this: When you purpoſe to raiſe ſtocks for buding, they ſhould be raiſed from citron ſeeds, taken out of the rotten fruit in ſpring; for the ſtocks of this kind are preferable to any other, both for their quickneſs of growth, and their readily taking buds either of *oranges*, lemons, or citrons.

A good hot bed muſt be prepared, either of horſe dung or tanners bark. The laſt, where it can be had, is much the beſt;

beſt; the ſeeds muſt be ſown in pots of rich earth, and theſe, when the bed is of a due temper, muſt be plunged into it. The pots muſt be watered frequently, and the glaſſes of the hot-bed ſhaded with mats in the heat of the day, and at times raiſed to give air.

The ſeeds will come up in three weeks, and a month after this the plants will be fit to tranſplant into ſingle pots. The bed muſt be now renewed, and ſome pots of about five inches over at the top, muſt be filled half full with freſh earth, mixed with very rotten cow-dung. Place one plant in the middle of each of theſe pots, and then fill it up with the ſame earth; then place theſe pots in the new hot-bed, and water the plants every day. By July, the plants will be two foot high, and muſt then be hardened by degrees to the air, by raiſing more and more the glaſſes of the hot-bed. In September they muſt be taken into the greenhouſe; in the winter ſeaſon they muſt have frequent ſmall waterings, and in ſpring their heads muſt be waſhed, to cleanſe them from filth. In ſpring, they muſt have again a gentle hot-bed, but in June they muſt be hardened again; and in Auguſt they will be fit to bud.

At this time you are to make choice of cuttings from very thriving and fruitful trees; chuſing ſuch buds as are round. When the ſtocks are budded, they muſt be removed into the greenhouſe, to ſhelter them from wet, turning their buds from the ſun, but letting them have as free air as poſſible, and refreſhing them often with water. They muſt remain in the greenhouſe all winter, and in the ſpring muſt have another bark hot-bed; then cutting off the ſtocks about three inches above the buds, obſerve to give them as much water as they require.

The buds with this management will be by July three feet high, and they muſt then be hardened by degrees, that they may bear the greenhouſe in the winter; and as this will be a ſufficient height for the ſtems, it is proper at this time to ſtop the leading branch to force out lateral ſhoots. This firſt winter they will be tender, and muſt be taken great care of, and after this they require no more care than other full grown trees.

It is a regular and certain way of ſupplying a greenhouſe with *orange*-trees, but there is a much more expeditious one, which is the purchaſing ſuch trees as are brought over every year from Italy. Theſe are as large when we receive them, as thoſe of our own produce will be in ten or twenty years growth; and tho' they have but ſmall heads then, will be brought to have very good ones in three years, and to produce very fine fruit.

In the choice of theſe trees, thoſe which have two buds in ſtock are preferable to thoſe which have only one; and the ſtraitneſs of the ſtem, freſhneſs of the branches, and plumpneſs of the bark, are greatly to be regarded. When you have purchaſed a proper number of theſe trees, each of them is to be ſet in a tub of water, with its head and half its trunk above the ſurface; they are to ſtand in this three days, then they are to be taken out, their roots picked, and bruſhed clean, and the tops of the branches cut off, and they are to be planted ſingly, in pots juſt large enough to contain their roots, in a mixture of freſh earth and rotten cow-dung. Theſe are to be ſet in a moderate hot tanners bark-bed, and ſome potſhreds muſt be always put at the bottom of the pots, to keep their holes from being ſtoped, and give a free paſſage to the water. They are to be moderately watered at proper times, and by the month of June they will ſhoot out pretty long ſhoots, which muſt be ſtoped, in order to produce the lateral branches. They muſt now be hardened by degrees, and in the middle of July muſt be brought into the open air, in ſome warm ſituation, defended from winds and from the too great heat of the ſun. In September they muſt be removed into the greenhouſe, and watered gently during the winter. In the ſucceeding ſummer, the branches muſt be ſtopped from growing to their lengths, to furniſh a good head; and they muſt be frequently watered. And after this, they will require no farther management, but to be new potted every year; which ſhould be done in April, and the earth prepared for it a year beforehand, of cow-dung and freſh earth. The roots ſhould be ſoaked a quarter of an hour in water, and afterwards ſcrubed very clean, before they are put into the new pot.

If old *orange*-trees have bad heads, the way to mend them is to cut them moſtly off, and proceed with them in the ſame manner as with the trees brought from Italy.

All *orange*-trees require frequent waterings, but theſe ſhould not be large; there muſt always be a paſſage for the water to run off at the bottom of the pot or tub; they muſt have as much freſh air in winter, as the ſeaſon will allow, and they ſhould not be placed too near each other in the greenhouſe. In ſummer they ſhould be placed where they may have the morning and evening ſun, without too much wind; and they ſhould not be houſed till October. The ſhaddock and citron are much tenderer than the *orange*, and ſhould therefore be houſed ſooner.

In the Philoſophical Tranſactions, N° 114, there is a very remarkable account of a tree ſtanding in a grove near Florence, having an *orange* ſtock, which had been ſo grafted upon, that it became in its branches, leaves, flower, and fruit, three-formed; ſome emulating the *orange*, ſome the lemon, or citron, and ſome partaking of both forms in one; and what was very remarkable, was, that theſe mixed fruits never produced any perfect ſeeds; ſometimes there were no ſeeds at all in them, and ſometimes only a few empty ones.

The ſeeds of the *orange* kind ſeem different in their nature from thoſe of all other plants. In the generality of others, the ſeed is only a ſort of nidus, and bed of a nouriſhing matter, for the young plant contained in ſome one part of it, and called the plantula ſeminalis; and however minute the ſeed itſelf may be, this plantula is but a very ſmall part of it: but the ſeeds of the *orange*, though contained in the inſide of a pulpy fruit, and in all reſpects, ſeeming of the nature of the common ſeeds, yet, when examined nicely, are found to contain, not a ſimple plantula ſeminalis, but each of theſe ſeeds or kernels, contains within it another compleat ſeed. Both in the *orange*, and lemon kinds, on opening what we call the ſeeds, when the ſkin, or membrane, is ſtripp'd off, there are frequently found two ſeeds encloſed in that membrane, that is, under the ſkin, and without ſide of the kernel, there is a ſmall ſeed, the like of which does not appear in the ſeed of any other fruit.

It is true, indeed, that in hazel nuts, as alſo in almonds, and in peach and apricot kernels, we often find a double ſeed, or kernel, but then each of them is ſeparately encloſed in its own membrane, and has no communication with the other, but is only placed in ſimple contact with it; and each has its diſtinct ſtalk, or ſtring, by which it ſeverally receives its nouriſhment; and, in theſe, the containing of two kernels ſeems only an accident, a kind of ſuperfœtation, as in the twin births of animals, which, naturally, bear only one.

When one of the *orange* or lemon ſeeds is ſtripp'd of its outer membrane, there appears a little ſtring, which lying under it, cauſes a protuberance in the firſt ſkin; and from this ſtring not only the ſeed, but the plant within it receives its nouriſhment; and the firſt and hard ſkin, which is eaſily ſeparated, ſeems only given to it for the defence of the inward parts; whereas nuts, almonds, peach-ſtones, and the like, have a much harder and firmer coat given them for the ſame purpoſe. The ſtring which appears through the firſt membrane extends its ſmall veſſels alſo through the ſecond membrane near the ſeat of the plantule; but theſe are ſo extremely fine, that we loſe them before they enter it, no microſcope being able to ſhew them farther than where they grow extremely ſmall, and fine, near the entrance into this part. It is an amazing thought, but it is alſo an evident truth, that this ſmall ſtring, which runs in this manner under the coat of this ſeed, contains in it as many diſtinct veſſels as are to be found in a full grown *orange*-tree; for if all theſe veſſels were not in the young plant, while involved in its matrix, whence ſhould they come afterwards? When this ſtring is cut tranſverſely, and examined before a good microſcope, ſomething of this appears, for there are ſeen in it the ſections of ſeveral veſſels, and the ſmall quantity of pulpy matter between them is encloſed in a ſeemingly thick and tough membrane, together with them, in order to keep the whole together: if the ſeed, or kernel, be itſelf cut acroſs, it appears to be only a congeries of a great number of globules of a ſoft matter, preſſed together. Within this ſeed thus cut, and under all its membranes are ſeen the two regular, and perfect ſeeds, lodged together, and not ſeparated by any membrane, as the accidental double kernels of nuts, &c. always are; ſometimes, indeed, there is only one ſuch obſerved, and ſometimes there are three. Theſe are not always of the ſame ſize, but one is often larger than the others. Each of theſe is, however, a true perfect, and diſtinct ſeed, and is divided naturally into two lobes, and theſe ſeem only to have been united at firſt, juſt where the young plant lies, ſo that this whole kernel ſeems to have been deſtined by nature for no other end, but to foſter and cheriſh the young plant, till it become able to ſhoot up and live above ground. In the heart of this inner ſeed is found the plantula ſeminalis, which is not larger than a ſmall grain of ſand, to the naked eye. The wonderful conformation of this ſtructure, cannot but ſtrike any one who is uſed to examine ſeeds, with great amazement. It is plain that the ſeed contained within the other ſeed, can only receive its nouriſhment from the veſſels contained in the ſtring above deſcribed. But it is amazing, that theſe ſhould not be, as uſual, immediately diſtributed from that general cord, or congeries of them, to the ſeed itſelf, but to another that is the center ſeed, and can only come to the inner ſeed, after having paſſed thro' this, and been in it devaricated into other veſſels too fine for the eye to trace.

Signior Franciſco Lana, in his prodromus to ſome philoſophical diſcoveries, tells us, that there is a way of producing *oranges*, without ſowing or planting the trees, only by infuſing the flowers in oil of almonds; for that this oil will, every year afterwards, at the proper ſeaſon, produce both flowers, and ripe *oranges*. See the whole proceſs at large, under the article FRUITS, as atteſted by the author and his friends.

Sea ORANGE, in natural hiſtory, a name given by Count Marſigli to a very remarkable ſpecies of ſea plant. It is tough and firm in its ſtructure, and, in many things, reſembles the com-

common fucus; but, inſtead of growing into the branched form, the generality of thoſe plants have, it is round and hollow, and in all reſpects, reſembles the ſhape of an *orange*. It has, by way of root, certain very fine filaments, which faſten themſelves to the rocks, or to ſhells, ſtones, or any thing elſe that comes in the way. From theſe their grows no pedicle, but the body of the *orange*, as it is called, is faſtened by them to the rock, or other ſolid ſubſtance. The *orange* itſelf, is uſually of about three or four inches in diameter; and while in the ſea, is full of water, and retains this when taken up. In this ſtate, it frequently weighs a pound and an half, but when the water is let out, and it is dryed, it becomes a mere membrane, weighing ſcarce any thing. It is beſt preſerved, by ſtuffing it full of cotton, as ſoon as the water is let out of it, and hanging it up to dry in this form. Its ſurface is irregular and rough, and its colour a duſky green on the outſide, and a clearer, but ſomewhat bluiſh green within; and its thickneſs is about an eighth part of an inch. When viewed by the microſcope, it is ſeen to be all over covered with ſmall glandules, or indeed, compoſed of them; for they ſtand ſo thick, one by another, as to leave no ſpace between, and ſeem to make up the whole ſubſtance: ſo that it appears very like the rough chagrin skin uſed to cover toys. Theſe are all ſo many hollow ducts, thro' which the ſea-water finds a paſſage into the globe formed by this skin, and by this means it is kept always full and diſtended; on cutting it with a pair of ſciſſars, the water immediately runs out, and the skins collapſe: but there is ſomething farther remarkable, which is, that the whole ſubſtance, near the wounded place, is in motion, and ſeems as if alive, and ſenſible of the wound. The glandules are found full of water, and reſembling ſmall tranſparent bottles; and what goes to the ſtructure of the plant beſide theſe, is an aſſemblage of a vaſt number of filaments, all which are alſo hollow, and filled with a clear and tranſparent fluid.

There is another plant of this kind, deſcribed by Count Marſigli, Triumſetti, and others, and called the *ramoſe*, or branched *orange*. This is very much of the nature of the former plant, but inſtead of conſiſting of one round globule, it is formed of ſeveral oblong ones, all joined ſo together, that they repreſent the branches of ſome of the fucus's, but that they are ſhorter; and theſe are all hollow and full of water, in the ſame manner as the ſingle globes of the common kind. This has, by way of root, certain fine and ſlender filaments, which faſten it to the ſtones or ſhells near which it is produced; and it is of a duſky greeniſh colour on the ſurface, and of a fine bluiſh green within. The ſurface viewed by the microſcope, appears rough, as in the other, and the glandules are of the ſame kind, and are always found full of a clear water. *Marſigli*, Hiſt. de la Mer. p 81.

ORANGE-*dew*, a ſort of dew which falls in the ſpring-time, from the leaves of *orange* and lemon trees, and is extremely fine and ſubtile. Mr. De La Hire obſerving this, placed ſome flat pieces of glaſs under the leaves to receive it, and having thus procured ſome large drops of it, was deſirous of finding out what it was. He ſoon found that it was not a merely aqueous fluid, becauſe it did not evaporate in the air; and that it was not a reſin, becauſe it readily, and perfectly mixed with water: it was natural here to ſuppoſe it a liquid gum; but neither did this, on examination, prove to be the caſe; for being laid on paper, it did not dry as the other liquid gums do. Its anſwering to none of theſe characters, and its being of the conſiſtence of honey, and of a ſweet-ſugar-like-taſte, gave a ſuſpicion of its being a kind of manna; and whatever in the other tryals had proved it not a reſin, a gum, *&c.* all equally tends to prove that it is this ſubſtance.

ORARIUM, in eccleſiaſtical writers, the ſame with *brandeum*. See the article BRANDEUM.

ORATORIO, in the Italian muſic, a ſort of ſpiritual drama of dialogues, containing recitativos, duettos, trios, ritornellos, choruſſes, *&c.*

The ſubjects of theſe pieces are uſually taken from the Scriptures, or from the life of ſome ſaint, *&c.*

The muſic for the *oratorio* ſhould be in the fineſt taſte, and moſt choſen ſtrains. Theſe *oratorios* are greatly uſed at Rome in time of lent; and of late in England.

ORBICULAR *leaf*, among botaniſts. See LEAF.

ORBICULARE *os*. See the article OS.

ORBICULARIS, (*Cycl.*) in anatomy, a name given by Riolanus, and ſome others, to the muſcle called by Albinus *orbicularis oris*, and by Cowper and others, *conſtrictor labrorum*

ORBICULARIS, in botany, a name given by ſome authors to the *artanita*, or *cyclamen*, called in Engliſh *ſow bread*. *Ger.* Emac. Ind. 2. See CYCLAMEN.

ORBICULARIS *inteſtini*, in anatomy, a name given by Veſalius, and ſome others, to the muſcle now known by the name of the *ſphincter ani*.

ORBIS, in zoology, the name of a genus of fiſhes, of which there are a great many ſpecies: that, however, which is uſually meant by the word *orbis* above, is the ſpecies called *orbis primus*, by Rondeletius, and *orbis ægyptiacus* by Salvian, becauſe frequently caught in the oſtia of the Nile. Excepting the tail, this fiſh is of a round figure. It has no ſcales, but is covered with a firm and hard skin all over, full of ſmall prickles, which render it very rough. Its mouth is ſmall, and has four broad teeth. It has only one hole on each ſide for its gills, and a fin under each. It has another fin near the tail on its under part, and another anſwering to it in its upper. The tail is one broad and flat fin. It is not eatable, for the whole fiſh is head, or if you would rather call it ſo, belly. *Willughby*'s Hiſt. Piſc. p. 143. See Tab. of Fiſhes, N° 18, 63.

There is an opinion, that when this fiſh is dryed and hung up by the tail, it will always turn its mouth to that quarter from whence the wind blows.

The other ſpecies of this genus are, the *orbis lagocephalus*, *orbis ſcutatus*, *orbis muricatus*, *orbis ranæ rictu*, *orbis ſpinoſus Cluſii*, *orbis muricatus alter Cluſii*, and the *orbis oblongus teſtudinis capite*. *Rondelet*, *Geſner*, *Aldrovand.* and *Salv.an.*

ORBIS *magnus*, in aſtronomy, the *orbit* of the earth in its annual revolution round the ſun.

ORCHESOGRAPHY, the art of noting all the ſteps and motions uſed in dancing. See DANCE, *Cycl.*

ORCHIS, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the polypetalous anomalous kind, conſiſting of ſix leaves irregular in ſhape and ſize. The five upper of which are ſo diſpoſed, as in ſome degree, to reſemble a helmet. The lower leaf is of various ſhapes in the different ſpecies; it has uſually a head, and often a tail, and reſembles the body of a fly, a bee, a man, or other animal. The cup of the flower finally becomes a fruit, which is pervious by three feneſtræ, to each of which there adheres a valve. The ſeeds are extremly ſmall, and reſemble a fine duſt. To this it is to be added, that the roots are fleſhy, with fibres propagated from them, and are in ſome ſpecies roundiſh, and reſemble the teſticles of an animal, and in others divided into ſeveral ſegments, reſembling a hand and fingers. See Tab. 1. of Botany, claſs 11. *Tourn.* Inſt. p. 431.

The ſpecies of *orchis*, enumerated by Mr. Tournefort, are theſe: 1. The broad-leaved great *orchis*, with a gaping hood. 2. The ſmaller-flowered broad-leaved *orchis*, with a gaping hood. 3. The broad-leaved *orchis*, with a compact ſpike of flowers. 4. The narrower leaved *orchis*, with a gaping hood. 5. The great ſoldier *orchis*. 6. The middle ſoldier *orchis*. 7. The leſſer ſoldier *orchis*. 8. The mountain ſoldier *orchis*, with a red conglomerated ſpike. 9. The tall meadow ſoldier *orchis*, with variegated flowers. 10. The lower meadow ſoldier *orchis*. 11. The ſweet-ſcented purple mountain *orchis*. 12. The ſweet-ſcented dusky purple *orchis*. 13. The globular-flowered *orchis*. 14. The dwarf alpine moſſy-leaved *orchis*. 15. The common male *orchis*, with ſpotted leaves. 16. The common male *orchis*, with ſhorter ſpotted leaves. 17. The common *orchis*, with drooping leaves, not ſpotted. 18. The common *orchis*, with drooping plain leaves, and with ſmall white flowers. 19. The common female *orchis*. 20. The common female *orchis*, with roſe-coloured flowers. 21. The female *orchis*, with white and changeable-coloured flowers. 22. The common little male *orchis*, with ſpotted leaves. 23. The male man *orchis*. 24. The female man *orchis*. 25. The monkey *orchis*. 26. The male Portugal man *orchis*, with an aromatic ſmell. 27. The Portugal man *orchis*, with a ſmall green flower with a purple edge. 28. The bearded or goat *orchis*, with ſhort and broad leaves. 29. The goat *orchis*, with longer and narrower leaves. 30. The ſmaller goat *orchis*. 31. The ſmaller goat *orchis*, with a purple ſpike. 32. The common purple ſpiked ſtinking *orchis*. 33. The white ſweet-ſcented *orchis*, with ſpiral flowers. 34. The two-leaved *orchis*, with very broad leaves. 35. The narrower-leaved bifoliate *orchis*. 36. The ſmaller bifoliate *orchis*, with white flowers, with long ſpurs. 37. The greater trifoliate *orchis*. 38. The ſmaller trifoliate *orchis*. 39. The butterfly *orchis*, called by ſome the *frog orchis*. 40. The greater bee *orchis*, with the upper leaves white and purple. 41. The bee *orchis*, with greeniſh flowers. 42. The bee *orchis*, with ferrugineous flowers. 43. The bee *orchis* with blue flowers. 44. The bee *orchis*, with ſpotted flowers. 45. The bee *orchis*, with white flowers. 46. The bee *orchis*, with wholly purple flowers. 47. The bee *orchis*, with variegated flowers. 48. The greater fly *orchis*. 49. The leſſer fly *orchis*, with green wings and a green head. 50. The yellow fly *orchis*. 51. The narrow-leaved *orchis*. 52. The *orchis* reſembling an expanded butterfly, with green flowers. 53. The butterfly *orchis*, with ſpotted leaves. 54. The narrow-leaved white flowered butterfly *orchis*. 55. The ſpider *orchis*. 56. The Italian mountain *orchis*, with a ferrugineous flower with an oblong tongue. 57. The ſpotted-leaved Italian *orchis*, with long tongues. 58. The broad leaved handed meadow *orchis*, with long ſpurs. 59. The broad-leaved palmated meadow *orchis*, with freſh coloured flowers with long ſpurs. 60. The broad-leaved palmated meadow *orchis*, with ſnow-white flowers with long ſpurs. 61. The great narrow-leaved palmated meadow *orchis*. 62. The palmated meadow *orchis*, with ſpotted leaves. 63. The white-flowered ſpotted-leaved palmated meadow *orchis*. 64. The ſpotted leaved palmated meadow *orchis*, with variegated flowers. 65. The greate ſt

greateſt meadow-palmated *orchis*. 66. The leſſer palmated *orchis*, with long ſpurs to the flowers. 67. The ſmall narrow-leaved ſweet-ſcented palmated *orchis*. 68. The clove-ſcented palmated *orchis*. 69. The white-flowered palmated *orchis*, with the ſmell of elder. 70. The purple-flowered palmated *orchis*, with the ſmell of elder. 71. The palmated frog *orchis*. 72. The caſtrated *orchis*. 73. The broad-leaved marſh palmated *orchis*. 74. The narrower-leaved palmated marſh *orchis*. 75. The common palmated marſh *orchis*, with very narrow leaves. 76. The palmated marſh *orchis*, with ſpotted leaves. 77. The palmated marſh *orchis*, with red leaves and flowers. 78. The green-flowered palmated *orchis*. 79. The largeſt palmated *orchis*, with a bright-red ſweet-ſcented flower. 80. The greateſt palmated mountain *orchis*. 81. The narrower-leaved great palmated mountain *orchis*. 82. The white-flowered palmated mountain *orchis*, with ſpotted leaves. 83. The narrower-leaved palmated alpine *orchis*, with a black flower. 84. The narrow-leaved palmated mountain *orchis*, with roſe-coloured flowers. 85. The narrow-leaved palmated mountain *orchis*, with white flowers. *Tourn.* Inſt. p. 443.

ORCHIS-*root*, in the materia medica, is otherwiſe named *ſalep*, vulgarly called *ſaloop*. See the article SALEP.

ORCHIS, in ichthyology, a name given by Geſner, and ſome others, to the fiſh, commonly called *orbis*, and by Artedi the ſpherical *oſtracion*, with four teeth, and ſmall ſpines all over it. See the article OSTACION.

ORCHOTOMY, a word uſed by ſome chirugical writers for the operation of caſtration.

ORCYNUS, in zoology, a name by which ſome authors have called the fiſh commonly known by the name of the tunny or thynnus. *Willoughby*'s Hiſt. Piſc. p. 176. See THYNNUS.

ORDER, in rhetoric. See DISPOSITION, *Cycl.*

ORDINARY (*Cycl.*)—ORDINARY *Court of Chancery*. See PETTY *bag*.

ORDINATE (*Cycl.*)—To find the greateſt and leaſt *ordinates* to curves. See MAXIMUM, *Cycl. & Suppl.*

ORE (*Cycl.*)—Some *ores* are ſo kindly as to melt readily of themſelves, without any aſſiſtance from the common fluxes; theſe are of great value to the owners. Other are more intractable and require the aſſiſtance of various fluxes, and others ſo very obſtinate as not be work'd in the larger way, where there can be no very conſiderable expence allow'd for fluxes. On this account many mines remain at this time unwrought, as being untractable in the large way without great charges; hence the improving the buſineſs of fluxes ſerves to render them at once both cheap and effectual, and muſt be of great ſervice to metallurgy.

Some of the cheapeſt and moſt powerful fluxes now in uſe are dry'd wine lees, dry'd cow-dung and horſe-dung, dry'd river-mud, fuller's-earth, iron filings, common ſalt, potaſh, and ſandiver. Theſe may be uſed in the larger works, as nitre, tartar, borax, ſal armoniac, and mercury ſublimate in the leſs: as for compound fluxes they are very numerous, almoſt every operator having his particular noſtrum; and it is plain that ſome fluxes are better adapted to the *ores* of ſome metals than others; but certainly a few general ones might be fixed upon, one or other of which would anſwer all the operator's expectations.

The following three preparations are all very general, very powerful, and not expenſive. 1. Take of nitre, prepared by long boiling in lime water, of ſea-ſalt melted in the fire, of ſandiver, and of dry wine lees, each one part; glaſs of lead three parts, and powdered glaſs eight parts; mix them all well together, and uſe them in an equal weight with ſtubborn *ores*. 2. For a ſtill ſtronger flux take equal parts of white tartar, common ſalt, and nitre prepared as above; calcine all together to a white powder, and mix with it its own weight of glaſs of lead: of this flux add two parts to one part of the moſt ſtubborn ores. 3. For every powerful ſaline flux, take of the ſtrongeſt ſoap-boiler's lees four pounds, of white tartar and common ſalt, melted in the fire, each one pound, boil theſe together, with four gallons of human urine, to a dry ſalt. This flux is particularly ſerviceable where ſulphur and cobalt abound, and render the *ore* very refractory. *Shaw's* Lectures, p. 257.

The *ores* of the richer metals, as gold and ſilver, uſually contain a very conſiderable portion of ſulphur, and Alonſo Barba tells us, that the moſt expert mineraliſts in Peru, always eſteem abundance of ſulphur a ſign of a rich *ore* in the neighbourhood. Among the richeſt *ores* of the mountain of Potoſi, there are ſuch quantities of native brimſtone, that the cavities in the mines are often filled with a blue flame, on only bringing a lighted candle into them ſo as to touch their ſides. It has been wondered at, that where there is abundance of ſulphur in theſe mines, there ſhould be no vitriol found, that being only a metal diſſolved by means of ſulphur; but this objection ceaſes, when we conſider the denſe and compact nature of theſe two metals, which renders them not ſoluble by means of ſulphur, as the others are. Wherever there is ſtore of ſulphur, or of pyrites, or other ſtones which contain ſulphur in the mines of copper and iron, great ſtore of vitriols are always found there alſo, being formed by the corroſion of the *ores* of thoſe metals by ſulphur, which renders them ſoluble in water, from which they again concrete in form of ſalts. Chemiſtry is able to imitate the operations of nature on this occaſion ſeveral ways; for copper, or iron, being formed in thin plates, and either rubbed over with the acid ſpirit of ſulphur, or calcined with powder of common ſulphur, become ſoluble in water, and afford cryſtals of true vitriol wholly analogous to the natural ones, and either blue or green, as iron, or copper are the metals employed; but theſe proceſſes not being able to produce cryſtals of ſalt, or vitriol, from either ſilver, or gold, it is not wonderful that nature is not able to form them by the ſame means.

The general formation of ſulphur from the ores of metals yet lying in the bowels of the earth, is, probably, after this manner. An acid, ſaline, ſulphureous ſteam, or vapour, ſuch as common ſulphur is eaſily reduced to, by heat not greater than that within the bowels of the earth, inſinuating itſelf either through the pores of ſtones, or through their cracks, which are always frequent about the veins of metals, penetrates into the bed of *ore*; ſuppoſe of copper. The vapour is continually ſupplied with freſh quantities from below; and as it blends itſelf with the metal, corrodes it as the fume of brimſtone will the ſame copper in plates. The metal, thus corroded, being ſoluble in water; as we find by experience, it is neceſſary, that the *ore* muſt, under the ſame management, be ſo too; and, in this caſe, the water, which is continually pervading all the ſtrata of the earth, waſhes off the diſſolved metal; and wherever it happens to be ſtayed in ſmall quantities afterward, whether within the vein of the metal, or at a diſtance from it, it cryſtallizes the ſalt it contains, and common blue vitriol is produced, if the metal in the vein be iron. The ſame proceſs is obſerved, and the event is the ſame in all reſpects, when copper is the metal corroded, except that the vitriol, inſtead of blue, is green; this plainly accounts for the obſervation of the workers in copper-mines, that vitriol and brimſtone are uſually found together, the one being a natural conſequence of the other. Sulphur is, indeed, often found where there is no vitriol, but vitriol is very ſeldom found without ſulphur; it being not a diſtinct principle, but a genuine production of ſulphur. Phil. Tranſ. N° 104.

Dreſſing of ORES. See the article DRESSING.

Iron ORE. See IRON.

Gold ORE. See GOLD.

Firm, *Pottern*, and *Steel* ORE. See LEAD *ore*.

OREILLARD, in the manege. See WIDE-*eared*.

OREJUELAS, in botany, a name uſed by ſome authors for the *flos auriculæ*, a flower growing in New Spain, and uſed there in making chocolate. *Dale*, Pharm. p. 339.

OREON, a name given by the antients to a kind of *horſe-tail*, which they found growing on the mountains in wet and damp places. It is to this ſpecies that many authors have attributed the principal virtues of the genus; and this ſeems to have been the ſame with our great water *horſe-tail*. Neophytus ſays, that it roſe up with a ſingle ſtalk, reſembling a young reed, and that this was compoſed of ſeveral points, which, in the manner of cups, were inſerted one into another; and that from theſe joints the leaves grew, and that they reſembled thoſe of the pine-tree. The branches are what this author calls leaves, and they do pretty well reſemble the leaves of the pine-tree. They are long and ſlender, and of a bright green. Our great *horſe-tail* loves the heads of ſprings in hilly countries, and is always moſt plentiful in ſuch places.

OREOSELINUM, *mountain-parſley*, in botany, the name of a genus of plants of the umbelliferous kind, the characters of which are theſe: the flower is of the roſaceous kind, being compoſed of ſeveral petals, arranged in a circular order on a cup, which afterwards becomes a fruit compoſed of two large, oval, flattiſh, ſtriated, and marginated ſeeds, which ſometimes depoſit their covering. To this it may be added, that the leaves are like thoſe of parſley, or hemlock.

The ſpecies of *oreoſelinum* enumerated by Mr. Tournefort are theſe: 1. The great, parſley-leaved *oreoſelinum*. 2. The leſſer, parſley-leaved *oreoſelinum*. 3. The hemlock-leaved marſh *oreoſelinum*. 4. The ſhrubby, aniſe-leaved, African *oreoſelinum*, which produces the *galbanum* of the ſhops. This is called by many *ferula galbanifera*. *Tourn.* Inſt. p. 319.

OREXIS, *appetite*. The appetite, when exceſſive, or otherwiſe vitiated, is diſtinguiſhed by medical writers into ſeveral kinds, and deſcribed under ſeveral names, according to its difference in degree, and other particulars.

The firſt kind is the *addephagia*: this is the name given that ſpecies in which the food is not only eaten in too large a quantity, but is ſwallowed in a particularly ravenous manner.

The ſecond is the *orexis canina*: in this caſe the patient is continually eagerly longing for food, and if it is not ready ſo ſoon as he deſires, he is ſubject to fainting fits after the recovery, from which he does not feel the ſame craving appetite.

The third is the *pica*, or *ſitta*: this is the caſe when the patient has an eager appetite to things not fit for food, ſuch as chalk, cinders, tobacco-pipes, and the like.

The fourth is the *malacia*: this is diſtinctively made the name of that ſpecies of *exceſſive appetite* in which the pati-

ent has a great desire for some particular things, but those of the nature of common food, and usually of the nicer, and more delicate kind.

Signs attending it. An over-large eating is usually attended with cardialgias, anxieties, and straitness of the breast; after this, with nauseas, eructations, and not unfrequently with a vomiting, or a diarrhœa; often a dizziness of the head follows, and sometimes very violent pains in it, with a lassitude and pains in the limbs, and pains and rumblings in the abdomen; finally, sometimes fevers, sometimes suffocations, and sometimes convulsions, are the consequence.

Persons subject to it. The *excess of appetite*, in its different kind, affects different sets of people. The *addephagia* is usually the case with boys who are just come to distinguish good taste, and feed as their parents do; and sometimes with women who have more sensation than judgment. People in general of sanguine and sanguineo-phlegmatic habits, eat more food than others; and choleric persons often eat, and usually swallow their food, quicker than others. Persons of melancholic habits, are usually of all others, the least eaters. Finally, people, in general, eat heartily, and even excessively, when they come, from a coarse and homely diet, to a more elegant and agreeable one; and this *excessive appetite* becomes a symptomatic complaint with people who are troubled with worms, and with hypochondriac complaints, with quartans, and often with epilepsies.

The *malacia* seems particularly to affect women during the time of their being with child. The *pica* is common to women with child; to young women before the first eruption of the menses; with those who are emaciated by a too violent flux of that discharge; and, finally, sometimes, though more rarely, to persons in epilepsies, and in quartans.

Causes of it. *Excessive appetite* is generally occasioned by a too great love to agreeable tastes, which generally degenerates into a custom of devouring things of agreeable flavours greedily; and, finally, into an habitual and almost necessary desire of them. In infants who are over-much fed by their nurses, the fault is not in the will, but even this also, in fine, becomes habitual, and not to be overcome easily.

Prognostics in it. *Excessive appetite* does great mischief among men, and is a very common complaint, inasmuch that there are ten thousand who err in eating more than nature requires, for one who eats less. It is common for persons recovered from illnesses to have an *excessive appetite*; but, if this be indulged to the extent, it usually brings on either a return of the same disease, or, at least, one equally bad. People, after long hunger, have also the same sort of *excessive appetite* as after diseases, but there have been frequent instances, that those who indulged it freely have died upon the spot. In general, the consequences of *excessive appetite* indulged, is diseases of many kinds, particularly obstructions of the viscera, cachexies, and atrophies. When the *pica* attends a quartan, it very often happens, that all medicines are vain in the attempt of a cure, till that unnatural *appetite* has been perfectly sated. When young girls fall into a *pica* from a want of the menses at a due time, they are always relieved from it by the appearance of that evacuation; but in persons who fall into it from inordinate profluvia of that discharge, it is usually very difficult of cure, and the same difficulty always attends it when hereditary.

When people have eat to an immoderate degree by reason of any of these kinds of *excessive appetite*, the best method of relieving them, is by giving them large draughts of warm water, till they vomit; or, if the stomach will not be brought to discharge its contents by this means, a few grains of emetic tartar are to be given, or a small dose of ipecacuanha. After this the bowels are to be gently relaxed; but this is by no means to be done by any violent medicines, the stimulus of which would bring on violent and dangerous pains. After the mischief of a monstrous repletion is, by this means, got over, the best preservative for the future is abstinence, and gentle exercise. There have, however, been instances of people being cured of this disease, by palling the *appetite* by large draughts of oil, regularly taken, three times a day. The good women have a way of curing the *pica* in girls, by making the chalk, and other such things which they are to eat, bitter, or of some other disagreeable taste; when a girl has been once tricked in this manner, she will often have as violent a distaste to these unnatural eatables, as she before had an inclination for them; and, in like manner, grown persons who have violent *appetites* to certain particular foods, have been cured by conveying into them an infusion of tobacco, or some other such thing as will provoke vomiting, so disguised as not to be tasted, while eaten. When the stomach and bowels, over-loaded by these meals, are, of themselves, discharging their abundant contents, by vomit, or stool, it is a very rash and dangerous practice to give any thing to stop those emotions till the whole is thoroughly carried off. *Junker's* Consp. Med. p. 605, seq. See the articles CANINE, BULIMY, &c.

ORFUS, in zoology, the name of a fresh water fish, common in Germany, and called there the *orft*, the *oerve*, and the *nerfling*; seeming by the descriptions of Gesner, and other authors, to be the same with our *rudd*, or *rubellio fluviatilis*. See Tab. of Fishes, N°. 43. *Willughby's* Hist. Pisc. p. 252.

ORGANO, in the Italian music, is used to signify the thorough bass. It is usually scored with figures over the notes, for the harpsichord, bass-viol, and lute.

ORGUES, (*Cycl.*) are preferable to herses, or portcullises, because these may be either broke by a petard, or they may be stopped in their falling down; but a petard is useless against an *orgue*; for if it break one or two of the pieces, they immediately fall down again, and fill up the vacancy; or if they stop one or two of the pieces from falling, it is no hindrance to the rest; for being all separate, they have no dependance upon one another.

ORICHALCUM, or AURICHALCUM, *brass*. See the article BRASS, *Cycl.* and *Suppl.*

It is to be observed, that zink is the metal which has the power of giving a yellow colour to copper. We long supposed, from calamine's answering the same purpose, that two different substances could do this; but it has been since found that they are the same, and that calamine is no other than the ore of zink. See the article CALAMINE.

It is evident from all accounts, that the *orichalcum* of the antients was a fictitious substance, not a natural metal. They made it on the same basis that we make brass at present; but they had several ways of doing it, and distinguished it into several kinds. They had a white sort in frequent use and great esteem; and even the yellow they distinguished into two principal sorts, under different names. The *orichalcum* and *æs flavum*, brass and yellow copper, are with us synonymous terms; but with them they were used to express different combinations of the ingredients. Pliny tells us indeed of a natural mine of this metal found somewhere, and that the metal produced from it was in very great esteem. He says, that the making of brass was first found out in Cyprus, and that it was an artificial metal, but that this natural kind was greatly superior to it, and was the only kind in esteem, so long as the mine yielded any of it, but that at last it was exhausted. This account is unquestionably erroneous; but yet it has taken so much footing in the world from the authority of this author, that many suppose it truth, and think that we have not at present the metal called *orichalum* by the antients. They who suppose, according to Pliny, that there was once a vein or mine of this metal, which was afterwards lost again, certainly err, and there is sufficient proof of the truth of the contrary opinion by all the Greek writers, declaring the manner in which *oricalcum* was made, which was with copper and calaminaris-stone, as brass is made at this time. Some indeed have somewhat perplexed the matter, by adding the word pseudoargyron, as a part of the composition. Among these is Strabo, but by that author in other places we find, that all that he means by this name is, the calamine found in silver mines, which resembled, as the common calamine does, some kinds of silver ore; so that the two accounts come to the same thing.

ORICHALCUM, or AURICHALCUM *album*, *white brass*. This was a metal well known among the antients, and celebrated by Aristotle and by Strabo, and others, under the name of κραμα λευκον. It was made by mixing an earth with copper while in fusion; but what that earth was, we are not informed.

There have been many objections made to the name *aurichalcum album*, as a contradiction in terms. The epithet white being by no means allowable with a word which is generally supposed to express gold-coloured brass; but this is an error. The truth is, that *aurichalcum* is an error in orthography; the true word being *orichalchum*, ορειχαλκον, mountain copper. The Romans changing the *o*, in a Greek word into *au*, when they adopted it into their own language, is common; and we daily see so many instances of it, that this custom alone might justify it, were the word always written *aurichalchum* by the Romans; which, however, it is not, Virgil, and several others expressly calling it *orichalchum*, according to the original or proper orthography: there was, therefore, no idea of gold, nor any other denomination of colour intended in the word *aurichalchum*; all that was expressed by it was, mountain copper; and this term was made to express a mixed metal, made of copper and of some earth, stone, or other mineral. In this sense, the mixture of copper with that of earth, whatever it was that turned it white, was as properly called *orichalchum album*, as that with calamine was *orichalchum flavum*, or simply *orichalchum*. We know several ways of turning copper white, one of which was much practised some years ago, and spoons and other utensils made of it, had the name of *alchymy* things; but this was done by means of arsenic; a thing not known to the antients: this, therefore, could not be the same with their white brass, and indeed, none of our methods seem to be the same with theirs, since the metal is debased by all ours, and becomes brittle; whereas, in their management, according to their own accounts, it seems not to have lost any thing of its ductility, tho' it acquired a peculiar brightness.

ORIENTAL, (*Cycl.*) in astronomy. A planet is said to be *oriental* when it rises in the morning before the sun.

Hybernal

Hybernal ORIENT, that point of the horizon where the ſun riſes when in the firſt degree of Capricorn. See OCCIDENT.

ORIGANUM, *wild marjoram*, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts of one leaf, and is of the labiated kind, the upper lip is erect, of a roundiſh ſhape, and bifid, the lower is divided into three ſegments. The piſtil ariſes from the cup, and is fixed in the manner of a nail into the hinder part of the flower, and ſurrounded with four embryos, which afterwards become many ſeeds, and ripen in the cup of the flower. To theſe marks, it is to be added, that the *origanums* all bear their flowers in a ſort of ſcaly ears or ſpikes.

The ſpecies of *origanum* enumerated by Mr. Tournefort are theſe: 1. The common *origanum*. 2. The common *origanum* with variegated leaves. 3. The white wild *origanum*. 4. The low, woolly, procumbent *origanum*. 5. The heracleotic *origanum*, or *cunila gallinacea* of Pliny. 6. The *origanum* of Crete, called *pot-marjorum*, the genuine hyſſop of the antients, according to Lobel. 7. The round-leaved *origanum*. 8. The *origanum* with the ſmell of pennyroyal. 9. The broad-leaved, ſmooth, low *origanum*. 10. The Canada *origanum*, with umbellated flowers. 11. The broad-leaved woolly cretic *origanum*, uſually known by the name of *dittany of Crete*. 12. The *origanum* of mount Sipylus. 13. The ſlender-headed Canada *origanum*. 14. The woody *origanum* of Syracuſe, with large umbels of flowers. *Tourn.* Inſt. p. 199.

Origanum is a very pleaſant aromatic. An infuſion of the plant, drank in the manner of tea, is of great ſervice in diſorders of the ſtomach; it abſterges the viſcous matter apt to lodge there, and thereby promotes an appetite and aſſiſts digeſtion. It alſo diſpels flatus's, and is eſteemed good in jaundices, and all other chronic caſes occaſioned by obſtructions of the viſcera.

ORIGINARY, *originarii*, among the Romans, an appellation given to ſlaves born in their maſter's houſes, who were otherwiſe called *vernæ*. *Hofm.* Lex. in voc.

ORIOLUS, in zoology, a name by which ſeveral authors have called the *galbula*, a very beautiful yellow bird of the thruſh kind, remarkable for its manner of hanging its neſt. *Albertus*. See the article GALBULA.

ORITES, in natural hiſtory, the name of a ſtone deſcribed by the antients, and celebrated by the writers of the middle ages for its wonderful virtues. Pliny ſays, that it was round, and remained unhurt in the fire, and that ſome called it *Sideritis*. To this the later writers have added, that there are three kinds of it; the firſt round and black: this rubb'd over with oil of roſes was famous for the bites of venomous beaſts. The ſecond was green, variegated with veins and ſpots of white: this was to be carried about people, to preſerve them from many ſorts of injuries. And the third was compoſed of parallel plates, and ſaid to have the virtue of cauſing abortion, if only carried in the pocket.

ORITORIUS *lapis*, a name given by Ludovicus Dulcis, and ſome other authors, to the *ochreoferreous ætitæ*, or eagle ſtones; particularly to a ſpecies of them common in Germany, and uſed in the ſhops there, and in ſome other places, under the name of *eagle ſtones*. Theſe are of a browniſh colour and ſmooth ſurface, and are eaſily broken, being only compoſed of a thin cruſt of ferrugineous earth, encloſing ſeveral ſmall lumps of a greeniſh marle, which rattle in it when ſhaken.

ORIZEUS *color*, a term uſed by authors to expreſs the yellow colour in the eyes and urine of perſons afflicted with a jaundice. See JAUNDICE.

ORKNEY-*beans*, in natural hiſtory, a name given by authors to a ſort of fruit found on the ſhores of the *orkney* iſlands near Scotland. Theſe are of ſeveral diſtinct ſpecies, and are none of them the produce of thoſe iſlands, nor of any places thereabout, but are probably of American origin, many of them being plainly natives of Jamaica.

They are found principally on thoſe coaſts which are moſt expoſed to the waves of the great ocean, and are on theſe ſo plentiful, that they might be gathered in large quantities, if of any value; but the only uſe they are put to is the making ſnuff-boxes out of them. Sir Robert Sibbald, and Mr. Wallace, in their accounts of Scotland, have both named them under the title of *Molucca beans*. See MOLUCCA *beans*.

ORLEANA, in the materia medica, the name of the *arnotto*, or *uruca*. *Dale*, Pharm p. 388.

ORMENA, among the antient naturaliſts. See ASPARAGUS.

ORNICUS *lapis*, a name given by ſome anthors to the *ſapphire* of the antients, which is a peculiar ſpecies of our *lapis lazuli*, in which the gold-coloured matter is not diſpoſed in veins, but in ſeparate ſpots of the form of a ſtar. It was firſt called *o iniſcus*, and *orinus*, by corruption from *aurinus*, golden, and thence came, at length, the word *ornicus*.

ORNITHIÆ, a name given by the antients to certain winds, which uſually blew in ſpring, at the time when the birds of paſſage came over to them. Pliny ſays, that theſe winds blew from the Weſt, and that, by ſome, the Eteſian winds were called by this name. Others ſuppoſe that they blew from the North, or North-Weſt.

ORNITHOGALUM, *ſtar of Bethlehem*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is liliaceous, being compoſed of ſix petals, arranged in a circular form. The piſtil ſtands in the center of the flower, and finally becomes a roundiſh fruit, or ſeed-veſſel, divided into three cells, and containing a number of oblong ſeeds; to this it is to be added that it has a bulbous or tuberous root, in which it differs from the phalangium, which has a fibrous one.

The ſpecies of *ornithogalum* enumerated by Mr. Tournefort are theſe: 1. The great Syrian *ornithogalum*, with umbellated flowers. 2. The great, narrow-leaved, *ornithogalum*, with umbellated flowers. 3. The broad-leaved, middle-ſized, white *ornithogalum*, with umbellated flowers. 4. The narrow-leaved, middle-ſized, white *ornithogalum*, with umbellated flowers. 5. The leſſer white *ornithogalum*. 6. The umbellated *ornithogalum*, with bluiſh white flowers. 7. The greateſt, broad-leaved, Alexandrine *ornithogalum*. 8. The Indian, broad-leaved, *ornithogalum*. 9 The great, narrow-leaved, *ornithogalum*, with greeniſh white flowers. 10 The great, narrow-leaved, *ornithogalum*, with flowers in ſpikes. 11. The ſpiked *ornithogalum*, with ſnow-white flowers. 12. The great, white-ſpiked, French *ornithogalum*. 13. The great, white-ſpiked, Byzantine *ornithogalum*. 14. The ſpiked *ornithogalum*, with greeniſh-white flowers. 15. The Spaniſh white-flowered, ſpiked *ornithogalum*. 16. The pale, blue-flowered *ornithogalum*. 17. The *ornithogalum* with a large flower growing on a ſmaller. 18. The great, pale yellow *ornithogalum*. 19. The yellow *ornithogalum*, with larger flowers. 20. The tuberous-rooted, African, yellow *ornithogalum*, with onion-like leaves, and ſweet-ſcented flowers. 21. The common, wild *ornithogalum*. 22. The leſſer, wild, yellow *ornithogalum*. 23. The narrow-leaved, bulbiferous, *ornithogalum*. 24. The yellow-flowered, Portugal *ornithogalum*, with capillaceous leaves. 25. The Indian *ornithogalum*, with yellowiſh-green flowers. 26. The African *ornithogalum*, with green flowers, growing one out of another. 27. The one-leaved, ſpiked *ornithogalum*, with a ſnow-white, ſweet-ſcented flower. 28. The blue-flowered, two-leaved, German *ornithogalum*. 29. The trifoliate, German *ornithogalum*, with deep blue flowers. 30. The bifoliate, German *ornithogalum*, with fleſh-coloured flowers. 31. The bifoliate, German *ornithogalum*, with white flowers. 32. The narrow-leaved, white, late-flowering, *ornithogalum*. 33. The blue-flowering *ornithogalum*, with yellowiſh green ſtamina. 34. The purple-flowered *ornithogalum*. 35. The ſpiked *ornithogalum*, with grey flowers. 36. The blue-flowered, Conſtantinople *ornithogalum*. 37. The Conſtantinople *ornithogalum*, with bluiſh purple flowers. 38. The Conſtantinople *ornithogalum*, with a white flower. 39. The Conſtantinople *ornithogalum*, with duſky, bluiſh flowers. 40. The borrage-flowered, Conſtantinople *ornithogalum*. 41. The blue *ornithogalum*, with ſtriated flowers. 42. The Spaniſh, deep-blue, *ornithogalum*. 43. The great, purpliſh, blue *ornithogalum*. 44. The ſummer *ornithogalum*, with flowers ſtanding alternately on the ſtalks. 45. The great, autumnal *ornithogalum*, with pale, purple flowers. 46. The great, autumnal *ornithogalum*, with white flowers. 47. The leſſer, autumnal *ornithogalum*, with purple flowers. 48. The leſſer, autumnal *ornithogalum*, with blue flowers. 49. The little, ſpring *ornithogalum*. 50. The blue-flowered, Portugal *ornithogalum*. 51. The broad leaved, Portugal *ornithogalum*, with violet-coloured flowers. 52. The broad-leaved, Portugal *ornithogalum*, with fleſh-coloured flowers. 53. The broad-leaved, Portugal *ornithogalum*, with greviſh flowers. 54. The broad-leaved, Portugal *ornithogalum*, with white flowers. 55. The Peruvian, eriopherous *ornithogalum*. 56. The oriental, eriopherous *ornithogalum*. 57. The *ornithogalum* of the ſea ſhores, commonly called the *red-rooted ſquill*. 58. The white-rooted, maritime *ornithogalum*, commonly called the *white-rooted ſquill*. 59. The maritime *ornithogalum*, with an eſculent root, called the *eſculent ſquill*. *Tourn.* Inſt. p. 378.

The ſeveral ſpecies of this plant produced in our gardens are all propagated with great eaſe by the off-ſets which the roots produce in very great abundance. The beſt time to tranſplant the roots is in the beginning of July, when the leaves are decayed. They ſhould have a light, ſandy ſoil, which, if it be over-dunged, will decay, and rot the roots: they continue flowering a long time, and are a very great ornament in gardens, but they ought to be tranſplanted once in two or three years, otherwiſe the roots grow luxuriant in off-ſets, and the flowers are weak. *Miller's* Gard. Dict.

ORNITHOPODIUM, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the papilionaceous kind, and its piſtil which ariſes from the cup finally becomes a hooked, or falcated, jointed pod, of a flattiſh and undulated form, and containing, in each joint, one roundiſh ſeed. To this it is to be added, that the pods of this plant uſually grow four or five together; and by that means in their ſhape reſemble a bird's foot.

The ſpecies of *ornithopodium* enumerated by Mr. Tournefort are theſe: 1. The great *ornithopodium*. 2. The little *ornithopodium*. 3. The *ornithopodium* with roots compoſed of knotty tubercles. 4. The ſcorpioides *ornithopodium*, with flatted

pods.

pods. 5. The Portugal, ſcorpioide *ornithopodium*, with undulated pods. 6. The purſelain-leaved *ornithopodium*. *Tourn.* Inſt. p. 400.

ORNITHOSCOPI, ὀρνιθοσκοποι, in antiquity, diviners, or ſoothſayers, who made predictions, and drew omens, from birds. They were likewiſe called *ornithomantes*, and *orneoſcopi*, &c. *Potter*, Archæol. Græc. l. 2. c. 15. T. 1. p. 321.

OROBANCHE, *broom rape*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the perſonated kind, divided into two lips, the upper of which is galeated, and the lower divided into three ſegments. The piſtil ariſes from the lower part of the cup, and finally becomes an oblong fruit, conſiſting of only one cavity, which uſually contains extremely minute ſeeds.

The ſpecies of *orobanche*, enumerated by Mr. Tournefort, are theſe: 1. The great large flower'd *orobanche*, ſmelling like cloves. 2. The great ſtinking *orobanche*. 3. The great Portugal *orobanche*, with purpliſh flowers. 4. The ſmall flowered *orobanche*. 5. The bluiſh flowered *orobanche*. 6. The branched, purple-flowered *orobanche*. 7. The blue-flowered, branched *orobanche*. 8. The whitiſh-flowered, branched *orobanche*. *Tourn.* Inſt. p. 175.

OROBO, a name given by the chemiſts to any ſort of metallic glaſs.

OROBOIDES, a name given by Hippocrates, and other authors, to a furfuraceous ſediment in the urine of perſons who have the jaundice: it is uſually of a rediſh brown colour; and is not peculiar to that diſeaſe, but is found in ſome others.

OROBUS, *bitter vetch*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the papilionaceous kind; from the cup there ariſes a piſtil, which is covered with a membrane, and finally becomes a membranaceous pod of a cylindric figure, uſually containing oval ſeeds. To this it is to be added, that the leaves grow in pairs on a middle rib, which terminates in a point.

The ſpecies of *orobus*, enumerated by Mr. Tournefort, are theſe: 1. The purple-flowered, ſpring *orobus* of the woods. 2. The vernal, wood *orobus*, with a pale red flower. 3. The broad-leaved *orobus*, with ſmall purple flowers. 4. The broad-leaved *orobus*, with ſmall pure white flowers. 5. The narrow-leaved, aſphodell-rooted, wild *orobus*. 6. The vetch-leaved, wood *orobus*. 7. The red-ſtalked, vetch-leaved, wood *orobus*. 8. The Italian, narrow-leaved *orobus*, with variegated flowers. 9. The wood *orobus*, with oblong ſmooth leaves. 10. The Engliſh, wild, wood *orobus*. 11. The Pyrenæan *orobus*, with nervous leaves. 12. The American *orobus*, with ſcarlet fruit, marked with a black ſpot, by ſome called the *phaſeolus* of America, and the *abrus*, and ſcarlet Indian pea *Tourn.* Inſt. p. 393.

OROCONITES, in the materia medica, a name given by Hippocrates, and others, to a bulbous root that is recommended as a rich food. It has the name from the Greek, ὄρος, a mountain, and κονιτες, of a conic figure. This ſhews that it was a root of ſuch a ſhape, found growing in mountainous places; but the learned have been puzzled in their attempts to find out what it was.

Guillandinus is of opinion, that the *oroconites* of Hippocrates is the *traſi*, or ſweet *cyperus* root, but there are many arguments againſt this opinion, though the two circumſtances expreſſed in its name, that is, the place of growth, and the ſhape of it, are ſufficient to throw this to the ground. The *traſi* grows in low marſhy grounds, near waters, and its roots are ſmall tubera of the ſhape of a hazel-nut, whence the Spaniards, who are very fond of them, have called them *avellanda*. The Arabians have a root which they call the bulb, by way of eminence. This ſeems, indeed, to be the ſame with the *oroconites* of Dioſcorides; and they give the ſame account of its virtues, and tell us, that it grew far from waters on the mountains of Syria, near Damaſcus, and elſewhere, and that it was of the ſize and ſhape of a pear; this may very well be called a conic ſhape in a root.

ORONTIUM, in botany, a name given by ſome authors to the *antirrhinum*, called in Engliſh *calf's ſnout*, or *ſnap-dragon*. *Ger.* Emac. Ind. 2.

OROSPIZA, in zoology, a name by which the antient naturaliſts called the *brambling*, or *mountain finch*.

The word is Greek, and expreſſes *mountain-chaffinch*. See the article MONTIFRINGILLA.

ORPELLO, a preparation of braſs uſed in the glaſs trade, and prepared in this manner: cut plates of braſs into ſmall pieces, and place them in a luted crucible, in a ſtrong fire, but not ſo violent as to melt it. Let it ſtand in this manner for four days, in which time it will be well calcined; when cold, powder, and ſift it, and finally grind it on a porphyry. This will be a black powder; ſpread this on tiles, which place on burning coals in the leer, near the hole, for four days; take off the aſhes that may fall into it, and finally powder and ſift it fine for uſe. It is known to be nicely prepared, when, on mixing with the melted metal in the glaſs furnace, it makes it ſwell and boil.

The colour it gives is a very elegant ſky-colour, and a ſea-green, or a mixt colour, between them, according to the quantity, and degree of calcination. *Neri*'s Art of Glaſs, p. 35.

ORPHAN (*Cycl.*) — Among the Athenians, the *orphans* whoſe fathers had loſt their lives in the ſervice of their country, were under the guardianſhip of the *polemarchus*, who was to provide them with a competent maintenance, out of the public treaſury. See POLEMARCHUS.

ORPHANUS, in natural hiſtory, a name given by ſome authors to a poor ſpecies of *opal*, called by ſome *pſeudo-opalus*: it has no other colours beſide a milky white, and purpliſh red. This ſtone is frequent in Germany, and Hungary.

ORPHEOTELISTÆ, ὀρφεοτελισται, in antiquity, perſons initiated in the Orphic myſteries. They aſſured all that were admitted into their ſociety of certain felicity after death; which when Philip, one of that order, boaſted of, Leotychidas, the Spartan, replied, Why do not you die then, you fool, and put an end to your misfortunes, together with your life? At their initiation, little elſe was required of them beſides an oath of ſecreſy. *Potter*, Archæol. Græc. T. 1. p. 497.

ORPHEUS, in zoology, the name of a fiſh caught in the Archipelago. It is of a broad and flat figure, and of a fine purple colour; its eyes are large and prominent, and its teeth ſerrated; it has only one fin on the back, and the anterior rays of that are prickly, the others ſoft to the touch. Its anus is ſmall, and it is ſaid to have no paſſage for the ſemen.

This was the fiſh called *orpheus* by the antients, but the modern Greeks call another fiſh by that name. This is of a flat figure, but very thick, has a ſmall mouth, and is covered with ſmall, but very rough ſcales, which adhere very firmly to the fleſh; the tail is not forked; it has fleſhy lips, and very ſmall teeth; its back and ſides are black; its belly white; it has a large black ſpot at the root of the tail. Its head is reddiſh, and its fins are very elegantly diverſifyed with various colours; it has only one back fin, and that has the anterior ray prickly, the hinder ones not at all ſo. It grows ſometimes to twenty pound weight, and is much eſteemed among the modern Greeks. *Geſner* de Piſc. p. 752.

ORPIMENT, (*Cycl.*) *auripigmentum* — *Orpiments* are inflammable foſſile ſubſtances compoſed of numbers of thin flakes, like the talcs, which eaſily ſplit, and are ſeparated from one another, and are flexile, and not elaſtic, ſoluble in oil, fuſible in a moderate fire, and yielding in burning an offenſive ſmell like that of garlic.

Theſe, like the talcs, are, in ſome of the ſpines, compoſed of large plates, or flakes, each making the whole ſurface of the maſs, and, in others of ſmall flakes lodged in extraneous matter, or cohering alone into a maſs in form of ſpangles.

Of this genus of foſſils, there are only three known ſpecies: 1. A broad-flaked, gold-coloured kind, well known among the antients, as is plain from the deſcription of it left us by Dioſcorides, and much eſteemed at preſent by our painters. This is found in ſeveral places, as in the iſlands of the Archipelago, in the mines of Goſſelaer, in Saxony, in ſome parts of Turky, and the Eaſt-Indies, and in its utmoſt purity about Smyrna; this makes the fineſt of all yellows in painting. 2. The ſmall-flaked, yellow kind, which is the common *orpiment* of the ſhops, and is a fine colour, though greatly inferior to the former. This is found in many parts of the Turkiſh dominions, and in Germany. And, 3. Red *orpiment*. This has been a name given by the more judicious to ſandarach, and, by the vulgar, to red arſenic, but is to be reſtrained only to this foſſile, which is of a fine bright red, and of the regular texture of the *orpiments*, and anſwering all their characters. This is a very beautiful ſubſtance of a fine bright red, very gloſſy, and a little tranſparent, and is found in the Turkiſh dominions, in the iſlands of the Archipelago, and even in our own country, Dr. Hill having lately received ſome of it from Cornwall, under the name of red mundic.

The Engliſh druggiſts are guilty of an unpardonable piece of ignorance, in that, in general, they know no difference between yellow *orpiment*, and the yellow factitious arſenic, which they regularly ſell under its name; the *orpiment* is known to be a ſafe internal medicine, and the thing they ſell under its name is a very terrible poiſon. The colour-men, however, who ſell both are well acquainted with the difference. *Hill*'s Hiſt. of Foſſ. p. 204.

ORRHAGOGA, a name given by the antients to ſuch medicines as operated violently, as purges, and evacuted ſerous and watery humours.

ORRHOPIGION, a word uſed by anatomical authors, ſometimes to expreſs the extremity of the ſpine, but more frequently the line or ſeam which runs from the penis along the middle of the ſcrotum to the anus.

ORRHOPISSA, a name given by the antients to the thinner or more fluid parts of tar.

ORRICE, a name given by the vulgar to the *iris-root*. See the article IRIS.

ORRUS, in botany, a name by which many of the antients called the cultivated pine tree, from its being remarkably full of juice.

The firſt perſon who has given us the name is Theophraſtus; but he is followed in it not only by the other Greeks, but alſo by the Latins, who have called the ſame tree for the ſame reaſon *ſapinus*, a contraction or abbreviation of the word *ſapapinus*, the juicy pine. Pliny tells us, that this laſt was the name of the manured pitch tree; but in this he errs, for Vitruvius, and others, tell us that the pine nuts, *nuces pineæ*, which were eaten

and used in medicine, were the fruit of the *ſapapinus*, or *ſapinus*; and it is evident, that theſe muſt be the produce of a pine tree, not of a pitch tree, or any thing of the fir kind.

ORTHOCERATITES, in natural hiſtory, a name by which ſome late authors have called a ſpecies of ſea ſhell, found frequently foſſile, but not known at preſent in its recent ſtate; called by others *polythalamium* and *tubulus marinus concameratus*. It is uſually ſtrait, but ſometimes its end is twiſted like the *cornu ammonis*. See TUBULIS *Concamerati*.

ORTHODOXI, in botany, ſuch ſyſtematic writers as have formed their methods on the true natural foundation, and divided the plants under their conſideration into claſſes and genera, according to the characters of their parts of fructification. Theſe are either the *univerſales*, or *particulares*; by the firſt are meant, thoſe who have thus ranged the whole vegetable world; and by the latter, thoſe who have undertaken only ſome one claſs of plants, as the umbelliferous, &c. *Linnæi*, Fund. Bot. p. 2.

ORTHODROMICS, that part of navigation which teaches the art of ſailing in the arch of ſome great circle.

The word is Greek, Ορθοδρομικα, derived from ορθος, *rectus*, ſtreight, and δρομος, curſus, run or diſtance; *q. d.* the ſtreight or ſhorteſt diſtance; and this can only be in the arch of a great circle.

ORTHRAGORISCUS, in zoology, the name uſed by Rondeletius, and ſome other authors, for the fiſh more commonly known by the name of the *mola*, and called in Engliſh the *ſun fiſh*. *Willughby*'s Hiſt. Piſc. p. 151. See the article MOLA.

ORTYGOMETRA, in zoology, the name of a bird called in Engliſh the *daker-hen*. It is ſomewhat larger than the quail. Its body, in ſhape, reſembles the common hen. It has two dusky lines on the head: its breaſt and belly are white: its throat of a dusky brown: its back feathers are black in the middle, and of a tawny colour at their edges: its thighs are variegated with transverſe-white ſtreaks. It is common in Ireland, and in ſome of the northern counties of England, particularly in Northumberland. The noiſe it makes is only *crex*, *crex*, whence the antients have called it by that name. The Italians call it *re edelle quaglie*, or the *king of the quails*. It is a very delicately taſted bird. *Ray*'s Ornithol. p. 122.

ORVALA, in botany, the name given by Linnæus to a genus of plants, called *papia* by Micheli. The characters are theſe: The perianthium is compoſed of one leaf, it is tubulated and dilated at the mouth, and is crooked and divided into five ſegments; the lower two being ſhorter than the reſt. The flower is compoſed of one petal, and is not of the labiated kind; the tube is of the length of the cup. The limb is erect, long, and divided into four ſegments. The upper of which is oblong, convex, and falcated and lunated at the point. The lower is oblong, and is alſo lunated at the point, and the ſide ones are oblong and pointed, and divided each into three ſegments. The ſtamina are four filaments of the length of the flower; they are placed under the upper ſegments of the flower; the antheræ are two in number. The germen of the piſtil is divided into four; the ſtyle is ſimple, and of the ſame length with the ſtamina; the ſtigma is bifid, and acute. The ſeeds are four, and of an oval kidney-like ſhape. *Linnæi*, Gen. Plant. p. 278.

ORVALA, in botany, is alſo a name uſed by ſome authors for the *horminum*, or *clary*. *Ger.* Emac. Ind. 2.

ORYCTOGRAPHY, is that part of natural hiſtory wherein foſſils are deſcribed. *Wolfm.* Diſc. Prælim. Logic. §. 81.

ORYCTOLOGY, is that part of phyſics which treats of foſſils, or it is the ſcience of foſſils. Under this head comes the doctrine of ſalts, ſulphurs, ſtones, gems and metals. *Wolfm.* Diſc. Prælim. Logic. §. 81.

ORYGMA, ὄρυγμα, among the Athenians, a name given to the pit, more uſually called *barathron*; (See BARATHRON) whence the public executioner received the appellation of ὁ επὶ τῳ ὀρυγματι. It was a dark noiſome hole, and had ſharp ſpikes at the top, that no man might eſcape out; and others at the bottom, to pierce and torment ſuch as were caſt in. From its depth and capaciouſneſs, it came to be uſed proverbially for a covetous miſer, or voracious glutton, that is always craving, and can never be ſatisfied; and ſuch a one the Latins called *barathro*. *Potter*, Archæol. Græc. l. 1. c. 25. T. 1. p. 134, ſeq.

ORYX, in zoology, an animal mentioned by Ariſtotle and Pliny, with only one horn. Pliny makes it a ſpecies of wild goat; but Columella thinks it was a kind of deer. It is ſaid, that this creature was of great uſe in Africa, to relieve the ſcorched inhabitants from thirſt, there being always found in its body veſicles full of a very wholeſome and pleaſant liquor. *Hofm.* Lex. in voc.

ORYZEUM, a name given by many of the chemical writers to gold.

OS *(Cycl.)* — Os *argenteum*, in natural hiſtory, the name of a ſpecies of ſhell fiſh, of the round mouthed ſnail, or *lunaris cochlea* kind. It has a very elegant ſilver colour in the round opening, or mouth of the ſhell. See LUNARIS *Cochlea*.

Os *aureum*, the golden mouth, in natural hiſtory, a name given to a ſpecies of cochleæ of the lunar kind, or of that genus which have a round mouth. This, in the *os aureum*, is of a fine yellow. See LUNARIS *Cochlea*.

Os *calcis* *(Cycl.)* — This is the largeſt bone of the foot, of which it makes the poſterior part, and in ſome meaſure the baſis. It is oblong and very irregular, and may be divided into a body and two apophyſes, one great and anterior, the other ſmaller, lateral and internal. The body of the *os calcis* has ſix ſides; one poſterior, one anterior, one ſuperior, one inferior, and two lateral. The poſterior ſide is broad, unequally convex, and as it were divided into two portions, one ſuperior, ſmall and poliſhed, the other inferior, much larger, unequal, and rough, which, in children, is an apophyſis, and may be termed the *tuberoſity* of the *os calcis*. The lower part of it is bent downward, and terminates in two tubercles or obtuſe points, which belong rather to the inferior than the poſterior ſides of the bone. The upper ſide may be divided into two parts, one poſterior and unequal, having a ſmall depreſſion; the other anterior, convex, and cartilaginous, proportioned to the great inferior cavity of the aſtragalus. This ſide is turned obliquely forward, and by this obliquity becomes part of the foreſide, the remaining part of which is loſt in the anterior apophyſis. The lower ſide is narrow, and behind it lies the two tubercles already mentioned, of which the internal is the biggeſt; they both ſerve for the inſertion of the aponeuroſis in the ſole of the foot, but chiefly the biggeſt. The two lateral ſides are continued over the anterior apophyſis, the external is gently convex and unequal, covered only with the common integuments and ligaments; the internal is hollow and depreſſed. The greater anterior apophyſis lies in the ſame direction with the body, being a continuation thereof. It has five ſides or remarkable parts, and were it not for the body would have a ſixth. The upper ſide has an irregular and unequal depreſſion, which, together with that in the apophyſis of the aſtragalus, forms a conſiderable foſſula. And its anterior extremity has a ſmall cartilaginous ſurface, anſwering to one of thoſe in the apophyſis of the aſtragalus. The anterior ſide of the apophyſis is broad, oblique, cartilaginous, partly convex and partly concave, and is articulated with a like ſurface of the os cuboides: this is the foreſide of the whole *os calcis*, when conſidered without any diviſion. The outſide of the apophyſis is very rough, being a continuation of the outſide of the body, with a tubercle or eminence of the place where the two ſides meet. This, however, is not found in all ſubjects. On the lower part of this tubercle is a cartilaginous ſurface for the paſſage of the tendon of the *peronæus longus*: ſometimes we ſee only ſome ſmall veſtiges of this eminence, and often none. We ſometimes alſo meet with a cartilaginous ſurface, ſmall, lower down, and more forward, near the anterior extremity of the apophyſis, for the paſſage of the ſame tendon. The lower ſide is a tuberoſity continued from the ſide of the body, and deſigned for the inſertion of muſcles. The lateral apophyſis is almoſt common to the body, and to the great anterior apophyſis, and increaſes the cavity on the inſide of the *os calcis*. On its upper part it has a very ſmooth cartilaginous ſurface, articulated with one of the inferior ſurfaces of the aſtragalus. This apophyſis is very low down, and its inferior part is ſmooth for the paſſage of tendons. *Winſlow*'s Anatomy, p. 97, ſeq.

Os *calcis luxated*. It ſometimes happens, that the *os calcis* above, and no other bone of the foot, is diſplaced or luxated by ſome external force; and this happens ſometimes toward the external, ſometimes toward the internal ſide of the foot. When this accident happens, it is eaſily diſcovered by the violent pain it occaſions; and by the inequality of the part, that is, there is a cavity plainly obſervable in one part, and a tumor in the other, on the place. The reduction of this diſlocation is very eaſy. The patient is to be placed on a bed, and while two aſſiſtants extend the limb in the oppoſite directions, the ſurgeon replaces the diſlocated bone with his fingers, and the preſſure of the palm of his hand, and then there is no more than a proper bandage and reſt required to the cure. *Heiſter*, Surg. p. 174.

Os *cuneiforme*. This in the carpus is the third bone of the firſt row. It has its name from the Latin *cuneus*, a wedge. Its figure much repreſenting that of a wedge ſticking between the two rows. It has a rough ſurface with a ſmall tubercle upon it, which forms the greateſt part of the cubital edge of the carpus; and four articular ſides of which one is convex, which compleats the articular convexity of the carpus, one orbicular and internal, or on the concave ſide of the carpus, on which the os piſiforme is ſet; and two others, which make an angle between them, one for the os ſemilunare, and the other for the os unciforme. *Winſlow*'s Anatomy, p. 83.

The *oſſa cuneiformia* of the tarſus are ſituated before the os ſcaphoides. The firſt of them is the largeſt, and the third the leaſt; with the os cuboides, theſe form a ſort of arch, which on the ſide next the other foot is high, and low on the oppoſite ſide. In each of theſe bones we may diſtinguiſh the baſis, the apex, and four ſides, one poſterior, one anterior, and two lateral; whereof one is internal, the other external. The firſt bone is like a wedge contorted and bent. Its baſis is low down, unequally rounded, like an oblong tuberoſity, ſerving for the inſertion of a tendon; the internal lateral ſide, or that which is turned towards the other foot, is unequally convex, and rough, for the inſertion

tion of ligaments. The external lateral side, or that next the second bone is unequally concave, and cartilaginous toward the superior and posterior edges. The largest portion of this side is articulated with the second bone. The rest toward the anterior edge is joined laterally to the second bone of the metatarsus. The backside is the least; it is cartilaginous and almost triangular, suited to the first of the three triangular surfaces of the os scaphoides. The anterior side is cartilaginous, large, and semilunar, the convex edge being turned toward the other foot, and by this the first *os cuneiforme* is articulated with the first bone of the metatarsus. The angle is turned upwards, and the obliquity of it occasions the anterior side to be the highest, and the posterior lowest. The second *os cuneiforme* has the basis upward, and the angle downward, and resembles a wedge more than the first: this basis is short and rough, for the insertions of ligaments. The backside is cartilaginous, and perfectly triangular, suited to its articulation, with the middle surface of the convex side of the os scaphoides The anterior side is also cartilaginous, a little more oblong and articulated with the basis of the second metatarsal bone. The two lateral sides have, toward their superior and posterior edges, oblong cartilaginous surfaces, by which they are articulated with the first and third *ossa cuneiformia*; the rest of these two sides is a little depressed, and there, by small interstices, void spaces are left between the bones: this is every way the straitest bone of the three, its angles hid between the two other bones of the same name, and does not reach so low as theirs, which makes this part of the foot a little hollow. The third *os cuneiforme* has likewise its basis upward, and its angle downward. The basis is longer than that of the second, almost flat or very little convex, and rough for the insertion of ligaments; the angle runs down lower than that of the second bone. The backside is cartilaginous and triangular, that is of the same figure with the third surface of the convex side of the os scaphoides: the anterior side is, likewise, cartilaginous and triangular, but a little oblong, being articulated with the basis of the third bone of the metatarsus. The internal lateral side is broad, with two cartilaginous surfaces, one toward the posterior edge, the other toward the anterior; the first is for its lateral articulation with the second *os cuneiforme*; the second for its lateral articulation with the basis of the second metatarsal bone. The external lateral side is likewise broad, and toward its posterior edge has a large cartilaginous surface for its articulation with the os cuboides towards its anterior edge. There is a sort of void space for the passage of vessels, and sometimes a little cartilaginous corner for its lateral articulation with the fourth bone of the metatarsas. *Winslow*'s Anatomy, p. 100.

Cartilages of the Os *femoris*. No part of the *os femoris* is covered, except the uniform convexity of the head, and the articular portion of the lower extremity. The trochanters have no true cartilage, what appears like it being only the remains of tendinous insertions; the cartilaginous substance, which to a certain age unites the apophyses to the body of the bone, does not belong to these, because it is only found in the time of youth, and in adults is converted into a bone. The cartilaginous matter, by which the head of the *os femoris* is cemented, deserves, however, to be observed here, because that apophysis has been separated by violent falls. The convexity of the head of the *os femoris*, all the way to its symphysis with the neck, is covered with a very smooth, shining cartilage. A little below the middle of this convexity, and something toward the back part, there is a depression in the shape of a crescent, the cartilage being here interrupted by the insertion of the internal articular ligament of the head of the *os femoris*. The cartilage which covers the lower extremity of this bone is exactly fitted to the semi-oval convexity of the inferior surface of each condyle, and to the pulley formed by their union. *Winslow*'s Anatomy, p. 126.

Ligaments of the Os *femoris*. The *os femoris* is connected by its upper extremity to the os innominatum, and by the lower to the bones of the leg, by means of several ligaments. The ligaments of the upper extremity are two in number, one which surrounds the whole articulation thereof, with the cotyloide cavity, and one contained in the articulation. The first is termed the orbicular ligament of the head of the *os femoris*; the other the internal ligament; and to these may be, though but improperly, added a third, which is of the nature of a capsular ligament. The orbicular ligament is the most considerable, the largest, and the strongest, of all the articular ligaments of the human body; it is fixed quite round the border of the cotyloide cavity, and is made up of several sorts of fibres, and is much stronger and thicker in some parts than in others; the other, or internal ligament of the head of the *os femoris*, resembles a flat cord, and is composed of a bundle of flat fibres, closely interwoven. The ligaments of the lower extremity of the *os femoris*, by which this bone is connected with the leg, are six in number, one posterior, two lateral, two middle, or crucial, and the capsular. The crucial ligaments lie within the joint, and are fixed by one end to the back part of the notch, or opening, which parts the two condyles: these are surrounded by the capsular ligament, but all the rest lie on the outside thereof, being closely joined to it. Of the two lateral ligaments, one is internal, and broad, being fixed to the tuberosity of the internal condyle; the other is external, and narrow, and is fixed to the tuberosity of the external condyle. The posterior ligament is broad and thin, and being fixed a little above the convexity of the external condyle, it thence descends obliquely behind the great notch, and internal condyle. The capsular ligament is, as it were, glued to the three former, and is fixed quite round the inferior extremity of the *os femoris*; at a small distance above the anterior, lateral, and posterior parts of the cartilage, and above the posterior part of the great notch; and from the cartilage and notch, through the small space upward already mentioned, it covers the bone, and afterwards is inverted downward, to form the capsula for the mucilaginous liquor of the joint. *Winslow*'s Anatomy, p. 126.

Os *frontis*. This is situated in the anterior part of the skull, and forms that part of the face which is called the forehead, from whence it has its name. Its figure is symmetrical, resembling a large shell almost round. Tho' this has always been looked upon as one bone, it is to be observed that it is sometimes found divided into two equal parts by a continuation of the sagittal suture; and this division is equally common to both sexes. Considered as one bone it may be divided into an upper part, which belongs to the crown of the head, a lower part which belongs to the basis of the skull, an anterior part which is the forehead, and two lateral parts at which the temples begin. Its two sides are the one external, which is in its greatest part convex, and forms the forehead; the other internal, which is concave in proportion. On the outside are observed the following eminences: Two superciliary arches, which form the upper edge of each orbit, or the supercilia; three risings not always equally apparent, one between the two arches, and the other two above them; which may be called the knobs of the forehead: five apophysis, one at the extremities of each arch, one between the orbits, which sustain the ossa nasi, and which in some subjects makes a part of the bony septum of the nose. This last may be called the nasal apophysis, the other four the angular apophyses. The external cavities are these two orbitary portions or vaults forming the upper portions of the orbits: a remarkable depression in each of these vaults above the external angle, which contains the lachrymal gland: a small depression above the internal angle, to which is fixed the cartilaginous pully of the great oblique muscle of the eye; two portions of the temporal fossæ; two little cristæ which form the anterior extremity of the great semicircular plane of the temples, on each side, at the edge of the superciliary arches, near the external angle; two superciliary foramina, which are sometimes double, and sometimes only notches; and, lastly, two holes or portions of holes, called the internal orbitary holes.

On the inside of this bone we see a sharp perpendicular eminence, called the frontal or coronal spine, directly opposite to the middle rising on the outside already mentioned; above this spine, a portion of the groove for the longitudinal sinus, which when the spine is wanting, runs down lower; below the spine a considerable opening, called the ethmoidal opening, because it contains the os ethmoides; the sides of this are always more or less cellular. Between this opening and the coronal spine, a blind opening, which in some subjects is wholly in the *os frontis*, in others, common to that bone and to the os ethmoides, and which seems to open into the frontal sinuses near the nose. The anterior fossæ of the basis of the skull, which receive the anterior lobes of the brain, and which, by juting out forwards, form the risings on the outside, before taken notice of: toward the lower part they are uneven, answering the inequalities of the lobes, and they are also a little raised, to make room for the orbits, sulci or furrows of the arteries of the dura mater, and sometimes other indeterminate depressions. Tho' this bone is in general composed of two tables, and a diploe, yet the orbitary vaults are very thin, and without any diploe. About the middle of the lower part of the bone, where the middle rising is commonly situated, the two tables are parted, to form two cavities called the frontal, or superciliary sinuses, and the separated portions are here each of them composed in some measure of two tables, or at least have two surfaces, which make in all four surfaces of each of the two tables.

The frontal sinuses are extended on the edge of the superciliary on each side, more or less, all the way to the superciliary perforations; below they are open, and communicate with the cells of the os cribrosum. They are commonly parted by a bony septum, which is often more or less uneven; sometimes also it is perforated, and sometimes part of it, sometimes the whole is wanting.

In different subjects these sinuses are observed to vary extremely both in extent and form; in some they are very small, and often very irregular, and their disposition cellulous; sometimes also they are entirely wanting, and in such subjects the cavity of the nose is larger than ordinary; one of them does not open into the nose but only communicates with the other.

The *os frontis* is articulated by suture with seven other bones, the ossa parietalia, os ethmoides, os sphenoides, ossa lacrymalia, ossa nasi, maxillaria, and the ossa malarum. It contains

tains the anterior lobes of the brain, and a portion of the longitudinal ſinus, and forms the forehead, the upper parts of the orbits, and a portion of the temples. *Winſlow*'s anatomy, p. 21.

Cartilages of the Os *humeri.* The cartilage by which the hemiſphere of the head of the *os humeri* is covered, is gradually thicker toward the middle, and thinner toward the edges. The four ſurfaces of the tuberoſities, which appear cartilaginous in dry bones, ſerve only for the inſertion of the tendons of four muſcles, which move the *os humeri* on the ſcapula. The channel, or ſinus, between the two tuberoſities is partly covered by a thin cruſt, which appears rather ligamentary than cartilaginous, and partly by a tendinous ſtratum. The trochlea and ſmall head of the lower extremity of the *os humeri*, are covered with a common cartilage, in which the ſame proportion of thickneſs is obſervable, as in that of the upper extremities; and this holds indeed pretty generally of the convex articular cartilages: and the foſſulæ near the pulley and ſmall head, are covered with a thin cartilaginous and ligamentary varniſh.

Ligaments of the Os *humeri.* The capſular, or mucilaginous ligament, looſely ſurrounds the whole articulation of the ſcapula with the head of the *os humeri*. The true ligament of this joint ſeems to be made up of two ſorts of ligaments cloſely united together, *viz.* of a capſular ligament, which ſurrounds the whole articulation, and of ſeveral true ligaments which run over, and cloſely adhere to the former at different diſtances. On the body of the *os humeri* there are two particular ligaments, which may be termed the intermuſcular, or lateral ones: they are long, flat, thin, but ſtrong and narrow, fixed by one edge along the two lower thirds of the bone, and reaching to both condyles; they are broad, pretty tight, and are very narrow at the upper part, but broader toward the condyles.

The lower extremity of the *os humeri* is joined to the bones of the fore arm, by two faſciculi of ligamentary fibres, one fixed to the internal condyle, the other to the external. Each faſciculus is compoſed of fibres cloſely joined together near the condyle, but afterwards parting in diſtinct bands like a gooſe's foot. The capſular ligament is fixed to the condyles, and then covers them, and is afterwards fixed round both ſides of this lower extremity above the foſſulæ. The foſſulæ are ſlightly varniſhed over alſo with a cartilaginous ſubſtance. This capſula ſeems to be ſtrengthened by a ligamentary wall, the fibres whereof croſs one another in different directions, and appears larger and looſer when the muſcles are ſeparated from it, than when cloſely united to them in its natural ſtate. *Winslow*'s Anatomy, p. 139.

Os *humeri fractured.* Fractures of the *os humeri* are leaſt dangerous when near its middle, and much worſe when near its upper or lower head. It ſometimes happens, that the fractured ends of this bone keep their places, but much more frequently they are found ſlipped one over another; by which means the fractured limb is made ſhorter than the ſound one: ſometimes alſo, tho' much more rarely, it happens, that the divided ends of the bone recede from one another, by reaſon of the weight of the arm, and by that means the fractured limb becomes longer than the ſound one. In fractures of this bone, where the ends of the divided bone have ſliped one over another, as is uſually the caſe, there is required both force and ſkill to reduce them, eſpecially if the patient has tenſe nerves and larger muſcles, as is uſually the caſe in ſtrong men. To extend the arm on this occaſion, the patient muſt be ſeated on a high ſtool, and an aſſiſtant muſt lay hold of his arm firmly above the fracture, keeping his elbow gently bent; then the lower part of the arm beneath the fracture, is in like manner to be taken hold of, and the arm is to be gently extended forward, by endeavouring to remove eaſily each part from the other, in a right line. The ſurgeon is then to take hold of the fractured part of the arm, and with both his hands reduce the fractured bones into their proper places, while the arm is kept in a proper ſtate of extenſion by the aſſiſtants; and when they are replaced, the limb is to be rolled up with the proper bandages. *Heiſter*'s Surg. p. 127.

Os *hyoides.* Mr. Du Vernoy obſerves, that the right ſide of the *os hyoides* is ſhorter than the left. Comment. Acad. Petrop. Tom. 7.

Cartilages of the Ossa *innominata.* Theſe are not ſo numerous as might be imagined, on examining the bones in a dried ſkeleton, where we are apt to think we ſee the dried remains of cartilages on the criſta of the os ilium, on the tuberoſity of the os iſchium, and on the grooves and notches which give paſſage to the tendons of muſcles; but none of theſe incruſtations are true cartilages, but for the moſt part tendinous, aponeurotic or ligamentary, which ſubſtances being dryed, look more like cartilages than the true cartilages themſelves in the ſame ſtate. The true cartilages of theſe bones in adults are properly five in number, three of which are common, and two proper. The firſt and principal common cartilage, is that which makes the ſymphyſis of the oſſa pubis. This forms a kind of arch, which is more conſiderable in men than in women; the two others join the oſſa ilium to the os ſacrum, but are thinner than that of the oſſa pubis. The proper cartilages are thoſe which line the cotyloide cavities, in the edge of each of which there is a notch or opening between the anterior or inferior parts, and in the cavity itſelf there is a broad and ſhallow depreſſion, reaching from the notch beyond the middle part of the cavity; all the reſt of the acetabulum is covered with a very white, ſhining, ſmooth cartilage, which terminates preciſely at the edge of the cavity. *Winſlow*'s Anatomy, p. 122. See Ilium.

Ligaments of the Ossa *innominata.* Theſe are of two kinds, common and proper: the common ligaments are thoſe which go between theſe and the neigbouring bones, of which there are a conſiderable number: One ſuperior, inſerted by one end in the internal labium of the poſterior part of the os ilium; one inferior and anterior, fixed by one end in the inner ſide of the criſta of the os ilium, and by the other in the ſuperior and anterior part of the firſt falſe tranſverſe apophyſis of the os ſacrum. Several inferior and poſterior, fixed by one end along the internal labium of the tuberoſity of the criſta of the os ilium, and by the other in the firſt three falſe tranſverſe apophyſes: and to this muſt be added the ligaments by which the os femoris is joined to the *os innominatum*. The principal proper ligaments are four: the two ſacro-ſciatic, the obturator, and the inguinal, which ſee under their proper heads; but beſide theſe, there is another ſmall, flat, and very ſtrong ligament, which runs tranſverſely between the two angles of the cotyloide notch, and may be termed the proper, or tranſverſe ligament thereof. The elaſtic border of the cotyloide cavity may likewiſe be reckoned among the ligaments: it is a ſort of additional piece, ſtrongly united to the edge of the cavity, but eaſily yielding any way, on preſſure. The two ligaments by which the os femoris is connected to the *os innominatum*, are alſo inſerted in this bone; one of theſe ligaments ſurrounds the whole articulation, and the other is contained in it: the firſt is called the orbicular ligaments, the other, tho' very improperly, the round ligament: the orbicular is very ſtrong, and unequally thick, and ſurrounds the whole convex circumference of the ſupercilium of the cotyloide cavity. The ligament which lies in the joint is not round, but is a flat cord, broad at one end, and narrow at the other, and is in ſome degree of a triangular ſhape. *Winſlow*'s Anatomy, p. 122.

Os *innominatum fractured.* A fracture of this bone very ſeldom happens; but when it does, it is readily diſcovered by the injury and ſymptoms in the neighbouring parts, and is the more particularly dangerous, when the patient diſcharges a brown bloody matter. In reſtoring this bone, the patient muſt lie down on his ſound ſide; the bone muſt be replaced with the hands, covered with compreſſes, dipt in ſpirit of wine, and kept on by the ſpica bandages. Afterwards bleeding, with cooling and relaxing medicines, muſt be uſed, and a thin diet obſerved. *Heiſter*'s Surg. p. 126.

Os *orbiculare.* This, in the carpus, is the fourth bone of the firſt row. It has its name from the roundneſs of its figure, and is, for the ſame reaſon, by ſome called *os piſiforme*, and *os lenticulare*; it is, however, not perfectly, or regularly round; it has but one cartilaginous ſide, which is irregularly orbicular, and the border, a circumference of which repreſents a kind of narrow collar. The reſt of the bone is rough, convex, and irregularly round, making one of the four eminences, on the concave ſide of the carpus. This bone, and the os cuneiforme, may be ſuppoſed to make a third row, diſtinct from the other two. *Winſlow*'s Anatomy, p. 83.

Naſi Ossa. See Nasi *oſſa.*

Palati Ossa. See Palati *oſſa.*

Parietalia Ossa. See Parietalia *oſſa.*

Pectoris Ossa. See Pectoris *oſſa.*

Os *ſacrum* (*Cycl.*) — As this bone is the baſis by which the whole ſpine is ſupported, it has by ſome been called *os baſilare*; its figure comes near that of a long triangle, with the baſis upward, and apex downward. Anatomiſts, in its deſcription, divide it into the upper part, or baſis, the lower, as it is ſituated, or apex; two ſides, the anterior, or concave, and the poſterior, or convex; and two lateral parts, or edges. The pieces of which it is compoſed in infants, called falſe vertebræ, are five in number, and are united together by cartilages, which in time almoſt diſappear, leaving only little ridges, or lines, more or leſs prominent in their places. The firſt of theſe is much larger than any of the true vertebræ, but their ſize diminiſhes by very great degrees as they deſcend; ſo that the loweſt which makes the point of the *os ſacrum*, has ſcarcely the appearance of a vertebra. At the baſis, or upper part, of the *os ſacrum*, are two articular apophyſes, anſwering to the inferior ones of the laſt vertebra of the loins. Below each of theſe apophyſes laterally is a large notch, and between them, we ſee diſtinctly enough the body of this firſt falſe vertebra, which is like that of the lumbar vertebræ, being very much inclined backward; ſo that the body of this firſt falſe vertebra, as well as that of the laſt true one, is longer before than behind; and from this obliquity it is that the *os ſacrum* and laſt lumbar vertebra, form at their connection, a very conſiderable angle. The lateral parts are broad at top, forming on each hand a large, irregular, cartilaginous ſurface, in the figure of a great S, and ſometimes of a bird's head.

head. By these two sides the *os sacrum* is connected to the ossa innominata, by a cartilaginous symphysis. Between each of these lateral sides and the nearest posterior holes, there is a large rough depression, and under that another not so large. These depressions are often pierced by several holes, which lose themselves in the substance of the bone. *Winslow*'s Anatomy, p. 60.

Os *sacrum fractured*. When this bone is found to be fractured, the fragments are to be reduced into their proper places with the fingers, and if any part of it be depressed inwards, a finger dipp'd in oil or butter, and with the nail close cut off, must be introduced up the anus in order to thrust the depressed fragment into its proper place, to which it is to be directed externally by the other hand. This being performed, a sticking plaister is to be applied, and compresses dipped in spirit of wine over it, to be kept on by the T bandage, or the plaisters may be let alone, and only the compress and bandage applied. The patient must keep his bed a fortnight, lying on his sides; or if he will needs sit up, it must be on a chair without a bottom, that the bones may not be displaced by touching the seat. *Heister*'s Surg.

Os *sepiæ*, the cuttle-fish bone. See SEPIUM, *Cycl.*

OSSA *temporum*. See TEMPORUM *Ossa*.

Os-*tincæ*. The sides of the os-tincæ have been known to open together in women with child, and have been divided by incision, in order to extract the child. See Med. Ess. Edinb. Vol. 3. Art. 19.

OSSÆI, or OSSENI, a name sometimes given to the Jewish sect of religion called *Essenians*. *Hofm.* Lex. Univ. in voc. See ESSENIANS, *Cycl.*

OSCHEALIS *hernia*, a term used by some writers for a hernia of the scrotum.

OSCILLA, in antiquity, small images of wax or clay, made in the shape of men or women; which were consecrated to Saturn in order to render him propitious. *Hofm.* Lex. Univ. in voc.

OSCINES, among the Romans, an appellation given to such birds, from whose chattering or notes, omens and predictions were drawn. *Hofm.* Lex. Univ. in voc.

OSLEOM *iron*, in the wire-works, a particular sort of bars of iron wrought on purpose for the manufacture of iron-wire. These are small and square, and the first thing done with these, toward the making them into wire, is, the straining, or drawing them at a furnace to small rods, of the thickness of one's little finger; these they bow round, and deliver them to the wire-drawers. *Ray*'s Engl. Words, p. 132. See WIRE.

OSMERUS, in ichthyography, the name of a genus of fishes, of the malacopterygious, or soft-finned kind, the characters of which are these: The branchiostege membrane contains seven or eight bones on each side. The back and belly fins are placed at the same distance from the top of the snout; by which it is distinguished from the coregoni and salmons. The teeth are large, and are placed on the tongue in the palate and in the jaws.

The species of *osmerus*, enumerated by Artedi, are these: 1. The *osmerus* with seventeen bones in the pinna ani: this is the smelt or eperlanus of authors. 2. The *osmerus* with eleven bones in the pinna ani.

This is the little fish called *saurus* by Salvian, and by the people of Rome, named *tarantola*. It is about a span long, and somewhat thicker than a man's thumb. The scales are moderately large, and the pinna dorsi has twelve rays. *Artedi*, Gen. Pisc. 8.

OSMONDS, in our old writers, a kind of iron antiently brought into England. It is mentioned in Stat. 32. Hen. VIII. c. 14. *Blount*, *Cowel.*

OSMUNDA, in the Linnæan system of botany, the name of a genus of plants, of the fern kind, the characters of which are: That the seeds are produced in globose capsules which stand distinct, but are collected in a cluster on the branch, and open horizontally when ripe. The seeds are small, oval in figure, and very numerous: according to this character, that species of the fern kind usually called the *sensible polypody* of Muntingius, and ranked among the polypodies is, an *osmund*; for it produces clusters of globose capsules so large, that they are scarce to be conceived to belong to any thing of the fern kind. These also stand on particular stalks, not on the back of the leaf, which is also the case in the other species of *osmund*, as our common English kind evidently shews.

The characters of *osmunda*, according to Mr. Tournefort, are these: The flowers are not discovered, but the seeds are collected into clusters. The capsules in which they are enclosed, are of a spherical figure; and when ripe, they burst by the contraction of the fibres. The leaves resemble those of the fern's.

The species of *osmund*, enumerated by Mr. Tournefort, are these: 1. The common, or marsh *osmund*. 2. The *osmund* with lunated leaves, commonly called *moonwort*. 3. The *osmund* with multifid leaves, called *branched moonwort*. 4. The larger branched *osmund*, with lunated leaves. 5. The feverfew-leaved *osmund*, or *moonwort*. 6. The *osmund* with adiantum leaves. 7. The hairy lonchites-leaved *osmund*. 8. The great fern leaved *osmund*. 9. The lesser fern-leaved *osmund*. 10. The hart's-tongue-leaved *osmund*. 11. The cut-leaved *osmund*, with broad dents. 12. The deeply jagged, and lightly hairy *osmund*. 13. The asphodel-rooted *osmund*. 14. The verticillated *osmund*. 15. The spear pointed lightly serrated *osmund*. *Tourn.* Inst. p. 547.

OSOSOR, a word used by some authors as a name for opium. See the article OPIUM.

OSPRION, a word used by some authors for a bean, which is its proper and determinate signification; but by some authors it is extended to all sorts of pulse.

OSSA. See the article Os.

OSSELET, in the manege, is a very hard excrescence, resembling a little bone, on the inside of the knee, (and never on the outside) appearing to be of the same substance with the rest of the knee, and only distinguishable from the knee by its descending a little lower.

OSSERVANZA, in the Italian music, is used for singing or playing with care; that is, executing a piece of music justly and exactly as it is marked, without adding or diminishing. *Bross.* Dict. Mus. p. 22.

OSSICULA *auditoria*, in anatomy, are four little bones contained in the cavity of the tympanum, or barrel of the ear, and assisting to the hearing; they are denominated from things they have been supposed to bear a resemblance to, the malleus, incus, stapes, and os lenticulare, called by others the *os orbiculare*; each of which see under their proper heads.

OSSICULA *musculorum*, in ichthyology, a name given by authors to those oblong and slender bones which are situated in the flesh of some kinds of fish between the muscles: these, in the anterior part, and especially near the head, are of a forked shape; but in the hinder part of the body, they are usually simple and slender. These sorts of bones are found in the following kinds of fish: 1. In all the cyprini. 2. In the esoces. 3. In the clupeæ. 4. In the eels. 5. In the coregones. 6. In the osmerus. 7. In the salmon kind. 8. In mackrell. And 9. In the ammodytes or sand eel. In the five last, these bones touch the spine at one end, but in the others they no where come near it.

The use of these loose bones seems to be, to strengthen and support the muscles, that by this means they may be able the more forcibly to move the body, and turn it about: they are peculiar to fish, no land animal having them. *Artedi*, Ichthyol.

OSSIFICATION *(Cycl.)* — Dr. Nisbet's opinion of *ossification* is, that in the blood, or a fluid secreted from it, there is an ossifying juice consisting of particles which are not apparent: that whenever nature designs an *ossification* between membranes, or within a cartilage, she occasions a more than usual afflux of this fluid; which so much distends the vessels which were before invisible, as to make them capable of receiving the red globules of blood, which is always to be seen near to the place where *ossification* is begun. In this blood, gritty bony particles are to be felt by the point of a knife; which have been formed by the attraction and cohesion of the particles of the ossifying juice obstructed, along with the other grosser fluids, in the beginning of the vessels prepared to receive refuent juices. The blood being capable of forming fine membranes, the membranous parts of a bone, which act as a gluten to keep these particles and fibres together, if there be any such, that do not arise from the coats of its vessels, are produced by a cohesion round the cretaceous particles of a part of the fluid, in which they were generated and contained. Thus the membranes of cartilages serve as a bed between, or within which the bony particles are deposited, or shoot; but without any intermixture of the particles of the bone and cartilage, or continuation of the fibres of the one substance to those of the other, as is evident in cartilages containing bones kept long enough in water, and then slit; for the bone will, as soon as the large vessels that enter its substance are divided, slip as easily, if not easier, from it, than an acorn does out of its cup: and there is a smoothness and polish of the parts of both cartilage and bone, which shew there is no conjunction of the fibres of the two substances. While the bones are encreasing within cartilages, the cartilages are extended and spread out; by which, with the pressure which they suffer, and the great influx of various fluids, and the nutricious matter being hindered to flow freely into them, they decrease continually; and at last may truly be said to be entirely destroyed. Med. Ess. Edinb.

Dr. Buddeus endeavours to prove, that the preternatural *ossifications*, which are commonly said to be formed in different parts of the body, do not deserve that name; for that these hard substances have scarce any other properties of bone, except whiteness and hardness. *Misc.* Berol. Tom. 5. pars 2. §. 1.

OSSIFRAGUM, in botany, a name given by Bartholine, and some other writers, to a peculiar kind of grass, growing in some parts of Norway. It comes up early in the spring, before any other grass, and the cattle are tempted to eat it; but it emaciates them, and makes them sickly; their back bones become protuberant if they feed any time on it, and their legs so weak that they can hardly go. The remedy among

among the country people is a very odd one. They collect the bones of different animals, and break them into ſmall pieces. The cattle greedily devour this ſort of food when offered them in this diſeaſe, and there follows a ſort of driveling at the mouth for a conſiderable time, after which they become well. It is poſſible there may be much error in this ſtory. The kingdom of Norway is full of mines, and the effluvia of theſe may be the occaſion of the cattles illneſs, and the ceaſing of theſe effluvia their cure; for it is not probable that either of theſe effects ſhould be owing to the graſs or the bones. *Barthol.* Act. Med.

OSSIPAGINA, in botany, a name given by Arnobius and ſome other of the old Greek writers to the conſolida-major, or greater comfry. It had this name from its ſuppoſed quality of agglutinating broken bones on being taken internally. The Greek writers have ſometimes called this plant *pecte*.

OSTEOCOLLA, (*Cycl.*) a ſubſtance uſed in Germany in caſes of fractures, giving it inwardly to bring on a callous; but ſo inaccurately deſcribed by authors, ſeveral different ſpecies of the cruſtaceous ſpars having been deſcribed under its name, that it is not eaſy to aſcertain what it truly and regularly is. Dr. Hill, from the inſpection of what is now univerſally received in Germany as ſuch, which anſwers very well to the accounts given of the ſubſtance by thoſe who have firſt recommended it in medicine, has aſcertained the name to a peculiar ſpecies of cruſtaceous ſpar of the terrene kind, which he has deſcribed under the name of *cibdeloplacium craſſius, exalbo pallide fuſcum, durum, ſuperficie ſcabra*, or hard, pale brown, thick cruſtaceous ſpar, with a rough ſurface.

This is found in long, thick, and irregularly-cylindric pieces, which are uſually hollow, but are ſometimes filled up with a marley earth, and ſometimes contain within them the remains of a ſtick, round which the *oſteocolla* had been formed: but tho' it is plain from hence, that many pieces of *oſteocolla* have been formed by incruſtation round ſticks, yet the greater number are not ſo; but are irregularly tubular, and ſeem formed of a flat cake, rolled up into a cylindric ſhape. The cruſts of which theſe are compoſed do not form regular concentric circles round the internal cavity, as muſt have been the caſe had they been formed by incruſtation, but ſhewing plainly that they were once ſo many thin ſtrata, compoſing a flat ſurface, which has afterwards been rolled up as one might do a paper three or four times doubled, into two, three, or more ſpiral lines; in which caſe, each ſingle edge of the paper would be every where a regular part of a continued ſpiral line drawn from a given point; but they would by no means be ſo many detached concentric circles.

The *oſteocolla* is found of various ſizes, from that of a crow-quill to the thickneſs of a man's arm. It is compoſed of ſpar and earth, and is found, both in digging and in ſeveral brooks, in many parts of Germany and elſewhere. *Hill's* Hiſt. of Foſſ. p. 359.

Oſteocolla is called *hammoſteus* in many parts of Germany. It has this name in theſe places from the obſervation of its always growing in ſand, never in clay, or any ſolid ſoil, nor even in gravel. Where a piece of it any where appears on the ſurface, they dig down for it and find the branches run ten or twelve feet deep. They uſually run ſtreight down, but ſometimes they are found ſpreading into many parts near the ſurface, as if it were a ſubterraneous tree, whoſe main ſtem began at twelve foot depth, and thence grew up in a branched manner, till met by the open air. The main trunk is uſually of the thickneſs of a man's leg, and the branches that grow out from it are thickeſt near the trunk, and thinner as they ſeparate from it. The thinneſt are about the ſize of a man's finger. The people employed to collect this *oſteocolla* when they cannot find any mark of it on the ſurface, ſearch after the ſpecks of white, or little lumps of whitiſh ſoft matter, which they find lying in different parts on the top of the ſand. Theſe always lead them either to a bed of perfect *oſteocolla*, or to ſome in the formation. If they miſs of the ſubſtance which they ſeek after, they ſtill find a ſubſtance like rotten wood; which, when traced in its courſe, is found to proceed from a main trunk, at the depth of that of the *oſteocolla*, and to ſpread itſelf into branches in the ſame manner. The diggers call this ſubſtance the flower of *oſteocolla*, or *hammoſteus*.

The *oſteocolla* found in the earth is at firſt ſoft and ductile, but in half an hour's time, if expoſed to the air, it becomes as hard as we find it in the ſhops. The method to take up a perfect piece for a ſpecimen, is to open the ground, clear away the ſand, and leave it ſo for an hour or thereabouts: in this time it will harden, and may be taken out whole. It is certain, that the *oſteocolla* is produced at this time; for, if a pit be cleared of it, there will more grow there in a year or two, but with this difference, that it will be ſofter and will not harden ſo eaſily in the air as the other. What the rotten ſubſtance reſembling the decayed branches of trees is, it is not eaſy to ſay, unleſs it really be ſuch: but the opinion of the common people, that it is the root of ſomething, is abſurd; becauſe its thickeſt part always lies at the greateſt depth, and the branches all run upwards. The *oſteocolla* is a marley ſpar, which concretes round this matter; but what it is that determines it to concrete no where in the ſame ground but about theſe branches, is not eaſy to ſay. The rottenneſs of this ſubſtance which forms the baſis of the *oſteocolla*, renders it very liable to moulder and fall away; and hence it is that we uſually ſee the *oſteocolla* hollow. Sometimes it is found ſolid, but in this caſe there will be found to have been a vegetable matter ſerving as its baſis, and inſtead of one branch, it will be found in this caſe to have concreted about a number of fibres, the remains of which will be found in it on a cloſe examination. *Phil.* Tranſ. N. 39.

OSTEOCOLLA-*flower*. See the article FLOWER.

OSTEOCOLLA-*roots*. See the article ROOT.

OSTEOCOLLON, in botany, a name given by ſome authors to the great comfry. *Ger.* Emec. Ind. 2.

This name was given by ſome of the old writers to the ſymphytum, or comfry, from an opinion that its agglutinating quality reached to the bone, and that it was of great ſervice taken internally in caſes of fractures.

OSTEOGONY. See the article OSSIFICATION.

OSTEOLOGY (*Cycl.*)—There are properly two kinds of *oſteology*, one of which is to be learned from bones dried and prepared by boiling, and the other from the bones of a dead ſubject, as they are naturally connected with each other. Both theſe methods are very neceſſary for the practice of phyſic, and for the exact knowledge of the human body. By examining dry bones, however, we can only learn their exterior forms, their ſituation, and the connection which they may have with one another; but when we conſider them as joined together in a dead body, we are in a condition to obſerve many other things in regard to them, very uſeful in phyſic: becauſe their connections with one another by cartilages and ligaments, and by the diverſity of articulation, are ſometimes very different in the dry from what we ſee them in the freſh bones; there are, for inſtance, in dry bones, certain cavities which appear to be cotyloide, becauſe they are diveſted of their cartilages; but in freſh bones, they are found to be glenoide, their cavities being filled with cartilages. And, on the other hand, ſome cavities appear to be glenoide in the ſkeleton, which are cotyloide in the body, their cavities being augmented by cartilaginous ſupercilia.

The exterior form and qualities of bones are much better demonſtrated alſo from freſh ſubjects, than from prepared bones; becauſe they looſe a great many things in boiling, ſuch as the cartilaginous bodies, the perioſteum, the mucilaginous ſubſtance found between them, and the marrow contained in their cavities; all which may be ſhewn in a freſh body, but cannot be ſeen in a ſkeleton. *Riolan.* Encheiridion Anatomicum.

OSTINATO, or *Contrapunto* OSTINATO, in the Italian muſic, is much the ſame with *Perfidia*. See PERFIDIA, *Cycl.*

OSTRACION, in the Linnæan ſyſtem of zoology, the name of a large genus of fiſhes of the general order of the branchioſtegi. The characters which diſtinguiſh the fiſh of this genus, are, that they have no belly-fins, and their ſkin is always hard and often prickly. Of this genus, beſides the *oſtracion*, commonly ſingly ſo called, are the orbis, hyſtrix, atinga, &c. *Linnæus's* Syſtem. Naturæ, p. 52.

The characters of the *oſtracion*, according to Artedi, are theſe: there is no branchioſtegi membrane; the figure of the body is particular, being globoſe, or ſpherical, or roundiſh, oval or oblong and ſquare, or finally conic; the ſkin is very hard, and uſually beſet with rigid and hard ſpikes, either on the whole body or on ſome part of it, but in ſome ſpecies it is wholly ſmooth; there are no belly-fins; the number of the others is five, there are two pectoral or lateral fins, two others are on the back, the other at the anus and the tail; the mouth is ſmall; the teeth are large; and the eyes are covered with the common ſkin of the head; there are on each ſide two foramina for the noſtrils, near the eyes; the lips may be drawn back, but in their natural ſtate they cover the greater part of the teeth. *Artedi*, Gen. Piſc. 39.

The ſpecies of this genus are theſe. 1. The oblong ſquare *oſtracion*, with four large tubercles on the back: this is the piſcis quadrangularis maximus of Ray. 2. The oblong ſquare *oſtracion*, with a gibbous back: this is covered all over the body with beautiful hexagonal figures. 3. The oblong ſquare *oſtracion*, with a ſharp ſnout, and with ſeveral ſpots on the back and head; there is a ſpecimen of this in the cabinet of Sir Hans Sloane. 4. The ſquare *oſtracion*, variegated with a great number of ſpots: the ſpots of this are rounded, and are of various colours. 5. The triangular *oſtracion*, with two ſpines on the head, and two more on the lower part of the belly: this is covered with hexangular and other radiated bodies inſtead of ſcales. 6. The triangular *oſtracion*, with two ſpines near the head, and one long one on the upper part of the body near the tail: this is very beautifully ſpotted. 7. The triangular *oſtracion*, with two ſpines in the lower part of the belly, and covered with hexagonal bodies, with prominent edges: this is the piſcis triangularis of Cluſius and other authors. 8. The triangular *oſtracion*, ſpotted all over and covered in many places with tubercles, having two ſpines in the lower part of the belly: the ſpots of this fiſh are of various colours, and they are larger than the tubercles. 9. The triangular *oſtracion*, with hexagonal and radiated tubercles, and

with two ſpines in the lower part of the belly. This is ſmaller than moſt of the others. 10 The triangular *oſtracion*, covered with innumerable ſmall tubercles, and having no ſpines.

The ſpecies hitherto enumerated, have all a conſiderable number of teeth, the following ſpecies have only four: 1. The round *oſtracion*, with four teeth, covered every where with ſmall ſpines. This is the orbis of ſome authors. 2. The ſpotted *oſtracion*, covered all over with ſmall and very thick-ſet ſpines. This is the orbis aſper of authors. 3. The oblong and compreſſed *oſtracion*, with a roundiſh belly, and with ſpines only on that part. This is the orbis lagocephalus of Grew. The following ſpecies of *oſtracion* have no teeth at all, but have bony jaws: 1. The ſphæric *oſtracion*, covered all over with thick-ſet three cornered ſpines. This is the atinga orbicularis of authors; and is about the ſize of a gooſe's egg. 2. The roundiſh *oſtracion*, covered every where with flat and ſhort ſpines, but with the belly ſmooth. This is the orbis ſpinoſus of Cluſius. 3. The roundiſh *oſtracion*, covered with ſhort three-cornered ſpines, ſet at diſtances from each other. This is the orbis reticulatus of Liſter. 4. The oblong roundiſh *oſtracion*, with tubercles on each ſide, and with a very long back fin. 5. The roundiſh *oſtracion*, with numerous thick-ſet ſpines of a three-cornered figure at the baſe. 6. The conic oblong *oſtracion*, with long cylindric ſpines on all parts of the body, but principally on the ſides. This is the hiſtrix piſcis, or porcupine fiſh of authors. 7. The oblong *oſtracion*, with long and cylindric ſpines covering all parts of it, but principally the head and neck. 8. The oblong ſmooth *oſtracion*, with a long head, and with a body adorned with various figures. This is the orbis teſtudinis capite of Ray. 9. The compreſſed roundiſh rough *oſtracion*, with horizontal pectoral fins, and with four foramina in the head. This is the fiſh called by authors the *mola*, or *ſun-fiſh*. *Artedi*, Gen. Piſc. p. 39.

Willughby uſes the word *oſtracion* for a fiſh caught ſometimes in the river Nile. It is very thick in proportion to its length, and of a ſomewhat pentangular form. It is uſually of about a foot long, and is covered with a ſhelly coat or skin, not leſs ſtrong and hard than many of the ſhell-fiſh kind. It has a ſtrait, not forked tail, two fins a little above it, and two more higher up the body. Its eyes are white; its mouth ſmall; and it is all over of a pale whitiſh hue. *Willughby*'s Hiſt. Piſc. p. 148.

OSTRACITES, (*Cycl.*) in natural hiſtory, a name given by authors to the foſſile *oiſters*, common in many parts of England. Theſe are of various ſhapes and kinds; and the name is by ſome authors made to ſignify, the ſhell itſelf, when preſerved in its native ſtate and condition; as is the caſe with thoſe found about Woolwich and Blackheath; and by others, the ſtones caſt or formed in thoſe ſhells, or in cavities from whence they have been waſhed away and diſſolved: in both theſe caſes, the ſtone carries the exact reſemblance of the ſhell, even in its niceſt lineaments; in the firſt caſe, carrying every mark of the inſide; in the other, of the outer ſurface. *Hill*'s Hiſt. of Foſſ.

We have this ſtone in great plenty in many parts of England; and it is very famous, in ſome places, for its virtues in caſes of the gravel, and the like complaints, as mentioned in the *Cyclopædia*. See Tab. of Foſſils, Claſs 9.

This virtue of a foſſile, not generally known, may make it neceſſary to add ſuch an account of it, that it may not be miſtaken by thoſe who are willing to try it. It is the *oſtracites maximus rugoſus aſper*, the greateſt rough and uneven *oſtracites*, excellently deſcribed by Liſter. It burns to lime as the ſpars and ſelenitæ do, and yields no volatile ſalt on a chemical analyſis. The common oiſter ſhells freſh taken and uſed, do not afford more than half a ſcruple of a liquor moderately urinous, from a quarter of a pound of the ſhells; and probably, on being long expoſed to the weather, they would looſe even that, and yield no more, on trial, than the *oſtracites*.

Theſe foſſile oiſter-ſhells are more beaked at the part where the hinge is, than the common oiſter; and in their ſpecific gravity, they are heavier than freſh oiſter ſhells, and approach to the nature of the ſelenites.

It is to be obſerved, that all the foſſile ſhells, and particularly the *lapides judaici*, or Jew's ſtones, which have been the ſpines of ſea echini, have been eſteemed diuretics, and good in the ſtone and gravel. Among the antients, Dioſcorides, Pliny, and all the reſt recommend them highly. Phil. Tranſ. N° 251.

OSTRACODERMATA, a term uſed by Ariſtotle, to expreſs that claſs of ſhells which we call *teſtaceous*, in oppoſition to the cruſtaceous animals, or malacoſtraca. The definition Ariſtotle gives of this claſs of animals is, that they are ſoft within, but hard without; that their ſhells may be bruiſed or broken; but their parts cannot be torn from one another, as they can in the cruſtaceous kind, ſuch as the lobſter; whoſe ſhells covering the legs, body, tail, &c. being ſo many diſtinct pieces of ſhell, and only joined by membranes, may be torn aſunder by pulling till thoſe membranes give way. The echini marini, or ſea urchins, have been generally allowed to be teſtaceous animals; and even Ariſtotle himſelf, the author of the diſtinctions, as well as later writers, have arranged them in this manner; but it is plainly erroneous; for they have all the characters of the cruſtaceous kinds, when ſtrictly examined; and their ſhells are, as in the lobſter, made up of ſeveral pieces connected by membranes, and diviſible one from another, by tearing or pulling without breaking; and every one of the ſpines is a ſort of leg, moveable every way upon its ſocket, and joined in the ſame manner only by a membrane: Geſner ranks them among the teſtaceous fiſhes, tho' he acknowledges that Rondeletius, whom he uſually follows, claſſes them among the cruſtaceous kinds; reckoning them after lobſters and crabs. Pliny alſo is of this opinion, and differs in it from moſt others of the antients: yet the place of theſe fiſhes has ſcarce yet been aſcertained. A ſhell is properly enough the name of the covering of theſe, as well as of the other, or teſtaceous fiſhes; and in the teſtaceous kinds, may be defined to be a hard ſubſtance, covering an entire animal, or at leaſt one whole ſide of one without joints or ligatures: and, on the other hand, a cruſt may be defined to be ſuch a hard ſubſtance as covers only one particular joint of the encloſed animal; ſo that in the whole cruſtaceous fiſh, there are as many ſhells, if we may be allowed to uſe that word in the general ſenſe, on every animal, as there are joints in that animal. The ſcalops, oyſters, wilks, &c. give us familiar inſtances of the firſt kind or ſhells, properly ſo called; and the crabs and lobſters, of the latter kind or cruſts. The firſt, therefore, are properly teſtaceous animals; and the latter cruſtaceous: and in this caſe, whoever examines the ſea echini in their exact and perfect ſtate, will find that they evidently belong to the cruſtaceous, not to the teſtaceous claſs.

The echini, lobſters, &c. may be called *multi teſtaceous*, or many-ſhelled; and the others *ſimply teſtaceous*, *biteſtaceous*, and by other terms, expreſſing the characters of thoſe few genera which have more ſhells than two: and as in the ſcaly fiſhes, every ſeparate ſcale has its ſeparate muſcle, to which it is anſwered by a particular tendon; ſo all the cruſtaceous animals have particular muſcles, which are ſeparately inſerted one into every cruſt; and all theſe cruſts are alſo connected to each other by common membranes, which are in a particular manner neceſſary, as they do not lie one upon another as the ſcales of fiſhes do, and by that means ſecure and ſtrengthen each other. Phil. Tranſ. N° 219. p. 199.

OSTREA, the *oiſter*, in natural hiſtory, the name of a very large genus of ſhells, the characters of which are theſe: It is a bivalve ſhell, of a coarſe external ſtructure, and dirty appearance; each ſhell being compoſed of a great number of laminæ not nicely cloſed down upon one another. It is in ſome ſpecies ſmooth, in others ſtriated, tuberous, or prickly; uſually flat, but ſometimes globoſe, plicated, and wrinkled into ſinuſes. The lower ſhell being always deeper than the other. Aldrovand ſuppoſes this genus of ſhell fiſh obtained the name *oſtreum*, from the Greek ὀστέον, a bone, as they are of a bony hardneſs. See Tab. of Shells, N° 17.

Moſt authors have confounded the two genera of *oiſters* and chamæ together, tho' there is an obvious and invariable diſtinction. The *oiſter* is rough, and has a ſort of beak; and notwithſtanding the roughneſs of both ſhells, it always ſhuts very evenly and firmly: add to this, that one of its ſhells is flat, the other convex; and is thus abſolutely diſtinguiſhed from the chamæ. Hiſt. Nat. Eclair. p. 313.

Oiſters in their growth become faſtened to every ſolid ſubſtance which they happen to come into contact with; and rocks, ſmall ſtones, wood, ſea-plants, and a thouſand other things are found at times with *oiſters* adhering to them, whoſe ſhells have fitted themſelves to the form of the thing itſelf, and left their natural ſhape. The people who fiſh for, and trade in *oiſters*, pretend to diſtinguiſh two kinds; one which is fecund and will breed; the other which is barren. They ſay, they diſtinguiſh theſe by a little black fringe, which always ſurrounds the good breeding *oiſters*.

The way to make *oiſters* green is, to put them into ſmall pits where the water is about three foot deep, and where the ſun has great power; in theſe they become green in three or four days.

The ſpecies of *oiſters* being very numerous, they may be better underſtood by being arranged under ſome general heads.

I. Some *oiſters* are plane and ſmooth.

Of theſe we have the following ſpecies: 1. The common *oiſter*. 2. The naturally green *oiſter*. 3. The oriental *oiſter*. 4. The pearl *oiſter*, or berberis; this is by many authors deſcribed as a peculiar genus, under the name of *concha margaritifera*; but it is a true ſpecies of *oiſter*. 5. The green-onion-rind *oiſter*. 6. The roſe-coloured-onion *oiſter*. 7. The yellow-onion *oiſter*. 8. The amber-coloured-onion *oiſter*. 9. The ſtriated-onion *oiſter*. 10. The ſaddle *oiſter*. 11. The violet-coloured ſaddle *oiſter*. 12. The pintado *oiſter*, whoſe ſpots reſemble thoſe of the pintado, or guinea hen. 13. The pond *oiſter*. 14. The red-ſtriated japan *oiſter*. 15. The ſwallow *oiſter*.

II. Some *oiſters* are ſmooth, yet foliated on the ſurface.

Of theſe we have, 1. The malleum, or brachiated *oiſter*; called *the mallet-headed oiſter*. 2. The ſmall plicated *oiſter*, called *the cocks comb*, or *the hog's ear oiſter*. 3. The hedge-

hog *oyſter*: this has its ſhells round, with tubular ſpines. 4. The leaf *oyſter*. 5. The tortuous *oiſter*, called by many the leg *oiſter*. 6. The thigh *oiſter*.

III. Some *oiſters* are of a globoſe form, and carry ſpines on their ſhells.

Of theſe we have the following ſpecies: 1. The round-ſpined *oiſter*. 2. The *oiſter* with flat ſpines. 3. The fire-coloured *oiſter*, with large ears. 4. The white-pointed rock *oiſter*: this is uſually found adhering to ſtones. 5. The bridge *oiſter*: this alſo is uſually found affixed to ſtones or pebbles, in ſuch a manner as to repreſent a bridge; the ſeveral ſmall ſtones its ſhell ſpreads over making the piers. 6. The furr and roſe-coloured *oiſter*, with flat white ſpines. 7. The coral *oiſter*. 8. The medal *oiſter*, ſo called from the place near Bourdeaux, where it is found. 9. The *oiſter* with red and blue ſpines. 10. The cluſter *oiſter*, with variegated ſhells.

IV. Some *oiſters* are of a globoſe figure, and jagged with high raiſed laminæ.

Of theſe we have the following ſpecies: 1. The great foliated *oiſter* of Rumphius, called by ſome the Placenta foliacea. 2. The ſtriated orange *oiſter*, from the Baltic. 3. The ſquammoſe or ſcaly *oiſter*, called Scandebec by Rondeletius. 4. The ſquammoſe *oiſter*, with tubular ſpines. 5. The yellow ſquammoſe foliaceous *oiſter*: this ſpecies is often found adhering to the ſeveral kinds of coral, and is not unfrequently itſelf covered with balani or center ſhells.

V. Some *oiſters* are oblong and umbonated.

Of theſe we have the following ſpecies: 1. The ſmooth ſpondylus or aſs-foot *oiſter*. 2. The rugoſe but not ſpinous *oiſter*. 3. The white-plated *oiſter*, with a digitated edge covered with roſe-coloured ſpines. 3. The yellow-plated *oiſter*, variegated with red and white. 5. The gaidaron *oiſter* of Rondeletius. See OYSTER.

OSTRICH, *ſtruthio*, in zoology. See STRUTHIO.

OSTRUCIUM, a name given by the Latin writers of late ages to the plant called ſmyrnium and oluſatrum. Macer calls this plant caulis ſylveſtris, and has given to it the virtues attributed by the antients to the ſtruthion, ſuppoſing theſe to be the two names of the ſame plant; but this is evinced to be an error by the writings of all the antient Greeks. Theophraſtus in particular ſays, that the ſtruthion is a prickle or thorny plant. This alone is ſufficient to prove it can have no relation to the *oſtrucium* of the later authors, or Alexanders, which is a ſmooth unbelliferous plant.

This inaccuracy of the writers who collect their accounts from the ancients, is ſometimes of bad conſequence; ſince thoſe who are unable to have recourſe to the original authors, are miſled ſo far as to ſuppoſe the virtues of one plant may be found in another. See the article SMYRNIUM.

OSYRIS, in botany, the name given by Linnæus to a genus of plants, including the caſia of Tournefort, and other authors. The characters are theſe: it produces both male and female flowers. In the male flowers the perianthium is one leaved and hollow, and is divided into three ſegments, which are all of the ſame ſize, and of an acute oval figure. There are no petals, and the ſtamina are three ſhort filaments. The antheræ are ſimple. In the female flowers the cup is of the ſame figure as in the male, but is very ſmall and ſtands upon the germen of the piſtill, and remains on it a long time. There are no petals. The germen of the piſtill is roundiſh, the ſtyle is very flat, and the ſtigma roundiſh. The fruit is a round berry, having one cell, in which is contained a ſingle bony ſeed. *Linnæi* Gen. Plant. p. 472. *Tourn.* 448.

OSYRIS is alſo uſed by ſome authors for the linaria or toad-flax. *Ger.* Emac. Ind. 2.

OTAPULLI, in botany, a name given by ſome authors to the tree which produces the *gamboge*, or *gutta gamba* of the ſhops. Hort. Malab. Vol. I. p. 41.

OTENCHYTES, a name given by ſome authors to a ſyringe made for injecting into the ears

OTHOMAN. See the article OTTOMAN.

OTHONE, οθων & οθονιον, among the antients, a kind of linnen garment worn by women. *Pitiſc.* in voc.

OTHONI, a word uſed by chemical writers for what they otherwiſe call the *mercury of the philoſophers*, or *philoſophic ops*.

OTHONNA, the name given by ſome authors to a ſtone found in Ægypt, and deſcribed to be always in ſmall pieces, and of the colour of poliſhed braſs: probably it is ſome ſpecies of the *pyrites*.

OTHONNA, in botany, a name given by ſome authors to the *african marygold*. *Ger.* Emac. Ind. 2.

OTIS, in zoology, the name of a large bird, called in Engliſh the *buſtard*. The *otis* is called *tarda* and *otardes* by ſeveral authors. See Tab. of Birds, N° 28.

In the Linnæan ſyſtem of zoology, the *otis* makes a diſtinct genus of birds of the order of the Gallinæ; the diſtinguiſhing characters of which are, that the feet have only three toes each, and thoſe all placed before, and the head is not adorned with a creſt or any other ornament. *Linnæi* Syſtem. Nat. p. 47.

It is of the ſize of the common turkey, its beak is like that of the common gallinaceous fowls; its head and neck are grey; its belly white, and its back variegated with tranſverſe ſtreaks of red and black; it has no hinder toe, by which, and by its ſize, it is eaſily diſtinguiſhed from all the reſt of the gallinaceous kind. It feeds on herbs, and eats very greedily the leaves of dandelion, and particularly on the ſeeds of hemlock, which ſeems a very ſtrange food It is frequent in many parts of England, where there are large heaths and plains: they are very bad fliers, and very difficultly raiſe themſelves up from the ground; but they are extremely ſhy, and if they ſee a man at a very great diſtance, they immediately eſcape as faſt as they can. Their fleſh is eſteemed. *Ray*'s orinthology, p. 129.

OTITES-*digitus*, the *ear-finger*, a name given by authors to the finger next the little one.

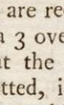
OTOMO, in zoology, the name of a bird of the lagopus kind, called alſo *colmeſtre*, and by the Germans, *ſteinhun*, that is, *ſtonehen*. It is of the bigneſs of a tame pigeon; its belly and wings are white, with only a very few browniſh feathers; its head, neck, and breaſt are variegated with brown feathers, and the upper part of the neck with black and white; its beak is very ſhort and black, and it has fine red granulated membranes over its eyes; its tail is principally black, but is variegated with brown and white; and its legs and feet are feathered to the ends of the toes. *Geſner* de Avibus.

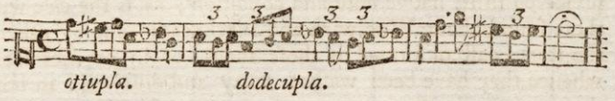
Mr. Ray is of opinion, that this is the ſame ſpecies of bird, with the common white *lagopus*, it being no way different but in colour, and thoſe birds being ſaid to change colour in the ſummer months. It is caught on the mountains of Germany, and is a very delicate bird for the table.

OTTER, in zoology. See the article LUTRA.

OTTERPIKE, in zoology, the name of a large ſpecies of the *draco-marinus*, or *ſea-dragon*, called in Engliſh the *weaver*: it is not greatly larger than the *weaver*, but is of a great variety of beautiful colours; and inſtead of the yellow ſide-lines which that fiſh has, this has rows of large black ſpots. *Willughby*'s Hiſt. Piſc. p. 288.

OTTOMAN, or OTHOMAN, an appellation given to the empire of the Turks, or rather to their emperors, from *Othomannus*, or *Oſmanhus*, the firſt prince of the preſent family. See *Hoffm.* Lex. in voc.

OTTUPLA, in the Italian muſic, ſignifies *octuple*, or the meaſure of four times; it is marked with a ſemi-circle, C; and ſometimes thus:  when it is to be played very quick. In this time, eight quavers are contained in a bar. But it often happens, that ſuddenly, inſtead of two quavers for every time of the bar, three are required; this is called *dodecupla*. 'Tis enough to place a 3 over three quavers, or notes of equal value, to ſhew that the meaſure muſt be changed; and when this three is omitted, it ſufficiently demonſtrates the meaſure to be *ottupla* again: this makes what is called by the Italians *ottupla è dodecupla*, thus:



ottupla. *dodecupla.*

Corelli, in the laſt movement of his tenth ſonata, opera terza, very often uſes an 8 after the *dodecupla*, to ſhew, that the triple there is changed to common time.

OTUS, in zoology, the name of the common *horn-owl* of the ſmaller kind, in many reſpects different from the great *horn-owl* or *eagle-owl*. It is a moderately large bird; its beak is black, and its face ſurrounded with a double circle of feathers, the outer of which is variegated with fine black, white and brown lines, and the place where both circles join is all the way black; its belly and the feathers on its legs are brown; its throat and breaſt are covered with feathers black in the middle, with white and brown edges; its long wing feathers are ſpotted with black; its horns, or feathers that riſe up from its ears, are black in the middle and variegated with brown and white at their edges; and its tail is grey above and yellow underneath, and is variegated with ſeveral tranſverſe black ſtreaks; its feet are hairy down to the toes. It is common in Italy, and is ſometimes caught in ſome parts of England, and generally fixes its abode in mountainous places. *Ray*'s Ornithol. p. 64.

OVA (*Cycl.*)—The ingenious Dr. Kerkring was the firſt who advanced the generation of all animals to be from *ova*, and that even man himſelf was produced out of an egg. The ſyſtem occaſioned great raillery at the time, and the author found himſelf under a neceſſity of publiſhing all his obſervations by way of juſtification. The *eggs* which he found in the teſticles of all females countenanced his opinion, and he gave figures of the parts in their natural ſituation, and of the eggs which he found in women from the age of eighteen to more than forty, in his different diſſections. Among the other creatures he examined, he found many ſmall eggs in the teſticles of cows, and other creatures of the viviparous kind. He gives an account of one *egg* which he had an opportunity of opening about four days after it had fallen into the matrix of a woman, and in this he could perceive the marks of the little embryo, the head of which was diſtinctly to be ſeen from the body. Another *egg*, which he had an opportunity of opening at about a fortnight after conception, afforded him a ſight of a little ſecundine. The membrane chorion divided in four places, and the amnion divided in the ſame manner the navel ſtring, by which the child was faſtened to the ſecundine;

cundine; and in the child itſelf, the face at this time began to be formed, and the features were diſtinguiſhable, and the principal parts of the body eaſily traced. At longer periods from the time of impregnation, the features and lineaments of all the parts appear more and more ſtrong; and the author has given accurate deſcriptions of the progreſs of the fœtus toward perfection, and figures of it at three, four, five, and ſix weeks after conception, at which laſt time all is very fair and plain.

The *ova* in which theſe lineaments of the fœtus are found after conception, are themſelves formed without ſuch lineaments, not only in married women, but in maids who have had no commerce with men at all; and it is the ſame in creatures naturally oviparous. The pullet will even lay her eggs without any intercourſe with the cock, but then they will have none of the lineaments of the young fowl, which are found in the eggs laid after treading, and enlarging every day after the beginning of the incubation.

The eggs found in the teſticles of unmarried women are generally of the ſize of a pea, round, and containing a glutinous liquor, which will harden, on boiling, in the ſame manner as the yolk and white of a common egg. The taſte is rather unpleaſant than inſipid, and they are inveloped in two ſkins, which after they are fallen into the womb become two membranes, called the amnion and chorion, which enlarge as the contents enlarge.

Fallopius obſerved theſe eggs in women before the time of Kerkring, but it was this author who carried on the conjectures of the other into a ſort of certainty, and added proofs to what he had firſt hinted from a number of experiments; and Wharton, in his account of human generation, is of opinion, that the ſemen penetrates into the teſtes of the female by means of the Fallopian tubes; in which caſe, the impregnation is in this inſtance performed exactly as in others of the oviparous creatures, and the whole difference amounts to no more than this, that in ſome the impregnated matter loſes its figure of the *egg* before it is excluded the parent; but in others, it retains it till it is not only put forth out of the body, but hatched by its genial heat afterwards.

The egg being impregnated by the ſemen admitted this way, deſcends into the womb, and there becomes, in a few days, of the biggneſs of a cherry; and afterwards increaſes, as we have already obſerved. This author having an opportunity of opening the body of a woman who had died ſuddenly about four days after the end of one of the menſtrual diſcharges, found in the womb an egg, of the biggneſs of a black cherry: he aſked the husband carefully, whether he had lain with his wife ſince the time of the menſes; and was informed that he had. This egg was evidently the produce of that impregnation; and tho', at the utmoſt, it could be no more than four days old, the fœtus was plainly diſtinguiſhable in it, on an accurate inſpection; and the head in ſome ſort found: the reſt of the body ſeemed an unformed maſs of fleſh. In ſuch another caſe, where there was reaſon to believe the embryo about fifteen days old, the eyes, noſe, ears, and mouth, were eaſily diſtinguiſhable in the head; and the body was ſo far faſhioned, as to be eaſily known by its ſhape, and the rudiments of legs and arms appeared very plainly from it. The bones, as they are afterwards to become, are at theſe young periods mere griſtles, and harden by degrees afterwards; but they ſoon acquire that degree of firmneſs, that the fleſh may be taken off and they preſerved as ſkeletons.

At about three weeks from the time of the conception, the fœtus has its cartilages for bones ſo perfect and ſo firm, that with due care in the management of ſo tender an object, the fleſh may be ſeparated, and a ſkeleton preſerved of this ſmall ſize. The head is very large at this period, in proportion to the body; but what is afterwards to become the ſkull, is only a membrane inflated with wind. The arms and hands are ſeen diſtinctly, and even all the fingers are formed. The number of the ribs may be eaſily counted, and the toes are as diſtinct as the fingers; but they are all ſo minute and tender, that a very nice hand, and very great art are neceſſary for the diſplaying them. After another week, that is, when the fœtus is a month old, the bones are ſo well formed, that the whole figure preſerves its form, and is able to ſupport itſelf. The jaw bones appear; the clavicles are formed; and all the ribs are very fair and diſtinct, except the firſt and laſt; and theſe two, even after another month, do not acquire the conſiſtence of bones. At this period of one month, the joints of the arms, and thoſe of the legs, are all very diſtinctly ſeen.

On examining a fœtus at two weeks beyond this period, that is, at ſix weeks from the time of conception, the inferior jaw bone has in it ſomewhat very remarkable; for it is plainly ſeen to be compoſed of ſix little bones; whereas, in the younger periods this is not obſervable; and when the child is born they are all joined together, and make but one bone.

Theſe are the proportions of growth in fœtus's, which have continued regularly growing to the time of the death of the parent, and have been taken out by diſſection afterwards: much leſs is to be judged from abortions, where the regular proceſs of nature in the growth and formation of the fœtus is perverted, and the child has, perhaps, been dead ſome months before it is excluded, or has been ſickly, and therefore not capable of taking nouriſhment, and growing as it ſhould have done. For theſe reaſons it not unfrequently happens, that an abortive fœtus of four months is not larger than one of theſe regular fœtus's of ſix or eight weeks; nor the parts any thing more advanced in their ſtate and ſolidity, or if at all, but very imperfectly and irregularly.

Mr. Dennys has added ſome obſervations on this ſyſtem of Kerkring; he agrees that theſe eggs, in which the rudiments of the fœtus are firſt to be diſcerned, are generated in the teſticles of the female, and made to deſcend thence by the ſpiritous effect of the male-ſemen, making its way thither thro' the tubes; and adds, that they are of very different forms and ſizes in different women The ſame woman often has, in her teſticles, eggs of very different ſizes; and as to the proportion in ſize, between different animals, no regard ſeems paid in it to their bulk, ſince not only thoſe of a cow, are much ſmaller than thoſe of a woman, but thoſe of a duck, or a hen, are vaſtly larger than either. The firſt beginnings of things do not always bear a proportion to their ſtate and increaſe, in the animal or vegetable world: beans are a much larger ſeed than that of the apple or pear, tho' the latter raiſes a large tree, while the former only furniſhes a ſmall plant. The reaſon why the eggs of fowls are proportionably larger than thoſe of the human ſpecies, or of quadrupeds, is, that they are to contain not only the young animal, but alſo the food for it to live on in the firſt part of its life. *Dennys*, in *Kerkring*, de Ovo.

Monſieur Gaulois obſerves, that the veſicles or eggs, in all ſorts of females, are to be obſerved in three ſorts of ſtate or condition: Firſt, while they are faſtened to the place where nature has lodged them, as in a repoſitory. Secondly, when they are looſened from the place. And Thirdly, when they incloſe the embryo

In the firſt of theſe ſtates, they are common to all females in the animal world; and authors of long ſtanding have obſerved, that there were in all the female animals, veſicles faſtened to certain parts of their bodies It is alſo certain, that after conception, that which incloſes the fœtus is very like an egg; but this is no new doctrine neither, for even Hippocrates and Ariſtotle have advanced it: Harvey alſo, of later times, has treated very much at large on this ſubject. The whole matter, in the doctrine of Kerkring that is new, and that deſerves a further enquiry is, whether theſe veſicles, which were always known to be faſtened to the bodies of females, are at all looſened from them; and whether that kind of egg, wherein the embryo is found, be, or be not one of theſe veſicles looſened?

The ſyſtem of Kerkring is founded on the anſwering this queſtion in the affirmative; but thoſe who are of the contrary opinion, who are not a few, think, that the bladder reſembling an egg, in which the fœtus is formed, comes not from elſewhere, but is formed in the place of the conception; and Harvey pretends to explain in what manner it is formed there; and they all agree, that the veſicles, called eggs in females, are ſo faſtened that they never can be removed; and even if they were, that there is no paſſage large enough for them to deſcend by from the place of their formation into the womb. Some pretend alſo, that if theſe are eggs then men have eggs alſo; for that the veſicles found in cluſters at the ſides of the *vaſa deferentia*, which anatomiſts from their figure compare to a cluſter of grapes, are truly and exactly of the ſame kind with thoſe veſicles called eggs in females. See EGGS.

OVA, among the antients, a kind of verſes, wherein the verſes were reduced to the form of an egg. *Hofm.* in voc.

OVAL-*leaf*, among botaniſts. See LEAF.

Foramen OVALE. See FORAMEN *Ovale*.

OVARY, *ovarium* (*Cycl.*)—OVARIUM of fiſhes. All fiſh have *ovaria*, but they, as well as the eggs they contain, differ greatly in the different kinds, in number, ſituation, figure, and ſtructure. In the cetaceous, the cartilaginous, and moſt of the other kinds of fiſh, the *ovarium* is double, or there are two *ovaria*; but in ſome fiſh, as in the *oſmarus*, the *perea fluviatilis* of Bellonius, and perhaps in ſome others it is ſingle. As to its ſituation, it generally occupies the whole length of the abdomen, as in moſt of the ſpinoſe fiſhes; and in the petromyzum and accipenſer. In many of the cartilaginous fiſhes it occupies only the upper part of the abdomen; and finally, in the cetaceous fiſhes it is placed at the corner of the uterus. As to its figure, it is generally oblong and compreſſed, as is ſeen in moſt of the ſpinoſe kinds: in thoſe fiſh which have it ſingle, it is oblong and cylindric, and in the cetaceous fiſhes it is round.

The eggs themſelves are alſo very different in number and ſtructure. In regard to number, they are in ſome fiſhes very few, as in the cetaceous kinds. In the cartilaginous kinds they are ſomewhat more numerous, amounting to fifty or a hundred; and in other kinds of fiſh they are ſo numerous, as to be beyond account.

In regard to their ſize and ſtructure, they alſo differ conſiderably: in ſome fiſh they are large, and reſemble a hen's egg in their contents; having a white, and yolk, and cica-

tricula, all distinct in them, as in the cartilaginous fishes of many kinds. In others, as in the cetaceous kinds, they are very small and simple, and have no distinct appearance either of white, yolk, or of the cicatricula. Hence it is evident, that the fœtus of cetaceous fishes, while included in the egg, receives its nourishment from the womb itself; but in the others, as the cartilaginous, and other fish, the white of the egg serves as nourishment to the fœtus while it remains in it. Finally, in the generality of other fishes, the eggs are very small, and probably do contain a white, and yolk, tho' their size makes it not easy to see their parts distinctly. All the spinose fishes have these small sorts of eggs, and among the cartilaginous ones, the accipenser and petromyzum. It has been supposed by some, that the eggs of these fishes were simple bodies, and only answered to what Harvey, and other authors on these subjects call the *cicatricula*; but this cannot be the case, for if so, the young fish must perish; for the semen of the male fish is only scattered over the eggs while they lie in the water, and serves only to the rendring them prolific. The figures of all the eggs of fishes, so far as is yet known, is round. *Artedi*, Ichthyology.

OVATED-*leaf*, among botanists. See LEAF.

OUCH, in our old writers, a collar of gold, or such like ornament, worn by women about their necks. Stat. 24 Hen. VIII. c. 13. *Blount*, *Cowel*.

OVEN, or *Assaying* OVEN, in metallurgy, is the particular sort of furnace, used by the assayers in their operations on metals.

It is most conveniently constructed in the following manner: Make with iron plates a hollow quadrangular prism, eleven inches broad, and nine inches high, ending at top in a hollow quadrangular pyramid of seven inches in height; this prism must be closed at bottom with such another iron plate, which serves as a bottom to it. Near the bottom make a door three inches high, and five inches broad, to lead to the ash-hole. Above this door, and at the height of six inches from the basis, make another door of the figure of the segment of a circle, four inches broad at its basis, and three inches and a half high in the middle; then fasten three iron plates on the forepart of this furnace; let the first of them, which must be eleven inches long, and half an inch high, be placed with its lower edge against the bottom of the furnace, and fastened there with three or four rivets in such a manner, that there may be, between the upper edge of the said plate, and the side of the furnace, a groove so wide, that the sliders of the lower door may be put into it, and freely move backward and forward therein: these must be made of a thicker iron plate.

The second iron plate eleven inches long, and three inches high, must be placed perfectly parallel to the foregoing plate; and in the space between the two doors in such a manner, that both the upper and lower edge of it may, with the side of the furnace, form a hollow groove: one of these grooves which looks downward, serves to receive the upper edges of the sliders that shut the lower door; and the other that looks upward, is to receive the inferior edges of the sliders of the door above.

The third plate, which is to be of the same dimensions with the first, must be riveted close above the upper door, in such a manner, that it may form a groove looking downward, and contiguous to the upper edge of the upper door. In order to shut both doors, you must adapt to each of them two sliders made of iron plates, that may move within the above-mentioned grooves; but the two sliders belonging to the upper door, must have each a hole near the top; that is, one a small hole a fifth of an inch broad, and an inch and a half long; and the other a semicircular aperture, one inch high, and two inches broad: besides this, let each slider have a handle, that it may be laid hold of when it is to be moved.

Beside these, let five round holes, each of an inch in diameter, be bored in the furnace; two of these must be made in the fore part of the furnace, two in the back part of it, but all at the height of five inches from the bottom, and three inches and a half distant from each side of the furnace: and, finally, a fifth hole must be made at the height of one inch above the upper edge of the upper door. The inside of the furnace must be lined throughout with iron hooks, standing out about half an inch, and placed at about three inches distance from one another, to hold on, and fasten the matter of the lute, with which the whole inner surface of the furnace is to be coated.

Let an iron moveable hollow quadrangular pyramid, of three inches in height, be next adapted to the upper aperture of the furnace; this must be seven inches broad at the basis, and end upwards in a hollow tube three inches in diameter, two inches high, and nearly cylindrical, but a little convergent at the top: this prominent tube serves to support a funnel, or flue, which must be nearly cylindrical, hollow, and two foot high, and made of iron plates. This, when a very strong fire is required, must be put perpendicularly upon the shorter tube, in such a manner, that it enters closely and evenly into it an inch and a half, or two inches deep; and may be taken off at pleasure when the fire is not required to be so very violent. This pyramidal cover must, however, have beside, two handles fitted to it, that it may conveniently also be taken off or put on at pleasure; and that this when put on the aperture of the furnace may not be subject to be easily thrown down, let an iron plate be riveted to the right and left upper edge of the furnace, and be turned down toward the inside, so as to make a furrow open before and behind, into which the lateral edges of this cover may enter, and be fastened, and at pleasure moved backward and forward when it is to be put on or removed.

Lastly, let a square ledge, made of a thick iron plate, be fastened on the top of the upper edge of the lower door, which will conveniently support the grate and the lute; but this must be made of two pieces, that it may easily be introduced into the cavity of the furnace; and thus will you have an *assay oven* compleat, and ready for a great variety of operations.

When this is to be used, that the fire may be the better confined, and the iron not be destroyed by growing red-hot, the whole inside of the furnace must be covered over with lute, a finger, or a finger and a half thick. The matter for the making the assaying metals, &c. or a mixture of clay with sand, powder of calcined flints, or broken crucibles, either mixed with water, or with blood diluted with water, will serve very well for this purpose: but the most ready of all lutes, and at the same time one of the best in the world, is the coarse earth called Windsor loam: this must be mixed up with water pretty stiff, and pressed on the inside of the furnace, first wetted also with water; and when this lute begins to dry, it must be beat down close to the sides with a wooden mallet; and then the unevennesses and cracks, filled up with clay somewhat moister, so as to be made smooth and even with a trowel, and then left to dry gently; and if any cracks happen, they must again be filled up. If any pieces of this lute are broken off by the fire, let it be quite cold, and wet it after the operation is over, and the edges of the old lute and fresh clay will unite very well, and fill up the holes. If the crack is but small you may use the furnace again immediately, even before the fresh clay is dry.

This is the method of coating the *assay furnace* or *oven*; but before this is done there must be put within the furnace small iron bars, equal in length to the diameter of the oven; these must be prismatical in shape, quadrangular, and half an inch thick: their extremities will be supported by the ledge before described within the oven; and they must be placed at three quarters of an inch distance from one another. These must also be so placed, that their flat sides may be oblique with regard to the transverse section of the furnace, and that the two opposite angles may look one upwards and the other downwards. The bars being thus not laid flat, but edgeways, you hinder the ashes of the fuel of the fire from being detained too long between the interstices of the bars, and from making any obstruction that would oppose the free draught of the air. After the placing these, the furnace being coated over with lute, and dried by a gentle heat, is fit for use.

When an operation is to be performed in this, two iron bars of an inch in thickness, and somewhat more than the diameter of the furnace in length, must be put thro' the four holes before described, standing opposite to one another; and the ends of the bars must jut out a little beyond the edges of the holes on each side; these serve to support the muffle with its bottom, in which the coppel or test, with the matter to be worked on is to be placed: these are then to be introduced thro' the upper aperture of the furnace, and set on these bars in such a manner, that the open foreside of the muffle be contiguous to the inward border of the upper door. The fuel is to be introduced thro' the top of the furnace, and the cover on this account must be moveable, and not too heavy. The best fuel is charcoal made of hard wood, and broken into pieces of an inch big, that the muffle may be covered regularly over some inches high; large pieces of coal are to be avoided at this time, because they cannot fall into the narrow interstices between the sides of the muffle and those of the furnace; and cannot of course surround every way this circumference of the muffle; for which reason if such were used, there must be some places void of fuel, and the fire, consequently, either not strong enough, or unequal: and if, on the other hand, the pieces of coal were too small, they would fall immediately thro' the interstices of the grate into the ash hole, and the tenderest particles of them turn too soon into ashes, and increase the heap of ashes, and obstruct the free draught of the air.

Scotch coal, or Kennel coal, but not Newcastle or sea coal, broken into small pieces, may be mixed with an equal quantity of charcoal; or if any ores require long roasting, the fire may be first kindled with Scotch coal alone, but the operation must be finished with charcoal alone. *Cramer's* Art of Ass. p. 75. seq.

OVER *(Cycl.)* — OVER-*blow*, in the sea language. They say it *over-blows* when the wind blows so very hard that the ship can bear no top sails.

OVER-

OVER-*done*, in the manege, in French, *outré*. A horſe is ſaid to be *over-done*, or *outré*, when his wind and ſtrength are broke and exhauſted with fatigue.

OVER-*flowing of lands*. The farmers of England having long obſerved how great an advantage it was to meadow and paſture land, to be ſometimes *over-flowed* by the ſudden riſe of brooks, rivers, or the like, which brings the ſoil of the uplands upon them, and makes them need no other mending or manuring, tho' conſtantly mowed, have found an artificial method of working the ſame effect, and by it producing the ſame good effect in many of their grounds without any ill one. The benefit of the natural *over-flowings* of meadow lands, which lie in the way of floods, is in ſome ſort taken off, by their being ſubject alſo to theſe inundations at improper times; and when a winter flood has cauſed a fine crop of graſs, a ſummer flood ſometimes comes and deſtroys it all before the hay-making ſeaſon.

There are ſome lands ſo advantageouſly ſituated, that with the aſſiſtance of art they may be laid under water or left dry, at the pleaſure of the farmer. Theſe are the moſt valuable of all graſs lands, and it is upon theſe that the farmer practiſes his artificial *over-flowings*; improving them in winter by letting in the floods to have their ſoil for manure upon them, and keeping them dry in ſummer when the graſs is long.

The artificial *over-flowing* of lands is commonly effected by directing the ſtreams of rivers, brooks, ſprings, or land floods, or ſome part of them, out of their proper channel; but where the ſtreams lie ſo low as to be incapable of *over-flowing* the lands, they are made uſe of to turn ſuch engines as may raiſe a quantity of water ſufficient to do it. The beſt and cheapeſt engine for effecting this, is that called the Perſian wheel; which may be made of any ſize, according to the height the water is to be raiſed to, and the ſtrength of the ſtream by which it is turned. This wheel is placed ſo, that its bottom only is immerſed in the ſtream; and there are open boxes at its cogs; theſe are all filled one after another with water, which is raiſed with them to the upper part of the wheel's circuit, and then naturally empties itſelf into a trough which carries it to the land.

Where there are not ſtreams to turn this wheel, the farmers have recourſe to pumps, and other engines, moved by wind. Lands that lie near brooks give more frequent opportunities for theſe practices, than thoſe which are near rivers; the brooks having greater falls, and the rivers running more ſlow and level: but when it can be effected by the water of large rivers, the land is yet more enriched by it, theſe waters being more fruitful than the others.

When the water is, by this engine, thrown into the trough, it is to be conducted by it to the higheſt part of the land; and when that is ſufficiently flooded, the water is to be let into a large but not deep trench, ſeveral ſmall ones running out of which to all parts of the land, may convey it every where, and every part may be enriched by it. It is always proper to contrive this matter ſo, that the *overflowing* may be often repeated, and the water quickly carried off; for when it is ſuffered to lie long upon the land in winter, it is apt to breed ruſhes and other coarſe plants in the ground.

Some farmers graze their lands till Chriſtmas, and ſome longer; but as ſoon as fed bare, from Allhallows till ſpring, that the graſs is not too high, is the propereſt time of *overflowing*, except that it prove a dry time in April or May. If this happen, *overflowing* the lands at this time will be of ſingular advantage; for the graſs will grow three times as faſt after it, in hot weather, as it would in cold. Land-floods are the beſt to *overflow* with in winter, and warm fattening ſprings in ſummer; only it muſt be obſerved, that the water of one operation is dried in before any more is let on. It is always beſt alſo to do it at night, that the moiſture may be ſoaked into the ground before the heat of the day; for otherwiſe the land is often burnt. The waſhings of towns and of public highways is of great improvement to lands, as is alſo the waſhings of lands where ſheep feed.

All waters are not proper for this purpoſe of *overflowing* of lands to enrich them, the waters of coal mines and other places where there is any ſulphureous mineral mixed among them, being apt to deſtroy and kill the graſs where-ever they come. Theſe waters are eaſily known from the healthful ſpring, by their leaving a reddiſh mud or ſediment behind them where-ever they have paſſed; but it is poſſible, that even theſe may have their uſe when properly applied. They ſeem to contain a vaſt quantity of ſalt of ſome kind, and we know that urine, dung, and many other things, that are moſt fit of all others to enrich land, will burn up and deſtroy plants, if improperly laid on in large quantities: the caſe may be the ſame in theſe, and very probably theſe waters abounding in ſalt would do great good if they were properly blended with common water, and let in upon the lands with floods of ſweet water. The farmers have gone ſo far towards the proving the truth of this, that they have found ſome of theſe ſprings, when more diſtant from their ſource, not only more innocent than before, but beneficial.

Cold clay lands, and other ſtrong lands that lie flat, will only be improved by *overflowing* them with land floods, and that only in ſummer, when the ſeaſon is very dry. Theſe lands will not bear water in ſuch quantity at any other time, becauſe it will not ſoak into them eaſily; and it is for the contrary reaſon, that the light and ſpungy lands are always moſt improved by *overflowing*. *Mortimer*'s Huſbandry.

OVER-*grown*, in the ſea language. When the waves of the ſea grow high, the ſailors call it *rough ſea*; but when the ſurges and billows grow vaſtly high, then it is an *over-grown ſea*.

OVER-*hale*, in the ſea language. A rope is ſaid to be *over-haled*, when drawn too ſtiff, or haled the contrary way.

OVER-*hale the runner*, in the ſea language. See RUNNER.

OVER-*hale the ſheet*, in the ſea language. See SHEET.

OVER-*ride*, in the manege, the ſame with *over-done*. See the article OVER-*done*, ſupra.

OVER-*ſet*, or *overthrow*, in the ſea language. A ſhip is ſaid to *over-ſet* when her keel turns upwards; which misfortune happens either by bearing too much ſail, or by grounding her, ſo that ſhe falls upon one ſide.

OVER-*worked*, in the manege, is the ſame with *over-done*. It is called in French, *eſtrapaſſer*. See OVER-*done* and ESTRAPASSER.

OVER-*laying of children* may be prevented by a machine called *arcuccio*. See ARCUCCIO.

OVIEDA, in botany, the name given by Linnæus to a genus of plants, called by Plumier *valdia*. The characters of which are theſe: the perianthium is a ſhort and broad one-leaved cup, lightly divided into five erect and pointed ſegments, and remaining after the flower is fallen. The flower conſiſts of one petal, and is of the labiated kind. The tube is extremely long and ſlender, and ſtands upon the germen of the piſtil. It is ſomewhat thicker at the top than at the baſe, and the upper lip is hollow and emarginated; the lower is divided into three ſegments. The ſtamina are four filaments longer than the flower. The antheræ are roundiſh. The germen of the piſtil is globoſe, and ſtands between the cup and the flower. The ſtyle is capillary, and of the length of the ſtamina; and the ſtigma is bifid and acute. The fruit is a globoſe berry, placed in the cup, which grows larger to receive it, and is of a campaniform ſhape. The ſeeds are oval, and are two in number. *Linnæi* Gen. Plant. p. 295. *Plumier*, Gen 24.

OVILE, among the Romans, a name given to the incloſures in which the comitia met to create magiſtrates. See the article COMITIA, *Cycl.*

OVIPAROUS (*Cycl.*)—The diſtinction between *oviparous* and viviparous creatures, ſeems, in the inſect world, to be much leſs fixed and determinate than is ſuppoſed. It is evident, that ſome flies, which are naturally *oviparous*, if they are kept from the finding a proper nidus for their eggs, be it meat, or any thing elſe, will retain them ſo long beyond their due time of excluſion, that they will hatch into worms in the body of the parent, and be afterwards depoſited alive on fleſh, or in the manner of the young of the viviparous inſects. Bartholine gives an account in his Medical obſervations, of a hen, which, inſtead of eggs, brought forth no leſs than five living chickens; but ſhe died of it.

This ſtory of Bartholine is countenanced in a great meaſure by a thing which happened in this kingdom; where, in the county of Norfolk, ſome years after his publiſhing this hiſtory, there was a hen, which, tho' big with eggs, could not lay, but after a time died; and people being curious to open her afterwards, there was found in the ovarium, a chicken diſcloſed from the ſhell, and perfectly formed in all its parts; and probably had this been excluded in this ſtate, more would have followed, after being hatched in the ſame unnatural manner. We have in ſome authors inſtances given of the ſame accident in the ſerpent kind, which puzzle the diſtinction between the *oviparous* and viviparous kinds.

OVIS, the *ſheep*. The character of this genus of animals, given by naturaliſts, is, that the covering is wool, not hair; the mouth proportionably ſmaller than in the ox kind; the horns crooked, wrinkled, and often ſpiral, and the papillæ only two.

The wool of theſe animals is only a congeries of very long and ſlender hairs, oddly twiſted and contorted, and variouſly interwoven with one another. This is a cloathing peculiar to the ſheep kind, ſo far as is yet known, no other animal having been ſeen to poſſeſs it: it is not, however, the cloathing of all the ſpecies of ſheep, ſome of the diſtant nations having ſhort hair, like that of the goat.

We at preſent know five ſpecies of this animal: 1. The common *ſheep* of our own paſtures. 2. The *ovis laticaudo*, famous for the enormous ſize and breadth of its tail, which often weighs thirty pounds. See the article PLATYCERCOS. 3. The *ovis ſtrepſichoros*. See STREPSICHOROS. 4. The *ovis Afri.ana*, or African *ſheep*, which inſtead of the wool of the *ovis*, has ſhort hair like that of the goat; we have theſe often brought into England, and they ſeem no way different from ours but in their covering. And 5. the *ovis Guinienſis*, commonly called the *Angola ſheep*. This is of the ſize of our *ſheep*, but the hinder part of its head is more prominent, and its ears hang down. Their ſcrotum is very large, and their penis placed in the middle of the belly; the horns ſmall, and bending down to the eyes; and the neck adorned with a large mane.

mane. The hair of the reſt of the body is ſhort, and they have a dewlap under the throat like our bulls. *Ray*'s Syn. Quad. p. 73.

To theſe are uſually added the *pacos* and *muſmon*; the firſt of which properly belong to the camel claſs, not the *ſheep*, and the latter an animal ſuſpected not to be found any where at this time.

In the Linnæan ſyſtem of zoology, the *ſheep* makes a diſtinct genus of animals, of the order of the *pecora*. The characters by which the creatures of this genus are diſtinguiſhed from the reſt of that order, are theſe: their horns are hollow, bent backward, wreathed and crooked, and ſcabrous, not ſmooth on their outſide. *Linnæi* Syſtem. Nat. p. 43.

OUMIEN, a name given by the Chineſe to a peculiar ſort of porcelain, of which they are very fond. It is black, ornamented with gold. They ſometimes alſo call the blue and gold, which is made in the ſame manner, by the ſame name. They colour it with three parts of the azure, and ſeven parts oil of ſtone, and lay on the gold afterwards. If they would have it bluiſh, they add leſs of the azure, and ſome ceruſs white. Obſerv. de l'Aſie.

OUNCE *(Cycl.)* — The *ounce averdupois* weight, is about 37½ grains *troy*. See POUND.

OUNCE is alſo the Engliſh name of the lynx, or *lupus cervarius*, a very fierce beaſt of prey. See LYNX.

OURISSIA, in zoology, a name by which Cluſius and ſome other authors have called the *humming-bird*, or *guainumbi*. *Cluſ* Exot. l. 5. c. 7. See the article GUAINUMBI.

OUROLOGY, in medicine, a name given by authors to a treatiſe or diſcourſe on the ſubject of urine. The chemiſts have given us treatiſes on the analyſis of urine, and the preparations of it, ſuch as the phoſphorus, &c. under the name of *ourologies*: and medical writers have, under the ſame name, given us treatiſes on the prognoſtics from the urine, and its various appearance in different diſeaſes.

The firſt ſtep towards judging by the urine, is to fix ſomething as its ſtandard in a healthy ſtate, all the deviations from which, in whatever reſpect, are to be judged ſignals of diſtempers or diſtempered habits. This ſtandard is beſt taken from the urine of a perſon in health, of between thirty and forty years old, and it is of a citron colour and moderate conſiſtence, of a due and ſomewhat ſtrong ſmell, and made in a conſiderable quantity. This, when it has ſtood a proper time, is alſo to depoſit a natural ſediment. By being well acquainted with all the ſtages and changes of this, the diſeaſed urine will be eaſily judged of by their ſeveral peculiarities in difference from it. Phil. Tranſ. N°. 100.

It is ſaid by ſome, that people often die with good and healthful urine; but this is only ſaid by thoſe who are not ſkilful in urine: for it is as impoſſible for the urine to be healthful at the approach of death in diſeaſes, as for the blood to be ſo.

The time of inſpecting the urine, and the time that the urine is made that is to be inſpected, are alſo circumſtances of great conſequence. The urine by which the beſt judgment is to be formed, is that made after the firſt ſleep in the night; and the time of judging of this is not immediately when it is made, but about two hours after, when it has had time to ſettle. It muſt in the mean time be ſet to ſettle in a moderate air, neither too cold nor too hot. The firſt hinders the ſettling, and the latter rarifies the colour; and if very great, it cauſes an ebullition, which deſtroys what ſhould ſwim upon the ſurface of the urine. The urine muſt not be judged of in the ſun, nor by candle-light; for either of theſe lights will give falſe colours: but the proper place is, when there is a moderate, not glaring light; and when it is firſt received, it muſt be held very ſtill and ſteady; afterwards it will be proper to ſhake it, to ſee the whole that ſwims in it, and will ſeparate from it. *Eygel.* de Urinis.

The colour of the urine is the moſt precarious of all its appearances, and to be judged of with the greateſt caution. What is taken to be the mark of a diſeaſe in this caſe, is often only the effect of medicines or the food: rhubarb or ſaffron will make the urine yellow, and a common ſallad will make it greeniſh; but theſe tinctures go off after a few hours from the time of taking the things which occaſion them. People who live in a hot air, and thoſe who uſe violent exerciſe, uſually make more high coloured urine than others. The ſubſtance, the quantity, the qualities, and the contents of the urine, will always diſcover to the attentive view the nature, cauſe, and ſymptoms of the perſon who made it. What is moſt to be obſerved as to the ſubſtance of the urine is, whether it be thick or thin, clear or turbid, oily or not oily. The copiouſneſs of it is only to be judged of by compariſon of the quantity voided within the twenty-four hours by the patient, with that he uſed to void in health, or that quantity which at a medium a man in health does uſually void. Among the qualities of the urine, the principal is the ſmell. This is affected not only by diſeaſes, but by medicines taken for them. The urine is on many occaſions rendered fœtid; and there are ſome things which communicate an agreeable ſmell to it, ſuch as turpentine and many of the diſtilled oils. Among the things which render the urine fœtid, the principal are ulcers and purulent matter. The taſte of the urine alſo declares its qualities. It is naturally of a ſaltiſh and ſulphurous taſte, but this goes off, and a ſweetneſs or inſipidity is obſerved in it. The principal colours of the urine in its various ſtates, as inflamed by diſeaſes, are white, yellow, reddiſh, and black; to one or two of theſe, differing in degree or to mixtures of two or more of them, in different proportions, may be referred the other leſs common colours of pale citron, high-red, green and blue, which laſt two, in any perfect degree, are very uncommon. The moſt dangerous of all urines are the blue and the black, particularly the laſt: the antients, however, judged too ſeverely of it. Galen ſays, he never knew any one recover who made black urine; but we meet with ſome inſtances of children eſcaping after this ſymptom.

The contents of the urine are of three kinds: the ſediment or matter ſubſiding to the bottom; the matter hanging in the middle; and the matter ſwimming at the top. Theſe differ according to their degrees of weight, and in all theſe the phyſician is to obſerve, the ſubſtance, colour, uniformity and likeneſs. For example: the beſt ſediment is that which is moderate in ſubſtance and quantity, white, uniform, and alike both for matter and time. We are not to expect a ſediment in the urine in all diſeaſes, and in ſome a thinner, in others a thicker ſediment, is the beſt ſymptom. Among all the appearances of the middle and top of the urine, the worſt is that of a ſort of clouds forming themſelves in the urine, and riſing to the top entirely. Theſe are the ſigns of light-headedneſs, and often of death itſelf.

Beſides theſe, which are the general contents of urine, there are particular ones; ſuch as mealy matter, ſcales, coagulated blood, purulent matter, aſhes, ſlime, pieces of ſeeming fleſhy matter, ſmall hairs, woolly filaments, flying duſt, tough ſtuff adhering to the ſides of the veſſel, and reſembling the webs of ſpiders, bladders, froth, fat or cream-like ſubſtances, and finally ſandy or ſtony matter. This laſt is the moſt frequent of all, and is of two kinds; the one found in the body, the other only ſeparated from the urine after it is diſcharged. It is of great conſequence to know theſe, as they give great light into the nature of nephritic complaints. The ſandy matter generated in the body always precipitates itſelf to the bottom in the urine, as ſoon as it is made, and remains looſe in it; but the other only ſeparates from it in the pot, and adheres to the ſides of it in form of a ſort of cruſt. It has been ſuppoſed by many, that preſages of the ſtone may be made from theſe ſeparations from the urine, but there is no certainty in it; only this, that thoſe who have been uſed to void grains of ſand, if they ſuddenly leave it off, and from that time begin to make a whitiſh and thin urine, they then may be ſuſpected to have a ſtone breeding within them.

The nature of the ſand voided at times by people afflicted with the ſtone, may ſerve as a guide to judge of the nature of the diſeaſe. When it is hard and red, the ſtone is likely to be ſituated in the bladder; if hard and white, the kidneys are likely to be the ſeat of the diſorder. We have inſtances of very particular matters voided by urine, beſide theſe: ſome wholly erroneous; others certain, tho' very ſtrange. Plempius gives an account of a woman who voided a yellow fatty matter with her urine for ſeveral months after the going off of a quartan ague, and tho' ſhe diſcharged great quantities of this, was not at all the better for it. Phil. Tranſ. N°. 100.

OUT, OUTSIDE, or WITHOUT, in the manege, is the contrary of *in*, *inſide*, *inner*, &c. See IN, INNER, &c.

OUTIN, in zoology, a name by which ſome call the fiſh known among authors by the name of *oxyrynchus*. *Willoughby*'s Hiſt. Piſc. p. 187. See the article OXYRYNCHUS.

OUTLICKER, or OUTLIGGER, in a ſhip, a ſmall piece of timber, three or four yards long, as occaſion ſerves, made faſt to the top of the poop, and ſtanding right out a-ſtern: at the outmoſt end of it is a hole, into which the ſtanding part of the ſheet is received, and made faſt through the block of the ſheet; and then again received through another block, which is ſeized to this *outlicker*, hard by the end of it. This is ſeldom uſed in men of war, or in great ſhips; and whenever it is made uſe of, it is becauſe the mizen maſt is placed ſo far aft, that there is not room enough within board to hale the ſheet flat.

Outligger ſeems the true orthography of the word, which appears to be derived from the Dutch *uitlegger*, q. d. *outlier*.

OUTNESS, is uſed by ſome for that relation of things by which one appears out of, or at a diſtance from another.

Dr. Berkeley, in his eſſay on viſion, makes uſe of the word *outneſs*; and obſerves, that we form no notion of *outneſs* from the ſenſe of ſeeing merely, but only from motion.

OVUM *(Cycl.)* — OVUM-*anguinum*, a name given by many authors to a foſſil, ſuppoſed by the vulgar to be the petrified egg of a ſerpent, but being really like the brontiæ and ombriæ, ſpecies of the *echinites*. See ECHINITES.

OVUM-*polypi*, in natural hiſtory, a name given by ſome of the earlier writers, to the papyraceous, or thin-ſhelled nautilus. The reſemblance of the body and arms of the fiſh which inhabits this ſhell, with thoſe of the ſea-polypus, gave occaſion to their ſuppoſing this creature the ſame animal, not yet got out of the egg. The ſhell of this ſpecies being very thin, and

and looking like an egg-shell, gave farther countenance to this error in less knowing ages.

OVUM *rumphii*, in natural history, the name of a species of *porcelane shell*, of the oblong kind, called an *egg*, from its shape, by that author. See PORCELLANA.

OUZELL, or *Brook* OUZELL, in zoology, an English name for the *rollus aquaticus*, more usually called the *water rail*. See the article ROLLUS.

OUZELL, or *Ring* OUZELL, an English name for a bird of the *merula* or *blackbird* kind, remarkable for a white ring about its neck, and thence called by authors *merula torquata*; it is more commonly called in English, the *ring amzell*. *Ray*'s Ornithology, p. 144. See AMZELL.

OUZEL, or *Water* OUZEL, the English name of the *merula aquatica*. See MERULA.

OWL, in zoology. See the article BUBO.

Churn OWL. See CAPRIMULGUS.

Horn OWL. See HORN.

OWL *fish*, or *sea* OWL, in ichthyography, an English name for the *lumpus*, more frequently called the *lump-fish*; and by the Scotch the *cock-paddle*. *Willughby*'s Hist. Pisc. p. 208. See the article LUMPUS.

OWL *pigeon*, the name of a particular species of *pigeon*, called by Moore the *columba bubo nominata*. It is a small and short-bodied *pigeon*. It has a short round head, and has a series of feathers that separate and open two ways upon the breast: but its most remarkable character is its beak, the upper chop of which is bent, and hooked over like an owl's: this is the occasion of its name. It is of various colours, as white, blue, or black, but is always of only one colour, never pied. *Moore*'s Columbarium, p. 54.

OX, *bos*, in zoology. See the article BOS.

The *ox* is a very serviceable animal, in many respects; but his nature depends wholly on that of the bull and cow, from which he is bred. Derbyshire and Lancashire are said to have the best *oxen* in England. Wales, and the island of Anglesea, afford a kind that are very valuable to the farmers, as they will fatten upon middling land; and the Scotch *oxen* are yet hardier than these. The long-legged short-horned cow, of the Dutch breed, is the best for milk; but then this kind needs to be very carefully kept. This sort of cow will often yield two gallons of milk at a time.

When these creatures are intended to breed, the better the land is the larger sort of beasts are to be chosen, and the greater will be the profit. But of whatever sort the breed is, the bull should always be of the same country with the cow, otherwise it never succeeds so well. The bull should be chosen of a sharp quick countenance, his forehead broad and curled, his eyes black and large, his horns long, his neck fleshy, his belly long and large, and his hair smooth and like velvet; his breast should be large, his back strait and flat, his buttocks square, his thighs round, his legs strait, and his joints short. This sort of bull is the best for breed, and makes the best *oxen* for draught as well as for fattening.

The cow ought to have a broad forehead, black eyes, great clean horns, the neck long and thin, the belly large and deep, the thighs thick, the legs round, and the joints short; a white large and deep udder with four teats, and large feet. The size must be proportioned to the goodness of the land. The largest cows, in general, give the greatest quantity of milk; and it is always a good rule to take the cattle from a worse ground than that on which they are to be kept; for if from a better they are apt to degenerate. The best time of a cow's life for breeding of calves, is from three years old till twelve: the black cows are usually chosen to breed out of.

The largest *oxen* are to be chosen for work, and for feeding, but then it must be where there is land rich enough to maintain them. When they are to draw, care must be taken to match them well, both for height and strength; for if one be stronger than the other, the weakest will soon be destroyed. They must never be driven beyond their natural pace, for the beating them throws them into surfeits, and many other diseases.

The time of putting *oxen* to work, is at three years old; they must be worked gently the first year, especially in hot weather, and fed with a large quantity of hay: this will enable them to bear their labour better than grass; and they should be always kept in a middle state, neither too fat nor too lean. They may be worked till they are ten or twelve year old, and then sold.

It is observed, that meat and fair treatment, succeed much better with this animal than blows. The best way to break a young one to the yoke, is to put him to it with an old tame *ox* of about his own height and strength. If he prove unruly after this, he must be kept hungry, and made to feed out of the driver's hand. *Oxen* are much more profitable to keep than horses, there being no loss in them; and an old wrought *ox* fattening as well as a young one, and being as good meat. Their keeping also is cheaper, for they eat no oats: their harness and their shoes also are considerably cheaper, and they are not so subject to diseases. They must always indeed have good grass and good hay, and they are not so serviceable as horses, when there is much working in carts, and where the ways are good; but for winter plowing, where the ground is heavy, an *ox* will do as much work as a horse. Every farmer who can keep two teams, would do wisely to have one of them of horses, and the other of *oxen*; it is much better to yoke them together by the necks and breasts, than by the horns as some do; and where a man keeps an *ox* team, he should raise two *oxen* and two cow calves every year to keep up his stock; for it is better for a farmer, in all necessary things, to be a seller than a buyer. Chalky land spoils the feet of *oxen* more than any other. *Mortimer*'s Husbandry, p. 233.

Stealing OXEN, or creatures of the *ox* kind, old or young, whether bull, cow, &c. strictly so called, steer, bullock, heifer, or calf, is now felony without benefit of clergy; as is likewise killing any of these, with an intent to steal any part of their carcases. Stat. 15 & 16. Geo. II. c. 34. & Stat. 14. Geo. II. c. 6. See CATTLE.

Diseases of OXEN. As scarce any creature is more useful to man than the *ox* kind, nothing is more worthy consideration than the nature and origin of their diseases, and the remedies for them. The same distemper that has of late years carried off such vast numbers of these cattle with us and elsewhere, has at other times raged in Italy. In the year 1710, and the succeeding one, there was a great mortality amongst the horned cattle there, and the occasion of it was evidently the unnatural season preceding. The whole autumn before had been wet, and at the time of the winter solstice there were continual cold winds, and small, but lasting rains. The spring that succeeded, was also cold and rainy, and the defect of heat and abundance of moisture, made a change in the whole face of nature: the medicinal springs had not their wonted effect; and the fruits of the earth could not appear at their proper seasons, nor in their due perfection. The grass was injured by this, and the ground rendered continually damp and unwholesome; and to this was evidently owing the malignant and contagious disease that raged among the cattle afterwards. It was supposed at that time with them, as of late with us and elsewhere, that the contagion was brought in among their *oxen* by strange cattle coming from infected places, but this proved to be an error; for if an *ox* was removed to ever so distant a pasture, he never escaped the better for it: the whole earth and its productions were vitiated throughout the country, and there was no safety in any part of it. *Michelotti* de Morbis Boum.

The use of this observation must be, the keeping the cattle in succeeding years out of the way of those things which occasion their sicknesses in such as these. If the autumn or winter be extremely cold and wet, remove the cattle out of the low grounds, and put them to feed in sandy dry soils on the high grounds; give them water from such places where the sun has most power, and it is less chilling cold than in others; and in cases of imminent danger, always mix some salt in it. If the bad weather continues, let them always have clean straw to lie on, and a dry covering; and in cases where the contagion is already begun, the fumigating the houses where they are kept with bay-leaves and eleutherian bark, is judged convenient. As to remedies, when they are once seized with the distemper, it is hard to understand what intention to prescribe in, and how to ascertain the doses; and as the late practice, in attempting to cure, has been of very little service, the cautions for the preserving and preventing the disease, ought to be redoubled, to prevent an almost incurable misfortune.

The diseases of *oxen* are much less frequent than those of the human species; but where-ever they appear, they usually become more violent after a time, and generally are very contagious. In Italy in the year 1711, there appeared a disease among the *oxen*, which carried off as great numbers as the late distemper among us has done. Some acrid and caustic salts in the blood, seem to have been one of the principal causes of this disease; as when the blood was let out at the ear of the dying cattle, and fell upon the ground, there were always found, as it dried up, certain concretions of salts sparkling like so many crystals.

In many of the creatures which were opened, after dying with this disease, the insides of the stomach and intestines were found covered with tubercles like the pustules of the small-pox: the common people supposed this the cause of the disease; but upon farther enquiry, it appeared only one of the effects of it; for such beasts as died very suddenly of this disease, when opened, had their intestines sound; so that these pustules on their surface appear to have been only a symptom of the disease in a very advanced stage. All medicines were found vain in this disease; and such of the creatures as recovered, had always pustules of this kind on their skin, which ouzed out a bloody ichor.

From the whole it appears, that this disease was an acute fever in these creatures, of a malignant kind; and that the texture of the blood was always broke in it; and that its cause was to be attributed to various salts taken in from the air, or in eating or drinking. Many had called it a plague among the cattle, but it appeared rather what we understand by the name of a contagious pestilential fever, than an absolute plague; and a peculiarly humid season, joined with exhalations of mineral substances out of the earth, for some reason which we cannot comprehend, more frequent than

uſual, brought it upon theſe creatures, whoſe noſes being continually near the ground, gave theſe exhalations immediate entrance.

The method of cure ſeems to conſiſt in two intentions; the firſt of abating the fever; the ſecond of reſtraining the acrimonious malignity of the ſalts.

Purges of all kinds are cautiouſly to be avoided; and bleeding in the beginning is always neceſſary, and muſt be more largely admitted in the more robuſt creatures. The common medicines given as febrifuges and cephalics, all do harm; the fumigations of diverſe kinds, all are idle or miſchievous; and moſt of theſe things intended as reliefs, tend plainly to the increaſing the diſeaſe, as they add to the accelerated motion of the blood, and break its texture more than before. The moſt rational method of treatment is this:

As ſoon as a beaſt is ſeen to be affected, let him be ſeparated from the reſt and kept warm. When his mouth begins to be ſore, let a clyſter be given; and if this does not work, then a gentle emollient may be given by the mouth, made of lenitive electuary and cream of tartar, diſſolved in a large quantity of water-gruel; this is the more neceſſary if the creature be fat: if a lean beaſt be ſeized, bleeding is the firſt thing to be done; after this, a ſeton muſt be made in the neck, and the parts about where the vein was opened ſhould be ſcarified. If the fever does not abate on theſe methods, the creature ſhould be blooded again: then, inſtead of the great quantities of watry liquors, which are uſually given, the creature ſhould have ſomething ſtrong, ſuch as a mixture of wine with its liquor, and that in conſiderable quantity. When the fever abates, he is to be allowed but little drink for the three firſt days, and that ſhould be a decoction of mallows with a mixture of lemon juice, or ſome other ſuch acid. In caſes where the ſeton does not diſcharge kindly, a bliſter muſt be applied over it. When by this means the creature begins to recover, elm leaves and olive leaves, are to be mixed with the hay it eats; the creature muſt be walked out a little, and its litter changed for freſh: this ſhould be done every day, in caſes where the creature is weak and poor.

For the preſervation of cattle from the diſeaſe, nothing is ſo proper as the taking great care that they drink only clean and pure water, and that they eat only dry food till ſome hours after ſun-riſe: they muſt be carefully kept out of infected places, and their ſtables fumigated, by burning in them frankinſence, juniper berries, and the like ingredients; or by firing off ſmall quantities of gunpowder at ſeveral times, or ſprinkling vinegar and camphor on a red-hot iron. The creatures mouths ſhould be waſhed at times with lemon juice, and their ears with vinegar or urine; and no hogs, ſheep, or other animals ſhould be ſuffered to feed among them. *Gazola* de Peſte Boum.

Theſe were the ſentiments of Gazola on this fatal diſeaſe, which he had carefully attended to in all its ſtages Lanciſi, however, diſſents from this author in ſome particulars. He ſays, that the diſtemper was a true plague among the cattle; and obſerves, that this very plague among the *oxen*, was well known among the antients. It was firſt brought into Italy from Hungary, and infected the cattle by the breath, by the pores of the skin, or by any other paſſage that it found open. He preſcribes for the preſervation, the taking great care that they have perfectly good food and drink; and adviſes the waſhing their mouth and noſtrils with a mixture of vinegar, garlick, ſulphur, ſalt, and juniper berries; and both he and Gazola agree in adviſing the rubbing the creatures over with ſweet oil. This author condemns all medicines, and even bleeding, but greatly recommends ſetons, cauteries, and bliſters. He adviſes theſe to be uſed as ſoon as ever the creature is perceived to be ſick, and that not only on the neck, but on the ſhoulders, the hips, and any other part. *Lanciſi*, ap. Acta Eruditor. Ann 1715. p. 463.

Franciſcus Fantaſti publiſhed a treatiſe on the ſame ſubject, about the ſame time; and by his writings it appears, that the *oxen* were ſeized differently, and affected with different ſymptoms in different places, tho' the cauſe of the diſtemper was evidently the ſame in all.

Some of the cattle, he obſerved, voided great quantities of blood by the urinary paſſages. Theſe uſually died, and on opening them the blood was always found fluid, and the brain was often decayed, or full of a fœtid matter; and the marrow in their bones was found dried up and waſted, and all the humors were found evidently tending to a ſtate of corruption.

This author rejects bleeding in all periods of the diſeaſe, as a practice that could be of no uſe in a caſe where the blood and humors had all loſt their due ſtate, and were tending to corruption. He commends ſcarification and cauteries; he alſo greatly recommends the trepaning the horns to the medullary part, and the making ſetons in the ears, on their necks, and in their breaſts; the only internal medicine he preſcribes, is a mixture of the theriaca diateſſaron, two ounces; dioſcordium, one ounce; powder of peruvian bark, two ounces. This doſe is to be given every day for three ſucceſſive days, diſſolved in three pints of the juice of brook lime, water creſs, and ſcurvy graſs, with the addition of a pint of ſtrong white wine. John Baptiſt Mazzini, wrote in another part of the world at the ſame time, on the ſame ſubject; with him we find, that the *oxen* which were ſeized with the diſeaſe, continually had a running of a mucous matter from their noſe, and a weeping at the eyes; and that when the corners of theſe creature's eyes were waſhed with wine, in which ſage leaves had been infuſed, there came out ſeveral cluſters of ſmall and ſlender worms twiſted one among another, and forming little bundles of twenty and more. He obſerves alſo, that theſe creatures, when affected, uſually carried their heads upward, not bending to the earth as uſual. This author adviſes every thing to be done to promote perſpiration: he preſcribes contrayerva and angelica root, in white wine, in large doſes once or twice a day warm, and recommends the fumigating their ſtalls with juniper and bay berries. The waſhing their mouths and noſtrils with wine and ſulphur, is alſo preſcribed in his treatiſe: a decoction of roſemary, fennell, and ſage, with white wine, vinegar, and ſalt, is alſo recommended as a drink to be often given; and he preſcribes the holding their heads forcibly in a depending poſture, that they may give opportunity to the ſaliva to run out, and the waſhing their mouth with vinegar and ſalt to cleanſe it of the foulneſs. *Mazzini*, Litter. ad Vallinier. de Peſte Boum.

Ox-*eye*, in the ſea language, a name given by the ſeamen to thoſe dreadful ſtorms that are ſometimes met with on the coaſt of Guinea; for at firſt it appears in the form of an *ox*'s eye, and not much bigger; but it deſcends with ſuch celerity, that in a very little ſpace of time, and often before they can prepare themſelves for it, it ſeems to them to overſpread the whole hemiſphere; and at the ſame time forces the air with ſo much violence, that the ſhips are ſometimes ſcattered ſeveral ways, ſome directly contrary, and ſometimes are ſunk down right.

Ox-*eye*, *certhia*, in ornithology. See CERTHIA.

Ox-*fly*, in natural hiſtory, a ſpecies of two-winged fly, bred from a fly-worm, hatched under the ſkin of oxen, from the egg of the parent fly lodged there.

The female of this fly makes a number of ſmall wounds in the backs of horned cattle, and in each of theſe depoſits an egg; which is afterwards hatched by the warmth of the creature's body. As ſoon as hatched, the young worm finds itſelf in a very convenient lodging, and in a way to be furniſhed with all the neceſſaries of life.

The places were they lie are eaſily diſcovered, as there is ever a tumor about them, like that on the foreheads of children from falls; within this, and under the thick skin of the creature, is the worm lodged. The country-people know very well that a worm is contained within each of theſe tumors, but they are ſomething miſtaken as to the fly it comes from; the gad-fly being the moſt buſy about theſe creatures, and giving them moſt vexation, they naturally enough have ſuppoſed this the produce of the egg of that fly; but this is an erroneous opinion: Mr. Valliſnieri ſeems the firſt who underſtood the true ſtate of the caſe, and he has given a very full and excellent account of it.

Every one of theſe tumors on the ox has within it a cavity proportioned to the ſize of the worm, and both the internal cavity, and the external tumor, always increaſe gradually as the incloſed worm grows larger. In the middle of May theſe tumors are ſeen of their full ſize, and are then an inch high, and an inch and a half broad at their baſe.

The greater number of theſe tumours are always found on cattle of about three years old. The number of tumors on the creature are uncertain, and are according to the number of eggs which have ſucceeded from the laying of the fly; ſometimes only three or four, ſometimes twenty or thirty, or more, are found on the ſame creature. They are not regularly placed, but are uſually on the back about the ſpine, tho' ſometimes on the legs and ſhoulders. Sometimes they ſtand very cloſe to one another; ſometimes they are more diſtinct and ſeparate. It is obſerved alſo, that the oxen which feed on open plains are much leſs ſubject to them than thoſe that are kept in the neighbourhood of woods.

At the time when the worm has obtained its full growth, and is about to leave the tumor, there is a perforation in it ſufficiently plain to eyes accuſtomed to obſervations of this kind; nor is it indeed only at this time that this hole may be obſerved; it is diſtinguiſhable at all times, if properly ſought after, and is evidently the hole made by the parent fly to introduce its egg, which has never cloſed, but, on the contrary, has opened more as the tumor increaſed, and the incloſed worm grew; but toward the end of the time that the worm is incloſed, it enlarges much more quickly than at any other period.

The hole is placed in various parts of the tumor, but very rarely on or near its top, more frequently near ſome part of its circumference. But theſe often, tho' near the circumference while the tumor is ſmall, become ſituated at its top, when it is grown to its utmoſt ſize, from the irregular growth of its ſeveral parts. This hole is of very ſignal ſervice, and indeed of abſolute neceſſity to the life of the animal incloſed; ſince it is by means of this that it holds a communication with the external air, and its poſterior ſtigmata are placed as thoſe of the reſt of the fly-worms, near the hinder extremity of the body, and that part were they are is always placed directly againſt this hole in the tumor. When the tumor is of a conſiderable ſize, theſe may be ſeen by the naked eye; and

when

when ſmaller, the help of glaſſes will always diſcover them; the place where they are ſituated being rendered the more conſpicuous and obſervable by two brown creſcents placed round them.

Theſe worms may be properly enough ſtiled the inhabitants of animal galls, ſince the tumors which contain them are truly analogous to the galls of the oak and other the like vegetable excreſcences.

The hole in theſe tumors is not only uſeful to the animal for a breathing place, but it has another not leſs neceſſary uſe; which is to let off a quantity of abundant matter formed in the tumor, which would, if confin'd there, occaſion a large abſceſs, and choak and deſtroy the animal.

If theſe worms were endued with the qualities of thoſe of the common fleſh-fly, and had hooks at their head-part, to tear and pull the fleſh in pieces, the creature who had thirty or forty of theſe gnawing devourers in its back, preying upon its fleſh at once, would be in a very miſerable ſtate: but this is by no means the caſe, the creatures have no organs to tear its fleſh with, they only live on the matter found in the abſceſs, and give the creature no great pain; being only like ſo many tents kept in a wound neceſſary to be preſerved open, or ſo many peas in iſſues.

The worms may at any time be diſlodged from theſe tumors by a moderate preſſure, and made to come out at the hole of the tumor. This, tho' it appear conſiderably too little, yet anſwers the purpoſe; as the body of the worm well enough bears preſſure, and it is only neceſſary, in order to get them out whole, to renew the force upon the tumor, for the puſhing out every ſeparate ring of its body.

While theſe worms are young, they are white, like thoſe of the common fleſh-fly; but when they grow towards their full ſize, they become ſomewhat brown They are of different ſizes, as is uſual with the worms of other flies; thoſe which are to give the female fly being always the larger, and thoſe which give the male the ſmaller. The larger of theſe are conſiderably more than an inch long, and more than half an inch thick in the fulleſt part of their bodies.

They have nothing very remarkable in their ſhape; their anterior part is ſomething ſmaller than their poſterior, and they have no legs. They are compoſed of eleven rings, counting that for one where the mouth is placed; and of theſe the eighth is the largeſt. Theſe rings are not quite circular, being ſomewhat flatted on one ſide; but what is moſt remarkable is, that the flatter ſide is the back, and hence the creature is, contrary to the uſual cuſtom of theſe inſects, hollow, as it were, on the back, and convex on the belly: and there is a good reaſon for this, ſince, as all the other worms which are deſtined to crawl upon a flat ſurface ought to have their bellies flat, that they may touch it in as many points as may be, and the creature be by that means kept ſteady, ſo this creature which inhabits the concave ſurface of a cavity, ought, in order to have its belly touch in as many points as may be, the ſurface it has to crawl upon, to have it, as it is found, tolerably convex.

The worm has ſix longitudinal furrows on its back and ſides, which interſecting the channellings of the rings, make its ſurface very rough and uneven: but beſides this, the whole intermediate ſpaces appear chagrined, and when examined by the microſcope, are found to be covered with yellowiſh prominent triangular bodies.

As this worm has no legs, it is eaſy to determine, that theſe innumerable ſmall protuberances were allotted it, in ſome ſort, to ſupply the place of them, to fix itſelf by to any place, and to aſſiſt it in moving; and may, beſides this, ſerve to the continual irritation of the inſide of the tumor, and keep up the ſeparation of a matter neceſſary to the creature's life. When the worm has attained its full growth, and is to make its way out of the hole in the tumor, this, as yet, appears much too ſmall to give it paſſage. Nature, however, has inſtructed this worm to do what our ſurgeons practiſe on a like occaſion; when they are to open the orifice of a wound, they often do it by means of large tents; the creature incloſed in this tumour makes the hinder part of its own body ſupply the office of a tent on this occaſion: for three or four days before it is to make its way out, it forces its hinder part into the orifice, and keeps it there a long time; then takes it back, and afterwards thruſts it thither again, and continues without intermiſſion repeating this operation; and when, by this means, the hole is ſufficiently enlarged, it crawls out ſlowly, with its hinder part backward.

As ſoon as it is out of its habitation, it falls to the earth, where it crawls ſlowly about till it finds a place where it may reſt, to go through its ſeveral changes, under a ſtone, or in any quiet place.

Stags and ſome other animals are ſubject to theſe worms in the ſame manner as oxen, and the ſeveral ſtages they go through in the tumors on theſe animals are the ſame with thoſe of the ox.

When they have fixed upon a place to reſt in for their changes, they loſe all motion, and their ſkin becomes black and hard, and makes a ſhell for their remaining in through their ſucceeding changes.

When the time of the egreſs of the fly is come, it appears a two-winged one indeed, but ſo extremely like the humble-bees of a middling ſize, that it is not eaſily to be diſtinguiſhed for what it is: one humble-bee cannot be more like another, than theſe flies are to that ſpecies of them; their bodies are as ſhort, all of the ſame colours, and are even more hairy.

This fly, cloſely examined, appears to be of the ſecond claſs, and to have a mouth without teeth or lips, and its mouth very ſmall. The antennæ are ſhort, rounded at their ends, and of a gloſſy hue. The reticular eyes are of a deep cheſnut colour.

The female has, in the under and hinder part of her body, a cylindric tube, which ſhe can thruſt out at pleaſure, and which is the inſtrument with which ſhe pierces the ſkin of the animal, to depoſit her egg. *Reaumur* Hiſt. Inſect. Vol. 4. p. 503, ſeq. to 537.

Ox-*gang*, or OXENGATE. A term uſed in Scotland for a portion of arable land, containing 13 acres. Tr. Pract. Geom. P. 86.

OXALME, in the materia medica of the antients, the name of a compoſition of vinegar and brine, made by a ſolution of ſea-ſalt in water. This was uſed externally in ulcers, and ſuppoſed of great ſervice againſt the bites of venomous animals, and for the curing childrens ſcabby heads. It was alſo uſed as a ſtyptic poured into wounds, and was ſometimes given warm in clyſters; but theſe were always followed by thoſe of milk.

OXELÆUM, a word uſed by many authors to expreſs a mixture of vinegar and oil, for outward application, in caſes of bruiſes and other injuries.

OXUCIÆ, in natural hiſtory, the name of a genus of foſſils of the claſs of the *ſelenitæ*, but of the columnar not the rhomboidal kind. The word is derived from the Greek ὀξὺς ſharp, and κίων a column; and expreſſes a body of a columnar form, and pointed or ſharp at the ends. The *ſelenitæ* of this genus conſiſt of ſix equal planes, having their top or bottom no broader or more depreſſed than the others; and in this differing from the *iſchnambluces*, or flatted columnar *ſelenitæ*, as they do from the *iſambluces* or *cryſtaliform*, but broken ended ones, by having their ends naturally tapering off to a point. See Tab. of Foſſils, Claſs 2. *Hill*'s Hiſt. of Foſſils, p. 121.

The bodies of this genus, like thoſe of the other genera of the columnar *ſelenitæ*, are liable to a longitudinal crack in their middle; and this ſometimes includes a little clay, in form of an ear of graſs. See SELENITES.

Of this genus there are only two known ſpecies: 1. A fine kind, with thin flakes and tranſverſe filaments, found in the clayey banks of the river Neu, near Peterborough, in Northamptonſhire; and, 2. A dull kind, with thick plates and longitudinal filaments. This is not uncommon in Yorkſhire, and lies ſometimes in a yellow, ſometimes in a blue clay. *Hill*'s Hiſt. of Foſſ. p. 141, 142.

OXYA, in botany, a name by which many authors, eſpecially the Greeks, have called the *fagus* or *beech-tree*. *J. Bauhin*, Vol. I. p. 117.

OXYBLATTA, among the antients, is uſed to denote a bright and gloſſy kind of purple colour. *Hoffm.* Lex. in voc.

OXYCEDRUS, in botany, a name given by ſome authors to the *cedrus folio cupreſſi*, or the *berry-bareing cedar*. *Chabræus*, p. 72.

OXYCOCCUS, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the roſaceous kind, being compoſed of ſeveral petals, arranged in a circular form; the cup finally becomes a roundiſh fruit or berry, which is divided into four cells, containing roundiſh ſeeds.

The ſpecies of *oxycoccus* enumerated by Mr. Tournefort, are theſe: 1. The common *oxycoccus*, or *moor-berries*; and, 2. The broad-leaved *oxycoccus*. *Tourn.* Inſt. p. 655.

OXYGARUM, a word uſed by the antients to expreſs a mixture of vinegar and *garum*, which is a pickle for the preſerving fiſh, or a ſimple mixture of ſea-ſalt and water.

OXYGLUCA, a word uſed by the antients to expreſs a liquor made of a mixture of honey, water, and vinegar. The common way of making it was by macerating the combs, after the honey was preſſed out, in water; and then adding a ſmall portion of vinegar, to give it a tartneſs. It was ſometimes made without the addition of the acid, and made a weaker ſort of mead, uſed as a common drink in hot weather. Galen ſays, it was the ſame with the *apomeli*.

OXYLIPES, a word uſed by ſome authors as a name for bread, which has a mixture of vinegar in it; intended ſometimes for eating, ſometimes for medicinal uſes.

OXYMYRSINE, in botany, a name by which ſome authors have called the *ruſcus*, or *butcher's broom*.

OXYPHŒNICON, in botany, a name uſed by ſome authors for the tree whoſe fruit is the *tamarind* of the ſhops. Mant. Exot. p. 10.

OXYPYCNI, ὀξύπυκνοι, in the antient Greek muſic, was a name given to ſuch chords as formed the higheſt ſounds of the *ſpiſſa*. There were five *oxypycni* in the ſcale. See the articles PYCNI and SPISSUM.

OXYREGMIA, a word uſed by the antients to expreſs acid eructations.

OXYRYNCHUS, in zoology, the name of a fiſh of the truttaceous kind, called by ſome *hautin*, and *outin*. It is caught frequently in the Engliſh and other ſeas, and is frequently carried to market in Holland among the whitings. It is very much of the ſhape and figure of the trout, but a little flatter, and is covered with large white ſcales. The back is of a ſomewhat duſky colour, and the lines on the ſides a little bent near their origin. The tail is forked; but the mark by which it is moſt readily diſtinguiſhed from all other fiſh of this genus, is the figure of its ſnout, or upper jaw, which runs out beyond the under, and goes off rounding and tapering to a point, making in the whole a ſort of conic figure. The head is ſomewhat tranſparent. It has no teeth, but a conſiderably rough tongue. *Aldrovand.* de Piſc. l. 5.c. 24.

OXYS, in botany, the name by which authors call *wood-ſorrel*. The characters of this genus of plants are theſe: the flower conſiſts of one leaf formed into a bell, and wide open at the mouth, where it is alſo divided into ſeveral ſegments. From the cup of the flower there riſes a piſtil, which is fixed like a nail into the bottom of the flower, and ripens into an oblong membranaceous fruit, uſually divided into five cells, opening outward from the baſe to the apex, and full of ſmall ſeeds, which uſually fly out forcibly on the touching the ſeed-veſſel, by means of the elaſticity of ſome of its parts. *Tourn.* Inſt. p. 89.

The ſpecies of *oxys* enumerated by Mr. Tournefort, are theſe: 1. The common white flowered one, called by authors *trifolium acetoſum*, and *alleluja flore albo*. 2. The purple flowered kind. 3. The blue flowered kind. 4. The common yellow one. 5. The upright American yellow flowered one. 6. The fibroſe rooted American one, with red flowers. 7. The yellow ſhrubby American *wood-ſorrel*, having the appearance of the ſtinking trefoil. 8. The ſcaly rooted purple *wood-ſorrel* of Virginia. 9. The bulboſe-rooted African *oxys*, with roundiſh leaves and with purple ſtalks and large purple flowers. 10. The bulboſe-rooted round-leaved African *oxys*, with green ſtalks and large purple flowers. 11. The Æthiopian bulboſe-rooted *oxys*, with heart faſhioned leaves, and large purpliſh white flowers. See Tab. 1. of Botany, Claſs 1.

The ſeveral ſpecies of this plant are uſually diſtinguiſhable even when they are not in flower, by their having their leaves growing regularly three at the top of every ſtalk; and being each uſually of the figure of a heart at cards, and theſe are generally of an agreeably acid flavour. See SORREL.

OXYSAL-*diaphoreticum*, the name of a compound medicine greatly recommended by ſeveral authors, and invented by Angelus Sala. The manner of preparing it is this: take fine ſalt of carduus benedictus, put it into an earthen pot, and pour upon it gradually ſome ſtrong wine-vinegar, or ſpirit of ſugar; continue to pour this on till the ebullition ceaſes and an agreeable ſmell ariſes, and the matter has an agreeable tho' ſomewhat acid taſte; let all the humidity from this mixture be evaporated over a gentle heat, and after this, let all the ſalt be again diſſolved in water, and ſet in digeſtion in balneo mariæ for eight days: a liquor of a beautiful and pellucid colour is there produced, which, when poured carefully off into another veſſel, is to be again evaporated to a dryneſs with a very gentle heat, and the remaining matter, which is the ſalt, is to be collected together, and kept in a phial carefully ſtopt; for it is ſubject to run, if left to the acceſs of the air, like the common alcali ſalts.

OXYSCHÆNOS, in the materia medica, the name of the *juncus acutus capitulis ſorgli*; or *hard pricking large ſea-ruſh*. *Dale*, Pharm. p. 258. See JUNCUS.

OXYTOCHA, in medicine, a term uſed by many authors to expreſs ſuch medicines as are given to promote delivery.

OXYTRIPHYLLUM, in botany, a name uſed by ſome authors for the *trifolium bituminoſum*, or *ſtinking trefoil*. *Chabræus* p. 110.

OYSTER, or OISTER, *oſtrea*, in zoology. See the article OSTREA.

The *oiſter* affords the curious in microſcopic obſervations a very pleaſing entertainment. In the clear liquor many little round living animalcules have been found, whoſe bodies being conjoined, form ſpherical figures, with tails not changing their place otherwiſe than by ſinking to the bottom, as being heavier than the fluid; theſe have been ſeen frequently ſeparating, and then coming together again. In other *oiſters*, animalcules of the ſame kind were found, not conjoined, but ſwimming by one another, whence they ſeemed in a more perfect ſtate, and were judged by Mr. Lewenhoek, to be the animalcules in the row or ſemen of the *oiſter*.

A female *oiſter* being opened, incredible multitudes of ſmall embryo *oiſters* were ſeen, covered with little ſhells, perfectly tranſparent, and ſwimming along ſlowly in the liquor: and in another female, the young ones were found of a browner colour, and without any appearance of life or motion.

Monſieur Job'ot alſo kept the water running from *oiſters* three days, and it appeared full of young *oiſters* ſwimming about nimbly in it; theſe increaſed in ſize daily, but a mixture of wine, or the vapour of vinegar, killed them.

In the month of Auguſt *oiſters* are ſuppoſed to breed, becauſe young ones are then found in them. Mr. Lewenhoek, on the fourth of Auguſt, opened an *oiſter*, and took out of it a prodigious number of minute *oiſters*, all alive, and ſwimming nimbly about in the liquor, by means of certain exceeding ſmall organs, extending a little way beyond their ſhells; and theſe he calls their beards. In theſe little *oiſters* he could diſcover the joinings of the ſhells, and perceived that there were ſome dead ones, with their ſhells gaping. Theſe, tho' ſo extremely minute, are ſeen to be as like the large *oiſters* in form, as one egg is to another.

As to the ſize of them, he computes, that a hundred and twenty of them in a row would extend an inch; and conſequently, that a globular body, whoſe diameter is an inch, would, if they were alſo round, be equal to a million, ſeven hundred and twenty-eight thouſand of them. He reckons three or four thouſand are in one *oiſter*, and found many of the embryo *oiſters* among the beards; ſome faſtened thereto by ſlender filaments, and others lying looſe: he likewiſe found animalcules in the liquor five hundred times leſs than the embryo *oiſters*. *Lewenhoek* Arcan. Nat. T. 4. p. 513.

It is not very uncommon to ſee on *oiſter* ſhells, when in a dark place, a ſhining matter or bluiſh light, like a flame of brimſtone, which ſticks to the fingers when touched, and continues ſhining and giving light for a conſiderable time, tho' without any ſenſible heat. This ſhining matter being examined with a microſcope, was found to conſiſt of three ſorts of animalcules: the firſt, whitiſh, and having twenty-four or twenty-five legs on a ſide, forked, a black ſpeck on one part of the head, the back like an eel with the ſkin ſtripped off. The ſecond ſort, red, reſembling the common glow-worm, with folds on its back, but legs like the former; a noſe like a dog's, and one eye in the head. The third ſort, ſpeckled, with a head like a ſoal, with many tufts of whitiſh hairs on the ſides of it. Some much larger and greyiſh might be ſeen, having great heads, two horns like a ſnail's, and ſix or eight whitiſh feet; but theſe did not ſeem to ſhine. Philoſ. Tranſact. N. 279.

As the bodies of lobſters, and ſome other ſorts of fiſh, tainted fleſh, rotten wood, and other ſubſtances, are ſometimes found to ſhine with a light like that on *oiſter* ſhells, may it not very probably proceed from the ſame cauſe? Some alſo have gone ſo far as to imagine the willow-wiſp, ſo common in fenny countries, to be only a collection of flying inſects, which emit light from ſome part of their body, as the glow-worm and lantron-fly do; and the place, motion, and ſome other circumſtances of that lambent flame, as it is called, ſeem, indeed, not a little to favour that conjecture. *Baker's* Microſcope, p. 241.

Foſſile-OYSTERS. The greateſt bed of *foſſile-oiſters* any where known of, is that near Reading, in Berkſhire. They have the entire ſhape, figure, and are of the ſame ſubſtance with the recent *oiſter* ſhells, and yet muſt have lain there for a long time, the oldeſt hiſtories that mention the place giving an account of them. They are extended over no ſmaller a ſpace than ſix acres of ground, and juſt above them there is a large ſtratum of a greeniſh loam, called by ſome writers a green earth, and by others a green ſand. It is compoſed of a crumbly marle, and a very large portion of ſand. Under them there is a thick ſtratum of chalk. They all lie in a level bed, and as the ſea comes no where near this part of the kingdom, it ſhould ſeem, that the deluge only could give place to them here. It has been idly imagined by ſome, that the Roman ſoldiers once quartered there, threw away theſe ſhells from the *oiſters* they fed on in vaſt quantities, but this is anſwered by obſerving, that the ſtrata above the ſhells are natural, and have never been dug thro' till the time of finding the ſhells.

The *oiſter* ſhells and green earth together, make a ſtratum of about two foot thick; and over this, a much thicker ſtratum, of a bluiſh and very brittle clay, but this has never been dug through, except where we find the ſhells. The people call this *piercy-clay*, and ſay it is fit for no uſe. This bed of clay is about a yard deep, and above it is a ſtratum of fuller's earth, about two foot and an half deep. It is of a very good kind, and is uſed by the clothiers. Over this there lies a ſtratum of a fine white ſand, unmixed either with the clay or fuller's earth: this is near ſeven foot deep, and above this there is a ſtratum of a ſtiff red clay, of which they make tiles in the place. This is covered with a little vegetable mould, and the depth of this ſtratum of tile-clay cannot be aſcertained, becauſe of the unevenneſs of the hill.

Theſe *oiſters* are ſometimes found whole, but more uſually in ſingle ſhells. When they are in pairs, there is uſually ſome of the green ſand found within them: they ſeldom ſtick very faſt together, ſo that unleſs very carefully taken up, it is not eaſy to get them in pairs. Phil. Tranſ. N. 261, p. 484.

OYSTER-*ſhells*. Theſe are an alcali of a more powerful kind than is commonly ſuppoſed, and probably are in reality much better medicines than many of the more coſtly and pompous alkalies of the ſame claſs. The proof of alkalies is in their ſolution by acid ſpirits; and Mr. Homberg found, that they diſſolved much more eaſily in the acids of nitre and ſea-ſalt, than pearls, coral and the reſt; which he ſuppoſes owing to their containing in the body of the ſhell a conſiderable portion of ſal-ſalſus, which is eaſily perceived upon the tongue, and which keeps the whole ſubſtance of the ſhell in a ſort of half diſſolved ſtate. Theſe ſhells are found to produce very great effects on the ſtomach, when injured by acid humours; and Mr. Homberg is of opinion, that this their eaſineſs of ſolution is one great reaſon of their good effects, and that the quantity of ſal-ſalſus

which

which it contains, contributes not a little towards it, ſince we are not to look upon that as a mere ſalt, but a ſalt of a peculiar kind, formed of ſea ſalt by the organs of the animal, and the ſeveral fermentations it undergoes in the body of it, in the ſame manner as the nitrous and other ſalts of the earth ceaſe to be nitrous, *&c.* as ſoon as they have been blended with the juices of plants, and form with them a ſalt peculiar to that plant; and this is plainly the caſe in regard to this ſalt, ſince it is evidently of a more penetrating taſte, and of a different ſmell, from the ſalt left by the ſea water between the ſeveral external ſcales, or flakes of the ſhell.

As *oiſter* ſhells were found by Mr. Homberg to be a very valuable medicine, and as one of the common methods of preparing them is by calcination, which he obſerves cannot but much impair their virtues, he gives the following method of preparing them for taking inwardly, which was what he always uſed:

Take the hollow ſhells of the *oiſters*, throwing away the flat ones as not ſo good; waſh them perfectly clean, and then lay them to dry in the ſun; when they appear dry, beat them to pieces in a marble mortar, they will be then found to contain yet a large quantity of moiſture; lay them again in the ſun till perfectly dried, and then finiſh the powdering them, and ſift the powder thro' a fine ſieve. Give twenty or thirty grains of this powder every morning, and continue it three weeks or a month. Mem. Acad. Par. 1700.

OYSTER-*worm*, in natural hiſtory, a name given by writers to a kind of ſmall worm found in *oiſters*, which ſhines in the dark, in the manner of the glow-worm; but with an univerſal light, and not in a peculiar part only, like this animal.

The firſt obſerver of theſe *oyſter-worms* was Mr. De Lavoye, who communicating his obſervations to Mr. Auzout, gave occaſion to a very diſtinct account of them from this author.

The firſt thing that preſents itſelf on the opening the *oiſters* which contain theſe worms, is only a ſort of ſhining clammy moiſture, which appears like a ſtar of a blueiſh colour, and being drawn out, will extend itſelf to near half an inch long, and ſhine as much for that whole length as in the contracted ſtate: it will alſo ſhine for ſome time after it is taken out of the *oiſter*.

On a ſtricter obſervation, theſe ſhining ſubſtances are found to be real living worms, and there are indeed three diſtinct ſpecies of them. One ſort is whitiſh, and has twenty-four or twenty-five feet on each ſide: there is a black ſpeck on one ſide the head, and the back exactly reſembles that of an eel, when the ſkin is ſtriped off. The black ſpeck in the head is certainly an eye, and it is remarkable that the creature has but one. The ſecond ſort of theſe worms, is red: this alſo has but one eye: its body is made up of ſeveral rings; its noſe is like that of a dog, and it has the ſame number of feet with the former. The third ſort is very different from the other two; it is ſpeckled, and its head is like that of a ſoal, and has a tuft of hair on each ſide. There are other worms found alſo in the *oiſter*, particularly a large greyiſh one with two horns, a great head, and ſeven or eight whitiſh feet; but theſe do not ſhine. The two firſt ſorts are eaſily miſtaken for ſhining moiſture only, their ſubſtance being ſo tender, and eaſily reſoluble, that on the leaſt ſhaking or touching, they turn into a viſcous jelly. This, however, has the property of ſhining as much as the living worm, and when taken from the ſhell, will ſhine on the obſerver's fingers for twenty or thirty ſeconds; and if any part of this matter be let to fall to the ground, it ſhines as long, and exactly reſembles a piece of burning brimſtone. Sometimes when ſhaken off nimbly, it becomes a ſhining line, which diſſipates itſelf before it comes to the ground. The ſhining matter in this caſe, is in ſome whitiſh, in others reddiſh; but yet in both caſes it gives a violet appearance to the eye. The white ones are the tendereſt of all: theſe ſo eaſily burſt, and become a mere lump of jelly, that if it were not for the feet which are ſeen among it, one would ſcarce imagine that they were ever worms, or any thing living. When they are large and robuſt, they move their heads and tails about, and this is a great addition to the luſtre of their ſhining; every motion of this kind giving a flaſh of light brighter than the reſt. On forcibly ſhaking the *oiſter* in the dark, the whole ſhell is ſometimes ſeen full of lights, which are now and then as big as the finger's end; after this, a great deal of this clammy matter, both red and white, may be obſerved; ſo that it is probable great numbers of the worms are burſt in their holes. In the ſhaking it may be diſtinguiſhed, that their holes run into, and communicate with one another, like the holes made by worms in wood. This light occurs more frequently in large, than in ſmall *oiſters*: there are few of theſe large ones that do not yield it in the ſhells, and in ſome it is ſeen in the *oiſters* themſelves.

Thoſe ſhells which are viſibly pierced by the worm, more frequently emit the light than thoſe which are not; and the convex ſhell more than the flat one. The worms are not apt to give light when irritated, but if they do, it laſts only a little time; but when they are at reſt, the light they give uſually laſts ſeveral hours. The outſide of the ſhell being a little ſcaled, the communication of the holes may be ſeen; the form of the worms is generally deſtroyed in doing this, but there is the jelly like moiſture left, and this ſmells like the *oiſter* liquor. Journal de Scavans, 1666.

OZE, a word uſed by ſome writers to expreſs a *fœtor*, or *ill ſmell of the mouth*.

OZEMAN, a word uſed by ſome of the chemical writers for the white of an egg.

OZO, a word uſed by ſome of the chemical writers for *arſenic*, or *ratsbane*.



P.

PABOS, in botany. See CAAMINI.

PACA, in zoology, the name of an American animal of the Guinea-pig kind, having the general characters of the rat kind, and the voice and hair of the hog.

This is the largeſt of all the animals of this kind, being of the ſize of a ſmall pig, and uſually very fat. Its head is like that of a rabbit, and its beard long, and reſembling that of the hare: its ears are naked, and a little pointed; its noſtrils very wide and large; the upper chop is longer than the under one, and the hinder legs than the fore ones. Its feet have all four toes a-piece; its hair is hard and harſh, like that of a hog, and of a duſky brown colour: it has ſeveral grey ſpots diſpoſed in a longitudinal direction along the ſides, and its belly is white. It does not uſe its fore feet in the nature of hands, as the other ſpecies do, but eats it on the ground in the manner of the hog. It is uſually fat, and the fleſh very well taſted. *Ray*'s Syn. Quad p. 226.

PACAMO, in zoology, the name of a long-bodied fiſh of the muſtela kind, caught among the rocks, and of a very well-taſted fleſh. It is uſually about eleven fingers long, and grows narrower and ſmaller toward the tail. Its head is large, broad, and thick. Its mouth is of the ſhape of a half-moon, and has very ſolid, but not ſharp teeth. Its eyes are ſmall, black, and placed very cloſe together. Behind the gills are two fins ſoft and skinny; and lower on its belly, two more. Its back and belly fin, which runs from the middle of the back to the anus, is very ſoft and ſkinny alſo; the tail fin is more than a finger long, and is ſkinny like the reſt. The ſkin is ſmooth, and has on each ſide four rows of white ſpots running from the gills to the tail. Its ſkin eaſily ſlips off from the body like that of an eel. *Marggrave*'s Hiſt. Braſ. p. 113.

PACHODECARHOMBIS, in natural hiſtory, the name of a genus of foſſils, of the claſs of the ſelenitæ.

The word is derived from the Greek παχυς thick, δεκα ten, and ῥομβος, a *rhombus*, and expreſſes a thick rhomboidal body, compoſed of ten planes. See Tab. of Foſſ. Claſs 2.

The characters of this genus are, that the ſelenitæ of it conſiſt of ten planes; but as the top and bottom in the leptodecarhombes, or moſt common kind of the ſelenitæ, are broader and larger planes than any of the reſt, the great thickneſs of this genus, on the contrary, make its four longer planes in all the bodies of it, meeting in an obtuſe angle from its ſides, its largeſt planes. *Hill*'s Hiſt. of Foſſ. p. 120.

Of this genus there are only four known ſpecies: 1. A very pellucid one, with ſlender tranſverſe ſtriæ. This is frequent in the clay-pits of Northamptonſhire, and ſome other counties; and the ordinary people have an opinion, that it is good to ſtop hæmorrhages; whence it has acquired among them the common name of *ſtaunch*. 2. A dull-looking kind, with very fine tranſverſe filaments. This is found in the clay-pits of Northamptonſhire, Staffordſhire, and Yorkſhire. 3. A fine and beautiful kind, with very ſlender longitudinal filaments. This is common in Yorkſhire, and ſeems almoſt peculiar to that county; it is not only found there in digging, but frequently lies on the ſurface of the earth. And 4. A brown pellucid kind, found very frequently in Germany, and ſometimes in England. *Hill*'s Hiſt. of Foſſ. p. 130—133.

PACHUNTICA, a term uſed by ſome medical writers to expreſs incraſſating medicines.

PACOS, in zoology, the name of a ſpecies of camel, uſually, but very improperly accounted a ſpecies of ſheep; and known among many by the name of the *Indian ſheep*, or *Peruvian ſheep*.

It very much reſembles that ſpecies of camel uſually known by the name of *glama*, and found in the ſame countries; but this is much ſmaller, and is much leſs tractable, and a very obſtinate animal.

The reaſon of this creature's having been accounted a ſheep, is, that its hair is ſo long as to reſemble wooll, and it is cloathed prodigiouſly thick with it. Its head and neck alone, have more wooll on them than the whole body of our largeſt ſheep. Its body is cloathed in the ſame proportion with a woolly hair, equally fine. It is a much weaker creature than the glama, and is never uſed for carrying burthens, but is kept as our ſheep for the ſake of its wooll and its fleſh, which is very well-taſted, and is a rich food. *Ray*'s Syn. Quad. p. 147.

PACQUING, in natural hiſtory, a name given by the people of the Philippine iſlands to a ſmall bird of the ſparrow kind, but very beautifully variegated. It feeds on the ſeeds of graſs.

PADDLE, in glaſs-making, the name of an inſtrument with which the workman ſtirs about the ſand and aſhes in the calcar. *Neri*'s Art of Glaſs, Appendix.

PÆCILIA, in ichthyology, a name given by Schoneveldt [a], and ſome others [b], to the fiſh called by moſt authors the *muſtela foſſilis*. It is properly a ſpecies of *cobitis*, and is called by Artedi the *bluiſh cobitis*, with five longitudinal black lines on the body.—[[a] *Schonoveldt* de Piſc. [b] *Willughby*'s Hiſt. Piſc. p. 124.]

PÆDARTHROCACES, in ſurgery, is a diſeaſe of the bones, raiſing them into tumors near the joints, and differing from the ſpina ventoſa, in that it is not attended either with violent pains, or eroſions of the bone and adjacent parts. The word is derived from the Greek παις a child, αρθρον a joint, and κακον an evil, ſignifying that it is a diſorder of the joints, to which children are principally ſubject; which is the caſe, becauſe the bones of children being ſofter than thoſe of adults, are therefore the more eaſily diſtended by humors, and more frequently raiſed into tumors: theſe are hard in this caſe, and the adjacent ſoft parts are not inflated, and are free from redneſs, inflammation and pain. It is, however, to be obſerved, that this diſorder, tho' at firſt very different from the ſpina ventoſa, is ſometimes known to degenerate into that diſorder. *Heiſter*'s Surg. p. 261.

PÆDEROTA, in botany, a name by which Linnæus has diſtinguiſhed a plant nearly related to the veronicæ or ſpeedwells, and called *bonarota*, by Micheli. This, in the Linnæan ſyſtem of botany, is alſo a diſtinct genus of plants, the characters of which are, that the cup is a perianthium, divided into four ſegments, and remaining after the flower is fallen. The ſeveral ſegments are ſtrait and pointed; the flower is compoſed of a ſingle petal, which forms a cylindric tube, nearly of the length of the cup, placed erect at its extremity, and divided into two labia; the upper of which is long, hollow, and narrow; the under expanded, but ſomewhat erect, broadeſt in its upper part, lightly divided into three ſegments, and thoſe all equal. The ſtamina are two filaments bent downward, and of the ſame length with the cup: the antheræ are ſomewhat erect: the piſtil has a roundiſh germen, a thread-like ſtyle of the ſame length with the ſtamina, and a truncated ſtigma. The fruit is a flatted capſule of an oval figure, but bifid and pointed at the top, conſiſting of two cells with four valves. The ſeeds are very numerous, oblong, and obtuſe, and adhere to a columnar receptacle. *Linnæi* Genera Plantar. p. 4.

PÆDEROTA, among ſome of the old botanical writers, is alſo a name given to the *acanthus*, or *bear's-breech*. *Ger.* Emac. Ind. 2.

PÆDOTHYSIA, παιδοθυσια, in antiquity, an inhuman cuſtom that prevailed among the antient Heathens of ſacrificing their children. Thus it is related in the Scriptures, that the king of Moab being beſieged by the Iſraelites in his capital, and reduced to great ſtraits, took his eldeſt ſon that ſhould have reigned in his ſtead, and offered him for a burnt offering upon the wall, on which the ſiege was raiſed. 2 *Kings* iii. 27.

From Phœnicia this cruel practice paſſed into Europe, and Africa, and ſpread itſelf far and wide: and it is reported, that the Mexicans are, at preſent, guilty of it. *Hoſm.* Lex. in voc.

PÆNULA, among the Romans, a thick garment fit for a defence againſt cold and rain. *Pitiſc.* Lex. Ant. in voc.

PÆONIA, *piony*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the roſaceous kind, conſiſting of ſeveral petals diſpoſed in a circular form. The cup is alſo compoſed of ſeveral leaves, and from it ariſes a piſtil, which finally becomes a fruit, compoſed, as it were, of ſeveral capſules collected into a head: theſe all bend downwards, and are uſually hoary; they ſplit open longitudinally when ripe, and contain roundiſh ſeeds.

The ſpecies of *piony*, enumerated by Mr. Tournefort, are theſe: 1. The common male *piony*, with a ſhining blackiſh flower. 2. The male *piony*, with fleſh-coloured flowers. 3. The white-flowered male *piony*. 4. The male *piony*, with larger ſegments to the leaves. 5. The great male *piony*, with fleſh-coloured flowers. 6. The late flowering male *piony*. 7. The common female *piony*. 8. The narrower-leaved female *piony*. 9. The broader-leaved female *piony*. 10. The dwarf roſe-flowered winter *piony*. 11. The purple-flowered *piony*, with finely divided leaves, hoary underneath. 12. The whitiſh-flowered *piony*, with leaves hoary underneath. 13. The aquiline-leaved *piony*. 14. The orange-coloured *piony*. 15. The *piony* with variegated flowers. 16. The *piony* with very deep-red flowers. 17. The Conſtantinople *piony*, with pale-red flowers. 18. The large-flowered double deep red *piony*. 19. The ſmaller-flowered double deep red *piony*. 20. The common *piony*, with double large pale red flowers. 21. The common *piony*, with ſmaller double pale red flowers. 22. The ſmaller-flowered whitiſh double *piony*. *Tourn.* Inſt. p. 273. See PIONY.

PÆONITES, in natural hiſtory, a name given by ſome writers to the ſtone called by others *pæanites*, and eſteemed of great

uſe to women in labour. It ſeems to have been called *pæonites*, from Pæonia in Macedonia, where it was found.

PAGANELLUS, in ichthyology, the name of a fiſh of the ſea-gudgeon, or rock-fiſh kind, called by authors *gobius maximus marinus flaveſcens*. This name, however, which was given it by Rondeletius, is a very erroneous one, ſince it is ſmaller than the common kind, which it much reſembles; it is alſo of a paler colour, and has a fine yellow line ſurrounding the edge of its firſt back fin, and has but a ſlight furrow on its back, whereas that has a much larger one. Its head alſo is ſhorter, and its jaws more tumid; and its belly fins more regularly connected into the ſhape of a funnel. It is common in the Mediterranean and other ſeas, and is frequently brought to market at Rome, Venice, &c. *Willughby*'s Hiſt. Piſc. p. 207. See the article GOGET.

PAGANINA, an Italian word uſed by ſome authors to expreſs the firſt excrements of children: theſe dried and reduced to power, are eſteemed by ſome a very great and powerful medicine againſt epilepſies. It is to be taken in ſmall doſes every day, for ſome time.

PAGEL, in ichthyology, a name given by the Spaniards to that fiſh which authors in general call the *erythrinus*, or *rubellio*, and ſome the *xathus* and *pagrus*. It is properly a ſpecies of the *ſparus*, and is diſtinguiſhed by Artedi from the reſt of that genus, by the name of the *ſilver-eyed red bodied ſparus*. See the article SPARUS.

PAGOYUM, a word uſed by Paracelſus and his followers, to expreſs an imaginary being which preſides over, or is the occaſion of diſeaſes, whoſe cauſes are leſs known, and which have been ſuppoſed to ariſe from inchantment. Such is the doctrine of this ſtrange writer, and on this ſubject he has written a treatiſe called *Pagoyus*.

PAGRUS, in ichthyology, the name of a ſea-fiſh, known in Engliſh by the name of the *ſea-bream*. It is a conſiderably large fiſh, growing ſometimes to ten or twelve pounds weight. It is very broad in proportion to its length, and is alſo conſiderably thick; its head is flatted at top, and at the baſis of the gill fins, it has on each ſide a large black ſpot. Its gill-fins are large and long, and the extremities of all its fins are hid, and as it were involved in ſkin, which is a very ſingular circumſtance in regard to this fiſh. The eyes are large, and their hairs white, and the mouth is frequently of a fine red within; it has broad teeth in the forepart of its mouth, and rough tubercles in the place of teeth in the hinder. Its tail is forked, and it has one long back-fin; the nerves, or rays of the anterior part of which are ſharp and prickly, and thoſe of the hinder part ſoft and ſmooth to the touch. It is caught in conſiderable plenty in the Mediterranean, and is common in the markets of Italy. Some account it a very delicate fiſh, but many think it eats too dry. See Tab. of Fiſhes, N. 58. *Aldrovand* de Piſc. l. 2. c. 7. *Rondelet.* de Piſc. l. 5. c. 15. p. 142. *Geſner* de Piſc. p. 173.

PAGRUS is alſo uſed by Joannes Cuba, and others, for the fiſh commonly called *dentex*, the *ſynodon*, and *ſynagris* of the Greeks. It is a ſpecies of the ſparus, and is accurately diſtinguiſhed by Artedi, by the name of the *variegated ſparus*, with a ſharp back, and with four large teeth. See SPARUS.

PAGRUS is alſo a name given by Paulus Jovius, and ſome other authors, to the fiſh called *erythrinus* and *rubellio*, and by Appian, *xathos*. It is of the ſparus kind, and is diſtinguiſhed by Artedi, by the name of the *ſilver-eyed red bodied ſparus*. See PAGAL.

PAGRUS *indicus*, a name by which ſome authors have called the Eaſt Indian fiſh, more uſually known by the name of *brama ſaxatilis*. *Ray*'s Ichthyology, Append. p. 1. See the article BRAMA *ſaxatilis*.

PAIN *d'abeiles*, a word uſed by ſome to expreſs the yellow ſubſtance found concreted in lumps on the legs of bees, and ſuppoſed by the generality of the world to be real wax.

Experiments made by Mr. Reaumur and others, have ſufficiently proved that this ſubſtance is not wax, nor has it any of the properties of wax; but it alſo appears, that it is the matter out of which wax is finally made.

In tracing this ſubſtance up to its origin, we find that the bees collect the farina of flowers, which when moulded by their feet into a lump, makes this matter. It is very probable that they feed on this matter, and that after paſſing thro' certain changes in their bodies, it becomes wax. This was an opinion ſo old as the days of Pliny; ſome of the authors he quotes calling this ſubſtance *ambroſia*, or the food of theſe little deities; but late obſervations overthrow this opinion, till it again got credit under the more accurate examinations made by Mr. Reaumur, on the ſtructure and parts of the bee.

Swammerdam exploded this notion, from the orifice of the trunk of the bee being infinitely too ſmall to give admiſſion to this matter, the ſeveral particles of which always retained, in the lumps, their original form and ſize; and the opinion eſtabliſhed by this author, of the bees receiving nouriſhment only by its trunk, made it neceſſary to ſuppoſe, that only honey, or the ſaccharine juices of vegetables, could be the food of this creature; ſince nothing ſolid could poſſibly be received thro' that minute orifice: but Mr. Reaumur has ſuſpected even the exiſtence of any ſuch orifice, or any aperture at all in the trunk, and has plainly proved, that the bee has a real mouth, and that large enough to receive ſolid food. This mouth is ſituated in the anterior part of the head, very near the origin of the trunk, and by means of this, the yellow matter collected on the thighs may be eaſily received into the body, and thence evacuated again in form of wax; all the parts of its compoſition having been received as nouriſhment by the animal, except this indiſſoluble ſubſtance. The poſſibility of the bees feeding on this matter, is not, however, all the argument we have in favour of this opinion; for it is evidently ſeen on diſſecting them, that they really do feed on it, their ſtomachs being uſually found filled with it, and that in its proper form, the figures of the globules not being deſtroyed.

This is a food not only eaten occaſionally by the bees, but neceſſary to their ſupport, and is found ſtored up in their hives againſt a bad ſeaſon. The combs have their different cells made for different purpoſes; and beſide that, ſome are deſtined for receiving honey, and ſome for the young worms which are hereafter to become bees; there are ſome alſo which ſerve to contain this yellow matter, collected on the legs of theſe inſects. In fine weather, when more of this matter is collected than is eaten for immediate nouriſhment, the bees ſcrape off the lumps of it from their legs into ſome of the holes, or cells of the combs, where others following their example, there finally become large reſerves of it; which are eaten on ſuch days as they cannot go out in ſearch of more.

When one bee has depoſited her load of this matter in a cell, and is flown out to work again, another always enters immediately head foremoſt into the cell, and flats and preſſes down the matter into the bottom of the cell; others afterwards depoſit more of it, and others ſtill repeat the work of preſſing it down; and as they preſs it, they break and bruiſe it with their teeth, and pour in ſome of their honey upon it, and by this means they finally compleat the magazine of food, by rendering the mixt maſs in condition to keep, and to be taken out with great eaſe upon occaſion. It is evident from all this, that the yellow matter collected on the thighs of bees, and uſually ſuppoſed to be wax, is really a ſubſtance which ſerves for the food of the bees, and that after it has been diveſted of the nutritious matter it contained, it is again thrown out of the body in form of wax. It might be naturally ſuppoſed from this, that the wax was an excrement voided by way of fæces thro' the anus; but this is by no means the caſe, what is voided by that paſſage is true fæcal matter, of no farther uſe or ſervice to the animal; and the wax in its perfect form is voided out of the body by the ſame paſſage by which it was taken in while in its rough ſtate, that is, by the mouth; and is, on being thus voided, immediately worked into cells, &c. by the teeth of the animal. This was a diſcovery in the œconomy of this little animal reſerved for that excellent naturaliſt Reaumur.

Swammerdam, who had ſtudied the creature's operations very accurately, had been in no condition to obſerve this particular, for want of the advantage of glaſs hives; and Maraldi, tho' he had theſe, yet had them ſo ill conſtructed, that they could not give him an opportunity of ſeeing with ſufficient accuracy.

The teeth of the bee, tho' the principal part concerned in the working the wax, are not, however, the only part; the tongue of the creature is very greatly aſſiſtant on the occaſion: it is darted with incredible velocity on the ſeveral parts of the work, and ſeems to do great matters toward the forming it. Beſide this, the bee has a method of rendering the wax fit for receiving any form, in a manner we do not know any thing of. In order to manage this ſubſtance, we are obliged to heat it, and it ſo becomes ductile; but this is not in the power of the bee, and muſt be of very deſtructive conſequence to the whole if it was, ſince the circumjacent parts muſt be heated, as well as that on which it was at work, and then they would burſt with the load of honey they contain, or break under the weight of the bees at work on them: as this would be a deſtructive method, nature has given the animals another; ſhe has furniſhed them with a liquid, with which, when the wax is properly wetted, it becomes as ſoft as a gum, and as ductile as the filaments of ſilk when ſpun from the caterpillar.

The bee collects this yellow matter, which is the prime conſtituent of the wax, from whatever flowers happen to be moſt plentiful about the hives; and tho' generally yellow, as the farina of moſt plants is ſo, yet it is ſometimes ſeen in red, or green lumps on their thighs; but whatever be its natural colour, it is always turned yellow before it is diſcharged from the body of the animal; and when the ſtomach of any of them is diſſected, after the feeding on a red ſubſtance collected from flowers, the farina of which is of that colour, the change is found to be made as to colour in this part, for the whole is found there in form of a yellow jelly. This matter, if taken out of the ſtomachs of ſeveral bees and dryed, is found to be of a diſagreeable ſmell, like fermented matter, and of a pungency ſomewhat reſembling that of the volatile ſalts. Mr. Reaumur was hence induced to try the effect of the volatile ſalts in turning the bees bread, or rough wax, into perfect wax by digeſtions, continued a long time, but in vain. If we may give credit, however, to the German

man Ephemerides, there is a much more eaſy way of reducing this matter, while yet contained in the apices of the plant, into true wax; and that without the aſſiſtance of the work of the bees. Mr. David Maja gives an account in thoſe papers, that the perſons he employed in beating roſes into conſerve, always obſerved in the pounding of the roſes, before the ſugar was put to them, that a piece of ſolid but ſoft matter was found adhering to the peſtle of the mortar, which, on a ſtrict examination, proved to be true and genuine wax. It appeared from this experiment, that the juice of the petals or leaves of the roſes, was able, by the aſſiſtance of beating, to convert into true wax the farina contained in the apices of that flower. Mr. Reaumur tried what effect the juice of roſes would have on the yellow matter collected on the legs of the bees and on the farina of plants, but no treatment he could give theſe ſubſtances was ever able to produce wax.

Mr. Reaumur brought it to an abſolute proof, that the bees eat the rough wax or bees bread, by obſerving the bees of a certain hive to come home loaded with it every day, ſeveral times over, during the month of April and a great part of May; and after this, opening and examining the hive they belonged to, there were found no new combs, nor were the old bees enlarged in ſize: it is true, that there were ſome cells found, filled with magazines of this matter, but as the far greater part was brought to no ſort of account, it ſeems very plain that they had eat it. It is to be obſerved, that the bees have their ſeveral periods of going out in ſearch of this matter and of honey: it would be too fatiguing for them to be always thus at work, and to avoid this there is always a very large part of them, even more than half the hive, found at reſt within it; theſe are ſuch as have worked till they are tired, and the others in turn take this manner of reſting, and ſend theſe out to work again. *Reaumur*'s Hiſt Inſ. Vol. X. p. 68. See WAX.

PAINTED *lady*, among the floriſts, a term for a particular ſort of carnations, the flowers of which have all their petals red or purple on the out ſide, and white underneath.

PALA, in botany, a name by which ſome authors have called the *nutmeg-tree*. *Piſo*, Mant. Arom. p. 173.

PALA, in zoology, a name uſed by ſome authors for a fiſh of the truttaceous kind, more uſually known by the name of *ferra*. *Willughby*'s Hiſt. Piſc. p. 185. See the article FERRA.

PALÆSTE, the name of a Greek meaſure of length, being the ſame with the *dochme* and *doron*, and containing four finger-breadths, or digits.

PALALACA, in natural hiſtory, the name given by the people of the Philipine iſlands to a bird common among them, and ſomewhat reſembling the *upupa*. It has a very coarſe and harſh voice; its head is brown, and has a comb or creſt of feathers like the *upupa* or *hopoe*; its beak is as ſtrong as iron, and in the building ſeaſon it cuts its way with this into the firmeſt part of trees, and builds its neſts in the holes it makes in this manner; it is of the ſize of a common hen, and is of a very beautiful green colour, ſometimes variegated with other colours, ſometimes plain. This is the deſcription Father Camelli gives of this bird, and it ſeems very plainly to be a ſpecies of *woodpecker* of a very large and beautiful kind. They have got an opinion there, that if the opening into this creature's neſt be ſtopped up with a large iron pin, the bird knows a plant which has the effect of ſoftening iron; and that it procures this plant, and applying it to the iron ſoon makes its way in. A ſtory ſomething like this the common people of England alſo have of the *woodpecker*.

PALALIA, in botany, a name uſed by ſome authors for the *cyclamen* or *ſowbread*. *Ger.* Emac. Ind. 2. See CYCLAMEN.

PALAPARIJA, in zoology, the name of a ſpecies of Eaſt India ſerpent, found in the iſland of Ceylon. It is a large kind, and beautifully variegated in colour, with a great deal of red about it. It is one of thoſe ſpecies which naturally live under ground. *Ray*'s Syn. Anim. p. 33.

PALARIA, among the Romans, a kind of excerciſe performed at a ſtake by the ſoldiers.

The ſtake being fixed immoveable in the ground, and ſix feet high above it, the young undiſciplined ſoldiers advanced againſt it armed with a hurdle and cudgel, inſtead of a ſhield and ſword, and went through all the rules of attack and defence, as if actually engaged with an adverſary. Sometimes they ſtood at a diſtance, and attacked it with miſſive weapons, at the ſame time uſing all the requiſite motions for defending themſelves, and warding off what might be thrown againſt them. *Pitiſc.* Lex. Ant. in voc.

PALATE (*Cycl.*)—Wounds of the *palate* and other parts of the mouth are only to be healed by being anointed with honey of roſes, either alone or mixed with balſam of Peru, or with oil of myrrh *per deliquium*. *Heiſter*'s Surg. 81.

Bones of the PALATE. There are two bones ſituated in the poſterior part of the arch of the *palate*, between the *pterygoide apophyſis* and the *oſſa maxillaria*, and running up on the ſides of the *naſal foſſæ* all the way to the bottom of each orbit. The figure of theſe bones is not ſquare, as has been ſaid by thoſe who have only ſeen that portion of them which belongs to the *palate*, and from thence have named them *oſſa palati*. The entire bone is crooked, hooked, pointed and uneven, tho' of a ſmall ſize. Each of theſe may be divided into four portions, one ſuperior, one middle, and two lower; whereof one is the anterior, the other the poſterior.

The lower and anterior portion, to be called properly the *portio palatina*, is the baſis or body of the bone, and the only part of it which the antient anatomiſts, except Vidus Vidius, have obſerved. It completes the arch of the *palate*, and the bottom of the *naſal foſſa*; the inner edge of it is raiſed, and that, joined to the like edge of the other bone, forms a groove which receives part of the *ſeptum narium*, in the ſame manner as the other part of it is received in a like groove of the *oſſa maxillaria*. The poſterior edge is gently ſloped, and ends inward in a point, which joins a like point in the other bone.

The lower and poſterior portion, to be called properly the *pterygoide*, is pointed and hollowed on each ſide, to join the *pterygoide apophyſis*, of which it completes the *foſſa*, being fixed like a wedge in the irregular notch of that proceſs. Exteriorly it is uneven, the better to be connected with the *os maxillare*. This portion is diſtinguiſhed from the *portio palatina*, and alſo from the middle portion, by an oblique half canal, which with the half canal in the maxillary tubercle, forms an entire canal, the lower end of which is the poſterior *foramen palatinum*.

The middle portion, properly to be called the *naſal*, is very thin, and is ſituated laterally. The internal ſide of it is a little concave, the outſide a little convex; the concavity is turned toward the nares, and at the lower part of it there is a tranſverſe eminence or bony line, which diſtinguiſhes this portion from the *portio palatina*. The convex outſide partly covers the opening of the maxillary lines. At the lower part of it is a tranſverſe groove, anſwering to the eminence on the other ſide, and moulded, as it were, by the tranſverſe exterior eminence of the *os maxillare*.

The upper portion, properly called the *orbitary portion*, is diſtinguiſhed from the *naſal portion* by a notch, which, together with the *pterygoide apophyſis* of the ſpheroidal bone, forms an opening more or leſs conſiderable, which may be called the *foramen ſpheno-palatinum*, or *pterygo-palatinum*. This portion has five little ſides, three of which are rather cavities. One ſuperior, which completes the extremity of the bottom of the orbit, and is more or leſs flat, very ſmall, ſmooth, and triangular. One anterior, which is a little hollow, covering the upper part of the maxillary tubercle, and by a ſmooth raiſed edge compleating the *fiſſura ſpheno-maxillaris*. The third ſide is likewiſe anterior, more hollow than the former, and joins the back part of the labyrinth of the *os ethmoides*. The fourth is poſterior, and more or leſs hollow, anſwering to the ſphenoidal *ſinus*. The fifth is lateral and external, covering the poſterior and upper part of the maxillary *ſinus*. Theſe ſides and cavities, however, ſometimes vary; being in ſome ſubjects found ſingle, in others complex: there is very little diploe in theſe bones, except in the *palatine* and *pterygoide* portions. They are joined to each other by the *portio palatina*; to the vomer by the common groove, formed by their raiſed edges; to the maxillary bones before and laterally; and behind to the ſphenoidal bone; to the inferior ſhells of the nares by their tranſverſe eminences; and laſtly, by their orbitary portions, to the *os ethmoides*. *oſſa maxillaria*, and *os ſphenoides*. They complete the arch of the *palate*, the *pterygoide* and *naſal foſſæ*, and the orbit. They aſſiſt alſo in ſupporting the vomer and the *conchæ narium inferiores*. *Wiſlow*'s Anatomy, p. 37.

PALATO-*ſtaphylinus*, in anatomy, a name given by Douglaſs to the muſcle called by Morgagni *columellæ muſculus teres*, and by Albinus and ſome others, the *azygos uvulæ*, and by ſome the *epiſtaphylinus*.

PALINCOTOS, a term uſed by Hippocrates to expreſs ſuch diſeaſes as are wont to return with all their violence upon the patient, after their ſeeming to have left him, whether for a longer or a ſhorter period of time.

PALINDROMIA, a term uſed by Hippocrates and many other writers to expreſs a preternatural running of the peccant matter of diſeaſes to the more noble parts.

PALINGENESIA, is uſed among chemiſts for the reproducing a mixed body from its aſhes.

This has been pretended to by many, as well as the philoſopher's ſtone and other wonderful powers; but as to the *palingeneſia*, or reſuſcitation of plants, the inſtances produced are no more than ſome of thoſe artificial vegetations which the learned Monſ. Homberg has obſerved and deſcribed many times. See *Homberg* in Mem. Acad. Sciences, 1710; and *Boyle*'s works abridg. Vol. I. p. 69.

PALINGMAN, in our old ſtatutes, ſeems to be a merchant-denizen, one born within the Engliſh pale. Stat. 22. Ed. IV. c. 23. and 11 H. VII. c. 22. *Blount*, *Cowel*.

PALINIDRYSIS, a word uſed by Hippocrates to expreſs the ſubſiding of a tumour by the diſperſion of the matter that occaſioned it without its breaking.

PALIRRHŒA, a word uſed by the old Greek authors to expreſs the reflux or retrograde courſe of the humours, as in caſes of the cholera morbus, where people vomit up their ſtools.

PALIURUS, *Chriſt-thorn*, in botany, the name of a genus of trees, the characters of which are theſe: the flower is of the roſaceous kind, and is compoſed of ſeveral petals arranged in a circular form; from the cup of the flower there ariſes a piſtil,

piſtil, which finally becomes a clypeiform or ſhield-like fruit, containing a roundiſh ſtone, divided into three cells, in which there are three roundiſh kernels. *Tourn.* Inſt. p. 616.

There is only one known ſpecies of the *paliurus*, which is the common *Chriſt-thorn*.

PALLAS, in aſtronomy, a name given by ſome to the firſt ſatellite of Jupiter. *Lowthorp*'s Abr. Phil. Tranſ. Vol. I. p. 407.

PALLAX, a name given by ſome of the affected chemical writers to an imaginary factitious ſtone, compoſed of the heaven and earth, of the moon or ſilver, with an equal weight of the ſun or gold. This is their own explication of it.

PALLET *(Cycl.)*—PALLET, in ſhip-building, is a room within the hold, cloſely parted from it, in which, by laying ſome pigs of lead, *&c.* a ſhip may be ſufficiently ballaſted, without loſing room in the hold; which, therefore, will ſerve for ſtowing the more goods.

PALLIUM *(Cycl.)*—PALLIUM-*ducale*, in natural hiſtory, a name given by writers on ſhells to a kind of *pecten* or *ſcallop*, of a large ſize and beautiful appearance, tho' ſimple colour: there are two ſpecies of this, a red and a yellow one. See the article PECTEN.

PALLIUM-*purpureum*, a name given by Baſil Valentine, and others of the affected writers in chemiſtry, to a powder of a purple colour, prepared from gold. It is made by preparing an amalgama of gold and mercury, and after the mercury is driven off by the retort, the remaining matter is mixed with ſulphur, and calcined by a well regulated fire till reduced to a purple powder. This is called alſo the *ſolar powder*, and has, like the other preparations of this metal, many imaginary virtues aſcribed to it.

PALMETTO-*royal*, a name given by Ligon to a tree of the palm kind. Its trunk is very tall and ſtreight, and hollowed regularly in the center; yet ſo tough, that it is never blown down, nor deſtroyed by ſtorms. It is recommended for the making long teleſcopes for celeſtial obſervations.

PALM *(Cycl.)*—The famous cabbage-tree of Barbadoes is a kind of *palm:* it grows to the height of three hundred feet, and tho' the ſprouts of one year's growth are ſo tender, that they are eaten as cabages, yet the tree itſelf is one of the moſt durable woods we are acquainted with, and will not rot on any account, but is ſo firm, that it is ſcarce poſſible to make a nail enter it. Phil. Tranſ. N. 36.

PALM-*tree*. The ſeveral ſpecies of this tree may be all raiſed with us from the ſeeds, which muſt be ſown in pots of light earth, and plunged into a bark hot-bed. When the young plants come up, they muſt be tranſplanted into ſingle pots, and preſerved in the ſtove. The ſoil they ſucceed beſt in is made of one third paſture land, one third ſea ſand, and the other third rotten tanner's bark, or rotten horſe-dung; and they muſt be planted in pots, in proportion to their ſize, but theſe ſhould not be too large. They will require to be removed once a year, but this muſt be done with great care. *Miller*'s Gard. Dict.

PALMARIS *cutaneus*, a muſcle commonly known by the name of the *palmaris brevis*. It is a ſmall thin plane of fleſhy fibres, ſituated tranſverſely, or more or leſs obliquely, under the ſkin of the large eminence in the palm of the hand, between the carpus and the little finger; its fibres adhering to the ſkin, and being in ſome meaſure interwoven with the *membrana adipoſa*. Theſe fibres are fixed along the edge of the *aponeuroſis palmaris*, from the large ligament of the *carpus* toward the little finger: and they run in for ſome ſpace on the plane of the *aponeuroſis*, but without any connection with the bones of the *metacarpus*. Near the *aponeuroſis* theſe fibres are more or leſs tendinous, and ſome of them often croſs each other. They are ſometimes ſo thin and pale, as hardly to be ſenſible; and in ſome ſubjects the muſcle ſeems to be divided into ſeveral parts. *Winſlow*'s Anatomy, p. 193.

It is a doubt with ſome authors whether the *palmaris cutaneus* or *brevis* be a diſtinct muſcle. Fallopius calls it, *caro quædam quæ muſculorum effigiem habet*; a portion of fleſh which has the appearance of a muſcle. And Douglaſs calls it, *caro quadrata*; a ſquare portion of fleſh: tho' he adds the name *palmaris brevis*, given it, on its ſuppoſition of being a muſcle, by another author.

PALMATED-*roots*, are tuberoſe-roots of a flattiſh ſhape, and divided into ſeveral oblong and ſlender branches, reſembling ſo many fingers. Of this ſort are the roots of ſome of the orchis kind, called hence *palmated*.

PALMATED-*leaf*, among botaniſts. See LEAF.

PALMATED-*ſtone*, *palmati-lapides*, in natural hiſtory, a name given by the antients to a ſort of ſtones which were always found of the ſhape of a hand with its fingers. They were frequent in Spain, and ſome which were found of a fine black were reputed to be a kind of marble. The greater number were white, and were compoſed of the matter of one of the ſofter and leſs beautiful quarry-ſtones.

PALMIPEDES, *web-footed*, in zoology, the name of a genus of birds living about waters, and furniſhed by nature with feet for ſwimming. The general characters of theſe birds are theſe: they have all ſhort legs, excepting only three, the *flamingo*, *corrira*, and *avoſetta*, which are ſingular and of a peculiar genus. Their thighs are feathered to the joint; their hinder toes, if any, are ſhort; their rumps are leſs prominent than in other birds; and they have in general broad beaks, and have an appendage on the extremity of their upper chap. *Ray*'s ornithology, p. 241.

PALMIPES, among the Romans, a long meaſure, containing a foot and a *palm*, or five *palms*; and was leſs than the cubit by one *palm*. *Pitiſc.* in voc.

PALMITES, in botany, a name given by ſome authors to the *palma humilis*, or *dwarf palm*, called by others *chamærops*. Gen. Herb. 1335.

PALPÆBRA *(Cycl.)*—PALPEBRÆ *ſuperioris primus*, in anatomy, a name given by Coſſerius and ſome others to one of the muſcles of the face, whoſe office it is to lift up the upper eye-lid, and by that means open the eye: it is hence called by Cowper and Douglaſs, *aperiens palpebram*; by ſome, *aperiens oculum*; and by Albinus, the *levator palpebræ ſuperioris*. See APERIENS, *Cycl.*

PALPITATION *of the heart*, *(Cycl.)* a term uſed by medical writers to expreſs a ſpaſtic contraction of the heart, when it leaps and beats violently at different intervals.

This is ſometimes idiopathic, or a diſeaſe in itſelf, and attendant on no other; but that rarely happens, and it is uſually ſymptomatic, and merely an attendant on other diſorders. In general we are to diſtinguiſh a *palpitation of the heart* thus conſidered as a diſeaſe, or at leaſt as a ſymptom of one, from thoſe commotions of the heart which we occaſionally bring on by running or any other violent exerciſe, which throw the blood into commotions.

Signs of it. The evident and obvious ſymptom of this complaint, is the vehement pulſation of the heart againſt the ſolid parts of the breaſt, which is often ſo great, that it may be ſeen or even heard by the perſons who ſtand by. To this there are uſually joined an anxiety of the *præcordia*, which throws the perſon into a ſweat, a languor and laſſitude of the limbs in general, a paleneſs of the face, a difficulty of reſpiration and cardialgia, with frequent faintings; and finally, there is uſually a coſtiveneſs and flatulences of the abdomen attending on it.

Perſons ſubject to it. It is a complaint that chiefly affects perſons of ſedentary lives, and of a plethoric habit of body. Scorbutic, hyſteric, and hypochondriac perſons are alſo frequently ſubject to it; and ſuch as have obſtructions of the menſes. Thoſe people who have been uſed to regular bleedings, and have afterwards neglected them, are alſo ſubject to this complaint; and thoſe who are ſubject to ſudden paſſions, and frequently ſuppreſs them. Sleeping in the open fields has alſo been known to bring it on; and perſons of a melancholic habit are uſually more than others ſubject to it. Young women, whoſe menſes have not appeared, or who have had them ſuppreſſed by ſome accident, and in whom nature is labouring to bring them on again, are alſo very ſubject to violent *palpitations*; and ſuch as have acute or intermittent fevers coming upon them. Perſons of plethoric habits are often ſeized with *palpitations of the heart* in their ſleep, and when they wake they feel them for ſome minutes afterwards. Finally, perſons who have polypuſes of the heart are always grievouſly afflicted with *palpitations*, attended with difficulties of breathing.

Cauſes of it. Beſides what has been already obſerved, it is to be remarked, that the paſſions of the mind very frequently occaſion this diſorder; thus, ſudden terror, fear, a ſuppreſſion of anger, and the like, will at any time bring on a *palpitation*, without any other cauſe. A high diet and eaſe, with a ſedentary life, alſo often occaſion them; and in young people, not arrived at puberty, they are often found to be occaſioned by worms in the inteſtines.

Prognoſtics in it. The beginnings of complaints of this kind, and ſlighter caſes, when they continue ſo, are attended with no great danger; but when the diſorder grows into a habit, it is not only very troubleſome, but very dangerous. When more cauſes than one conſpire to produce it, it is not only more violent, but the patient is more ſubject alſo to relapſes; and in the end, inflammations, ſpittings of blood, polypuſes of the heart, and infarctions of the viſcera come on: not unfrequently alſo are left fevers, which become dangerous. Sometimes alſo convulſions and other affections of a like kind, even palſies are brought on by theſe diſorders. Finally, when an habitual *palpitation of the heart* has been brought on by terror alone, it always proves very difficult of cure, whatever means are uſed.

Method of cure. The primæ viæ muſt be firſt cleanſed by infuſions of rhubarb and ſena, and other gentle purges: after this it is proper to bleed in the foot; but it is to be obſerved, that if the orifice be not large, nor the blood taken away in ſufficient quantity, it is of not the leaſt effect in this caſe. After this the blood is to be attenuated by drinking plentifully of warm and weak liquors, and by moderate exerciſe. After this, ſome of the gentle alexipharmics are to be given, and the ſpring juices of brook-lime, water-creſs, and the like. Finally, there are to be given ſuch things as promote an equal diſtribution of the blood and humors: mixtures of volatiles and alcalies, as of ſpirit of hartſhorn and tincture of ſalt of tartar, and gentle anodynes, if neceſſary. Beſides theſe, clyſters will often do great good, as will alſo the frequent waſh-

ing the feet with warm water, and the hanging camphor near the part, and ſpirit of caſtor, ſaffron, and the like, do well to be rubbed on the breaſt.

Bleeding muſt never be omitted in this caſe, for without it no medicines will be able to take effect. In caſes when a hypochondriac habit conſpires in the cauſe of this complaint, the attemperating powders of nitre, cinnabar, and the like, always prove of very great ſervice. In caſes of a chloroſis with this complaint, bitters and chalybeates uſually prove a remedy; and when a ſuppreſſion of the menſes, or hæmorrhoids is the cauſe, the bringing them to their priſtine regular ſtate is a cure. It is never proper to allay the motion till the plethora, which occaſions it is removed, unleſs in caſes of its coming on merely by the paſſions, without any antecedent cauſe in the blood; in this caſe, gentle opiates may be given without danger. Steel medicines and the volatile ſalts, when they are given in an imprudent manner, always make the diſeaſe worſe, inſtead of doing any thing toward a cure. Finally, a change of a ſedentary life, into a moderately active one, will do more than any medicines. *Junck.* Conſp. Med. p 626, ſeq.

Monſieur de la Hire was cured of a chronical *palpitation* of the heart, by a quartan ague. See *Fontenelle*, in his Eloge.

PALSY *(Cycl.)* — Among other remarkable caſes of this terrible diſeaſe, we have, in the philoſophical tranſactions, one of a periodical *palſy*. The author quotes two inſtances of a like kind, by way of countenance to that which he relates. The German Ephemerides mention a young paralytic man who ſpoke only one hour in every four-and-twenty, and that always at a regular time, beginning between twelve and one at noon every day, and his power of ſpeech ceaſing always between one and two: this continued twelve years upon him. The other caſe is not recorded in books, tho' well atteſted.

The caſe in the tranſactions, is of a ruddy ſanguine young woman who fell into a *palſy*, in which ſhe loſt her voice and the uſe of her legs. This was at firſt carried off by medicines, but afterwards returning again at times, at length became regularly periodical, ſeizing her on the Tueſday of every week, and going off again on the Friday. This courſe it obſerved very regularly for the firſt year, except twice.

After this, on taking proper medicines for ſome conſiderable ſpace of time, ſhe became ſo well, that her fits laſted only a day and a half, coming on always on a Tueſday morning, and going off again on a Wedneſday. In this manner ſhe continued to have them ſeveral months, but ſhe was at length perfectly recovered. Phil. Tranſ. N° 242. p. 60.

This diſtemper, according to Dr. Cheyne, may be cured by a total cow-milk diet. He thinks the medicines commonly preſcribed in ſuch caſes may retard the progreſs of the diſtemper, but that it is never to be eradicated if the ſtroke be deep, or life far ſpent, but by cow-milk only. See Nat. Method of curing, p. 265.

Mr. Boyle gives an account of an *hemiplegia*, or *palſy* of one ſide, occaſioned by a ſmall ſplinter of a bone preſſing on the dura mater. The patient in leſs than five hours after the bone was taken out, found himſelf able to move his finger, and within two or three days to lift his arm, which had been reduced to ſkin and bone, but ſoon recovered its proper ſize. Works Abr. Vol. 1. p. 37.

Hofman diſtinguiſhes *palſies* into ſerous and ſanguineous. In the firſt kind, raiſing an artificial fever by hot, acrid, nervous, and volatile medicines, by ſtrong exerciſe, and hot bathing, often effects a cure. But in the ſanguineous kind, accompanied with febrile motions, ſuch remedies ought not to be applied. Oper. T. 3. p. 198. §. 26.

There is a kind of *palſy* called *beriberii*, to which the natives of the Eaſt Indies are peculiarly ſubject.

The word in the Indian language ſignifies a ſheep; and Bontius ſuppoſes it was attributed to this diſeaſe, becauſe the perſons afflicted with it thruſt out their knees, and lift up their legs ſo much in walking, as in ſome ſort to imitate the gate of ſheep. It is a kind of tremor, or *palſy*, in which the uſe of the hands and feet are in a great meaſure taken away; and ſometimes it extends itſelf to the whole body.

The principal cauſe of this diſeaſe is ſaid to be a thick viſcous humor, which in the night ſeaſon, eſpecially in the rainy time, which holds inceſſantly from November to May, falls upon the nerves, while people fatigued with the heat of the day, throw aſide their cloaths and ſleep without any covering; by which means the phlegmatic humor which before generated principally in the brain, eaſily ſeizes upon the nerves; for the nights in theſe countries, compared to the days, are very cold. The conſequence of this is, that the joints become lengthened, the pituitous humors inſinuating themſelves between the junctures, ſo as to relax the nerves and ligaments. Tho' this diſeaſe for the moſt part comes on very gradually, and by ſlow advances, yet ſometimes it ſeizes a perſon all at once, as when any one being very much fatigued and hot, drinks a vaſt quantity of any cold liquor. And thus we ſee, even in our own country, that when any one has been violently heated by exerciſe, and drinks an immoderate quantity of a cold liquor, it often throws him into the utmoſt hazard of his life.

The ſymptoms of this diſeaſe are always manifeſt, even to the ſight. There is ever an univerſal laſſitude of the whole body. All motion, but particularly that of the hands and feet, becomes vitiated and depraved; and the ſame ſort of throbbing and titillation is felt as we feel in our fingers and toes in cold weather, only the pain is leſs acute; and ſometimes the voice is ſo far affected, that the patient can ſcarce ſpeak articulately.

Bontius himſelf was once afflicted with this diſtemper, while in the Eaſt Indies, and had this particular ſymptom of it in ſo great a degree, that for a whole month thoſe who ſat cloſe by him could not, without great difficulty, hear what he ſaid. Theſe are the common ſymptoms of the diſeaſe; but beſide theſe, it is at times attended with all thoſe others which may be ſuppoſed to ariſe from a cold cauſe.

The cure is uſually very tedious; for theſe cold humors are very ſlowly, and with difficulty diſcuſſed. The diſeaſe is not naturally mortal, however, unleſs it affects the breaſt; in which caſe it ſometimes wholly ſtops the breath. In order to a cure, the patient is of all things to avoid confining himſelf to his bed; walking, riding, and all ſorts of exerciſe are uſeful; ſtrong and ſmart frictions are alſo very uſeful, and the Bengal ſervants are uſed to theſe, and are very dextrous in the uſe of them.

There is alſo great relief had from fomentations made of decoctions of the herb *lagondi*, which has all the virtues of our chamæmile and melilot, but in a much greater degree. The leaf of this plant is like that of our perſicaria or arſmart; and its ſmell very aromatic. The hands and feet are alſo to be anointed with oil of cloves, or mace mixed with oil of roſes. But more than all theſe, there is relief found in a kind of naphtha, which is very common in Sumatra, and is called *miniac tarnoh*, or *oil of the earth*. This is of a ſtrong, but not very nauſeous ſmell, and is ſo great a remedy, that being rubbed on the hands and legs, it is always an almoſt immediate relief. The Barbarians know as well as we the value of this precious balſam; and the king of Achin, who is the moſt powerful prince in that iſland, has forbidden its exportation, under the pain of death; ſo that the inhabitants can only bring it off by ſtealth in the dead of the night, to the Dutch and Engliſh ſhips which happen to lie in the way.

Theſe are the things which give temporary relief; but as the diſeaſe is of the chronic kind, the cure is to be performed by long courſes of the decoctions of the roots of China, and ſarſaparilla, and guaiacum wood, which by their gentle heat diſcuſs the cold humors which are the root of the diſeaſe, and carry them off by perſpiration or urine. Purging at proper intervals is alſo highly neceſſary; and the cathartics moſt in uſe there in this caſe, are, aloes and gamboge. Bleeding is by all means to be forbid; and the relicks of the diſeaſe are uſually very happily carried off by Venice treacle, and other ſudorific and nervous medicines, and gentle exerciſe is the beſt remedy to prevent its return. *Bontius* de Medicina Ind.

PALUM *ſanctum*, in botany, a name by which ſome authors have called a ſpecies of the *guaicum tree*, called the *lignum ſanctum*, or *holywood*. *Park.* Theatr. p. 1587.

PALUMBARIUS *accipiter*, the *goſhawk*, a ſpecies of hawk of the ſhort-winged kind. It is larger than the common buzzard, and is brown on the back, and very white on the belly, with tranſverſe ſtreaks of browniſh black; theſe are of an undulated figure, and laid very near one another. Its legs and feet are yellow, and its beak black, with a yellow membrane covering its baſe. Its wings, when cloſed, do not nearly reach to the end of its tail; by which, and by its ſize it is eaſily diſtinguiſhed from all other hawks. Its tail is long and of a browniſh grey, with three or four tranſverſe ſtreaks on it, placed very diſtant from one another. It will ſeize on pheaſants, geeſe, and even hares, but its moſt common prey is the partridge. *Ray*'s Ornithology, p. 51.

PALUMBES, the *ring-dove*, in zoology. See RING-*dove*.

PAMBŒOTIA, Παμβοιωτια, in antiquity, a feſtival celebrated by all the Bœotians who aſſembled near Coronea, at the temple of Minerva, ſurnamed Itonia. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 419.

PAMMACHION, Παμμαχιον, a name by which the exerciſe *pancratium* is ſometimes called, whence the combatants were likewiſe called *pammachi*, Παμμαχοι. *Potter*, Archæol. Græc. l. 2. c. 22. T. 1. p. 444.

PAMUCHLEN, in zoology, a name by which ſome call the ſpecies of *cod-fiſh*, commonly named by authors *aſellus ſtriatus*. *Willughby*'s Hiſt. Piſc. p. 172.

PANACIA, Πανακεια, in antiquity, a feſtival in honour of Panace. *Potter*, T. 1. p. 422.

PANALETHES, a name uſed by many authors for a plaiſter ſuppoſed to be of the greateſt virtues. It is deſcribed by Aëtius. Tetrabib. 4. Serm. 3. cap. 2.

PANAMA-*ſhell*, a ſpecies of *dolium*. See DOLIUM.

PANARITIUM, a word uſed by ſome authors to expreſs a *whitlow*, or *paronychia*.

PANCALA-*aurea*, a name of a famous antidote, compoſed of many ingredients, deſcribed by Myrepſus.

PANCARPIA, the name of a ſort of cake much uſed at Alexandria,

andria, and usually covered with paper for the sake of its keeping the longer.

PANCH, or PANTCH, in the sea language. See PAUNCH.

PANCHRESTARII, among the Romans, those who prepared the *pancrest*, or *universal remedy*. *Pitisc.* in voc. See the article PANCHREST, *Cycl.*

PANCHRUS, the name given by some of the antient writers on natural history to a gem which they say has all colours: probably the opal.

PANCLADIA, Πανκλαδια, in antiquity, a festival celebrated by the Rhodians when they pruned their vines. *Potter*, Archæol. Græc. T. 1. p. 419.

PANCRASIUM, in the materia medica, a name used by some authors for the *squill*, of the root of which the oxymell of squills is made. *Park.* Parad. p. 133.

PANCRATIASTES, in antiquity, a combatant in the exercise called *pancratium*. *Potter*, Archæol. Græc. T. 1. p. 444. See PANCRATIUM, *Cycl.*

PANCRATIASTES was also applied to one who had gained the victory in all the kinds of exercise used in the *pancratium*. *Pitisc.* in voc. See PANCRATIUM, *Cycl.*

PANDEMON, Παυδημον, in antiquity, the same with the festival Chalceia and Athenæa. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 422.

It was so called from the great concourse of people that used to meet at this solemnity. See CHALCEIA and ATHENÆA.

PANDIA, Παυδια, in antiquity, an Athenian festival in honour of Jupiter. For the origin of this solemnity, see *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 422.

PANDROSOS, Παυδροσος, in antiquity, an Athenian festival in memory of *Pandrosus* the daughter of king Cycrops. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 423.

PANDURIFORM *leaf*, among botanists. See LEAF.

PANDYSIA, Παυδυσια, in antiquity, public rejoicings when the season through its coldness and intemperance forced the sailors to stay at home. *Potter*, T. 1. p. 423.

PANEGYRIS, Παυηγυρις, among the Greeks, a fair, or festival day, on which the people used to meet together. It exactly corresponded to the Nundinæ of the Romans. *Pitisc.* in voc. See NUNDINÆ.

PANELLENIA, Παυελληνια, in antiquity, a public festival celebrated by an assembly of people from all parts of Greece. *Potter*, Archæol. Græc. T. 1. p. 423.

PANEMUS, in chronology, the Bœotian name of the Athenian month *metagitnion*, which was the second of their year, and answered to the latter part of our July and beginning of August. See METAGITNION and MONTH.

PANEROS, the name of a beautiful stone dedicated to Venus. It was called also by some *pausebastos*, and was probably one of the beautiful agates.

PANGONIA, in natural history, the name of a genus of crystal. See Tab. of Fossils, Class 3.

The word is derived from the Greek πᾶς, numerous, and γόνυ, an angle, or bending, and expresses a crystal, composed of many angles.

The bodies of this genus are single-pointed, or imperfect crystals, composed of dodecangular or twelve-planed columns, terminated by twelve-planed pyramids, and the whole body, therefore, made up of twenty four planes.

Of this genus there are only three known species: 1. A brownish-white one, with a long pyramid. This is found in Silesia and Bohemia; sometimes in mountains, and sometimes on the sides of rivers, and is esteemed a very valuable crystal. 2. A yellowish-brown one, with a short pyramid. This is often brought over to us under the name of *Saxon topaz*, among the other crystals commonly known by that name. And 3. A clear colourless one, with a very short pyramid. This is a very valuable crystal, and is produced in the East Indies, being often brought over among the Indian ballast. *Hill*'s Hist. of Foss. p. 187.

PANICASTRELLA, in botany, the name by which Micheli has called a genus of plants named by Linnæus *cenchrus*. See the article CENCHRUS.

PANICUM, in the Linnæan system of botany, the name of a distinct genus of plants, of the grass kind, the distinguishing characters of which are, that the calyx is composed of several leaves, and contains only one flower; the leaves of it are capillary and unequal in their insertions. The glume is made of two valves, and contains only one flower: the valves are oval and pointed, and are both small, but one more so than the other. The flower is also composed of two valves, both oval and pointed, but the one smaller and flatter than the other. The stamina are three short capillary filaments. The antheræ are oblong. The germen of the pistil is roundish; the styles are capillary and two in number, and the stigmata are feathered. The flower surrounds and incloses the seed, and never opens to drop it out. The seed is single and roundish, but something flatted. *Linnæi*, Genera Plantatum, p. 17.

PANIONIA, Παυωνια, in antiquity, a festival in honour of Neptune, celebrated by a concourse of people from all the cities of Ionia.

One thing is remarkable in this festival, that if the bull offered in sacrifice happened to bellow, it was accounted an omen of the divine favour; because that sound was thought to be acceptable to Neptune. *Potter*, Archæol. Græc. T. 1. p. 423.

PANIS-*dæmonum*, in natural history, a name given by authors to a sort of coarse stone, common in Sweden, and some other places, and usually found in roundish, but somewhat flatted masses, resembling a loaf in form.

PANNEL, in the Scotch law, denotes the prisoner at the bar, or person who takes his trial before the court of justiciary, for some crime.

PANNONICA-*bolus*, in the materia medica, a name by which Kentman, and some others, have called the earth more usually known by the name of *bolus toccaviensis*. *Kentman*'s Nomenclator Foss. p. 7. See the article TOCCAVIENSIS.

PANOCHIÆ, a name by which some chirurgical authors call *bubos* in the groin.

PANOMPHÆUS, Παυομφαιος, in antiquity, a designation given to Jupiter, because he was looked upon as the original author of all sorts of divination, having the books of fate, and out of them revealing either more or less, as he pleased, to inferior dæmons. *Potter*, T. 1. p. 263.

PANOPSIA, Παυοψια, in antiquity. See PYANEPSIA, *Cycl.*

PANSAPAN, in botany, a name by which some authors have called the tree whose wood is the logwood, used in dying, and in medicine. *Herm.* Mus. p. 42.

PANTARBE, in natural history, a name given by authors to an imaginary stone, the virtues of which were similar to those of the magnet; but exerted upon gold as those of the loadstone upon iron. The antients as well as later writers, seem to have all had an opinion, that there was such a stone as this, and the *amphitane* of Pliny is described as possessing this remarkable quality; but neither they nor we, ever found reason from any experiment to believe, that there was any such stone.

PANTER, in the sea language. See SHANK-PANTER.

PANTHERA, in zoology, a name by which many have called the *leopard*, more properly called *pardalis*. See PARDALIS.

PANTHERA-*lapis*, in natural history, the name of a species of stone found in Egypt, and the East Indies, and described to be of a yellowish colour, variegated with dusky spots of the colour of those on the skin of the panther. The writers of the middle ages have attributed many absurd properties to it: it seems to have been a species of agate.

PANTHERINE *tables*, *pantherinæ mensæ*, among the Romans, tables made of citron wood, which were held in such high esteem, as to equal the value not only of silver and gold, but likewise of pearls. They had this name from their being spotted after the manner of panthers. *Hofm.* Lex. in voc.

PANTICES, a word used by some medical writers to express the intestines.

PANTOMIME, Παυλομιμος, among the antients, a person who could imitate all kinds of actions and characters by signs and gestures, without speaking.

The *pantomimes* made a part in the theatrical entertainments of the antients; their chief employment was to express in gestures and action, whatever the chorus sung, changing their countenance and behaviour as the subject of the song varied. They were very antient in Greece, being derived from the heroic times, according to some; but however this may be, they were certainly known in Plato's time. In Rome it was so late as the time of Augustus before they made their appearance. As to their dress, it was various, being always suited as near as possible to that of the person they were to imitate. The crocota was much used among the Roman *pantomimes*, in which and other female dresses they personated women. *Pitisc.* in voc. See MIME, *Cycl.*

PANTON-*shoe*, in the manege, a horse-shoe contrived for receiving narrow and hoof-bound heels. Its spunges are much thicker on the inside than on the outside; so that the part which rests upon the horn or hoof, runs slope-wise to the end, that the thickness of the inside of the shoe may bear up the heel, and throw or push it to the outside.

Panton-shoes are likewise proper for horses that have false quarters.

PAPAN, in natural history, the name given by the inhabitants of the Philippine islands, to a species of duck common in their lakes and marshes. This is very large and beautiful, and is called by Father Camelli *anas regia*, or the *royal duck*: it is not so common, however, as a little kind which they call *salagosir*; this is not larger than a man's fist. See SALAGASIR.

PAPAVER, *poppy*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the rosaceous kind, consisting usually of four leaves, disposed in a circular form. The cup is composed of two leaves, and from it there arises a pistil, which finally becomes a seed vessel, of a sort of oval oblong figure, and adorned with a head or covering; under which, in many species, there are a chain of apertures. Within the head or fruit, there are numerous lamellæ, to which the seeds adhere in the manner of placentæ. The seeds are usually small, and of a roundish figure. See Tab. 1. of Botany, Class 6.

The species of *poppy*, enumerated by Mr. Tournefort, are these: 1. The white *poppy*, or garden *poppy*, with white seeds.

2. The

2. The white-ſeeded garden *poppy*, with pale purple flowers. 3. The garden white-ſeeded *poppy*, with greyiſh flowers with purple bottoms to the petals. 4. The garden *poppy*, with flowers of a fair white, variegated with red, and with yellow ſeeds. 5. The garden *poppy*, with black ſeeds; the wild *poppy* of Dioſcorides, and black *poppy* of other authors. 6. The garden *poppy*, with double flowers of a deep violet colour. 7. The garden *poppy*, with double flowers of a pale violet colour. 8. The hoary-ſeeded *poppy*, with apertures in the heads. 9. The red-flowered *poppy*, with brown ſeeds. 10. The creſted *poppy*, with white flowers and white ſeeds. 11. The creſted *poppy*, with red flowers and black ſeeds. 12. The creſted *poppy*, with variegated red and white flowers. 13. The ſingle flowered creſted *poppy*, with purple petals with bluiſh grey bottoms. 14. The double fleſh coloured garden *poppy*. 15. The double purple *poppy*. 16. The double bright red *poppy*. 17. The double ſilver white *poppy*. 18. The double white *poppy*, with red edges. 19. The ſnow-white double *poppy*. 20. The double deep purple *poppy*. 21. The blood-red double *poppy*. 22. The violet coloured double *poppy*. 23. The ſmall white many flowered *poppy*. 24. The double flowered black *poppy*. 25. The double *poppy*, with variegated and jagged flowers. 26. The jagged flowered *poppy*, with bluiſh and whitiſh bottoms to the leaves. 27. The common wild red *poppy*. 28. The greater wild red *poppy*, with variegated flowers. 29. The common wild corn *poppy*, with white flowers. 30. The red corn *poppy*, with white bottoms to the petals. 31. The wild corn *poppy*, with fleſh-coloured flowers. 32. The double flowered corn *poppy*. 33. The corn *poppy*, with a double red lead coloured flower. 34. The corn *poppy*, with double fiery red flowers. 35. The double corn *poppy*, with fiery red flowers with white edges to the petals. 36. The double purple flowered corn *poppy*. 37. The double red corn *poppy*, with white bottoms to the leaves. 38. The common ſmaller corn *poppy*. 39. The corn *poppy*, with oblong hairy heads. 40. The longer hairy-headed corn *poppy*. 41. The very long ſmooth headed corn *poppy*. 42. The corn *poppy*, with undivided leaves. 43. The yellow flowered pyrenæan *poppy*. 44. The coriander-leaved alpine rock *poppy*. *Tourn.* Inſt. p. 237. ſeq.

PAPAYA, in botany, the name of a genus of plants, the characters of which are theſe: the flowers are of two kinds; the one ſort is tubulated and divided into ſegments, like the rays of a ſtar, at the end: the flowers of this kind are the barren or male ones. The others are of the roſaceous kind, being compoſed of ſeveral petals arranged in a circular form; from the cup of theſe flowers there ariſes a piſtil, which finally becomes a fleſhy fruit, of the ſhape of a melon, containing ſtriated ſeeds covered with huſks.

The ſpecies of the *papaya* enumerated by Mr. *Tournefort*, are theſe: 1. The *papaya* tree, with a fruit like the melopepo, or melon pompion, called the platanus-leaved *papaya*, and by ſome the male mamolla. 2. The *papaya*, with very large fruit, of the ſhape of the pompion. 3. The *papaya* with oblong or melon-ſhaped fruit. *Tourn.* Inſt. p. 659.

PAPER (*Cycl.*)—Mr. Boyle tells us, that *paper*, beſides its common uſes, may be made into frames for pictures, fine embоſſed work, and other parts of furniture. For this purpoſe, a convenient quantity of the beſt white ſort may be ſteeped for two or three days in water, till it becomes very ſoft; then reducing it by the mortar and hot water into a thin pulp, it is laid on a ſieve to draw off its ſuperfluous moiſture; then putting it into warm water, wherein a conſiderable quantity of freſh glue, or common ſize, has been diſſolved, it may afterwards be put into moulds to acquire the deſigned figure; and when taken out may be ſtrengthened, as occaſion requires, with plaiſter or moiſtened chalk, and, when dry, painted or overlaid. *Boyle*'s works abr. Vol. I. p. 149.

Another uſe of *paper* is to ſtop up cracks or fiſſures in wooden veſſels, to hold water; for, in this caſe, it will forcibly dilate, and fill the place wherein it is to lodge.

PAPER-*office*, an antient office within the palace of Whitehall, wherein all the public papers, writings, matters of ſtate and council, letters, intelligences, negotiations of the king's miniſters abroad, and generally all the papers and diſpatches that paſs through the offices of the two principal ſecretaries of ſtate, are lodged and tranſmitted, and there remain diſpoſed in the way of library. *Blount.*

PAPER-*office* is alſo the name of an office belonging to the court of King's-bench. *Blount.*

PAPHIS, in zoology, a name by which ſome have called the gar-fiſh. *Willughby*'s Hiſt. Piſc. p. 231.

PAPIA, in botany, the name of a genus of plants, called by Linnæus *orvala*. It has a monopetalous flower, ſucceeded by four ſeeds. *Micheli*, 17. See ORVALA.

PAPILIO, *butterfly*. For the ſeveral parts of the *butterfly*, ſee the articles ANTENNÆ, WING, TRUNK, &c.

Their arrangement into genera and claſſes are in a great meaſure taken from theſe ſeveral parts, and from the great uſes which they make of them. The general diſtinction is that which divides them into the day and night kinds; we have among the birds ſome few that fly abroad only by night, but theſe bear only a ſmall proportion in number to the day-fliers: on the contrary, the number of *butterflies* which we ſee fluttering about the fields and gardens, are ſcarce ſo many as thoſe which fly abroad only by night. We often meet with theſe even in our houſes, flying about the candles, aud the hedges ſwarm with them: in the day-time we find them hid under the leaves of plants, and often, as it were, in a torpid ſtate. In this condition they remain till evening, but they are ſo cunning in hiding themſelves at this time, that it is difficult to ſee one even in places where there are a great number. The way to diſcover them is to beat and diſturb the buſhes, or ſhake the branches of trees in places where they are ſuſpected to be, and they will often be driven out in ſwarms. In this caſe, they never fly far, but ſettle again upon the firſt tree or buſh they come to; and in ſummer, if any one goes out into the fields or gardens, with a candle, in a calm and ſtill night, there will numbers of different kinds of them almoſt immediately gather about it. Theſe are called by naturaliſts *night-butterflies*, *phalenæ*, and *moths*. *Reaumur*'s Hiſt. Inſ. Vol. I. p. 1. 330.

The ſeveral kinds of *butterflies* that have thoſe various inclinations, have alſo external characters by which they may be diſtinguiſhed; all thoſe which have buttoned *antennæ*, or *club antennæ* are of the diurnal kind, and are never ſeen flying about candles in the night. There are other forms of the *antennæ* alſo, which are peculiar to the day *butterflies*; and the night ones are diſtinguiſhed by their having the plumoſe, the priſmatic, or the conic ones. See ANTENNÆ.

Thoſe which fly about our candles are always of one of theſe three kinds. It is not, indeed, to be wholly affirmed, that no one of theſe kinds is ever ſeen flying by day-light, ſince in woods and thickets we often ſee them fluttering about without having been diſturbed; but all that are thus caught flying are males, and are that time ſeeking after the females to couple with them, theſe being all fixed immoveably under the leaves and on the branches of trees.

The common kinds that we ſee fly about from flower to flower are all of the day kind: a few ſpecies of the *phalenæ* ſometimes flutter about the thiſtle flowers, and ſeem to ſuck them; but theſe are ſeldom ſeen; and among the moths, or night kinds, as we call them, there are a great many that never fly about by night any more than by day, and, indeed, make no uſe of their wings at all.

It is alſo a ſingular obſervation, that the moths which fly about our candles, whether in the houſe or abroad in the gardens, are all males: the females never do it. The male of the glow-worm flies in the ſame manner at a candle, thinking it the light of his female; and it is poſſible, that the female moths may, in the night, yield a light that affects the eyes of the male of the ſame ſpecies, tho' it be inſenſible to our view. See Tab. of Inſects, N° 10.

The great general diſtinctions of the *butterflies* into day and night kinds being made, it is neceſſary to have recourſe to numbers of other ſub-diſtinctions, in order to arrange them in any method; and theſe can by no means be taken from them in their prior ſtate of caterpillars, many of them being in that ſtate alike in all their general characters, tho' of different genera in their flying ſtate.

As the *antennæ* ſerve for diſtinctions of the *butterflies* into claſſes, ſo do their trunks into genera; but theſe are only capable of diſtinguiſhing a few, the flat and the round being their principal diſtinction. Mr. Reaumur has obſerved, that the day *butterflies* all have theſe trunks, but that many of the night kinds want them. The wings, however, give the greateſt variety of generical characters among theſe animals. The ſhape of theſe, and the manner in which theſe creatures carry them, when walking and at reſt, ſerve as great and eſſential diſtinctions. *Reaumur*'s Hiſt. Inſ. Vol. I. P. 1. p. 334.

The inferior wings, in ſome certain poſitions of the animal, hide the ſuperior ones; but this is rare, and as the ſuperior are moſt in ſight and obvious, the characters are moſtly drawn from them. All the wings are of a triangular form, but they have their differences; ſome being rectilinear, ſome curvilinear, and ſome mixtilinear: one of theſe angles is the place of joining of the wing to the body of the animal, and this is called by naturaliſts the ſummit of the wing; the angle is here broke off, to give more room to a firm joining on, otherwiſe this would be that part of the wing which would make the ſummit of the triangle. The two ſides are called interior and exterior; the firſt, is that neareſt the body of the creature; the other, the oppoſite one. The baſe or end of the wing, is that part which is oppoſite to the ſummit, and forms the verge of the wing endways. The different proportions which theſe three parts of the wing bear to one another, are the origin of a great variety of figures in the whole. When the exterior and interior ſide, or as they may be called in other words, the upper and under rib or verge of the wing, are nearly ſtrait and equal, the whole wing then forms an iſoſceles triangle, or a ſection of a curve, according as the baſe is ſtrait or convex; and the angle is larger or ſmaller according as the baſe is more or leſs broad. The differences of the exterior and anterior edges from one another, give alſo a great number of varieties in the form. The inner edge is uſually the ſhorteſt, and this is the caſe in various different ſpecies. The baſe alſo has its varieties in figure, as remarkable as the reſt; it is ſometimes ſtrait or plane, ſome-

times concave, and often convex: in ſome ſpecies the edge of it is perfectly ſmooth and even, and in others it is more or leſs deeply indented; and in ſome of the ſpecies it is jagged, and in ſome few inſtances one of the jaggs is ſo far extended from the reſt of the wing, as to form a ſort of tail. The wings are alſo in ſome very large, in others ſmall, in proportion to the body. The two pairs have alſo great varieties in their proportion one to the other; in ſome ſpecies the inferior pair are nearly or wholly as large as the ſuperior, and in others they are very ſmall in compariſon of them; and in ſome ſpecies the under wings are remarkably longer than the upper.

The differences in the manner of the *butterflies* carrying their wings has been more conſidered by Reaumur than by any author who went before him. He obſerves, that ſome of the ſpecies carry their wings perpendicular to the thing they ſit upon; others carry them plain or level with the horizon; and others let them fall below that level: theſe are called the drooping-wing kind. Some others form a ſort of canopy with them, to cover their bodies; and others makes them as it were embrace their bodies. The colours of the wings make excellent diſtinctions for the ſeveral ſpecies; but they are not at all fit for generical diſtinctions.

It has been already obſerved, that there are three kinds of antennæ which are peculiar to the day *butterfly*, but the diſtribution under theſe alone would be too large; the ſpecies of the button-horned ones being alone greatly too numerous to be held altogether. It is neceſſary, therefore, to take in with theſe the poſitions of the wings, according to the preceding differences, and the day *butterflies*, or *papilios*, are thus diſtinguiſhed into ſeven claſſes. *Reaumur*'s Hiſt. Inſ. Vol. I. P. 1. p. 344.

Claſs 1. Contains thoſe *papilios* whoſe antennæ are terminated by buttons, and whoſe wings, when at reſt, are placed in a perpendicular direction to the thing the creature ſits upon, the under edges of which embrace the lower part of the body, and whoſe ſix legs are all employed in ſuſtaining the body, and in walking. The black-ſpotted white *butterfly*, produced from the beautiful cabbage carterpillar, is one of the *papilios* of this claſs.

Claſs 2. Contains the *papilios* of the ſame characters with the former in all reſpects, except that they uſe only four of their legs in ſuſtaining the body and in walking. The two anterior legs in the flies of this claſs are held in a bent poſture, and are furniſhed with a downy part at their ends, and ſeem to ſerve as a ſort of arms. Theſe *papilios* in general are produced from the prickly caterpillars. The ſolitary nettle kind gives us an inſtance in its *papilio*.

Claſs 3. Contains thoſe *papilios* which agree in all reſpects with the former, except that their two anterior legs, which they uſe as arms and never in walking, are not terminated by downy ends, but are faſhioned like the other legs at the extremity, only ſo ſmall, that it requires a microſcope to diſtinguiſh them. There is an inſtance of this claſs in a common grey and yellow *papilio*, that is found in paſtures among the graſs in June, July, and Auguſt.

Claſs 4. Contains thoſe *papilios* which have buttoned antennæ, as the others, and which carry their wings, when at reſt, in a perpendicular direction to the thing they ſit upon; but, as the former have the inferior edge of their wings bent round the under part of their body, ſo in theſe the inferior edge is bent upwards in both pair of wings, and embraces and covers the upper part of the body. However obvious this diſtinction may be, there is another yet more plain one in this, that all of this claſs have one of the jaggs of the wing ſo far extended beyond the reſt of the verge, that it forms a kind of tail, and they are called the tailed *butterflies*. Theſe uſe all their ſix legs in walking.

Claſs 5. Contains thoſe *papilios* which have ſix real legs, which they uſe as ſuch, and their horns terminated by buttons as the others; but whoſe wings, when they are in repoſe, are not elevated perpendicularly to the thing they ſit on, as in the four preceding claſſes, but are held in an horizontal direction, or at the utmoſt never meet in an angle over the back. We have an inſtance of this claſs in a *butterfly* bred from a ſmooth caterpillar of the marſh mallow.

Claſs 6. Contains thoſe *papilios* which have club antennæ, that is, ſuch antennæ as gradually increaſe in thickneſs from their origin to their extremity. See FEELERS. Theſe are that claſs of *papilios* which are always upon the wing, and buzz about flowers without ever ſettling upon them. They dart their trunks into the flower while they ſuſtain themſelves in the air, and have a way of holding themſelves in poize, like a kite or other bird of prey; but when they are buſy about the flowers, they have their wings in continual motion, and make a humming noiſe, like the humble bees. Mad. Merian has called all theſe *phalenæ*, or night *butterflies*, but they are all truly of the day kind. The French, from their poizing themſelves on the wing, and making that humming noiſe, call them *eperviers*, and *papilions-bourdons*. Of this claſs are thoſe ſmall ſpecies called the fly *butterflies*, whoſe wings are only covered in part with duſt or ſcales, the remainder being tranſparent and glaſſy, as ſome expreſs it. *Reaumur*'s Hiſt. Inſ. Vol. I. p. 1, 356.

Claſs 7. In this laſt claſs are comprehended thoſe *papilios* whoſe antennæ are large at their origin, ſmaller afterwards, and finally terminated by an oval head; and which differ from the club antennæ in having no pencils of hairs at the end. This claſs is not very numerous, and the moſt frequent inſtance we have of it is in a painted kind, which we frequently find on blades of graſs, in meadows in July. This flies little in the day time, but is uſually found fixed to a plant, as the moths are. Mad. Merian and others have thence called it a *phalena*, or *night-fly*; but the truth is, that it flies no more by night than by day light, but is a lazy creature which makes very little uſe of its wings. See PHALENÆ.

There is ſome appearance from one of Mad. Merian's tables, *viz* the 20th, that an eighth claſs of theſe day *papilios* ſhould be found, ſhe having figured one with conic granulated antennæ, common to ſome of the moths. If this obſervation be juſt, or if any new ones of a like kind ſhould demand it, the claſſes may be eaſily enlarged. *Reaumur*'s Hiſt. Inſect.

The world is well acquainted with the beauties of this part of the animal creation, but Mr. *Reaumur* has given accounts of ſome very ſingular ſpecies, which deſerve a peculiar regard.

One ſpecies of theſe he has called the *bundle of dry leaves*. This, when it is in a ſtate of reſt, has wholly the appearance of a little cluſter of the decayed leaves of ſome herb. The poſition and colour of its wings greatly favour this reſemblance, and they have very large ribs, wholly like thoſe of the leaves of plants, and are indented in the ſame manner at their edges as the leaves of many plants are. This ſeems to point out the care of nature for the animal, and frequently may preſerve it from birds, *&c.*

The *ſkull butterfly* is another ſingular ſpecies, ſo called from its head reſembling, in ſome degree, a death's head, or human ſkull. This very remarkable appearance is terrible to many people, but it has another yet greater ſingularity attending it; which is, that, when frighted, it has a mournful and harſh voice. This appeared the more ſurprizing to Mr. Reaumur, as no other known *butterfly* had any the leaſt voice at all; and he was not ready of belief that it was a real voice, but ſuſpected the noiſe, like that of the cicadæ, to be owing to the attrition of ſome part of the body; and, in fine, he, by great pains, diſcovered that this noiſe was not truly vocal, but was made by a hard and briſk rubbing of the trunk againſt two hard bodies between which it is placed.

Another *butterfly* there is, ſo ſmall, that it might be miſtaken for a very ſmall fly. This is certainly the extreme in degree of ſize of all the known *butterflies*, and cannot but have been proportionably ſmall in the ſtate of a caterpillar and chryſalis: this creature ſpends its whole life in all the three ſtages of caterpillar, chryſalis, and *butterfly*, on the leaf of the celandine. It lives on the under ſide of the leaf, and tho' in the caterpillar ſtate it feeds on it, yet it does no damage. It does not eat the ſubſtance of the leaf, but draws from it only a fine juice, which is ſoon repaired again, without occaſioning any change in the appearance of the leaf. This ſpecies is very ſhort lived, and paſſes through its three ſtates in ſo ſhort a time, that there are frequently ten generations of it in one year; whereas in all the other *butterflies*, two generations in the year are all that are to be had. Theſe two generations are ſufficient to make a prodigious increaſe: in a large garden, if there are twenty caterpillars in ſpring, theſe may be overlooked, and there may be eaſily concluded to be none there, even on a narrow ſearch; but if theſe twenty caterpillars afterwards become twenty *butterflies*, ten of which are male and ten female, and each female lay the ſame number of eggs that the common ſilk-worm does, that is four hundred; if all the caterpillars hatched of theſe become *butterflies*, and theſe lay eggs in the ſame proportion, which remain the winter, and come to be hatched in the ſucceeding ſpring; then from theſe twenty, in only one year, you will have eight hundred thouſand; and if we add to this the increaſe of theſe in a ſucceeding year, the account muſt appear terrible, and ſuch as no art could guard againſt. The great ruler of the world has put ſo many hinderances in the way of this over-abundant production, that it is very rare ſuch years of deſtruction happen. Some ſuch have happened, however, and much miſchief has been dreaded from them, not only from their eating all the herbage, but from themſelves being eaten with herbs in ſallads and otherwiſe; but experiments has proved this an erroneous opinion, and they are found to be innocent, and eatable as ſnails or oyſters.

Caterpillars in general are by ſome ſuppoſed poiſonous to the touch. Mr. Reaumur has proved by repeated experiments, that all the ſmooth ones are perfectly clear from this accuſation, and may be handled with perfect ſafety; but the hairy ones are capable of producing great pain and itching after the touching them. Theſe pains are not only felt in the hands, but alſo in the face, or any other part; and that even tho' the animal have not been touched, if it have only been brought near the part. The ſpolia, or caſt ſkin of theſe animals, have alſo the ſame effect; but then it is abſolutely neceſſary they ſhould be touched. This unqueſtionably carries the appearance of the effect of a poiſon to vulgar eyes, but the caſe will appear otherwiſe to thoſe who will examine into the whole more nearly. The miſchief occaſioned by theſe creatures

comes on very quick, and ſometimes continues many hours, ſometimes even three or four days.

The explication of this by Mr. Reaumur, is only this, that theſe caterpillars have, beſide their coarſe and large hairs which we ſee them covered with, a vaſt number of others, which are ſo extremely ſmall and fine, as to be inviſible to our eyes. Theſe are ſharp-pointed, very rigid, and are looſely faſtened to the creature's body; ſo that they ſeparate from it on the lighteſt touch: theſe make a ſort of atmoſphere of fine darts ſurrounding them every way; and many of the ſpecies of hairy caterpillars have evidently a method of darting theſe out in great numbers. When the hand of any one is put toward this creature, ſo as to come within the reach of theſe ſmall darts, it immediately diſcharges a whole ſhower of them, and of theſe a great number enter the pores of the ſkin, and a great number more lie along upon it, ready to enter, as ſoon as any accident changes their poſture. If while the hand be thus covered with theſe weapons, whoſe ſmallneſs, tho' it makes them inviſible, yet does not incapacitate them from being very troubleſome, be moved up to the face, or the cheeks, or eyes, rubbed with it, it is eaſy to conceive, that many of theſe little darts will be made to lodge in the ſkin on which the hand where they lie is rubbed; and the conſequence muſt be a greater itching, pain, and ſwelling in theſe tender parts, than on the hand. And thus is produced by ſimple means, what is by many eſteemed the effect of a piercing and penetrating poiſon. And thus are the ſtrangeſt appearances often explained by the moſt ſimple means.

As it has been obſerved, that the abundance of caterpillars would be a terrible miſchief to mankind if they were ſubject to no accidents in their increaſe, it may be proper to examine what are the means by which gracious providence has provided againſt an over ſupply of them. Many of the ſpecies are great devourers, and feed on one another; but they have all much more deſtructive enemies; theſe are reptiles like themſelves, a ſort of worms, in a ſtate of paſſage, at the end of which they are to paſs thro' the chryſalis ſtate into that of flies or beetles. Even the ſmall ſpecies of butterfly, which lives on the celandine, has its enemies proportioned to its own ſize; and the ſame leaf of the plant is uſually covered at the ſame time with theſe butterflies, their chryſaliſes, and their caterpillars, and with theſe ſmall beetles, their chryſaliſes and worms all confuſedly together; and by their ſmallneſs they are not eaſily diſtinguiſhed one from another. The caterpillars of this ſmall ſpecies are very unhappily circumſtanced; they have not only an open war to carry on with the worms of theſe beetles, which are continually attacking them, and piercing their bodies and ſucking their juices; but they have much more terrible inteſtine enemies, a ſort of ſmall worms which they carry within their bodies, and which eat away their fleſh within the ſkin.

The firſt people who obſerved theſe creatures, ſuppoſed them the young of the caterpillars; but this was not only wholly out of the courſe of nature, but the cruelty of the thing gave it no title to belief. The true hiſtory of theſe little worms bred within the body of the caterpillar, is, that they are not its children, but its moſt cruel enemies; they are depoſited there by a ſpecies of fly, which at the time of laying her eggs pierces the ſkin of the caterpillar with an inſtrument ſhe carries on the hinder part of her body for that purpoſe; in the ſame manner in which the fly which occaſions the galls on oaks, pierces their wood. She depoſits her eggs in the wound ſhe has made, the ſkin of the caterpillar heals over the place, and the creature feels no inconvenience at firſt from the wound; but the heat of her body ſoon hatches theſe eggs, and they producing maggots, which are naturally fleſh-eaters, they feed on the fleſh among which they are produced, and eat the miſerable creature up alive, without breaking its skin; and they are often ſo numerous, that when they are increaſed to their deſtined ſize, they fill up the whole body of the caterpillar, ſcarce leaving a ſufficient ſpace for the entrails. What might appear very ſingular, is, that during all this time the animal which carries theſe inteſtine enemies, ſeems well and at eaſe; it eats and grows larger, as it would do without them. Mr. Reaumur inquiring into the reaſon of this, found that caterpillars have a long canal reaching from the mouth to the anus, and ſerving for ſtomach, œſophagus and inteſtines; and beſides this, there is throughout its whole body, a cellular and fatty ſubſtance. It is on this that theſe devourers feed, without touching the inteſtine, or breaking its communication, which would kill the animal, and deprive them of a ſupply of food. Thus they are ſupplied from the great quantity of food the caterpillar takes, with a renewed fleſh; and when the caterpillars which are infeſted with them are opened, this always is found to be the caſe; they being lodged in, and feeding intirely on this celluſar ſubſtance, or the fat contained in it.

When theſe worms have arrived at their full growth, they come out of the body of the caterpillar, but this not all the ſame way, or by any natural paſſage, but each eats its way thro' the ſkin. As ſoon as they are got out they go to work, to ſpin themſelves ſhells, or caſes for their transformation: theſe they make upon the ſpot, and place them ſide by ſide, either upon the body of the caterpillar, or cloſe by it; and ſtick ſo cloſe to one another, that they appear one caſe or ſhell. This is a circumſtance which has contributed not a little to the belief of their being the natural produce of the caterpillar, as people have thought they were all incloſed in one caſe of that creature's ſpining for them. The caterpillar dies of the wounds it has received by their eating their way out, added to the loſs of what they had eat from it; and after a few days, the worms hatch out of this their chryſalis ſtate into that of the fly, like the parent that lodged the eggs, from whence they aroſe in the body of their ſuppoſed parent. Sometimes the caterpillar enters into its chryſalis ſtate before theſe worms arrive at the time of their going out of its body; and in this ſtate ſometimes they eat thro' the ſides of the caſe, but more frequently they remain in it, and become flies there, ſaving themſelves, by this means, the trouble of ſpining. Some ſpecies of caterpillars are ſo greatly infeſted with theſe worms, that they are very ſeldom found free from them; and it is not more than one in twenty that by this means comes to the butterfly-ſtate. Here then is one great ſtop to the increaſe of theſe deſtructive animals. Another cauſe of their deſtruction is alſo very common, and not leſs ſingular: a ſort of flies lay their eggs in the eggs of the butterflies; and the maggots produced from theſe eat up the embryo caterpillars.

Theſe worms are very terrible to the caterpillars by their number, but the ſmall birds are much more ſo by their ſtrength; multitudes of caterpillars are annually deſtroyed by theſe creatures, either for their own food, or for that of their young. In this alſo there ſeems a ſort of regularity; for as the caterpillars have their taſte for pecu iar ſpecies of plants, ſo the birds have theirs for peculiar ſpecies of caterpillars. In general, they do not love the hairy kinds; but tho' this accident is a defence to them in that ſtate, it is but a temporary one; for they are as ſubject to be devoured when butterflies, as thoſe of the ſmooth ſorts; and thoſe which have eſcaped danger in their two firſt ſtates of life, are by their ſize and conſpicuous colours, very much expoſed to theſe devourers in this their laſt ſtage. Each of their ſtates has its appropriated enemies; and it is the ſame with reſpect to us, whether it is in the caterpillar, the chryſalis, or the fly-ſtate, that the creature is deſtroyed; ſince the propagation is equally ſtopped in which ever it happens, provided only that it be before the laying of the eggs; all the difference, at the utmoſt, however, is, that if they are deſtroyed in the beginning of the caterpillar-ſtate, a few leaves or herbs are ſaved that would have been eaten by them. Memoirs Acad. Science, Ann. 1736. See Tab. of Inſects.

PAPILIO-*muſca*, in natural hiſtory, a name given by ſome authors to a ſeries of ſmall inſects, which ſeem to be of a middle nature, between the fly and the butterfly claſſes. Its wings are in part covered with thoſe ſcales in form of duſt, which render the wings of the butterfly kinds opake, and in part are tranſparent and glaſſy. Reaumur has called the wings *ailes vitrees*, glaſſy wings. *Reaumur*'s Hiſt. of Inſ.

PAPILION-*bourdon*, in natural hiſtory, a name given by the French authors to a ſort of butterflies, which while they feed keep upon the wing with a humming noiſe like that of the humble-bee. *Reaumur*'s Hiſt. of Inſects. See the articles EPERVIERS and PAPILIO.

PAPILION-*a-queue*, *tailed butterflies*, a name given by the French naturaliſts to a ſort of butterfly, of which there are ſeveral ſpecies. The ſeeds of the wings of theſe butterflies are jagged, and one of the jaggs runs out ſo far beyond the reſt as to repreſent a ſort of tail iſſuing from the creature. *Reaumur*'s Hiſt. of Inſects.

PAPILLARIS, in botany, a name uſed by ſome authors for the common *lampſana*, or *nipple-wort*. *Chabræus*, p. 318. See the article LAMPSANA.

PAPILLOSE, among botaniſts. See LEAF.

PAPIO, in zoology, the name of thoſe ſpecies of monkeys which we call *baboons*. The word ſeems not yet properly determined as to the ſpecies which are to be comprehended under it; but what we uſually acknowledge for *papiones* or *baboons*, are ſuch as have long heads like a dog, and very long tails, and are of the number of thoſe called by authors *cynocephali*.

PAPULÆ, a name uſed by many authors for eruptions of various kinds upon the ſkin, but appropriated by Bontius to thoſe reddiſh and rough eruptions thrown out upon the body by ſweat in the Eaſt Indies. Theſe are thrown out all over the ſurface of the body, and at their firſt appearance are accompanied with an intolerable itching and deſire of ſcratching.

Strangers are more expoſed to theſe eruptions at their firſt arrival in theſe countries, than the natives, or thoſe who have long reſided there; as they are alſo to the bitings of the muſquitos, than which they are not leſs frequent: hence a new comer into the country is diſtinguiſhed by theſe troubleſome maladies. The natives call him *organ bearon*, that is, a new arrived man; and tell him theſe complaints are a tax upon him for conſuming the proviſions. They call themſelves *organ lamme*, or *veterans*, and honour with the ſame name ſuch ſtrangers as have lived long in the country.

The *papulæ* are in themſelves no way dangerous; but when they are raſhly and ignorantly treated, or when the ſkin is torn

off

off from them by the nails, they often are the occaſion of malignant and very troubleſome ulcers, that are not eaſily cured.

Bontius, whoſe long reſidence in this part of the world gave him many opportunities of obſerving theſe *papulæ* in all their ſtages, adviſes people, to prevent danger and remove their troubleſome itching, to foment all the parts where they appear with a mixture of vinegar, water, and ſaltpetre; or if this be required yet more acrid, to add to it juice of lemons, and uſe it as before. The effect of this application is at firſt an intenſe pain, but this ſoon decreaſes ſo far, as to become leſs troubleſome than the intolerable itching of the parts. He gives great caution alſo againſt purging medicines, however mild; for by theſe the matter which cauſes the *papulæ* is often carried to the bowels, and produces dyſenteries. The cure is either to be wholly left to nature, or aſſiſted by ſudorifics. *Bontius* de Med. Ind.

PAR (*Cycl.*)—PAR *acceſſorium*, in anatomy, See the article ACCESSORY, *Cycl.*

PARABELE, in ichthyology, a name given by Marggrave to the flying fiſh, the *milvus hirundo* and *cuculus* of ſeveral authors. Theſe are names, however, ſo little expreſſive of the characters of fiſh, that they are applied by different authors to the different ſpecies. Artedi is the only author who has reduced this part of natural hiſtory to a regular ſyſtem; he makes this fiſh a ſpecies of the *triglia*, and diſtinguiſhes it by the name of the *triglia* with the head a little aculeated, and with a ſingular fin placed near the pectoral fins. See the articles MILVUS and TRIGLIA.

PARABOLIC (*Cycl.*)—PARABOLIC *aſymptote*, in geometry, is uſed for a *parabolic* line approaching to a curve, ſo that they never meet; yet by producing both indefinitely, their diſtance from each other becomes leſs than any given line.

There may be as many different kinds of theſe *aſymptotes* as there are parabolas of different orders. See *Mac Laurin*'s Flux. B. 1. ch. 10.

When a curve has a common parabola for its *aſymptote*, the ratio of the ſubtangent to the abſciſs approaches continually to the ratio of two to one, when the axis of the parabola coincides with the baſe; but this ratio of the ſubtangent to the abſciſs approaches to that of one to two, when the axis is perpendicular to the baſe. And by obſerving the limit to which the ratio of the ſubtangent and abſciſs approaches, *parabolic aſymptotes* of various kinds may be diſcovered. See *Mac Laur.* Flux. Art. 337.

PARABOLIC *ſpiral*, in conics. See HELICOID *parabola*, *Cycl.*

PARACENTESIS (*Cycl.*)—See TAPPING.

PARACOPE, a word uſed by Hippocrates to expreſs a ſlight delirium in fevers.

PARACRUSIS, a word uſed by Hippocrates, and by many other writers, and expreſſing the ſame as *paracope*, a ſlight delirium in a fever.

PARADIGRAMMATICE, is uſed by ſome for the art of making all ſorts of figures in plaiſter. The artiſts in this are called *gypſochi*.

PARADISÆA, in zoology, a name uſed by ſome authors for the bird *manucodiata*, or *avis paradiſæa*, the bird of paradiſe, by others. In the Linnæan ſyſtem this makes a diſtinct genus of birds of the order of the *picæ*, the diſtinguiſhing characters of which are, that they have two ſingular and extremely long feathers, which are neither inſerted in the wings nor rump. See Tab of Birds, N°. 6 and *Linnæi* Syſtem. Nat. p. 44.

PARADISIACA, in botany, a name given by ſome authors to the *arbor* vitæ, or *thuya*. *Chabræus*, p. 73.

PARADOX (*Cycl.*)—Geometricians have of late been accuſed of maintaining *paradoxes*; and it muſt be owned, that ſome uſe very myſterious terms in expreſſing themſelves about aſymptotes, the ſums of infinite progreſſions, the areas comprehended between curves and their aſymptotes, and the ſolids generated from theſe areas, the length of ſome ſpirals, &c. But all theſe *paradoxes* and myſteries amount to no more than this: that a line or number may be continually acquiring increments, and thoſe increments may decreaſe in ſuch a manner, that the whole line or number ſhall never amount to a given line or number.

The neceſſity of admitting this is obvious from the nature of the moſt common geometrical figures: thus, while the tangent of a circle increaſes, the area of the correſponding ſector increaſes, but never amounts to a quadrant. Neither is it difficult to conceive, that if a figure be concave towards a baſe, and have an aſymptote parallel to the baſe, as it happens when we take a parallel to the aſymptote of the logarithmic curve, or of the hyperbola, for a baſe; it is not difficult to conceive, I ſay, that the ordinate in this caſe always increaſes while the baſe is produced, but never amounts to the diſtance between the aſymptote and the baſe. In like manner, a curvilinear area may increaſe while the baſe is produced, and approach continually to a certain finite ſpace, but never amount to it; and a ſolid may increaſe in the ſame manner, and yet never amount to a given ſolid. See LOGARITHMIC *curve*.

A ſpiral may in like manner approach to a point continually, and yet in any number of revolutions never arrive at it; and there are progreſſions of fractions which may be continued at pleaſure, and yet the ſum of the terms ſhall be always leſs than a given number. See *Mac Laurin*'s Fluxions, B 1. ch. 10. ſeq. where various rules are demonſtrated, and illuſtrated by examples, for determining the aſymptotes and limits of figures and progreſſions, without having recourſe to thoſe myſterious expreſſions which have of late years crept into the writings of mathematicians. For, as that excellent author obſerves elſewhere, tho' philoſophy has, and probably always will have myſteries to us, geometry ought to have none.

PARÆA, in zoology, the name of a ſpecies of ſerpent, called alſo *anguis æſculapii*. It is a perfectly innocent and harmleſs creature, and is ſo little dreaded by the inhabitants, that it is common about their houſes, and even ſometimes gets into their beds. Its mouth is full of very ſmall teeth, and when much provoked, it is ſometimes known to bite, tho' without any bad ſymptoms attending the wound. It is a very long kind, and is of a yellowiſh green colour on the ſides and blackiſh on the back: it has two ſmall eminences on the neck, and between them two ſmall ſinews. It is very common in Spain, Italy, and moſt other of the warm countries. *Ray*'s Syn. Anim. p. 291.

PARAGAUDÆ, among the Romans, a ſort of wreaths, either wholly of gold, or of ſilk adorned with gold, which were interwoven in garments, and not ſowed to them. The garment was ſometimes of one colour, in which was woven one *paragauda*; others were of two colours, and had two *paragaudæ*; and ſome had three colours, and three *paragaudæ*. They were worn both by men and women.

PARAGOGE (*Cycl.*) a word uſed by medical writers to expreſs a reduction of luxated bones.

PARAGONE, in natural hiſtory, the name given by many to the baſaltes, a black marble, uſed as a touchſtone. See the article BASALTES.

PARAGUA, in zoology, the name of a Braſilian parrot, of the ſize of our common green parrot; but its back is all black, and its breaſt and the forepart of its belly are of a beautiful red. Its eyes are black, with a red circle round them; its beak brown, or a very duſky grey, and legs and feet grey. *Marggrave*, Hiſt. of Braſil.

PARALAMPSIS, a word uſed by medical writers to expreſs a cicatrix in the tranſparent part of the cornea of the eye.

PARALIA, Παραλια, in antiquity, a day kept in memory of an antient hero, called Paralus. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 424.

PARALIA was alſo the name of one of the Athenian tribes. *Potter*, ibid. T. 1. p. 49.

PARALLAXIS, in the medical writers, expreſſes a mutual change in the ſituation of the parts of a broken bone, as when the two fragments ſlip to the ſides of one another.

PARALLEL (*Cycl.*)—PARALLELS *of declination*, in aſtronomy, are circles parallel to the equinoctial, imagined to paſs through every degree and minute of the meridians, between the equinoctial and each pole of the world.

PARALLELA, a word uſed by medical writers to expreſs a ſort of ſcurf or leprous appearance, affecting only the palms of the hands. It is a ſymptom of the pox.

PARALLELOGRAM (*Cycl.*)—PARALLELOGRAM *of the hyperbola*, in geometry, is uſed for the *parallelogram* formed by the two aſymptotes of an hyperbola, and the parallels to them, drawn from any point of the curve. A *parallelogram* thus formed, is of an invariable magnitude in the ſame hyperpola; and the rectangle of its ſides is equal to the power of the hyperbola. L' Hopital, Sect. Coniq. Art. 99—101. See the article POWER, *Cycl.*

This *parallelogram* is the modulus of the logarithmic ſyſtem; and if we take it as unity, the hyperbolic ſectors and ſegments will correſpond to Napier's or the natural logarithms. If the *parallelogram* be taken = 0. 43429, &c. theſe ſectors and ſegments will repreſent Briggs's logarithms. See the article LOGARITHM.

Huygens has made uſe of this term, De cauſ. gravitat. in fin. See LOGARITHMIC-*curve*.

PARALLELOGRAM-*protractor*, a mathematical inſtrument, conſiſting of a ſemicircle of braſs, with four rulers in form of a *parallelogram*, made to move to any angle: one of theſe rulers is an index, which ſhews on the ſemicircle the quantity of any inward or outward angle.

PARALLELLOPIPED (*Cycl.*)—The *parallellopiped* with oblique angles, is a figure very common to many kinds of ſtones, eſpecially of the ſofter ſort. The common cryſtalizations of grottos break naturally into fragments of this ſhape; and the ſtalactitæ which hang down from their roofs in form of icicles, are originally ſmall hollow pipes formed by the water which continually trickles down drop by drop; and whoſe outer ſurfaces, fixing themſelves by their ſmall baſes, form by degrees a ſort of blunted pyramids, which, like ſo many rays from the axis, which is the hollow pipe, grow hollow at laſt. This axis ſeems to be compoſed of plates, almoſt cylindrical, laid one over another; but if broken, the whole divides into fragments of a *parallellopiped* figure: the blunted pyramids that are about the axis divide themſelves at firſt into other blunted pyramids; but afterwards almoſt all theſe fragments divide of themſelves into other fragments of a *parallellopiped* figure, this ſeeming every where the ultimate ſhape of the particles.

In the mountain of Barege there is found a vaſt quantity of aſbeſtus; the ſtone upon which this grows, tho' in itſelf of

no determinate figure externally, yet always breaks into regular *parallellopipeds*: nor is this peculiar to theſe ſtones found naturally concreted on the ſurface or within the bowels of the earth, but it is alſo found in ſuch as are concreted by means of art out of the water in which they are originally ſuſpended. The water of the fountain de Salut, near Bagneres in Gaſcony, when evaporated to a certain degree, yields a ſcum on the ſurface, which alſo adheres to the ſides of the veſſel; and this ſcum, examined by the microſcope, is found to be compoſed of many regular *parallellopipeds*. If the ſame waters, and thoſe of ſeveral other ſprings, be evaporated to a drineſs, there remains a white ſhining powder, out of which the microſcope can direct us to ſeveral the like regular figures. Phil. Tranſ. N. 472, p. 32.

PARALLELLOPIPEDIA, in natural hiſtory, the name of a genus of ſpars, thus called, becauſe regularly of a *parallellopiped* form.

They are pellucid cryſtaline ſpars, externally of a determinate and regular figure, always found looſe, detached, and ſeparate from all other bodies, and in form an oblique *parallellopiped*, with ſix parallelogram ſides and eight ſolid angles, eaſily fiſſile, either in an horizontal or perpendicular direction, being compoſed of numbers of thin plates, and thoſe of very elegantly and regularly arranged bodies, each of the ſame form with the whole maſs, except that they are thinner in proportion to their horizontal planes; and naturally fall into theſe and no other figures, on being broken with a ſlight blow.

Of this genus there are four known ſpecies. 1. The hard pellucid and colourleſs one, called the iſland cryſtal of authors. See ISLAND *cryſtal*. 2. A dull and whitiſh kind, found in France, Germany, and England, particularly in the Derbyſhire and Yorſhire lead-mines, and about Scarborough. This has the ſame property with the former, of giving a double refraction; but it is ſo dull and opake, that it does not ſhew it ſo elegantly. 3. A ſoft, whitiſh, and very bright one, found principally in the lead-mines of Yorkſhire and about the ſeaſhores of that county. And, 4. a dull, hard, and pale brown one: this is found in the lead-mines of the ſame county, and in ſome parts of Ireland. All theſe ſpecies have the ſame power of double refraction with the firſt, but are too opake to ſhew it ſo beautifully, and often have not tranſparence enough to make it at all diſtinguiſhable. *Hill*'s Hiſt. Foſſ. p. 333.

PARALOPHIA, a word uſed by Keil and ſome other anatomical writers, to expreſs the lower and lateral part of the neck.

PARALOURGES, Παραλουργες, among the antients, a kind of garment, with a purple clavus on each ſide. *Pitiſc.* Lex. Ant. in voc. See CLAVUS.

PARALYSIS, in botany, *&c.* the ſame with *primula veris*. See PRIMULA *veris*.

PARAMERIA, a word uſed by the antients to expreſs the internal part of the thighs.

PARAMESE, in the Greek diagram, or ſcale, was the note above the meſe, which anſwers to a-la-mi-re of Guido's ſcale. V. *Wallis*'s Append. Ptolem. Harm. p. 157. Hence, as the *parameſe* was the firſt of the diazeugmenon tetrachord, it will be equivalent to Guido's higheſt ♮ mi. See DIAGRAM.

PARAMESOS, a word uſed by ſome to expreſs the ring-finger, that next the little one.

PARANETE, in the antient muſic, was a name ſometimes uſed to ſignify the next note, or chord to the nete, or laſt note of a tetrachord. See TETRACHORD.

Hence it might be called the penultimate chord. It was otherwiſe, and more properly called, *lichanos*, or index: the reaſon of which ſee under LICHANOS.

PARANETE *diezeugmenon*, in the Greek muſic, was the penultimate note of the *diezeugmenon* tetrachord, and anſwers to Guido's de-la-ſol-re. *Wallis*'s Append. Ptolem. Harm. p. 157. See DIAGRAM.

PARANETE *hyperbolæon*, in the Greek muſic, was the penultimate note of the *hyperbolæon* tetrachord, and anſwers to Guido's g-ſol-re-ut. *Wallis*'s Appen. Ptolem. Harm. p. 157. See DIAGRAM.

PARAPHORA, a word uſed by the antients to expreſs a ſlight kind of delirium, or light-headedneſs in a fever: ſome have made it ſignify a delirium in general.

PARAPHRENITIS, in medicine, the name of a diſtemper which conſiſts in an acute ſymptomatic fever; which is the means uſed by nature to break through inflammatory ſtates in the diaphragm. The alienation of the mind in this diſeaſe is owing to the conſent of the nerves.

Signs of it. This is always attended with a moſt violent and painful cardialgia, or heart-burn; inſomuch, that the perſon cannot bear the leaſt touch of a finger on the region of the breaſt or ſtomach. It always brings on alſo a tumor of the præcordia, and an alienation or roving of the mind, which is always ſenſible in the words and actions of the perſon, but is not ſo great as in the true *phrenitis*. The reſpiration is interrupted by frequent ſighings; belchings are very frequent; as alſo the diſcharge of a black matter by vomit. The mouth is dry and parched, and the tongue very white and furred; and there is great thirſt.

Cauſes of it. The moſt frequent cauſe of this is a ſudden tranſlation of the morbific matter in fevers to the diaphragm; a ſuppreſſion of natural hæmorrhages by the noſe, the hæmorrhoidal veſſels, or by the menſes; an omiſſion of habitual bleedings, and the drinking cold liquors when the blood is heated by exerciſe; and finally, a tranſlation of the matter of a quinſey to this part.

Prognoſtics in it. This is a dangerous diſeaſe, but it has three ways of terminating, according to the diſpoſition of the patient's blood and humours: 1. Sometimes the matter which cauſed the obſtruction is eaſily diſcuſſed, and ſweats happening on the critical days, carry off the diſtemper. 2. Sometimes the matter is reſolved, indeed, but not ſo happily; the reſolution takes longer time, and the matter finally does not evacuate itſelf by ſweat, but is tranſlated to the ears, where it occaſions deafneſs, tumors, and other accidents; or to the joints, where it brings on either the gout or eryſipelatoſe diſorders: or, 3. The matter comes to ſuppuration; in which caſe, the perſon dies either within ſeven days, or, at the utmoſt within fourteen. The ſigns which preſage a gangrene in this diſeaſe, are violent hiccoughs, coldneſs of the extremities, violent internal heat, and clammy ſweats.

Method of cure. When, by a preceding error in the perſon's diet, the peccant matter remains in the primæ viæ, a gentle emetic is to be given, with the digeſtive medicines before it; and if the vomit does not operate, a few grains of emetic tartar are to be given afterwards. When the patient is of a plethoric habit, bleeding is extremely neceſſary; and ſometimes, where the ſymptoms require it, may be repeated to a third time. Twenty drops of the mixtura ſimplex may afterwards be given at a doſe, every four hours, in the morning; and in the afternoon, powders of purified nitre, with vitriolated tartar and crabs eyes ſated with juice of lemons: beſides theſe, there may be externally applied, plaiſters, with a large portion of camphor, to the breaſt and back; ſinapiſms, and other hot cataplaſms, to the ſoals of the feet; ſtimulating clyſters, and acrid ſuppoſitories have alſo their uſe in this caſe; and the application of leeches to the hæmorrhoidal veins, in people who have been ſubject to diſcharges from thence, are very often of ſingular ſervice. All the while there muſt be kept up a gentle tranſpiration, either by copious draughts of warm and weak liquors, or by lightly accidulating medicines. *Junker*'s Conſp. Med. p. 307, ſeq.

PARAPHROSYNE, a word uſed by ſome medical writers to expreſs a delirium, or an alienation of mind in fevers, or from whatever cauſe.

PARAPOTAMIA, in the materia medica of the antients, a word uſed at firſt as an epithet of diſtinction for a kind of Œnanthe, from which the œnanthine ointment of the Greeks was made; but afterwards uſed ſimply as the name of that plant. This kind of œnanthe was the moſt fragrant of all the kinds, and was therefore uſed for the making the ointment preferably to the reſt.

Theophraſtus makes a very great difference in the œnanthe of different places, obſerving, that the Cyprian kind was fragrant, and fit for making this ſweet ointment; but that the Grecian had no ſmell at all: and thence it probably aroſe, that the Greeks uſed afterwards the flowers of the wild vine for this purpoſe, and called them by the ſame name.

Pliny's account of this ointment is by no means to be depended upon. The whole paſſage where he names it, and the others of the like kind, is taken from the account of Apollodorus, in Athenæus; but it is ſo careleſly tranſlated by Pliny, that the author's ſenſe can ſcarce any where be made out. *Athenæus*, l. 15.

PARAPROSDOCIA, Παραπροσδοκια, in rhetoric, the ſame with *paradox*. See PARADOX, *Cycl.* and *Suppl.*

PARARTHREMA, a word uſed by medical writers to expreſs a ſlight luxation.

PARARYTHMOS, an epithet uſed by the antients to expreſs any kind of pulſe which did not ſeem ſuitable to the age and ſtate of the perſon.

PARASCEUE, (*Cycl*) in antiquity, a Greek word which ſignifies *preparation*. The Jews gave the name of *paraſceue* to Friday, becauſe being not allowed on the Sabbath to prepare their food, they provided the day before. Exod. xvi. 23. xxxv. 2. 3. *Calmet*. Dict. Bibl.

PARASCHIDES, a word uſed by chirurgical writers to expreſs the ſplinters of fractured bones, or the fragments of bones corroded by ſharp humours.

PARASEISMA, a ſort of exerciſe preſcribed by the Greek phyſicians in many caſes. It was a general concuſſion of the body.

PARASEMUM, Παρασημον, among the antients, a ſign painted or carved on the prow of ſhips, by which they were diſtinguiſhed from one another. This ſign was commonly the figure or picture of ſome animal, as the bull, lion, *&c.* or of any other thing, as a mountain, tree, flower, *&c.* *Pitiſc.* in voc. and *Potter* Archæol. Græc. T. 2. p. 128.

PARASIOPESIS, Παρασιώπησις, in rhetoric. See the article PARALEPSIS, *Cycl.*

PARASITIUM, among the antients, a granary or place where the ſacred corn, deſigned for religious purpoſes, was preſerved. *Pitiſc.* Lex. Ant. in voc. See PARASITE, *Cycl.*

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PARASPHAGIS, a word uſed by ſome anatomical writers to expreſs that part of the neck which is contiguous to the clavicles.

PARASTREMMA, a name given by medical writers to a convulſive diſtortion of the mouth, or of any part of the face.

PARATHENAR-*major*, a pretty long muſcle forming part of the outer edge of the ſole of the foot. It is commonly called *hypothenar*, but very improperly, according to the proper ſignification of that word. It is fixed backward by a fleſhy body to the outer part of the lower ſide of the os calcis, from the ſmall poſterior external tuberoſity all the way to the anterior tuberoſity, there it joins the metatarſius; and at the baſis of the fifth metatarſal bone, ſeparates from it again, and forms a tendon which is inſerted in the outſide of the firſt phalanx of the little toe near its baſis, and near the inſertion of the *parathenar*-minor. *Winſlow*'s Anatomy, p. 226.

PARATHENAR-*minor*, a fleſhy muſcle fixed along the poſterior half of the outer and lower ſide of the fifth bone of the metatarſus; it terminates under the head of that bone in a tendon which is inſerted in the lower part of the baſis of the firſt phalanx of the little toe.

The tendinous inſertion of this muſcle is very cloſely united to the cartilaginous ligament; and the ſame thing is to be obſerved of the other muſcles, which go to the baſis of the firſt and ſecond phalanges of the toes. In aged perſons, ſome part of theſe ligaments are often turned to bone, and thereby form thoſe bony portions which many have taken for diſtinct ſeſamoide bones. *Winſlow*'s Anatomy, p. 226.

This muſcle is more expreſſively named by Albinus, the *flexor brevis digiti minimi pedis*.

PARATI, in zoology, the name of a Braſilian fiſh of the mullet kind, much reſembling that ſpecies called *curema*, or *taintra*, in all reſpects but ſize; and in the colour of its eyes, the iris of which, inſtead of the ſilvery colour it has in the *curema*, is of a fine yellow. Its fleſh alſo when dreſſed, is drier than that of the *curema*. *Piſo*'s Hiſt. of Braſ. See the article CUREMA.

PARBUNCLE, in a ſhip, the name of a rope almoſt like a pair of ſlings; it is ſeized both ends together, and then put double about any heavy thing that is to be hoiſed in or out of the ſhip; having the hook of the runner hitched into it to hoiſe it up by.

PARCELLING, in ſhip-building, is caulking the ſeam of a ſhip, then laying over it a narrow piece of canvas, and then pouring on it hot pitch and tar. See PAYING.

PARDALIS, in zoology, a name by which many authors call the bird more commonly known by the name of *pluvialis*, and called in Engliſh the *grey* and *green plover*; birds of the ſize of the lapwing, and much eſteemed at table. *Ray*'s Ornithology, p. 229.

PARDALIS is alſo uſed as the name for the leopard, called alſo *pardus*, *panthera*, and *varia*, by ſome. It is diſtinguiſhed from the lion by its variegation of colour, and from the tyger by the diſpoſition of thoſe colours; which are in this creature always in round ſpots like eyes, as in the tyger they are in long ſtreaks. The leopard is alſo leſs than the tyger.

PARDUS, in zoology, a name uſed by many for the *leopard*; the more accurate authors, however, uſe the word *pardalis*. See PARDALIS and LEOPARD.

PARDUS, in conchyliology, a name given by authors to a kind of ſhells, of the genus of the volutæ. We have three kinds of this ſhell: 1. A voluta ſpotted with black. 2. Another ſpotted with yellow. And 3. A very elegant one ſpotted with a rediſh colour. They are called *pardi*, or *leopard-ſhells*, from their diſtinct ſpots reſembling thoſe on the ſkin of a leopard.

PARE, in the manege. To *pare* a horſe's foot is to cut his nails; *i. e.* the horn and ſole of his foot; which is done with a butteris, in order to ſhoe him. See BUTTRESS, *Cycl.*

In England, the ſmith or farrier holds the horſe's foot between his knees; in which poſture he *pares* the foot, ſets on the ſhoe, drives the nails, and rivets them, and this all alone without any aſſiſtance from the groom.

PARECBASIS, Παρεκβασις, in rhetoric, is uſed to ſignify the exaggeration of a crime, and not a digreſſion from the queſtion in hand, as ſome have thought. *Voſſ.* Rhet. l. 3. p. 364.

PARECHESIS, Παρήχησις, in rhetoric, the too frequent repetition of the ſame ſyllable, thus, *perire me malis malim modis*. *Voſſ.* Rhet. l. 5. p. 331.

PAREDRIA, a term uſed by Hippocrates to expreſs an aſſociation of two or more diſeaſes in the ſame patient, making what we call a complicated illneſs.

PAREDRI, Παρεδροι, among the Athenians. When the Archon, Baſileus, or Polemarchus, by reaſon of their youth happened not to be ſo well ſkilled in the laws and cuſtoms of their country, as might have been wiſhed, it was cuſtomary for each of them to make choice of two perſons of age, gravity, and reputation, to ſit with them upon the bench, and direct them as there was occaſion. And theſe aſſeſſors, or *paredri*, were obliged to undergo the ſame probation in the ſenate-houſe and public forum, with the other magiſtrates; and like them too, to give an account how they had behaved themſelves in their reſpective truſts, when their office was expired. *Potter*, Archæol. T. 1. p. 77.

PAREIRA-*brava* (*Cycl.*)—The Portugueſe name ſignifies the wild vine, and is given to a root firſt brought into Europe by Mr. Amelot, and celebrated by many at that time for its extraordinary virtues. The plant which produces it is not known, but is generally ſuppoſed to be of the vine kind. Mr. Geoffroy examined into its virtues carefully, and alſo its characters and diſtinctions; he found that there were properly two kinds of it: The one brown on the outſide, and yelloviſh within. This is what was then moſt frequent in uſe; and the other white on the outſide, and of a paler yellow or lemon colour within. This is ſaid to be of a fleſh colour on the outſide where recent, and to turn white in drying; both are of a ſpungy or porous texture, yet conſiderably hard and woody; of a bitter taſte, but with an admixture of a ſweetiſh flavour like that of liquorice; and their uſual ſize is from that of one's middle finger, to that of one's thumb.

The Portugueſe were informed of the virtues of this root by the natives of the Braſils; and on trial extolled it above all the medicines in uſe. Their accounts of its efficacy were too exaggerated to gain credit with the judicious part of the world; but Mr. Geoffroy's experiments, which ſet its virtues in a much modeſter light, yet ſhew them to be very great; and that the root deſerves to be for ever continued in uſe in medicine, and rekoned among the moſt valuable ſimples. The Portugueſe pretend, that it diſſolves the ſtone in the bladder; but tho' this is not true, Mr. Geoffroy found that it was admirable for breaking the common weaker ſabulous concretions in the kidneys and ureters; and that the taking it was always attended with the voiding of large quantities of gravel. He gave it alſo with great ſucceſs, to perſons afflicted with ulcers in the kidneys and bladder, and whoſe urine was purulent, and at many times totally ſuppreſſed: theſe ſuppreſſions of urine were always cured by it, and their urine became leſs thick and purulent; many alſo were perfectly cured of theſe complaints by a courſe of it, with the addition of balſam of capivi toward the end of the courſe.

This property of the *pareira-brava*, of diſſolving thick humors, gave Mr. Geoffroy an opinion of trying it in humorous aſthmas; and theſe obſtinate caſes often were greatly abated, and ſometimes perfectly cured by it. The uſual way of taking it, is in decoction, ſweetening it in the manner of tea. Mem. Acad. Par. 1710.

PAREMBOLE, Παρεμβολή, in rhetoric, a figure wherein ſomething relating to the ſubject is inſerted in the middle of a period. All the difference between the *parembole* and *parentheſis*, according to Voſſius, is, that the former relates to the ſubject in hand, whereas the latter is foreign to it. An example of each we have in Virgil, and firſt of the *parembole*.

Æneas (neque enim patrius conſiſtere mentem
Paſſus amor) rapidum ad naves præmittit Achatem.

The following is an inſtance of the *parentheſis*:

——— ipſique ſuos jam morte ſub ægrâ
(Di meliora piis, erroremque hoſtibus illum)
Diſciſſos nudis laniabant dentibus artus.

Voſſ Rhet. l. 5. p. 334. See PARENTHESIS, *Cycl.*

PARENCEPHALIS, a name given by ſome authors to the *cerebellum*.

PARENTHESIS, Παρενθεσις, in rhetoric, is frequently confounded with *parembole*. See the articles PAREMBOLE, *Suppl.* and PARENTHESIS, *Cycl.*

PARERGON, in painting, an appendix, or piece added to the main deſign by way of ornament. *Hoſm.* Lex. in voc.

PARER, in the manege, a term formerly uſed as a command to ſtop, but now exploded; all the riding-maſters, when they have a mind the ſcholar ſhould ſtop the horſe, calling out *hola*. *Guillet*, in voc. See STOP.

PARETONIUM, in natural hiſtory, the name of an earth antiently found on the ſhores of Egypt, Cyrene, and the iſland of Crete; and uſed by the antients in painting.

It had its name either from a part of Egypt near which it was gathered, or from the name of a town in that kingdom where it was uſually ſold. Vitruvius is of the firſt opinion, and Volaternus of the other.

There have been ſome differences among the earlier writers about the nature and origin of this ſubſtance; and much confuſion and miſtake among the moderns. Pliny imagined it formed of the froth of the ſea coaleſced into a ſolid maſs, with the addition of ſome mud: Aldrovand thought it formed of the diſunited particles of what he calls the fatter ſtones, ſuch as lime-ſtones, and the like, waſhed from them by the motion of the water, and afterwards got together in that form. And Daleſchamp eſteemed it a chalk, produced about the ſhores, which he adds was very white, fat, and glutinous, and could not be taken up without a mixture of ſome of the mud along with it. It is very clear, however, according to this very account, that the ſubſtance could be no chalk: viſcidity and fatneſs, are qualities that cannot belong to an earth of that claſs; neither are we to imagine, that it was ever dug up from the flat parts of the ſhores; ſince if there was a ſtratum of it there, tho' ever ſo thin, it might certainly have been taken up pure.

Such were, however, the opinions of authors about this ſubſtance. Of late we have been taught to think it loſt; but it is ſtill common on the ſhores of moſt of the iſlands of the Archipelago, tho' not obſerved or regarded; and is truly a very heavy and tough clay of a fine white colour, found in maſſes of different ſizes, generally as ſoft as the ſofter clays within the ſtrata; and by rolling about on the beech in this ſtate, it gathers up the ſand, ſmall ſhells, and other foulneſſes we always find about it. It is moſt probable, that there are ſtrata of it fine and pure in the cliffs there, and that the ſea waſhes off maſſes of them in ſtorms and high tides, which are what we find. *Hill*'s Hiſt. of Foſſ. p. 17.

PARGET, in natural hiſtory, a name given to the ſeveral kinds of gypſum or plaiſter-ſtone, which when ſlightly calcined, make what is called *plaiſter of Paris*, uſed in caſting ſtatues, in ſtuccoing floors and cielings, and many other like occaſions.

The word *parget*, tho' generally underſtood of all the gypſums, is, however, by the workmen principally applied to the two ſpecies which make up the firſt genus of that claſs, called by Dr. Hill the *pholides*. Theſe are the Montmartre kind, and that of Derbyſhire. See PHOLIS.

The firſt of theſe, or *parget* of Montmartre, is dug in the place from whence it has its name, and is very pure; of a conſiderably bright and gloſſy appearance: when freſh broken, of a cloſe, firm, and compact texture, and ſomewhat ſoft and ſmooth to the touch. It is found in maſſes of different ſizes, from four inches to as many feet in diameter; and of no determinate ſhape or figure, but uſually ſomewhat flatted. It is uſually of a pure and fine white, tho' ſometimes a little browniſh; and in both caſes ſo exactly reſembles in ſtructure and appearance, a lump either of coarſer or finer loaf ſugar, as not to be eaſily diſtinguiſhed from it at ſight. When broken, it looks conſiderably bright, and is ſeen to be compoſed of ſmall flat particles laid together with no order or regularity. It will not give fire with ſteel, nor ferment with aqua fortis; but very freely calcines to a fine white powder, the uſes of which are well known. We have none of this kind in England. *Hill*'s Hiſt. of Foſſ. p. 112.

The Derbyſhire *parget* of this genus, (for there are many of the others dug in the ſame county, which are much leſs valuable) the *pholis* of that country, as it ought diſtinctly to be called, which is what our workmen diſtinguiſh by the name of *Derbyſhire parget*, of all the gypſums comes the neareſt the nature of the French. This is diſtinguiſhed from all the other Engliſh gypſums by its ſuperior hardneſs, its brightneſs, and the breadth of its conſtituent particles. It is of an extremely irregular, rough, coarſe, and unequal texture, and is not at all ſoft to the touch. It is very beautifully variegated in colour with a fine bright white, and a duſky pale red. The white is uſually the ground, and the red is diſpoſed in form of clouds, ſpots, or veins in it. It is found in broad flat maſſes of uneven and rugged ſurfaces; ſome of theſe are four or five feet in breadth, and two or three in thickneſs.

Theſe are of a duſky ſurface, but very bright and ſhining when broken, and its conſtruction is very irregular; ſome parts of it, where the broad faces of its flakes are ſeen, appearing of a foliaceous ſtructure, and others, where their egdes come in view, of a ſtriated one. Its conſtituent particles are ſcaly, but longer and narrower than thoſe of the French kind. It is much heavier than the French kind, and will neither give fire with ſteel, nor ferment with acids; and calcines a little more ſlowly than the other to a white plaiſter. This is dug in vaſt quantities in Derbyſhire, in Yorkſhire, and ſome other parts of England. *Hill*'s Hiſt. of Foſſ. p. 113.

PARHELIUM *(Cycl.)*—The frequent appearances of *parhelia* in cold climates, ſeem to confirm Deſcartes's hypotheſis, of their proceeding from icy particles ſuſpended in the air. See Phil. Tranſ. N° 465. Sect. 2.

PARHOMOLOGY, Παρομολογια, in rhetoric, a figure wherein part is yielded to the opponent, and the reſt denied: thus, *Sume hoc ab judicibus noſtrâ voluntate: neminem illi propiorem cognatum, quam te, fuiſſe, concedimus: officia tua nonnulla in illum extitiſſe, ſtipendia vos unà feciſſe aliquamdiu, nemo negat ſed quid contra teſtamentum dicis, in quo ſcriptus hic eſt. Voſſ.* Rhet. l. 5. p. 389. See CONCESSION, *Cycl.*

PARIETALIA *oſſa*. Theſe are ſituated on the ſuperior, lateral, and a little on the poſterior parts of the ſkull. They are of a larger extent than any other bone of the ſkull; and their figure is nearly that of an irregular convex ſquare. They have each an external and convex ſide, and an internal and concave one, four edges, one ſuperior or ſagittal, one inferior or temporal, one anterior or frontal, and one poſterior or occipital. The ſuperior edge is the longeſt; the inferior the ſhorteſt; in this laſt there is a very large ſquammoſe ſlope, which may be properly named the temporal ſlope; the upper and poſterior edges are indented thro' their whole length; the anterior edge is indented alſo, except at its lower part; and all the lower edge is ſquammous, except a ſmall portion next the os occipitis. It has four angles, the anterior and upper, the anterior and lower; the poſterior and upper, and the poſterior and lower: the anterior and lower angle ends in a ſquammous production, which from it ſituation may be called the *temporal angle*, or *apophyſis*. On the outſide above the temporal ſlope, is ſeen the moſt conſiderable portion of the ſemi-circular plane of the temporal muſcle; near the upper edge toward the poſterior angle, is a ſmall hole called the *parietal hole*, which is ſometimes found only in one of the bones, ſometimes in the ſagittal ſuture, and in ſome ſubjects is intirely wanting. In ſome this hole alſo goes only to the diploe, in others it perforates both tables.

Theſe bones are the weakeſt of all the eight that compoſe the ſkull. The diploe is found between the tables thro' the whole length of the ſagittal and occipital edges, and thro' the upper half of the coronal ſuture. Theſe bones contain a large portion of the brain, form part of the temples, and ſerve for the inſertion of the temporal muſcles. *Winſlow*'s Anatomy, p. 24.

PARIETARIA, *pellitory of the wall*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the apetalous kind, and conſiſts uſually of only four ſtamina, which ariſe out of a cup divided into four ſegments. This is ſometimes of the bell-ſhape, ſometimes of the funnel-ſhape, and ſometimes rotated. The piſtil finally becomes an oblong ſeed, which is contained in the cup of the flower.

The ſpecies of *parietaria*, enumerated by Mr. Tournefort, are theſe: 1. The common *parietaria*, or *pellitory of the wall*. 2. The Baſil-leaved *parietaria*. 3. The leaſt annual Portugal *parietaria*. *Tourn.* Inſt. p. 509.

This is a plant of a long time famous in medicine. It is cooling and abſtergent. It is preſcribed in ſtranguries, and in caſes of gravel or ſmall ſtones in the kidneys; and is an ingredient in many of the ſhop-compoſitions, intended for thoſe purpoſes. It is ſometimes made an ingredient in decoctions for clyſters, to be given in nephretic caſes, and externally is much recommended in the eryſipelas, and for the ſoftening of hard tumors.

PARISTHIMA, a word uſed by ſome authors to expreſs the tonſils. See TONSILS.

PARIUM *marmor*, in the natural hiſtory of the antients, the white marble uſed then, and to this day, for carving ſtatues, *&c.* and called by us at this time *ſtatuary marble*.

Too many of the later writers have confounded all the white marbles under the name of the *parian*; and among the workmen, this and all the other white marbles have the common name of *alabaſters*; ſo that it is in general forgotten among them, that there is ſuch a thing as alabaſter different from marble; which, however, is truly the caſe. Almoſt all the world alſo have confounded the Carrara marble with this, tho' they are really very different; the Carrara kind being of a finer ſtructure and clearer white than the *Parian*, but leſs bright and ſplendid, harder to cut, and not capable of ſo glittering a poliſh.

The true *Parian* marble has uſually ſomewhat of a faint blueiſh tinge among the white, and often has blue veins in different parts of it. It is ſuppoſed by ſome to have had its name from the iſland Paros, one of the cyclades in the Ægean ſea, where it was firſt found; but others will have it to have been ſo called from Agoracritus Parius, a famous ſtatuary, who ennobled it by cutting a ſtatue of a Venus in it. *Hill*'s Hiſt. of Foſſ. p. 462.

PARK *(Cycl.)*—A *park* ought to have three ſorts of ground in it: 1. Mountainous and barren. 2. Hilly and yet fertile. And 3. Plains that are ſufficiently fruitful. The mountainous part ſhould be well covered with high woods over at leaſt a third part of it. The downs and hilly part ſhould have one third part coppices and low woods; and the plains ſhould be at leaſt one third part paſture ground, with ſome arable or corn land. There ſhould be a river contrived to run thro' ſome part of it, and a ſpring or brook to go through a great part, and at length fall into the river.

Theſe are the natural advantages to be wiſhed in a *park*; but when they are wanting, they are to be ſupplied as far as may be by art, as by ponds to preſerve rain water, to ſupply the place of rivers and ſprings and proper plantations, and expoſures for the reſt; only the perſon who is to make a *park* ſhould know what the natural advantages are, that he may take in as many of them as he can. When ponds are to be made to ſupply the place of natural brooks and rivers, they ſhould be made large enough; the extraordinary expence in this will be eaſily repaid, by breeding fiſh in them, and fowl may alſo be kept in plenty on them. The *park* ſhould alſo be well ſtored with trees; oaks ſhould not be wanting in it; but beech and cheſnut are the quickeſt of growth, and are eaſy to be had: theſe, therefore, ſhould be planted in conſiderable numbers. Apple-trees and plum-trees alſo ſhould be planted, as generally thriving very well, and affording good food to the deer, *&c.*

The beſt incloſure for a *park* is a brick or ſtone wall; but as the expence of this is very great, it may be done by paling; the pales muſt, in this caſe, be of ſound heart of oak; and ſo cloſe planted, that no animal of prey can make its way in between them; and for a farther defence, a good-quick ſet hedge is very proper, and ſhould be kept in good order. Some part of the mountain and high wood, may conveniently be made a heronry, and ſome part of the

middle

middle may be a warren for hares and rabbits. Colts and horſes may be bred at large in the *park*, and in the ſummer ſeaſon it will be proper to have cows in the paſture ground on the plains.

There ſhould be at leaſt five or ſix encloſures in the *park*, that the deer may be ſhut out or let in as occaſion requires. In the coldeſt ſeaſons they ſhould always be kept altogether in the high woods, where they have good ſhelter, and are to be fed conſtantly with provender by the keepers. In the ſummer ſuch a number as are intended to be uſed may alſo be kept on the beſt ground, that they may thrive quicker than thoſe intended only for ſtore. Some artificial holes and caverns ſhould alſo be made for the deer to retire into in the hot weather, as well as in the cold.

PARK-*bote*, in our old writers, ſignifies to be quit of incloſing a *park* or any part thereof. 4. Inſt. 308. *Blount.*

PARKINSONIA, in botany, the name of a genus of plants, ſo called in honour of the Engliſh botaniſt, Parkinſon. The characters are theſe: the perianthum is deciduous, and is formed of one leaf divided into five ſegments at the edge. The flower is compoſed of five petals, nearly equal in ſize, and larger than the ſegments of the cup. They are diſpoſed in a circular form, and the four uppermoſt are oval, the under one kidney-ſhaped. The ſtamina are two filaments, ſomewhat crooked; the anthenæ are oblong; the germen of the piſtil is oblong, ſlender, and ſomewhat bent; there is ſcarce any ſtyle; the ſtigma is oblate and aſſurgent. The fruit is an extremely long pod, of a cylindric figure, and ſwelling out in the places where the ſeeds are, ſo that it looks like a necklace. The pod terminates in a point, and contains as many round ſeeds as there are protuberances on it. *Linnæi* Gen. Pl. p. 179i *Plum.* Gen. 3.

PARLIAMENT (*Cycl.*)—From the inquiries and reaſonings of our antiquarians, it ſeems there has always been ſomething of the nature of a *parliamentary* aſſembly, as antient as any thing we know of our conſtitution. This aſſembly was ſometimes called *magnates regni, omnes regni nobiles, proceres et fideles regni, diſcretio totius regni, generale concilium regni.* *Spelm.* Gloſſ. voc. *Parliament.* *Prynn*'s Rights of Commons, 99.

But tho' this in general ſeems ſettled, yet many have been the diſputes of antiquaries, with reſpect to the power and authority of theſe aſſemblies; as alſo about the perſons who compoſed them. The firſt formation of the houſe of commons has been particularly the ſubject of warm debates.

Cambden, in his *Britannia* [a], dates the original of the houſe of commons, as now elected, from the 39th of Henry III. and ſays he has it *ex ſatis antiquo ſcriptore*, but does not name his author. Pryn, in his plea for the lords, follows him [b]; and ſo do Dugdale, Heylin, Brady, Filmer, and others. Among other reaſons this is one, that the firſt writ of ſummons of any knights, citizens and burgeſſes, now extant, is no antienter than the 49th of Henry III. and it ſeems the moſt probable, and moſt commonly received opinion, that the houſe of commons was eſtabliſhed during the reign of Henry III. after he had vanquiſhed the barons. Before that it is ſcarce credible they would have ſuffered any power in oppoſition to their own. Thus much is certain, that in the reign of Edward I. we find a houſe of lords, and alſo a houſe of commons, conſiſting of knights, citizens, and burgeſſes. [a *Cambd.* p. 13. b Pryn. l. c. p. 182.]

Sir Edward Coke, in his fourth inſtitute [a], ſays, that the lords and commons at firſt ſate together. Whether they did or did not, does not well appear, nor does Selden [b] determine the point. [a p. 2. b Tit. of Hon. 704.]

The parliament commences by the king's writ or ſummons: antiently ſome of the peers only were ſummoned, as it might have often proved inconvenient to ſummon them all, if it be true that they were once about 3000 in number [a]. When a parliamentary peerage was eſtabliſhed, all were ſummoned: hence my lord Coke ſays [b], that every lord, ſpiritual and temporal, of full age, ought to have a writ of ſummons *ex debito juſtitiæ*. [a Vid. *Spelm.* Gloſſ. 67. *Seld.* Tit. of Hon. 692. b 4 Inſt. 1. For the form of ſuch ſummons, ſee *Cotton*'s Records, 3, 4.]

Antiently the tenure firſt created the honour, and ſuch as held *per baroniam* were ſummoned to do ſuit and ſervice in parliament; and as ſuch a ſummons was an evidence of the tenure, ſo it has been ſince ſettled, that the ſummons and ſitting in parliament makes the baron. But in all degrees of quality above a baron, a ſummons is not ſufficient; becauſe there are other ceremonies requiſite, which muſt be performed, unleſs diſpenſed with by letters patent; and theſe being matters of record muſt be produced [a]. [a *Seld.* Tit. of Hon. 495, 530. *Show.* P. C. 5. *Spelm.* Gloſs. 142.]

The firſt ſummons of a peer to *parliament* differs from an ordinary ſummons, becauſe in the firſt ſummons he is called up by his proper chriſtian and ſurnames, not having the name and title of dignity in him till he has ſat; but after that, the name of dignity becomes part of his name: but the writ of creation, in all other things, is the ſame with the ordinary writ that calls him. *Co. Litt.* 16.

The writ of ſummons iſſues out of chancery, and recites, that the king *de aviſamento concilii*, reſolving to have a *parliament*, deſires *quod interſitis cum*, &c. Each lord of *parliament* is to have a diſtinct ſummons, and each ſummons is to iſſue at leaſt forty days before the parliament begins. Vid. 7 and 8 of *Will.* and *Mar.* c. 25.

Of the manner of ſummoning the judges, barons of the exchequer, king's council, and civilians, maſters in chancery, who have no voices, and how the writs differ from that to a lord of *parliament*, Vide Reg. 261. F. N. B. 229. 4 Inſt. 4.

Alſo a writ of ſummons muſt be directed to every ſheriff of every county in England and Wales, for the choice and election of knights, citizens, and burgeſſes, within each of their reſpective counties [a]. [a 4 Inſt. 6. 10. *Co. Litt.* 109. Vid. 7 and 8 *Will.* and *Mar.* c. 25.]

So a writ of ſummons muſt iſſue out to the lord warden of the cinqueports, for the elections of the barons for the ſame; who in law are burgeſſes. 4 Inſt. 6.

The ſubſtance of thoſe writs ought to continue in their original eſſence, without any alteration or addition, unleſs it be by act of *parliament*. 4 Inſt. 10.

At the return of the writ, the *parliament* cannot begin but by the royal preſence of the king, either in perſon or by repreſentation: by repreſentation two ways; either by a guardian of England by letters patent under the great ſeal, when the king is out of the realm, or by commiſſion under the great ſeal of England to certain lords of *parliament*, repreſenting the perſon of the king, he being within the realm, in reſpect of ſome infirmity. 4 Inſt. 6.

Every lord ſpiritual and temporal, and every knight, citizen, and burgeſs, ſhall, upon ſummons, come to the *parliament*, except he can reaſonably and honeſtly excuſe himſelf; or he ſhall be amerced. That is, reſpectively, a lord by the lords, nd one of the commons by the commons. 4 Inſt. 43, a 4.

If any member of the houſe of commons votes, or ſits there during any debate, after the ſpeaker is choſen, without having firſt taken the oaths of allegiance and ſupremacy, *&c.* between the hours of nine and four, in full houſe, he ſhall be adjudged a popiſh recuſant convict, be incapable of any office, and ſhall forfeit 500l. Stat. 30. *Car.* II. c. 1. But ſee 1 *Will.* and *Mar.* by which the form of the oath is altered; and 13 and 14 *Will.* III. which enjoins the abjuration oath, with like penalties, which is altered in its form by 4 *Ann.* c. 5.

The rights and qualifications of elections depend for the moſt part on ſeveral acts of *parliament*. But it is to be obſerved, that the rights and qualifications of voters in cities, towns, and boroughs, depend on their charters, and ſuch cuſtoms as have prevailed in them time immemorial. *Hobart.* 120, 126, 141.

The 2 Geo. II. c. 24, was made for the better aſcertaining in general the right of voting, and for the greater ſecurity of returning officers.

Antiently the manner of proceeding in bills was very different from what it is at this day: formerly the bill was in the nature of a petition, and theſe petitions were entered upon the lords rolls; upon theſe rolls the royal aſſent was likewiſe entered; and upon this, as a ground work, the judges uſed, at the end of the parliament, to draw up the act into the form of the ſtatute, which was afterwards entered upon the rolls called the *ſtatute rolls*: this was different from thoſe called the *lords rolls*, or the rolls of *parliament*. Upon theſe *ſtatute rolls*, neither the bill, nor the petition from the commons, nor the anſwer of the lords, nor the royal aſſent, was entered; but only the ſtatute, as it was drawn up and penned by the judges. This was the method till about Henry Vth's time; but then it was deſired, that the acts of *parliament* might be drawn up and penned by the judges before the end of the *parliament*; by reaſon of a complaint then made, that the ſtatutes were not equally and fairly drawn up and worded. After the *parliament* was diſſolved or prorogued in Henry VIth's time, the former method was altered; and then bills *continentes formam actus parliamenti*, were firſt brought into the houſe. Theſe bills, before they were brought into the houſe, were ready drawn in form of an act of *parliament*, and not in the form of a petition, as before: upon which bills it was written by the commons, *ſoit baile al ſeigneurs*; and by the lords, *ſoit baile al roy*; and by the king, *le roy le voit*. The bill thus endorſed, was to remain with the clerk of the *parliament*, and he was to enter the bill thus drawn at firſt in the form of an act of *parliament*, or ſtatute, upon the *ſtatute rolls*, without entering the anſwer of the king, lords, or commons; and then he iſſued writs to the ſheriffs, with tranſcripts of theſe *ſtatute rolls*, to proclaim the ſtatute.

To the paſſing of a bill the aſſent of the knights, citizens, and burgeſſes muſt be in perſon; but the lords may give their votes by proxy: and the reaſon hereof is, that the barons did always ſit in *parliament* in their own right, as part of the *pares curtis* of the king; and therefore, as they were allowed to ſerve by proxy in the wars, ſo they had leave to make their proxies in *parliament*; but the commons coming only as repreſenting the *barones minores*, and the ſocage tenants in the county, and the citizens and burgeſſes as repreſenting the men of their cities and boroughs, they could not conſtitute proxies, becauſe they themſelves were but proxies and repreſentatives

of others, and therefore could not conſtitute a proxy in their place; according to that maxim of law, *delegata poteſtas non poteſt delegari*. 4 Inſt. 12.

Both houſes muſt be prorogued together, and diſſolved together; for one cannot ſubſiſt without the other [a]. [a Sir *Robert Atkin*'s argument.]

PARNASSIA, in botany, the name of a genus of plants, the characters of which are theſe: 1. The flower is of the roſaceous kind, being compoſed of ſeveral petals, ſome large and others ſmaller, fimbriated and arranged in a circular form. The piſtil ariſes from the cup, and finally becomes a membranaceous fruit of an oval figure, unicapſular, and containing ſmall ſeeds affixed to a four-fold placenta. There is only one known ſpecies of this plant. See Tab. 1. of Botany, Claſs 6. and *Tourn.* Inſt. p. 246.

PARNOPS, in natural hiſtory, the name of a ſpecies of waſp, found very frequently in vineyards, and among the wine-preſſes, eſpecially in hot countries. It is diſtinguiſhed from all the other waſps by the roundneſs of its body, which is not ſlender or flatted in the common way, but round and tumid.

PAROCHETEUSIS, a term uſed by Hippocrates to expreſs a derivation of the humors from one part, in order to the evacuating them by another not far diſtant. This is often a very happy turn for the cure of a diſeaſe.

PAROCHUS, among the Romans, one who provided mules, tents, and carriages, with all other neceſſaries, for the provincial magiſtrates in their journies, as alſo for ambaſſadors. For in the early times of the republic, they had their charges borne by the public, that the allies or provincials might not be burthened. *Pitiſc.* in voc.

PARONYCHIA, *whitlowgraſs*, in botany, the name of a genus of plants, the characters of which are theſe: the flower has no petals, but is compoſed of numerous ſtamina, ariſing from a cup formed into the ſhape of a baſin and divided into five ſegments. The piſtil finally becomes an orbicular ſeed, which is contained in a ſort of pentangular capſule, which was once the cup of the flower.

The ſpecies of *paronychia*, enumerated by Mr. Tournefort, are theſe: 1. The Spaniſh *paronychia*, called by ſome the *white anthyllis*, and *white ſmall knot-graſs*. 2. The upright Narbonne *paronychia*. 3. The broad-leaved procumbent *paronychia*. 4. The chickweed-leaved procumbent Spaniſh *paronychia*, with leſs compact heads. 5. The ſhrubby myrrh leaved Spaniſh *paronychia*. 6. The knotgraſs-leaved Portugal *paronychia*, with echinated heads. *Tourn.* Inſt. p. 507.

PARRELS, in a ſhip, are frames made of trucks, ribs, and ropes, which having both their ends faſtened to the yards, are ſo contrived as to go round about the maſts, that the yards by their means may go up and down upon the maſts. Theſe alſo, with the breaſt ropes, faſten the yards to the maſts.

PARROT, the Engliſh name expreſſing in general the whole pſittacus kind, but appropriated by uſe to that claſs only of them, which is of a middle ſize between the macaw and paroquette.

The common green *parrot* is of this kind, and beſides that, there are eleven other known ſpecies: 1. The white creſted *parrot*. 2. The ſpotted beaked kind. 3. The black beaked kind. 4. The white headed one. 5. The changeable, or red and blue *parrot*. 6. The blue-grey one, common in our cages. 7. The red and white one. 8. The Ajuracura, or blue and green *parrot* of the Braſils; of which there are two ſubordinate ſpecies beſide the common one, the one with a ſea-green, and the other with an admixture of black about the head. 9. The paragua, a black *parrot* with a red belly. 10. The tarabe, a green one with a red head. And 11. The ajuracatinga, a *parrot* of conſiderable ſize, all over of a beautiful green, except that the beak is white and the legs grey; and of this there is a ſmaller ſpecies, no way different except in ſize. The four laſt are Braſilian birds, the reſt are natives of both the Eaſt and Weſt Indians; but many of them have never been ſeen amongſt us. *Ray*'s onrithology, p. 74, 75, 76.

PARSLEY, *apium*, in botany, *&c.* See APIUM.

PARSNEP, *paſtinacha*, in botany, ſee PASTINACHA.

The *parſnep* is to be propagated by ſowing the ſeeds in February or March, in a rich mellow ſoil, which muſt be deep dug, that the roots may be able to run deep without hindrance.

It is a common practice to ſow carrots at the ſame time, upon the ſame ground with the *parſneps*; and if the carrots are deſigned to be drawn young, there is no harm in it. The *parſneps* when they are grown up a little, muſt be thinned to a foot diſtance, and carefully kept clear of weeds. They are fineſt taſted juſt at the ſeaſon when the leaves are decayed; and ſuch as are deſirous to eat them in ſpring, ſhould have them taken up in autumn, and preſerved in ſand. When the ſeeds are to be ſaved, ſome very ſtrong and fine plants ſhould be left for it at four feet diſtance, and towards the end of Auguſt, or in the beginning of September, the ſeeds will be ripe: they muſt then be carefully gathered, and dried on a coarſe cloth. They ſhould always be ſown the ſpring following, for they do not keep well. *Miller*'s Gard. Dict.

The common wild *parſnep* is frequent by road-ſides and in dry paſtures; it flowers in autumn and ripens its ſeed ſoon after. The ſeeds deſerve to be brought into uſe in medicine much more than they are at preſent. They are warm and carminative, tho' not ſo violently hot as the caraway ſeeds and others which we commonly uſe on theſe occaſions. They diſpel flatuſes, and are in great eſteem among the country people for curing the colic. They alſo are diuretic and aperient, and gently promote the menſes.

PART *(Cycl.)*—PART, in the manege, in French *partir*, is uſed to ſignify the motion and action of a horſe when put on at full ſpeed. From the horſe's *parting* to his ſtop there is commonly two hundred paces of ground. To make your horſe *part* with a good grace, you muſt put your bridle three fingers lower, and preſs gently with your heels, or only with the calves of your legs. See ECHAPER.

To PART *again*. See REPART.

PART *owners*, thoſe that are concerned in ſhip matters, and who have joint ſhares therein.

PARTERRE, *(Cycl.)* in gardening, a level diviſion of ground, which for the moſt part faces the ſouth, or beſt front of a houſe, and is generally furniſhed with ever greens, flowers, *&c.* There are two kinds of theſe, the plain ones and the *parterres* of embroidery.

Plain *parterres* are moſt valuable in England, becauſe of the firmneſs of the Engliſh graſs turf, which is ſuperior to that of any other part of the world; and the *parterres* of embroidery are cut into ſhell and ſcroll work, with alleys between them. An oblong, or long ſquare, is accounted the moſt proper figure for a *parterre*; and a *parterre* ſhould, indeed, be always twice as long as it is broad, becauſe, according to the known laws of perſpective, a long ſquare always ſinks to a ſquare; and an exact ſquare always appears leſs than it really is. As to the breadth of a *parterre*, it is to be proportionable to the front of the houſe; but leſs than a hundred feet in breadth is too little.

There ſhould be on each ſide the *parterre* a terras walk raiſed for a view, and the flat of the *parterre* between the terraſes ſhould never be more than three hundred feet, at the utmoſt, in breadth; and about a hundred and forty feet in width, with twice and a half that in length, is eſteemed a very good ſize and proportion. *Miller*'s Gard. Dict.

PARTHENIUM, in botany, the name given by Linnæus to a large genus of plants, comprehending, beſide the *parthenia* commonly ſo called, the partheniaſtrum of Niſſole and Dillenius, and the hyſterophorus and tarchonanthus of the ſame author, and of Vaillant. The characters of the genus are theſe: the common cup is very ſimple, being five leaved and expanded; the leaves of it are roundiſh, plane and equal; the corolla is compound and convex; the corollulæ or ſemifloſcules are very numerous; and the hermaphrodite ones are placed in the center. The female ones are only five in number; they are placed in the verge or radius, and ſcarce exceed the others in length. The hermaphrodite flowers are monopetalous, tubuloſe, and erect; the rim divided into five ſegments, and of the length of the cup. The female ones are monopetalous and tubuloſe, but they are flatted at the end, obtuſe, and roundiſh, and of the ſame length with the hermaphrodite ones. In the hermaphrodite flowers there are five capillary filaments ſerving as ſtamina; theſe are of the length of the flower, and the antheræ are thick and almoſt looſe. In the hermaphrodite flowers the piſtil has a germen placed under the cup, and ſo ſmall as to be ſcarce viſible; the ſtyle is very ſlender, and ſhorter than the ſtamina, and it has no ſtigma. In the female flowers the germen of the piſtil is turbinated and cordated at the end, and is naked and of a compreſſed figure; the ſtyle is capillary and of the flower's length; there are on this two capillary ſtigmata of the ſame kind, and opening at their tops. There is no other fruit but the cup, which remains upon the plant unaltered. The ſeed in the hemaphrodite flowers is abortive, and in the female, remains in the cup and is ſingle, of a turbinated form, cordated at the extremity, and compreſſed. The flowers are ſo diſpoſed in the head, that every female has two hermaphrodite ones at its back. *Linnæi* Gen. Pl. p. 455. *Niſſole*, A. G. 1711. *Dillen.* Gen. 13. Hort. Elth. 22. *Vaillant*, A. G. 1720. p. 1719.

Some of the Greek writers have called the *parthenium* by the name of the ſweet marjoram, *amaracus*; and this has often occaſioned great doubts, as to which of the two plants was meant. Dioſcorides ſays, that the *parthenium* was by ſome called *Leucanthemum*; and by others, *amaracus*. Pliny ſays, that ſome called it *tamnacus*; but this is evidently only a falſe print, for he has trrnſlated the before mentioned words of Dioſcorides in the very order in which they ſtand in that author, and the word *tamnacus* ſhould be *amaracus*. But this is not the only perplexity Pliny has occaſioned about this plant: he has tranſlated the account of it in a Greek author, which plainly ſhews, that the plant was the ſame that we now call by the name *parthenium*. Pliny has miſtaken his original when he ſays, that it has a white flower, ſwelling like an apple; whereas the original ſays, that the exterior border of the flower was white, and the central part a diſcus yellow.

The antients had another *parthenium*, which they diſtinguiſhed by the name *murale*. This is our *parietaria*.

PARTISAN, in the military art, the commander of a *partiſan* party.

PARTISAN-*party*, a ſmall body of infantry given to a *partiſan*, to make an incurſion upon the enemy, to lurk about their camp, to diſturb their foragers, and to intercept their convoys.

PARTITION (*Cycl.*)—PARTITION, in huſbandry. The *partitions* in land ſown with wheat by the drill, for the horſe-hoing huſbandry, are different according as the wheat is ſown, in double, treble, or quadruple rows. The double row has but one *partition*, and this is beſt to be uſed in caſes where the land is ſuſpected to be full of the ſeed of weeds, which muſt be taken out with the hand hoe. This *partition* ſhould be twelve or fourteen inches wide. Whole fields drilled in theſe rows may be hand-hoed at the expence of four ſhillings an acre; and when there is but one foot in ſix, the price of that work ought to be proportionable.

The common width of the two *partitions*, when the wheat is ſown in treble rows, is ſix or eight inches. Care is to be taken in this particular; for, if they are planted cloſer, they will ſtarve one another before the intervals are hoed to give them a freſh ſupply of nouriſhment; and if they are planted too far aſunder, the two outer rows will thrive well, but the middle row will be ſtarved, and look worſe and weaker, becauſe of its being at ſo great a diſtance from the hoed intervals. In quadruple rows the *partitions* are beſt to be ſeven inches wide each: at this diſtance the plants will thrive ſufficiently, and if they are ſet nearer, the whole will be worſe; and if farther off, the two outer rows will thrive, but the two inner ones will be ſtarved, by reaſon of their diſtance from the plowed intervals.

PARTITION, *partitio*, in rhetoric, the ſame with diviſion. See the article DIVISION.

PARTITIONE *facienda*, in law, a writ which lies for thoſe who hold lands or tenements *pro indiviſo*, and would ſever to every one his part, againſt them that refuſe to join in partition, as copartners, &c. F. N. B. 61, 31 H. 8. c. 1. *Cowel.*

PARTITURA, in the Italian muſic, the ſame as *partition*. See PARTITION, *Cycl.*

PARTNER (*Cycl.*)—PARTNERS, in a ſhip, are ſtrong pieces of timber bolted to the beams incircling the maſts, to keep them ſteady in their ſteps, and alſo keep them from rolling, that is, falling over the ſhip's ſides. There are alſo of theſe *partners* at the ſecond deck, to the ſame end; only the miſſen-maſt hath but one pair of *partners*, in which that maſt is wedged ſo firm that it cannot move. Some ſhips do not ſail well unleſs their maſts are looſe, and have leave to play in the *partners*; but in a ſtorm this is dangerous, leſt the *partners* ſhould be wronged, (as they ſay) *i. e.* forced out of their places; for then there is no help but to cut the maſt by the board.

PARTRIDGE, *perdix*, in ornithology. See PERDIX.

The *partridge* is a timorous and ſimple bird, and is ſo valuable at the table, that there are a great many ways of taking it invented by ſportſmen, all of which ſucceed from the folly and fear of the animal.

The places that *partridges* moſt delight in, are corn-fields, eſpecially while the corn grows; for that is a ſafe retreat, where they remain undiſturbed, and under which they uſually breed. They frequent the ſame fields after the corn is cut down, and that with another intent; for they then feed on the corn that has fallen from the ears, and find a ſufficient ſhelter for them under the covert of the ſtalks, eſpecially thoſe of wheat ſtubble. When the wheat ſtubble is much trodden by men or beaſts, they retire to the barley ſtubble, and will there hide themſelves in coveys of twenty or thirty. When the winter comes on, and the ſtubble fields are trodden down or ploughed up, they then retire to the upland meadows, where they lodge in the high graſs and among the ruſhes; ſometimes they reſort to the low coppice woods, eſpecially if there be corn lands near them.

In the harveſt time, when the corn fields are full of men, they are found in the fallow fields next to the corn fields, where they lie lurking among the weeds till evening, and then they get over into the corn, and feed late and early on the corn in the ſheaves. When the proper haunts are known, the next thing is to find the birds in them: this is done variouſly, ſome will do it by the eye only; and this art can never be taught, but can be had only from long obſervation: the colour of the birds being ſo like that of the earth at a diſtance, that no eye but a very converſant one could diſtinguiſh them. When they are once ſeen, the buſineſs is to keep the eye upon them, and then to keep in continual motion. They are a very lazy bird, and by this means will let a perſon almoſt tread upon them; tho' if the perſon ſtands ſtill to eye them, they will riſe immediately, tho' they are at a conſiderable diſtance.

Another method of obſerving them is by going to their haunts very early in the morning, or at the cloſe of the evening, which is called jucking time. The noiſe of the cock *partridge* is to be attended to at this time, and is very loud and earneſt. The hen will ſoon come up to the cock after her making the noiſe, which ſhe does by way of anſwer; and when they are got together, their chattering will diſcover them. Thus they may always be found at theſe times: but there is a yet better method of finding this bird, which is by the call. The buſineſs, in order to have ſucceſs in this way, is carefully to learn the notes of the *partridge*, and be able to imitate all the ſeveral ſounds. When perfect in this, the perſon is to go to the haunts morning and evening, and placing himſelf in ſome place where he can ſee the birds without being ſeen by them, he is to liſten to their calling; and when they are heard, he is to anſwer in the ſame notes, doubling again as they do: by continuing this, they may be brought ſo near, that the perſon lying down on his back may count their whole number. Having in this manner found where the birds are, the next care is to catch them.

They are ſo fooliſh, that it is extremely eaſy to take them in nets. In order to this, there needs no more than the going out, provided with two or three nets, with meſhes ſomewhat ſmaller than thoſe of the pheaſant nets, and walking round about the covey, a net is to be fixed ſo as to draw over them, on pulling a line at a diſtance. All this may be eaſily done; for ſo long as the ſportſman continues moving about, and does not fix his eyes too intently upon them, they will let him come near enough to fix the nets, without moving. If they lie ſo ſtraggling, that one net will not cover them, then two or three muſt be fixed in the ſame manner. The ſportſman may then draw the nets over them, and they will often lie ſtill with the nets upon them till he comes up to fright them, then they will riſe and be entangled in the net.

A ſecond method of taking them is with bird-lime: this is done by means of wheat ſtraws. Theſe muſt be large, and cut off between knot and knot; they muſt be well limed with the beſt and ſtrongeſt bird-lime, and the ſportſman muſt carry a great number of them out with him. Having found a field where there are *partridges*, he is to call; and if they anſwer, he is then to ſtick up the limed ſtraws in rows acroſs two or three lands, and going backward, call again to them, leading them on in the road where the ſtraws are: they will follow one another like a flock of chickens, and come out to the call; and will in their way run upon the ſtraws, and liming themſelves, they will daub one another by crowding together, ſo that very few of them will be able to eſcape.

But there is yet a pleaſanter way of taking them than this, that is, by driving of them: in order to this, an engine is to be made of canvas ſtuffed with ſtraw, to repreſent a horſe; this horſe and nets are to be taken to the haunts of the *partridges*, and the nets being placed ſlanting or ſlopewiſe in the lower part of the field, the ſportſman is to take the wind in his back and get above them, driving them downwards; his face is to be covered with ſomething green or blue, and placing the horſe before him, he is to go towards them ſlowly and gently; and by this means they will be raiſed on their legs, but not on their wings, and will run before the horſe into the nets. If in the way they go into a wrong path, the horſe is to be moved to face them; and they will be thus turned back again, and driven every way the ſportſman pleaſes.

Indian PARTRIDGE, *coturnix Indica*, the name given by the Spaniards to a bird of the Weſt Indies, of which there are three or four ſpecies; all which, Nieremberg ſays, are properly of the *partridge* kind. See the articles COLIN, and QUAUHTZONECOLIM.

Red-legged PARTRIDGE, a very delicate and valuable bird, called *cutumo* by the Italians.

It is diſtinguiſhed from the common *partridge* by the redneſs of its beak and legs. It is of a greyiſh aſh colour on the back; its throat is white near the head, but has a ſmall black ſpot on each ſide at the angle of the bill, and this white ſpace is ſurrounded by a black line; its breaſt is of a yellowiſh brown, and its wings are variegated with black, yellowiſh, and white. It is not found in England, but is ſometimes ſhot in the iſlands of Guernſey and Jerſey. *Ray*'s ornithology, p. 122.

PARTY (*Cycl.*)—PARTY-*bleu*, in the military art, a name given to a party of robbers who infeſted the roads in the Netherlands. They belonged to neither army, but robbed both ſides, without any regard to paſſes.

PARTY-*china*, a name given by the Engliſh merchants and others to a ſort of porcelain or china-ware, which is elegantly painted on the outſide with ſome bright colour, and blotted or variegated with round or ſquare ſpots of a different tinge. The manner in which the Chineſe do this is a very ſimple and eaſy one, and may be imitated in our own potteries with great eaſe. They prepare as many pieces of paper as they intend to have ſpots on the veſſel, and cut them exactly into the ſhape of thoſe ſpots: they wet theſe, and then ſpread them ſmoothly on the places where the ſpots are to be. When this is done, they cover the veſſel with the brown and gold, or any other varniſh, and then take off the papers: in the places which they covered no varniſh has come, ſo that they are ſo many regular white ſpaces. Theſe they cover with ſome other colour, laying it on carefully with a pencil: when this is done, they varniſh over the whole veſſel with the common varniſh, and bake it. In ſome veſſels they lay on only plain blue, or plain black in the ſpaces deſtined for ſpots; and after the firſt baking they cover theſe with gold, and make them ſo many figures of ſquares, triangles, or globes in pure gold. Obſerv. ſur les Coutumes de l'Aſie.

PARU, in natural hiſtory, the name of a very ſingular American fiſh.

It is broad, flat, and roundiſh; of no great thickneſs, and is uſually of about five or ſix inches long, and more than four broad. It has ſix fins, one large and long, one on the back, and another on the belly, behind the anus. Each of theſe reaches to the tail, and has, toward the end, a long ſtring or cord, made of a ſingle filament; that, on the back fin, being longer than that on the belly. Behind the gills it has alſo two fins of two fingers breadth long, and one broad; and two others on t e belly, which are very narrow. Its head is ſmall, and its mouth elevated and ſmall, and furniſhed with ſmall teeth. Its ſcales are of a moderate ſize, and are half black and half yellow; ſo that the fiſh appears of a black colour, variegated with yellow half moons. Its gills, and the beginning of its fins, are alſo yellow; and it has, on each ſide near the head, a yellow ſpot; it is an eatable fiſh. *Marggrave*'s Hiſt. of Braſil.

PARULIDES, in ſurgery. See GUM-*boils*.

PARUS, the *titmouſe*, in zoology, the name of a genus of ſmall birds, of which there are ſeveral ſpecies; ſome very common with us, the others of foreign origin. The Engliſh kinds are, 1. The *fringillago*, or great *titmouſe*. See FRINGILLAGO. 2. The *parus ater*, or *co'emouſe*, which has a black head, white ſpot on the back part of it, a greyiſh green back, and a green rump. This is the ſmalleſt of all the kind, not weighing above two drams. 3. The *parus paluſtris*, or *marſh titmouſe*, commonly called the *black cap*. This is ſomething larger than the colemouſe, and weighs three drams; its head is black, but its jaws white; its back greeniſh, and its feet of a lead colour. It has a larger tail alſo than the colemouſe, and wants the white ſpot at the back of its head, which is its diſtinguiſhing character. 4. The *parus cæruleus*, or *blue titmouſe*, or *nun*. This is of the ſame ſize with the black cap, but its head is blue, with a circle of white drawn round it; and round that white circle there is another of different colours, which ſurrounds the back part of the head and throat; there runs on each ſide a black line, from the beak to the hinder part of the head, and the jaws are white; the back is of a greeniſh yellow, its ſides, breaſt, and belly, yellow; but there runs a white line longitudinally down the middle of its breaſt 5. The *parus caudatus*, or *long-tailed titmouſe*. The head of this ſpecies is white, the neck black, and ſeveral black lines of the ſame colour, run from the beak to the back of the head; the breaſt is white, variegated with ſmall ſpots of brown; the belly and ſides are of a pale cheſnut colour. Its tail is extremely long, and is variegated with black and white. It is found in gardens and orchards, and builds its neſt with great art and nicety. *Marggrave*'s Hiſt. of Braſil.

The kinds not known to be found in England, are the blue American one called *guiracenoia*. See GUIRACENOIA. The *parus criſtatus*, or *creſted titmouſe*, known by its black head being fimbriated with white feathers, and its creſt, which it can at pleaſure raiſe to a fingers breadth high: and the *parus ſylvaticus*, or *wood titmouſe*, of Geſner and Aldrovand, which is very ſmall, and is diſtinguiſhed from all others by a red ſpot on its head. *Aldrovand.* de Avib.

The *titmouſe*, in the Linnæan ſyſtem of zoology, makes a diſtinct genus of birds, of the order of the paſſeres; the diſtinguiſhing characters of which are theſe: The extremity of the tongue is truncated, or as it were cut off, and terminated by four briſtles, and the beak is pointed. *Linnæi* Syſtema Naturæ, p 49.

The general characters of the *parus* kind, according to Mr. Ray, are, that they are all very ſmall, and are fond of climbing about trees, where they feed on the ſmall inſects they find in their bark; tho' ſome of them will alſo eat ſeeds. They are always reſtleſs; their beaks are ſhort, and their tails long; they make a conſiderably loud noiſe, ſome of them ſinging very agreeably; and all lay a great number of eggs. *Ray*'s Ornithology, p. 174.

PARVUS *naſi muſcu'us*, in anatomy, a name given by Caſſerius, and ſome others, to a ſmall muſcle of the noſe, called by Albinus *comprefſor naris*; by Winſlow, *tranſverſalis*, or *inferior naſi*; and by Cowper, *elevator alæ naſi*.

PARVUS *et tenuis palpebræ*, in anatomy, a name given by Fallopius to one of the muſcles of the face, called by Cowper and Douglaſs, *aperiens palpebram rectus*; and by Albinus, the *levator palpebræ ſuperioris*. See APERIENS, *Cycl.* and *Suppl.*

PARYPATE, in the antient muſic, was the name of that note or chord of a tetrachord which lay next to the hypate. As the hypate was the *principalis*, the firſt or principal ſound, according to Martianus Capello's tranſlation; ſo the *parypate* was, according to him, the *ſub principalis*. See the article TETRACHORD.

The name *parypate* was given to this ſecond note when a tetrachord was conſidered ſeparately from others; but when combined, this chord ſometimes took the name *trite*. See the articles DIAGRAM and TRITE.

PARYPATE *hypaton*, in the antient Greek ſcale of muſic, was the ſecond note of the hypaton tetrachord, and anſwers to C-ſa-ut of Guido's ſcale. *Wallis*, Append. ad Ptolem. Harm. p. 157. See DIAGRAM and PARYPATE.

PARYPATE *meſon*, in the Greek muſic, was the ſecond note of the *meſon* tetrachord, and anſwers to F-fa-ut of the Guidonian ſcale. *Wallis*, Append. Ptolem. Harm. p. 157. See DIAGRAM.

PAS *de ſouris*, in the military art, the ſame with *liziere*. See the article LIZIERE, *Cycl.*

PASHA, an office of dignity under the Grand Seignior, otherwiſe called *baſhaw*. See BASHAW, *Cycl.*

All Egypt is, on the part of the Grand Seignior, governed by a *paſha*, who has in reality but little power; but ſeems principally to be meant for the means of communicating to his divan of beys, and to the divans of the ſeveral military ogiacs, that is, their bodies, the orders of the Grand Seignior, and to ſee that they be executed by the proper officers.

If he farms the country of the Grand Seignior, the fines that are paid when any life drops upon the lands belong to him; for originally all the lands of Egypt belonged to the Grand Seignior; and the porte ſtill looks on them as its own: but the Grand Seignior's power being now loſt, they all go to the next heir; who muſt, however, be inveſted by the *paſha*, and is glad to compound for a ſmall ſum.

The nature of the *paſha*'s office requires him to be ever attempting means to cut off ſuch as are too aſpiring, or engaged in deſigns that may be any way prejudicial to the porte. This often occaſions his own depoſition; but he is in no care about that, as his perſon is always ſacred; and his loſing this poſt is only a ſtep to higher preferment. *Pecock*'s Egypt, Vol. 1. p. 162.

PASHAUNA *beady*, in natural hiſtory, a name given by the people of the Eaſt Indies to a kind of fibroſe talc, found in the ſides of the mountains, and uſed in medicine with them. They calcine it, and then powder and boil it in milk, and give half a dram for a doſe mixed in milk, for the gravel and ſtone.

PASS *(Cycl.)*—PASS, among miners, a frame of boards conſiſting of two or three bottom boards and two ſide ones, ſet ſlope-wiſe; thro' which the ore ſlides down into the coffer of the ſtamping mill.

PASQUE-*flower*, in botany. See PULSATILLA.

PASSACAGLIO, in the Italian muſic, is properly no more than a chacone. See CHACONE.

The only difference then, is, that the movement of the *paſſacaglio* is ſomewhat graver, the tune ſofter, and the expreſſion leſs lively: they are for the moſt part in the minor modes, or flat keys.

PASSADE, *(Cycl.)* in the manege. This cannot be performed without changing the hand, or turning and making a demi-tour at each of the extremities of the ground. Hence it is, that there are ſeveral ſorts of *paſſades*, according to the different ways of turning, in order to part or put again, and return upon the ſame piſte, or tread; which we call cloſing the *paſſade*. See CLOSE and SERRER.

A paſſade of five times, or a demivolt of five times, is a demi-tour made at the end of the ſtraight line, one hip in, in five times of a gallop upon the haunches; and at the fifth time ought to have cloſed the demivolt, and to preſent upon the *paſſade*-line ſtraight and ready to return. The demivolts of five times or periods, are the moſt common airs of changing the hand or turning, that are now practiſed.

Furious paſſades, thoſe performed upon a full career, being moſtly uſed in duels. To make theſe *paſſades*, you put your horſe ſtraight forwards, and towards the extremity of the line make a half ſtop, keeping the horſe ſtraight without traverſing; then you make the demivolt at three times, in ſuch a manner, that the third time the horſe preſents ſtraight upon the *paſſade*-line ready to ſet out again upon a ſhort gallop. You continue this ſhort gallop half the length of the *paſſade*, then you put on furiouſly at full ſpeed; and at the end of the *paſſade* mark a half ſtop, and then a demivolt of three times. This you continue to do as long as the horſe's wind and ſtrength will hold. This *paſſade* at full ſpeed, ſuppoſes that the horſe has an excellent mouth, and requires ſtrength and agility both in the horſe and horſeman. There are but few horſes that are capable of it.

Paſſade of one time, is a demivolt or turn, made by the horſe, in one time, of his ſhoulders and haunches. To make this *paſſade*, which is the moſt perfect of all, the horſe ſhould ſtand ſtraight upon the *paſſade*-line; and then putting forwards, he forms a half ſtop, making falcades two or three times in ſuch a manner, that he is ſtill ſtraight upon the line; and at the laſt time he prepares to turn nimbly, and retain to fix his haunches as a center; ſo that the demivolt is performed in only one time of the ſhoulders: and tho' the haunches make likewiſe a time, they make it in the center, or upon the ſame ſpot, and *de ferme a ferme*, as the French call it.

Raiſed or high paſſades, are thoſe in which the demivolts are made in corvets.

In all *paſſades* the horſe ſhould, in making the demivolt, gather and bring in his body, making his haunches accompany his ſhoulders, without falling back, or not going forward enough each time: and he ſhould go in a ſtraight line, without traverſing or turning his croupe out of the line.

PASSAGE *(Cycl.)*—*Birds of* PASSAGE, a name given to thoſe birds which at certain ſtated ſeaſons of the year remove from certain countries, and at other ſtated times return to them again, as our ſwallows, and many other ſpecies.

The places to which theſe birds retire on their leaving the countries in which they have made their abode, for a certain

ſeaſon,

ſeaſon, not having been ever perfectly known, ſome have formed idle conjectures of their not going away, but remaining torpid in hollow trees, in caverns, and under waters; but theſe are too abſurd to gain credit with the thinking part of the world; and their whole journey ſeems directed by inſtinct toward ſuch parts of the world as will afford them food, when that whence they depart will no longer do ſo: this want of food ſeems in all the ſpecies to be the chief reaſon of their departure; and the plenty of it in an after-ſeaſon, that of their return from a place which then, perhaps, affords it no more.

The generality of birds that remain the winter with us, have ſtrong bills, or are enabled to feed on what they can find at that ſeaſon; thoſe which leave us, have uſually very ſlender bills, and their food is the inſects of the fly kind; which diſappearing toward the approach of winter, compel them to ſeek them in regions where they may be found; and the length of the wings of the generality of theſe birds, enables them to prey flying, if there be food for them in their way, and to continue a long time on the wing without reſt.

The various conjectures about the places to which they retire, are owing to want of ocular teſtimony; but if we conſider the vaſt tracts of land yet unknown to us, we cannot doubt but there may be many places for them, in which we can have had no opportunities of finding them. But the moſt probable conjecture ſeems, that the places to which they retire lie probably in the ſame latitude in the ſouthern hemiſphere, as the places from whence they depart; where the ſeaſons reverting, they may enjoy the like agreeable temperature of the air. And if theſe places are ſuppoſed to be divided from them by too large ſeas, why may not ſome other parts of the ſouthern hemiſphere, which are leſs diſtant, ſerve their turn?

This, certainly, ſeems much more reaſonable than that they ſhould remain on our ſide of the northern tropic, within a few degrees of which, at the winter ſolſtice, it is ſo cold as frequently to produce ſnow; which, by diſperſing ſuch inſects as birds that feed upon the wing ſubſiſt on, muſt make them periſh, were they not to remove to thoſe warmer climates where they may ſtill find food.

The ſwallows, as they cannot ſubſiſt ſo long in cold ſeaſons as ſome other birds of *paſſage*, which feed after the diſappearance of flies in the air, on what inſects they find in their receſſes, viſit us later, and depart from us ſooner, than the reſt. The nightingales, and ſome other birds, which leave us for the winter, are ſeen, ſometimes, a month after the ſwallows: and from the whole it ſeems natural to infer, that the ſwallows paſs the tropic of Cancer, tho' it is not yet known to what place they at length retire.

The manner of the birds of *paſſage*, journeying to their ſouthern abode, may vary, according to the different ſtructure of their bodies, and their power of ſupporting themſelves in the air. Thoſe birds with ſhort wings, ſuch as the redſtart, blackcap, *&c.* tho' they are incapable of ſuch long flights as the ſwallow, or of flying with ſo much celerity, yet may paſs to leſs diſtant places, and by ſlower movements. Swallows and cuckows, may perform their paſſage in a very ſhort time; but there is for them no neceſſity for ſpeed, ſince every day's paſſage affords them an increaſe of warmth, and a continuance of food.

Providence, which has guided the defenceleſs animals in many other inſtances to the ſafeſt methods of performing their neceſſary works, may have inſtructed many of theſe birds which have ſhorter paſſages to make, or places to ſtop at by the way, to fly only in the night, that they may be ſecure from the birds of prey: and Mr. Cateſby gives a proof that ſome ſpecies do ſo, from his own obſervation; for lying on the deck of a ſloop on the north ſide of Cuba, himſelf and the whole company, heard ſucceſſively, for three nights, flights of rice birds, which are eaſily diſtinguiſhed from all others birds by their notes, and which were paſſing over their heads northerly; which is their direct way from Cuba, and the ſouthern continent of America, from whence they got to Carolina, annually about the time that rice begins to ripen, and from whence they return ſouthward again, when it is gathered, and they are become fat.

The ſhort winged birds are ſuppoſed little qualified for long flights, particularly the quail, which is a bird never ſeen long together on the wing, or making any long flights: its not doing this frequently, is, however, no proof that it is not able to do it; nor does the ſtructure of its body at all beſpeak its inability: and Bellonius affirms, that he ſaw them in great flights paſſing over, and repaſſing, the Mediterranean ſea, at the very ſeaſons when they leave us, and return to us again. The ſame inſtinct that directs theſe birds to depart to diſtant countries, doubtleſs, alſo directs them to the ſhorteſt way, and ſends them to the narroweſt cuts, not the wider ſeas to croſs.

Among the birds of *paſſage*, we have ſome alſo which come to us in the autumn, at the time when the ſummer birds are leaving us; and go from us again in the ſpring at the times when theſe return: theſe, however, are only four kinds; the fieldfare, the redwing, the woodcock, and the ſnipe; and of theſe, the two laſt often continue with us thro' the ſummer, and breed; ſo that the two firſt ſeem the only kinds that certainly leave us at the approach of ſpring, retiring to more northern parts of the continent, where they live the ſummer and breed; and at the return of winter, are driven ſoutherly from thoſe frigid climes, in ſearch of food, which there the ice and ſnow muſt deprive them of. There are many others alſo, particularly of the duck or wading kind, that bre d and make their ſummer abode in the deſolate fenny parts of our iſland; and when the ſeverity of our winters deprives them of their food, neceſſity forces them to retire toward the ſea in numerous flights; where they find water unfrozen, and where they remain till the return of ſummer; but theſe cannot properly be called birds of *paſſage*.

It ſeems pretty evident from the whole, that the ſummer birds of *paſſage* leave us only in ſearch of a more warm climate, and a greater plenty of food; both which advantages they procure to themſelves by their alternate change of climate; but the migration of the winter birds of *paſſage* is not ſo eaſily accounted for, ſince there is no ſuch apparent neceſſity of their leaving us either on the ſcore of food, or climate. The place of the ſummer retirement of theſe birds is Sweden, and ſome other countries in that latitude; but as they would find thoſe places too cold and deſtitute of proviſion, were they to haſten immediately to them on their departure from us, they journey along gradually, and prolong their paſſage thro' the more moderate countries of Germany and Poland; by which means they do not arrive at their northern habitations, where they are to paſs their ſummer, and where they breed till the ſeverity of the cold is ſo far abated as to render it pleaſing to them, and there is proper food there for them: and when they reviſit us the following winter, thier journey is performed in the ſame leiſurely manner.

Sweden, and the other countries whence they come to us, ſeem the proper home of theſe birds; ſince there they were bred; and the journey they take to us being only for a warmer climate, and a plenty of food, it is no wonder that when theſe benefits are to be expected again in their native place, they return to it.

The principal food of theſe birds, while with us, is the fruit of the white thorn, or haws; which hang on our hedges, in winter, in prodigious plenty; but where they breed, and ſeem to live moſt at eaſe, as in Sweden, *&c.* there are no haws, nor indeed in many of the countries thro' which they journey in their way; ſo that it is evident they change their food in their paſſage. And upon the whole it appears, that Providence has created birds, *&c.* with conſtitutions and inclinations adapted to their different degrees of heat and cold; which, to them, are moſt agreeable, and to which they will travel from places which to other animals might ſeem more agreeable: by this means no part of the globe is without its inhabitants.

Beſide the migratory birds, which live in different countries a whole winter, or a whole ſummer, there are ſome others which annually appear in particular places, at the time of the ripening of particular kinds of grain which their own country is deſtitute of; and theſe depart after a ſhort ſtay, and are no more ſeen till that time the following year. Of this kind are the rice-bird, and bluewing of Carolina. Birds like men, purſue their ſearches after food, or whatever elſe is neceſſary and agreeable, thro' diſtant climes; and when they diſcover ſome new grain, or pleaſing food, they return and acquaint their community of the good fortune, and then joining in numerous flights, make annual excurſions to ſolace themſelves on this exotic food.

Since the diſcovery of America, there have been introduced from Europe ſeveral ſorts of grain which were before unknown there, and which, not before ſome length of time, were found out, and coveted by birds of this migratory kind. Of this ſort there is a very beautiful ſpecies, which has very lately made its firſt appearance in Virginia: theſe arrive annually at the time that the wheat is ripe, or nearly ſo; and conſtantly ſince they found it out, have appeared in great droves every year, at the ſeaſon of its ripening; the inhabitants call them, for this reaſon, *wheat-birds*. Phil. Tranſ. N° 483.

PASSAGE, in the manege. To *paſſage* a horſe upon his own length. See LENGTH.

PASSAGIO, in the Italian muſic. See PASSAGE, *Cycl.*

PASSAGO, in the glaſs trade, the inſtrument with which the workman makes the bowl of the drinking glaſſes, or other the like veſſels. *Neri's* Art of Glaſs, p. 247.

PASSARADO, in a ſhip, is a rope whereby all the ſheet-blocks of the main and fore ſails are haled down; the clew of the main ſail to the cubbridge-head of the main maſt, and the clew of the fore ſail to the cat-head. This is to be done when the ſhip goes large; and they are alſo kept firm down, and hindered from flying up, by this *paſſarado* rope.

PASSEPIED, in the French muſic, an air in all reſpects like a minuet, except that it is more briſk and lively. See the article MINUET.

PASSER, the *ſparrow*, in zoology, the name of a large genus of birds, the diſtinguiſhing characters of which are theſe: they feed on corn and worms; their beak is thick, ſhort, and ſomewhat bent; their colour commonly a duſky brown.

There

There are many known ſpecies of this bird. 1. The common houſe *ſparrow*. 2. The *paſſer ſtultus*, or fooliſh *ſparrow*, which is of a yellowiſh brown, with duſky ſtreaks. 3. The baſtard *ſparrow*, *paſſer congener*, of Aldrovand, which is of a reddiſh brown, and has no black ſpot under its throat. 4. The *paſſer tricolor*, or three coloured *ſparrow*; this is variegated with an equal proportion of black, white, and yellow. 5. The *paſſer albicilla*, or white-tailed *ſparrow*, diſtinguiſhed by its greyiſh white tail. 6. The *paſſer Illyricus*, or Illyrian *ſparrow*, which is larger than the common kind, and has a very white belly. 7. The *paſſer torquatus*, or ring *ſparrow*, which is very ſmall, and has a white ring about its eyes: the ſpot under the throat, which is black in the common *ſparrow*, is yellow in this ſpecies. 8. The *paſſer Indicus caudatus porphyromelas*, or long tailed black and red Indian *ſparrow*. 9. The *paſſer Indicus*, called *tijepiranga*. See TIJEPIRANGA. 10. The *paſſer Indicus macrouros roſtro miniaceo*, or long-tailed Indian *ſparrow*, with a red beak. 11. The *paſſer Indicus macrouros alius* of Aldrovand, or the other long-tailed Indian *ſparrow*; a very beautiful bird, with a blue beak and a black head; the body being moſtly of a fine ſcarlet. 12. The *paſſer Indicus brachyuros*, or ſhort-tailed Indian *ſparrow*, which is ſmall, and all over of a bluiſh black. 13. The *paſſerculus brachyuros Europæanus*, or European ſmall ſhort-tailed *ſparrow*: this is common in Italy, and is very ſmall, and all over of a pale yellow. 14. *Paſſer erythromelas Indicus, ſine uropygio*, the red and black Indian *ſparrow*, with no tail. 15. *Paſſer Indicus cyanerythromelas, ſine uropygio*; the blue, black and red Indian *ſparrow*, without a tail. Theſe are deſcribed by Marggrave; but he only ſaw the figures of them, ſo that the painter, not nature, perhaps, denied them tails. 16. The *paſſer montanus*, or mountain *ſparrow*: this is common in Carinthia, and is variegated with a browniſh red and black. 17. The *paſſer ſylveſtris*, or field *ſparrow* of Aldrovand: this is of the ſize of the common *ſparrow*, and is of a duſky ruſt-coloured brown, and has a broad ſtreak running from the angle of its beak to its tail. And laſtly, 18. The Braſilian *ſparrow*, called *Guiranheemgatu*. See GUIRANHEEMGATU. *Ray*'s Ornithology, p. 184. *Aldrovand.* de Avibus, l. 15 c. 33. *Ray*'s Ornithology, p. 182, to 186. *Aldrovand.* Hiſt. l. 15. c. 16.

In the Linnæan ſyſtem of zoology, the *paſſer* is one of the orders of the bird kind; the diſtinguiſhing mark of which is, that the beak is of a conic form, and tapers to a point. *Linnæi* Syſtem. Natur. p. 48. See Tab. of Birds, N°. 29 and 38.

PASSER, in the hiſtory of fiſhes, the name of the common plaiſe, a flat fiſh, of a duſky olive-colour, ſpotted with red on the back, and white on the belly, called in Latin alſo, *quadratulus* and *plateſſa*. *Willughby*'s Hiſt. Piſc. p. 96.

PASSER-*aquaticus*, the water *ſparrow*, the name of a bird deſcribed by Nieremberg, which he ſays the Indians call *acototle-quichitl*. It ſings all day long without ceaſing, but with no very pleaſing note: it is, however, a well taſted bird; it lives among ſedge and buſhes, and is of the ſize and ſhape of a ſwallow, but has a black bill and yellow legs; its breaſt and belly are white, and its back is of a browniſh yellow, variegated with ſpots of black and white. This bird much reſembles our reed *ſparrow*. *Ray*'s Ornithol. p. 300.

PASSER-*arundinaceus*, the reed *ſparrow*, a bird of which there are two ſpecies, a greater and a ſmaller, both living among reeds and in watery places, and both ſinging very ſweetly: the greater is known among authors by the name of *junco*, and the leſſer by that of *cannevarola*. *Ray*'s Ornithology, p. 99. See JUNCO and CANNEVAROLA.

PASSER *arundinaceus torquatus*, the ringed reed *ſparrow*, the name of a ſmall bird, ſcarce exceeding the linnet in ſize, found among reeds, and always building its neſt among them. Its head is black; its neck has a very beautiful ring of white, reaching to the angle of the beak on each ſide; its throat is black, and its breaſt and belly white; its back and wings are of a browniſh black, and its rump bluiſh or greyiſh, with an admixture of brown. In the female the ring ſcarce appears, and the colours on the throat are reddiſh, brown, black, and grey. *Ray*'s Ornithol. p 197.

PASSER *aſper*, in ichthyology, the rough or ſcaly *plaiſe*, called in Engliſh the *dab*; a flat fiſh, ſomething thicker than the common *plaiſe*, and of the ſame general ſize, covered with conſiderably large ſcales, rough at their extremities, and edged as it were with teeth: the eyes are on the left ſide, and are placed very cloſe together: its back is of a reddiſh grey, ſpotted with yellow, and the mouth moderately large. It is caught in the Mediterranean and Engliſh ſeas. *Rondelet.* de Piſc. p. 352.

PASSER *Britannicus*, in ichthyology, a name given by Charleton to the ſoal fiſh, and by ſome others to the turbut. See the articles HIPPOGLOSSUS, and PLEURONECTES.

PASSER *canarius*, and *canarienſis*, in zoology, the common name for what we call ſimply in Engliſh, the *canary bird*.

The *canary bird* may be bred with us, and if treated with proper care, they will become as vigorous and healthful as in the country from whence they have their name. The cages in which theſe birds are kept are to be made of either walnut-tree or oak, with bars of wire; becauſe theſe being woods of ſtrength, do not require to be uſed in large pieces; and the more freedom they have of looking about them, the leſs will they be ſtartled at people going up to them. The common ſhape of cages, which is cylindric, is very improper for theſe birds; for this allows little room to walk, and without that the birds uſually become melancholy. The moſt proper of all ſhapes is the high and long, but narrow.

If theſe birds eat too much they grow over fat, loſe their ſhape, and their ſinging is ſpoiled; or at leaſt they become ſo idle, that they will ſcarce ever ſing. In this caſe their victuals is to be given them in a much ſmaller quantity, and they will by this means be recovered, by degrees, to all their beauty, and will ſing as at firſt.

At the time that they are about to build their neſts, there muſt be put into their cages ſome hay, dried thoroughly in the ſun: with this muſt be mixed ſome moſs dried in the ſame manner, and ſome ſtag's hair; and great care is to be taken of breeding the young, in the article of food. As ſoon as the young birds are eight days, or ſomewhat more old, and are able to eat and pick up food of themſelves, they are to be taken out of the cage in which they were hatched, and each put ſeparately into another cage, and hung up in a room where it may never have an opportunity of hearing the voice of any other bird. After they have been kept thus about eight days, they are to be excited to ſing by a bird pipe; but this is not to be blowed too much, or in too ſhrill a manner, leſt they ſing themſelves to death.

For the firſt fifteen days the cages are to be covered with a black cloth, and for the fifteen days following with a green one. Five leſſons in a day from the pipe are ſufficient for theſe young creatures, and they muſt not be diſturbed with ſeveral ſounds at the ſame time, leſt they confound and puzzle them: two leſſons ſhould be given them early in the morning, one about the middle of the day, and two more at night. *Hervieux*, des Serins de Canarie.

The genius and temper of the ſeveral birds of this kind are very different. The males are almoſt always melancholy, and will not ſing unleſs they are excited to it by hearing others continually ſinging about them. The male bird of this kind will often murder the female put to him for breeding; and when there are ſeveral females together with the males, they will often do the ſame to one another with jealouſy. It is therefore not eaſy to manage the article of their breeeing well in this particular, unleſs in this manner: let two female birds be put into one cage, and when they have lived together ſome time, they will have contracted a ſort of love for one another, which will not eaſily be diſſolved. Put a male bird into the cage with theſe two, and every thing will go well; their friendſhip will keep them from quarrelling about his favours, and from danger of his miſchievous diſpoſition; for if he attacks one of them, in order to kill her, the other will immediately take her part, and after a few of theſe battles, the male will find that they are together an overmatch for him at fighting, and will then diſtribute his favours to them, and there will not fail of being a young breed or two, which are to be taken away from their parents, and educated as before directed.

Some males watch the time of the female's laying, and devour the eggs as faſt as ſhe depoſits them; and others take the young ones in their beaks, as ſoon as hatched, and cruſh them to death againſt the ſides of the cage, or ſome other way deſtroy them. When a male has been known once to have been guilty of this, he is to be ſhut up in a ſmall cage, in the middle of the large one in which the female is breeding her young, and thus he will often comfort her with ſinging all day long, while ſhe ſits upon the eggs or takes care of the young ones; and when the time of taking away, to put them into ſeparate cages, is come, the male is to be let out, and he will always after this live in friendſhip with the female.

If the male become ſick during the time of the female's ſitting or bringing up her young, he muſt be removed immediately, and only brought to the ſide of her cage at certain times, that ſhe may ſee him, till he is perfectly cured; and then he is to be ſhut up again in his cage in the middle.

PASSER *faber*, in zoology, a name given by Nieremberg to a bird, the genus of which we are not very certain about; it being alſo called *turdus chiappæ*. It is remarkable for perforating the bark of the pines, and lodging its acorns there, which it afterwards eats occaſionally. *Ray*'s Ornithol. p. 303.

PASSER *fluviatilis*, in ichthyology, the name of the common flounder, diſtinguiſhed from other fiſh of that genus by the ſmallneſs and cloſe ſituation of its ſcales, which are ſuch, that which ever way it is rubbed, the hand perceives no roughneſs; and that at the inſertion of the fins there is a ſeries of ſhort prickles bent backwards, which are eaſily perceived by the touch, or by the eye on a cloſe view. *Willughby*'s Hiſt. Piſc. p. 98.

PASSER *moſquitus*, a name by which ſome have called the *guainumbi*, or *humming bird*, the ſmalleſt of all birds. Ornithol. See GUAINUMBI.

PASSER *niger*, in ichthyology, a name given by Artedi from Charleton, to the common flounder. The *fleſus* and *fleteletus* of authors, and the *plaad* of the Germans.

PASSER *ſolitarius*, the ſolitary *ſparrow*, a name given by authors to a bird properly of the *merula* or *black-bird* kind, and of the ſame ſize and ſhape with the common black bird, and not very different from it in colour.

Its head and neck are large and thick; the upper part of its head of a duſky grey, and its back of a deep bluiſh black, but with a little whiteneſs at the ends of the feathers; its tail is of a browniſh black, and its wings are variegated with brown, black, and a little white; its breaſt, throat, and belly are beautifully variegated with black, white, and grey; its beak is long and ſtrong, and its legs of a blackiſh brown, and very ſhort: it feeds on berries and other vegetables. The male is more beautiful than the female, and has a caſt of purple in the blue of his back. It ſings very ſweetly, and loves the tops of old buildings. It builds in the ſame places, and is the bird mentioned in the book of pſalms. It is much eſteemed for its ſinging, and will learn to imitate the human voice, and talk as the ſtarling, parrot, *&c.* *Ray*'s Ornithol. p. 140.

PASSER *ſtultus*, in ichthyology, a name given by Nieremberg to a ſpecies of the *larus*, or *ſeagull*, ſo tame and fooliſh that it will ſtand ſtill for any to lay his hand upon it. *Nieremberg.*

PASSER *troglodites*, in zoology, the name by which authors call the ſmall bird known in Engliſh by the name of the *wren*.

Some have very erroneouſly called this the *regulus*, which is the name of a perfectly different bird. See REGULUS.

Our *wren*, tho' a very ſmall bird, is three times as large as the regulus, and of a browniſh colour, with tranſverſe ſtreaks of black on its back, wings, and tail; a yellowiſh throat and a white breaſt, with ſome tranſverſe ſtreaks of black alſo on its lower part, and its belly of a reddiſh hue; and ſinging very ſweetly and melodiouſly, much finer and louder in its voice than could be expected from ſo ſmall a bird. *Ray*'s Ornithol. p. 164.

PASSERINE, in botany, a name by which Ruellius and ſome other authors have called the common *alſine* or *chickweed*.

PASSION *(Cycl.)*—PASSION-*flower*, *granadilla*, in botany. See the article GRANADILLA.

The different ſpecies of this plant cultivated in the gardens of the curious are very numerous, and moſt of them very beautiful.

The three more common kinds, which are what we ſee in moſt gardens, are very hardy, and bear all the ſeverities of our climates as well as if natives of it; for, tho' the tender branches, and ſometimes even the main ſtem, are deſtroyed in our ſeverer winters, yet it always ſhoots up again from the root.

Theſe are propagated by laying down their branches, which in one year's time will take good roots, and may be removed to the places where they are deſigned to remain. The beſt ſeaſon for tranſplanting them is the latter end of March or the beginning of April: they ſhould be planted againſt a wall, or other building, which faces the ſouth eaſt or ſouth weſt; or elſe mixed among the flowering ſhrubs in quarters of large gardens: in this caſe they muſt be trained up to poles fixed in the earth for that purpoſe, and thus will flower well, and appear extremely beautiful. The beſt ſeaſon for pruning them is in the ſpring, and it is a good cuſtom to lay a foot thickneſs of mulch at the roots, which will effectually preſerve them from the ſeverity of the winter, and is neceſſary when they are planted in open quarters, and have not the defence of a wall behind them. The manner of pruning is to cut entirely off all the weak ſhoots, and ſhorten the ſtrong ones to about three feet in length. When they are planted againſt high buildings, they may be left ſomething longer than this, to fill up the wall; but this is not very neceſſary, for they are very quick growing plants, and in open quarters they ſhould be always pruned much ſhorter than this, to bring their flowers nearer the ground.

The moſt common kind with us never bearing fruit in this climate, can never be propagated any way but this; but there is another ſpecies which has by ſome been miſtaken for the ſame, tho' really very different, which conſtantly bears fruit with us; and the plants of this may be raiſed from ſeeds in the common way. *Miller*'s Gard. Dict.

Hyſteric PASSION. See HYSTERICS.

PASSIONATO, in the Italian muſic, intimates that the part to which it is annexed ought to be played paſſionately, or in a moving and affecting manner.

PASSULATUM, a name given by the antients to medicine compoſed of the pulp of raiſins paſſed through a ſieve, ſometimes alone, ſometimes with other ingredients.

PASSUM, a name given by the antients to a kind of wine made of grapes, which had been ſuffered to remain on the vines till much withered and dried up: it is hence uſed alſo by ſome of the moderns to expreſs raiſin wine.

PASTE *(Cycl.)*—PASTES, in the glaſs trade, a ſort of compoſitions of the glaſs kind, made from calcined cryſtal, lead, and metallic preparations, to imitate the ſeveral natural gems. Theſe are no way inferior to the native ſtones, when carefully made and well poliſhed, in brightneſs or tranſparence, but want their hardneſs.

The general rules to be obſerved in the making them are theſe: 1. That all the veſſels in which they are made are firmly luted, and the lute left to dry before they are put into the fire. 2. That ſuch veſſels are choſen for the work as will bear the fire well. 3. That the powders be prepared on a porphyry ſtone, not in a metal mortar, which would communicate a tinge to them. 4. That the juſt proportion in the quantities of the ſeveral ingredients be nicely obſerved. 5. That the materials be all well mixed; and if not ſufficiently baked the firſt time, to be committed to the fire again, without breaking the pot; for if this be not obſerved, they will be full of bliſters and air-bladders. 6. That a ſmall vacuity be always left at the top of the pot, to give room to the ſwelling of the ingredients. *Neri*'s Art of Glaſs, p. 127.

To make a *paſte* of extreme hardneſs, and capable of all the colours of the gems, with great luſtre and beauty, take of prepared cryſtal ten pounds; ſalt of polverine, ſix pounds; ſulphur of lead, two pounds; mix all theſe well together into a fine powder, make the whole, with common water, into a hard *paſte*, and make of this *paſte* ſmall cakes, of about three ounces weight each, with a hole in them made in their middle; dry theſe in the ſun, and afterwards calcine them in the ſtraighteſt part of a potter's furnace; after this powder them, and levigate them to a perfect fineneſs on a porphyry, and ſet this powder in pots in a glaſs-furnace to purify for three days; then caſt the whole into water, and afterwards return it into the furnace, where let it ſtand fifteen days; in which time all foulneſs and bliſters will diſappear, and the *paſte* will greatly reſemble the natural jewels. To give this the colour of the emerald, add to it braſs thrice calcined: for a ſea-green, braſs ſimply calcined to a redneſs: for a ſapphire, add zaffer, with manganeſe: and for a topaz, manganeſe and tartar. All the gems are thus imitated in this, by the ſame way of working as the making the coloured glaſſes; and this is ſo hard, that they very much approach to the natural gems. *Neri*'s Art of Glaſs, p. 142.

The colours in all the counterfeit gems made of the ſeveral *paſtes*, may be made deeper or lighter, according to the works for which the ſtones are deſigned; and it is a neceſſary general rule, that ſmall ſtones for rings, *&c.* require a deeper colour, and large ones a paler. Beſides the colours made from manganeſe, verdigreaſe, and zaffer, which are the ingredients commonly uſed, there are other very fine ones, which care and ſkill may prepare: very fine red may be made from gold, and one not much inferior to that from iron; a very fine green from braſs or copper, and a ſky colour from ſilver; and a much finer one from the common ſmall garnets of Bohemia, which are of little value. The gems alſo afford glorious colours like their own. *Neri*'s Art of Glaſs, p. 136.

The fine blue from ſilver is, probably, only from the ſmall quantity of copper uſed in the alloy.

A very ſingular and excellent way of making the *paſte* to imitate the coloured gems, is this: take a quantity of ſaccharum ſaturni, or ſugar of lead, made with vinegar in the common way; ſet it in ſand, in a glaſs body well luted from the neck downwards; leave the mouth of the glaſs open, and continue the fire twenty-four hours; then take out the ſalt, and if it be not red, but yellowiſh, powder it fine and return it into the veſſel, and keep it in the ſand-heat twenty-four hours more, till it becomes as red as cinnabar. The fire muſt not be made ſo ſtrong as to melt it, for then all the proceſs is ſpoiled. Pour diſtilled vinegar on this calcined ſalt, and ſeparate the ſolution from the dregs; let the decanted liquor ſtand ſix days in an earthen veſſel, to give time for the finer ſediment to ſubſide; filter this liquor, and evaporate it in a glaſs body, and there will remain a moſt pure ſalt of lead; dry this well, then diſſolve it in fair water; let the ſolution ſtand ſix days in a glazed pan; let it ſubſide, then filtre the clear ſolution and evaporate it to a yet more pure white and ſweet ſalt; repeat this operation three times; put the now perfectly pure ſalt into a glaſs veſſel, ſet it in a ſand heat for ſeveral days, and it will be calcined to a fine impalpable powder, of a lively red. This is called the ſulphur of lead. *Neri*'s Art of Glaſs, p. 140.

Take all the ingredients as in the common compoſition of the *paſtes* of the ſeveral colours, only inſtead of red lead uſe this powder, and the produce will well reward the trouble of the operation, as experience has often proved.

PASTE *for angling*. There are many receipts which particular people are fond of, but the following compoſition ſeems one of the beſt: take equal quantities of freſh butter and ſheep's ſuet, about half as much of good old cheeſe, and the crumb of an old ſtale white loaf, as much as will, when they are all beaten in a mortar, make the whole into a *paſte*; add a little wool or tow; that it may keep the better on the hook. The place ſhould be baited with blood and grains over night, and in the morning this *paſte* will be found an excellent bait.

PASTES *for birds*, a general ſort of food made by the people who breed up birds from the neſt, and ſuiting almoſt all kinds.

It is made in the following manner: grind half a peck of large beans, well dried, to a very fine meal; take of this meal two pounds, of the beſt ſweet almonds blanched one pound; theſe muſt be well beat together in a mortar, till perfectly mixed; then to a quarter of a pound of freſh butter, in a ſaucepan well tinned, add the *paſte*, and mix all well together over a charcoal fire, ſtirring it as it boils with a wooden ſpoon; then add the yolks of four eggs, and a little ſaffron, and finally a ſmall quantity of the fineſt virgin honey. When theſe are well incorporated, and are tolerably thin and without lumps,

the whole is to be poured into a colander made with ſuch holes as will let the compoſition paſs thro': if any of it is ſo ſtiff that it will not go thro', it muſt be beat again in a mortar, and by that means made fit to paſs the holes and mix with the reſt. When the whole is done, it is to be put into a pot, and a little clarified honey being melted and poured on it, it will keep very well for ſix months or longer.

PASTELL, *(Cycl.)* a name given by ſome to the *iſatis*, or *woad*. See the articles WOAD and ISATIS.

PASTERN *(Cycl.)*—PASTERN-*joint*, in the manege, called alſo the *fetlock* of a horſe's leg, is the joint above the *paſtern*, which ſerves for a ſecond knee in each fore leg, and a ſecond ham or hough, to each hinder leg. The *fetlock* is apt to be cut by the ſide of one of the ſhoes; and when that happens, we ſay, a horſe cuts or interferes. Sprains happen upon the *fetlock*, and cratches above it behind.

PASTINACHA, *parſnep*, in botany, the name of a genus of plants, the characters of which are theſe: The flowers are diſpoſed in umbells, and are of the roſaceous kind, being compoſed of ſeveral petals arranged in a circular order upon a cup; which finally becomes a fruit compoſed of two large oval, flattiſh, marginated ſeeds; which frequently depoſit their covering. To this it may be added, that the leaves are large and alated.

The ſpecies of *parſnep*, enumerated by Mr. Tournefort, are theſe: 1. The great broad-leaved garden *parſnep*. 2. The broad-leaved wild *parſnep*. 3. The largeſt wild *parſnep*, called by authors *panax coſtæriums*. *Tourn.* Inſt. p. 319. See the article PARSNEP.

PASTINACHA *marina*, in zoology, the name of a fiſh, called in Engliſh the *poiſon fiſh*, or *fierce flaw*. It is one of the flat cartilaginous fiſhes, and ſomething like the common ſkate. It is very broad, and is thick in the middle, and thin at the edges; ſmooth ſkined, and yellowiſh on the back, and of a ſilvery white on the belly; but the ridge, or middle part of the back and the tail, are blue. It has only two ſmall fins, which ſurround the anus; the whole body is, however, thinned off at the edges into a ſort of fins. Its ſnout is very ſharp; its eyes large and protuberant; its mouth is ſmall, and without teeth; but its jaws are rough and rugged. Its noſtrils are very large, and placed near the mouth, and of a lunulated figure. Its tail, in which all its poiſon is lodged, is long, ſmooth, and round, with a thorn, or dart, of a finger's length, toothed on each ſide like a ſaw, with the teeth ſtanding upwards, or toward the head. This is placed at the diſtance of about one third of the length of the tail; and that from this place grows very ſlender, and ends in a very ſlender point. It grows, ſometimes, to ten pound weight; and when the tail is cut off, is commonly ſold in the markets in Italy and elſewhere. See Tab. of Fiſhes, N° 6.

Authors give us many remarkable accounts of the poiſon of this fiſh, which it communicates to animals by the ſtroke of its tail. They mention alſo two kinds of it; that is, beſide the ordinary ſpecies which is ſmooth, another called the *paſtinacha marina aſpera*, which is rough and prickly. *Jonſon*, de Piſc. p. 19.

PASTOPHORI, Παστοφόροι, among the antients, prieſts whoſe buſineſs it was, at ſolemn feſtivals, to carry the ſhrine of the deity, when they were to pray to him for rain, fair weather, or the like. *Pitiſc.* in voc.

PASTOPHORIA, in antiquity, the apartments near the temples where the *paſtophori* were lodged.

Clemens Alexandrinus [a], deſcribing the temples of the Egyptians, ſays, that after having paſſed through magnificent courts, you are conducted to a temple, which is at the farther end of theſe courts, and then a *paſtophorus* gravely lifts up the veil which is at the door, to ſhew you the deity within; which is nothing but a dog or a cat, or ſome other animal. Theſe *paſtophori* alſo ſupported the ſhrine, or niche of theſe ridiculous divinities, when they were carried in proceſſion. Apuleius [b] ſpeaks of the *paſtophori* that carried the Syrian goddeſs. —[[a] *Clem. Alex.* l. 3. c. 2. Pædag. [b] *Apul.* Aſin. Aur. l. 10. c. 11. *Calm.* Dict. Bibl. in voc. *paſtophoria.*]

In the temple of Jeruſalem there were two courts ſurrounded with galleries, and all round about were ſeveral lodging rooms for the prieſts, and to lay up wood, wine, oil, ſalt, meal, ſpices, incenſe, veſtments, valuable veſſels, and proviſions neceſſary for the ſacrifices and lamps; as alſo for the ſupport and maintenance of prieſts. Vid. 1 *Chron.* ix. 26, 33. *Ezek.* xl. 17, & 18. 1 *Chron.* xxvi. 16. *Calmet.* Dict. Bibl.

PASTOR *(Cycl.)*—PASTOR *piſcis*, in zoology, the name of a fiſh of the mullet kind, caught in the American ſeas and rivers, and eſteemed a very well taſted one.

It is of the uſual ſize of our river-trout, and not unlike that fiſh in ſhape. Its ſcales are large and of a ſilvery white; and are ranged in the ſame order that thoſe of the perch are, with greyiſh lines between the ſeveral arrangements. It has ſeven fins all very large, eſpecially that on the back; and its tail is remarkably forked. All the fins are white, and the coverings of the gills are ſcaly, not bony, as in moſt other fiſhes; whence it has been ſuppoſed to have no gills. *Marggrave's* Hiſt. of Braſil.

PASTORAL, in the Italian muſic, an air compoſed after a very ſweet, eaſy, gentle manner, in imitation of the airs ſhepherds are ſuppoſed to play.

PASTURE *(Cycl.)* — *Paſture-land* is of ſuch advantage to huſbandry, that many prefer it even to corn-land, becauſe of the ſmall hazard and labour that attends it, and as it lays the foundation for moſt of the profit that is expected from the arable-land; becauſe of the manure the cattle afford which are fed upon it. Where dung is not to be bought, as is often the caſe in places diſtant from large towns, the farmer is forced to proportion his arable to his *paſture*-land, in ſuch manner, that the cattle fed on the latter may be ſufficient for a ſupply of dung, ſo neceſſary for producing the fruits of the former.

Paſture-lands are of three kinds: 1. The uplands: theſe lie ſo high as not to be overflowed by rivers, or land-floods. 2. Thoſe low lands which lie near rivers and fens. And 3. Thoſe that lie near the ſea. *Mortimer's* Huſbandry, p. 15. See the articles UP-LAND, MARSH-LAND, *&c.*

Paſture-land requires the refreſhment of dung, as well as the arable or corn-land; but there is to be a difference made in the laying it on and ſpreading it. A harrow performs the office of ſpreading the dung on ploughed lands; but the beſt contrivance for paſtures, is, to lay the dung in ſmall heaps, and draw over it a gate ſtuck full of buſhes. All dung that is laid on *paſture*-land, muſt be laid on in winter, that the rains may waſh its fatneſs into the ground before the ſun ſcorches it, or evaporates its goodneſs. Fine mould mixed with the dung, and ſpread with it over the land, is very good for *paſtures*; for it is waſhed down to the very roots of the graſs, and gives them a new and fine ſoil juſt in thoſe places where it is moſt wanted.

The beſt manure for *paſture*-land, is, the rotten bottoms of old hay-ſtacks; for theſe moulder away into a very rich ſoil, and are always full of vaſt quantities of ſeed, fallen at times from the hay, which all grow when ſpread on the ground: and thus new nouriſhment, and a new ſet of plants are given at once to the exhauſted ground. But as particularly uſeful as this is for *paſture*-ground, it is as improper for corn-land, and ſhould by no means ever be ſuffered to mix with the manure for thoſe grounds; as it will then raiſe graſs and other plants, which tho' of uſe in the *paſture*, are weeds among the corn. *Mortimer's* Huſbandry.

Artificial PASTURE. As to the difference of the quantity of *artificial paſture* made by dung without tillage, and that made by tillage without dung, the latter is many times greater, as has been proved by repeated experiments on unploughed land, whereon a dunghill had lain for two or three years, and being then removed, was planted with turneps; and at the ſame time a tilled land contiguous thereto, was drilled with turneps, and horſe-hoed. The other being hand-hoed, ſeemed to proſper beſt at firſt, but, in fine, it did not amount to a fifth part of the tilled and horſe-hoed land, either in bigneſs or in crops; ſo that the benefit of the dung and hand-hoe was inconſiderable in compariſon of the plough and horſe-hoe. The little quantity of *artificial paſture* raiſed to the other, was only near the ſurface, and did not reach deep enough to maintain the turneps till they arrived at the fifth part of the growth of thoſe which were placed in an *artificial paſture*, that reached to the bottom of the common bed of mould.

Another proof of the ſame kind, is, that ſeveral lands of turneps drilled on the level, and at three foot rows, ploughed, and doubly dunged, and alſo horſe-hoed, did not produce nearly ſo good a crop of turneps as ſix foot ridges adjoining horſe hoed, tho' no dung had been laid on them of many years.

In this caſe, there was no other difference but that the three foot rows did not admit the hoe-plough to raiſe half the *artificial paſture* as the ſix foot rows did. The dung ploughed into the narrow intervals before drilling, could operate no farther with any great effect, than the hoe-plough could turn it up and help its pulverization. Upon the whole, dung without tillage can do very little; with ſome tillage it does ſomething, with much tillage it pulveriſes the ſoil in much leſs time than tillage alone can do it in; but tillage alone, in more time, can pulveriſe it as well. Much of the dung commonly uſed on fields is to be ſaved on this principle; a little more hoeing between the rows of the plants ſupplies the place of it, and is done at much leſs expence than that of ſo much manure, of the hands neceſſary to lay it on, and the carriage. *Tull's* Horſe-hoeing Huſbandry.

PASTURE *of plants*. Plants themſelves make the *paſture* for animals; but before they are in a condition to give nouriſhment to them, they muſt themſelves receive that nouriſhment from the earth. This *paſture* of plants ſeems lodged out of the way of our ſenſes; and the ignorance in regard to this, ſeems the reaſon why husbandry, tho' one of the moſt uſeful and neceſſary arts to man, has been treated in a very ſuperficial manner by the authors who have written of it. The food, or matter of increaſe of plants, is earth; and, therefore, that may be properly enough called *their paſture*.

This *paſture* is the inner, or internal ſuperficies of the earth; or, which is the ſame thing, it is the ſuperficies of the pores, cavities

cavities and interſtices of the divided parts of the earth: theſe are of two kinds; the one natural, the other artificial. By nature the whole earth, or ſoil, is compoſed of parts; and if theſe had been in every place abſolutely joined, it would have been without interſtices or pores, and would have had no internal ſuperficies, or *paſture* for plants; but ſince it is not ſo denſe, there muſt be theſe interſtices at all thoſe places where the parts remain ſeparate or divided. Theſe interſtices, by their number and largeneſs, determine the ſpecific gravity or true quantity of every ſoil; the larger they are, the lighter is the ſoil, and the inner ſuperficies anſwers accordingly. The mouths of the veſſels deſtined to take in the food or nouriſhment of the plant, are all ſituated on the convex ſurface of the roots; and theſe take their pabulum or food, which is extremely ſmall particles of earth, blended with a due proportion of water, from the ſuperficies of the pores or cavities within which the roots are included.

It is certain that the earth is not diveſted of this pabulum by any other means than by the roots of plants, or by actual fire; for where no vegetables are ſuffered to be, the ground will always grow the richer.

Plough it or harrow it as oft as you pleaſe; let it be expoſed to the ſun in horſe-paths all the ſummer, and to the froſts all the winter; let it be covered by water at the bottom of ponds and ditches, or grind it to fine powder; the longer it is expoſed or treated by any or all of theſe methods, or any other poſſible way, except actual fire be uſed, the more fertile it will be.

Thoſe particles which are the pabulum of plants are ſo extremely minute and light, as not to be ſingly attracted to the earth, if ſeparated from thoſe parts to which they adhere, or with which they are in contact. They adhere in the earth like duſt to the ſurface of a ſmooth clay, which, tho' you turn it up and down, ſtill remains in its place, as theſe particles do to thoſe parts of the earth, till removed by ſome external agent. The proper agent for this purpoſe is the root of a plant, but this cannot act upon them unleſs they are firſt moiſtened by water; which helps to looſen them, and goes with them into the mouths of the veſſels in the root. It is neceſſary alſo that the nitre of the air come in contact with the matter of this pabulum, in order to relax and render it fit to be ſeparated and imbibed by the roots of thoſe plants which are in the way of it.

As to the ſize of the particles of this pabulum of plants, it is not unlikely that the roots may take in no groſſer ones than thoſe on which the colours of bodies depend; but to diſcover the magnitude of theſe corpuſcles, Sir Iſaac Newton thinks will require a microſcope that will repreſent things five or ſix hundred times bigger than they appear to the eye at a foot diſtance, and that with ſufficient diſtinctneſs.

We are well aſſured, that the fine particles of the food of plants, after they have been received into the bodies of plants, do perſpire thro' their pores in a large quantity, and fly off into the air: this affords us a proof, that they are not to be ſeparated from the parts of the earth with which they are in contact, otherwiſe than by means of plants; for if they could, then all our ſtirring and digging the earth would make it the poorer, by giving them occaſion to evaporate; the contrary of which is found by experience.

Water alone affords in appearance nouriſhment to plants, ſince they will grow in water; but this water is allowed never to be free from earth, and that makes it ſo very nutritive to plants, even when freſh rained down. This is the earthy matter, which is properly the pabulum or food of plants, which is continually in great abundance evaporated from plants and trees into the air, and in a manner fills the whole atmoſphere about them; this is met by and embodied in the watry vapours in their aſcent, and again brought down to the earth in ſhowers of rain with them.

Hence it is no wonder, that rain-water proves ſo very nutritive to plants, ſince it contains the very matter of their food, ready ſeparated from the reſt of the earth, and mixed in that very vehicle with, and by means of which alone it can be received into the bodies of plants, through the mouths of the veſſels of their roots.

The pores, cavities, and interſtices of the earth being of two ſorts, *viz.* natural and artificial, the one affords the natural, the other the artificial *paſture* for plants; all depending on the different nature of the internal ſuperficies of the earth. *Tull*'s Horſehoeing Huſbandry. See the article *internal* SUPERFICIES.

PATA, in zoology, the name by which the Portugueze in Braſil call a large and very beautiful American duck, known among others by its Braſilian name, *ipecati-apoa*. It is nearly of the ſize of the gooſe. See IPECATI-*apoa*.

PATÆCI, in mythology, images of certain gods carried by the Phœnicians on the prows of their gallies. *Hoffm.* Lex.

Herodotus, lib. 4. calls them Παταϊκοὶ. The word is Phœnician, and derived from *pethica*, i.e. *titulus*. See *Bochart*'s *Chanaan*, l. 2. c. 3. but Scaliger does not agree. Morin derives it from Πίθηκος, monkey, this animal having been an object of worſhip among the Ægyptians, and hence might have been honoured by their neighbours. Vid. *infra*.

Mr. Elſner [a] has lately obſerved, that Herodotus does not call the *patæci*, gods; but that they obtained this dignity from the liberality of Heſychius and Suidas, and other antient lexicographers, who place them at the ſtem of ſhips, whereas Herodotus placed them at the prow. Scaliger, Bochart, and Selden [b], have taken ſome pains about this ſubject. [[a] In Mem. de l'Acad. de Berlin, Tom. 2. p. 379. [b] *Gale*, Not. ad Herodot.]

Mr. Morin has alſo given us a learned diſſertation on this head, in the Memoires de l'Acad. des Inſcript. and Belles Lettres, Tom. 1. but Mr. Elſner thinks it defective in point of evidence. He alſo rejects the etymologies of Bochart, Scaliger, and Morin; he himſelf thinks that the *patæci* were the ſame as the Dioſcuri [c], not Caſtor and Pollux, invented by the Greeks, but the Dioſcuri of oriental and higher antiquity. [[c] Children of Jupiter, Διοσκωροι, or Διοσκοροι; for we may meet with both. See *Hemſterhuys* in Lucian. Dialog. Deor.]

Herodotus ſays, the *patæci* reſembled the little ſtatues of Vulcan. Pauſanias tells us they were about a foot high. They were eſteemed the protectors of navigation. See *Eſner*, loc. cit.

PATAGONULA, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: The cup is an extremely ſmall perianthium, divided into five ſegments, and remains after the flower is fallen. The flower conſiſts of a ſingle petal, with ſcarce any tube, the margin of which is divided into five acute oval ſegments. The ſtamina are five filaments of the length of the flower. The antheræ are ſimple. The germen of the piſtil is oval and pointed. The ſtyle is ſlender, and ſlightly bifid; its ramifications are alſo bifid again. This is of the ſame length with the ſtamina, and remains when the flower is fallen. The ſtigmata are ſimple. The fruit is an oval and pointed capſule, ſtanding on a large cup, made up of five long ſegments emarginated, or rimed round their edges. The ſeeds of this plant are yet unknown; but the conſtruction of the cup in which the capſule ſtands is alone a ſufficient diſtinction for this genus. *Linnæi* Gener. Plant. p. 66.

PATANGHI, in botany, a name by which ſome authors have called the tree whoſe wood is the logwood, uſed in dying and in medicine. *Herm.* Muſ. Zeyl. p. 42.

PATE *(Cycl.)*—PATE, in zoology, a name given by the people of the northern counties of England to the *badger*. See the article TAXUS.

PATEE *(Cycl.)* in heraldry, a term uſed by ſome to expreſs a ſort of irregular line, differing from the indented, ingrailed, and all the other regular and common lines, and called by ſome the dovetail line.

It is ſomewhat like the joint called by our joiners by this laſt name, but it is not in general uſe, and is by ſome reckoned among what the French call the *clatte*, a term they have for ſuch irregular lines as they find in old engravings or figures, tho' not in uſe in any arms preſerved to this time. *Niſbet*'s Heraldry. See CLATTE.

PATELLA, *(Cycl.)*—This is a ſmall bone, ſituated above the ſpine of the tibia, reſembling a large cheſnut. It is about half as thick as long, and its length and breadth are nearly equal. It is divided into a baſis, apex, and two ſides, one convex, the other concave. The baſis is the ſuperior and thickeſt part of the bone, and is marked with a very conſiderable muſcular impreſſion, which runs down for a little way on the convex ſide. The apex is obtuſe, and ſerves for the inſertion of a ſtrong ligament, which ties the *patella* to the ſpine of the tibia. The anterior ſide is convex, with ſome ſmall inequalities and furrows upon it. The poſterior ſide is concave, covered with a cartilage, reaching near the apex, and terminating at an unequal cavity or foſſula, which is an impreſſion for the ligament already mentioned. This cartilaginous ſide is parted in two by a ridge which goes between the baſis and apex, and the two parts are exactly ſuited to the pulley of the os femoris, the external part being broader than the internal, which is likewiſe obſervable in the pulley. The *patella* remains long cartilaginous, and in offifying it becomes entirely cellular, except the ſurfaces of its two ſides and the impreſſions. It is connected with the tuberoſity of the tibia by a thick ſhort ligament; and, indeed, it may be looked upon as belonging in a particular manner to the tibia, or as a moveable olecranum; which again may be looked upon as a fixed *patella*. *Winſlow*'s Anat. p. 94.

Fracture of the PATELLA. The *patella* or *knee-pan* is much more ſubject to a tranſverſe fracture than to one in any other direction. The longitudinal fracture of this bone happens more rarely, but when it does, is much more eaſily cured; becauſe the fragments of the bone in this caſe, generally keep in their right places, but when the bone is broken not only tranſverſely, but into ſeveral pieces, the caſe is yet more difficult and dangerous. The cure of this fracture muſt be attempted in this manner: in a longitudinal or perpendicular fracture, the patient muſt be laid upon his back, and, extending the foot, the ſurgeon muſt replace the fragments on both ſides with the preſſure of his hands, binding them up carefully with the uniting bandage; which muſt be applied in this caſe in the ſame manner with that uſed in large wounds in the belly or forehead. But when the *patella* is broken tranſverſely, or into ſeveral pieces, the patient being laid in the ſame poſture, and extending his foot as before, the ſurgeon is with great

care to endeavour with the palms of both hands, aſſiſted by his fingers and thumbs, to bring together and replace the fragments in their natural ſituation; and when that is done, they muſt be retained firmly together, by means of a plaiſter made in form of a half moon, or properly perforated, and then the foot and leg are to be bound up, and placed ſo that they cannot be eaſily moved: but to prevent the bone from being diſplaced again, the patient muſt not uſe his leg till after the ninth or tenth week. *Heiſter*'s Surg. p. 134.

PATELLA *luxated.* The *patella* is moſt uſually luxated either on the internal or external ſide of the joint, tho' phyſicians give accounts of its being ſometimes luxated both above and below it. Whenever the knee itſelf is perfectly luxated, the *patella* can ſcarce avoid being diſplaced at the ſame time, becauſe of its ſtrong connection to the thigh and to the tibia.

The reduction of a luxated *patella* is uſually no great difficulty. The patient is to be laid flat on his back upon a table or bed, or upon an even floor, ſo that his leg may be pulled out ſtreight by an aſſiſtant; when this is ſufficiently extended, the ſurgeon muſt graſp the *patella* with his fingers, and afterwards, by the aſſiſtance of his hand, preſs it ſtrongly into its proper place. This may be alſo poſſibly effected while the patient ſtands upright: when this is done, there remains nothing but carefully to bind up the part, and let the patient reſt for ſome days; ſometimes gently bending and extending his leg in the mean while, that it may not become ſtiff. *Heiſter*'s Surg. p. 171.

PATELLA, the *limpet*, in natural hiſtory, the name of a genus of ſhell-fiſh, the characters of which are theſe: It is an univalve ſhell, of a gibbous ſhape, always fixed in its natural ſtate to a rock or to ſome other hard body, and having its apex or ſummit ſometimes ſharp pointed, ſometimes obtuſe, ſometimes ſtreight, ſometimes crooked, ſometimes whole, and ſometimes perforated. There are ſeveral ſpecies of each of theſe kinds. See Tab. of Shells, N° 1, 2.

Of the *limpet* with a ſharp pointed ſummit, there are the following ſpecies: 1. The pyramidal mucronated *limpet*. 2. The pyramidal furrowed *limpet*. 3. The grey *limpet*: this, tho' a plain ſpecies in its rough ſtate, is very beautiful when its outer coat is taken off by poliſhing. 4. The ten-ribbed *limpet*.

Of the *limpets* with depreſſed heads are the following: 1. The furrowed marbly *limpet*. 2. The nipple *limpet*: this reſembles the nipple of a woman's breaſt. 3. The ſtriated *limpet*, jagged at the edge. 4. The finely ſtriated *limpet*: the lines in this ſpecies are as fine as hairs. 5. The ſtriated and prickly *limpet*: this, when poliſhed, makes a very different figure, and is like a ſhield with variegations of colour like thoſe of tortoiſe-ſhell. 6. The red-ſpotted *limpet*. 7. The red and white ſtriped *limpet*. 8. The goat's eye *limpet*, ſo called from its variegations on its inſide, repreſenting the eye of a goat. 9. The carbuncle *limpet*, ſo called from a glowing red in the ſhell: this is beſt ſeen when the ſhell is poliſhed, and held againſt a ſtrong light. Hiſt. Nat. Eclairc, P. 2. p. 237.

Of the *limpets* with perforated tops we have the following ſpecies: 1. The cancellated open *limpet*. 2. The high-ridged *limpet*. 3. The fine ſtreaked *limpet*, with ſtreaks like hairs. 4. The oblong *limpet*, with two holes: this, when its ſurface is taken off by poliſhing, makes the fine red *limpet* ſeen in many collections; and the ſame ſhell, with the coat juſt eraſed from the ſurface, ſo as not to penetrate to the red part, makes the grey *limpet* with the double aperture, alſo frequently ſeen in the cabinets of collectors. Hiſt. Nat. Eclairc, P. 2. p. 238.

The Latins call this ſhell *patella* from its reſemblance to a diſh, and the Greeks named it *lepas*, as if they meant to call it a ſcale or flake of the ſtone. Indeed this fiſh always adheres to rocks, as if a part of the ſtone; and the rock ſerves it in the place of a ſecond ſhell, to defend it from the injuries of the weather. Aldrovand and Rondeletius have carried this thought ſo far, as to place the *limpet* among the bivalve ſhells; but no author has followed them in this. Bellonius obſerves, that when they are found adhering to ſtones in great numbers, as they frequently are, they reſemble the heads of ſo many large nails driven into the ſtone. Columna diſtinguiſhes four kinds of the *limpet*: the firſt he calls the common *limpet*, becauſe it was moſt common of all the ſpecies about Naples where he wrote; this is of an oval figure and of an aſh colour. The ſecond he calls the great exotic *limpet*: this he had from Spain; it was large and hard, and had ſeveral ribs, which ended into many dents at the verge. The third he calls the wild *lepas*: this is a ſmall *limpet*, of an irregularly oval figure, and of an aſh colour, and has a hole at the top, out of which the excrements are evacuated. The fourth kind he calls the royal *limpet*, becauſe he ſays it is worthy to come to the table of a king: this is rough and has ſeveral holes at the top. The number of holes in the laſt is either accidental, or elſe it is a ſpecies of *limpet* unknown at preſent; the others may be eaſily found among the already mentioned ſpecies. *Bellonius. Fab. Columna* Aquat. et Terreſt. p. 11.

Some *limpets* are concamerated within, or formed into ſeveral diſtinct apartments. Of theſe there are the following ſpecies: 1. The oblong beaked *limpet*. 2. The rounded arched *limpet*. 3. The large Chineſe *limpet*. 4. The *limpet* with a ſtyle riſing within it from the bottom. 5. The irregularly ſhaped longed beaked *limpet*. 6. The ſemi-concamerated *limpet*: this has ſeven remarkable ribs running from its top, which terminate in ſeven ſpines at the baſe. This ſpecies is hence radiated like a ſtar at the verge, and is thence called by ſome *aſtrolepas*.

Of the *limpets* with crooked tops are the following ſpecies: 1. The long and crooked headed *limpet*. 2. The red nipple *limpet*. 3. The grey *limpet*, of an elegant roſe colour within. 4. The *limpet* with a crooked top ending at the limb, and making the whole ſhell thus repreſent, in ſome meaſure, a deeply ſtriated pecten or ſcallop: this is hence called by ſome *concholepas*. 7. The leſs ſtriated *concholepas*.

PATELLA, in the hiſtory of inſects, a name given by Liſter and ſome others to a certain little huſk or ſhell found on the bark of the cherry, plum, and roſe trees, and ſome others, containing an animal within, and uſeful in colouring. Theſe *patellæ* are of a globular form, except when they adhere to the tree, and are of a ſhining cheſnut colour in moſt kinds. The huſk itſelf ſtrikes a very fine crimſon colour on paper, and within it is found a white maggot of no value: this, in time, hatches into a very ſmall but beautiful bee. The whole ſize of this bee is not more than that of half the body of an ant. They have the ſting of bees, and the three ſpots placed in a triangle on the forehead, which are ſuppoſed to be eyes. They are black, and have a large round whitiſh or pale yellow ſpot upon the back. The upper pair of wings are ſhaded and ſpotted, but the under pair are clear.

The ſhells or huſks deſerve a trial, to find whether the colour they yield might not be brought to uſe; it is to be obſerved, that the deepeſt coloured huſks afford the fineſt and deepeſt purple: they muſt be alſo uſed while the creature contained in them is in the maggot form; for when it is changed into the bee ſtate the ſhell is dry and colourleſs. Dr. Liſter, who firſt obſerved theſe *patellæ*, went ſo far on the comparing them with the common kermes, as to declare that they were of the ſame nature with that production; but his hiſtory of their being the workmanſhip of a bee, to preſerve her young maggot in, is not agreeable to the true hiſtory of the kermes; for that is an inſect of a very peculiar kind. This author has been too juſtly cenſured for his precipitancy of judging of things, and perhaps has fallen into an error by means of it here.

It is very poſſible that theſe *patellæ* may be the ſame ſort of animal with the kermes, but then it produces its young within this ſhell or huſk, which is no other than the ſkin of the body of the mother animal; but as there are many flies, whoſe worms or maggots are lodged in the bodies of other animals, it may be, that this little bee here deſcribed may love to lay its egg in the body of the proper inſect here deſcribed, and the maggot hatched from that egg may eat up the proper progeny, and undergoing its own natural changes there, iſſue out at length in form of the bee. This may have been the caſe in ſome few which Dr. Liſter examined, and he may have been miſled by this to ſuppoſe it the natural change of the inſect. Phil. Tranſ. N°. 72.

PATELLA *fera*, the wild *limpet*, a name very improperly given by Rondeletius and Aldrovand to the *auris marina*, or *concha veneris*. This is by no means of the *patella* kind. See the article EAR-*ſhell*.

PATENT-*leaf*, among botaniſts. See LEAF.

PATER *patratus*, among the Romans, the firſt and principal perſon of the college of heralds, which formed a kind of board or council to examine the differences that aroſe between neighbouring ſtates, and endeavour amicably to accommodate the ſame. *Danet* in voc.

PATETÆ *uvæ*, a name given by the antients to grapes dried on the vine. See PATETHISÆ.

PATETHISÆ *uvæ*, a name given by the antients to grapes which were ſuffered to remain on the vine till they were greatly dried and withered. They were alſo called *patetæ uvæ*, and were ſuffered to hang thus to make a peculiar wine called *paſſum*.

PATH (*Cycl.*)—PATH-*fly*, the name given by us to the fly called in Latin *humiſuga*; it is found in foot-paths, and ſuppoſed to live by ſucking the ground. It is of a grey colour, ſtreaked with duſky white. See HUMISUGA.

PATHOGNOMIC *ſigns*, in medicine. See ASSIDENT.

PATIENCE, in botany, the name by which ſome people call the monks rhubarb; but the French, from whom we have borrowed the word, mean by it all the ſpecies of the *lapathum* or dock kind. See the article LAPATHUM.

PATIENTIÆ *muſculus*, in anatomy, a name given by Spigelius to a muſcle of the ſhoulder, which he alſo calls by the more expreſſive name of *ſcapulam attollens*. The French call it the *releveur propre de l'omoplate*, and Albinus, Morgagni, Cowper and others *levator ſcapulæ*.

PATIN-*ſhoe*, in the manege, a kind of horſe-ſhoe, under which is ſoldered a ſort of half ball of iron, hollow within. It is uſed for hip-ſhot horſes, and put upon a ſound foot, to the end, that the horſe not being able to ſtand upon that foot without pain, may be conſtrained to ſupport himſelf upon the lame foot, and ſo hinder the ſinews to ſhrink, and the haunch to

dry up. We likewiſe clap *patin-ſhoes* upon horſes that are ſprained in the ſhoulders.

PATIS, in zoology, the name of a ſmall ſea-bird, deſcribed by Oviedus, and ſeeming to be the ſame with the ſtormſink deſcribed by Hoier in his epiſtle to Cluſius. It is a little larger than our ſparrow, and ſkims the ſurface of the water very nimbly, and is ſuppoſed a fore-runner of ſtorms.

PATLAHOCA, in botany, the name given by ſome authors to the tree which produces the reſin, commonly called *gum-copal*. *Hernand*, p. 46.

PATREZ, a name for a ſort of vermichelli, a paſte made of flour and water, and formed into beads. This and all other kinds of vermichelli are often ſtained with ſaffron.

PATRICIDE, *patricidium*, the ſame with *parricide*. See the article PARRICDE, *Cycl.*

PATRIMI *and* MATRINI, among the Romans, children whoſe father and mother were both living.

It was by a certain number of theſe that hymns were ſung to ſupplicate the gods. V. *Liv.* 37, 3.

PATTALIA, in natural hiſtory, a word uſed by Ariſtotle and the reſt of the old Greek writers, to expreſs a ſtag or deer of two years old. The interpreters of Ariſtotle have generally rendered this by the Latin word *ſubulo*; but that is of a very vague and uncertain ſenſe, and this Greek word of a very determinate one, never being uſed to expreſs any animal except the ſtag at this age. Pliny and the Roman authors in general uſe the word *ſubulo*, indeed, ſometimes for a young ſtag; but they oftener uſe it to expreſs that imaginary beaſt the oryx or unicorn. Pliny ſays, that nature has given this animal *cornua ſimplicia*, ſingle horns, as it is generally underſtood to mean; but the phraſe may as well be tranſlated plain, uniform, and unbranched horns. The word may have been thus uſed to diſtinguiſh the horns of this creature, whatever it was, from the ſtag, and not to imply that each of them had only one horn: in this ſenſe, however, it is no proper tranſlation of the word *pattalia*, which ſignifies a ſtag of a certain age, not any other animal.

PAVANA, in botany, the name of the plant which produces the *grana tiglia* of the ſhops. It is a ſpecies of *ricinus*. *Jonſ.* Dend. p. 458. See RICINUS.

Pavana-wood, when freſh, operates very violently, both by vomit and ſtool: when dried, it is much more gentle, never vomiting at all; but at preſent it is ſcarce heard of in the ſhops.

PAVIA, in botany, the name of a genus of plants deſcribed by Boerhaave and Linnæus, the characters of which are theſe: the perianthium conſiſts of one leaf, and is coloured, of an oval figure, and divided into five obtuſe ſegments at the edge. The flower conſiſts of five oval petals, the upper ones longer than the others; the longeſt of all are very long, and are inſerted into the cup. The ſtamina are eight ſubulated filaments, ſomewhat crooked, and of the length of the flower. The antheræ are roundiſh, the germen of the piſtil is of an oval figure, the ſtyle is ſubulated, and the ſtigma acute. The fruit is a coriaceous turbinated capſule, of an obtuſely four ſquare form, compoſed of four valves, and containing four cells; in each of which is contained a ſingle roundiſh ſeed. *Linnæi* Gen. Pl. p. 158.

PAVICULA, among the Romans, a rammer, or inſtrument for beating down and levelling a ſpot of ground.

It conſiſted of a block of wood one foot long and half a foot thick, with a long handle. *Pitiſc.* in voc.

PAVILIONS, among jewellers, the under ſides and corners of the brilliants, lying between the girdle and the collet. *Jeffries* on Diamonds. See GIRDLE, *&c.*

PAULA *gumda*, in natural hiſtory, a name given by the people of the Eaſt Indies to a ſpecies of foſſil of the *oſteocolla* kind, found in ſome ſprings, the waters of which are loaded with ſpar. Theſe people uſe it in medicine, giving it in milk for gonorrhœas, and that with good ſucceſs.

PAULADADUM, a name given by ſome authors to the medicinal earth of the iſland of Malta, called *terra melitenſis*, and *gratia ſancti Pauli*. Some have given this name alſo to a ſpecies of white bole found in ſome parts of Italy, which is made into cakes, and ſealed, and ſerves in the place of this and other white earths.

PAULINIA, in botany, the name of a genus of plants, according to Linnæus, taking in the *ſeriana* and the *cururu* of Plumier. The characters are theſe: the perianthium is compoſed of four oval and expanded leaves, and remains when the flower is fallen. The flower conſiſts of four oblong and cordated petals; theſe ſtand expanded, and are of twice the bigneſs of the leaves of the cup. The ſtamina are eight ſimple and ſhort filaments. The antheræ ſmall. The germen is three cornered, obtuſe, and of a turbinated form. The ſtyles are capillary, and are three in number, and very ſhort. The ſtigmata are ſimple and broad. The fruit is a large three cornered capſule, compoſed of three valves, and containing three cells, in each of which is a ſingle ſeed of an oval figure. The difference between the *cururu* and *ſeriana* of Plumier is, that the *ſeriana* produces its ſeeds in the baſe of the cells, and the *cururu* in the cells of them. *Linnæi* Gen. Pl. p. 170. *Plumier* Gen. 35.

PAUNCH, or PANCH, on ſhip-board, thoſe matts made of ſinnet, which are made faſt to the main and fore yards, to keep them from galling againſt the maſt.

PAVO, *(Cycl.)* The *peacock*, in the Linnæan ſyſtem of zoology, makes a diſtinct genus of birds of the *gallina* kind; the diſtinguiſhing characters of which are, that the feet have each four toes, and the head is adorned with an erect ornament of feathers, in form of a plume. *Linnæi* Syſtem. Naturæ, p. 47.

PAVO, in ichthyography, the *peacock-fiſh*, one of the larger ſpecies of the *turdus*, or *wraſſe*, but of a middle nature between the long and the flat bodied kinds. Its uſual ſtandard, as to ſize, is about three pounds weight; and its colour on the back a mixture of blackiſh and a duſky blue: the blue is diſpoſed in three or four longitudinal parallel lines, on a duſky blackiſh ground; about the head and gills the blue lines are more bright and numerous. Its lower jaw is almoſt wholly blue, and its belly is of a fine ſaffron colour or reddiſh yellow. It has thick lips, and very ſharp tho' not very large teeth. Its back fin is, on the anterior part, of a fine deep blue, with an edge of purple, and ſometimes of yellow; and the reſt of the fin is red at the bottom and yellow at the top, and in the middle is finely variegated with blue ſpots. The foremoſt nerves of the back fin are rigid and prickly, and have ſoft and flexile rays accompanying them beyond the limb or edge of the fin, and of more than their own length. Its gill-fins are a mixed red and yellow, and its belly-fin behind the anus of a pale fleſh colour, with a variegation of blue and yellow. The other belly-fins are of the ſame colours, and the tail is wholly blue. It is a moſt remarkably beautiful fiſh, and from the ſpots and variegations of its fins has obtained its name. *Ray*'s Ichthyol. p. 321. See Tab. of Fiſhes, N° 59.

PAVONIUS-*lapis*, the *peacock ſtone*, a name given by Ludovicus Dulcis, and other writers of his time, to a ſtone of which they ſay many idle things, ſuch as its having the virtue of gaining a perſon's love to another, and the like. They have left us no deſcription of it, but probably it was one of the variegated agates.

PAURAEDRASTYLÆ, in natural hiſtory, the name of a genus of cryſtals. The word is derived from the Greek παυρος, a few, ἕδρα, a ſide or plane, the privative particle α, not, and στύλος, a column; and expreſſes a foſſil compoſed of but a few ſides or planes, and having no column.

The bodies of this genus are cryſtals compoſed of two pyramids joined baſe to baſe, without the intervention of a column; theſe being both hexangular, and conſequently the whole body compoſed only of twelve planes; the others of the ſame ſtructure being compoſed of ſixteen. *Hill*'s Hiſt. of Foſ. p. 167.

Of this genus there are only four known ſpecies: 1. A whitiſh one with ſhort pyramids, found in many parts of France. 2. A brown one, with long pyramids, found in great plenty in ſome parts of Scotland. 3. A crooked or ſlanting one, very clear and colourleſs: this is common both in the Eaſt and Weſt Indies, but no where ſo plentiful as in New Spain. And, 4. A bright and blackiſh one, with very ſhort pyramids: this is found in Italy, Germany, France, and England, but with us is uſually met with very ſmall. It is commonly found in cluſters together. See Tab. of Foſſils, Claſs 3.

PAUSANIA, Παυσανια, in antiquity, a feſtival in which were ſolemn games, wherein freeborn Spartans only contended. It had its name from Pauſanias, the Spartan general, under whoſe conduct the Grecians overcame Mardonius in the famous battle at Plateæ, there being always an oration in praiſe of him. *Potter*, Arch. Græc. B. 2. c. 20. T. 1. p. 424.

PAUSEBASTOS, in natural hiſtory, the name of a beautiful ſtone dedicated to Venus, and called alſo *paneros*. It ſeems to have been a beautiful agate.

PAUSICAPE, Παυσικαπη, among the Athenians, a kind of puniſhment. A round engine was put about the neck in ſuch a manner, that the ſufferer could not lift his hand to his head. *Potter*, Archæol. Græc. T. 1. p. 131.

PAUSIS, a word uſed by the old phyſicians for a remiſſion in acute diſeaſes.

PAUXI, in zoology, the name of an American bird deſcribed by Nieremberg, and ſeeming to be the ſame with the *mitu* of the Braſilians deſcribed by Marggrave, and with the *tepetototl* of Nieremberg: the whole difference is, that this, inſtead of a creſt, has a fleſhy protuberance at the baſis of its bill; this is of the ſhape of a pear and as hard as a ſtone, and is of a beautiful turcois colour, or fine pale blue. *Ray*'s Ornithol. p. 305. See the article MITU.

PAW, *(Cycl.)* in the manege. A horſe is ſaid to *paw* the ground when his leg being either tired or painful, he does not reſt it upon the ground, and fears to hurt himſelf as he walks.

PAWLE, in a ſhip, a ſmall piece of iron bolted to one end of the beams of the deck, cloſe to the capſtan; but yet ſo eaſily as that it can turn about. Its uſe is to ſtop the capſtan from turning back, by being made to catch hold of the whelps; therefore they ſay, *Heave a pawle*; that is, heave a little more for the *pawle* to get hold of the whelps; and this they call *pawling the capſtan*.

PAWN *(Cycl.)*—PAWN, among miners, is a pledge of money put into the bar-maſter's hand, at the time when the plaintiff cauſes

cauſes the bar-maſter to arreſt the mine. *Houghton*'s compl. Miner in the Explan. of the Terms.

PAYING, in the ſea language. When the ſeams of a ſhip are laid over with a coat of hot pitch, it is called *paying her*; and when this is done with canvas, *parcelling*. Alſo when after ſhe is graved, and her ſoil burned off, a new coat of tallow and ſoap, or one of train oil, roſin and brimſtone, boiled together, is put on her; that is called *paying of a ſhip*. They ſay alſo ſometimes, when in tacking about, a ſhip's ſails being back ſtayed, fall all flat againſt the maſts and ſhrouds, *ſhe is paid*.

PEA, *piſum*, in botany. See PISUM.

Chick-PEA. See the article CICER.

PEACH, *perſica*, in botany. See PERSICA.

The curious in fruits account twenty-eight ſorts of *peaches*, but many of them ſeem very trifling diſtinctions. The fineneſs of this fruit, in general, depends on the firmneſs of the pulp, the delicacy of the flavour, and the thinneſs of the ſkin. A fine *peach* ſhould be of a fine deep red next the ſun, and of a pale whitiſh hue next the wall; and the pulp ſhould be of a yellowiſh caſt, and very juicy; and the ſtone ſhould be ſmall, tho' the fruit in general be large.

The varieties of the *peach* are produced like thoſe of the finer flowers, by ſowing the ſeeds; and tho' many raiſed this way will be of little value, as is alſo the caſe in flowers, yet probably among a parcel of ſtones, ſaved from the finer kinds of *peaches*, there would be ſome new kinds produced; which, as they were raiſed here, would be eaſily kept up in their perfection; which is not to be expected of thoſe brought from other countries.

The beſt method of ſaving the ſtones is, to let ſome of the fineſt *peaches* of the beſt kinds hang till they drop of themſelves from the tree, and then the ſtones ſhould be immediately planted on a bed of light rich earth, planting them four inches deep in the earth, and at about ſix inches aſunder. The beds ſhould be covered, to preſerve them in the winter; and in ſpring, when the trees come up, they muſt be cleared of weeds, and well watered. The next ſpring they ſhould be carefully taken up, and planted in the nurſery, at greater diſtances; and after two or three years ſtanding here, they may be removed to the places where they are to remain; or they may at that time, when the condition of their fruit is known, be grafted on other ſtocks, which is the common way now uſed to propagate theſe trees.

The common method of propagating the *peach* is, by grafting. In order to this, ſome good ſtocks ſhould be provided, which ſhould be of the muſcle, or white pear-plum. When theſe ſtocks are two or three years old, they will be ſtrong enough to bud; and the common ſeaſon for doing this is about Midſummer. The buds ſhould be choſen from a healthy tree, which produces a great deal of fruit: they muſt be taken from the trees either in a cloudy day, or elſe in the morning or evening, when the ſun has not much power: they ſhould be then inoculated on the ſtocks as ſoon as poſſible, and the ſtocks treated with the uſual care afterwards. See INOCULATION.

When theſe are to be tranſplanted where they are to remain, the moſt proper ſoil for them is, a light rich paſture-land, taken up with the turf, and rotted together, before it is to be uſed; and the borders to be made with this cannot be too wide, and ought to be raiſed five or ſix inches above the level of the ground; or if the ſoil be moiſt, more than that. They muſt be tranſplanted in autumn, as ſoon as the leaves are fallen off; and ſhould never be ſet at leſs than fourteen feet diſtance from one another. The heads of the trees are then to be raiſed up againſt the walls, to keep the roots from being moved by the wind; and they ſhould be watered at times, with a noſe on the watering pot, and the water ſprinkled all over them. In the middle of May the new ſhoots are to be nailed to the wall, training them horizontally; and the foreright ſhoots are to be rubbed off: in October the new branches ſhould be pruned, ſhortening them according to the ſtrength of the tree; if ſtrong, they may be left eight inches long; if weak, they ſhould only be left five; and the ſame care is to be taken of them for the ſucceeding years.

There are two general rules always to be obſerved in the pruning of *peach* and nectarine trees, which are, 1. Always to have enough bearing wood. And 2. Not to lay in the branches too cloſe to one another. All *peach* trees produce their fruit from the young wood either of the ſame, or at the moſt, of the former years ſhoot; for this reaſon the branches are to be ſo pruned, as to encourage them to throw out new ſhoots in every part of the tree: and this is to be done in May; when by pinching, or ſtopping the ſtrong ſhoots, there may be new wood forced out in any part of the tree. This is the method of the ſummer pruning; the winter pruning is uſually done in February or March, but is much better done at Michaelmas, as ſoon as their leaves begin to fall; and the wounds will then have time to heal before the ſevere froſts come one.

In pruning of theſe trees it muſt always be obſerved alſo, that it is beſt done under a wood bud, not a bloſſom bud; which may be diſtinguiſhed by the wood buds being leſs turgid and longer, and narrower than the bloſſom bud; for if the ſhoot have not a leading bud where it is cut, it will commonly die down to the leading bud. In nailing the ſhoots to the wall, they ſhould be placed at as equal diſtances as poſſible; and ſo far apart that the leaves may have room; and they muſt always be trained as horizontally as poſſible, that the lower part of the tree may be well wooded, which it will not be if the branches are ſuffered to run upright. *Miller*'s Gard. Dict.

PEACH-*colour*, the pale red colour of the bloſſoms of the *peach*-tree.

To give this beautiful colour to glaſs, add at different times, and in ſmall quantities, the powder of prepared manganeſe to the maſs, for the making of lattimo, or milk-white glaſs while in fuſion. This alone gives the *peach*-colour; but the metal muſt be immediately worked when of a right tinge, for the colour is very apt to go off. *Neri*'s Art of Glaſs, p. 99. See the article LATTIMO.

PEACH-*colour*, in the manege. See BLOSSOM.

Wolf's PEACH. See LYCOPERSICON.

PEACH *flowers*. Theſe are uſed as a purge for children, made into a ſyrup, and are by ſome recommended as great deſtroyers of worms; but there is a circumſtance attending them which is little taken notice of, and yet greatly alters their virtue. The cuſtom of gardeners is, to graft the *peach* upon the almond, or the plumtree, and the flowers partake of the nature of the ſtock; thoſe which are produced on *peach*-trees grafted on plum-ſtocks, being much more purgative than thoſe from almonds; the reaſon of which ſeems plainly, that the plum is a purgative fruit, the almond not at all ſo. The flowers of the leaſt eſteemed ſorts of *peaches* are alſo uſually found to be the beſt for medicinal uſe.

In examining theſe flowers, they are found to contain more than three fourths of a ſuperfluous humidity. The buds contain a little leſs than the blown flowers; which is very natural to ſuppoſe, becauſe it is their being afterwards charged with a larger portion of humidity which makes them open. The buttons, or buds of the flowers, are found on experiment, however, to be ſomewhat more purgative than the flowers when open.

If four pounds of theſe flowers are diſtilled in a *balneum mariæ*, they yield 12 or 13 ounces of a whitiſh liquor, ſweet to the taſte, and of an agreeable ſmell, reſembling that of bruiſed *peach* kernels; and this is ſo ſtrong in the water, that a few drops of it will very agreeably ſcent a larger quantity of any thing. If the buds are uſed to this purpoſe, inſtead of the open flowers, the ſame ſort of liquor is drawn over; but it is of a ſomewhat coarſer and more earthy ſmell. The reſiduum of theſe diſtillations put into a retort, and diſtilled by a reverberatory fire, gradually raiſed to its ſeveral degrees, yields both acid and alkaline ſubſtances; and, finally, a red ſpirit comes over, full of fuliginous particles, and containing ſome oil, part of which ſwims at the top of the liquor, and the other part which is heavier, ſinks to the bottom. This is what a chemical analyſis ſhews in theſe flowers, different from other vegetable matters. Spirits of wine draws a very weak tincture from theſe flowers; it is indeed much weaker than an infuſion of them in common water. An infuſion in water of half an ounce of freſh *peach*-flowers, or of a dram of dry ones, (for, as before obſerved, they contain three fourths of ſuperfluous moiſture) is a very gentle and agreeable purge. This method of infuſion is much better for theſe and all other purgative flowers, than the taking the expreſſed juice; for in that caſe there is always a large quantity of purgative matter remaining in the reſiduum; which water in a warm infuſion is able to take out. The infuſion of roſe or *peach*-flowers, keeps alſo better than their expreſſed juice. The juice always turns ſour very ſoon, but the infuſion, with the common caution of pouring a little oil on the ſurface, will keep good even for years.

When oil is uſed to this purpoſe, there ſhould always be care taken that it be ſuch as does not freeze eaſily; for in that caſe the air gets in between the cake of frozen oil, and the ſides of the veſſel, and ſpoils the liquor. Oil of almonds is greatly to be prefered to oil of olives on theſe occaſions; as it freezes with much more difficulty. Another way of preſerving the infuſions is, the evaporating about half the liquor; and thus they will often keep a long time: infuſions keeping better than the juices of plants, ſeems to ſhew, that the former contains more of the principles than the latter.

The young leaves of the *peach* made into an infuſion in the ſame manner as the flowers, are more purgative than they, but leſs agreeable; they are to be taken in the ſame manner. Mem. Acad. Par. 1714.

PEACH-*gall-inſect*, in natural hiſtory, a ſmall *gall-inſect*, found in great plenty on the *peach*-tree. It is of an oblong figure, flat at the belly, and prominent on the back; pointed, and not unaptly reſembling in miniature a ſmall boat turned bottom upwards. Their longer diameter is uſually extended in the ſame direction with the length of the branch; ſometimes a little obliquely, but ſcarce ever perpendicular to that direction. Their exterior ſkin, the only part of them one ſees, as they are attached to the tree, is very like the fine, thin,

and

and glofſy outer bark of many trees, as that of the cherry, &c. Their colour is uſually a faint brown, ſometimes it approaches to a coffee colour, ſometimes to a bright cheſnut, but more frequently it has ſomething reddiſh in it.

The young ſhoots of the *peach*-tree are often covered with theſe on all ſides; ſometimes they are more diſtant and fewer in number. All that one ſees of this kind at this ſeaſon have the ſame lifeleſs appearance, and all appear perfectly motionleſs; but they are, however, of very different ſtates and conditions, for uſually ſome are in full life and vigour, others already dead, and others even the ſpoils of thoſe of a former ſeaſon, which remain in the places on which they died without the leaſt ſenſible alteration in their appearance. Thoſe, however, on the old wood may be judged to be dead ones, but thoſe on the branches of the preſent year are uſually found alive and well. The dead ones, if touched, appear as a mere film, and fall off in their ſcales from the branch; but the others, if cruſhed, yield a viſcid juice, like that from the cruſhing of other living inſects. The living animal is at this ſeaſon ſo cloſely affixed to the tree, that it is not eaſy, by the fingers alone, to ſeparate them without deſtroying them; but with caution they may be eaſily raiſed unhurt, by getting the point of a knife between them and the bark: in this caſe, the part of the tree from whence they are raiſed is ſeen covered with a cottony matter. The belly of the animal, which is naturally applied againſt this downy matter, is at this ſeaſon puffed up, as it were, and ſeems as full as it can well hold. A little later than this ſeaſon, if others are raiſed from the tree, it is then leſs eaſy than before to know them to be animals.

If in a fortnight, or a little more, after the time of their being as full as can be, they are removed from their place, they then make no other appearance than that of one of thoſe dead and dry ones before mentioned, no more of the full fleſhy appearance is to be ſeen, but they appear merely a thin flake of tortoiſe ſhell, or ſome other ſuch ſubſtance, covering a vaſt number of ſmall bodies cloſe lodged together, but as looſe from one another as ſo many grains of ſand, and fall to the earth on raiſing the ſhell, unleſs it be done with great care.

Theſe ſmall bodies are ſomewhat reddiſh, and when examined by the microſcope, the oval figure of them will not let one doubt but that they are eggs; and the whole inſect might now appear to any one no other than a caſe prepared by ſome animal for the ſafety of its eggs. A little afterwards, if the animals in this ſtate be examined, the ſhell is found, inſtead of eggs, filled with ſmall living inſects, among a quantity of looſe powder. No more eggs are found entire: theſe are the animals hatched from them, and the ſhells are what now make the looſe powder.

The galls, and ſuch excreſcences on vegetables, are always found pierced with holes, out of which the fly iſſues, which, in its worm ſtate, had been nouriſhed there; and that there might be no reſemblance wanting in theſe creatures to galls, their ſkins are often found pierced in two or three different places, nay, and flies are ſeen ſometimes iſſuing out of theſe, which had lived within them in the worm ſtate. That theſe are of a certainty animals, and not galls, is evinced, however, beyond doubt and diſpute, by raiſing one of them in an intermediate time between that of its being found full of eggs, and that of its appearing only diſtended and ſwelled; becauſe in this interval the animal will be found in the act of laying them, and may be ſeen doing ſo.

The young animals hatched from theſe eggs are for many months ſeen in the condition of other ſmall inſects; but as they become full of eggs, they ſwell, and, by degrees, loſe their true ſhape: they grow in ſize as theſe eggs grow in them, and when full grown and ready to lay, their bellies are ſmooth and even, and the rings of which they are compoſed are not to be diſtinguiſhed: in another ſtate it is eaſy to diſtinguiſh theſe; they are five in number, and the paſſage for the eggs is in the laſt. The animal has ſix legs, which not having been uſed of a long time, are found cloſely applied to its belly; and a little above the firſt pair there may be ſeen a ſmall prominence, which is the part by which the creature takes in its nouriſhment. The cottony bed that lies under theſe inſects on the tree, ſhews extremely plain the impreſſions of all the parts of the animal; the legs, rings, &c. are eaſily diſtinguiſhable here.

It is a general law of nature, that inſects periſh when they have done all that was neceſſary for the multiplying of their ſpecies; that is the caſe alſo with this little animal. It lives but a little while after it has laid its eggs, and its dried body makes an excellent covering and defence for them; and what is very remarkable is, that as this inſect is now immoveable, and cannot draw itſelf over its egg, they are not thrown out behind its body, as the eggs of other animals; but as they are laid, are drawn under the belly, and evenly arranged there. The eggs are ten or twelve days before they hatch, and when hatched, the young animals remain quiet under the cover of their mother's carcaſs for ſeveral days.

After ſome time, when their parts are duly ſtrengthened, they get out and enjoy their liberty: theſe new-born inſects are ſo extremely ſmall, that it requires a microſcope to obſerve them; but they are in nothing like what their parent was, or what they are to be hereafter; they are very nimble and active, and march backward and forward with prodigious ſwiftneſs. There is now nothing ſingular in their form; they are ſomewhat flattiſh, and of an oval figure, and have two horns or antennæ, as well as their ſix legs, very eaſily diſtinguiſhable. The number of young ones hatched by each parent is very great, often not leſs than four thouſand. The young ones have an eaſy paſſage from under the ſhell made of their parent's body in this, that the hinder extremity of that ſhell is ſplit, and is not, as are all the other parts, faſtened to the branch.

It has been ſuppoſed, that the young *gall-inſects* eat up their mother's body, and eat holes through it to get out; but this is by no means the caſe; the opening already mentioned gives them a free paſſage, and the holes we ſometimes ſee on the backs of theſe animals are ever made by extraneous animals, ſmall flies, which have in the worm ſtate grown and been nouriſhed within the body of the animal, as they do in the bodies of caterpillars and many other inſects; and which, when hatched into the fly ſtate, make themſelves theſe holes for their eſcape.

It is uſually about the beginning of June that the young inſects get at liberty from under the body of their parent; they may then be found running very nimbly all over the branches of the tree, but are not diſtinguiſhable otherwiſe than by examining the branches with a microſcope. The branches thus covered with theſe young animals, are in a few days cleared again, and the inſects found in form of ſmall ſcales, covering the leaves, and now large enough to be ſeen by the naked eye. They are of different colours; ſome white, ſome yellow, ſome greeniſh, and ſome reddiſh: and in this ſtate they are ſo very flat, and withal ſo immoveable, that they may naturally be miſtaken for the ſkins quitted by ſome inſects; but on cruſhing them with one's nail, a yellowiſh juice is always ſqueezed out, which ſhews them to have been real animals; but the greateſt proof of it is to be had from obſervation, for after ſome time they will be found again very ſwiftly in motion.

Thus theſe little animals, after being hatched on the branches, run over them in ſearch of the leaves for nouriſhment: they do not eat theſe, however, but ſuck the juices from their veſſels by a fine trunk, and it is only while they are employed in this that they in this ſtate appear immoveable. Theſe trunks are placed a little above the firſt pair of legs; but we are not to look for them in the young inſects, it is only in the full grown ones that they are diſtinguiſhable, and in thoſe not without difficulty. In theſe, however, with attention, one may obſerve in this part a ſmall hollow, or ſhort fleſhy pipe, out of which the inſect can at pleaſure thruſt a fine white trunk, as ſmall as a fine hair, and of half the length of its body.

The more careful gardeners always clear their beſt fruit-trees from theſe inſects, eſpecially their orange-trees, well knowing that they drain the juices of the tree, and will ſometimes even kill it. This is not to be ſuppoſed owing to what juices they take in for their nouriſhment alone, but they occaſion the waſte of a vaſt deal beſides: under ſeveral *peach*-trees, and particularly under diſtinct parts of them which are loaded with theſe *gall-inſects*, it is common in the middle of May, or between that and the beginning of June, to ſee the earth as wet as if newly watered, while that all about is dry; a very large quantity of the juices of the tree continually making their way through the holes left by the trunks of theſe innumerable little animals. At the ſame time that one finds the young *gall-inſects* on the leaves, one finds them alſo on the young ſhoots of the *peach*-trees, and the reaſon is the ſame, that theſe parts are more eaſily pierced by the tender organs of the young animals than the branches and harder parts of the tree. Their backs in this ſtate are not ſmooth and even, but, examined by the microſcope, are found to be wrinkled and channelled in a beautiful and regular manner.

Not only the *gall-inſects* of the *peach*, but all the other ſpecies, after a certain time, become immoveably fixed to the place where they are, and no longer able to uſe their legs. Their growth is very ſlow from the time of their hatching, through the months of July, Auguſt, September, and October; at the beginning of November they are found ſomewhat enlarged in breadth, but they are yet no thicker, and at this time they are all become of the ſame colour, which is ſomewhat reddiſh.

In the beginning of March they begin to ſwell and be filled with the growing eggs; their backs become a little convex, and, viewed with a microſcope, appear covered with little tubercles; and one may, at this time, perceive ſeven or eight long threads, which run from ſeveral parts of their bodies: theſe faſten themſelves to the branch at a diſtance from the creature, and fix it immoveably in its place. In the beginning of April they become much more convex, and tho' they can no longer walk about, they yet have at this time ſufficient motion to ſhew an animal life. At this time, by very ſlow motions, they change their ſkin; and it is after this change that they aſſume ſo exactly the figure of galls, and grow ſo very quickly to their full ſize. Seven or eight days now make ſuch a change in them, that they are not to be known for the ſame animal; but it is not till the beginning of May that they ar-

rive at their utmoſt ſize. About the 15th of May they are in a condition to lay, and as the eggs are diſcharged, the belly is puſhed cloſer and cloſer to the back; and when all are laid, becomes the ſhell before deſcribed, and the young ones are hatched under it, and become full of eggs, and do the ſame office afterwards to their young.

One great difficulty, however, is to conceive by what means they are fecundated: ſome have imagined them each to be male and female in the ſame individual, and hermaphrodites of a very ſingular kind; for as in ſnails, worms, and ſome other inſects, which are both male and female in the ſame individual, there ſtill is the congreſs of another animal of the ſame ſpecies required for propagation; in theſe it ſhould ſeem, on the contrary, that one alone was ſufficient. Others imagine them males and females, as other animals, and that they perform theſe offices during the three or four firſt days after they are hatched, while they are running on the branches. Had theſe obſervers known that the animals were in a condition to move during all the winter months, that is during the greater part of their lives, they would not have been reduced to the improbable conjecture of their performing this office as ſoon as produced: the truth is, however, that it is not known that they do it at all, theſe obſervers never having ſeen the thing, but only judging it an indiſpenſible neceſſity; but a cloſe obſervation will furniſh grounds for an opinion of another kind.

In the end of April the branches of the *peach* and other trees covered with theſe inſects, will be found to be greatly frequented by a ſort of ſmall flies, beautiful enough to demand attention: their head, breaſt, body, and legs are all of a deep red; they have only two wings, but thoſe very large, being nearly twice as long as their bodies: theſe, in the fly's common poſture, are croſſed on the back, and the upper almoſt entirely hides the under one; they are leſs tranſparent than thoſe of the common flies, and are of a duſky white, bordered with an edge of a fine bright and beautiful red: but what chiefly diſtinguiſhes them from all other ſpecies is, that they have two long white threads which run from their hinder part, and are of twice the length of their wings; between theſe there is alſo a remarkable part, a ſort of tail made like a piercer, and of a third or fourth part of the length of theſe threads. This is like all other ſtings, thicker at its baſe than at its point, and is bent a little downwards.

The antennæ of this fly are adorned with long bodies, hairy, and larger at their extremities than at their inſertions on the antennæ. It is eaſy at firſt ſight to conceive, that theſe are the flies that had been produced of worms fed in the bodies of the *gall-inſects* of a former year, and that they were now ſearching an opportunity to depoſit their eggs in the bodies of theſe little creatures, to be hatched into worms there, and thence to come out in flies, as they themſelves before had done.

The piercer at their tails made this the more probable, as it ſeemed to refer them to the ichneumon claſs; but a cloſer attention to the whole progreſs of theſe inſects will give much more room to believe, that theſe flies are the male *gall-inſects*. They are, indeed, very ſmall in proportion to the females, but this will give the judicious naturaliſt no cauſe to doubt their being the males of the ſame ſpecies, any more than their having wings and the females not; ſince the ſame difference and diſproportion is found in beetles and many other inſects; the colour of their juices, when cruſhed, and their ſmell, are in both exactly the ſame. And another obſervation adds greatly to the probability, which is, that many branches of the *peach*-tree are ſo loaded with the young *gall-inſects* that have newly fixed themſelves, that one would wonder what muſt become of them when they ſwell in bulk, as there could be no room for their growth on the branch on which they already ſtood ſo cloſe as to touch one another.

But examining theſe branches afterwards, at the ſeaſon when theſe flies appear, multitudes of theſe *gall-inſects* are found converted into mere ſhells, out of which ſomething has eſcaped and gone; and theſe are ſo compleat, and ſeem to have been quitted in ſo very different a manner from the broken ſpoils of the female *gall-inſects*, that there is all the probability in the world of theſe flies having been let out of them, which had before lain there in the form of nymphs: ſeveral of theſe, in the very ſtate of nymphs, Mr. Reaumur found in theſe ſhells; and the whole remaining queſtion is, whether theſe were the proper animal, or whether they were owing to the egg of ſome fly accidentally depoſited there, and hatched in the body of the animal. The former, however, ſeemed on all conſiderations to be the more probable opinion; for no obſervation at a proper ſeaſon will ever ſhew a living worm in the body of the *gall-inſect*: and the manner of the fly's egreſs is not that of theſe unnatural births, which are always by a hole made by the fly; but the ſhell in this caſe readily opens at a proper ſeaſon, and lets out the fly, by parting all round at the commiſſure of the belly and back, which ſeems too natural for any thing but the very manner deſtined for the production of the proper ſpecies.

The flies examined on the branches with a glaſs will alſo be found to introduce this ſeeming piercer always at the ſame place into the body of the *gall-inſect*, and this is that cleft in the hinder part of the body, out of which the young ones when hatched, afterwards find their way. The flies, which lodge their eggs or young worms in the bodies of other inſects, if cruſhed at that ſeaſon, will be always found to contain ſuch eggs or ſmall worms; and the microſcope never fails to diſcover them in the matter cruſhed out of flies even ſmaller than theſe, but in theſe no obſervation ever ſhews any ſuch. See Tab. of Inſects, N° 29

Notwithſtanding that the *peach-gall-inſect* is the only ſpecies in which the male fly has been obſerved, there is no room to doubt but that the other ſpecies all have males of the ſame kind. The orange *gall-inſect* has been obſerved not univerſally fecundated, but that there is only a part of the animals that lays eggs; probably the others are thoſe which hatch into the male flies: and the kermes, the nobleſt and moſt valuable of all the *gall-inſects*, is known often to produce a white winged fly, very like that of the *peach-gall-inſect*. And Brennius, who gave ſome time ſince a hiſtory of the ſcarlet grain of Poland, the *coccus Polonicus*, a kind of *pro-gall-inſect*; tho' in the firſt account he gave into the opinion of both ſexes being included in each of theſe animals, and that each was in itſelf ſufficient for the propagation of its ſpecies: yet afterwards, to his very great honour, he added an account of his having diſcovered the male of this ſpecies, which he deſcribes to be a ſmall fly, with a red body and white wings bordered with red; a fly in all reſpects like the male of the *peach-gall-inſect*.

Theſe flies, carefully examined, and preſſed gently on their belly, and at the ſame time obſerved with a good microſcope, will be ſeen to thruſt out of the part which reſembles the piercer of the ichneumon race, a fine, ſlender and ſoft white thread. Were this in reality the ſame with the piercers of the ichneumons, this part muſt have been hard and horny, to be able to enter hard ſubſtances; on the contrary, it is ever found ſoft and fleſhy, and is undoubtedly no piercer, but the organ of generation in the male inſect.

It is much to be doubted, whether the *gall-inſects*, in form of a boat inverted, are not the ſame ſpecies living on different trees: this is certain, that the animal taken from one tree will live and multiply on another; and the diſtinctions between the ſpecies, even ſo different in their maturity, are often not eaſy while the animals are young, the boat-faſhioned, the orbicular, and the reniform being not diſtinguiſhable till the time they acquire the greateſt ſize, and with that ſize, this their natural figure. The *gall-inſects* of the hazel and lime, which are of the half-round kind of the *peach*, and the perfectly orbicular one of the oak, are all inſtances of this; and all between the time of their being a ſimple flat body, and their acquiring an orbicular or partly orbicular figure, aſſume one much like that of the boat-faſhioned ones. *Reaumur*'s Hiſt. Inſ. Tom. IV. p. 1, to 44.

PEANTIDES, the name of a ſtone to which the antients attributed great virtues for promoting delivery,

Theſe ſtones were found in Macedonia and other places; and all the deſcription we have of them is, that they reſembled water congealed by froſt. Probably the antients meant by this name the *ſtalactitæ*, or ſtony icicles, which, as they hang from the roofs of caverns, greatly reſemble the droppings of water from the eves of houſes congealed in froſty weather.

PEARCH, *perca*, in ichthyology. See PERCA.

PEARCH-*glue*, in mechanics, the name of a kind of glue, of a remarkable ſtrength and purity, the manufacture of which we owe to the Laplanders, from whom Scheffer has deſcribed it. They take a number of large *pearches*, and ſlitting them open, they carefully pick away the fleſh with a knife, ſo as to leave the ſkin pure. They put a number of theſe ſkins into a veſſel of warm water, which they expoſe to the ſun, and by that means keep it in a continual moderate heat for ſeveral days; when the ſcales become looſe by this maceration, they take out the ſkins and rub them clean off. The ſoft and clean ſkin then remains alone, and feels as ſoft as a wetted bladder. Theſe clean ſkins they throw into a ſmall quantity of freſh water, and boil them gently over the fire, ſtirring the whole together, and toward the end beating it forcibly with little ſticks. The ſkins by this means at length wholly diſſolve in the water, and the whole becomes a thick tranſparent liquor; which, when boiled as long as the thickneſs of it will permit, without burning, they pour out on a flat ſtone, and as it cools they cut it into cakes exactly reſembling our glue, but that they want the coarſe reddiſh colour it has, and have no diſagreeable ſmell. When they would uſe this, they diſſolve it in more water, exactly as we do our glue. The bows of this people give us a very great proof of the ſtrength of this ſort of glue: they are made of two pieces faſtened together with it, and tho' put to the moſt forcible trials, as theſe people are very ſtrong, and uſe them in ſhooting bears, rain-deer, *&c.* yet the glue part is never known to ſtart. *Scheffer*'s Hiſt. Lapland.

PEAR, *pyrus*, in botany. See the article PYRUS.

All the ſorts of *pears* propagated in gardens, are produced by budding, or grafting them upon ſtocks of their own kind; which are commonly called *tree-ſtocks*, or elſe upon the quince or whitethorn ſtocks; but the laſt are now generally diſuſed, the fruit produced this way being apt to be dry and mealy. The quince-ſtocks are, however, in great eſteem

for the trees deſigned for dwarfs or for walls; becauſe they do not let the ſhoots grow ſo faſt and luxuriant. But there are objections againſt even theſe, which are of ſome conſequence; for there are many kinds of *pears* which will not do upon them, but will die, or become weak and good for nothing after three or four years; and the hard-breaking *pears* are rendered very unpleaſant by being grafted on theſe ſtocks, while the buttery or melting ones are meliorated by them. And it is to be added, that no ſort of *pear* will thrive upon a quince ſtock in a poor or gravelly ſoil.

PEAR-*trees* planted either againſt walls, or in eſpaliers, muſt not be placed nearer to one another than twenty foot. *Pear*-trees commonly produce their bloſſom-buds firſt, at the extremity of their laſt year's ſhoots; the common way of pruning is very prejudicial, therefore, as it takes off the part which ſhould bear the fruit, and occaſions new ſhoots from the ſame branch, which will over-fill the tree with wood, the trees ſhould always be carefully looked over in ſummer, and all the foreright ſhoots taken off; by which means the fruit will not be over ſhaded, and the trees will need but little winter-pruning. The ſeveral ſorts of ſummer *pears* all ripen beſt in eſpaliers, but the winter *pears* require a ſouth-eaſt or ſouth-weſt, or elſe an eaſt wall. *Miller*'s Gardener's Dict.

It is ſaid that crabs and wild *pears*, ſuch as grow in the wildeſt and moſt barren clifts, and on hills, may make the richeſt, ſtrongeſt, moſt pleaſant and laſting wines that England yields. See Phil. Tranſ. N° 477. Sect. 4.

Indian PEAR, a name given by ſeveral writers to the fruit of a large tree in the Eaſt Indies. The bark of this tree is reddiſh without and white within, and very ſmooth; the leaves are ſmall, thick, and of a pale green; the flower conſiſts of three long triangular leaves, which, when ſhut up, form a ſort of triangular pyramid; this is of a very diſagreeable ſmell. The fruit is alſo of a conic figure, its broad part being joined to the pedicle: this is of a woody texture, and of the thickneſs of one's finger; it divides itſelf into ſeveral filaments, which run thro' the whole body of the fruit. When the fruit is ripe, its rind or ſkin is red, very ſmooth and thin, which is contrary to the common courſe of nature in the Indian fruits, to which nature has given very thick rinds, in order to make them able to bear the great heats they are expoſed to. The inſide of this fruit is full of a white, ſoft, and ſweet ſubſtance, which is uſually ſcooped out with a ſpoon, and is of a very pleaſant taſte: within this fruit there are ſeveral ſmooth, black, kernels, like thoſe of our common *pears*. When this fruit is mellow, the pulpy part of it falls away from the fibres, and they remain hanging to the pedicle for a long time.

Chio PEAR. See CHIO PEAR.

PEARCH, in ichthyology. See PERCA.

PEARLS *(Cycl.)*—Mr. Reaumur was very happy in his conjectures as to the nature, origin, and differences of *pearls*, founded on what he ſaw in the coarſe *pearls* of the *pinna marina*. He very judiciouſly obſerves, on that occaſion, that often the leaſt valued things are thoſe which moſt of all explain, even by their imperfections, the manner of formation and the true hiſtory of the moſt perfect.

The *pearls* found in the *pinna marina*, are of two kinds; ſome being white and gloſſy, like the common *pearls*, and others browniſh, reddiſh, or blackiſh. He very well obſerves, that they are all formed of extravaſated juices; which have made their way out of broken veſſels, and therefore are the effect of a diſtempered ſtate of the animal, and are formed in the manner of bezoars in the ſtomachs of animals, or the ſtones in their bladders. The inner ſurface of the ſhell of the *pinna* is of a ſilvery white, or of the nature of mother of *pearl*, to a certain depth, after which it is reddiſh or browniſh. Theſe are the two colours alſo of the two ſorts of *pearls*.

The ſhells of fiſhes Mr. Reaumur ſuppoſes, are formed merely like thoſe of ſnails, of a viſcous matter, ſecreted from their bodies, which hardens by degrees into a ſort of ſtony texture; and that the *pearls* in this fiſh owe their colour to their being formed of the extravaſated juices of the white or the brown parts of the ſhells. The juices of theſe parts are ſeverally intended to form their part, and the bed or plate of ſhelly matter formed of either, in its proper and natural ſtate, could be only white or brown, as the liquor was coloured; and, conſequently, ſo muſt be the diſtempered production of *pearl*. The breaking of the veſſels of the inner *pearly* coat, both in this and other ſhells, ſeems much more frequent than that of thoſe of the browner external part; and it is eaſy to ſee, that this may much eaſier make its way into the hollow of the ſhell than that from the more outward part; but it is alſo eaſy to ſee that, provided the brown juices of this outer part could be extravaſated, and find their way into the hollow of the ſhell, they could only form *pearls* of their own colour.

In this ſhell of the *pinna marina*, the white or *pearly* inner part is formed of a vaſt number of flat plates or beds, laid one upon another; and the brown external part is formed of tranſverſe fibres, not formed into ſuch plates, but running in long ſtriæ. The *pearls* of the two different colours have alſo this difference in their ſtructure; not but that both the one and the other are compoſed of concentric beds or plates, but theſe are much leſs diſtinguiſhable in the brown than in the white ones; and each of them may in theſe be ſeen to be made up of filaments exactly as the brown part of the ſhell, to the extravaſated juices of which they owed their origin, and whoſe texture therefore they could not but emulate. Mem. Acad. Par. 1708.

PEARLS, in commerce, increaſe in value as the ſquare of their weight: thus, the price of a *pearl* of one carrat being ſettled at 8 s. to find the price of a *pearl* weighing ſix carrats: firſt find the ſquare of ſix, *viz.* 36; which multiplied by 8 gives 288 ſhillings, or 14 l. 8 s. the price required. *Jeffries* on Diamonds, p. 64.

PEARL, in ichthyology, a name given by us in the parts about London, to that fiſh which is called in Cornwall, and other parts of the weſt of England, *lug-a-leaf*; it is the *rhombus lævis* of the generality of authors; and, according to the new ſyſtem of Artedi, it is a ſpecies of the *pleuronectes*, diſtinguiſhed by the author by the name of the *ſmooth bodied pleuronectes*, with the eyes on the left ſide. See the articles RHOMBUS, PLEURONECTES, and LUG-A-LEAF.

PEARL-*barley* affords to the microſcopic obſerver, a peculiar kind of mite worthy attention, and very different from the common ſpecies. The bodies of theſe have ſome brown marks upon them, and have not ſuch long hairs as the common mites have; the hinder part of the body alſo is of a different make. They have eight legs; and before the head there ſtand two weapons twice as thick as the legs, and of about half their length: theſe are divided toward the ends with joints like fingers, and theſe have at their ends a ſort of nails formed with ſharp and crooked claws; and one of the longeſt joints is ſerrated at the edge like a ſaw. Theſe weapons ſerve not only as arms and hands to ſeize hold of things, but they alſo ſerve as a defence; for as ſoon as any danger threatens the creature's head, it erects them both, and makes them meet and fold into one another over the head, as we can join our hands and fingers together in the ſame erect poſture. Phil. Tranſ. N° 222.

PEARL *colour*, in glaſs. This beautiful colour is given to glaſs in the following manner: Put tartar calcined to a whiteneſs into putrified cryſtal, while in fuſion, at ſeveral times, in ſmall quantities, mixing it well every time, till the glaſs is become of the deſired colour; and when it is, work it as quick as can be, for it is a colour that is quickly gone. *Neri*'s Art of Glaſs, p. 103.

PEARL-*fiſhing*, in the north of Ireland. See an account of it in the Philoſophical Tranſactions, N° 198.

PEASE, *piſa*, in botany. See PISUM.

We have ſeveral ſorts of *peaſe* cultivated for uſe in the gardens about London and elſewhere; and as many people are deſirous of having them very early, it is a common practice to raiſe them on hot beds. The method of doing this is, to ſow the *peas* under warm hedges or walls. In the middle of October, when the plants are come up, their ſtalks are to be kept earthed up, and thus they are to remain till the beginning of January, or even till February, covering them againſt the ſevere froſts with *peas*-haulm, or other light covering. In January or February, there muſt be made a moderate hot-bed; the dung muſt be laid about two foot thick, and carefully beat down, and covered about ſix inches deep with light freſh earth; and when the frames have been ſet on about four days, the plants muſt be planted in the earth, at about a foot diſtance, in rows, and placed in each row at about two inches one from another. They muſt be watered and ſhaded till they have taken root, and then they muſt have as much air as may be; and when they begin to fruit, they ſhould be watered more frequently than before, which will occaſion their producing a larger quantity of fruit.

The common dwarf *pea* is the ſort always uſed on this occaſion, as all the reſt ramble too much in their ſtalks.

The firſt ſort of *pea* to be ſown to ſucceed thoſe on the hot-beds is, the hotſpur; of which the gardners reckon three or four ſorts, which differ very little from each other; but that called the maſters hotſpur is uſually preferred to the reſt. Theſe are to be ſown in October, as thoſe intended for the hot-bed, and treated every way in the ſame manner; but in ſpring theſe are ſubject to be deſtroyed by ſlugs and other vermin; the beſt method of deſtroying which is, to ſlake a little lime, and throw over the earth among the plants. For fear of this crop miſcarrying by the ſeverity of weather, it is always proper to ſow two others after this, at the diſtance of a fortnight each; and after this there ſhould be no others ſowed till the end of January; and after theſe there ſhould be others at the beginning and end of February. To ſucceed theſe, which will ſupply the table with early *peaſe*, the Spaniſh morotto, which is a large *pea*, and a very plentiful bearer, ſhould be ſowed in rows on a clear plat of ground; the rows ſhould be two foot and a half diſtant, and the *peaſe* dropt at an inch or two aſunder: theſe muſt be all very carefully covered two inches deep with earth, and the rooks, mice, *&c.* prevented from getting at them. A fortnight after this another ſpot ſhould be ſowed with this or ſome other

large *pea*, and this continued every fortnight till the latter end of May. *Miller*'s Gardner's Dict.

Field-PEASE. The common white *pea* ſucceeds beſt in a light land, ſomewhat rich: the time of ſowing them is in the middle of April. Three buſhels are the common allowance for an acre; and they kill the weeds a land is ſubject to, better than any other crop. In Staffordſhire they ſow the garden rowncivals in fields, and they grow and yield very well, tho' they are left trailing upon the ground without any ſupport of ſticks.

The white and rowncival *pea*, are only to be ſown with a broad caſt, and harrowed in; but the common grey *pea*, which is more frequently ſown in fields than either of them, muſt be ſown under furrow, and delights moſt in a cold wet clay. Theſe are to be ſown in February; and the common quantity of ſeed is two buſhels to an acre. The blue *pea* is the beſt kind for light ſandy land, and is to be early ſown; all *peaſe* love land manured with lime or with marle. In Suffolk they plough up their lays in the beginning of March, and turning the turf well, they have a croſs-ſtick ſet with iron pegs, which they ſtrike down with their feet: theſe pegs make holes at an even diſtance; into which they have boys and girls following to put the *peaſe* ſingly, till all the land is ſet. As ſoon as this crop is cut, they plough the land a-croſs, and harrowing it well they plough it again, and ſow it about Michaelmas with wheat, and the next year with barley, then with oats; after which the land requires new improvement. *Mortimer*'s Husbandry.

PEASE *bloom-damp*, in natural hiſtory. See the article DAMP, *Cycl.* and *Suppl.*

PEAUCIER, in anatomy, a name given by Winſlow, in his treatiſe on the head, and by other of the French writers, to the muſcle called by Albinus *latiſſimus colli*; and by others *detrahens quadratus*, and *quadratus genæ*. Santorini has called the part of this which ariſes from the cheek, *muſculus riſorius novus*; and ſome call the whole *platyſma myoides*.

PEBBLES, *calculi*, in natural hiſtory, the name of a genus of foſſils, diſtinguiſhed from the flints and homochroa, by their having a variety of colours. Theſe are defined to be ſtones, compoſed of a cryſtalline matter, debaſed by earths of various kinds in the ſame ſpecies, and then ſubject to veins, clouds, and other variegations; uſually formed by incruſtations round a central nucleus, but ſometimes the effect of a ſimple concretion, and veined like the agates, by the diſpoſition, the motion of the fluid they were formed in gave their differently coloured ſubſtances.

The variety of *pebbles*, were it of England alone, is ſo great, that a haſty deſcriber would be apt to make almoſt as many ſpecies as he ſaw ſpecimens. A careful examination will teach us, however, to diſtinguiſh them into a certain number of eſſentially different ſpecies, to which all the reſt may be referred, as accidental variations. When we find the ſame ſubſtances and the ſame colours, or thoſe reſulting from a mixture of the ſame, ſuch as nature frequently makes in a number of ſtones, we ſhall eaſily be able to determine that theſe are all of the ſame ſpecies, tho' in different appearances; and that whether the matter be diſpoſed in one or two, or in twenty cruſts laid regularly round a central nucleus, or thrown without a nucleus into irregular lines, or, finally, blended into a ſort of uniform maſs.

Theſe are the three ſtates in which we are liable to find every ſpecies of *pebble*; for if it have been moſt naturally and regularly formed by incruſtation round a central nucleus, we find that ever the ſame in the ſame ſpecies, and the cruſts not leſs regular and certain. If the whole have been more haſtily formed, and have been the reſult only of one ſimple concretion, if that has happened while its different ſubſtances were all moiſt and thin, they have blended together and made a mixed maſs of the joint colour of them all; but if they have been ſomething harder when this has happened, and too far concreted to diffuſe wholly among one another, they are found thrown together into irregular veins. Theſe are the natural differences of all the *pebbles*; and having regard to theſe in the ſeveral variegations, all the known *pebbles* may be reduced to thirty-four ſpecies. *Hill*'s Hiſt of Foſſ. p. 512, ſeq.

Theſe are, 1. A yellowiſh grey one, with a bluiſh white cruſt, very common in the gravel pits about London. 2. A yellow-centered one, with whitiſh grey and reddiſh cruſts, very common in moſt of the gravel pits about London. 3. A yellow-centered one, with white, black, brown, and ſtraw-coloured cruſts. This is a very beautiful one, and is very common on Hampſtead-heath. 4. A dull brown-centered one, with whitiſh, bluiſh, and brown cruſts. This is a tolerably beautiful ſtone, and is common about London. This, in a certain ſtate, is a very fine ætites or eagle ſtone. See ÆTITES. 5. A ſhining brown-centered *pebble*, with white and brown cruſts. This is a very elegant ſtone, and is found plentifully in the gravel-pits about Iſlington, and more rarely on Hampſtead-heath. 6. A ſmall browniſh yellow-centered *pebble*, with white, brown, red, and yellow cruſts. This is an extremely elegant ſtone, and is not uncommon in our gravel-pits about London, and would be worth the cutting into toys. 7. A ſmall brown-centered *pebble*, with greyiſh white, pale brown, brown, and reddiſh cruſts. This is another very beautiful *pebble*, and is common in the gravel-pits on Hampſtead-heath. 8. A reddiſh brown-centered *pebble*, with yellow, red, and bluiſh white cruſts, common about Kenſington, and in ſome other places. 9. A brown-centered one, with white, orange-coloured, brown, and dusky yellow cruſts. This is an extremely elegant ſtone, and is common about London. 10. A dull brown centered one, with thick whitiſh, browniſh, and yellowiſh cruſts. This is a very ſcarce ſpecies, and is of the coarſeſt texture of all the *pebbles*. 11. A bluiſh white large centered *pebble*, with yellowiſh-brown, and aſh-coloured cruſts; very common on Hampſtead-heath and about Windſor. 12. An elegant large white-centered one, with fleſh-coloured, brown, and bluiſh-white cruſts. This is found principally in Hertfordſhire, and is ſometimes wrought into toys, and ſold in London by the name of an *agate onyx*. 13. An elegant white-centered kind, with red, yellow, and fleſh coloured cruſts. This is found on Hampſtead-heath; and we ſometimes meet with it wrought into vaſes. 14. A greyiſh-white-centered kind, with very thin and numerous brown, and yellow cruſts. This is common in Hertfordſhire, and is ſometimes found on Hampſtead-heath. 15. A greyiſh-white-centered *pebble*, with brown, yellow, and white cruſts; common on Hampſtead-heath, and in the gravel-pits about Iſlington. 16. A very white-centered one, with white, grey, yellow, and fleſh-coloured cruſts; common in the gravel-pits about London. 17. A browniſh-white-centered one, with browniſh-white, ferrugineous, and yellowiſh cruſts; found about Windſor, and ſometimes in Northamptonſhire, bedded in the ſtrata of ſtone. 18. A bluiſh centered one, with brown and grey cruſts; common in Hertfordſhire. 19. A grey-centered thick-coated one, with whitiſh and red cruſts. This is a ſcarce ſpecies, but is ſometimes found about Paddington, and in ſome parts of Northamptonſhire. 20. A very elegant bluiſh-white one, with fleſh-coloured and bright red cruſts; found frequently about London. 21. A bluiſh-grey one, with brown, yellow, and fleſh-coloured cruſts; common on Hampſtead-heath, and frequently wrought into tops of ſnuff-boxes. 22. A greeniſh-blue-centered one, with white, yellow, fleſh-coloured, and red cruſts; common in many parts of England. 23. A fleſh-coloured centered one, with whitiſh brown and yellowiſh cruſts, and a very thick white external coat. This is a very uncommon ſpecies about London, but in Northamptonſhire and Leiceſterſhire is found in great abundance. 25. A red-centered one, with black, white, and fleſh-coloured cruſts. This is a very rare ſpecies, but is ſometimes found on Hampſtead-heath. 26. A yellow-centered one, with yellow and greeniſh white cruſts. This is found principally on the ſhores of Yorkſhire. 27. A red-centered one, with purple and pale yellow cruſts; found on the ſhores of Suſſex, and ſometimes in the gravel-pits about Oxford. 28. A yellow-centered one, with grey and pale-red cruſts; found principally on the Yorkſhire ſhores. 29. A pale grey-centered one, with red, purple, bluiſh, and brown cruſts. This is a very ſcarce ſpecies, and found principally in Hertfordſhire. 30. A black-centered one, with black and white cruſts. This is a very beautiful ſtone, and is ſometimes wrought into ſeals, *&c.* under the name of the *onyx*. 31. A yellowiſh-brown one, with brown and greyiſh black cruſts; very common in Hertfordſhire and ſome other countries, but ſeldom ſeen about London. 32. A pale-grey-centered kind, with white and greeniſh cruſts. This is a very elegant ſtone, and is found on the ſhores of the Thames, and in the gravel-pits about Iſlington. 33. A browniſh white-centered one, with yellowiſh brown and black cruſts. This is well known among our lapidaries by the name of the *Ægyptian pebble*. And, laſtly, 34. A deep green-centered *pebble*, with yellow and pale-cruſts. This is ſometimes found in the gravel-pits about London, but is not common. *Hill*'s Hiſt. of Foſſ. p. 540.

In all the ſtrata of *pebbles* there are conſtantly found ſome which are broken, and whoſe pieces lie very near one another; but as bodies of ſuch hardneſs could not be broken without ſome conſiderable violence, their preſent ſituation ſeems to imply, that they have ſuffered that great violence in or near the places where they now lie. Beſide theſe, there are others alſo found which have as plainly had pieces broken off from them, tho' thoſe pieces are no where to be found; whence it ſeems equally plain, that whatever has been the cauſe of their fracture, they have been brought broken, as we find them, from ſome other place, or elſe that the pieces broken from them muſt at ſome time or other have been carried from this place to ſome other diſtant one.

Several of theſe broken *pebbles* have their edges and corners ſo ſharp and even, that it ſeems evident they never can have been toſſed about or removed ſince the breaking; and others have their ſides and corners ſo rounded, blunted, and worn away, that they ſeem to have been roughly moved and rolled about among other hard bodies, and that too either with great violence, or for a very long continuance; ſince ſuch hard bodies could not have been reduced to the condition we now ſee them in without long friction.

It may be ſuppoſed by ſome, that theſe ſtones never were broken,

broken, but have been naturally formed of this ſhape; but it will be eaſily ſeen by any one who accurately ſurveys their veins or coats that ſurround the nucleus, like the annual circles of a tree, that they muſt have been originally entire; and this will be the more plain if they are compared with a ſtone broken by art. Such *pebbles* as are found in ſtrata, that lie near the ſurface of the earth, are much more brittle than thoſe which lie in deeper ſtrata.

The more clear and tranſparent the ſand is, which is found among *pebbles*, the more beautiful the *pebbles* are generally obſerved to be.

The uſe of theſe ſtones, and their diſpoſition in the earth, is a ſubject of great admiration; and may ſerve as one of the numerous proofs of an over-ruling Providence in the diſpoſal of all natural bodies. The ſurface of the earth is compoſed of vegetable mould, made up of different earth mixed with the putrid remains of animal and vegetable bodies; and is of the proper texture and compages for conducting the moiſture to the roots of trees and plants: and under this are laid the ſands and *pebbles* which ſerve as a ſort of drain to carry off the redundant moiſture deeper into the earth, where it may be ready to ſupply the place of what is conſtantly riſing in exhalations; and leſt the ſtrata of ſand ſhould be too thick, it is common to find thin ones of clay between, which ſerve to put ſome ſtop to the deſcent of the moiſture, and keep it from paſſing off too ſoon; and leſt theſe thin ſtrata of clay ſhould yield and give way, and by their ſoftneſs, when wetted, give leave to the particles of ſand to blend themſelves with, and even force their way through them, there are found in many places thin coats of a poor iron ore placed regularly above and below the clay; and by that means not only ſtrengthening and ſupporting the clay, but effectually keeping the ſand from making its way into it. Phil. Tranſ. N° 483.

Ridged PEBBLES. It is not uncommon to meet with *pebbles* in our gravel-pits which have one or more ridges, or white lines, ſtanding above the ſurface of the reſt of the ſtone, in form of a rib or zone, laid on the ſtone after its formation. This, however, is not the caſe; but the lime or zone always goes through the whole body of the *pebble*: the matter forming this *ridge* is always harder than the reſt of the ſtone; and it ſeems probable, that at firſt it was not extant or elevated, but level with the reſt of the ſurface; but being not ſo eaſily worn away by accidents, and when the whole *pebble* came in the way of rubbing among harder bodies, this would be leſs rubbed away, and conſequently would be left more elevated than the reſt. We daily ſee on the ſea-ſhores numbers of ſtones rounded by the continual rolling and toſſing among the waves, and in theſe the ſofter parts have given way firſt and been worn into holes, while the harder have been left prominent. It ſeems probably to have been the caſe with theſe *pebbles* alſo; but they are not found on the ſhores, but in our gravel-pits, at a great diſtance from the ſea: and it is evident, that theſe have had their ſurfaces thus ground and worn down between the time of their being formed by concretion in the waters of the deluge, and their being depoſited where we now find them. This could only happen by means of the hurry and rapid motion of the waters of the deluge, at the time of their running off from the ſurface of the earth into the ocean or great abyſs, at the bottom of it: for, by numerous obſervations, it is plain, that the force of this water thus returning off from the earth was ſo great, that in many places it tore up the ſolid ſtrata, and waſhed off vaſt maſſes from them, tumbling them afterwards along, and rounding and ſmoothing their ſurfaces in its paſſage, and finally leaving them where its force began to abate. This we have inſtances of in all parts of the world, and that ſmaller pieces of ſtone were thus rounded we ſee in the caſe of theſe *pebbles*, the harder parts of which are left ſtanding higher than the reſt, and in many other the like inſtances.

The ſmoothneſs of the ſurfaces of ſome *pebbles* and flints, which we find with their natural coats or cruſts worn off, is another proof of the ſame thing. Theſe *pebbles*, in this unnaturally naked ſtate, as well as the ribbed and lineated ones, are found in our pits under the ſtrata of earth; and we doubtleſs find them where they have lain undiſturbed ever ſince the time of their having been depoſited there at the going off of the general deluge: and yet they are in exactly the ſame condition with thoſe which have been toſſed about and rounded on the ſea ſhores.

This is a plain indication, that they have been, before their being depoſited there, toſſed and rolled about in the ſame manner with the others; and there remains no time at which this ſhould have been done, but that of the going off of the waters of the deluge, when a much larger body of water was evidently in a much greater agitation, and conſequently could do in a very little time what we ſee done on the ſea ſhores in a longer ſpace

Swallowing of PEBBLES. There are many people of opinion, that the ſwallowing of *pebbles* is very beneficial to health, in helping the ſtomach to digeſt its food, and a *pebble* poſſet is an old woman's medicine in the colic in many parts of England. They uſually order the ſmall white ſtones to be picked up out of gravel walks for this purpoſe, and eat them in large quantities in ſome ſort of ſpoon meat, of which milk is an ingredient.

The thing that has given occaſion to this practice ſeems to have been, that people obſerve the birds to pick up the gravel, and that they are never well unleſs they have frequent recourſe to this to help their digeſtion: but this is no ſimilar caſe at all, for the gizzard or ſtomach of a bird is made very ſtrong, becauſe the creature hath no teeth to chew its food; and this gizzard is lined with a rough coat, by the help of which and theſe ſtones, the food they ſwallow whole is ſo ground, as to yield its juices to the nouriſhment of the animal. But the ſtomach of man is formed ſo very differently, that it can never require thoſe aſſiſtances to the comminution of food. Many people have, however, accuſtomed themſelves to ſwallow not only theſe ſmall white ſtones, but large *pebbles*, even to the ſize of a walnut each; and theſe will often paſs ſafely, and people who have long accuſtomed themſelves to ſwallow them, boaſt of receiving no injury from them: we can never know, however, that the death of ſuch perſons is not owing to them at laſt; and as they can do no good, it is beſt always to avoid them. There is one inſtance on record, of much miſchief done by them; this is in our Philoſophical Tranſactions. Phil. Tranſ. N° 253, p. 190.

A man of about twenty-ſeven years of age, and lean habit, had been uſed for three years before to ſwallow round white *pebbles*, as a cure for ſome windy diſorders to which he was ſubject, and they uſed to paſs thro' him eaſily, and give relief for the time. In one of his fits, at the end of this time, having ſwallowed his uſual number, which was nine, and they not paſſing thro' him, he ſwallowed more and more, to the number of two hundred. None of theſe paſſed off at the time, nor even in the ſpace of two years and an half; at the end of which time he applied for relief in a miſerable way: he could digeſt no food, but vomited up all he ſwallowed. On examining his belly, the ſtones were found lodged, not in the ſtomach, but almoſt as low as the os pubis; they might be felt with the hand thro' the integuments, and rattled as if in a bag; if the man was hanged up by the feet to a ladder for a ſmall ſpace of time, they would get up into his ſtomach again; but upon ſetting him on the ground they would ſoon fall into their old place, and that ſo plainly to the ſenſes, that they might be diſtinctly heard and counted one by one. If his body was not laxative, he certainly vomited all he eat; if it was, he had a little reſpite at times; and as he lay in bed he could perceive the ſtones alſo higher than their uſual place, and give him great diſturbance. He was on theſe occaſions always forced to get up, and on ſtanding or kneeling he could perceive them fall down into their old place again, and could count them as they fell. He uſually on theſe occaſions could count more than an hundred: at length he became unable to work or move for them, and voided large quantities of blood by ſtool, after diſturbing them by any violent motion. The uſe of proper medicines relieved him in many of theſe ſymptoms, but no means ever made uſe of was able to carry off one ſingle ſtone.

PECHEM, in the materia medica, a name given by the modern Greek writers to the root called *behem* by Aviſenna and Serapion. Many have been at a loſs to know, what this root *pechem* was; but the virtues aſcribed to it are the ſame with thoſe of the *behem* of the Arabians; its deſcription the ſame, and the diviſion of it into white and red, is alſo the ſame as that of the *behem*. Nay, the word *pechem* is only formed of *behem*, by changing the B into a P, which is very common, and the aſpirate h into χ, or ch, which is as common.

Myrepſus, who treats of this root, ſays the ſame thing that the Arabian Aviſenna ſays of *behem*, namely, that it was the fragments of a woody root much corrugated and wrinkled on the ſurface, which was owing to its being ſo moiſt whilſt freſh, that it always ſhrunk greatly in the drying.

PECHYAGRA, a name given by authors to the gout affecting the elbow.

PECHYS, a name uſed by ſome anatomical writers for the elbow.

PECHYTYRBE, an epithet uſed by ſome medical writers for the ſcurvy.

PECORA, *locks*, in the Linnæan Syſtem of zoology, a claſſical term, comprehending a whole order of quadrupeds. The characters of this order are, that the creatures have *dentes inciſores*, or *cutting teeth*, in their under-jaw, but none in their upper: they have no *canini*, or *dog-teeth*, and have five molares each way. The paps of this order of animals are ſituated in their groin, and their feet have hoofs. Of this order are the camel, ſtag, goat, ſheep, and ox. *Linnæi* Syſt. Nat. p. 41.

PECTE, in botany, a name given by ſome of the old Greek writers to the *great comfry*, called alſo *oſſipagina*, from its agglutinating broken bones.

PECTEN (*Cyd.*) in natural hiſtory, the name of a genus of ſhell-fiſh, the characters of which are theſe: it is a bivalve ſhell, ſhutting cloſe in all parts, of a flatted ſhape, ſtriated in the manner of a comb, and often auriculated, ſometimes only ſemiauriculated, and in ſome ſpecies not auriculated at all. There are alſo ſome few ſpecies which are elate, not flat as the others.

This

This genus of ſhells has had its name *pecten* from the longitudinal ſtriæ with which its ſurface is covered, which reſemble the teeth of a comb. According to the general character of this ſhell, it will be eaſy to perceive that it is meant to include the cockles as well as the ſcallops; theſe being the *pectens* without ears, and with leſs flat or elated ſhells. Theſe are called by all authors by a name which is only a diminutive of *pecten*, *pectunculus*. And tho' the having ears is the common mark of diſtinction between the *pectens* and the *cockles*, which laſt uſually have none, yet the genera are not diſtinct, as ſome have ſuppoſed; for there are ſhells allowed to be *pectens*, or ſcallops, which have yet no ears, and others univerſally allowed to be *pectuncles*, or cockles, which have ears. Hence appears the error of Liſter, who made theſe two diſtinct genera, and gave the ears and the equal convexity of both ſhells as the great characters of them: theſe, tho' good marks to diſtinguiſh the ſpecies by, are by no means unalterable enough to found different genera upon. Hiſt. Nat. Eclairc. p. 340.

The genus of *pectuncles*, or *cockles*, has been made by all authors a very extenſive one, but the reader will find all the ſuppoſed ſpecies of it very aptly received into the genus of the *cordiformis*, or *heart-ſhell*, and the *pectens*.

According to this eſtabliſhment of the genus of the *pecten*, the ſpecies are to be enumerated under ſeveral diſtinct heads. Thus, ſome *pectens* are auriculated on both ſides: of theſe we have the following ſpecies; 1. The red *pecten*, called the *ducal mantle* 2. The yellow *ducal mantle pecten*. 3. The coral *pecten*, with beautiful red tubera. 4. The variegated *pecten*, called the St. *James's ſhell*. 5. The yellow variegated *pecten*, called the St. *Michael's ſhell*. 6. The gold yellow *pecten* of the Caſpian ſea. 7. The great reddiſh *pecten*. 8. The variegated bluiſh *pecten*. 9. The red deep furrowed *pecten*. 10. The umbrella *pecten*, or, as ſome call it, the *ſun pecten*: this is yellow at the upper part of the ſhell, and white on the under. 11. The *pecten* which is variegated on the upper part, and white on the under. 12. The yellow high-ribbed *pecten*, with a bordered lip. 13. The *pecten* with both ſhells equally hollow. 14. The pear-faſhioned *pecten*. 15. The beautiful *pecten*, called by Rumphius, *virgineus*. 16. The *amuſium*, or ſmooth poliſhed *pecten* of the ſame author. 17. The rough *pecten*, variegated with brown ſpots. Hiſt. Nat. Eclairc. p. 338.

Of theſe *pectens*, which are ſemiauriculated, we have the following ſpecies: 1. The black ſpinoſe *pecten*: this is all over beſet with ſharp points. 2. The red ſpinoſe *pecten*. 3. The grey ſpinoſe *pecten*. 4. The yellow ſpinoſe *pecten*. 5. The variegated ſpinoſe *pecten*. 6. The ſmooth white *pecten*.

Of thoſe *pectens* which have no ears at all, we have the following ſpecies: 1. The rough *pecten*, called the *file cockle*. 2. The oblong white rough *pecten*. 3. The yellowiſh ribbed and jagged *pecten*. 4. The variegated *pecten*, jagged at the edge. 5. The thick *pecten*, with blue, yellow, and brown ſtreaks. 6. The ſmooth variegated *pecten*. 7. The white globoſe *pecten*, called the *common cockle*.

This ſhell-fiſh is one of the ſpinners of the ſea, having a power of ſpinning or forming threads like the muſcle; but they are much ſhorter and coarſer even than thoſe of that fiſh: ſo that they can never be wrought into any ſort of work, in the manner of the longer and finer threads of the *pinna marina*. The uſe of theſe threads which the *pecten* or *ſcallop* ſpins, is to fix the creature to any other body that is near, whether it be a ſtone, a piece of coral, or another ſhell. All theſe threads proceed, as in the muſcle, from one common trunk; they make their way out of the ſhell in thoſe *pectens* which have only one ear, a little below that ear; in the others probably they iſſue out on both ſides. It is an evident proof, that the fiſh has a power of fixing itſelf at pleaſure to any ſolid body by means of theſe threads, that after ſtorms the *ſcallops* are often found toſſed upon rocks, where there were none the day before; and yet theſe are fixed by their threads, as well as thoſe which had remained ever ſo long in their place. They form their threads in the very ſame manner with the muſcle, only their organ which ſerves for ſpinning is ſhorter, and has a wider hollow, whence the threads are neceſſarily thicker and ſhorter. See MYTULUS.

PECTINATION, *combing of the head*. Frequent *pectination* is recommended by many phyſicians to women, and men who wear their hair, as an exerciſe; and at the ſame time, a kind of friction.

PECTORAL *(Cycl)*.—PECTORALIS *internus*, in anatomy, a name given by Riolan and others to a muſcle of the breaſt, now generally known by the name of the *triangularis ſterni*; called by the older writers, *ſextus thoracis*.

PECTORALIS *major*, a large, thick, and fleſhy muſcle, covering the breaſt from the ſtomach, where it is very broad, to the axilla, where it contracts in its paſſage to the arm. It is naturally divided into two portions, one ſuperior and ſmall, and the other inferior and large; the firſt may properly be called the *clavicular portion*, the other the *thoracic*.

The *clavicular portion* is fixed by a fleſhy inſertion in almoſt half the clavicle next the ſternum, ending under the inſertion of the ſterno-maſtoidæus; from thence it runs obliquely down towards the axilla, contracting by ſmall degrees, and finally ending in a flat tendon or tendinous band. The *thoracic* portion is broad, and in ſome meaſure radiated. It is fixed by its anterior circumference in the lateral part of the outſide of the ſternum, in the outſide of the cartilages, and in a ſmall part of the bones of all the true ribs, and of the firſt and ſometimes the ſecond falſe rib; all theſe inſertions are like ſo many digitations. The inſertions in the ſternum, end by a great number of very ſhort tendons, which run towards the middle of the bone, meeting and decuſſating thoſe from the ſame muſcle on the other ſide.

This muſcle, together with the deltoides, ſends off an aponeuroſis, which joining that of the biceps, is ſpread over the muſcles of the arm: it partly covers the pectoralis minor, and ſerratus major; and by its broad tendon covers tranſverſely the brachial channel, and the tendon of the biceps lodged there. Laſtly, it forms the anterior border of the hollow of the axilla, as the poſterior is formed by the latiſſimus dorſi. *Winſlow's* Anat. p. 180.

PECTORALIS *minor*, a muſcle called alſo *triangularis*. It is ſmall and fleſhy, ſomething of a triangular ſhape, and is ſituated at the ſuperior, lateral, and anterior part of the thorax. By its baſis it is inſerted into the external labium of the upper edge of the ſecond, third, fourth and fifth true ribs, near their union with the cartilages, by the ſame number of digitations, or ſeparate fleſhy portions, between the intervals of the ribs; and for that reaſon it has been called the *ſerratus minor anticus*. From hence theſe portions run up more or leſs obliquely toward the ſhoulder, and form a fleſhy belly, which contracts as it paſſes before the two firſt ribs; and then becoming a ſhort, flat, and broad tendon, is inſerted in the upper part of the apophyſis coracoides of the ſcapula, reaching all the way to the point of that proceſs. This muſcle is covered by the *pectoralis major*, and adheres very cloſely to the external intercoſtal muſcles. The digitations commonly taken notice of cover and hide ſeveral others, by which the number of fibres and thickneſs of this muſcle is increaſed. Its tendon unites a little at the apex of the coracoide apophyſis, with the inſertion of the coraco-brachialis, and with that of one portion of the biceps.

PECTOREL, in our old writers, armour for the breaſt, a breaſt-plate or *petral*, for a horſe. It is mentioned Stat. 14. Car. II. c. 3.

The word *pectorel* comes from the Latin *pectus*, a breaſt.

PECTORIS *oſſa*, in fiſhes. The bones of the breaſt and belly are beſt ſought after in the cetaceous and ſpinoſe kinds. In the ſpinoſe kinds they are theſe: the clavicles, the ſternum, the ſcapulæ, or bones, to which the *pinnæ pectorales* are affixed at their baſis, the bones at the roots of the *pinnæ ventrales*. The number, ſituation, and figure of theſe differ greatly in the ſeveral kinds of fiſh, and make very eſſential characters. *Artedi* Ichthyol.

PECUARII, among the Romans, thoſe who farmed the public paſtures, in order to let them again to advantage. *Pitiſc.* Lex. Ant. in voc.

PECULATOR, one who is guilty of the crime called *peculate*. See PECULATE, *Cycl.*

PEDARIAN, in antiquity, thoſe ſenators who ſignified their votes by their feet, not their tongues; that is, ſuch as walked over to the ſide of thoſe whoſe opinion they approved of, in diviſions of the houſe.

The origin of the word Dr. Middleton thinks owing to this, that tho' the magiſtrates of Rome had a right to a place and vote in the ſenate, as well during their office as after it, and before they were put upon the roll by the cenſors, yet they had not probably a right to ſpeak or debate there on any queſtion, at leaſt in the earlier times of the republic. For this ſeems to have been the original diſtinction between them and the antient ſenators, as it is plainly intimated in the formule of the conſular edict, ſent abroad to ſummon the ſenate, which was addreſſed to all ſenators, and thoſe who had a right to vote in the [a] ſenate. From which diſtinction, theſe laſt, who had only a right to vote, were called by way of ridicule, *pedarian*; becauſe they ſignified their votes by their feet, not their tongues, and upon every diviſion of the houſe, went over to the ſide of thoſe whoſe opinion they approved [b]. It was in alluſion to this old cuſtom, which ſeems, however, to have been wholly dropt in the later ages of the republic, that the mute part of the ſenate continued ſtill to be called by the name of *pedarians*, as we learn from Cicero [c], who in giving an account to Atticus, of a certain debate and decree of the ſenate upon it, ſays, that it was made with the eager and general concurrence of the *pedarians*, tho' againſt the authority of all the conſulars [d]. [a *Feſtus* in voc. ſenatores, *A. Gell.* l. 3. 18. b Vid. *A. Gell.* ibid. *Feſt.* in pedarius. c Ad *Attic.* 1, 19. d *Middlet.* of Rom. ſen. p. 86. ſeq.]

PEDATURA, in Roman antiquity, was uſed for a ſpace or proportion of a certain number of feet ſet out. *Pitiſc.* Lex. Antiq. in voc.

The word occurs frequently in writers about military affairs: thus in Hyginus de Caſtrametatione we meet with, *memineri-mus itaque ad computationem cohortis equitatæ milliariæ pedaturam ad milletrecentos ſexaginta dari debere*; which is to be thus explained: the *pedatura*, or ſpace allowed for a cohors equitata, or provincial cohort, conſiſting of both horſe and foot, (ſee COHORS *equitata*) could not be the ſame as the *pedatura* of an uniform body of infantry, of the ſame number, but muſt exceed

ceed it by 360 feet: for the proportion of the room of one horſeman to one foot ſoldier he aſſigns as two and an half to one. Vid. Phil. Tranſact. N°. 482. ſect. 3.

PEDETICHE, in natural hiſtory, a name given by ſome of the Greek writers to the chamois goat, the creature whoſe ſkin affords us the chamoy leather.

The antient Greeks called this creature *ixaros*, and from thence came the word *iſarus* and *yſſaros* or *yſardos*. The Latin authors of antiquity call this *dama*, but authors have ſince applied the word *dama* to the *cervus platyceros*, or broad-horned ſtag.

Ariſtotle has called this laſt animal *prox*, and his tranſlators have rendered the word *dama*; but they are in this to be underſtood as meaning the *dama* of their own times, not that of the antients, or this *pedetiche*, or chamois goat.

PEDICULARIS (*Cycl.*)—PEDICULARIS, *louſewort*, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts of one leaf, and is of a perſonated form, and divided into two lips; the upper one hooded, the lower divided into three ſegments: the piſtil ariſes from the cup, and is fixed in manner of a nail to the hinder part of the flower. This afterwards ripens into a capſule, divided into two cells, and containing oblong, flatted, and marginated ſeeds. See Tab. 1. of Botany, Claſs 3.

The ſpecies of *pedicularis* enumerated by Mr. Tournefort, are theſe: 1. The common meadow yellow *pedicularis*, called yellow rattle and cockscomb. 2. The taller meadow yellow *pedicularis*, with horny flower cups. 3. The Alpine *pedicularis*, with pale yellow ſpiked flowers. 4. The ſerrated clammy-leaved meadow yellow *pedicularis*. 5. The umbellated Spaniſh *pedicularis*. 6. The narrow-leaved mountain *pedicularis*. 7. The ſpiked Italian *pedicularis*, with changeable coloured flowers. 8. The ſea *pedicularis*, with long ſerrated leaves. 9. The narrow-leaved annual Alpine yellow *pedicularis*. 10. The leaſt ſpring annual purple *pedicularis*, called by ſome purple eye-bright. 11. The leaſt annual white flowered ſpring *pedicularis*. 12. The ſhort blunt-leaved Engliſh red *pedicularis*, called alſo red eye-bright. 13. The blackiſh red-flowered Alpine *pedicularis*, with teucrium leaves. 14. The ſpeedwell-leaved Pyrenean *pedicularis*. 15. The tall germander-leaved Portugal *pedicularis*. 16. The late flowering purple *pedicularis*. 17. The late flowering yellow *pedicularis*. 18. The narrow flax-leaved *pedicularis*. 19. The Portugueſe graſſy-leaved meadow *pedicularis*. 20. The Spaniſh marſh *pedicularis*, with glaſs wort leaves. 21. The yellow Alpine *pedicularis*. 22. The great fern-leaved Alpine *pedicularis*. 23. The ſmall fern-leaved Alpine *pedicularis*. 24. The ſpleen-wort leaved Alpine *pedicularis*. 25. The purple Alpine *pedicularis*, with aſphodel roots. 26. The broader leaved, aſphodel-rooted, Alpine, red *pedicularis*. 27. The common meadow purple *pedicularis*. 28. The white-flowered meadow *pedicularis*. 29. The taller red meadow *pedicularis*. 30. The taller white meadow *pedicularis*. *Tourn.* Inſt. p. 172.

A decoction of *pedicularis* is eſteemed good againſt hæmorrhages and fluxes of all kinds. *Demery*, Dict. des drogues.

PEDICULUS, the *louſe*, in the hiſtory of inſects. See LOUSE.

PEDICULUS *marinus*, a name given by ſome to the Molucca crab. *Ray*'s Ichthyogr. p. 3. See SQUILLA.

PEDILUVIUM. The uſes of warm bathing in general, and of the *pediluvium* in particular, are ſo little underſtood, that they are often prepoſterouſly uſed, and ſometimes as injudiciouſly abſtained from. Med. Eſſ. abr. Vol. I. p. 244.

In the Medical Eſſays of Edinburgh, we find an ingenious author's opinion of the warm *pediluvium*, notwithſtanding that of Borelli, Boerhaave, and Hoffman, to the contrary, to be: that the legs becoming warmer than before, the blood in them is warmed; this blood rarifying, diſtends the veſſels; and in circulating imparts a great degree of warmth to the reſt of the maſs: and as there is a portion of it conſtantly paſſing through the legs, and acquiring new heat there, which heat is, in the courſe of circulation, communicated to the reſt of the blood; the whole maſs rarifying, occupies a larger ſpace, and of conſequence circulates with greater force. The volume of the blood being thus increaſed, every veſſel is diſtended, and every part of the body feels the effects of it; the diſtant parts a little later than thoſe firſt heated. The benefit obtained by a warm *pediluvium* is generally attributed to its making a derivation into the parts immerſed, and a revulſion from thoſe affected, becauſe they are relieved; but the cure is performed by the direct contrary method of operating, *viz.* by a greater force of circulation through the parts affected, removing what was ſtagnant, or moving too ſluggiſhly there. Warm bathing is of no ſervice where there is an irreſoluble obſtruction, tho' by its taking off from a ſpaſm in general, it may ſeem to give a moment's eaſe; nor does it draw from the diſtant parts, but often hurts by puſhing againſt matter that will not yield with a ſtronger impetus of circulation than the ſtretched and diſeaſed veſſels can bear: ſo that where there is any ſuſpicion of ſcirrhus, warm bathing of any ſort ſhould never be uſed. On the other hand, where obſtructions are not of long ſtanding, and the impacted matter is not obſtinate, warm baths may be of great uſe to reſolve them quickly. In recent colds, with ſlight humoral peripneumonies, they are frequently an immediate cure. This they effect by increaſing the force of the circulation, opening the ſkin, and driving freely through the lungs that lentor which ſtagnated or moved ſlowly in them. As thus conducing to the reſolution of obſtructions, they may be conſidered as ſhort and ſafe fevers; and in uſing them we imitate nature, which by a fever often carries off an obſtructing cauſe of a chronical ailment. Borelli, Boerhaave, and Hoffman are all of opinion, that the warm *pediluvium* acts by deriving a larger quantity of blood into the parts immerſed. But arguments muſt give way to facts: the experiment related in the Medical Eſſays ſeems to prove to a demonſtration, that the warm *pediluvium* acts by rariſying the blood. Vid Med. Eſſ. abr. Vol. I. p. 245. ſeq.

A warm *pediluvium*, when rightly tempered, may be uſed as a ſafe cordial, by which circulation can be rouſed, or a gentle fever raiſed; with this advantage over the cordials and ſudorifics, that the effect of them may be taken off at pleaſure. Med. Eſſ. Edinb. abr. Vol. I. p. 237.

Pediluvia are ſometimes uſed in the ſmall pox; but Dr. Stevenſon thinks their frequently tumultuous operations render that ſuſpected, and at beſt of very doubtful effect; and he therefore prefers Monſ. Martin of Lauſanne's method of bathing the ſkin, not only of the legs, but of the whole body, with a ſoft cloth dipped in warm water, every four hours, till the eruption; by which means the puſtules may become univerſally higher, and conſequently more ſafe. Med. Eſſ. abr. ib. p. 248.

PEDO, in natural hiſtory, a name given by ſome writers to the *tipula*, or father long-legs; called alſo by others, *Gruina*, or the crane-fly.

PEDRO *de Porco*, a ſort of bezoar, called by the Portugueſe *pedro de vaſſar*, and found in the gall bladders of the wild boars in the Indies. It is uſually of the ſize of a filbert, and of an irregularly oval ſhape; it is generally of a pale greeniſh colour, and of a very ſmooth ſurface.

This ſort of bezoar is extremely valued; the Dutch Eaſt India fleets are ſeldom able to bring home more than five or ſix of the ſtones, and they are purchaſed at three or four hundred livres each, by the opulent burghers, either for preſents to the great, or elſe to be handed down to their poſterity in their families; ſo great is their opinion of their virtues.

The Indians call this ſpecies of bezoar, *maſticha de ſcho*, and have as high a veneration for its virtues as the Dutch. The Inhabitants of Malacca alſo eſteem it greatly, not as an antidote againſt poiſon, but as a remedy for the mordixi; a diſeaſe to which they are ſubject, and which is as fatal as the plague with us. It is alſo eſteemed a very valuable medicine in the ſmall pox. The method of uſing it is to ſuſpend it in wine or water, till it has given it an agreeable bitterneſs; and this is to be drank every morning, and as often beſide as the nature of the diſorder may require. The common method of keeping it is in a gold box, bored full of holes, and having a gold chain faſtened to it: by this means they can dip it into liquors as they pleaſe, without taking it out of the box; and by that means prevent the miſchiefs it might get by handling. *Bont.* Med. Ind.

PEDUNCLE, among botaniſts, expreſſes that little ſtalk which grows from the trunk or branches of a plant, and ſupports the parts of fructification, the flower and the fruit, or either: when this is produced from the ſtalk, it is called *caulimus*; when from the alæ of the leaves, *alaris*; when it terminates the plant or its branches, *terminalis*.

PEDUNCULARIA, in botany, a name by which ſome authors have called the *ſtaphiſagria*, or ſtaveſacre; a plant whoſe ſeeds are uſed to kill vermine. *Ger.* Emac. Ind. 2.

PEE, in mining, is uſed for the place where two veins meet and croſs one another, thus +. *Houghton*'s compl. Miner, in explan. of the terms.

PEGANELÆON, a word uſed by the antients to expreſs oil, in which the leaves and flowers of rue had been infuſed and inſolated.

PEGANERON, a name given by ſome old authors to a plaiſter in which rue was a principal ingredient, from *peganon*, the Greek name of rue.

PEGANON, or PEGANUM, a name uſed by ſome authors for the *ruta ſylveſtris*, or wild rue; called *harmala*, or *harmel*, in the ſhops. *Ger.* Emac. Ind. 2. See HARMALA.

PEGEMUS, one of the many names by which the Chemiſts have called mercury.

PEGMA, among the Romans, a wooden machine, uſed in theatrical entertainments, which was raiſed and let down by ſecret engines, whence it was ſaid to grow. *Pitiſc.* Lex. Ant. in voc.

PEGOMANTIA, Πηγομαντεια, in antiq ity, a ſpecies of divination, which was performed with fountain water. See the article HYDROMANTIA.

PEGORELLA, in ichthyography, a name by which ſome have called a fiſh of the truttaceous kind, caught in the Mediterranean, and more uſually called *callarias*. *Bellonius* de Piſc. See the article CALLARIAS.

PELADA, a kind of alopecia, or diſtempered ſtate of the body, occaſioning the ſhedding of the hair, ariſing from a venereal cauſe. *Caſtel.* Lex. Med.

PELÆAS, Πελαιας, in zoology, the name by which the antients called that ſpecies of pigeon now known by the name of the *livia* and *ſaſſaroilo*; a grey pigeon, of a very ſmall ſize, and with ſome variegations of purple and green. *Ray*'s Ornithol. p. 136. See LIVIA.

PELAGIA, (*Cycl.*) in natural hiſtory, a name by which Pliny, and other of the antient naturaliſts, have uſually called the *purpura*. See PURPURA.

PELAMYS, in zoology, a name by which the antients expreſſed the young brood of the *thynnus*, or tunny fiſh, at a certain age and ſize; but later writers have appropriated the word for the name of a diſtinct ſpecies of fiſh, of the ſame genus, called by others *ſarda*; and by ſome by the two names joined into one, *pelamys-ſarda*.

It is a ſea-fiſh, of the ſhape of the tunny; but of a ſmooth ſkin, and free from ſcales every where, except about the gill-fins. Its teeth are large, long, and crooked. Theſe are the only external marks by which it is to be known from the young brood of the tunny; but when brought to the table, it is eaſily diſtinguiſhed by the hardneſs of its fleſh. *Ray*'s ichthyography, p. 179.

PELAMYS *vera*, a name given by Rondeletius, and ſome other authors, to the fiſh more diſtinctly known by the name of *amia*. *Willughby*'s Hiſt. Piſc. p. 180. See AMIA.

PELANI, Πελανοι, among the Athenians, a kind of cakes uſed in their libations. *Pett.* T. 1. p. 214.

PELATÆ, Πελαται, in antiquity, a particular kind of ſervants among the Athenians.

The *pelatæ* were free-born citizens, who, by reaſon of their indigence, were forced to ſerve for wages. They had no ſuffrage in public affairs, as not being maſters of an eſtate proper to qualify them for giving their votes; but this reſtriction was not perpetual. They were otherwiſe called *thetes*, and continued in the condition of ſervants only during their own pleaſure and neceſſities; for they had power either to change their maſters, or (if they became able to ſubſiſt themſelves) wholly to releaſe themſelves from ſervitude. *Pott.* Arch. Græc. T. 1. p. 57.

PELECANUS, a name given by ſome authors to the *platea*, or ſpoon-bill; a bird very different from the pelican, being of the ſtork, or heron kind. *Aldrovand.* de Avib.

PELECINUS, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the papilionaceous kind, and from its cup ariſes a piſtil, which finally becomes a flat, bicapſular and bivalve fruit, containing ſeveral flat ſeeds, uſually approaching to a kidney-like ſhape.

There is only one known ſpecies of this genus, which is the plant called by ſome the ſmooth-podded *ſecuridaca*, and by others the radiated *lunaria*. *Tourn.* Inſt. p. 417.

PELICAN, (*Cycl.*) in the Linnæan ſyſtem of zoology, makes a diſtinct genus of birds of the order of the *anſeres*, or gooſe kind; the characteriſtic of which is to have a beak of a depreſſed form, with a hooked point, and furniſhed with a large bag or purſe beneath. *Linnæi* ſyſtem. Nat. p. 46.

PELLA, in zoology, a name by which many have called the common grey heron. See the articles ARDEA and HERON.

PELLACK, the name of a young ſpout-whale, often found in Zetland; where they run into creeks, and ſo entangle themſelves among the rocks, that they are caſt on ſhore, or eaſily taken. Phil. Tranſ. N°. 473, ſect. 8.

PELLAGE, in our old writers, a cuſtom or duty paid for ſkins or leather. Rot. Parl. 11 *Hen.* IV. *Blount.*

PELLITORY *of Spain*, in the materia medica. See the article PYRETHRUM.

PELLITORY *of the wall*. See PARIETARIA.

PELOPIA, Πελοπεια, in antiquity, a feſtival celebrated by the Eleans, in honour of Pelops, for whom that nation had more veneration than for any other hero. For the ceremonies of this ſolemnity, ſee *Pott.* Archæol. Græc. l. 2. c. 20. T. 1. p. 429.

PELORIA, Πελωρια, in antiquity, a feſtival not unlike the Roman ſaturnalia, celebrated by the Theſſalonians. *Pott.* Archæol. Græc. l. 2. c. 20. T. 1. p. 425.

PELORIDES, in natural hiſtory, a name given by ſome to a peculiar ſpecies of chama. Bellonius, who firſt uſed the word, never gives it alone as the name of the ſhell, but only uſes it as an epithet derived from *peloro*, the name of the place where a particular ſpecies of chama was very frequent.

PELT-*wool*, wool ſtripped of the ſkin or *pelt* of a dead ſheep. Stat. 8 Hen. VI. c. 22. *Blount*, *Cowel.*

PELTASTES, Πελταστης, among the antients, one who uſed the buckler called *pelta*. See PELTA, *Cycl.*

PELTATED-*leaf*, PELTATUM *folium*, among botaniſts. See the article LEAF.

PELVIS (*Cycl.*)—The *pelvis* is the third and loweſt part of the trunk, conſiſting chiefly of two large pieces, called *oſſa innominata*; which being united anteriorly by a cartilaginous ſymphyſis, and poſteriorly to the two ſides of the os ſacrum, repreſent a kind of baſin. When conſidered ſeparately, they are of no determinate figure; being of different breadths in different parts, and unequally convex on the outſide, and unequally concave within. Each bone is but one piece in adults, but in children each conſiſts of three pieces, joined together by a cartilage; which afterwards perfectly oſſifies, leaving commonly no veſtige of the firſt diviſion. Anatomiſts conſider it, however, even in adults, as made up of three portions; and diſtinguiſh them by different names, as if they were three different bones. Of theſe three bones the largeſt is ſuperior and poſterior, and is called *os ilium*. The ſecond inferior called *os iſchium*: and the third and ſmalleſt anterior called *os pubis*. Without entering on the particular deſcription of theſe, (which, ſee under their proper heads) it is to be obſerved, that there are in the entire bone ſeveral common parts, or parts which belong to more portions of it than one, *viz.* a deep cartilaginous cotyloide cavity, called in Latin *acetabulum*: this is formed by all the three portions. A large opening, called the *foramen ovale*, formed by the *os iſchium* and *os pubis*. A large poſterior notch or ſinus, called the *iſchiatic* notch, and formed by the *os iſchium* and *os ilium*. An oblique eminence, or protuberance, above the *acetabulum*, toward the *foramen ovale*, made by the *os ilium* and *os pubis*: and to theſe may be added, a ridge on the inſide the *pelvis*, which divides the wide upper part from the bottom, to which alone the antients gave the name *pelvis*. *Winſlow*'s Anatomy, p. 69.

PELUS *armena*, in the materia medica, a name given by ſome of the old writers to the drug that we at preſent call *bole armoniac*. This was the original name, and the term *bolus armena* is not to be found, but in the later writers.

PEMPHINGODES, an epithet beſtowed by Hippocrates on fevers by flatulencies and inflations, in which the patient feels a kind of wind paſſing along under the ſkin, and the phyſician may perceive it in the ſame places riſing againſt the preſſure of his finger, called by ſome an inflative fever.

PEMPTÆUS, a word uſed by medical writers, as the name of an ague, the fits of which return always on the fifth day.

PENDANT-*gardens*. See PENSILES *horti*.

PENDULOUS *roots*, among botaniſts, ſuch as are fixed to the ends of fibres, whence they ſeem to hang. See ROOT.

PENDULUM (*Cycl.*)—Mr. Poleni ſeems to think, that if a long *pendulum* were made to ſwing in the place of the meridian, and another of equal length in a plane perpendicular to the meridian, ſome difference might be found in their vibrations from the centrifugal force ariſing from the earth's rotation about its axis. See Phil. Tranſ. N°. 468. ſect. 1.

Pendulum clocks reſting againſt the ſame rail, have been found to influence each other's motions. See the Phil. Tranſ. N°. 453, ſect. 5 and 6, where Mr. Ellicot has given a very curious and exact account of this phænomenon.

PENELOPE, in zoology, the name uſed by authors for the bird commonly known in England by the name of the *wigeon*; called alſo in ſome places the *whewer*; and by the Germans the *ſchmey*. The head and upper part of the neck in this bird are of a reddiſh hue, variegated with black ſpots; but toward the beak the colour is paler, and blended with ſome white and yellow. The upper part of the breaſt and the ſides are of a deep reddiſh hue, and variegated with tranſverſe ſtreaks of black, and the back is brown; the head is proportionably ſmaller than that of the wild duck. It feeds on weeds and ſmall ſhell-fiſh. *Ray*'s Ornithol. p. 288.

PENETRALE, among the Romans, properly denoted the chapel conſecrated to the *penates*, or houſehold gods. *Pitiſc.* Lex. Ant. in voc. See PENATES, *Cycl.*

PENGUIN, in zoology, a name given by ſailors of different nations to two different ſpecies of water-fowl, both web-footed, and both wanting the hinder toe.

The *penguin* of the Engliſh is the bird more commonly known by the name of the *goiſugel*.

It grows to the ſize of a common tame-gooſe, and is black on its back, or upper part, and white on the belly. Its wings are very ſmall, and by no means fit for flying. Its beak is ſomewhat broad and long, compreſſed on the ſides and back, and has toward the extremity ſeveral furrows, ſeven or eight on the upper ſide, and about ten on the under; and the lower chap ſwells into a protuberance downward. Its head has two white lines reaching from the beak to the eyes. It tail is very ſhort, and it has no hinder toe.

The *penguin* of the Dutch is the *anſer magellanicus* of Cluſius. *Ray*'s Ornithol. p. 242. See the article DUCK.

PENICILLI *marini*, in natural hiſtory, a ſort of marine tubuli, or caſes of ſea-worms, making a diſtinct genus of thoſe ſhells. They are defined to be ſhelly tubes, very ſlender, and terminating in the ſhape of a painter's pencil; many of them in their native ſtate adhering to ſtones, &c. on the ſea-ſhores, by means of a ſoft and lax ſubſtance. Some of theſe are white and pellucid, others yelloviſh or brown; and the more common ſort are about a finger's length, and about the thickneſs of a wheaten ſtraw; and ſome are of a ſort of funnel-like ſhape, and have their mouths ſurrounded by a ſort of hairs, or filaments. Theſe are called by ſome *proboſciplectani*, others are called *cadi*, and others *entalia*. *Klein*, de Tubul. Marin. p. 1.

PENIS (*Cycl.*)—Bleeding in the vena dorſalis of the *penis* is uſually found to ſurpaſs all remedies whatever in abating inflammatory diſorders of this member. This large vein, which runs along the back or upper ſide of the *penis*, being generally pretty much diſtended and conſpicuous in an inflammation of this part, may be opened about the middle, and kept bleeding till the member becomes flaccid, and a ſufficient quantity of blood be diſcharged proportionably to the urgency of the caſe; which done, a compreſs muſt be applied, and kept on by bandage. There muſt, however, be great caution in this operation not to injure the arteries or nerves which enter the *penis* near this vein, as alſo not to make the bandage too ſtrict,

ſtrict, by which the inflammation and ſymptoms may become worſe than before. *Heiſter*'s Surgery, p. 284.

PENIS *primus muſculus*, in anatomy, a name given by Veſalius and others, to a muſcle of the *penis* now generally known by the name of *accelerator*.

PENITENTS, in the church of Rome. See POENITENTES.

PENNANT, in a ſhip, a ſhort rope made faſt at one end to the head of the maſt, or to the yard-arm, with a block at the other end, and a ſhiver to receive ſome rope into. All the yard-arms, except the miſen, have *pennants*.

PENNATED-*leaf*, in botany. See LEAF.

PENNEVISCH, in zoology, a name given by ſome to the moſt common ſpecies of the fiſh called *bagre*, caught in the Eaſt and Weſt Indies. *Ray*'s Ichthyol. Append. p. 4. See the article BAGRE.

PENNY *(Cycl.)* — PENNY-*earth*, in agriculture, a term uſed by the farmers for a hard loamy, or ſandy earth, with a very large quantity of ſea ſhells intermixed in it; ſome of which being round and flat, and in ſome meaſure reſembling pieces of money, have occaſioned the earth's being called by this name. It is an earth not eaſily dug, but is uſually undermined with pick-axes, and then falls in large lumps; which, with the froſts, break to pieces, and leave the ſhells looſe. It is prepared by breaking and mixing well with water, and then makes very deſirable floors. The Jerſey combers combpots are alſo made of it, and the ſides and roofs of ovens are plaiſtered with it; and being rightly managed, it combines into a floor almoſt as ſtrong as plaiſter of Paris. *Moreton*'s Northampt. p. 66.

PENNYROYAL, *pulegium*, in botany, *&c.* See PULEGIUM.

The ſeveral ſorts of *pennyroyal* all propagate themſelves very faſt by their trailing branches, which take root at every joint; ſo that no more is required in their culture and propagation than to cut off and plant out theſe rooted branches: they ſhould be planted at a foot diſtance every way, that they may have room to grow. The beſt ſeaſon for this is in September, that the plants may be rooted before winter. They love a moiſt ſoil, and generally grow very faſt. *Miller*'s Gardener's Dict.

PENSILES-*horti*, in antiquity, gardens raiſed on arches by the kings of Babylon. Q. Curtius makes them equal in height to the walls of the city, *viz.* fifty feet. Trees of a very large ſize grew and flouriſhed here. *Hofm.* Lex. in voc. Q. *Curt.* l. 5. c. 1.

PENTACEROS, in natural hiſtory, a name given by Linkius, and ſome other authors, to a kind of *ſtella marina*, or *ſea ſtar-fiſh*, compoſed of five principal rays, with ſeveral tranſverſe hairy or downy proceſſes.

PENTACTINODOS, in natural hiſtory, a name given by ſome authors to thoſe ſpecies of ſtar-fiſh which are compoſed of a body divided into five rays.

PENTADACTYLON, *five fingers*, in botany, a name given by ſome authors to the *ricinus* or *palma chriſti*, from the figure of its leaf. *Ger.* Emac. Ind. 2.

PENTADACTYLOS *piſcis*, *the five fingered fiſh*, in zoology, the name of a fiſh common in all the ſeas about the Eaſt Indies, and called by the Dutch there *viif vinger viſch*.

It has this name from five black ſtreaks which it has on each ſide, reſembling the prints of five fingers. It grows to about a foot and a half long, and its head is ſmall in proportion to its body. Its ſnout is long, and its fins large, and reaching almoſt to its tail. Its general colour is very bright and elegant, a yellow with an admixture of purple and of a ſilvery gloſs. It has no ſcales, and is a dry but not ill-taſted fiſh. *Ray*'s Ichthyogr. Append. p. 6.

PENTADACTYLOS-ASTER, in natural hiſtory, a name given by Linkius, and ſome other authors, to a ſpecies of *ſtar-fiſh*, compoſed of a ſmall body, and five principal rays, which have each ſeveral proceſſes coming from them, covered with down.

PENTAEDROSTYLA, in natural hiſtory, the name of a genus of ſpars. The word is derived from the Greek πεντε five, ἑδρα ſides, and στυλος a column.

The bodies of this genus are ſpars, in form of pentangular columns, terminated by pentangular pyramids at one end, and irregularly affixed at the other to ſome ſolid body.

Of this genus there are three known ſpecies: 1. One with a very long pyramid. This is found in the mines on Mendip-hills. 2. One with a thick column, and a very ſhort and large pyramid. This is found in the Hartz foreſt in Germany and in Cumberland. And 3. One with a broad depreſſed pyramid. This is found, ſo far as is yet known, only in the mines at Rammelſberg in the Hartz foreſt in Germany. *Hill*'s Hiſt. of Foſſ. p. 220.

PENTAGON-ASTER, in natural hiſtory, a name given by Linkius, and other authors, to a kind of *ſtella marina*, or *ſtar-fiſh*, compoſed of five rays, with a number of tranſverſe proceſſes iſſuing from them, covered with a hairyneſs.

It is one of the general claſſes of the *ſtellæ crinitæ*, ſo called from this hairyneſs.

PENTAGONOTHECA, in botany, the name given by Vaillant to the plant called by Linnæus, Plumier, Houſton, and others, *piſonia*. It has this laſt name from Piſo, the great botaniſt, and the other from the figure of its ſeed-veſſel, which is of a ſort of pentangular figure, but contains only one cell. *Vaillant* Act. Germ. See PISONIA.

PENTANDRIA, in botany, a claſs of plants which have hermaphrodite flowers, with five ſtamina or male parts in each. See Tab. 1. of Botany, Claſs 1.

The word is formed of the Greek πεντε five, and Ἀνηρ male. Of this claſs of plants are the primroſe, willow-herb, bindweed, *&c.*

PENTANGLE, in geometry, a figure with five angles.

PENTAPHARMACUM, a medicine conſiſting of five ingredients: it has alſo been uſed in the ſame ſenſe to aliments. Adrian the emperor was, as we are informed, particularly fond of a diſh of five ingredients, called by this name. The ingredients were the udder of a ſow, ham, peacock, brawn, and a ſort of paſte.

PENTAPHYLLOIDES, in botany, the name of a genus of plants, the characters of which are theſe: The flower and fruit are the ſame with thoſe of the common cinque-foils, but the leaves do not grow as in that at the tops of the ſtalks, but arranged along them, as in the other plants.

The ſpecies of *pentaphylloides*, enumerated by authors, are theſe: 1. The erect *pentaphylloides*, called by authors the *ſtrawberry-cinque-foil*. 2. The procumbent *pentaphylloides*, called by authors the *creeping ſtrawberry-cinque-foil*. 3. The ſilvery *pentaphylloides*, with alated leaves, called by authors, *argentina*, *potentilla*, *ſilver-weed*, and *wild fanſy*. 4. The upright ſhrubby *pentaphylloides*. 5. The red-flowered marſh *pentaphylloides*. 6. The red-flowered marſh *pentaphylloides*, with thicker and hairy leaves. *Tourn.* Inſt. p. 298.

PENTAPLEURUM, a name given by ſome botanical writers to the common ſmall plantain, uſually called *ribwort* and *plantago quinquenervia*, from its leaves always having juſt five ribs running along them.

PENTAPTEROPHYLLUM, in botany, a name by which Dillenius has called the *myriophyllum* of other authors, characterred under that name in the genera plantarum of Linnæus, p. 459. See MYRIOPHYLLUM.

PENTAUREA, a name given by ſome fabulous authors to a ſtone ſaid to have been firſt found by Apollonius Tyaneus, and to poſſeſs the virtues of all the other ſtones, and to attract them all to it, as the magnet does iron.

PENTECONTARCHA, among the antients, the captain, or commander of a galley, called *penteconteros*. *Pitiſc.* Lex. Ant. in voc. See PENTECONTEROS, *Cycl.*

PENTELICUM-*marmor*, in the works of the antients, a name given to a very beautiful and gloſſy ſpecies of white marble, of which many of the columns and ſtatues of larger ſize of the antients were made: the Parian marble, from certain cracks and fiſſures in the ſtrata, ſeldom affording blocks of more than five foot in length.

PENTEXOCHE, a name given by authors to a ſpecies of echinites, reſembling the ripe fruit of a medlar, and thence called alſo *meſpileus lapis*.

PENTHORUM, in botany, the name of a genus of plants, the characters of which are theſe: The cup is very ſmall and permanent; it is compoſed of one leaf divided into five ſegments at the edges. There is no flower, the ſtamina are ten ſetaceous filaments of double the length of the cup. Theſe are permanent, the antheræ are roundiſh and fall off very quickly. The germen of the piſtil is divided into five parts, and terminates in five ſtyles, which are conic, erect, and of the length of the ſtamina. The ſtigmata are obtuſe; the fruit is a capſule divided into five parts, and containing five cells. The ſeeds are numerous, ſmall, and compreſſed. *Linnæi* Gen Plant. p. 204.

PENTODRYON, in botany, a name given firſt by the Greek writers, and after that by the Romans, to a kind of *ſtrychnum* or *nightſhade*, which cauſed madneſs in thoſe who eat of it. This was called by others *manicum ſtrychnum*, and by ſome ſimply *manicum*.

PENTOPHTHALMOS, in zoology, the name of an Eaſt Indian fiſh, approaching to the European *liparis* or *butterfiſh*, but larger, and called by the Dutch there *viifoog*. It has theſe names from five round ſpots in the tail-fin, reſembling five eyes. It is of a yellowiſh colour, and is covered with a ſmooth ſkin, having no ſcales. Its body is thick; its head ſmall; its beak long. It has two red fins, and its tail is bluiſh. It is an inhabitant of the freſh waters, and is a very well-taſted fiſh. *Ray*'s Ichthyogr. Append. p. 6.

PEPIN-*cyder*. See CYDER.

PEPITA, in the materia medica, a name given by ſome authors to the *faba ſancti Ignatii*, or *St. Ignatius's bean*. *Dale* Pharm p. 328.

PEPLION, or PEPLOS, names given by the antients to medicines which they uſed as briſk cathartics to purge off the bile and other humors.

PEPLIUM, in botany, a name given by the antient Greek writers to a ſhrub which had pinnated leaves and papilionaceous flowers. It is tranſlated by many *ſena*; but this does not appear certainly to be right: the ſeveral ſpecies of *colutea* agree as well with this deſcription as the *ſena*, and they have indeed been called *ſena* by many; probably it was one of theſe.

PEPLUS,

PEPLUS, Πεπλος, among the antients, a kind of garment worn by women. *Pitiſc.* in voc.

The *peplus* was a long robe that reached to the feet, without any ſleeves, and ſo exceeding fine that the ſhape of the body could eaſily be diſcovered through it. Hiſt. l'Acad. Inſcr. vol. 3. p. 401.

The *peplus* of Minerva is very famous among antient mythologiſts. The Athenians uſed a great deal of ceremony in the making the *peplus*, and dreſſing the ſtatue of this goddeſs with it. See *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 421.

PEPLUS, in botany, a name given by ſome authors to the ſmaller round-leaved ſpecies of *tithymal*, or *ſpurge*, as they call the narrow-leaved ones *eſula*. See the article TITHYMALUS.

PEPO, the *pompion*, or *pumpkin*, the name of a genus of plants allied to the melon and cucumber kinds. The characters of the genus are theſe: The flowers conſiſt of one leaf each, ſhaped like a bell, wide open at the mouth, and divided into ſeveral ſegments at the end. Of theſe flowers ſome are male or ſteril, having no embryo; others are female or fruitful, having an embryo, which ripens into a large fruit, with ſometimes a ſmooth, ſometimes a rough bark. The figure is ſometimes oval, ſometimes round, and the bark often very hard, tuberous, and hollow: it is divided into three cells within, and contains flat ſeeds ſurrounded with a ſort of ring, and fixed to a ſpongy placenta.

The ſpecies of *pompion*, enumerated by Mr. Tournefort, are theſe: 1. The great long-fruited *pompion*. 2. The great round-fruited *pompion*. 3. The orange-fruited *pompion*. 4. The ball *pompion*, or *ball gourd*, called by authors *cucurbitula pilæ palmariæ figura*. 5. The ſmall round fruited-*pompion*, called the *ſmall rough-fruited yellow gourd*. 6. The round-fruited variegated *pompion*. 7. The *pompion* with a variegated fruit of a turbinated form. 8. The turbinated white *pompion*. 9. The turbinated yellow *pompion*. 10. The leaſt turbinated *pompion*. 11. The pear-faſhioned *pompion*. 12. The oval yellow *pompion*. 13. The rough oval yellow *pompion*. 14. The variegated yellowiſh oval *pompion*. *Tourn.* Inſt. p. 105.

We generally eſteem the *pompion* but an unwholſome food, but there is another uſe in it worth enquiring into. The world heard much of the fame of a ſecret medicine prepared by Petrus de Caſtro, chief phyſician to the duke of Mantua, for the cure of pleuriſies. When the ſecret of this was diſcovered and publiſhed in the Acta Leipſienſia, it appeared to be no more than the rinds of the oblong Italian *pompions*, pared clean from the pulp, and boiled many hours together in old oil of olives.

PEPPER *(Cycl.)* — *Ciapa* PEPPER, *pimienta de Ciapa*, a name given by the Spaniards to a ſort of ſpice which they diſcovered in Ciapa, a province of Guatimala in New Spain, and of which they were at firſt very fond, both in food and medicine.

In medicine it is a very good cephalic and ſtomachic. It is recommended very ſtrongly alſo by ſome of the Spaniſh writers, as a cure for the epilepſy and the gutta ſerena, but thoſe who have tried it in theſe caſes do not confirm ſuch accounts.

The deſcriptions we have of it are, that it has the taſte of cloves, pepper, cinnamon, and ginger, all blended together; and Redi is of opinion, that it is no other than our *pimenta*, or *Jamaica pepper*. *Redi*'s Eſperien.

PEPPER-*muſhroom*, in botany, a name given by Dr. Liſter to a new ſpecies of fungus, diſcovered by him in the woods of Yorkſhire, whoſe juice is acrid and hot as pepper. This is ſomewhat larger than the common eſculent muſhroom, but of the ſame ſhape with that, having a round head and open gills underneath. The head is very fleſhy, and the pedicle alſo is ſolid, not hollow, as in moſt other of the larger funguſes: any part of this *muſhroom* being cut or broken, it bleeds very freely a white milky juice, like that of the tithymals. This juice taſtes like pepper, only that it is much hotter. It is not viſcous or clammy to the touch, and the air does not much diſcolour it; nor does it render the blade of the knife, with which it is cut, black, as moſt other vegetable juices do. When let out of the plant it very ſoon concretes into a firm and dry maſs, making a ſort of cake; and when thus dried into a ſolid ſubſtance, it retains its white colour and pungent taſte. It is very remarkable, that this *muſhroom*, tho' ſo hot to our tongues as not to be endured, yet is ſo well ſuited to the palates and nature of certain inſects, that they can not only feed on it, but live comfortably in the midſt of it. The yellow naked ſnail feeds greedily on the plant while growing, and the ſtalks of it at ſuch times as the juice is ſharpeſt of all, that is, while it is growing to the full ſize, are full of the maggots or worms hatched from the eggs of flies, depoſited there for a nidus and food for them in that ſtate. The juice has a great affinity with euphorbium, and may be brought into medicinal uſe, perhaps, to very good purpoſe.

John Bauhine deſcribes a *muſhroon* much reſembling this, but ſmaller and leſs fleſhy; and the Pruſſians and Polanders have a ſort of great *muſhroom*, which they call *groozdiſhys*, which agrees with this in many particulars; but it is larger and thicker. Phil. Tranſ. N° 89. See the article GROOZDISHYS.

PEPPER-*tree* of Jamaica. See PIMIENTA.

PEPPER-*water*, a liquor prepared by the curious for examination by the microſcope, as always affording a great number of ſmall animals.

The method of preparing it is this, put common black *pepper* groſsly powdered, into an open veſſel ſo as to cover the bottom of it half an inch thick, and put to it rain or river water, till it covers it an inch, ſhake or ſtir the whole well together at the firſt mixing, but never diſturb it afterwards: let the veſſel be expoſed to the air uncovered; and in a few days there will be ſeen a pellicle or thin ſkin ſwimming on the ſurface of the liquor, looking of ſeveral colours.

This is a congeries of multitudes of ſmall animals; and being examined by the microſcope, will be ſeen all in motion: the animals, at firſt ſight, are ſo ſmall as not to be diſtinguiſhable, unleſs to the greateſt magnifiers; but they grow daily till they arrive at their full ſize. Their numbers are alſo continually increaſing, till the whole ſurface of the liquor is full of them, to a conſiderable depth. When diſturbed they will ſometimes all dart down to the bottom, but they ſoon after come up to the ſurface again. The ſkin appears ſooneſt in warm weather, and the animals grow the quickeſt; but in the ſevereſt cold it will ſucceed, unleſs the water freezes. *Baker*'s Microſcope, p. 71.

About the quantity of a pin's head of this ſcum, taken up on the nib of a new pen, or the tip of a hair pencil, is to be laid on a plate of clear glaſs; and if applied firſt to the third magnifier, then to the ſecond, and, finally, to the firſt, will ſhew the different animalcules it contains, of ſeveral kinds and ſhapes as well as ſizes Phil. Tranſ. N° 284.

The animalcules found in this liquor, are principally of ſix kinds: 1. The largeſt kind of all is in length about the diameter of a hair, and of ſcarce a fourth part of that meaſure in breadth: they are very thin and tranſparent, but their back is darker than their belly: they turn about very frequently and nimbly in the water; their ſides are fringed with a great number of minute feet, which are ſeen principally at the two ends; and at one end there are alſo ſome briſtles longer than the feet, which make a ſort of tail. They are very nimble, and walk as well as ſwim, and will climb up a hair if put in among them.

2. There is a ſmaller ſort, whoſe length is about a third of a hair's breadth; but their tail is five or ſix times as long as their body. This they either carry ſtrait, or in a ſpiral form; and at the other end they thruſt out a ſort of bearded tongue: theſe make a conſtant current of water toward them.

3. There is a ſmaller ſort than theſe, which are ſometimes ſeen of an oval figure, and ſometimes long and flat like a flounder: theſe alſo have feet which are plainly ſeen when the water is evaporating.

A fourth kind appear like ſlender worms, fifty times as long as broad: their thickneſs is not above the hundredth part of a hair's breadth; and they move with equal eaſe either forward or backward. There are a fifth ſort extremely minute and round; and a ſixth kind which are longer than theſe, but not larger; and probably there may be yet many kinds not diſcovered. Theſe ſmall animals are eaſily deſtroyed; a little diſſolved ſalt or ſugar, or ſpirit of vitriol, or even ſpittle will kill them; and in the drying away of the waters many of them burſt. Phil. Tranſ. N° 203.

PERÆQUATORES, among the Romans, aſſeſſors appointed to regulate the *cenſus* according to every man's circumſtances, by eaſing thoſe that were overcharged, and raiſing the taxation if too low. *Pitiſc.* in voc.

PERANEMA, in zoology, the name of a Braſilian fiſh, of the ſize of the pearch, being ten or eleven fingers in length, and about three fingers broad in the broadeſt part.

Its mouth is large and round, and has no teeth, but ſeveral very rough and ſharp prominences. Its eyes are large, and it has one long fin running down the back, which is ſupported by rigid and prickly rays. Its tail is not forked; its whole body is a ſilvery white, with a faint bluſh of red. Its ſcales are extremely ſmall, and of a triangular figure, and its belly is very white. It is a ſea fiſh, and is wholeſome and well-taſted. *Marggrave's* Hiſt. Braſil. *Willughby*'s Hiſt. Piſc. p. 339.

PERANITES, the name of a ſtone mentioned with many idle ſtories of its origin, by the writers of the middle ages.

It ſeems originally to have been only a corruption of the word *peartides*, a name by which the antients ſeem to have called our *ſtalactites* or *dropſtone*.

PERCA, the *pearch*, in the Linnæan ſyſtem of zoology, the name of a genus of fiſhes of the order of the acanthopterygii. The characters of theſe are, that the membrane of the gills has ſeven bones, and the back has one or two fins. Of this genus are the *perca*, *lucioperca*, *lupus*, &c. *Linnæi* Syſtema Naturæ. p. 53.

In the Artedian ſyſtem of ichthyology, the characters of the *pearch* are theſe: It is of the acanthopterygious kind. The branchioſtege membrane on each ſide, contains ſeven bones. The ſcales are very hard and rough, or armed with a ſort of little

little hooks at the ends; and the upper lamina of the coverings of the gills is ſerrated at the edges. There are ſometimes two fins on the back, ſometimes only one.

Of the former ſort, or thoſe which have two fins on the back, the ſpecies are, 1. The *pearch* with ſix tranſverſe black lines, and with the fins of the belly red. This is our common *pearch*. 2. The pale ſpotted *pearch*, with two teeth in the jaws, on each ſide, larger than the others. This is the *lucioperca* or *harſe*. 3. The *pearch* with eight or nine black tranverſe lines on each ſide. This is the *aſper piſciculus* of authors.

Of thoſe *pearch* which have only one fin on the back, the following are the ſpecies: 1. The *pearch* with one back-fin, and a cavernous head. This is the *cernua* of authors. 2. The *pearch* with one back-fin, with black longitudinal lines on each ſide. This is the fiſh called by the Germans *ſchraitſer*. 3. The *pearch* with ſeven tranſverſe black lines on each ſide, and with red and blue marks on the head and belly. This is the *perca minima auctorum*. 4. The *pearch* with thirteen rays in the back-fin, and forty in the *pinna ani*. This is the *labrax* of authors, by ſome called the *lupus marinus*; and by others *ſpigola*; we call it a *baſſe*. *Artedi* Gen. Piſc. p. 38.

The name *perca* is of Greek origin, and is derived from the word πέρκος, which ſignifies variegated with black or duſky ſpots; a character common to moſt of the ſpecies of this fiſh.

The common *pearch* affords good ſport for the angler. The beſt time for their biting is, when the ſpring is over, and before the heats of ſummer come on. At this time they are very greedy, and the angler, with good management, may take at one ſtanding all that are in the hole, be they ever ſo many.

The proper baits are a minow or young frog; but the worm called the *branding*, well ſcowered, is alſo excellent at all times of the year. When the *pearch* bites, he ſhould always have a great deal of time allowed him to ſwallow the bait. The *pearch* will bite all day long, if the weather be cloudy; but the beſt time is from eight to ten in the morning, and from three till ſix in the afternoon. The *pearch* is very abſtemious in winter, and will ſeldom bite in this ſeaſon of the year; if he does at all, it is in the middle of the day; at which time indeed all fiſh bite beſt at that ſeaſon.

If the bait be a minow, which is the bait that affords moſt diverſion to the angler, it muſt be faſtened to the hook alive, by putting the hook thro' the upper lip or the back-fin; it muſt be kept at about midwater, and the float muſt be a quill and a cork, that the minow alone may not be able to ſink it.

The line muſt be of ſilk, and ſtrong; and the hook armed with a ſmall and fine wire, that if a pike ſhould take the bait, as is not unfrequently the caſe, he may be taken. The way to carry the minows or ſmall gudgeons alive for baits, is this: A tin pot is to be provided with holes in the lid, and filled with water, and the fiſh being put in this, the water is to be changed once in a quarter of an hour by the holes, without taking off the lid at any time, except when the bait is to be taken out.

A ſmall caſting-net made for theſe little fiſh ſhould be taken out with the *pearch* tackle, and one or two caſts of this will take baits enough for the day, without any farther trouble. When the bait is a frog, the hook is to be faſtened to the upper part of the leg. The beſt place for the fiſhing for *pearch* is, in the turn of the water near ſome gravelly ſcour. A place of this kind being pitched upon, it ſhould be baited over night with lobworms choped to pieces; and in the morning on going to it, the depth is to be regularly plumbed, and then the hook is to be baited with the worm or other bait; and as it drags along, the *pearch* will ſoon ſeize upon it.

PERCA *amboinenſis*, in zoology, the name of a freſh water fiſh, ſomewhat reſembling our pearch, but differing in that it is of a brown colour, and has ſeveral blue lines under its ſnout, and ſome blueneſs in the adjoining fins, but its back and belly fins are green. It is caught in the lakes and rivers of freſh water, at Amboina, and is a very delicately taſted fiſh. *Ray*'s Ichthyogr. Append. p. 1.

PERCA *aurata*, the *gilded pearch*, a fiſh of the ſhape of the pearch, but remarkable for a gold colour about its gills: it is common in our rivers, and is called in Engliſh a *ruffe*; its more common name among authors is *cernua*. *Geſner* de Piſc. p. 825. See CERNUA.

PERCA *marina*, the *ſea pearch*, in zoology, the name of a ſea fiſh, much reſembling the common freſh water pearch in ſhape, ſize, and colours, but ſomething thinner in proportion to its length, and more variegated.

Its back is variegated with ſix or ſeven blackiſh tranſverſe lines, like thoſe of the pearch, and the intermediate ſpace is of a ſomewhat reddiſh hue, eſpecially toward the head. Its whole head, and part of its belly, are very elegantly variegated with red and blue ſtreaks. Its back fin is of a pale yellow, with ſeveral reddiſh yellow ſpots, and is very long, and has its anterior rays terminated in ſpines. Its mouth is extremely wide, and almoſt always gapes open; its teeth are ſharp, and its eyes very large. It is very common in the Mediterranean, and is a well-taſted fiſh. *Rondelet.* de Piſc. p. 120. *Geſner* de Piſc. p. 819.

PERCOLATION *(Cycl.)*—Many have attempted the condenſing of wines by *percolation*, or ſeparating from them that ſuperfluous moiſture or water, which dilutes them below the true ſtandard of vinous liquors, in order to make them richer and fitter for keeping; but it does not appear that ſuch attempts have as yet ſucceeded. See *Stahl*, de concentr. vin.

PERCUNOS, the name of an antient Pruſſian idol. See the article POTRIMPOS.

PERCUSSION *(Cycl.)*—If an elaſtic body ſtrike a larger elaſtic body at reſt, the ſmaller body will always rebound, and move in a contrary direction to what it did at firſt, and alſo give the larger body a greater quantity of motion than what was originally in the ſmaller body. And this quantity of motion communicated, may be greater than the original motion, in any ratio leſs than that of 2 to 1. For ſuppoſing the ſmall body and its velocity, to be denoted by unity, and the larger body at reſt by x, the velocity of x after the ſhock will be $\frac{2}{1+x}$, and its quantity of motion will be $\frac{2x}{1+x}$. But tho' the proportion of $2x$ to $1+x$ increaſes when x increaſes, yet its limit will be the proportion of 2 to 1; which is the limit to which the motion of x may approach indefinitely near.

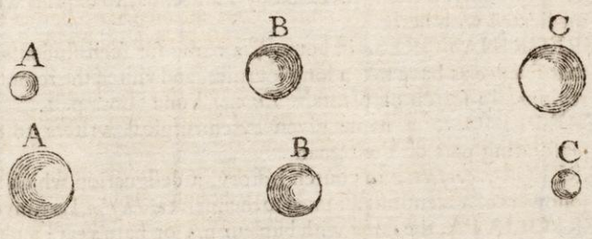
Hence it follows, that if the force of moving bodies be meaſured by their quantity of motion, a body may, by *percuſſion*, immediately communicate a greater force than itſelf has to another, and this in any proportion leſs than double.

But if other elaſtic bodies be interpoſed, a body may mediately communicate a greater force than its own to another larger body x, in any proportion leſs than that of $x\sqrt{x}$ to 1. Thus if $x = 1000000$, the body 1 with the velocity 1, may, by the means of intermediate bodies, give it the force 999000000; and the ſum of the abſolute forces of all theſe bodies taken together, ariſing from the *percuſſion*, may exceed the force of the firſt or unity, in any ratio leſs than $2x\sqrt{x}$ to 1, or 2000000000 to 1, altho' the relative force in all caſes remains as at firſt $= 1$.

Theſe are paradoxes which cannot be urged againſt thoſe who maintain the forces of bodies to be meaſured by their maſſes and the ſquares of their velocities.

It is alſo to be obſerved, that thoſe who meaſure force by the quantity of motion, muſt deny that there is any force loſt by the impreſſions made on ſoft bodies, or by the bending of elaſtic bodies: for if any were loſt from ſuch cauſes, the ſum of the quantities of motion of bodies moving the ſame way, could not remain the ſame before, during, and after the ſhock, which is an univerſal rule admitted by the Newtonians. But they admit that a ſpring bent between two bodies may, by unbending itſelf, generate motion in theſe bodies. Hence it follows, that according to this doctrine, tho' a ſpring may give motion to bodies, it cannot, by a contrary action, take it away; which ſeems no ſmall paradox.

If a body A move towards the body C, at reſt, and an intermediate body B of a mean magnitude be placed at reſt between them, ſo that A firſt impels B, and then B impels C, a greater motion will be given to C than if A had ſtruck it directly. And if B be a mean proportional between A



and C, the velocity communicated to C will be the greateſt that can be. *Huygens*, de mot. Corp. ex Percuſſ. Prop. 12.

If more bodies be interpoſed between A and C, the motion of C will be greater; and it will be the greateſt when the bodies interpoſed conſtitute a ſeries of mean proportionals between A and C. Ibid. Prop. 13.

If there be a ſeries of an hundred bodies in the proportion of 1, 2, 4, 8, 16, &c. and the motion begins by the greateſt body, the velocity communicated to the ſmalleſt will be to that with which the greateſt moved nearly as 2,338,500,000,000 to 1. And if the motion begins by the leaſt body, the quantity of motion will be increaſed on the whole nearly as 1 to 4,677,000,000,000. *Huyg.* ib.

But it is to be obſerved, that there is a miſtake in the impreſſion of Huygens's book, as to the firſt number, which is there printed 14,760,000,000, inſtead of 2,338, &c. ſo that the velocity thus given to the ſmalleſt body is 150 times greater than what the printed copy of Huygens aſſigns. *Bernoulli*, Diſc. ſur le Mouv. Oper. Tom. 3. p. 34. and *S. Graveſande*, Pref. ad Huygen. Oper. Poſth. Tom. 2. Amſt. 1728.

This ſtupendous augmentation of the quantity of motion, is a remarkable inſtance of the falſity of the Carteſian prin-

ciple, that the ſame quantity of motion is always preſerved in the world.

Some have thought this augmentation no ſmall difficulty againſt thoſe who maintain the moving force or power of action in bodies, to be proportional to their quantities of motion. This difficulty does not preſs the Leibnitians; for it is to be obſerved, that notwithſtanding the prodigious increaſe of motion here aſſigned, yet there is no increment of the *vis viva* of this ſyſtem of bodies. See the articles FORCE and VIS *viva*

A learned author has urged, that if the force of bodies were in proportion to their quantities of motion, the increaſe in the motion here mentioned might be employed to reſtore the motion of the firſt body, and hence make a perpetual motion. But it is anſwered, that as the motion of the laſt is increaſed in the ſame direction with the firſt, the motion of all the reſt will be in the contrary direction, and equal to that of the laſt diminiſhed by unity: hence the ſum of the motions in the ſame direction, remains as it did, equal to that of the firſt and ſmalleſt body, which we ſuppoſe unity. See *Maclaurin*'s Demonſtrat. des Loix du choc des Corps, p. 21. Paris, 1724. and *S. Graveſand.* rem. ſur la poſſibilité du mouvement perpetuel in Journ. Liter.

It is to be obſerved, that there is a limit which the velocity communicated to the laſt body never amounts to, (ſuppoſing the firſt and laſt bodies, and the velocity of the firſt before the ſtroke, to be given) but to which it approaches continually, while the number of ſuch bodies interpoſed between the firſt and laſt is always increaſed. And this limit is to the velocity of the firſt body before the ſtroke, in the ſubduplicate ratio of the firſt body to the laſt.

Mr. Huygens has not mentioned this limit, but the curious may ſee the determination of it in Mr. Maclaurin's fluxions, art. 514. In the caſe mentioned by Huygens, this limit will be a number expreſſed by fourteen figures, for its logarithm is 14.9004850.

PERDIX, the *partridge*, a bird well known and eſteemed at table, of which naturaliſts enumerate five ſpecies. 1. The common *partridge*. 2. The Braſilian *partridge*, called *iambu*, of a duſky yellow colour, ſpotted with brown: of this there are two ſpecies, a larger and a ſmaller. See the article IAMBU. 3. The *perdix damaſcena* of Aldrovand, which reſembles our *partridge*, but its feet are yellow and its beak longer. 4. The red-legged *partridge*, common in France and Italy, and called there *cotumo*. See COTUMO. And, 5. The Græcian *partridge*, which is twice as large as ours, and not ſeeming to differ from the *cotumo* in any thing but ſize: they are all very finely taſted birds, but none are ſo delicate as the *cotumo*. *Ray*'s ornithology, p. 119.

PERDIX *alba*, the white *partridge*, a name given by many to the *lagopus*, a rough-footed bird of the gallinaceous kind, common on the ſnowy mountains, and by ſome called the *rabolane*. See the article LAGOPUS.

PERDIX *marina*, the *ſea-partridge*, a name given by ſome authors to the ſoal-fiſh, from the firmneſs and delicacy of its fleſh. *Bellon.* de Aquat. Vol. I. p. 34.

PERDIX, in conchyliology, a name given by authors to a genus of ſhells, ſuppoſed to reſemble the partridge in the ſhades and diſpoſition of the colours.

The partridge-ſhell is of the *dolium*, or *concha globoſa* claſs, and is ſtriated and ſpotted in a peculiarly elegant and regular manner. See DOLIUM.

PERDONIUM, a term, invented by Paracelſus, to expreſs wine medicated with herbs.

PEREGRINATORES, in botany, a name for ſuch ſtudents in that ſcience as have taken long journies, and viſited the remoteſt regions, in ſearch of plants. *Linnæi* Fund. Bot. p. 1.

PERETERION, a name given by chirurgical writers to the perforating part of the trepan.

PERFECT, *perfecti*, in church hiſtory, a deſignation which the followers of Valentinus aſſumed to themſelves. *Hoffm.* Lex. invoc.

PERFOLIATA, the ſame with bupleurum, or hare's ear; a plant recommended by authors as a vulnerary of the firſt claſs. It is applied externally to contuſions, freſh wounds, and luxated joints.

There are many who eſteem it a remedy even for the king's evil, and its virtues in the cure of navel-ruptures have long been famous: but all this wants proof. See HARE's *ear*.

PERFOLIATE-*leaf*, among botaniſts. See LEAF.

PERFORATA, in botany, a name given by ſome authors to the *hypericum*, or St. John's wort, from the ſmall holes ſeen all over its leaves, if held up to the light. *Ger.* Emac. Ind. 2.

PERFORATUS *(Cycl.)*—PERFORATUS *brachii*, in anatomy, a name given by Placentini to a muſcle of the arm, now generally known by the name of the *coraco-brachialis*. It has been by many diſputed not to be a diſtinct muſcle. Veſalius calls it only *pars interioris principii cubitum flectentium primi carnoſa*, eſteeming it only a part of that muſcle. Many of the writers who followed Veſalius have given it alſo the name of *pars* and *portio*, not eſteeming it a diſtinct muſcle: and Caſſerius, who wrote after Placentini, calls it only *portio carnoſa*, and cenſures that author for thinking it a diſtinct muſcle, and calling it *perforatus*.

PERIAMMA, a word uſed by ſome medical writers to expreſs an amulet.

PERIANTHIUM, in botany, expreſſes that ſort of cup which conſiſts of ſeveral leaves, or elſe of one leaf divided into ſeveral ſegments, and ſurrounds the lower part of the flower. See the article CALYX.

PERIAGOGE, Περιαγωγὴ, in rhetoric, the ſame with peribole. See the next article.

PERIBOLE, a word uſed very frequently by Hippocrates, and in different places, in very different ſenſes. Sometimes it ſignifies a tranſlation of the humors from one part to another; ſometimes only the dreſs or garments of a patient. In the firſt of theſe ſenſes, the word is frequently uſed to expreſs a tranſlation of the morbific matter from the center to the ſurface, in the termination of a diſeaſe, by the breaking out of puſtules all over the body.

PERIBOLE, Περιβολὴ, in rhetoric, is uſed where many things are accumulated into one period; which might have been divided into ſeveral. We have an inſtance in Cicero's defence of Flaccus: *Quod ſi eſſet aliquando futurum, ut aliquis de L. Flacci pernicie cogitaret; nunquam tamen exiſtimavi, Judices, Decium Lælium, optimi viri filium, optimâ ipſum ſpe præditum, ſummæ dignitatis, eam ſuſcepturum accuſationem, quæ ſceleratorum potius civium odio, & furori, quam ipſius virtuti, atque inſtitutæ adoleſcentiæ, conveniret.*

Now this long period might very well have been divided into the three following: 1. *Quod ſi eſſet aliquando futurum, ut aliquis de L. Flacci pernicie cogitaret; nunquam tamen exiſtimavi, judices, Decium Lælium, eam ſuſcepturum accuſationem.* 2. *Eſt enim is optimi viri filius, optimâ ipſe ſpe præditus, ſummæ dignitatis.* 3. *Accuſatio vero hæc ſceleratorum potius odio et furori, quam ipſius virtuti atque inſtitutæ adoleſcentiæ, conveniret. Voſſii* Rhet. l. 6. p. 439. ſeq. See PUNCTUATION, *Cycl.*

PERICALAMITIS, in the materia medica of the antients, a name given by ſome to the *adarce*.

We find the word *pericalamitis* in a deſcription recorded in Galen, and it has generally been underſtood to mean *ſtyrax*, that being called *calamita*: but the *adarce* is the thing ſignified by the name, which expreſſes its manner of formation, it being always found concreted about the ſtalks of reeds that grow on the edges of waters. *Galen* l. 1. See ADARCE.

PERICARDIUM *(Cycl.)*—We read of a *pericardium* of a monſtrous ſize, out of which above three pounds of coagulated blood and ſerum were taken. See Medic. Eſſ. Edinb. Vol. V. art. 56.

PERICARPIUM, among botaniſts, a covering or caſe for the ſeeds of plants: it is the germen of the piſtil enlarged. There are no leſs than nine ſpecies of *paricarpia*: 1. A capſule. 2. A conceptaculum. 3. A pod. 4. A legume. 5. A nut. 6. A drupe. 7. An apple. 8. A berry. 9. A ſtrobilus. See CAPSULE, CONCEPTACULUM, *&c.*

PERICHAREIA, a word uſed by the antients to expreſs a ſudden ſurprize of joy, ſuch as has been frequently known to occaſion death.

PERICHRISIS, a word uſed by the antients for a liniment, principally of the oleaginous or ſpirituous kinds, and as thin and fluid as oil.

PERICLASIS, a word uſed by the antients for a fracture of a limb, attended with a large wound, by which the broken ends of the bone, or part of it, are laid bare.

PERICLYMENUM, *wood-bind* or *honey-ſuckle*, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts of one leaf, and is tubular, and divided into ſeveral ſegments at the edges; the cup finally becomes a roundiſh juicy fruit or berry, containing a compreſſed ſeed of a rounded ſhape.

The ſpecies of *periclymenum*, enumerated by Mr. Tournefort, are theſe: 1. The ever green Virginian long flowering *periclymenum*: and, 2. The yellow flowered Indian *periclymenum*. *Tourn.* Inſt. p. 608.

PERICNEMIA, a word uſed by ſome medical writers for the parts about the calf of the leg.

PERIDONIUS *lapis*, in natural hiſtory, a name given by ſome of the writers of the middle ages to the *pyrites*, which they call alſo *perithe*.

PERIDROMIDES, Περιδρομιδες, in antiquity. See XYSTI.

PERIDROMOS, a word uſed by the old Greek writers to expreſs the extreme edge of the hairs of the head, when hanging down in their natural form.

PERIESTECOS, in medicine, an epithet for diſeaſes, ſigns, and ſymptoms, which are ſalutary, and prognoſticate the future better health of the patient.

PERIGRAPHE, a word uſually underſtood to expreſs a careleſs or inaccurate delineation of any thing: but in Veſalius it is uſed to expreſs the white lines or impreſſions that appear in the muſculus rectus of the abdomen.

PERILEUCOS, in the natural hiſtory of the antients, a name given to an agate; but not of a diſtinct ſpecies, but only a particular appearance of the lead-coloured agate, more uſually known among them by the name of *phaſſachates*. See the article PHASSACHATES.

PERINEUCOS, an epithet given to a peculiar ſort of irregular pulſe common in hectic patients, in which the artery beats more ſtrongly in ſome parts than in others. See the article EPINEUCOS.

PERIOSTEUM *(Cycl.)*—The bones of the human body in their natural ſtate, are for the moſt part covered exteriorly by a membrane, called by the general name *perioſteum*. This is extended over the cartilages and ligaments alſo, as well as the bones; but when it covers the cartilages, it is called *perichondrium*, when the ligaments, *perideſmium*.

The *perioſteum* in general is a fine ſtrong membrane, or membranous expanſion, not equally thick in all its parts, more or leſs tranſparent, of a very cloſe texture, not eaſily yielding, extremely ſenſible, and compoſed of ſeveral planes of fibres differently diſpoſed, and mixed with a great number of fine veſſels and nervous filaments.

This membrane does not immediately ſurround thoſe portions of bones which are covered by cartilages, nor thoſe in which ligaments or tendons are inſerted; neither does it cover thoſe portions of cartilages which are expoſed to friction, as in the moveable articulations, channels, *&c.* and laſtly, it does not cover thoſe portions of the teeth which lie out of the ſockets and gums. The innermoſt plane of the fibrous texture of the *perioſteum*, or that which immediately adheres to the ſurface of the bones, is fixed thereto by an infinite number of ſmall fibrous extremities, brought from all the planes, and which enter the pores of the bones. Theſe extremities are accompanied by capillary veſſels and nervous filaments, which having run for ſome ſpace between the different planes of the *perioſteum*, perforate the innermoſt at the orifices of the pores of the bones. The *perioſteum* is of different thickneſſes, but this difference of thickneſs does not appear near ſo much on the outer ſurface, as on the inner; which is marked in many places with impreſſions, owing to the ſulci, depreſſions, lines, and inequalities on the ſurface of the bones.

Some anatomiſts have been of an opinion, that this membrane was not only united to, but cloſely braced round the bones; and that therefore it might ſet bounds to their growth. It is probable they had only examined a few bones on this occaſion, for had they conſidered thoſe which have concave ſurfaces, depreſſions, and inequalities, they would there have found only a ſimple adheſion of the *perioſteum*, without any tenſion. In places where it is only fixed to the bone by the filaments of its innermoſt plane, it is eaſily pulled off from the bones; but where the fibres of the other planes likewiſe penetrate the bones, eſpecially when theſe planes are very numerous, and where the inſertions of tendons and ligaments mingle with theſe fibres, the ſeparation is much more difficult.

The *perioſteum* in general ſerves to ſupport that admirable texture of an infinity of capillary veſſels, by which the bones and all the parts belonging to them are nouriſhed: it likewiſe ſupports a vaſt number of nervous filaments, by which ſenſation is communicated not only to this and to the internal membrane of the bones, but even, in ſome degree, to ſome portions of the bones themſelves. *Winſlow*'s Anat. p. 116.

PERIPHALLIA, Περιφαλλια, in antiquity, the ſame with *phalagogia*. See PHALLAGOGIA and DIONYSIA.

PERIPLOCA, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts of only one leaf, and is very open at the mouth, ſo as to reſemble a wheel; from the cup there ariſes a piſtil, which is fixed like a nail into the back part of the flower, and ripens into a fruit ſo like that of the *apocynum* or dog's bane, that authors in general have confounded the two genuſes. The pod is long, and is compoſed of two vaginæ, and ſplits open lengthwiſe from the baſe to the apex. *Tourn.* Inſt. p. 93.

The ſpecies of *periploca*, enumerated by Tournefort, are theſe: 1. The long-leaved *periploca*, with purple flowers. 2. The long and narrow-leaved one, called by the Ægyptians *ſecamone*. 3. The *periploca* of Monpelier, with roundiſh leaves, called by many authors *ſcammonia Monſpeliaca*. 4. The Montpelier *periploca*, with ſharp pointed leaves. 5. The American *periploca*, with a ſomewhat echinated fruit. 6. The broad American *periploca*, with a hard, oblong, ſmooth and tumid pod. 7. The white flowered climbing *periploca* of America, with very narrow willow-like leaves. 8. The low ſpreading American *periploca*, with leaves like thoſe of toad-flax. 9. Citron-leaved umbelliferous creeping *periploca* of America, with red flowers. 10. Creeping white-flowered American *periploca*, with leaves like thoſe of money-wort. 11. Citron-leaved climbing American *periploca*, with a very large fruit. And, 12. The climbing bindweed-leaved American *periploca*, with an alated fruit.

PERIPLYSIS, a name given by ſome authors to a diarrhœa, in which the ſtools are extremely thin and watry, and very frequent and large in quantity.

PERIPNEUMONY *(Cycl.)*.—This diſeaſe is very frequently confounded with the pleuriſy, and then one is miſtaken for the other, ſometimes even by phyſicians. As this, however, is a diſorder of the lungs, and the other of the pleura, there are ſymptoms attending them by which they may be certainly diſtinguiſhed. See PLEURISY.

PERIPYEMA, a word uſed by chirurgical writers to expreſs a collection of matter, wholly ſurrounding any part.

PERIRRHANTERION, Περιῤῥαντηριον, in antiquity, a veſſel, uſually of ſtone or braſs, filled with holy water, with which all thoſe that were admitted to the ſacrifices were ſprinkled; and beyond which it was unlawful for any one that was Βεβηλος, or profane, to paſs. Some ſay it was placed in the Αδυτον, or inmoſt receſs of the temple, into which none entered but the prieſt: but Caſaubon will have it to be placed at the door of the temple, which opinion ſeems moſt probable, becauſe all perſons who were Αβεβηλοι, or unpolluted, were permitted to paſs beyond it. *Potter*, Archæol. Græc. l. 2. c. 2. T. 1. p. 189.

PERISCYLACISMUS, Περισκυλακισμος, a method of purification in frequent uſe among the Greeks. It was done by drawing a whelp round the perſon to be purified. *Potter*, Archæol. Græc. T. p. 223. The word comes from σκυλαξ, a whelp.

PERISSON, in botany, a name given by the antient Greeks, and afterwards by the Romans, in the time of Pliny, to a kind of night-ſhade, which made thoſe people who took it internally run mad. It was called alſo *pentadrygon* and *anhydron*, and by ſome *manicum ſtrychnum*, or ſimply *manicon*. See the article STRYCHNUM.

PERISSOSIS, a word uſed by Hippocrates to expreſs a redundance of humours.

PERISSOLOGY, Περισσολογια, in rhetoric, a quality of ſtile directly oppoſite to *brachylogy*, and is otherwiſe called *macrology*. See MACROLOGY, BRACHYLOGY, and DICTION.

PERISTERION, in botany, a name given by ſome authors to the *ſcabioſa minor*, or ſmall ſcabious. *Ger.* Emac. Ind. 2.

PERISTERITES, the *pigeon-ſtone*, in natural hiſtory, a name given by ſome whimſical people to an odd conformation of a pebble, which they ſuppoſe to repreſent very exactly a pigeon without its wings. It ſeems to have been a mere *luſus naturæ*, in the formation of a common pebble. The variations of figure in the common pebbles are ſo infinite, that a perſon of a fertile imagination might find reſemblances to all the parts of the creation in the ſtones of a ſingle gravel-pit. The giving names to ſuch accidental things is not only unneceſſary, but miſchievous, as it cauſes great confuſion in natural hiſtory.

PERISTERNA, in anatomy, is uſed for the lateral parts of the thorax.

PERISTIARCHUS, Περιστιαρχος, in antiquity, a name given to the perſon that officiated in a luſtration. *Potter*, Archæol. Græc. T. 1. p. 35.

The word comes from Περιστια, another name for Καθαρμαλα.

PERISTOMA, in anatomy, a word uſed by authors to expreſs the villous coat of the inteſtines.

PERISTYLION, Περιστυλιον, among the Athenians, a large ſquare place, tho' ſometimes oblong, in the middle of the *gymnaſium*, deſigned for walking, and the performance of thoſe exerciſes which were not to be performed in the *palæſtra*. *Pott.* Archæol. Græc. l. 1. c. 8. T. 1. p. 39.

PERITERE, in architecture, a place encompaſſed round with columns, and with a kind of wings about it. Here the pillars ſtand without, whereas in the periſtyle they ſtand within.

PERITEXIS, a word uſed by the old medical writers to expreſs a colliquation.

PERITHE, a name by which ſome of the writers of the middle ages have called the *pyrites*; they ſay it has great virtues againſt the gout: ſome of them alſo have called it the *lapis peridonius*.

PERITONEUM *(Cycl.)*—In the fiſh kind, the *peritoneum*, or membrane ſurrounding the abdomen, is very variouſly coloured. In ſome it is of a ſhining ſilvery whiteneſs, as in the cyprini, perch, eſoces, *&c.* In others it is of a fine pale fleſh colour, as in the ſalmon; and in ſome it is wholly black, or elſe variegated with very numerous black ſpots, as in the clupeæ, gadi, cotti and ſpari. *Artedi*'s Ichthyolog.

PERIWINKLE, in natural hiſtory, the Engliſh name of a ſpecies of ſhells, called by authors *buccina*. See BUCCINUM.

PERIWINKLE, *pervinca*, in botany. See PERVINCA.

PERIZOMA, a word uſed by ſome authors for a truſs.

PERMISSION, *permiſſio*, in rhetoric, a figure which differs in nothing from *conceſſion*, except that the latter relates only to argument and pleading, but the former to action: E. G. *Quoniam, omnibus rebus ereptis, ſolum mihi ſupereſt animus et corpus: hæc ipſa, quæ de multis relicta ſunt, vobis et veſtræ condono poteſtati. Vos me quo pacto vobis videtur, utamini, atque abutamini; licebit impunè. In me, quicquid libet, ſtatuite,* &c.

PERNIONES, *childblains*. When theſe tumours tend to ſuppuration, it is proper to treat them like other recent abſceſſes; the beſt method is firſt to cleanſe the wound with ſome digeſtive ointment, then to dreſs it with balſam of Peru, or other the like application; and laſtly, to apply ſome of the lead or litharge plaiſters. Oil of myrrh *per diliquium* is alſo found of vaſt ſervice in theſe caſes, as is alſo the applying a compreſs dipped in a mixture of equal parts of lime-water and camphorated ſpirit of wine, over the other remedies.

In people who have been uſed to be afflicted with *chilblains* at the return of a certain ſeaſon, it will be found a great preſervative againſt thoſe troubleſome tumours, to anoint the parts where they are expected to appear, both before and during the acceſs of the ſevere cold, with oil of turpentine or petroleum; and when the diſorder firſt begins to ſhew itſelf, it is a very good method to wrap round the affected part a piece of a hog's bladder, well wetted with one or other of thoſe oils, and care taken to keep off the cold. *Heiſter*'s Surg. p. 211.

PERODACTYLÆUS, in anatomy, a name given by Riolan and others to one of the muſcles of the foot, called by Albinus the

the *flexor longus digitorum pedis*, and by Winslow, the *perforans pedis*, and the *accessorius perforantis pedis*.

PERONÆUS (*Cycl.*)—PERONÆUS *maximus*, a muscle of the leg, commonly called *peronæus posterior*.

It is long and penniform, and lies on the fibula. It is fixed above to the anterior and outer part of the head of that bone, and to a small portion of the head of the tibia; then to the outside of the neck of the fibula, to the upper half of the external angle of that bone, and to the aponeurosis tibialis; which at that place makes a septum between this muscle and the extensor pollicis; from hence turning backward according to the direction of the bone, it forms a considerable tendon; which running down behind the external malleolus is inserted in the side of the basis of the first metatarsal bone, and a little in the basis of the os cuneiforme majus. *Winslow*'s Anatomy, p. 221.

PERONÆUS *medius*. This is commonly called *peronæus anticus*, and is a long muscle situated anteriorly on the middle part of the fibula. It is fixed above by fleshy fibres to more than the middle third part of the anterior or outside of the fibula, and to the neighbouring part of the aponeurosis tibialis. It is likewise fixed to a production from the inside of that aponeurosis, which runs to the upper part of the tibia, and there serves for a middle septum between this muscle and the extensor digitorum longus; from thence it runs down and forms a tendon, which going in the direction of the oblique line of the fibula, passes behind the external malleolus, and then thro' an annular ligament common to it and to the *peronæus maximus*, and is afterwards inserted in the tuberosity, at the basis of the fifth metatarsal bone, sending off a small tendon to the first phalanx of the little toe. *Winslow*'s Anatomy, p. 218.

PERONÆUS *minimus*, a small muscle vulgarly thought to be a portion of the extensor digitorum longus, tho' it is easily separable from it.

It is fixed by fleshy fibres in the lower half of the inside of the fibula, between two oblique bony lines, on one side of the lower part of the extensor digitorum longus, to which muscle it is simply contiguous; from thence it runs down, contracting in breadth, and passes, with the extensor longus, thro' the common annular ligament, forming a flat tendon, which soon separates from those of the extensor, and is inserted near the basis of the fifth metatarsal bone. It is distinguished from the other two *peronæi* by a septum, or production of the ligamentary aponeurosis of the tibia. *Winslow*, Ibid.

PEROQUETTE, in zoology, the name of a small species of the *psittacus* or parrot kind, with a long tail.

There are several kinds of this bird: 1. The common, which is green, red, and yellowish, and was the first species of parrot brought into Europe, and well known among the antients. 2. The *peroquette*, which is green all over, without any variegation. 3. The pale, green, and red kind. 4. The red and green crested kind. 5. The red kind, with wings variegated with black and green.

Beside these, Marggrave has described seven other Brasilian kinds, called the *tuiaputejuba*, *tuitirica*, *jendaya*, *tuiete*, *tuipara*, *anaca*, and *quijubatui*, which see under their several names; and two others, to which no particular name has been given; one of the size of a swallow, all over green, with a black beak and a very long tail; and the other of the size of a starling, of a deep green on the back, and paler green on the belly, and with a shorter tail. *Ray*'s Ornithology, p. 76, 77, 78.

PERPENDICULAR-*roots*. See FIBROSE-*roots*.

PERSIAN-*shell*, a species of dolium. See DOLIUM.

PERSICA, the *peach-tree*, in botany, the name of a genus of trees, the characters of which are these: The flower is of the rosaceous kind, being composed of many petals, arranged in a circular form. The pistil arises from the cup, and finally becomes a fleshy fruit of a roundish figure, sulcated lengthwise, and containing a stone rough and full of irregular holes, containing an oblong kernel.

The species of *peach*, enumerated by Mr. Tournefort, are these: 1. The common green white soft fleshed *peach*. 2. The double flowered *peach*. 3. The *peach* with blood-red juice. 4. The hard *peach*, with white or flesh-coloured pulp. 5. The hard *peach*, with box-coloured pulp. 6. The summer apricot *peach*, or john *peach*. 7. The early ripe *peach*. 8. The fine flavoured corbelian *peach*. 9. The hardest *peach*. 10. The paler *peach*. 11. The *peach* with sweet-scented fruit, with a smooth skin. 12. The *peach* with a round dusky red, very sweet-tasted fruit. 13. The *peach* with a large round firm sugar-like fruit. 14. The large round yellow late *peach*, called the *admirable yellow*. 15. The *peach* with large round blackish late-ripening fruit. 16. The great scarlet *peach*. 17. The *peach* with a fruit variegated with purple and red, and of a rich vinous taste. 18. The early violet-coloured vinose *peach*. 19. The *peach* with red, roundish-flatted fruit, with red flesh. 20. The dwarf African *peach*, with single flesh-coloured flowers. 21. The dwarf African *peach*, with double flesh-coloured flowers. *Tourn.* Inst. p. 614. See PEACH.

PERSICA *concha*, in natural history, a name given to a very remarkable and beautiful sea shell, which authors have long been at a loss to reduce to any genus.

Aldrovand has thrown it to the end of his work, and says, it would be of the turbinated kind, if it did not want the turba. It is truly of the genus of the *concha globosa*, or *dolium*. See DOLIUM.

PERSICA *terra*, in natural history, an earth of the ochre kind, known in the colour shops of London by the name of *Indian red*.

It is a very fine purple ochre, of a considerably compact texture, and great weight; while in the earth it is of a pure blood colour, and is not to be cut with the spade, but is dug with iron crows, and falls in irregular masses. It is of a rough dusty surface, and full of considerably large bright glittering particles: these are white and of a fine lustre. It adheres firmly to the tongue, is rough and harsh to the touch, stains the hands very deeply, and is of a rough astringent taste, and makes a very violent effervescence with acid menstruums.

It is dug in the island of Ormuz, in the Persian gulf, and in some parts of the East Indies. *Hill*'s Hist. of Foss. p. 58.

PERSICARIA, *arsmart*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the apetalous kind, consisting of several stamina which arise from a cup divided into several segments. The pistil finally becomes a fruit of a flatted oval figure, and pointed at one end, and contained in the capsule, which was the cup of the flower.

The species of *persicaria*, enumerated by Mr. Tournefort, are these: 1. The common mild or spotted *arsmart*. 2. The spotted *arsmart*, with spots of the figure of a horse-shoe. 3. The mild *arsmart* without spots. 4. The white flowered mild *arsmart*. 5. The burning *arsmart*, or water pepper. 6. The burning *arsmart*, with white flowers. 7. The lesser *arsmart*. 8. The white flowered lesser *arsmart*. 9. The narrow-leaved *arsmart*. 10. The long and narrow-leaved *arsmart*, called the *long-leaved and water pondweed*. 11. The long-leaved Valentia *arsmart*. 12. The *arsmart* with leaves hoary underneath. 13. The great dock-leaved *arsmart*, with purple cups. 14. The black-leaved alpine *arsmart*, with white cups. 15. The *arsmart* with lepidium leaves. 16. The long procumbent *arsmart*, with narrow not spotted leaves, and long slender spikes. 17. The white flowered shrub spotted Virginian *arsmart*. 18. The shrub spotted Virginian *arsmart*, with flesh-coloured flowers. *Tourn.* Inst. p. 509.

The common *arsmart* without spots, is by some esteemed a good diuretic, but it seems too acrid to be given internally without great caution. Externally it is used by many in cataplasms against indurated tumors, and in inveterate ulcers. That with spotted leaves has no virtues.

PERSOLATA, in botany, a word used by Pliny as the name of a kind of burdock, different from the *personata*.

He has, in the beginning of the chapter, spoken of the arcium of the Greeks, which he says the Latins sometimes called *personata*, and afterwards adds this *persolata*; which, he says, was a plant vulgarly known and called by the Greeks *arcium*.

He seems to allow, that the Greeks called both these plants by the same name; but he distinguishes the *persolata* from *personata*, by saying that the former has leaves like those of the great gourd, but larger and more hairy. It is probable, therefore, that he distinguishes under these two names, the two different species of the great burdock common with us, the one with simple, the other with woolly heads.

PESONATA, in botany, a name by which some have expressed the common great burdock. *Bauhin*, v. 3. p. 111.

PERSONATED-*flower*. See PERSONATI, *Cycl.*

PERSPECTIVE (*Cycl.*)—*Military* PERSPECTIVE, that wherein the eye is supposed to be infinitely remote from the table or plane.

PERSPICUITY, *perspicuitas*, in rhetoric, is a principal virtue of stile, to which all the ornaments and beauties of speech ought to give way.

A discourse is equally obscured by too much conciseness and profuseness. (See BRACHYLOGY and MACROLOGY.) Several rhetorical figures are likewise destructive of *perspicuity*. See *Voss.* Rhet. l. 4. c. 1. p. 30, seq.

PERSPIRATION (*Cycl.*)—*Perspiration* is influenced by the passions of the mind. Thus anger and joy increase, and fear and sadness lessen both *perspiration* and urine. Anger causes a strong motion in the membranes of the heart, and quickens its contraction and dilatation, and thereby quickens the contraction and dilatation of the blood vessels and secerning ducts, and of consequence increases the discharges of *perspiration* and urine; and that more or less, in proportion to the strength and continuance of the passion.

Joy affects these discharges in like manner as anger. In the passions of fear and sorrow, *perspiration* and urine are lessened, by the depression of the activity of the soul under those passions. Dr *Bryan Robinson* of the Food and Discharges of Hum. Bodies, p. 77, seq.

The proportion of *perſpiration* to urine is increaſed by all thoſe exerciſes which increaſe the motion of the blood, and warm the ſkin. Dr. *Bryan Robinſon* of the animal Œconomy, p. 280.

We have an account of a perſon, who by paſſing many nights in aſtronomical ſpeculations, had his *perſpiration* ſo obſtructed by the cold and damp of the air in Holland, that a ſhirt he had worn for five or ſix weeks was as clean as if it had been worn but one day. The conſequence of this was, that he gathered ſubcutaneous waters, but was cured in time. Phil. Tranſ. N° 8. p. 138.

We have ſeveral obſervations, experiments, and tables, relating to the quantity of *perſpiration*, urine, and ſtool, in South Carolina, by Dr. John Lining. See Phil. Tranſ. N° 470 and 475.

PERTICA, a ſort of comet, being the ſame with *Veru*. See the article VERU.

PERTICA, among the Romans, a long rod for beating the fruit from trees. It was likewiſe uſed for a long meaſure. See PERCH, *Cycl.*

PERVIGILIA, in antiquity, an appellation given to nocturnal feſtivals, celebrated in honour of ſeveral deities, as Ceres, Venus, Fortune, *&c.* They were ſo called becauſe the nights were ſpent in waking.

PERVINCA, *periwinkle*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is of the funnel-ſhaped kind, but ſo very wide at the mouth, that it approaches to the ſaucer-ſhaped ones, and is divided into ſeveral ſegments at the rim. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower: this, afterwards, becomes a ſeed veſſel, compoſed of two capſules, containing an oblong ſeed, uſually of a cylindric figure, and ſulcated. See Tab. 1. of Bot. Claſs 2.

The ſpecies of *pervinca*, enumerated by Mr. Tournefort, are theſe: 1. The common broad-leaved *periwinkle*, with blue flowers. 2. The common broad-leaved *periwinkle*, with white flowers. 3. The common narrow-leaved *periwinkle*, with blue flowers. 4. The common narrow-leaved *periwinkle*, with white flowers. 5. The common narrow-leaved *periwinkle*, with red flowers. 6. The common narrow-leaved *periwinkle*, with double blue flowers. 7. The common narrow-leaved *periwinkle*, with double flowers, of a deep purple. 8. The variegated double flowered *periwinkle*. 9. The broad-leaved variegated *periwinkle*. And 10. The narrow-leaved variegated *periwinkle*. The tree called *padrus*, approaches very much to this genus. *Tourn.* Inſt. p. 119.

The *pervincæ* are eaſily known, even when not in flower or ſeed, by their branches being long and trailing, and their leaves ſmooth and gloſſy, and approaching to the ſhape of bay-leaves. Theſe plants ſeldom ripen their fruit; and the way to make them do it is, to plant them in a ſmall pot, and cut off all the trailing branches; by which means the nouriſhment will be carried up to the ripening the fruit. *Tourn* Inſt. p. 120.

PERUVIAN *bark* (*Cycl.*)—The virtues of this medicine are at this time ſufficiently known; but the largeneſs of its doſe in the common forms of powder, or infuſion in wine or in water, are great diſadvantages; and our common method of giving it in the extract or reſin, as we prepare them, not certain, and have their inconveniency.

Mr. Geoffroy has attempted a method of giving the *bark* in all its efficacy, without its ill taſte, and in one third of the uſual doſe, by means of his dry extract; twenty four grains of which, it is very certain, contains the whole efficacy of a dram of the choiceſt *bark* in powder; and is found by experience to be wholly as efficacious, as certain, and as ſpeedy, and really poſſeſſes all that the juices of the ſtomach can extract from thrice the quantity of powder, without loading it with ſo large a quantity of uſeleſs matter.

The experiments this gentleman made to be aſſured of what was the efficacious, what the uſeleſs part of the *bark*, and what the quantity of each in the whole, were theſe. He put into a matraſs a dram of choice *bark* in fine powder, and pouring on it an ounce and a half of rectified ſpirit of wine, ſet the veſſel in a balneum mariæ till the ſpirit was high coloured, and had extracted all the tincture it could, and filtering this tincture, and evaporating it on a China-plate in a balneum mariæ, he obtained twenty grains of a dry extract; and then putting on two ounces of water on the remaining powder, he drew what tincture he could by this means, and evaporating that in like manner, he obtained three grains and a half of extract in the like dry form.

Thus, by the niceſt proceſs, twenty-four grains were all that could be ſeparated of the efficacious matter from a dram of *bark*, and the remaining powder, which was perfectly inſipid, weighed as much as was required to make up the dram, excepting ſix grains, which the author ſuppoſes to have been the fibrous and inſipid powder remaining in the filtre.

Hence it appears very evident, that when we take the *bark* in ſubſtance, it is only about a third part of what we are forced to ſwallow that can be of any uſe to us; and that the ſame portion is all we can expect in the virtues of any decoction or infuſion of it.

The reſin of the *bark* is of ſuch a nature, that it is capable of being penetrated by, and ſuſpended in boiling water, poured on the ſubſtance in fine powder; and ſo long as this water retains a certain degree of heat, it remains ſuſpended and inviſible in it, and the water is of a clear browniſh colour; but when the liquor becomes cooler, the reſin can be no longer ſuſpended, the whole becomes milky, and the reſin precipitates itſelf.

Wine, which is a liquor partly aqueous, partly ſaline, and partly ſpirituous, is a menſtruum much properer to extract the virtues of the *bark* than mere water, as it is much more able to diſſolve the juices or ſap condenſed and inſpiſſated in the *bark* of the tree; and for this reaſon a ſtrong infuſion of *bark* in this menſtruum remains clear, and keeps the reſin ſuſpended when cold. Thus it is the fire alone which can ſuſpend the reſin in a watry infuſion of the *bark*; and in a vinous one, the ſpirituous and inflammable part of the liquor does the ſame thing: and as the reſin of the *bark*, which there is great reaſon to believe poſſeſſes all the virtues of that medicine, is wholly precipitated from watry infuſions when cold, it is plain that there can be very little dependance placed on the common clear infuſions in this menſtruum: the remaining taſte in theſe infuſions is only a faint bitterneſs, which ariſes from the gummoſe and ſaline parts of the dried juices of the *bark*; the whole concrete which alone poſſeſſes the virtue of the medicine, being of the nature of thoſe bodies properly called *gum reſins*; which are but very imperfectly ſoluble in water, and of which wine is the proper diſſolvent.

In making the dry extract by means of water, the ſame author put a dram of fine powder of pick'd *bark* into a large quantity of water, and keeping it in a conſiderable heat in a matraſs twenty-four hours, and after that, filtring the liquor as hot as poſſible, that the reſin might not coagulate, he ſet it to evaporate on a balneum mariæ in China-veſſels; the reſin ſoon began to ſeparate itſelf, and a pellicle appeared on the ſurface of the liquor, of all the changeable colours of the breaſt of a pigeon; and this covering the extract when dry, made it appear as if gilt or browned over. This infuſion from a pint and half of liquor, yielded twenty grains of extract perfectly dry; and an ounce and half of ſpirit of wine being poured on the remaining powder, when it had extracted all the tincture it could, left only three grains of extract; ſo that the reſult of this proceſs was much the ſame with that begun with ſpirit of wine; and from the whole it appears very evident, that by this method of management, the whole virtue of the *bark* may be given in a third part of the doſe. Memoirs Acad. Science Par. 1738.

Peruvian-bark has been found very effectual in preventing colds. The method in which it was uſed, in a caſe mentioned in the Philoſophical Tranſactions, was, after due preparation, by bleeding or purging, to take two ounces of it every ſpring and fall. By this method, an habitual taking of cold, and a conſequent ſore throat was cured. Phil. Tranſ. N° 478. p. 3.

We have many accounts of the great effects of the *peruvian-bark* in the cure of gangrenes and mortifications. See Med. Eſſ. Edinb. Vol. 3. Art. 5. or its Abridgment, Vol. 1. p. 175, ſeq. We have alſo ſeveral accounts of the good effects of this medicine in ulcers and the ſmall pox. See Med. Eſſ. Vol. 5. Art. 10. or Abridgment, Vol. 1. p. 187.

Many inſtances are recorded in medical writers of the jaundice, dropſy, aſthma, and all the train of nervous diſorders, brought on in a ſurpriſingly ſhort time after an injudicious adminiſtration of the *bark*: among others the curious may conſult the Med. Eſſ. Edinb. Vol. 4. Art. 24.

The *peruvian-bark* is diſcovered to be effectual in the cure of mortifications from an internal cauſe. The hiſtory of this diſcovery is: In 1715, Mr. Ruſhworth, ſurgeon in Northampton, gave it to a patient labouring under a mortification; and having afterwards other proofs of its good effects in this diſeaſe, communicated his diſcovery in 1731. Mr. Amyand ſoon tried it in ſuch caſes, and found it ſucceſsful in ſeven. Mr. John Douglas confirmed this by the hiſtory of a patient of his, which he publiſhed in 1732; and Mr. Shipton ſoon after related his ſucceſs by this medicine, to the Royal Society. Mr. Ruſhworth and Mr. Amyand confine its uſe to mortifications, from an internal cauſe; the former thinks it is not proper in all caſes of that kind, particularly where there is no intermiſſion of the fever. Mr. Douglas ſeems to think it will ſucceed in all mortifications. All theſe three gentlemen gave half a dram for a doſe every fourth hour. Mr. Shipton increaſed the doſe to two ſcruples, and gave it while the fever continued. He propoſed to have it tried in nomæ, phagedenæ, herpes, or other chironian ulcers. Mr. William Arrot, who lived a conſiderable time in Peru, deſcribes the tree from which the *peruvian-bark* is got.

It grows in the country between two and five degrees ſouth latitude; it is tall, without branches to near the top, where it ſpreads out into a hemiſphere; its bark is of a dark colour

on the outside; its leaves resemble those of a plum-tree. There are four sorts of the *bark*, the reddish, the yellowish, the curling, and the whitish. The two first are the best kinds; the curled is got from young trees, and the white soon becomes insipid. The best sort grows about the city of Loxa. The Indians slice off the *bark* from the trees, and carry it to houses to be dried [a]. M. de la Condamine [b] says this tree is called *casscarilla*, and is very different from the *quina quina*. [[a] See Phil. Transf. N°. 446. sect. 1. [b] Mem. de l'Acad. des Scienc. 1738.]

PERYGUA, in botany, a name given by some authors to a plant of the cassine kind, called the *cassioberry* bush, and by some the *Paraguay tea*. *Dale* Pharm. p. 319.

PERYSIAS, a word used by authors to express wine of the last year's vintage.

PES *(Cycl.)*—Pes *leonis*, in botany, a name by which some authors express the *alchymilla*, or ladies mantle. *J. Bauhin*, V. II. p. 3981. *Chebræus*. 172.

PESCE *vacca*, the *cow-fish*, a name given by Augustino Scilla to a kind of dog-fish, not described by any author before his time, but accurately drawn by him in his book on petrifactions, on occasion of its teeth: many species of the *glossopetræ* of the island of Malta, and other places, being plainly the same with the teeth in the jaws of this fish.

PESSOMANTIA, Πεσσομαντεια, in antiquity, the same with *clromantia*, which see.

PESTERABLE, in our old writers, an epithet for such wares as *pester*, or take up much room in a ship. Stat. 32 *Hen.* VIII. c. 14. *Blount*, *Cowel.*

PESTILENTIAL *buboes*. By *buboes* in *pestilential* cases, the writers in physic not only express such tumours as arise under the arms, under the ears, and in the groin; but comprehend under this term those also which are situated in the neck, breast, arms, legs, and other fleshy parts of the body, which swell and inflame in *pestilential* fevers, and seem the consequences of the endeavours of nature to throw out the pestiferous matter which lay concealed in the body.

Pestilential buboes are distinguished from other tumors by their happening at a time and in conjunction with the plague, and from their being accompanied by the symptoms proper to that disease. These tumours appear sometimes sooner, sometimes later, in the course of the disease; in some they appear before the patient knows he has the infection, and in others two or three days elapse before their appearance: they are very seldom known to appear later than on the fourth day, and are sometimes joined with carbuncles; but tho' the *buboes* frequently appear without these, yet the carbuncles never appear without tumors.

Persons who have these tumors come on without any very bad symptoms, and have them maturate speedily, are in general the soonest freed from the distemper, insomuch, that the best method of giving relief in this terrible disease, consists in the carefully promoting and keeping up the *buboes* and tumors. All discutient or dispersing medicines are carefully to be avoided, and the physician's business is to assist nature in the throwing out, and most speedily bringing these tumors to suppuration.

The patient is to be confined to his bed on the first appearance of these, and with the help of internal medicines proper to hasten the suppuration of tumors, the parts affected are to be rubbed pretty strongly with the hands or cloths, and external, maturating and emollient cataplasms to be applied; of this kind is that of yeast, salt, and mustard-seed, all mixed together, or of yeast alone: by means of these the tense parts are relaxed and stimulated, and the suppuration greatly promoted; as also by the cataplasms of roasted onions, with Venice-treacle and butter; or of crumb of bread, with milk and saffron. Plaisters are also very useful on some occasions, in these cases, as the frequent renewal of the cataplasms exposes the patient too much to the external air, and these are not attended with that inconvenience.

The most famed plaisters on these occasions are that of Barbet, made of the diachylon, with the gum and mucilage plaister, of each half a pound; mustard seed in powder, three ounces; basilicon, four ounces, all mixed and made into a plaister: and that of Dr. Hodges, made of three ounces of oxycroceum, an ounce of galbanum, the same quantity of gum caranna, and two ounces of black pitch, reduced to the consistence of a plaister.

This may be used like the former; nor is that plaister to be esteemed a trifle, which is made of honey, flour, and the yolks of eggs.

Blistering and cupping, so much used by the antients to forward suppuration, are entirely laid aside by the modern physicians: but the celebrated German physician, Beintern, asserts, that *pestilential buboes* have been very frequently discussed, without being brought to suppuration, by the application of warm ashes alone; and that with very happy success: and he observes, that in this case the *pestilential* venom is not absorbed into the blood again, but is attracted and carried off by the ashes.

In some cases in this terrible distemper, the tumor comes to suppuration in a few days; in others it is some weeks before it can be brought to it, by all that can be done. When thoroughly suppurated, it is to be opened with the scalpel, if it does not break of itself; and after thus opening, when the matter has been discharged, it must be well cleansed. The best digestive in this case is the common ointment used on that occasion, mixed with a small quantity of Venice treacle, and balsam of sulphur made with oil of turpentine. At each dressing the matter is to be gently squeezed out of the abscess, and the ointment applied without tents, unless the opening prove very narrow; then applying over all a plaister of the common diachylon, or of honey and flower, the whole may be bound on, and this dressing continued till it is a proper time to heal with some vulnerary balsam.

There has been much dispute between the physicians of different ages about the proper time for opening *buboes* of this kind; some have been for making an immediate incision, and others even for extirpating the whole swelling, as soon as it appeared, by means of the knife; but the first of these methods has been found to be frequently attended with the ill consequences of ill conditioned fistulæ, stiffness, and loss of motion in the limb, and sometimes even with mortifications and gangrene; and the other too harsh, and dangerous in many parts of the body: and the present practice universally disallows both methods, being always for bringing the swelling to suppurate. *Heister*'s Surg p. 200.

The poison of the matter of these sores has been nicely and boldly enquired into, as to its nature and properties, by Dr. Alpranus of Prague, in the time of the plague there in 1680. This gentleman having launced a *pestilential* boyle, collected the matter from it, and putting it into a retort, luting the junctures with the receiver very closely and exactly, and applying by proper gradation the several degrees of fire; at first there came over a water, then a more fat and viscid liquor, of an oily nature; and lastly, there appeared in the neck of the retort, a salt.

The fire being taken away, and the vessels cooled, the Doctor prepared himself for the opening of them by stopping his ears with cotton, his nostrils with pessaries, and his mouth with pieces of spunge, all soaked in vinegar and Venice treacle. The moment the vessels were opened, however, there proceeded out of them a stench more horrible than can be conceived, and striking the Doctor with an universal trembling, in spite of his defence. He proceeded, however, to break the neck of the retort, and separating the fœtid salt from it, he ventured himself to taste it, and desired Mr. Reshel, the person from whom the matter was obtained, to do the same: it was found to have a most dreadfully piercing acrid taste, which the Doctor compares to that of *aqua regia*.

Hence he infers, that the most terrible symptoms of this fatal disease are to be accounted for: the stomach, wounded by so acrid a juice as this mingled among the blood, nauseates food, and is afflicted with continual vomitings: the guts, infested by the same unwelcome guest, are thrown into violent perturbations, whence arise those diarrhœas which often accompany the patient to his death; and from the horribly acrid quality of this juice, it is no wonder that such piercing pains are found in the *buboes*, and such burnings in the carbuncles that attend this disease.

Hence also, as he observes, it is, that sudorifics are the best remedies, since they allay the acrimony, and tend to expel the venomous juices thro' the pores. In this sickness at Prague this gentleman observed, that almost all who sweat plentifully recovered, whereas those who did not sweat, were mostly taken off. *Hook*'s Philosoph. Collect. N°. 2. p. 18.

Pestilential *carbuncle*. This is an inflammation that arises in time of *pestilential* contagion, with a vesicle or blister, almost like those which are caused by burning; but this inflammation generally terminates in a mortification, and putrefies the adjacent parts down to the bone, all about becoming as black as a coal.

This kind of inflammation always breaks out very speedily, sometimes even in an hour or two, attended with the most intolerable heat and pain. On opening it, there is always discharged a darkish limpid or watry sanies, and the flesh underneath is of a black colour, the mortification having then already seized it, and spreading more and more by degrees; but in those who recover, the mortification at length stops, and the putrefied flesh suppurates, and parts from the sound.

The size and number of these inflammations in the same patient, are both very various and uncertain; there is no part of the body but what they may infest, and they are generally, if not always, accompanied by buboes.

The immediate cause of these is a violent inflammation, excited in the blood by the *pestilential* venom; and the inflammation, from the nature of the case, is ever speedy, and always followed by sphacelation and corruption of the parts. What is remarkable is, that the parts and juices do not suppurate into matter, as is usual in other tumors, but whatever is internally corrupted, separates and entirely falls off: for the inflamed parts suppurate at the margin of the inflammation, so that if the patient does not die suddenly, the sphacelated parts are separated, and naturally thrown off.

Carbuncles are always a worse symptom than buboes in these cases,

caſes, eſpecially if the eruptions turn directly either livid or black; but if they are red firſt, and then gradually turn to a citron colour, the danger is leſs.

Thoſe *carbuncles* alſo which ariſe in the face, neck, breaſt, or arm-pits, are always accounted the worſt, and uſually kill the patient.

The chief buſineſs of internal medicines, in this caſe, is to keep the patient in a conſtant breathing ſweat; and the buſineſs to be aimed chiefly at in external applications, is to procure, as ſoon as poſſible, the ſeparation of the ſphacelated parts from the ſound. Some, therefore, uſe ſcarification alone in this caſe, and that with very good ſucceſs; for, by making a great number of inciſions in the corrupted parts, they let out the *peſtilential* venom which corrupted the blood. Others only open the bliſters, and afterwards waſh the parts with a mixture of camphorated ſpirit of wine and Venice treacle, and afterwards apply a maturating cataplaſm, made of four ſpoonfuls of honey, three ſpoonfuls of yeaſt, the yolks of two eggs, and half an ounce of ſoap, which are all to be mixed and applied warm to the part: others on the ſame occaſion uſe alſo, as a cataplaſm, a mixture of two ounces of flour and half an ounce of vinegar, made with water or ſkimmed milk into a proper form, and with an ounce of honey, and an ounce of powder of ſaffron, thoſe ingredients are to be thoroughly mixed in, and the cataplaſm to be applied warm, and renewed frequently, till the whole carbuncle ſeparates and falls off from the ſound parts; and this is a much better and ſafer method of extirpating the *carbuncle*, than by cutting it out at once, by which operation ſome have been known to have been killed upon the ſpot. When the greateſt part of the *carbuncle* is, however, of its own accord ſeparated from the ſound parts, the part where it adheres may always be ſafely divided with the ſcalpel; and this, indeed, is abſolutely neceſſary.

If an ill-conditioned and luxuriant fleſh grows internally in this caſe, either of itſelf, or from the extirpation of the *carbuncle* being made too ſoon, this muſt ever be neceſſarily entirely conſumed by the application either of the Ægyptian ointment, or of the following: Take two ſpoonfuls of honey, the yolks of two eggs, and of burnt alum, gentian, and birth-wort root in powder, each an ounce, make the whole into an ointment.

If the inflammation inclines the adjacent parts to a gangrene, it will be moſt proper to uſe the following application: Take ſalt of wormwood, half an ounce of the herb ſcordium, and of elder and chamomile-flowers each a handful, and of river water two pints and an half; when theſe have been well boiled and ſtrained, mix with the liquor ſix ounces of camphorated ſpirit of wine, and two ounces of Venice treacle; and let this be applied hot to the parts by means of double linnen rags being well wetted in it, and repeated frequently till the violence of the inflammation abates.

When the mortified fleſh of the carbuncle has ſeparated itſelf from the ſound part, it is neceſſary to cleanſe the ulcer perfectly with digeſtive ointments, leſt any of the matter remain there, and mix itſelf again by degrees with the blood; and this deterging of the ulcer is always to be continued till there remain no more ſymptoms of the *peſtilential* infection in the patient; and after this the wound may be healed like other ulcers.

In the laſt great plague in London, and in many other the like caſes, it was found the beſt and happieſt method with *carbuncles* to extirpate them at once by the actual cautery, or red hot iron, till the dead parts being burnt to the quick ones beneath, there were no relicts of the *carbuncle* left in the patient. And in ſome caſes this may be a very proper method, but there are others where prudence will not allow the uſe of it; as where the patient is too much terrified by it, where the parts on which the carbuncle is ſituated are of the utmoſt tenderneſs and conſequence: in theſe it will be readily determined, that the milder treatment before adviſed muſt be greatly preferable.

Another famous remedy is the applying to the parts butter of antimony. The circumjacent parts being anointed with this, the diſorder is prevented from ſpreading, and an eſchar is readily made, which divides the ſound from the corrupted parts, and at length wholly ſeparates and throws off the latter.

There are not wanting, however, phyſicians who are againſt the uſe of butter of antimony on theſe occaſions; but where the actual cautery might have been applied, this ſurely is a ſomething milder, and not much leſs effectual remedy. *Heiſter*'s Surg. p. 205.

PESTILENTIAL *diſeaſes*. Many think that the cauſe of all theſe is in the air, and is exhaled in vapours through the pores of the earth.

It is generally obſerved, that *peſtilential diſeaſes* ſeize firſt the cattle; which is not wonderful, ſince they naturally carry their noſes near the ground, and ſuck in the vapours as they riſe, or feed on the herbage that is infected by them. It often happens, that the vapours do not riſe ſo high as to affect men at all; but tho' in this caſe the plague would be naturally confined to the cattle alone, yet it gets among men by means of the food eaten by them, and before tainted with the contagion. There is no doubt but that the fleſh of animals that die of diſeaſes, partakes ſomewhat of the nature of theſe diſeaſes; and when they are *peſtilential*, may ſpread a peſtilence among us, which, perhaps, would otherwiſe never have reached us.

The plague once begun, frequently joins itſelf with ſuch other diſeaſes as the people it attacks are moſt ſubject to; hence, in the northern nations, where the ſcurvy is frequent, it is often ſeen that the plague and ſcurvy appear mixed. Theſe two diſeaſes, in their nature ſomewhat agreeing, make each other the worſe and more violent; but, on the contrary, there are other diſeaſes, depending on ſuch contrary cauſes, that the plague, if the patient ſurvives, proves a cure to them.

Dr. Hodges inſtances the conſumption, and the king's evil, as two diſeaſes of this kind; which, tho' in themſelves of the moſt terrible kind, and when in an advanced ſtage uſually baffling all remedies, yet he ſaw perſons in the plague that laſt raged in London, cured of both by the plague: the ſymptoms of the diſeaſe appearing more mild in theſe than in other caſes, and the patients at once recovering of both complaints.

He alſo tells us of ſome people terribly afflicted with the gout for many years, who being at that time affected by the contagion, had the plague with leſs violent ſymptoms than others; and were, on its going off, cured of the gout alſo.

A fever is uſually a concomitant ſymptom of the plague, but it is not an inſeparable ſign of it. A palpitation of the heart is another of the uſual, but not conſtant ſymptoms; where this comes on, it is uſually very violent, and often is ſo loud, that it may be heard at a conſiderable diſtance.

The plague is leſs contagious than is uſually ſuppoſed, and thoſe who eſcape the terror of it, often eſcape it wholly. Hodges gives us an inſtance of a poor woman who had the plague ſoon after her delivery, and ſuckled her young child as ſhe lay ill of it. She had a carbuncle on her breaſt near the nipple which the child ſucked at, and yet the mother recovered, and the child never caught the infection at all; tho' this ſeemed a circumſtance under which there could be no eſcaping.

Hodges, treating of the prognoſtics of an imminent plague, tells us, that one very remarkable one is the change of chronic diſtempers in general into acute ones, and thoſe attended with very violent ſymptoms; and a murrain among the cattle happening at the ſame time, form together a prognoſtic not eaſily to be got over, without the terrible ſequel of a general *peſtilence*.

If the plague is very terrible at its firſt appearance, it never is of long duration; and on the contrary, when it comes, from a ſcarce perceptible beginning, more and more violent, it is generally of a long continuance. What time it takes from the beginning to the height, the ſame it takes from the height to the final period.

The moſt fatal ſymptoms in the laſt plague in London, and which uſually preſaged death very near, were hæmorrhages from the noſe or ears, fluxes of the menſtrua in women, diarrhœas, dyſenteries, and greenneſs and blackneſs of the excrements.

The firſt ſweats coming on without giving eaſe, and long naufeouſneſs continuing afterwards, are alſo terrible ſymptoms. The pulſe and urine, which are the two great things to judge by in moſt illneſſes, in theſe preſage nothing at all. The pulſe is fallacious in the higheſt degree, and the urine often appears as well in the height of the plague, as while the perſon was in health.

Among the ſeveral preſervatives for particular places, the two beſt are the burning ſweet-ſcented woods in the time, and ſome of the reſins, ſuch as frankinſence and the like; the other is the firing a number of cannon every morning and evening. *Hodges* de Peſt.

PETAL, among botaniſts, that part of the flower which conſtitutes the corolla: it generally diſtinguiſhes itſelf by its ſingular colour.

When the corolla conſiſts only of one *petal*, its lower tubular part is called the *tube*; its upper expanded part, the *limb*: when ſeveral *petals* go to make up the flower, the narrow part where they are inſerted is called *unguis*; their broader part towards the end, *bractea*. See COROLLA.

PETARDEER, in the military art, is he who loads, fixes, and fires the *petard*.

PETASITES, *butterburr*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the floſculous kind, being compoſed of many ſmall floſcules, divided into ſeveral ſegments at their edges, and placed on the embryo fruit, and all ſurrounded by a ſort of a cylindric cup, divided into many ſegments. The ſeeds, when ripe, are winged with down, and the flowers of this plant appear before the leaves, early in the ſpring.

The ſpecies of *petaſites*, enumerated by Mr. Tournefort, are theſe: 1. The great or common *petaſites*. 2. The leſſer *petaſites*, with white flowers and angular leaves. 3. The ſmall *petaſites*, with colt's-foot leaves. 4. The leſſer Alpine *petaſites*, with ſmall angular leaves. *Tourn.* Inſt. p. 450.

The common *butterburr* is famous as a cordial and alexipharmic. It has been made an ingredient in moſt of the compound medicines of that intention. The plague-water of the

old diſpenſatories owed the greateſt part of its virtues to it. The root is the part principally uſed; and beſide theſe virtues, it has thoſe of an aperient and detergent. It is preſcribed in ſuppreſſions of the urine and menſes, and in coughs, aſthmas, and other diſeaſes of the breaſt. See BUTTERBURR.

PETASUS, among the Romans, a covering for the head, not unlike our hats; it had a broad brim, and was uſed in journeys to ſave the face from being ſun-burnt.

The *pileus* differed from the *petaſus*, as having no brim. *Pitiſc.* in voc. See PILEUS.

The *petaſus* is obſerved upon the head of antient figures of Mercury; who wore it in the quality of the god of travellers and merchants. *Calmet.* Dict. Bibl.

PETECHIAL *fever*. See *catarrhal* FEVER.

PETELMA, in the Turkiſh military orders, is the procurator general of the effects of the janizaries. When any one dies under the protection of this body, he ſeals up their houſes, to ſecure the tenth part of their effects; which are due to the janizaries. *Pocock*'s Egypt, p. 168.

PETIA, a word uſed by medical writers in different ſenſes. It is commonly underſtood to mean a piece of rag, uſed to tie up medicinal ingredients in, to be uſed by infuſion in liquors; but *petia oculi* ſignifies an hæmorrhage of the eye.

PETICULÆ, the ſame as *petechiæ*, purple ſpots appearing on the fleſh in malignant fevers.

PETIGO, a word uſed by ſome authors for *impetigo*. See the articlee IMPETIGO, *Cycl.*

PETILIUS-*flos*, a name uſed by ſome botanical authors for the African marygold. *Ger.* Emac. Ind. 2.

PETIMBUABA, in ichthyography, the name of a fiſh caught in the American ſeas, and called by ſome, in Engliſh, the *tobacco-pipe fiſh*; a name more commonly uſed for the *acus ariſtotelis*. See Tab. of Fiſhes, N°. 40.

It grows to the length of three or four feet; its body is like that of an eel, long and ſlender; and its mouth without teeth. The length of the noſe is conſiderable, and the upper jaw is ſhorter than the lower. Its eyes are remarkably large, not ſmaller than a hazel nut, and ſomething of the ſame figure. Its ſkin is ſmooth, like that of the eel, and of a liver-colour on the back and ſides, with ſeveral rows of blue ſpots diſpoſed in three rows on the back, two on the head and one on each ſide; there are alſo ſome green ſpots every where interſperſed among the blue ones. The belly is white, but has ſomething of a browniſh red caſt, and is flat. It is a well-taſted fiſh. *Willughby*'s Hiſt. Piſc. p. 234.

PETIOLATE-*leaf*, among botaniſts. See LEAF.

PETIOLE, *petiolum*, among botaniſts, expreſſes that ſtalk which ſupports the leaves of a plant, as the peduncle does the fructifications.

Some uſe the word *petiolum* to denote the whole middle rib of a leaf of any plant, which is the ſtrongeſt part of it, and runs from the ſtalk by which the leaf adheres to the tree or plant to its extremity, and from which the lateral fibres or nerves, as they are uſually called, commonly ariſe.

The authors who have written on the ſubject of the anatomy of leaves, have had occaſion to be accurate about the diſtinctions of the ſeveral parts; and they have called this main or middle rib, the *petiolus*. The ſide branches going off from this, they call *rami*; and the ſubdiviſions of theſe into more minute fibres *furculi*: theſe generally are interwoven into a reticular plexus one with another, and make up the ſubſtance of the leaf, with the bladders of a liquid matter, which are contained in their interſtices.

All theſe ſolid parts of leaves, the *furculi* and *rami*, as well as the *petiolus*, are congeries of oblong fibres extended evenly together, and collected into one body; and the fibres in all parts of plants are divided into two kinds; the one containing juices, and called *ſucciferæ*; the other giving paſſage only to air, and therefore called *tracheæ*.

Lewenhoek has diſtinguiſhed the ſucciferous veſſels into two kinds, which he calls veins and arteries: the latter, he obſerves, receive the ſap from the root, where it is firſt collected, and carry it up to the reſt of the plant, and the others bring it back again from thence, in the manner of veins. Perralt has joined a great number of experiments to Lewenhoek's, in order to prove this ſyſtem of the juice veſſels, but Fontenelle, and ſome others, have doubted either the exiſtence, or at leaſt the uſe of the *tracheæ* or air veſſels, ſuppoſing them either imaginary veſſels, or deſtined for other purpoſes. The vine branches, however, examined either by a microſcope, or by a good eye in a good light, will ſhew evidently that ſuch veſſels exiſt, and that in very great numbers: and the veſſels in the *petiole* and *furculi* of leaves, when ſtrictly examined, are found to be of both theſe kinds. Act. Erudit. 1722. See TRACHEÆ.

PETIOLUS, a word uſed by botanical writers to expreſs the ſtalk of a fruit.

PETIVERIA, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium is compoſed of three ſlender, erect, obtuſely-pointed leaves, and remains to incloſe the ſeeds. There are no petals; the ſtamina are ſix ſubulated equal erect filaments, of the length of the cup; the antheræ are ſimple; the germen of the piſtil is oblong, and of a compreſſed figure; the ſtyles are four, they are ſubulated and ſtrait; the ſtigmata are ſimple and permanent; the ſeed is ſingle, of an oblong figure, narrow at the bottom, broader at the top, emarginated and crowned with the ſtyles, which are rigid, acute, and ſomewhat bent. *Linnæi* Gen. Plant, p. 156. *Plumier*, Gen 39.

PETOLIN, in natural hiſtory, the French name for a ſhrub of the piſtachia kind, famous for affording bladders or tubercles on its leaves and tender branches, in the manner of the common turpentine-tree; which are found full of inſects. Theſe inſects are always found to be of the puceron kind, and ſome of them are winged, others not, as is known to be the caſe in that genus of animals. Theſe bladders, and thoſe of the turpentine-tree, called its *horns*, have been by ſome ſuppoſed to be the natural production of the trees, but they are in reality only a peculiar ſpecies of bladder-galls, formed by theſe animals, one female of which making her way into the leaf, while the young raiſes its covering membrane into a bladder, in which ſhe produces her young ones; which by ſucking its ſides, derive the juices to it, and occaſion its increaſe. *Reaumur*'s Hiſt. of Inſ. p. 34. See the article PUCERON.

PETRÆA, in botany, a name given by Houſton to a genus of plants, in honour of the name of the Lord Petre. This author, however, was guilty of an error in the characters of this genus; for he deſcribed the flower of this, and the fruit of another very different genus, the *tetracera*. The external reſemblance of theſe two trees led him into the error; but Linnæus has given its characters more fully, and without any ſuch miſtake. They are theſe: The perianthium is very large and coloured; it is compoſed of one leaf divided into five obtuſe expanded ſegments, and remains with the fruit. The flower conſiſts of one leaf, and is irregular and ſmaller than the cup; its tube is very ſhort; its verge plain, and divided into five ſegments, which are roundiſh; and the loweſt of which is larger than the others. The ſtamina are four filaments, two being longer than the others, and all hid in the tube of the flower. The antheræ are ſimple; the germen of the piſtil is of an oval figure; the ſtyle is ſimple, and of the length of the ſtamina; and the ſtigmata is obtuſe. The error of Houſton, in regard to the fruit, has left the world wholly in the dark as to what it really is. *Linnæi* Gen. Pl. p. 298. *Houſt.* Act.

PETRIFACTIONS *(Cycl.)*—The knowledge of this part of natural hiſtory is but of very late years arrived at any degree of perfection. Dr. Hook, Steno, Boerhaave, and Auguſtino Scilla, have been among the firſt who treated judiciouſly of theſe things; but great honour is to be done to Fabius Columena, who, before the time of any of them, publiſhed two admirable diſcoveries upon the parts of aquatic and terreſtrial animals, and of plants buried in the earth, and which he had himſelf ſeen dug up in the mountains of Andria, Apulia, and other places. He boldly declares, that theſe could be depoſited there by no other means but by the general deluge in the days of Noah; and enters into the reaſons why, in ſome places, theſe remains of animal and vegetable bodies are found perfect and intire, and in others corrupted or altered; and obſerves, that they anſwer ſo exactly in every lineament to the recent bodies of the ſame kind, that there can be no doubt of their having once been alſo ſuch.

It is a very remarkable obſervation, in regard to the really and certainly determining the origin of *petrifyed* ſhells, that they are not all alike altered by lying in the earth, but that they differ according to the matter among which they have lain to *petrify*. Thus the ſame ſpecies of ſhell *petrifyed* in a looſe ſand-ſtone, is never nearly ſo hard as when *petrifyed* in a ſolid quarry, or in a hard lime-ſtone; ſo that it is evident they were brought into the places where they now lie, in the ſtate of ſhells; and that the ſtone in which they are depoſited, having imparted to them its own nature, they are harder or ſofter, in proportion to its hardneſs. We find in pits where the ſhells are depoſited in looſe earth, that they are often not *petrifyed* at all, but rendered more ſoft and crumbly than before.

The echini marini, and other ſuch hollow and open-mouthed ſhells, are very often found filled up with earth or ſtone, the ſame with that in which they lie; and refuſe matter is ſometimes found among this, ſuch as the fragments of other ſhells, and the ſpines of ſome other echini. All theſe ſerve to prove that the ſhell, in its recent ſtate, was ſuſpended in water among ſuch ſubſtances as theſe. And it is not to be ſuppoſed, with ſome authors, that they are found originally as foſſils within the ſhell; ſince, in this caſe, they would be ſometimes doubtleſs found of ſuch a ſize as could not have got in at the mouth of the living animal; but this is never the caſe. And upon the whole it appears very plain, that after the membranes which covered the mouths of theſe ſhells in their recent ſtate, were decayed or waſhed away, theſe extraneous bodies found entrance at them along with the marle, chalk, ſtone, or whatever other

ſubſtance

ſubſtance they were among, which was evidently all ſoft and fluid at that time. *Auguſtino Scilla* de Petrifact.

The *petrified* vertebræ of fiſhes cannot be ſuppoſed real foſſile productions, but are plainly remains of animals; and when examined ever ſo accurately, they are found to agree with the ſame bones in the recent animal in every lineament. Scilla mentions a foſſile lobſter's claw preſerved in his muſæum, and found in the hills near Meſſina, in which a piece of a ſcallop-ſhell was found clenched juſt in the manner in which that animal ſeizes its prey. Thoſe who ſuppoſe theſe foſſiles to be really produced in the earth, ſurely cannot ſuppoſe that there could be any ſeminal principle only for the claw of an animal. In Poland there is a kind of ſtone called *niec kamni*, which they bring from a place called by the ſame name. This ſtone has very much the appearance of the grain of wood, and is probably wood *petrified*. Rzaczinſki, in his hiſtory of Poland, mentions the place, and tells us, that there are many whole roots and parts of the trunks of trees *petrified* there. He tells us alſo of an old beech tree in Podolia, whoſe lower part is not only *petrified*, but that into the hardeſt and pureſt of the common ſtones; it being converted wholly into flint, and ſerving the country people thereabout for their common uſes as ſuch. The author tells us, indeed, that the lower parts of trees become *petrified* there as they ſtand, and while the upper parts continue growing; but this ſeems ſcarce credible.

We have indeed ſome other accounts of the ſame nature, but not from authors of ſufficient authority to build our faith on, in ſo ſeemingly unnatural a caſe. This author, in particular, ſeems too credulous in many inſtances; among other things, giving us an account of ſome earthen veſſels found at conſiderable depths in the earth, which he ſuppoſes to have been formed there by nature. We have other accounts beſide this of foſſile urns, but the authors of them all have either miſtaken the cruſtated ferrugineous bodies for urns, or elſe they have ſuppoſed things natural which are certainly artificial. *Rzaczinſki*'s, Hiſt. Polon.

Mr. Boyle mentions a kind of ſandy earth found in England, which turns wood into ſtone, tho' there be no *petrifying* ſpring near the place: and this, he ſays, is done in a better manner than by any water he ever ſaw. See Works Abr. Vol. 1. p. 161.

Animal PETRIFACTIONS, a term uſed to expreſs ſuch *petrifactions* as are found in the ſeveral parts of the bodies of living creatures.

Of theſe the human body affords many which are the occaſions of very terrible and generally incurable diſeaſes. The philoſophical tranſactions afford us two very ſingular inſtances of this ſort of *petrifactions*; the one in a woman, whoſe whole left kidney was intirely *petrified*, not being filled up in its cavity with a ſtony concretion, as frequently happens in nephritic caſes, but its whole ſubſtance converted into abſolute ſtone, only covered with a thin ſkin.

The other inſtance is in the caſe of a conſumptive perſon, whoſe lungs were found, on diſſection, full of ulcers, and thoſe having almoſt all of them, more or leſs gravel in them; but this was not all, for ſeveral large pieces of the lungs were found, as the kidney in the other inſtance, wholly concreted into ſtone, only covered with a thin ſkin. Phil. Tranſ. N° 71.

PETRIFACTIONS *of Lough Neagh*. The moſt noted place for *petrifactions* in our dominions is, the famous lake called *Lough Neagh*, in Ireland. Moſt of the antient writers who have given accounts of Ireland, have mentioned the power the waters of this lake have of turning wood into ſtone; and ſome of them have added the abſurd to the marvellous, by affirming, that it would turn that part of the wood which was buried in the mud into iron, that part that was in the water into ſtone, while the part which was above water remained mere wood ſtill.

Some late authors, as Molyneux Nevil, Smyth, Woodward, and others, ſuppoſe this effect not to be found in the water of this lake, but that it either is in the earth about the lake, or elſe that the *petrifactions* found there are not ſuch as have been formed there, but *petrified* elſewhere, and long ſince, and brought thither by the waters of the deluge.

Mr. Smyth affirms, that no experiment ever made has proved that the water of that lake has any power of *petrifying* wood; and gives an example of a gentleman's having planted two ſtakes of holly in the lake, on purpoſe to try; which were taken up after 19 years, without the leaſt advance made toward *petrifaction*. It is certain, indeed, that vaſt quantities of *petrified* wood are found in the lake, and even whole trees with their roots and branches all turned to ſtone, have been found buried in the mud of it; and it ſhould ſeem the moſt rational account of their being found there, that they had grown in their natural ſtate on the banks of the lake, and had, in fine, fallen in, and been there *petrified*. And it is equally certain, that of the great quantity of wood met with here, the different pieces are in different degrees of *petrifaction*; and that ſeveral of them are ſeen to be *petrified* in different degrees in their parts; nay, that one ſide of a large piece is often ſeen to be mere rotten wood, while the other is hard ſtone.

It is not to be aſſerted, becauſe ſtakes driven down in ſome one part of the lake are not *petrified* in a ſmall number of years, that therefore the water has no where a *petrifying* virtue; ſince it is poſſible that there may be ſprings ariſing in ſome parts of it, the waters of which may be ſo highly impregnated with ſtony matter, as to *petrify* wood, if they meet with it near their origin; yet the waters of theſe, when mixt with that vaſt body of water which makes the whole lake, may not be able to communicate that *petrifying* quality to ſo large a quantity.

There is ſcarce any water that does not contain ſaline and ſtony particles, which may be ſeparated from it by evaporation; and the generality of *petrifying* ſprings, when examined by this proceſs, are found to be very full of calcarious, or other ſtony matter, and frequently of ferrugineous and vitriolic kinds. Thoſe which contain calcarious matter, when they drop upon ſticks, moſſes, or other vegetable bodies, act on them by incruſtation; their calcarious particles being left behind while the water goes off, and forming by this means ſucceſſive cruſts ſometimes to a great number, which adhere cloſely to one another, and form a ſtony coat to the wood: if theſe be broken at different periods of time from their formation, ſome of them will be found with the wood remaining ſound within them, others with the wood rotten; and others with a ſtony matter of the ſhape of the wood, ſupplying its place, and formed by the depoſition of ſtony particles in the cavity left by the periſhed wood. Sometimes, indeed, theſe waters permeating the pores of wood, fill them up with the calcarious particles they leave behind them; and when the vegetable matter is periſhed, the calcarious concretion remains in its place and exact ſhape. The bodies in this laſt ſtate approach much more to the nature of *petrifactions* than the others, but they all differ greatly from the genuine *petrifactions*; becauſe it is not true ſtone that they conſiſt of, but merely a ſpar or calcarious matter, which readily ferments with, and is ſoluble in acids, and by a ſlight calcination is reduced to lime, in the manner of other ſpars.

The *petrifying* waters, which contain particles of true and genuine hard ſtone, and perhaps with them ſome ferrugineous or other metallic ones, do not act in this manner by incruſtation, but always leave the ſurface naked, and penetrate into the inner ſubſtance of the wood, filling every pore with the hard matter they depoſit; which, in fine, without altering their texture or ſize, adds greatly to their gravity, and gives them the hardneſs of a ſtone. In many parts of Ireland there are great quantities of the incruſtations of calcarious matter on vegetables; but the *petrified* wood found in the Lough Neagh, and on its ſhores, is wholly of the other kind; and ſhews no covering of any foreign matter, but preſerves the grain and all the veſtigia of wood; all the alteration is in the weight and cloſeneſs reſulting from the ſtony matter having filled all the pores: theſe make no effervescence with acids, nor will be calcined into lime in a common fire, as the calcarious incruſtations are.

It is probable, that the *petrifying* matter with which the water of ſome part of this lake is endued, is owing to ſeveral ſprings; which running in their courſe thro' mountains where there is abundance of ſtony and mineral matter, waſh off and carry with them great quantity of the particles of one or both theſe ſubſtances; which they afterwards depoſit in the wood they meet with, where they are diſcharged up thro' the mud of this lake; and that tho', when blended among the general water of the lake, they have not this property, yet if the ſtakes of holly had been driven down juſt where thoſe ſprings were, they would probably have been *petrified*, tho' there was no ſuch quality in the reſt of the water of the lake. And that there are theſe ſprings in ſeveral parts of the lake, is certain from hence, that when in the great froſt in the year 1740, the great lake in general was frozen over ſo as to bear men on horſeback, yet ſeveral circular ſpaces remained unfrozen.

The *petrified* wood is found in conſiderable plenty on the ſhores of the Lough, but moſt abundantly after ſtorms; and this rolling about of the *petrifactions* at the bottom in ſtorms, makes it not eaſy to fix upon the place where they received their alteration.

Nor are the *petrifactions* found only in and about the lake, but they are turned up by the plough almoſt daily in all places, at two or three miles diſtance from it; and ſome have believed that they were all *lapides ſui generis*, and never had been wood till the roots of trees were found in their natural poſition in the ground, with their ſmaller ramifications and every other part wholly *petrified*.

Many of theſe are much ſofter than the *petrifactions* in the lake, and may be cut and cleaned with a knife, tho' not near ſo eaſily as other wood. It is not impoſſible, but that many of theſe may have been originally *petrified* in the lake, which may have either once extended over a much larger ſpace of ground than it now does, or elſe have loſt on one ſide what it has gained on the other; not that it is neceſſary to ſuppoſe this, ſince there is no doubt but that mineral ſteams and exhalations being highly ſated with ſtony particles, are often found to have a *petrifying* virtue; and ſuch effluvia ariſing thro' the earth may operate on wood accidentally buried

in that ground; and this seems to be the most probable opinion as to the origin of the *petrifactions*, not only of our fields, but of those found in many parts of the world among sand or gravel.

It is to be observed also, that the finer the lapidific particles are, the more beautiful and natural the *petrifaction* will appear. Of this kind there was once found a beautiful specimen on the shores of the Lough Neagh. This was a root of the common yellow flag-flower, with the bottom part wholly converted into stone, but yet retaining all the fibres, and every part of the texture of the root; the pith in the middle was turned into a whiter stony substance, and the upper surface had all the traces of the several tubercles, or first shoots of leaves, tho' a very hard stone; and the outer covering of some of these retained its vegetable nature still so far, as to be flexile in a small degree, while all within was solid stone.

Some of the pieces of *petrified* wood, found on the shores of the lake, have curious veins of a red and blueish colour, and others are beautifully variegated with black and white striæ. The woody part of them gives a red tincture to aqua fortis, and when taken out of that menstruum, shews some red spots in its pores, which, perhaps, are its first approaches towards *petrifaction*, and are either of a mineral or stony matter.

It is common to find in the cracks of these stones, nay, and of such parts of them as are yet wood and not turned into stone, great numbers of very beautiful and regular, tho' small, crystals: these are transparent and hexangular, and of the same kind with the small crystals found in the cracks of ferrugineous stones, and within our common flints. When calcined, the powder yields to the magnet, which shews that they have some ferrugineous as well as stony particles: and it is not unfrequent to meet with pieces of unaltered wood in the very center of the largest of these *petrified* masses; and the *petrified* parts of the masses, when examined by the microscope, appear extremely beautiful, their pores being all visibly filled with pure and very bright crystal. The different degrees of *petrifaction* appear very various in the several pieces, some are woody on the outside, and altogether stony within; and others outwardly stony, and inwardly unaltered wood; and others having the woody or the stony part appearing only in thin lines and coats on different parts. The harder or more stony parts of these *petrifactions* always give fire with steel. Phil. Transf. N°. 481.

Some of them shew the grain of ash, some of holly, and some of fir, others of oak; but these are more rare. They frequently have the plain traces of knots and other irregularities, and some are found bent and half broken, and plainly have been worked by art before they were *petrified*.

It is a common opinion, that these stones are what are used for hones in different parts of England; but this is an error, the substance of which these are made being real stone, and not found here, but at Drogheda. Those *petrifactions* of the lake, which have part wood, part stone, usually lose the wood afterwards, by its cracking and falling to pieces as the stone dries; but if examined while it remains on the stone, it is very convincing, as to the reality of the origin of the whole from wood. Id. ibid.

PETRIFICATION, in medicine. See ANCUBITUS.

PETRIFIED *Ivy*. See the article IVY.

PETRIFYING *waters*. Alonso Barba gives an account of some *petrifying* waters of Peru, which greatly exceed all those we have in Europe in the quantity of stony matter they contain. He tells us, that they soon choak up their own passage by the stony matter they deposit there; and that all the cattle that drink of them die. He adds another story, which he probably took a little too hastily upon credit, which is, that they have moulds of the shape of our bricks, which they fill with this water, and that on being exposed to the sun a few days, the water is wholly converted into a stone of the same shape; and that they build their houses and other buildings with these stones. *Alonso Barba* de Metal.

PETROCOSSYPHUS, in zoology, a name given by some authors to the bird more usually called from its colour the *cæruleus*.

It lives among the rocks, in woody mountains, and sings very sweetly. See CÆRULEUS.

PETROL, or PETROLEUM—*(Cycl.)*

Mr. Boulduc made several experiments with the white *petroleum* of Modena, an account of which he gave to the Paris academy.

It easily took fire on being brought near a candle, and that without immediately touching the flame; and when heated in any vessel, it will attract the flame of a candle, tho' placed at a great height above the vessel, and the vapour it sends up taking fire, the flame will be communicated to the vessel of heated liquor, and the whole will be consumed. It burns in the water, and when mixed with any liquor swims on the surface of it, even of the highest rectified spirit of wine, which is $\frac{1}{7}$ heavier than pure *petroleum*. It readily mixes with all the essential oils of vegetables, as oil of lavender, turpentine, and the rest, and seems very much of their nature: nor is this very strange, since the alliance between these bodies is probably nearer than is imagined, as the essential oils of vegetables may have been originally mineral ones, and drawn up out of the earth into the vessels of the plant. Mem. Acad. Par. 1715.

Petroleum, when shaken, yields a few bubbles; but they sooner subside than in almost any other liquor, and the liquor resumes its clear state again almost immediately. This seems owing to the air in this fluid being very equally distributed to all its parts, and the liquor being composed of particles very evenly and nicely arranged.

The extensibility of this oil is also amazing. A drop of it will spread over several feet of water, and in this condition it gives a great variety of colours, that is, the several parts of which this thin film is composed, act as so many prisms. The most severe frost never congeals *petroleum* into ice, and paper wetted with it becomes transparent, as when wetted with oil; but it does not continue so, the paper becoming opake again in a few minutes, as the oil dries away.

Spirit of wine, which is the great dissolvent of sulphur, has no effect upon *petroleum*, not even with ever so long a digestion. It will not take fire with the dephlegmated acid spirits, as oil of cloves, and other of the vegetable essential oils do: and in distillation, either by balneum mariæ, or in sand, it will neither yield phlegm nor acid spirit; but the oil itself rises in its own form, leaving in the retort only a little matter, thick as honey, and of a browniſh colour. Whoever, therefore, would use this oil in medicine, must take it as nature has prepared it, art having no power to make any alteration in it. Mem. Acad. Paris 1715.

Alonso Barba, in his book of metals, gives a very melancholy instance of the power of *petroleum* of taking fire at a distance: he tells us, that a certain well, yielding *petroleum* on the surface of its water, being to be repaired, the workman took down into the well with him a lanthorn and a candle in it; there were some holes in the lanthorn, through which the *petroleum*, at a considerable distance, sucked out the flame of the candle, and taking fire, burst up with the noise of a cannon, and tore the man to pieces. *Alonso. Barba* de Met.

The people of mount Ciaro, in Italy, have some years since found out a much easier way of finding *petroleum*, than that they formerly had been used to.

This mountain abounds with a sort of greyish salt, which lies in large horizontal beds, mingled with strata of clay, and large quantities of a spar of that kind called by the Germans *selenites*; which is the common sort, that ferments with acids, and readily dissolves in them, and calcines in a small fire. They pierce these slates in a perpendicular direction till they find water, and the *petroleum* which had been dispersed among the cracks of those slates, is then washed out by the water, and brought from all the neighbouring places to the hole or well which they have dug, on the surface of the water of which it swims after eight or ten days. When there is enough of it got together, they lade it from the top of the water with brass basons, and it is then easily separated from what little water is taken up with it. It is remarkable, that all the *petroleum* got by this means is white, whereas that of Modena is yellow, and that of Parma brown. These wells or holes continue to furnish the oil in different quantities for a considerable time, and when they will yield no more, they pierce the slates in some other place. Mem. Acad. Scien. Par. 1736. See the article NAPHTHA.

Petroleum is never used among us; but the French give it internally in hysteric complaints, and to their children for worms: some also give it from ten to fifteen drops in wine, for suppressions of the menses. This, however, is rather the practice of the common people than of the faculty.

PETROMARULA, in botany, a name given by several authors to the pyramidal rapunculus of the island of Crete, called by Mr. Tournefort, *rapunculus creticus seu pyramidalis alter*. See RAPUNCULUS.

PETROMYZON, the *stone-sucker*, in the Linnæan system of zoology, the name of a genus of fishes of the chondropterygii order, comprehending the lamprey, &c. The characters of this are, that the apertures of the branchiæ are seven on each side. *Linnæi* System. Natur. p. 52.

The name is originally Greek, and is derived from the words πέτρον, a stone, and μυζαω. to suck; this fish being usually found in rivers adhering to the stones by sucking, and so keeping its place.

The characters of this genus, according to Artedi, are these: the foramina, or apertures of the branchiæ, or lungs, are seven on each side; they are placed longitudinally, and beside these, there is one single aperture in the head, placed immediately between the eyes. The body is long, and nearly of a cylindric figure; it is smooth, and has only two fins, and those are both placed on the back.

The species of this genus, enumerated by Artedi, are these: 1. The *petromyzon*, with only one row of minute teeth in the verge of the mouth, except the large lower ones. This is the *lampetra fluviatilis minor* of authors, or the lamprey eel: and the *lampetræ medium genus*, called by the Germans the *brick*, is only a variety of this, not a distinct species. 2. The spotted *petromyzon*, with about twenty rows of teeth. This is the *lampetra major* of authors, and is called in English the *lamprey*. 3. The *petromyzon* with an annulated body, and with two appendages on each side of the mouth. This is the *enneophthalmus cæcus* of au-

authors. The body consists of eighty-four rings, and it has no teeth. *Arted.* Gen Pisc. 42.

PETRONELLUS, in zoology, a name under which some have described the bunting.

PETRONIA *marina*, in zoology, the name of a small bird of the œnanthe kind, or nearly allied to that genus. Its beak is strong and sharp, like that of the chaffinch; its head is of a brownish grey, but has usually a long whitish streak running along it; its neck is ash-coloured, and at the bottom is variegated with black; the rump is of a brownish green; the long wing-feathers are blackish, with edges and tips of green, and are white underneath; the breast is of a dusky white, and the tail brownish, variegated with yellow. It is, however, distinguished from all other birds by a fine large yellow spot, which it has on the middle of its throat. *Aldrovand.* de Avib. l. 17. c. 38.

PETROSELENI *radix*, *parsley-root*. See PARSLEY.

PETROSELINUM *Macedonium*, in the materia medica, the name of a seed used in medicine. The plant which produces it is a native of the warm countries; and the seed should be chosen for use clean, well fed, longish, and of a brownish green colour, and well tasted, and aromatic. The buyer should be careful in the choice of this seed, because it is commonly adulterated, and the seeds of the common *parsley*, or those of a sort of smallage, are too frequently sold in its place. It is aperitive, provokes urine and the menses, and expells wind; and, in form of a cataplasm, is said extremely to help the gout. It is an ingredient also in the Venice treacle. *Lem.* Dict. of Drugs.

PETROSUM *sal*, in natural history, a name given by some of the old writers to the nitre of Ægypt, used in the antient times; and by others to the common nitre, which we use at present, and call by a similar name, *salt petre*.

PETTY *bag (Cycl.)* — In antient times the chancellor was likewise chaplain to the king, and it was his business, in the time of the justiciar, to write the diplomata; that is, all charters and commissions from the king: therefore, when the power of the justiciar was broke, he obtained the *officina brevium* and *chartarum regiarum*; from thence all the extraordinary jurisdictions, touching granting of charters, as likewise all inquests of office to entitle the crown, were returned into this office; and the exchequer, in which these things were antiently transacted, became only an ordinary court of revenue, to let leases to the king's farmers, and to get in the king's debts: and therefore the office in the exchequer was only an office of instruction, of what lands were in the king in particular counties; but to invest lands in the crown *de novo*, it was necessary to have an office under the great seal, and so to grant lands from the crown, unless it were merely farms granted for years. Vid. New Abr. Law, Vol. I. p. 587.

From hence, at this day this court has a jurisdiction to hold plea upon a *scire facias*, to repeal the king's letters patents upon petitions, *monstrans de droit*, traverses of offices, *scire facias* upon recognizances, executions upon statutes, &c. which being registred in this court, the process thereupon issues, and is returnable there, and entered in the office called the *petty bag*; whereas the writs which were the foundation of the business of the other courts, were put together in the hamper, which gave the distinction of those names, and begat distinct officers in the court. 4 Inst. 80.

If in this court the parties descend to issue, the chancellor cannot try it, but is to deliver the record, with his proper hand, into the king's-bench, where judgment is to be given; but upon a demurrer, the chancellor is to give judgment [a]: so if the issue is to be tried otherwise than by a jury, as by the bishop's certificate, judgment shall be given in chancery [b]. [a Vid. New Abr. Law, Vol I. p. 587. b 1 Jon. 80.]

Also all personal actions, by or against any officer or minister of this court, in respect of their service or attendance, may be determined in this court; but in these no jury process can issue, therefore the record is to be removed into the king's-bench, as before mentioned.

PETULANTIUM *festum*, in antiquity, a festival celebrated by the Athenians and Lacedæmonians in honour of the moon, under the name of Venus: at which the men assisted, dressed in womens cloaths; and the women in the habits of men. *Hoff.* Lex univ. in voc

PETUNTSE, or as it is usually called *petunse*, one of the two earths or fossile substances of which the porcelain ware of China is made. The other is named *kaolin*. See KAOLIN.

The *petuntse* is sprinkled all over with bright glittering particles. It is beaten to powder, and afterwards made up into a sort of bricks, and in that form it is sent to the places where it is to be wrought. It is of a hard texture, and of a somewhat greenish colour. Mr. Reaumur, of the academy of sciences of Paris, who was extremely industrious in searching into the nature of porcelain, obtained some specimens of the *petuntse*, both in its native state, and in form of the brick, which is given it after it is powdered and reduced to a paste.

Mr. Reaumur found that the *petuntse* was so far from being an earth, as usually supposed, that it was truly of the nature of the European flint or pebble, as he establishes the character of that body: but to understand this rightly, it is to be observed, that this author makes the flints and pebbles a very large class of bodies, some of which are more, some less transparent; and that this *petuntse* is of the nature of the coarser, or less transparent kind, the surface of which, when broken, is not so smooth and polished as that of the ordinary flint. The great character of these stones for the porcelain manufactures is, however, that they are very easily vitrified, without the assistance of any salt, and without the immediate contact of the fire, the operation succeeding in a crucible, which is not at all the case in regard to the European flints, they very differently melting alone in a crucible, and then only into a whitish opake glass.

It being certain from hence, that one of the two ingredients of the china-ware is easily vitrifiable, it follows, from the experiment of the whole mixture, or china-ware not being reducible into glass in a large fire, that it is a composition of a vitrifiable, and a not vitrifiable (or at least not easily vitrifiable) substance; and consequently, that the kaolin is a scarce vitrifiable body, and that the result of the action of fire on a mixture of these two, is a semivitrification; which is what we call the china-ware.

If we, therefore, could, in Europe, provide the materials of china, or such as were like them, we might reasonably hope to succeed; and this appears far from improbable. The *petuntse* is easily supplied by many of our own earths, stones, and sands, as nothing is required in it more than a property of running easily into a white glass. The kaolin seems most to be resembled by our European talcs. Mem. Acad. Par. 1727. See the article KAOLIN.

PEUCEDANUM, *hogs-fennel*, in botany, the name of a genus of plants, the characters of which are these: the flowers stand in umbells, and are of the rosaceous kinds, being composed of several petals arranged in a circular form, and placed upon a cup, which afterwards becomes a fruit, composed of two flat, oval, marginated, and striated seeds. To this it is to be added, that the leaves are alated, narrow, grassy, and divided always into three parts.

The species of *peucedanum*, enumerated by Mr. Tournefort, are these: 1. The greater Italian *peucedanum*. 2. The smaller or German *peucedanum*. 3. The French *peucedanum*, with fewer and shorter leaves. And, 4. The French *peucedanum*, with fewer and shorter leaves, with purple flowers. *Tourn.* Inst. p. 318.

The common *hogs fennel* is found in wet and moorish places, and about fen ditches. It flowers in June and July. Its root is esteemed of great use, as an expectorant and attenuant. It is prescribed in diseases of the breast and lungs, particularly in those in which those parts are loaded with a tough phlegm. It is also recommended in all obstructions of the viscera. It promotes urine, and is recommended in nephritic cases. The old authors have spoke greatly of its efficacy in all nervous cases, and have recommended it as a singular remedy in lethargies, palsies, epilepsies, and the like.

PEWIT, in zoology, the English name of a common bird of the *larus*, or sea-gull kind, called by some authors *larus cinereus*, and by others *cepphus*, and in some of the counties of England the *black cap*, and *sea-crow*.

It is about the size of a pidgeon. Its beak is red; its head and throat of a greyish black, and its neck, tail, breast, and belly white; the middle of its back grey. It has its English name from its note, which seems to express the word *pewit*. It is affirmed by many, that the head of this bird is only black at a certain season of the year. *Ray's* Ornithol. p. 264.

PHACOIDES, a word used by the antient physicians to express any thing that in size and shape approached to a lentill. Thus the crystalline humor of the eye was so called.

PHACOPTISANA, a medicine often mentioned by the antient writers as a nourishing and strengthening thing: it was a ptisan with lentills.

PHACOSIS, a word used by the antients to express a disorder of the eye, appearing in form of a black spot, of the size and round figure of the lentill.

PHÆCASIA, in antiquity, a kind of shoes. For the different opinions concerning which, see *Hofm.* Lex. Univ. in voc.

PHAGEDENIC-*water*, a name given to lime water, to every pint of which twenty or thirty grains of sublimate has been added. It is a great deterger of foul wounds; whence it has its name.

PHAGESIA, φαγησια, in antiquity, a festival in honour of Bacchus, celebrated during the Dionysia. See DIONYSIA, *Cycl.* It was otherwise called *phagesipolia*, φαγησιποσια; which names come from φαγειν, to eat, and πινειν, to drink; because it was a time of good chear. *Potter*, Archæl. Græc. l. 2. c. 20. T. 1. p. 434.

PHAGON, φαγων in antiquity, a festival of the same nature with that called *phagesia*. See PHAGESIA.

PHAGRUS, the *sea bream*. The Artedian system of ichthyology does not allow this fish a peculiar generical name, but makes it a species of the large genus of the *spari*: the author distinguishes this from the others by the name of the *reddish sparus*, with the skin hollowed into a sinus at the roots of the back fins. See SPARUS.

PHAGUS, in botany, a name given by many authors to the exulus, or sweet and esculent oak, found in Greece and Dalmatia. *Parkins.* Theatr. p. 1387.

PHALACRA, a word used by Hippocrates to express all the blunt

blunt inſtruments uſed in ſurgery; ſuch as probes and others, with buttons at the ends.

PHALACROCEPHALUS *indicus*, in zoology, the name of an anadromous fiſh of the Eaſt Indies. Its neck and head appear naked and bald, as it were. It is all over of a greyiſh white in colour, and is variegated with red ſpots about the mouth. The eyes are large and very prominent, and their iriſes yellow. Its uſual ſize is about a foot and a half in length, and it lives part of its time in the ſea, and part in rivers. It is an extremely delicate-taſted fiſh, and eſteemed one of the fineſt of that part of the world. It is called by the Dutch *kael kop*. *Ray*'s Ichthyogr. Append p. 2.

PHALAIA, a word invented by Baſil Valentine, and uſed as the name of a *panacæa*, or univerſal medicine; but Rolfink has ſince uſed it to expreſs a tincture of jalap.

PHALANGIUM, in the hiſtory of inſects, the name of a peculiar genus of *ſpiders*, the characters of which are theſe: They do not move regularly and evenly as other *ſpiders*, but hop in the manner of fleas. This was a character recorded of them by Pliny, and the antients, and is found at this time in all ſpecies. They have a ſquare forehead; and in this are placed eight eyes of different ſizes, and diſpoſed in form of a part of a circle. They have alſo the forelegs greatly longer and ſtronger than any of the others. Of theſe there are four principal kinds: 1. The grey *ſpider*, variegated on the belly, with ſix tranſverſe faſciæ meeting in an angle in the middle. Theſe are alternately black, and of a ſilvery white. It is of a middle ſize, and its grey colour ſeems a mixture of a deep black and a ſilvery white. It is common in woods and about old walls. 2. The reddiſh brown *ſpider*, variegated with two large black marks, and a foliaceous obſcure figure on the body. This is ſomewhat ſmaller than the former, and is found about old walls, but not frequently. 3. The yellowiſh *ſpider*, with green eyes, and with three yellow lines on the hips. This is of a middle ſize, but it is a very rare ſpecies. 4. The reddiſh rock *ſpider*. This is a moderately large kind, and is of a reddiſh cheſnut colour. It is a very ſcarce *ſpider*, and lives among rocks and on heaths. *Ray*'s Hiſt. of Inſects, p. 36. See OPILIO.

PHALANGIUM *apulum*, the *apulian phalangium*, a name given by authors to that large and poiſonous ſpecies of ſpider called by the vulgar, the *tarantula*, from the name of a city of Calabria, Tarantum; near which it is very common. Valetta, a monk of Apulia, who had always reſided about the places where this miſchievous animal is moſt frequent, and had had many opportunities of tracing its ſeveral qualities, publiſhed a ſuccinct, but very accurate hiſtory of it in the year 1706, under this name.

It had its name *phalangium*, from the three phalanges or joints of its legs, and this name equally ſuiting many other ſpiders, as well as this, it ceaſed to be its appropriated name, and was applied as a generical term to ſeveral other ſpiders of the larger kind; among which this ſpecies was always diſtinguiſhed by the epithet *apulian*, from the place where it was ſo frequently found.

The *tarantula*, or *apulian phalangium*, is frequent in all parts of this country, in uncultivated places, but more eſpecially it breeds moſt in ſunny dry hills, and particularly in ſuch parts of them as are expoſed to the ſouth. It is ſaid not to be found any where, except in Apulia; but probably it is an inhabitant of many other places, tho' its poiſon may not be violent enough any where elſe to bring on the effects it does there: as we find in vipers and many other poiſonous creatures, that the ſtrength of their poiſon differs greatly in degree in different places. As this ſpider is very tender, and eaſily injured by cold winds and rain, it always digs itſelf a cave in the ſide of a hill for its habitation; and uſually chuſes for this purpoſe the hardeſt ground it can find, which is better able to defend it, and which it eaſily works into with its forceps and claws. This always is hollowed upward in the hill, and by that means is ſafe from wet, all the water in rainy ſeaſons running down over its top. Sometimes it burrows itſelf a cave in a valley or plain, but then it always chuſes a dry, uſually a chalky ſoil. In this caſe the entrance into its cave is ſmall, and within there are ſeveral winding paſſages: if it happens to be ſurpriſed with wet in this place from hard rains, it quits the floor and hangs by its feet againſt the top of the cave. It preys upon a number of ſmall inſects with which the fields of Apulia abound, and ſeldom appears in the day-time, but creeps out about the time of ſun-ſet, and preys at large upon the animals which are then betaking themſelves to reſt; without the danger it would be expoſed to from its own enemies by day-light. If at any time he remains the whole evening in his cave or den, it is only to practiſe another method of hunting his prey. In this caſe he comes forward to the mouth of the hole, and there lies in wait; his fore-legs are placed at the extremity of the hole, and his eyes have a clear view all round. The other inſects are not aware of this trick, but as they walk near his hole he burſts out upon them, and ſeizing them, conveys them into his habitation; where, as ſoon as he has eaten them, he retires back into his cell to diſpoſe of the wings and other fragments, till he can carry them out at a more convenient time, and then places himſef in his former poſture for another prey.

The peaſants of Apulia have a method of getting him out of his hole in the day-time, in order to deſtroy him. This they do by making a ſoft hiſſing noiſe thro' an oat ſtraw; whether it be that the creature loves this ſound, or rather that he takes it for the voice of ſome inſect that he is uſed to prey upon, he always comes out, and falls a ſacrifice to his greedyneſs.

This creature has eight legs, and walks very well; his legs have each three joints, and are covered with a fine downy hairyneſs: they are of a whitiſh colour at the bottom, and variegated with black lines, and are wholly black in their upper part, where they are joined to the breaſt. Theſe all ariſe from a kind of oval ſhield, which is placed upon the breaſt, and is black, hairy, and very hard. This is called by ſome the *ſpeculum* of the *tarantula*. From the ſhoulders there grow a pair of horns, at leaſt they are uſually called ſo, tho' they ſeem much better to deſerve the name of *arms*. The uſe of theſe is to hold faſt the prey, that it may not be able to eſcape while he is killing it with his forceps. Theſe horns or arms have the ſame number of joints that the legs have, but they greatly differ from the legs, in that they are ſhorter and of a yellowiſh colour. They are alſo covered with a longer and thicker hair, for the more certainly holding the prey, and are terminated by black claws, and they are much ſmaller and more capable of motion every way. The belly is either white, or of a pale yellow, and is marked with a tranſverſe black ſtreak: this is ſurrounded with ſeveral other ſmall ſpots of the ſame colour, and is cloathed with a very fine and ſhort down. The whole body beſide is covered with longer hairs, and is of a whitiſh or browniſh colour. The apex of the head, the ſhield of the breaſt, and the ends of the forceps, are as hard as a crab's claws, but the reſt of the body is covered with a tender and ſupple ſkin. The eyes are very large, and of a fine ſhining black; they are continually in motion, and when ſeen in the night or in a duſky place, they ſhine like the eyes of a cat. In the place where the mouth is placed in other animals, there ariſes in this a black hard forceps; the upper part of this inſtrument is covered with a yellow hairyneſs, and it is terminated by extremely fine and ſharp claws, which the creature can open or cloſe up at pleaſure. While the arms hold the prey in a proper poſition, theſe ſharp points make wounds in the body, and the other parts of the forceps ſqueeze the body till all its juices are preſſed out, and the creature feeds on them. The mouth is placed much below theſe, and ſtands exactly in the proper place to receive the juices expreſſed by this operation. The *tarantula* ſleeps in his cave the whole winter, and a great part of the autumn and ſpring; and if during this time he is ploughed up, as is often the caſe, or is any other way taken out of his hole, he is found quite torpid and numbed, and is unable to do any miſchief by biting.

The hole or mouth of a tarantulous cave always gives ſome idea of the ſize of the creature within: he makes it ſmall if he enters while young; and as he grows larger he eats away more and more of the earth to widen it ſtill more, ſo that the diameter of it is uſually about equal to the diameter of the body. The ſize of a cheſnut is about the ſtandard of a full grown *tarantula*; but there are ſome old ones found much larger and more hairy. The female is known from the male by having longer legs and a larger belly. They copulate in June and July, and at that ſeaſon the females are often met with in the fields carrying the males upon their back. In Auguſt and September they lay their eggs, which remain the whole winter; and in the ſummer after are hatched. Pliny tells a ſtory of the young ones always eating up their mother for the firſt food, which is countenanced by the relation of the peaſants in thoſe parts, who ſay that they all ſwarm about her and ſuck her juices from many places at once, till they leave her lifeleſs carcaſs on the field, and then go each their ſeveral way in ſearch of other food. The bite of the *tarantula*, as it is called, is not properly a bite, but a wound inflicted in a very peculiar manner. The creature pierces the ſkin with its forceps, and at that inſtant injects from its mouth a poiſon into the wound. The time in which their wounds are fatal, is that of their copulation; at this time they are in their utmoſt vigour and power of hurting. People of faſhion are rarely hurt by them, but principally the poor labourers, who ſleep half naked in the field, and the women who travel the country with naked feet, gathering medicinal herbs.

Authors are divided about the nature of the poiſon of the *tarantula*. Cardan ſays it is a cold one, and Scaliger ſays it is a hot one; but be this as it will, its effect is very ſudden: it is no ſooner received into the fleſh but the veins take it up and carry it to the heart, where it becomes diffuſed thro' the whole maſs of blood, and gives an immediate trembling of the limbs, and a difficulty of breathing. The next part it ſeizes is the brain, where it produces different effects in different ſubjects; and according to their ſtate of health, and the condition of their juices, brings on various ſpecies of phrenſies.

The patient ſees a thouſand phantoms, ſometimes all jovial and merry ones, and ſometimes imaginary ſcenes of blood and cruelty. Some are fond of ſeeing little ſtreams of water trickling down into a baſon; others are never eaſy unleſs they have green leaves before them: this indeed is almoſt an univerſal ſymptom. Some are delighted with various colours, and ſome are fond of violent motion, ſuch as dancing, leaping, and the like; and ſome are in love with ſlow and graceful movements, as walking majeſtically, bowing, and dancing ſlow dances. Some are military mad, and call out for the noiſe of drums and trumpets, and the claſhing of ſwords; but all of them, as well the briſk and noiſy as the lethargic and dull, are pleaſed with muſic.

They will get up and dance to any inſtrument; and the moment it ceaſes playing they will fall down to the ground as if apoplectic, and not ſtir again till the muſic is renewed. Many people have laughed at the whole hiſtory of the bite of the *tarantula*, from this one accident of its poiſon being cured by muſic; but all who have been upon the ſpot atteſt it; and there ſeems no reaſon to call in queſtion the various authorities on which we have it related. *Valett.* de Phalang. Apulo.

PHALANGIUM *dectícum*, in natural hiſtory, a name given by all the old Greek writers to a poiſonous kind of field ſpider, the ſame with the *ſolipuga* of the Latins, or *ſolifuga*, as ſome write it. It is a ſmall inſect that buries itſelf in the ſand, and if it bites a man does very great miſchief; the part ſwelling, and the perſon becoming ſick as if bitten by a viper: ſome ſay the bite is actually mortal; but this ſeems to be going too far. Solinus tells us that this creature is peculiar to Sardinia, but we find Pliny mentioning it in Ethiopia; and Lucan tells us that it was one of the poiſonous reptiles that were in his time the peſt of Africa.

PHALANGIUM, *ſpiderwort*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is liliaceous, and conſiſts of four petals; from the center of which there ariſes a piſtil, which finally becomes a roundiſh fruit divided into three cells, and filled with angular ſeeds; to this it is to be added that the root is fibrous.

The ſpecies of *phalangium*, enumerated by Mr. Tournefort, are theſe: 1. The large flowered not branched *phalangium*. 2. The ſmall flowered not branched *phalangium*. 3. The branched *phalangium* with ſmall flowers. 4. The iris-leaved alpine marſh *phalangium*. 5. The iris-leaved Engliſh marſh *phalangium*. 6. The leaſt iris-leaved Scotiſh marſh *phalangium*. *Tourn.* Inſt. p. 368.

PHALANGOSIS, in ſurgery, the name of a tumor and relaxation of the eye-lids, which is often ſo great as to deform the eye, and very much impede viſion. Sometimes the relaxed eye-lid ſubſides or ſinks down, occaſioned either by a palſy of the muſcles which ſuſtain and elevate the eye-lid, or elſe from a relaxation of the cutis above, from various cauſes. Sometimes alſo an œdematous or aqueous tumor is formed on the eye-lids, ſo as almoſt entirely to exclude viſion; but this laſt caſe ſhould be well diſtinguiſhed from the other, and may be remedied without much difficulty, by the uſe of internal and topical medicines; ſuch as purges and diuretics given inwardly, and a compreſs dipped in warm ſpirit of wine and lime water.

But in the paralitic or relaxed caſe, the uſe of cordial and nervous medicines muſt be propoſed internally, and outwardly balſam of Peru and hungary water are to be employed. If all theſe fail, the remaining method is to extirpate a ſufficient quantity of the relaxed cutis; and then, after healing up the wound, the remainder will be ſufficiently ſhortened. *Heiſter's* Surgery, p. 367.

PHALANX (*Cycl.*) — PHALANX, in natural hiſtory, a term uſed by Dr. Woodward, and ſome other writers of foſſils, to expreſs an arrangement of the columns of that ſort of foſſile coralloide body found frequently in Wales, and called *lithoſtrotion*.

In the great variety of ſpecimens which are found of this, ſome have the whole *phalanx* of columns cracked through, and others only a few of the external ones; but theſe cracks never remain empty, but are found filled up with a white ſpar, as the ſmaller cracks of ſtone uſually are. This is not wonderful, as there is much ſpar in the compoſition of this foſſil; and it is eaſily waſhed out of the general maſs to fill up theſe cracks, and is then always found pure, and therefore of its natural colour white.

The *lithoſtrotion* or general congeries of theſe phalanges of columns, is commonly found immerſed in a grey ſtone, and found on the tops of the rocky cliffs about Millford in Wales. It is uſually erect, tho' ſomewhat inclining in ſome ſpecimens, but never lies horizontal. It ſeems to have been all white at firſt, but to have been ſince gradually tinctured with the matter of the ſtone in which it lies. The ſingle columns which form each *phalanx*, are uſually round or cylindric, tho' ſometimes flatted and bent; ſome of them are alſo naturally of an angular figure; theſe, however, are not regular in the number of their angles, ſome conſiſting of three ſides, ſome of five, and ſome of ſeven; ſome are hexangular alſo, but theſe are ſcarce. They are from five or ſix to ſixteen inches in length; and the largeſt are near half an inch over, the leaſt about a quarter of an inch; the greater number are very equal to one another in ſize; but the ſides of the columns being unequal, the ſame column meaſures of a different thickneſs when meaſured different ways: the phalanges or congeries of theſe are ſometimes of a foot or more in diameter.

The columns are often burſt, as if they had been affected by external injuries; and it is evident, that they were not formed before ſeveral other of the extraneous foſſils; for there are found ſometimes ſhells of ſea-fiſhes and entrochi immerſed and bedded in the bodies of the columns. It appears plainly from hence, that when theſe bodies were waſhed out of the ſea, and toſſed about in the waters which then covered the tops of theſe cliffs, which cannot reaſonably be ſuppoſed to have been any other than thoſe of the univerſal deluge; this elegant foſſil, together with the ſtony bed in which it is contained, were ſo ſoft that theſe other bodies found entrance into their very ſubſtance, and they were formed, as it were, upon them. This foſſil takes an elegant poliſh, and makes in that ſtate a very beautiful appearance, being of the hardneſs of the common white marble, and carrying the elegant ſtructure viſible in the ſmalleſt lineaments. *Woodward's* Coll. of Foſſ. p. 11.

PHALARIS, in the Linnæan ſyſtem of botany, the name of a peculiar kind of graſs called *phalaroides* by Scheuhzer and others; and with this author making a diſtinct genus of plants, the characters of which are: That the cup is a glume, containing only one flower; this glume is large, bivalve, obtuſe, and compreſſed, each of the valves being of a boat-like ſhape, flatted, obtuſe above, with ſtrait edges meeting one another in parallel lines. The flower is alſo bivalve, and is ſmaller than the cup; the exterior valve of it being oblong, pointed, and folded, the interior much ſmaller. The ſtamina are three capillary filaments, ſhorter than the cup; the antheræ are oblong; the germen of the piſtil is roundiſh; the ſtyli are two in number, and are capillary ones; the ſtigmata are hairy; the flower ſerves for a cloſe covering to the ſeed, not at all gaping from it; the ſeed is ſingle, ſmooth, and roundiſh, but pointed at both ends. *Linnæi* Gen. Plant. p. 14.

PHALENÆ, in natural hiſtory, the name by which authors diſtinguiſh thoſe butterflies which fly by night, and which the French thence call *papilions nocturnes*, and we vulgarly *moths*.

All the creatures of this claſs are quiet by day, remaining fixed to the ſtalks or leaves of plants, except only ſome of the males, which are now and then found fluttering about in the woods in ſearch of the females; but as ſoon as night approaches they all fly about. This diſpoſition is very remarkably implanted in their nature; for when kept ſhut up in boxes they always remain quiet without changing place all day, but as ſoon as the ſun is about ſetting, they always begin to flutter about and fly as much as their priſon will permit them. The ſpecies of theſe are more numerous even than thoſe of the day butterflies. The day kinds all have trunks fitted for the ſucking the juices of flowers for their nouriſhment, but many of the *phalenæ* wholly want them: theſe, however, have always the beards which ſerve to defend the trunk from injuries in the day-flies, and ſometimes in the place of the trunk within theſe, there is found a ſmall white protuberance or two. It is certain, therefore, that many of the *phalenæ* have no organs of eating, nor take in any food during their whole lives in that winged ſtate. *Reaumur's* Hiſt. of Inſ. Vol. 1. P. 1. p. 363.

The grand diſtinction of the *phalenæ* is into thoſe which have trunks, and thoſe which have not; or at leaſt which have not any ſenſible to the eye of a common obſerver; according to theſe, and to other eſſential diſtinctions, theſe, in the manner of the *papilios* or day-flies, are arranged into ſeven claſſes. See PAPILIO.

Claſs 1. This contains the *phalenæ* which have priſmatic antennæ, or ſuch as are of an equal thickneſs in almoſt all their length, and have their anterior part rounded, but their hinder part formed of two planes meeting in an angle; ſo that a tranſverſe ſection of one of theſe antennæ repreſents a curvilinear triangle. All the *phalenæ* of this claſs have trunks, and the greater part of them have their wings ſo diſpoſed, that they form a flat ſurface when the creature is at reſt, and leave the upper part of the body naked; and this uſually terminates in a point. The inferior wings are ſmall in compariſon of the ſuperior, and their inferior edge is ſhorter, and uſually very much ſo, than the ſuperior; and the end of this reaches to the end of the body, or beyond that, whereas the other uſually leaves two or three rings of it uncovered.

Thoſe moths which have large and heavy bodies, and have ſhort under-wings, and narrow, tho' long upper ones, always make a great noiſe in flying, and cannot ſupport themſelves in the air without agitating their wings very ſwiftly. This is alſo the caſe with ſome of the day-butterflies.

Many of the very large and beautiful *phalenæ* are of this firſt claſs, particularly that which is produced of the beautiful ſpurge caterpillar.

Claſs 2. This comprehends the *phalenæ* which have conic horns or antennæ, which regularly decreaſe in diameter from

their origin to their extremity, and terminate in a very fine point. These *phalenæ* also have trunks, as well as those of the former class; and their antennæ are usually very slender.

Class 3. This comprehends the *phalenæ* which have antennæ of the same form with those of the former class, but have no trunk.

Class 4. This comprehends the *phalenæ* which have bearded antennæ and a trunk.

Class 5. This comprehends those which have bearded antennæ and have no trunk.

There are several genera of each of these classes, distinguished by the particular structure of their antennæ, tho' of the general form described in the character of the class. Those which are composed of several vertebræ joined end to end, which make the length, have great differences in the size and proportion of these joints, and some of them are hairy, others smooth. These, however, tho' very certain and unerring distinctions, are not to be perceived without the assistance of the microscope; whereas the same animals offer us much more plain and obvious distinctions, and those equally certain, in the different manners in which they fly, and carry their wings when at rest. The butterflies have different manners of carrying their wings, but these are but few in comparison of the moths; so that if the classes in these last were to be established according to this character, they would be greatly too numerous; tho' this gives very happy subdistinctions of the peculiar genera of each class, of which we shall give some instances hereafter, in regard to this class.

Class 6. This comprehends a very peculiar sort of *phalenæ*, the females of which have no sensible wings. Several of those caterpillars which have long parcels of hairs at their heads resembling horns, give *phalenæ*, the females of which have no wings; and the creeping ones, with ten legs, also give some. *Reaumur*'s Hist. Inf. V. 1. P. 1. p. 408.

Class 7. This comprehends a set of *phalenæ* which are much more distinctly characterised by nature than any of the former: they have wings shaped like those of birds, and composed of true and proper feathers. All the *phalenæ* of this class are small, but their singular structure makes them worthy a peculiar attention.

It is scarce possible to determine exactly, whether they belong to the *phalenæ* or butterfly class most properly: they have the conic antennæ, which character a former class of the *phalenæ*; but they are often found flying about in the day time, in the manner of the day-flies: their changes also are made in the same manner with those of the day-flies; so that upon the whole, it is, perhaps, most proper to account them a peculiar class of the *papilio*, considered as a general term, but without regard to the first distinction of day and night kinds, or of moths and butterflies.

There are three genera of this class, each of which carries its distinctions from the others very obvious and distinct, so as not to be in any danger of being mistaken.

Those of the first genus are all of a remarkable whiteness; they always stand upon all their six legs, and the two hinder ones are much longer than the others. This creature never carries its wings lying on its body, as the generality of *papilios* do; but they are placed in a direction perpendicular to the length of its body, or nearly so. When it is at rest, the wings are closed somewhat in the manner of those of birds; yet in this state we may see that they are made of feathers, which, when we view them with the microscope, appear to be so many segments into which the wings are divided; the upper being divided into two, and the lower into three, each of which is edged on both sides with real feathers. Mr. Hook has figured this creature in his micrographia, and has given but two divisions to the under wing; but that was probably an oversight, the middle one being easily overlooked. When this little creature flies, it separates the segments of its wings farther off, and expands its feathers so, that they perfectly resemble those of a bird; and the two wings are in this state so placed together as to resemble only one. As beautiful, however, as these wings are to look at, they are but of very little use to the creature in flying. It is not known to fly at all by night, and in the day it takes only very small and short flights.

The creature given by Reaumur as an instance of the second genus of this class, is of a fine bright brown colour, as are all of the genus. When this creature is in a state of rest, its wings are not seen to be feathery, nor even to be wings at all; but are so folded up, as to resemble arms stretched out at length: and the creature in this posture looks like the miniature figure of a man upon a cross, the two wings of each side being folded into a sort of cord, and turning hooked at the ends. The inferior wings are composed each of three plumes, and are lodged in a furrow made by the upper ones, which are convex externally, and concave within, and are divided only about a sixth part of their length, but their segments are well feathered at the edges for half their length.

This species also differs from the former, in that it stands only on its four anterior legs, the two hinder ones being usually extended along the sides, and forming a sort of tail after they have crossed one another behind.

The creatures of the third genus of this class are small, and are frequently seen on the glass of our windows; and their wings are the most truly plumose of those of any species. They are of a brown colour, with somewhat of a gilded look when closely viewed, and have a few black spots in different parts. They carry their wings flat, or horizontally, when at rest; and these appear like the wings of the common butterfly, but when nearly examined, they are found to be composed of real feathers; and their seeming continuity is only owing to the close arrangement of these feathers. This is a very tender creature, and easily crushed to pieces; but when caught carefully, and examined by the glass, each upper wing is found to be composed of eight feathers, and each under one, of four; and the quill part of the pedicle of these feathers, is in all the wings separate to the very point at the top, which is very different from the others, where the wing is only divided a little way into segments; and the upper and under wing of each side are so nicely fitted together when the creature flies, that they only resemble one very large wing. Yet even these feathered wings, when viewed by powerful microscopes, are found not to be truly feathered; but what we term plumes are in reality only a nice arrangement of scales, like those of other butterflies upon the deep segments of the wing. This species has conic antennæ and a trunk. Its origin is unknown, but it seems to be produced of some of the teniæ which live in our houses, since it is always found within doors, never in the fields; and is seen in the month of March, which is earlier than the field butterflies are seen: they are also found in August, September, and October, and sometimes later than that month. *Reaumur*'s Hist. Inf. V. 1. P. 1. p. 419.

Mr. Reaumur has given an example of the manner of distinguishing the subordinate genera of the other classes, in those of the second, fifth, *&c.* before mentioned. In this he has regard to the position and direction of the wings, which is sufficiently certain and determinate, and is the most obvious of all characters; according to this he has established the following genera of this extensive class:

Genus 1. The *phalenæ* of this genus carry their wings parallel, and in an horizontal direction; but they cross one another, one of the upper wings lying in great part over the other. Sometimes it is the right that crosses over the left, and sometimes the left that crosses over that; but however this be, the under wings always lie folded underneath them. Many of the caterpillars which feed on our garden herbs, afford *phalenæ* of this genus, of which there are several of the second class.

Genus 2. This comprehends those *phalenæ* whose wings lie parallel, as in the former genus: they also cover in the same manner the under wing, but these never cross one another. Of this genus there are several subdivisions.

Genus 3. This comprehends those *phalenæ*, the upper wings of which have their interior edges applied one against the other: and tho' they are in general held parallel to the horizon, yet that part of them which covers the body has not the same parallelism with the rest; but are bent round about the body, and so moulded, as it were, upon it, that they shew the shape of that part of it which they cover. We have an instance of this genus in that *phalena* which is produced of the caterpillar which feeds upon the young and green seeds of the nettle. Its wings are variegated with white, and with a deep brownish black, in an elegant manner.

Genus 4. This genus comprehends those *phalenæ* which carry their upper wings in an horizontal direction, but which, instead of crossing, or even touching one another, are so wide asunder, that they do not cover any part of the body, but leave both that and the under wings naked. This genus comprehends a great number of species, which are distinguished according to the different distances to which they expand the wings in sitting; some having them little less so at rest than when flying.

Genus 5. This comprehends those which have the interior edges of the upper wings joined one to the other, and raised above the surface of the body, so that they form a sort of canopy over the creature. In this case, the under wings are always necessarily hid. We have an instance of this genus in the second class, one of the *phalenæ* of that being a very beautiful one, variegated with red and black, always carrying its wings in this manner very remarkably.

Genus 6. This comprehends a set of *phalenæ* which somewhat resemble the former in the placing of their wings, insomuch, that they meet at the interior edges, and form a canopy over the body; but as this is strait and angular in the former genus, it is rounded or arched in this: the inner part of each outer wing being bent, as it were, into the shape of the body. We have a very frequent instance of this genus in one of the *phalenæ* of the third class, which has conic antennæ and no trunk: the caterpillar of this species feeds on the rotten trunks of trees.

Genus 7. This comprehends a great number of *phalenæ*, the greater part of which are very small in size, and carry their wings almost horizontally, forming a very depressed canopy over their bodies. These are remarkably thick about the shoulders, or origin of the wings, and are known by many by the name of the *large-shouldered*. When these are in a state of rest, their largest diameter is either at the origin or at the middle of the breast, at or near the insertion of the wings.

We have many *phalenæ* of this kind produced from thoſe caterpillars which artfully roll up the leaves of trees, particularly one bred from a ſmooth caterpillar of this kind, with ſixteen legs.

Genus 8. This comprehends thoſe *phalenæ*, the wings of which are laid cloſe down upon the body, ſo as to be moulded on it, and take its exact ſhape: theſe cover the body exactly as the wings of birds do theirs. There are humbers of ſmall moths of this ſpecies, which are produced of thoſe kinds of caterpillars which live all their time in ſociety in one common web; of theſe there are many ſpecies.

Genus 9. This comprehends a ſet of *phalenæ* ſmaller than the former, which carry their wings in the ſame manner, cloſely folded upon their bodies; but differing in this, that they are extended to a conſiderable length, and towards their extremity riſe up above the level of the body, and form a ſort of tail like that of a cock. The *phalenæ* of this genus are diſtinguiſhed by ſome under the name of *cock-tailed*; and tho' they are ſmall, yet they are very numerous, and of very great variety; and when examined with the microſcope, appear of a beauty equalling almoſt any kind. Their wings thus viewed are frequently found variegated with gold and ſilver in appearance, the yellow and white ſpots frequent in them having a brightneſs which a painter could give us no idea of, but by uſing thoſe metals. The moths of the teniæ of ſeveral ſpecies are of this kind: their antennæ are uſually of the conic kind, and as ſlender as hairs; and it is difficult to ſay whether they have any trunk, it being, if they have any, of a very minute kind.

Genus 10. This comprehends a ſet of *phalenæ* whoſe upper wings are very remarkably folded over the body, one of them ſurrounding it in a manner, and the other turning itſelf ſpirally round that; ſo that a very great part of one of the upper wings is always covered by the other. *Reaumur*'s Hiſt. Inſ. V. 1. P. 1. p. 394, 396.

PHALERA, the name of a bandage for the noſe, deſcribed by Galen in his treatiſe on bandages.

PHALERÆ, among the antients, horſe-trappings. See the article TRAPPINGS.

PHALLUS *marinus*, a name given by ſome authors to a ſpecies of *canalis* or *tubulus marinus*, found about Amboina, and called by the French writers *priape* and *arroſoir*. It is an oblong ſhell, with a large head, which is pierced full of holes; ſo that it at once reſembles the *glans penis*, and the noſe of a watering-pot uſed by gardeners.

PHARI, among the antients, a kind of candleſtick. See the article BRANCH.

PHARICUM, the name of a famous poiſon among the antients: it was ſaid to be compoſed of many ingredients, but we know nothing of it at this time.

PHARMACI, φαρμακοι, among the Greeks, an appellation uſed for two perſons who were employed in the luſtration or purification of cities. *Pott.* T. 1. p. 400.

Theſe were two men, according to ſome; but others ſuppoſe them to have been a man and woman, to repreſent the male and female ſex, for each of which they offered a ſacrifice. It was uſual for the man to carry about his neck figs, called ισχαδες, of a blackiſh colour; and the woman ſuch as were white. *Pott.* Archæol. Græc. T. 1. p. 400, ſeq. See the article LUSTRATION, *Cycl.*

PHARMACIA, φαρμακεια, in antiquity, denotes the art of effecting ſtrange and wonderful things, by means of medicated and inchanted compoſitions of herbs, minerals, &c. Theſe things themſelves were called *pharmaca*, ſome of which being taken inwardly, were ſaid to cauſe blindneſs, madneſs, love, &c. Such were the medicaments by which Circe transformed Ulyſſes's ſoldiers; others infected by touch, ſuch was the garment Medea ſent to Creüſa; others ſpread their venom afar off, and operated upon perſons at a great diſtance.

There were alſo *pharmaca ſoteria*, φαρμακα σοτηρια, which were amulets againſt the former; ſuch was the herb moly, which preſerved Ulyſſes from Circe's inchantments; the laurel, the ſallow-tree, the rhamnus, or Chriſt-thorn, flea-bane, the jaſperſtone, and many others mentioned by Albertus Magnus, and Orpheus, in his book de lapillis. *Pott.* Archæol. Græc. l. 2. c. 18. T. 1 p. 353. See AMULET.

PHARMACITIS *terra*, in the materia medica, a name which ſome authors have given to the common *ampelites* or cannel-coal. See AMPELITES.

PHARMACOCHEMIA, a term uſed to expreſs that part of the chemical art which treats of the preparation of medicines.

It is thus called by way of diſtinction from that chemiſtry which is wholly employed about the tranſmutation of metals by means of the philoſopher's ſtone; this being called *ſpagirico-chemia*.

PHARMACY *(Cycl.)*—Moſt of the natural bodies being ſome way or other employed as ſubjects of *pharmacy*, the materia medica is extremely large, and its operations various. Its materials in the earlieſt ages, indeed, were very few, and the ways of managing them very ſimple: ſubjects afterwards multiplied, operations increaſed, and at preſent we ſeem abundantly ſtocked with both ſimple and compound medicines.

Diſeaſes muſt have been very early, if the firſt inhabitants of the earth experienced the ſame changes of ſeaſons, breathed the ſame kind of air, and uſed a like kind of diet and regimen of life with ourſelves: but ſoon after the diſeaſe afflicts, the patient ſeeks a remedy; and this appears to have been the foundation of *pharmacy* in different parts of the world.

Experiments being thus multiplied, and the preparations of ſimples better made, *pharmacy* became at length an art. Hippocrates, however, when he came to compile a kind of ſyſtem of phyſic from the obſervations of antiquity, deſcribed but few, and thoſe generally ſimple. *Shaw*'s Lectures, p. 193. Succeeding phyſicians then enlarged the materia medica; Galen conſiderably ſwelled the catalogue, and the Arabians much more; and when learning began to revive in Europe, the materia medica was again enlarged, and great changes wrought upon it by chemiſtry.

The art of *pharmacy* muſt be conſidered under the management of phyſicians, apothecaries, trading chemiſts, and druggiſts. To the phyſician it belongs to direct the medicines, and to give the rules of extracting and managing the ſimples. To the apothecary belongs the reduction of the materia medica into certain forms of medicines, according to the direction of the phyſician. And the deſign of trading chemiſts and druggiſts, is to furniſh medicinal matters to the apothecary, who cannot always detect an artificial counterfeit, or a dexterous ſophiſtication; and perhaps many remedies, well deſigned by the phyſician, have failed or had miſchievous effects on this account. *Shaw*'s Lectures, p. 195.

PHARMUTHI, in the Ægyptian chronology, one of the months of their year, which anſwered to the month of April among the Romans *Hoffm.* Lex. univ. in voc.

PHARYNGÆUM *ſal*, a name given by authors to an artificial ſalt, of uſe in the quinſey, and caſes of the like kind, when the *pharynx*, or fauces are incommoded by a diſcharge of ſerous or other humours.

It is prepared of cream of tartar and nitre, each an ounce, with half an ounce of burnt alum; all theſe are to be diſſolved in vinegar, and coagulated according to art. This ſalt mixed with honey, and diſſolved in plantain water, makes an excellent gargle.

PHASEOLUS, *kidney-bean*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the papilionaceous kind, and its piſtil, which ariſes from the cup, finally becomes a long pod, containing ſeveral kidney-ſhaped, or elſe oval ſeeds. To this it is to be added, that the leaves always ſtand three upon a ſtalk, and the whole trace and habit of the plant is peculiar, and diſtinguiſhes it from the other papilionaceous flowered genera.

The ſpecies of *phaſeolus*, enumerated by Mr. Tournefort, are theſe: 1. The common garden *phaſeolus*. 2. The common *phaſeolus*, with black fruit. 3. The common *phaſeolus*, with yellow fruit. 4. The common *phaſeolus*, with red fruit. 5. The common *phaſeolus*, with livid fruit. 6. The common *phaſeolus*, with pale coloured fruit. 7. The common *phaſeolus*, with violet coloured fruit. 8. The common *phaſeolus*, with fruit variegated with black and red. 9. The common *phaſeolus*, with white fruit, variegated with black lines and ſpots. 10. The common *phaſeolus*, with purple fruit, variegated with circles of white. 11. The leſſer garden *phaſeolus*. 12. The leſſer *phaſeolus*, with pods bending upwards, and with white fruit. 13. The black-fruited leſſer *phaſeolus*, with pods bending upwards. 14. The white-fruited leſſer *phaſeolus*, with pods bending upwards, and with black or purple circles variegating the fruit 15. The large *phaſeolus*, with broad white fruit, ſtriated with numerous black veins. 16 The large *phaſeolus*, with broad, compreſſed, perfectly white fruit. 17. The large *phaſeolus*, with large flat white ſtriated fruit. 18. The large *phaſeolus*, with ſmall ſnow-white tumid fruit. 19. The *phaſeolus*, with greeniſh black fruit, reſembling thoſe of the anagyris. 20. The *phaſeolus* with red fruit, reſembling that of the anagyris. 21. The ſmall *phaſeolus*, with white fruit, marked with a black ſpot. 22. The narrow-leaved exotic *phaſeolus*. 23. The narrow-leaved exotic *phaſeolus*, with variegated black and white fruit. 24. The ſmall-leaved foreign *phaſeolus*, with white, and ſometimes with variegated fruit. 25. The foreign *phaſeolus*, with the pod and the fruit both black. 26. The foreign *phaſeolus*, with variegated fruit. 27. The foreign *phaſeolus*, with reddiſh fruit, variegated with black lines. 28. The foreign *phaſeolus*, with white fruit, of the ſhape of a pigeon's egg, and marked with a ſingle black ſpot. 29. The foreign *phaſeolus*, with black fruit, variegated with a white ſpot. 30. The Æthiopian *phaſeolus*, with black pods, ridged with rough veins, and with a black ſhining ſeed. 31. The Æthiopian *phaſeolus*, with yellow leaves and a black ſeed. 32. The Æthiopian *phaſeolus*, with deep red pods and black ſeeds. 33. The black-fruited Ægyptian *phaſeolus*. 34. The red-fruited Ægyptian *phaſeolus*. 35. The American *phaſeolus*, or lablab, with roſe-coloured fruit. 36. The Indian *phaſeolus*, with cochleated flowers. 37. The ſcarlet-flowered *phaſeolus*. 38. The ſmalleſt flowered *phaſeolus*, with a green fruit of an oval ſhape. 39. The garden *phaſeolus*, with white ſmall oval ſeeds. 40. The American *phaſeolus*, which propagates itſelf by its tendrils. 41. The African *phaſeolus*, with ſmall white fruit. 42. The ſmalleſt *phaſeolus*, with very long pods. 43. The Braſilian *phaſeolus*, with a black fruit, of the ſize of a pea. 44. The ſmall perennial African *phaſeolus*, with bright

bright red flowers. 45. The American *phaſeolus*, with a ſinuated and ſpear-pointed leaf. 46. The knotty-rooted American *phaſeolus*, with purple flowers, and very narrow pods. 47. The knotty-rooted American *phaſeolus*, with yellow flowers and knotty pods. 48. The hairy *phaſeolus* of America, with knotted pods. 49. The largeſt American *phaſeolus*, with a great pod, and a hard ſcarlet fruit. 50. The large American *phaſeolus*, with a great flower and with ſlender crooked pods. 51. The hairy American *phaſeolus*, with jointed pods. 52. The American *phaſeolus*, with a tuberous eſculent root, and with hairy, and, as it were, jointed pods. 53. The American *phaſeolus*, with a cochleated flower, and falcated pods. 54. The American ſea *phaſeolus*, with a hard fruit and variegated ſeed. 55. The American *phaſeolus*, with ſmall pods and variegated ſeeds. 56. The American *phaſeolus*, with a pyramidal ſpike of flowers, and red ſeeds, marked with a black ſpot. 57. The American *phaſeolus*, with a remarkable large vexillum to the flower, and with ſtrait cylindric-ſhaped pods. 58. The round-leaved ſea *phaſeolus*, with a purple flower, a ſhort-creſted pod, and brown ſtriated ſeeds. And, 59. The pernicious wood *phaſeolus* of America, with open pale purple flowers, and ſlender black pods, and ſmall ſpotted ſeeds. *Tourn.* Inſt. p. 412. ſeq.

There are at preſent three ſorts of *kidney-beans* propagated for the table in England. Theſe are, 1. The common white or Dutch *kidney-bean*. 2. The ſmaller *kidney-bean*, commonly called the Batterſea *kidney-bean*. And, 3. The upright ſort, called the tree *kidney-bean*.

The firſt ſort was ſometime ago greatly propagated in England, and is ſtill in Holland: it grows very tall, and requires long ſtakes and poles to climb on, and its beans are conſiderably broad; this makes them leſs ſaleable in the markets, people ſuppoſing them to be old becauſe they are broad; and they are hence grown into diſuſe, tho' a much more valuable kind for eating than any other.

The ſecond, ſort or Batterſea bean, is what is more univerſally cultivated; it never grows very tall nor rambles far, and the air can eaſily paſs between the rows, becauſe of its moderate growth; and this makes it bear plentifully and ripen well for the table. It is the beſt-taſted bean, except the laſt.

The third, or tree *kidney-beans*, is alſo a plentiful bearer, and never rambles, but grows up in form of a ſhrub; but its beans are broader than the Batterſea kind, and are not ſo well-taſted.

They are all propagated from ſeeds which are to be put into the ground in the latter end of March or beginning of April for an early crop, but theſe ſhould have a warm ſituation and a dry ſoil; they muſt alſo be planted in a dry ſeaſon. The manner of planting them is, to draw lines with a bough over the bed, at two foot and a half diſtance, into which the ſeeds are to be dropped at about two inches aſunder, and the earth is to be drawn over them with the head of a rake, to cover them about an inch deep. In a week after ſowing, the plants will appear, and the earth ſhould be drawn up about their ſtalks as they riſe up; for a few days after this they will require no farther care, except to be kept clear from weeds, and when the beans appear, to have them gathered twice a week; for if the beans are ſuffered to hang on too long, they not only become of no value, but they weaken the plant.

The firſt crop of *kidney-beans* will continue a month in good order; and to ſupply the table afterwards, there ſhould be freſh ſowings in March, April, May, and June, the laſt of which will continue till the froſts come to deſtroy them. Some raiſe their early crops on hot-beds; and this is to be done exactly in the ſame manner as the raiſing the early cucumbers. *Miller*'s Gard. Dict. See the article CUCUMBER.

PHASSACHATES, in the natural hiſtory of the antients, the name of a ſpecies of *agate*, which, in its different appearances, they ſometimes called alſo *leucachates* and *perileucos*.

The ſame *agate*, from the various proportion or manner of admixture of its particles in different ſpecimens, often makes a very different figure; but no ſpecies is ſo liable to remarkable diverſities of this kind as this. It is but of a ſmall variety of colours, yet is often very beautiful; its ground or baſis is always a pale bluiſh grey, approaching to what we call a lead colour, or dove colour. Sometimes it is equally and evenly of this colour, thro' the whole maſs, but often alſo it is variegated within with veins of a deep black and of a pure and clear white: theſe ſometimes approach the ſurface of the ſtone, but more uſually they are only near the center; and they are almoſt always diſpoſed in concentrical, but irregular circles, round one, two, or more points. The pieces of this ſtone, cut where there are many of theſe veins, much reſemble parts of onyxes.

It is found in the Eaſt Indies, and in Bohemia, and ſome other parts of Europe. When the whole matter of the veins and baſis of this ſtone are all blended together into one equal maſs, as is frequently the caſe both with this and many other of the naturally veined ſtones, the whole becomes of a deeper greyiſh blue, or a dove colour, and is then the *phaſſachates*; when the veins are kept diſtinct and clear, it is the *leucachates* and *perileucos*, agreeing with all the deſcriptions of the antients. *Hill*'s Hiſt. of Foſſ. p. 480.

PHAUSINGES, a name given by the antients to red circles on the legs, occaſioned by fire: it is by ſome alſo extended to ſeveral other ſpots and blemiſhes on the ſkin.

PHEANTIDES, in natural hiſtory, a name given by ſome to the ſtone called *encymonites*; it was of the nature of our ſparry incruſtations on the roofs of ſubterraneous caverns. It was ſuppoſed to have great virtues in promoting delivery, and was given to women when they fell in labour.

PHEASANT, in ornithology, a bird ſo nearly allied to our common poultry, that it would naturally appear a very eaſy thing to breed them up from young; but the proper food of them is not ſufficiently enquired into. Tho' they eat corn when full grown and in health, yet they have recourſe in their young ſtate, and when ſick, to another ſort of food, preying on ſeveral inſects, and that in a very voracious manner.

The young *pheaſants* and partridges prey upon ants; and they will never ſucceed with us if they have not a proper quantity of ants to have recourſe to, as ſoon as they leave their rooſt in a morning. When muſty corn, or want of due care in cleaning their houſes has made them ſick, a repaſt of ants will often recover them. When that fails, they may be offered millepides or ear-wigs, or both together, which will always do much better than either ſingly. To this medicine muſt be added a proper care that their common food of corn be very ſweet, their habitation kept nicely clean, and their water ſhifted twice a-day. They muſt not be let out of the houſe in a morning till the dew is off the ground; and after ſun-ſet they muſt be immediately taken in again: in the heat of the day they muſt be allowed to baſk in the ſun in a dry ſandy place. With theſe regulations the birds of this kind will ſucceed much better than they uſually do. The *pheaſant* is a bird of a ſullen diſpoſition, and when the coupling time is over, there are ſeldom found more than one in a place. Phil. Tranſ. N° 23.

The way of taking *pheaſants* is, firſt to be acquainted with their haunts and breeding places; which are uſually young, thick, and well-grown coppices, free from the diſturbances of cattle, and having no path-way thro' them, for the *pheaſant* is an extremely timorous bird. When the haunts are diſcovered, the next thing to be attempted is, to find where the eye or brood is. In order to this, it is to be conſidered, that the *pheaſant* comes out of the wood three times a-day to feed in green corn, freſh paſtures, or the like places. The times of coming out are in the morning ſoon after ſun-riſe, at noon, and at ſun-ſet. The ſides of the wood where they are ſuppoſed to come out, are to be carefully watched on this occaſion, and the young ones will be ſeen following the female juſt as a flock of chickens follow the hen. The wood may be alſo well watched in the evenings, and the noiſe of the cock and hen calling the young ones together will ſoon be heard; and the ſportſman is on this occaſion to get as near as he can to the place, and being very ſtill and ſilent he may obſerve their numbers and diſpoſition, and learn how to ſpread his nets ſo as to take the whole brood with great eaſe; but if his leaſt motion when near them diſcover him, they will all take to their legs and run to a great diſtance; they ſeldom riſe on the wing, except very cloſe frighted indeed. Practice will make ſome people ſo expert at the imitating the voice of the old *pheaſant*, that he will be able to call the young ones together to any place that he pleaſes, when the haunts are once found out, and by this means they are eaſily led into the nets.

The beſt time for uſing the call is, in the morning or evening; and the note imitated ſhould be that by which the old ones call them out to feed; but by learning to imitate the other notes they will be brought together at any time of the day. The ſportſman who can make this call, muſt ſhelter himſelf in ſome cloſe place, and begin by very ſoftly making the note; then if none are near enough to be within hearing, he is to raiſe it to more and more loudneſs, and at length he will be anſwered as loud, if any are within hearing, tho' at a conſiderable diſtance; whereas if he ſhould ſet up the call too loud at firſt, and any of the birds ſhould happen to be very near, they would be frighted away.

As ſoon as a *pheaſant* anſwers, the ſportſman is to creep nearer and nearer, ſtill calling, tho' not ſo loud; he will ſtill be anſwered, till at length he will be led by the bird's voice within ſight of her. As ſoon as this is the caſe, he is to ſpread his net, and then begin to call again, keeping in ſome cloſe and well-ſheltered place behind the net: in this place he is to call till the bird approaches; and when he has drawn her under the net, he is to appear ſuddenly, and the bird riſing up will be caught in the net.

Another method of taking *pheaſants* much quicker than by this means is, the having a live cock *pheaſant* to uſe as a ſtale: this bird is to be fixed under the net, and by his crowing he will ſoon entice others in. The ſportſman muſt lie concealed, and as ſoon as another *pheaſant* comes in, he is to draw the net over him. Many people have a method of taking *pheaſants* in ſpringes or horſe-hair ſnares: the ſucceeding in this depends on the carefully ſearching out their haunts and the places by which they go out of the woods into the fields. When theſe are found, a peg is to be fixed in the ground at each, and at each peg two ſpringes are to be laid open; the one to take in the legs, the other the head. As

ſoon

ſoon as the ſpringes are ſet, the ſportſman is to go into the woods, and getting behind the birds, he is to fright them with ſome little noiſe, ſuch as ſhall not be enough to raiſe them to the wing, but only to ſet them a running. They will naturally make their way out of the wood thro' their accuſtomed paſſes, and be then caught in the ſpringes.

There is another method yet of taking theſe birds in the winter, provided that there is no ſnow. This is to be done with a net made like a caſting net, but with the meſhes much wider; they may be five inches wide. Some peas or wheat are to be taken out, and the path of the *pheaſants* being diſcovered, which may eaſily be done by their dung, a pint or thereabout of corn is to be thrown down in the path in a place marked, ſo that the ſportſman can come to it again. This is to be done for ſeveral days, till at length the *pheaſants* are expecting it every day regularly; and all the birds of this kind that frequent the place, are brought together to feed there, and then the net is to be fixed over the place; its top being tied up to ſome bough of a tree, and its bottom fixed down all round, except in one place, where the walk of the *pheaſants* lies. In this place it is to be raiſed in form of an arch, and the entrance is to be lined with ſeveral rods of hazel; the thick ends of which are to be tied to the net, and the thin ones let into the ſpace covered by it; and thus the *pheaſants* will eaſily get in by parting the ſmall ends of the ſticks, as fiſh into a wheel, but they will not eaſily get out again. The nets are to be dyed of a ruſſet colour, by laying them in a tan-pit; and they muſt, when planted for this purpoſe, be covered with boughs, ſo that the birds do not diſcover them, and then they will eaſily run into them, and be all taken at once.

PHECOS, in botany, a name uſed by ſome authors for the *ſagittari*, or *water-arrow-head*. *Ger.* Emac Ind. 2.

PHELLANDRIUM, *water-hemlock*, in botany, the name of a genus of plants, the characters o which are theſe: The flowers ſtand in umbells, and are of the roſaceous kind, each being compoſed of ſeveral heart-faſhioned leaves, diſpoſed in a circular form. The cup finally becomes a fruit compoſed of two ſmall ſeeds, lightly ſtriated and gibboſe on one ſide, and flat and plain on the other.

The ſpecies of *phellandrium*, enumerated by Mr. Tournefort, are theſe: 1. The common *phellandrium*, or *water-hemlock*. 2. The alpine *phellandrium*, with purple umbells, called by ſome *meum alpinum* and *mutellina*. *Tourn.* Inſt. p. 316.

PHELLOS, in botany, a name uſed by ſome authors for the cork-tree. *Ger.* Emac. Ind. 2.

PHELLOS, φελλος, in antiquity, a feſtival in honour of Bacchus, being a preparative to the Dionyſia. See DIONYSIA, *Cycl. Potter*, T. 1. p. 436.

PHENGITES, in the natural hiſtory of the antients, the name of a very beautiful ſpecies of alabaſter. It is a very rude and irregular maſs, very ſhattery and friable, yet of a brightneſs ſuperior to that of moſt of the other marbles, and excelling them all in tranſparence: it is in colour of an agreeable pale, yelloviſh, white, or honey colour; the yelloviſh is more intenſe in ſome places than in others, and ſometimes makes an obſcure reſemblance of veins. It is very weak and brittle in the maſs, and when reduced to ſmall pieces, is eaſily crumbled between the fingers into looſe, but conſiderably large angular pieces, ſome perfect, others complex, irregular, or mutulated, and all approaching to a flat ſhape.

The antients were very fond of this ſpecies in their public buildings; and the temple of fortune, built wholly of it, has long been famous. Its great beauty is its tranſparence; from which alone this temple was perfectly light when the doors were ſhut, tho' it was built without a window, and had no other light but what was tranſmitted thro' the ſtone its walls were built with. It was antiently found in Cappadocia, and is ſtill plentiful there: we have it alſo in Germany and France, and in our own kingdom in Derbyſhire, and ſome other counties. It takes an excellent poliſh, and is very fit for ornamental works where there is no great ſtrength required. *Hill*'s Hiſt. of Foſſ. p. 490.

PHEOS, in botany, a name given by Theophraſtus, Dioſcorides, and others, to a plant uſed by the fullers in dreſſing their cloths, and of which there were two kinds, a ſmaller called ſimply *pheos*, and a larger called *hippopheos*.

The name of this plant is ſometimes written *phleos*; and it is by that confounded with a kind of marſh cudweed, or *gnaphalium*, called alſo by that name; but it may be always found which of the two plants an author means, by obſerving the ſenſe in which the word is uſed, and the uſe to which the plant was put. The *pheos*, properly ſo called, that is, the cudweed, was uſed to ſtuff beds and other ſuch things, and to pack up with earthen veſſels to prevent their breaking; but the *pheos*, improperly called *phleos*, only about cloths; this was, however, alſo called *ſtæbe* and *cnaphon*.

Theophraſtus deſcribes the *pheos* and the *hippopheos*, and calls them the ſame plant, only differing in ſize and ſome other ſmall particulars. And he ſays, in many places, that this plant was alſo called by many *ſtæbe*; he mentions them often together, and ſeveral times compares ſome one plant to them both; ſo that there ſeems to have been only the difference of ſize between them. Galen alſo, as well as this author, calls the *hippopheos ſtæbe*.

Dioſcorides, however, has ſomewhat perplexed the matter, by deſcribing the *pheos* and the *hippophes*, ſo he writes the *hippopheos*, in different places of his works, and not ſeeming to allow any ſimilitude or alliance between them. The virtues he aſcribes to them are alſo plainly different; he tells us, that the *ſtæbe* or *pheos* binds, is good in dyſenteries; and, on the contrary, that the *hippopheos* is a purgative, and carries off the bile. The *ſtæbe* is numbered by him among the ſmooth plants, and the *hippopheos* among the prickly ones. Upon the whole, the names *ſtæbe* and *pheos* with this author, ſeem applied only to the plant properly called *phleos*, that is, *gnaphalium*; and he treats of this *ſtæbe* either as a thing univerſally known, or elſe as unknown even to himſelf; for he no where gives any deſcription of it. *Theophraſt.* l. 6. c. 5.

PHEREPHATTIA, φερεφαττια, in antiquity, a feſtival at Cyzicum, wherein a black heifer was ſacrificed to Pherephatta or Proſerpine. *Potter*, Archæol. Græc. T. 1. p. 436.

PHILADELPHIA-*ſtones*, a name given by ſome authors to what are called by others *Chriſtian's bones*, found in the walls of that city. It is a common error, that theſe walls are built of bones, and the tradition of the country is, that when the Turks took the place they fortified it for themſelves, and built their walls of the bones of the Chriſtians whom they killed there. Dr. Smyth in one of his epiſtles mentions this wall as an inſtance of the Turkiſh barbarity; but this is an idle opinion, what paſſes for bone being only a looſe and porous ſtone of the ſparry kind, found in an old aquæduct which is ſtill in the wall. Sir Paul Rycaut brought home pieces of theſe ſtones, which he alſo ſuppoſed to have been bones, but on examination they proved to be no other than various bodies, chiefly vegetable, incruſted over and preſerved in a ſpar of the nature of that which forms incruſtations in Knareſborough ſpring, and other places with us. Theſe bodies are often cemented together in great numbers by this matter, and their true ſhape loſt in the congeries, till a diligent and judicious eye traces them regularly. *Woodw.* Catal. of Foſſ. V. 2. p. 14.

PHILANTHROPOS, in botany, a name uſed by ſome authors for the common *aparine*, *cleavers*, or *gooſe-graſs*. *Ger.* Emac. Ind. 2.

PHILANDER, in zoology. See the article DIDELPHIS.

PHILETERIUM, in botany, a name uſed by ſome authors for the *behen album*, the common white flowered bladder campion, called *white ben*. *Ger.* Emac. Ind. 2.

PHILLEREA, a garden ſhrub, which, in the Linnæan ſyſtem of botany, makes a genus, the characters of which are: That the cup of the flower is very ſmall, indented into four ſeeming diviſions, and does not fall off with the flower. The flower is compoſed of one petal, beginning with a very ſhort tube, and dividing into four ſegments placed evenly, and each pointed; the ſtamina are ſhort, two in number, and placed oppoſite one to the other; the antheræ ſingle and erect; the piſtil is compoſed of a roundiſh germen, a ſingle ſtyle of the length of the ſtamina, and terminated by a ſomewhat larger ſtigma; the fruit is a ſingle berry, containing one large orbicular ſeed. *Linnæi* Gen. Plant. p. 2.

PHILOMEDIUM, in botany, a name uſed by ſome authors for the *great celandine*. *Ger.* Emac. Ind. 2.

PHILONIUM (*Cycl.*)—PHILONIUM *Londinenſe*, the name by which the medicine commonly called *philonium romanum*, is called in the late London diſpenſatory. The compoſition is alſo much altered, as well as the name, and is now ordered to be made thus: Take white pepper, ginger, caraway-ſeeds, of each two ounces, opium ſix drams, ſyrup of diacodium boiled to the conſiſtence of honey, three times the weight of all the reſt. The opium is to be diſſolved in a little wine, and then mixed with the ſyrup; after which the powders are to be ſtirred in, and the whole made into an electuary. *Pemberton*'s Lond. Diſp. p. 342.

PHILOSOPHIC *chemiſtry*, an art of dividing or reſolving all the bodies in our power by means of all the inſtruments that can be procured, and that as well into integrant as into conſtituent parts, and joining theſe parts together again, ſo as to diſcover the principles, relations and changes of bodies, make various mixtures and compoſitions, find out the phyſical cauſes of phyſical effects, and hence improve the ſtate of natural knowledge and the arts depending on it. *Shaw*'s Lectures, p. 1. See the article CHEMISTRY.

PHILOSOPHIC *ſpirit of wine*. See the article WINE.

PHILOSOPHY (*Cycl.*)—By *philoſophy* we mean the knowledge of the reaſons of things, in oppoſition to hiſtory, which is the bare knowledge of facts; or to mathematics, which is the knowledge of the quantity of things or their meaſures.

Theſe three kinds of knowledge ought to be joined as much as poſſible. Hiſtory furniſhes matter, principles and practical examinations, and mathematics compleat the evidence. *Philoſophy* being the knowledge of the reaſons of things, all arts muſt have their peculiar *philoſophy* which conſtitutes their theory: not only law and phyſic, but the loweſt and moſt abject arts are not deſtitute of their reaſons, which might uſefully

employ the time of the ſtudious. It is true, thoſe who call themſelves *philoſophers* and learned men have as yet done little towards forwarding the intelligence of arts: but we ſpeak not of what is done, but of what ought to be done.

One great obſtacle to the progreſs of arts and ſciences has been the neglect of practice in ſpeculative men, and the ignorance or contempt of theory in mere practical men. What chimeras and abſurdities the neglect of experience and practice has produced, need not be mentioned; the miſchiefs ariſing from a neglect of theory, are not ſo obvious: yet certainly it retards the progreſs of arts. All invention or improvement muſt be either caſual or rational, including analogy or inference from ſimilar caſes, under the term rational. Now altho' the foundations of arts have often been owing to ſome caſual diſcovery, as gunpowder or the loadſtone; yet is this not to be truſted to alone. Improvements do not always flow from this ſource, but rather from the reflexions of artiſts; and if theſe reflexions were rendered more diſtinct, more communicable and eaſier to be retained, by the proper uſe of ſigns and other *philoſophical* helps, great advantages might be expected: it being certain, that *philoſophical* knowledge is more extenſive, and more ſure in the application; and beſides, gives a pleaſure to the mind not to be expected from that which is merely hiſtorical.

It is to be obſerved, that the bare intelligence and memory of *philoſophical* propoſitions, without any ability to demonſtrate them, is not *philoſophy*, but hiſtory only. However, where ſuch propoſitions are determinate and true, they may be uſefully applied in practice, even by thoſe who are ignorant of their demonſtrations. Of this we ſee daily inſtances in the rules of arithmetic, practical geometry, and navigation; the reaſons of which are often not underſtood by thoſe who practiſe them with ſucceſs. And this ſucceſs in the application produces a conviction of mind, which is a kind of medium between *philoſophical*, or ſcientifical, and hiſtorical knowledge. The ingenious author of the Analyſt has gone ſo far as to ſuggeſt, that mathematicians have no other conviction of the truth of the doctrine of fluxions.

Philoſophy may be divided into three parts, intellectual, moral, and phyſical. The intellectual part comprizes logic and metaphyſics. The moral part contains the laws of nature and nations, ethics and politics. And laſtly, the phyſical part comprehends the doctrine of bodies, animate or inanimate. Theſe, with their various ſubdiviſions, will take in the whole of *philoſophy*.

Wolfius makes the three parts of *philoſophy* to be the doctrine of God, the human ſoul, and of bodies [a]. However, when he ſubdivides, and comes to treat the ſeveral branches ſeparately, his diviſions readily come under the three heads intellectual, moral, and phyſical, before mentioned. The doctrine of God and the human ſoul may be ranged under the ſame head metaphyſics, the notion of the divine nature being formed from that of the human ſoul, excluding limitations and imperfections [b]. [[a] *Wolf.*. Diſc. Prælim. Logic. ſect. 56. [b] *Wolf.*. Theol. nat Part. 1. ſect. 1059.]

We have ſaid that *philoſophy* is the knowledge of the reaſons of things. It may be aſked what is the reaſons of things, or what is the explication of phænomena or facts. An ingenious author tells us, that the explication conſiſts only in ſhewing the conformity any particular phænomenon hath to the general laws of nature, or, which is the ſame thing, is diſcovering the uniformity there is in the production of natural effects. This he thinks evident to whoever ſhall attend to the ſeveral inſtances, wherein philoſophers pretend to account for appearances. By a diligent obſervation of the phænomena within our view, we may diſcover the general laws of nature, and from thence deduce, tho' not demonſtrate other phænomena, all deductions of this kind depending on a ſuppoſition that the author of nature always operates uniformly, and in a conſtant obſervation of thoſe rules we take for principles; which we cannot evidently know. *Berkeley*, Princip. of Hum. Knowl. Sect. 62 & 107.

If we take a view of the ſeveral phænomena, and compare them together, we may obſerve ſome likeneſs and conformity between them. For example, in the falling of a ſtone to the ground, in the riſing of the ſea towards the moon, in coheſion and cryſtallization, there is ſomething alike, namely an union or mutual approach of bodies: ſo that any one of theſe, or the like phænomena, may not ſeem ſtrange or ſurpriſing to a man who has nicely obſerved and compared the effects of nature: for that only is thought ſo which is uncommon, or a thing by itſelf, and out of the ordinary courſe of our obſervation. That bodies ſhould tend towards the center of the earth, is not thought ſtrange, becauſe it is what we perceive every moment of our lives; but that they ſhould have a like gravitation towards the center of the moon, may ſeem odd and unaccountable to moſt men, becauſe it is diſcerned only in the tides; but a philoſopher, whoſe thoughts take in a larger compaſs of nature, having obſerved a certain ſimilitude of appearances, as well in the heavens as the earth, that argue innumerable bodies to have mutual tendency towards each other, which he denotes by the general name attraction, whatever can be reduced to that he thinks juſtly accounted for. Thus he explains the tides by the attraction of the terraqueous globe towards the moon, which to him doth not appear odd or anomalous, but only a particular example of a general rule or law of nature.

If, therefore, we conſider the difference there is betwixt natural philoſophers and other men, with regard to their knowledge of the phænomena, we ſhall find it conſiſts not in an exacter knowledge of the efficient cauſe that produces them, for that can be no other than the will of a ſpirit; but only in a greater largeneſs of comprehenſion, whereby analogies, harmonies, and agreements are diſcovered in the works of nature, and the particular effects explained: that is, reduced to general rules, which rules, grounded on the analogy and uniformneſs obſerved in the production of natural effects, are moſt agreeable and ſought after by the mind; for that, they extend our proſpect beyond what is preſent and near to us, and enable us to make very probable conjectures, touching things that may have happened at very great diſtances of time and place, as well as to predict things to come; which ſort of endeavour towards omniſcience, is much affected by the mind. *Berkeley*, Princ. of Hum. Knowledge, Sect. 104, 105.

PHILYRA, in natural hiſtory, a name given to the ſubſtance of which ſome of the moſt antient books are written. It is the inner bark of the *tilia*, or common lime-tree. The emperor's library at Vienna has a book written by Tully, never yet publiſhed, which is written on this ſubſtance. *Munting.* de Plantis.

PHLEBOTOMY, *(Cyc.)* in ſurgery, the opening of a vein by a proper ſharp-edged and pointed inſtrument of ſteel, for letting out a proper quantity of blood, either for the preſervation or recovery of a perſon's health.

This appears not only to be one of the moſt uſeful, but one of the moſt antient operations in ſurgery, ſince we find by Hippocrates, Celſus, *&c.* that it was practiſed near three thouſand years ago. The operation is frequently performed in different parts of the body, as the hand, the foot, the forehead, temples, neck, tongue, penis, and other parts; yet it is moſt generally performed in that vein of the arm which lies near the joint of the cubit. *Heiſter*'s Surg p. 273.

In bleeding it ſometimes happens, that an artery is opened either inſtead of, or together with, the vein: an accident of this kind is attended with the utmoſt danger. An artery is known to be wounded when the blood ſpins out very forcibly from the orifice, and that by ſtarts or leaps, not in an even ſtream, and extends itſelf in a greater arch from the orifice to the baſin. The colour of the blood from an artery is alſo much more florid than from a vein; to which add, that on preſſing the finger on the veſſel below the orifice, the blood ſtarts out more violently than before; and ſtops, or at leaſt abates, on preſſing above the orifice; quite the contrary of what happens on the opening a vein.

In an accident of this kind, the ſurgeon ſhould have preſence of mind not to betray the caſe by his fears to the patient, or attendants: he ſhould obſerve whether the blood flows freely from the orifice, or whether it inſinuates itſelf in any conſiderable quantity between the integuments. If the firſt is the caſe, he muſt take a large quantity of blood away, even till the patient faints, perſuading the attendants, that the heat of the blood requires it; and while the patient is in his fainting fits, as the flux then ceaſes, he may commodiouſly dreſs and bind up the wound; and by this precaution hinder a freſh hæmorrhage or an aneuriſm. The ſurgeon muſt place ſome ſmall piece of money between the folds of the firſt compreſs; and on this place two, three, or more compreſſes, each larger than the other: and then bending the cubitus, apply two bandages in this manner, as after bleeding in the vein, only a little tighter; and lay a thick, long, and narrow compreſs over the artery, from the cubitus to the axilla: and the patient muſt be warned to wear his arm in a ſling, pinned to his cloaths, for a fortnight, and refrain from all uſe of it. *Heiſter*'s Surg. p. 287.

If the blood from the wounded artery is found to inſinuate itſelf between the integuments, the orifice muſt be immediately compreſſed, and tied up as before directed; and the arm often inſpected, to ſee whether a bleeding within the integuments does not yet continue. The patient muſt be frequently bled in the other arm, and if a large quantity of blood ſhould be lodged from the wounded artery under the integuments, it will be neceſſary to open the integuments to diſcharge it.

It is too common an accident to find a nerve or tendon punctured in bleeding, and this is generally known to be the caſe by the patient's making a ſevere outcry at the time; and eſpecially if he complains afterwards of acute pains, and the limb begins to ſwell and be inflamed, convulſed, ſtiff, and extended as in the cramp: which ſymptoms, if not timely relieved, threaten convulſions of the whole body, a gangrene of the part, and even death in a ſhort time.

The beſt method to be taken in theſe accidents, is to firſt bathe the part with a mixture of oil of turpentine and ſpirit of wine, and then inveſt the whole arm with the diachalciteos plaiſter, melted down in oil of vinegar and roſes, retaining it on by the expulſive bandage; which beginning upon the hand, aſcends gradually by ſpiral turns to the top of the ſhoulder; by which means the impulſe of the blood on the part is not only much abated, but alſo the pain and inflammation much diminiſhed: and laſtly, the following cataplaſm ſhould be applied

to

to the arm, to compleat the cure: take of flour of barley and of bitter vetch, of each two ounces; chamomile flowers and melilot flowers, of each two handfuls; freſh butter, an ounce and half: boil theſe into a cataplaſm with ſoap ſuds, and apply them to the arm till the pain and other bad ſymptoms are removed. *Heiſter*'s Surg. p. 286.

PHLEBOTOMY *in the eyes.* There are ſeveral ways of performing this operation, but the beſt ſeems to be this. The patient being ſeated on a chair, and his head held in a proper poſture, a tranſverſe inciſion is to be made, with a fine lancet, upon the turgid ſmall veins in the corners of the eye, ſo as to open them or cut them quite aſunder. The eye-lids muſt be held apart with one hand, whilſt the veins are opened with the other; and ſome uſe a pair of fine ſciſſars for this purpoſe, inſtead of a lancet, and others elevate the veins with a crooked needle before they divide them: but in this operation the better way would be to make the needles with edges, that when the veins were thus elevated, they might divide them without the help of any other inſtrument. When the inciſion is made, the diſcharge of blood muſt be promoted by means of fomentation, with a ſpunge dipped in warm water; and if the diſcharge is not ſufficient, the inciſion may be repeated two or three times: but few patients can be brought to ſuffer this, and there is no practiſing it at all upon infants, becauſe they will not keep the eye ſteady. *Heiſter*'s Surg. p. 377.

PHLEGMASIA, a word uſed by ſome of the medical writers for an inflammation. Hippocrates alſo ſometimes uſes it to expreſs the violent heat in fevers.

PHLEGMON *(Cycl.)*—If the proximate cauſe of theſe tumors be enquired into, we ſhall find it generally riſes from too thick or viſcid a ſtate of the blood, ſtagnating in the anaſtomoſes of the ſmalleſt veins and arteries; ſo that the blood being propelled in larger quantities than can paſs thro' thoſe veſſels, it muſt of conſequence excite the ſymptoms that are the attendants of this tumor, and occaſion great diſorder at every part where ſuch ſtagnation is made.

No part of the body, whether external or internal, is perfectly exempt from this ſort of tumor, not even the bones themſelves; but it is more common in the fat and glands than elſewhere.

The cauſes of this ſtagnation of the blood are either external or internal.

Among the external, are all wounds, fractures, luxations, contuſions, punctures, by thorns and ſplinters, with a too great compreſſion of the veſſels, whether by too ſtrict a bandage, or by other means; each of which obſtructing the paſſage of the blood thro' its minute veſſels, either by dividing, bruiſing, compreſſing or diſtorting them, may give riſe to this tumor. And to this may be added, burns of all kinds, with too violent cold, the too great motion of the body, the external application of ſharp and ſtimulating ſubſtances to the ſkin, and others, which ſtop the pores of the ſkin, and impede the circulation of the blood.

Among the internal cauſes, are to be reckoned the too great acrimony of the blood, as in ſcorbutic habits, the blood's abounding in too great quantities, or being of too thick a conſiſtence, or, laſtly, its circulating in the body with too violent a motion; for by this laſt means, the groſſer particles of the blood are protruded, and wedged in, as it were, in the ſmaller veſſels, thro' which they cannot find a paſſage; and this is eſpecially the caſe, when a ſudden cold is given to the body from a ſtate of extreme heat. In ſhort, every thing will produce an obſtruction that makes either the particles of the blood too large, or the mouths of the veſſels too ſmall and narrow to receive them.

The reſolution or diſperſion of a tumor of this kind is only practicable when the tumor is of a milder kind; when it is in a ſound habit of body, and when the blood is not yet too viſcid, or too violent in its motion: but ſuppuration follows when the inflammation is more violent, the circulation more rapid; but yet the maſs of blood ſomewhat temperate and free from acrimony. That is, when the blood becoming more inſpiſſated, and its larger particles ſticking in the more minute veſſels, can find no paſſage; but the ſmall veſſels are burſt by the preſſure and impulſe of the obſtructed blood, ſo that their contents are extravaſated in the fat, fleſh, and adjacent parts. Upon this extravaſation, the more ſubtle and fluid parts of the blood putrefy, by means of the great heat, and become fœtid and acrimonious, and corrode the adjacent parts: the fluids thus changed or corrupted, are, by the ſurgeons, called matter or pus; and this is of ſeveral kinds, according to its conſiſtence and colours: it is either white, yellow, greeniſh, reddiſh, or party-coloured.

When the forementioned ſymptoms are much more violent, and the blood at the ſame time more acrimonious than it ought to be, this inflammation generally terminates in a gangrene: for in that caſe, the ſmalleſt arteries and veins are corrupted, burſt, and broke; and hence the adjacent parts are diſſolved and corrupted by theſe extravaſated acrimonious humors, and particularly the ſkin is very ſubject to be filled with puſtules, when its cuticle has been ſeparated, as in burns. The ſanies contained in theſe puſtules and elſewhere, is uſually termed ichor, and is generally of a pale reddiſh caſt, and ſometimes brown or livid, which is much worſe; for unleſs the patient in this caſe is timely aſſiſted, the ſymptoms of inflammation all go off, the tumor, reſiſtance, heat, redneſs, pain, and pulſation, gradually diſappear, and the limb becomes flaccid and cold; it afterwards turns pale, and becomes dead and inſenſible, and the inflammation creeps to ſome other part.

If this caſe be treated with medicines too hot, too aſtringent, cooling, fat, acrimonious, or narcotic; or if the parts be bound too tight, the fleſh quite dies, its paleneſs turns to a livid lead colour; and the incloſed ſanies finding no vent, becomes more acrimonious, and ſo greatly corrodes the adjacent parts, as to deſtroy all ſenſe and motion, and brings on an entire ſphacelation of the whole limb. But if the inflamed part be full of glands, and the blood very thick, glutinous, and tough, the ſmall veſſels are then ſtrongly ſtuffed up with it, and impacted together; and the parts loſing their ſenſation, become changed into a hard tumor, called a ſcirrhus. The cure of *phlegmons* is by diſperſion or ſuppuration: the methods for bringing on theſe, ſee under the heads DISPERSION and SUPPURATION. *Heiſter*'s Surg. p. 178.

PHLEOS, in botany. See the article PHEOS.

PHLEUM, in the Linnæan ſyſtem of botany, a graſs called *typhoidea*, or cat's-tail graſs by Scheuhzer, which makes, with this author, a diſtinct genus of plants, the characters of which are: that the cup is a glume, containing one flower; it is bivalve, oblong, ridged, and compreſſed, and opens into a double-pointed ſummit; the valves are erect, hollowed, compreſſed, equal in ſize, and bearded; the flower is compoſed of two valves, ſhorter than that of thoſe of the cup, the outer one, which is the larger, ſurrounding the inner or ſmaller one; the ſtamina are three capillary filaments, longer than the cup; the antheræ are oblong, and divided into two at the ends; the germen of the piſtil is roundiſh; the ſtyles are two in number, ſmall, and bent; and the ſtigmata are plumoſe; the cup and flower incloſe the ſeed, which is ſingle, and of a roundiſh form. *Linnæi* Gen. Plant. p. 14.

PHLOGIDAUGIA, in natural hiſtory, the name of a claſs of inflammable foſſils, of a pure texture, and in ſome degree tranſparent.

Of this claſs are the ſulphurs, orpiments, zornics, and amber. They are by this name diſtinguiſhed from the *phlogiſcieria*, or inflammable foſſils, of a coarſe texture, and opake; ſuch as the ambergreaſe, jet, and aſphalta, and the ampelites and common coal. *Hill*'s Hiſt. of Foſſ. p. 399.

PHLOGINOS, the name of a ſtone found in Ægypt, and called by ſome *chryſitis*, from its colour, reſembling gold.

Pliny deſcribes it as reſembling the Attic oiſter, as the paſſage is uſually printed; and hence Agricola and ſome others have ſuppoſed he only meant the *oſtracites*, or foſſile oiſter-ſhell, by this name, tho' the other name, *chryſitis*, could not well be applied to that body. Salmaſius has very well explained the paſſage, by obſerving, that as the antients have no where mentioned the Attic oiſter, the words probably were originally *Attic ochre*; the ſenſe is then plain, and the ſtone is only ſaid to be of a fine yellow, like gold; or the *Attic*, that is the brighteſt yellow *ochre*. It probably was an agate of the cerachates kind.

PHLOGISCIERIA, in natural hiſtory, the name of a claſs of foſſils, the characters of which are, that the bodies contained in it are inflammable, of a coarſe and impure texture, and not pellucid.

The word is derived from the Greek φλόγωσις, inflammable, and σκίερος, opake. The bodies of this claſs are divided into two general orders, and under thoſe, into five genera. Thoſe of the firſt order, are ſuch as are found looſe, and in detached maſſes: thoſe of the ſecond, ſuch as are found conſtituting whole ſtrata. The genera of the firſt order are, ambergreaſe, jet, and the aſphalta; and thoſe of the ſecond, cannel and common coal. *Hill*'s Hiſt. Foſſ. p. 411. See AMBERGREASE, GAGATES, ASPHALTA, AMPELITES, and LITHANTHRAX.

PHLOGITES, in natural hiſtory, a name given by Pliny and other authors to a ſtone, which, they ſay, had the appearance of flames of fire, bubbling up and riſing to ſeveral points within it. It is ſometimes called alſo *phlegonites*.

Some have ſuppoſed that the antients meant no more by this diſtinction, than to expreſs a fire colour lodged in the ſtone, and have meant it as a name for the opal; but as the Germans have at this time an odd ſtone among them, which they commonly call petrified flames of fire, it is poſſible the antients might have had the ſame ſtone, and called it by this name.

The abſurdity of petrified fire is too groſs to need refutation, but the whole that is meant by the name, ſeems to be, that the ſtone had ſome ſtrait and erect rays, of fire colour.

Pliny ranks the *phlogites* among the gems, but Sabinus and others place it among the larger ſtones: and we have from ſome parts of Germany, a ſpar, with radiations of a fiery red in a white ground, which looks as like flames as any thing one could expect in a ſtone; but whether this, or ſome other, be the ſtone called petrified flames of fire by the collectors of that nation, we are not aſſured; the name only having as yet come to us, without the ſubſtance itſelf.

PHLOGONIÆ, in natural hiſtory, the name of a claſs of foſſils, uſually included by authors with many others of a very different kind, under the general name *pyritæ*. Theſe are de-

fined to be compound, inflammable, metallic bodies, found in ſmall maſſes, and of determinately angular figures. Of this claſs of bodies there are three genera.

1. The *pyricubia*, which are *phlogoniæ* of a regularly cubic figure. 2. The *pyroctagonia*: theſe are *phlogoniæ* of an octohædral figure, or compoſed of eight planes. And, 3. The *pyripolygonia*: theſe are *phlogoniæ* of a dodecahædral figure, or compoſed of twelve planes. *Hill*'s Hiſt. of Foſſ. p. 618, 619. See PYRICUBIUM, *&c.*

PHLOGUS, in botany, a name given by ſome of the antients to the ſeveral ſpecies of the *iris* and *gladiolus*. and by ſome to the *flammula jovis*, a ſort of clematitis, ſo called becauſe of the violent heat of its leaves to the taſte.

Theophraſtus mentions this in the ſame part of his work with the violet and other ſpring flowers, and this, not becauſe they are allied to one another in their characters, but becauſe they all flower at the early time of the year. Pliny miſtakes the author's meaning in this ſo far, as to ſuppoſe that he placed it among the violets as a plant of that kind; and has accordingly mentioned it as a violet with a flame-coloured flower.

This plant ſeems to have owed its name *jovis flamma* to a miſtake of Pliny's, who copying Theophraſtus, and finding him mention this *phlogus*, or *phlogium*, and another flower, called *dioſanthos*, or Jove's flower, together, has ſeemed to blend the two names, and make out the word *flamma*, or *flammula Jovis*, between them.

PHLOMIS, in botany, the name of a genus of plants, the characters of which are theſe: the flower is labiated, conſiſting of one leaf; the upper lip is hooded, and the lower, over which this lies, is divided into three ſegments: the piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower, and ſurrounded with four embryos, which finally ripen into four ſeeds, of an oblong ſhape, contained in a pentangular cup, which is the cup of the flower.

The ſpecies of *phlomis*, enumerated by Mr. Tournefort, are theſe: 1. The ſhrubby *phlomis*, with a broad and roundiſh ſage-like leaf. 2. The ſhrubby *phlomis*, with a narrow and longer ſage-like leaf. 3. The round leafed purple-flowered ſhrubby *phlomis*. 4. The pointed-leaved purple-flowered ſhrubby *phlomis* of Portugal. 5. The purple-flowered clary-leaved *phlomis*. 6. The purple-flowered very white Spaniſh ſhrubby *phlomis*. 7. The herbaceous very white Spaniſh *phlomis*. 8. The taper *phlomis*, commonly miſtaken for a ſpecies of mullein, and called by authors *verbaſcum anguſtis ſalviæ foliis*, or the narrow ſage-leaved mullein, and the wild yellow mullein, with gaping flowers. *Tourn.* Inſt. p. 177.

PHLOMON *ſtephanomaticon*, in the botanical writings of the antients, a name given to the common white mullein. The upper part of the thyrſus, or ſpike of flowers of this plant, was frequently uſed in the garlands and coronæ of the antients; and it is named by Dioſcorides and others among the yellow flowers in general uſe on that occaſion.

It is remarkable, that Dioſcorides, tho' he mentions this plant in the claſs of garland herbs, among the elychryſa and other yellow flowered herbs, no where mentions it under the mullein, where he is deſcribing the characters and ſpecies of that plant. It ſhould ſeem from this, and from ſome other ſuch paſſages, where this author deſcribes the ſame plant twice without knowing it; or omits it in its proper place, and treats of it only occaſionally in ſome other, that he had not a perfect knowledge of the botany of his time: but that, like Pliny, he collected what he has left us from the works of other authors now loſt.

PHLYSIS, a term uſed by the antients to expreſs an eruption on the ſkin, from a redundance of humors.

PHLYZATION, a puſtule or inflammation on the ſkin, or the bliſters ariſing on it after being burnt or ſcalded with a hot liquor.

PHOCA, the *ſea-calf*, in the Linnæan ſyſtem of zoology, a diſtinct genus of animals, the characters of which are, that they have two paps placed near the navel, feet adapted to ſwimming, and have no ears.

There are two kinds of this animal: the common one, called the *ſea-calf*, which has its canine, or dog-teeth, encloſed like the others in its mouth; and the other, which ſome improperly call the *hippopotamus*, or ſea horſe, which has theſe teeth exſerted or thruſt out. *Linnæi* Syſtem. Natur. p. 36.

We have a draught of this animal in the philoſophical tranſactions, numb 469, by Dr. Parſons, who obſerves, that Aldrovandus, Johnſton, Rondeletius, and Geſner, have made ſeveral miſtakes in the figure of this creature, ſo as to convey no juſt idea of it.

Upon diſſecting one of theſe animals, the ſtomach, inteſtines, bladder, kidneys, ureter, diaphragm, lungs, great blood-veſſels, and pudenda, were like thoſe of a cow; the hairs of the whiſkers were very horny and clear; the ſpleen was two foot long, four inches broad, and very thin; the liver conſiſted of ſix lobes, each hanging as long and as lank as the ſpleen, with a very ſmall gall-bladder. The beaſt was long and flabby in its contexture in general, having a large foramen ovale, and very great columnæ carnoſæ. In the lower ſtomach were about four pounds weight of flinty pebbles, all ſharp and angular, as if the animal choſe them of that form for cutting the food. The uterus was of the horned kind, each of the cornua being thicker than the body or duct leading to them. The ovaria were very large, being granulated on the ſurface with the ova, under a very thin membrane; and the opening into the tubes leading to the cornua is a great hole.

The authors who have treated on this animal, are Ariſtotle, Pliny, Aldrovandus, Rondeletius, Geſner, Wolfgangius, and Johnſton. Phil. Tranſ. N°. 469.

This animal is viviparous, and ſuckles its young by the mamillæ, like quadrupeds; and its fleſh is carnous and muſcular. That diſſected by Dr. Parſons was ſeven foot and an half long, tho' very young, having ſcarce any teeth, and having four holes regularly placed about the navel, which in time become papillæ.

PHOCÆNA, in zoology, the name uſed by authors for the *porpeſſe*, diſtinctively from the dolphin, a fiſh very like it, and by many confounded with it. See DELPHINUS.

The *phocæna* is of a roundiſh, not flat body, growing gradually ſmaller toward the tail; and juſt at the root of the tail is a little flatted. Its noſe is long and pointed, and furniſhed with ſtrong muſcles; by means of which it is able to turn up the mud and ſand, to ſeek after ſmall animals. Its ſkin is ſmooth, and but thin: its back is of a duſky bluiſh hue, almoſt black in ſome of the fiſh; and from the middle of the ſides downwards, it is whitiſh: it has no gills, nor any apertures in the place of them; but in the middle of the upper part of its head, it has a ſpiracle, in form of a half moon, divided by a ſubſtance reſembling a coxcomb, into two noſtrils, which, as they run inward, join and make one canal, which opens within the mouth a little below the œſophagus. This canal is provided with muſcles, to keep it ſhut againſt the admiſſion or emiſſion of any fluid, but at the creature's pleaſure; and by means of this he diſcharges the water taken in with his food. Its eyes are ſmall: its auditory paſſages extremely minute: its teeth alſo ſmall: it has two fins on the breaſt, and one on the back: and its tail is ſlightly forked, and placed horizontally, not vertically, as in other fiſhes: its lungs are like thoſe of quadrupeds: it is common in many places, and ſometimes is ſtranded on the Engliſh coaſt: its fleſh is not at all valued. *Ray*'s Ichthyol. p. 31.

PHŒNICOPTERUS, in zoology, the name of a very remarkable water-bird, called alſo *flammant* and *flamingo*.

It has extremely long legs, and an extremely long neck. Its beak is broad, and of a very ſingular figure; the upper chap being bent, depreſſed, and dentated; the lower, much thicker, and firmer. It is black at the end, and in the other part of a duſky blue. Its neck and body are white; the long flight feathers of its wings black, but the ſhorter feathers, which make the covering of the wings, are of a very elegant and bright red, whence the bird has its name: it is web-footed, tho' ſo remarkably long legged: it lives about waters, and feeds on fiſh: it is common in many parts of America, and is ſeen at times in many parts of Europe: it was well known to the antients, and its tongue was accounted a very great delicacy among the nice eaters of old times. See Tab. of Birds, N° 46. *Ray*'s Ornithol. p. 240.

One thing very remarkable about it is, that its beak is ſo long and crooked, that the whole head muſt be immerſed before the water can get into it. *Pitiſc* in voc.

PHŒNICOPUS *gallinula*, in zoology, a name by which ſome authors have called a bird, more uſually known by the name *tringa*. *Geſner* de Avib. See TRINGA.

PHŒNICURUS, φοινικερος, in zoology, a name by which the antient naturaliſts called the *ruticilla*, or redſtart. See the article RUTICILLA.

PHŒNIX, (*Cycl.*) in botany, a name given by medicinal writers to the graſs called *lolium rubrum*, and in Engliſh, *ray-graſs*. *C. Bauhin.* p. 9.

PHOENIX is alſo the name given by Kæmpfer and Linnæus to a genus of plants, called by others *elate* and *katovindel*. The characters are theſe: it produces ſeparate male and female flowers, in both the whole ſpatha ſerves for a cup: in the male the petals are three in number, and are of an oval figure, and concave: the ſtamina are three ſlender filaments, and the antheræ are very ſhort: in the female flower the germen of the piſtil is of a roundiſh figure: the ſtyle is ſhort and pointed, and the ſtigma is acute: the fruit is an oval berry, having only one cell; this contains one ſeed, which is of a bony hardneſs, and of an oval figure, with a deep longitudinal furrow reaching from one end to the other. *Linnæi* Gen. Pl. 513. Mus Cliff, 12. Hort. Mal 3, 23.

PHOENIX, φοινιξ, among the antients, a muſical inſtrument not unlike the *cithara*. *Hoffm.* Lex. in voc. See the article CITHARA, *Cycl.*

PHŒOPUS, in zoology, a name uſed for two different birds; the one called by the Germans *brachvogel*, and the other the *whimbrell*, or *aquata minor*, the ſmall curlew of authors.

The firſt of theſe, or the *brachvogel*, is of a deep black colour, ſpotted with a yellowiſh and a reddiſh brown: its beak is long, ſlender, and black, and is moderately bent: its neck is grey, tending to reddiſhneſs towards the bottom, and its belly is white. Mr. Ray ſuſpects this not eſſentially to differ from the other, but the ſight of the bird alone can determine that. *Geſner* de Avib. *Aldrovand* de Avib. L. 20. c. 41.

PHOLAS, in natural hiſtory, the name of a genus of ſhells, the characters of which are theſe: It is an oblong multivalve ſhell, compoſed of five ſhells, tho' in ſome, improperly accounted ſpecies of this genus, only of two. It is ſmooth in ſome ſpecies, in others rough, and in ſome reticulated; in ſome ſpecies it ſhuts cloſe and even, in others it gapes always open.

Of the oblong ſhells, uſually called *pholades*, and conſiſting only of two ſhells, we meet with the following ſpecies: 1. The ſmooth *pholas*, of Rondeletius. 2. The ſmooth narrower *pholas*, of Aldrovand. 3. The wood-*pholas*, of Rumphius. 4. The ſmooth muſcle-like *pholas*. 5. The finger-*pholas*, of Bonani. 6. The pale red and white *pholas*.

Of the oblong and irregular *pholades*, which conſiſt only of two valves, we have the following ſpecies: 1. The great American *pholas*. 2. The broad *pholas*, with the long trunk.

Of the oblong irregular *pholas*, conſiſting of five valves, we have only one known ſpecies, which is the *pholas* of Liſter. See Tab. of Shells, N°. 29. and Hiſt. Nat. Eclairc. p. 356.

The word *pholas* is derived from the Greek, and ſignifies no more than any thing which is hidden; the name was given to this genus of ſhell-fiſh from their cuſtom of making themſelves holes in earth, ſand, ſtones, or wood, and living hidden in them. Many being of opinion, that theſe fiſh could not work themſelves into the ſubſtance of hard ſtones, have thought that they were hatched in holes accidentally formed in ſtones, and that the ſhells naturally grew of ſuch a ſhape as was neceſſary to fill the cavity. Nor is this the only error propagated concerning the *pholas*; for as all that was ſignified by the name being only that the ſhell was hidden in ſome ſolid ſubſtance, whenever an author found a ſhell-fiſh of whatever kind thus buried in ſtone, he deſcribed it under the name of *pholas*.

There are many ſpecies of the ſhell-fiſh, and theſe of ſeveral different genera, which thus hide themſelves in ſtone; and theſe have therefore been called by different authors *pholades*; and hence it has been ſaid, that the *pholas* was in ſome ſpecies a bivalve, and in others a multivalve ſhell. The true *pholas*, which Liſter has very well deſcribed, is a genuine multivalve, being compoſed of five pieces; but this is a very ſcarce fiſh, and ſeveral of the muſcles and of the chamæ being often found in ſtone, they have all been called bivalve *pholades*; and ſuch as have found the chamæ thus immerſed, and found them really to conſiſt of only two ſhells, have cenſured the authors of error who have deſcribed the *pholas* as having five. Hiſt. Nat. Eclairc. p. 362.

All the ſpecies of ſhell-fiſh which are found in ſtone, have certainly been the means of making the holes in which they are found: the fact is inconteſtible, but the means yet wholly unknown. Perhaps when ſome accurate obſerver ſhall have an opportunity of examining the fiſh alive, the myſtery will be cleared up. All that we know at preſent is, that they are firſt buried in the ſtone while very ſmall; ſince the aperture on the ſurface of the ſtone is uſually much ſmaller than the diameter of the ſhell contained within, and only ſerves to admit the ſea water, or to give paſſage to the proboſcis of the incloſed fiſh.

The chamæ, which are frequently known among us under the name of the *pholas*, and common about our ſhores, are often found in a ſoft ſtone of the ſeptaria or ludus Helmontii kind; and as there is a great reſemblance between this ſtone and a hardened clay in its external appearance, many have fallen into an opinion of its being a petrified clay. On this principle it has ſeemed eaſy to account for the ſtrange phænomenon of the *pholades* or chamæ being found in it, ſince it has been ſuppoſed that they made their way into it while in the ſtate of clay, and that it afterwards became petrified or hardened into ſtone while they were in it. But not to mention the error of the opinion of this ſort of ſtone being a petrified clay, or the abſurdity of ſuppoſing that ſuch a petrifaction, were it made at all, could be effected in ſo ſhort a time as during the life of the fiſh. It is eaſy to anſwer this opinion by another obſervation, which is, that on the coaſts of Italy it is not uncommon to find wrought pieces of hard marble, formed into pillars and other ornamental parts of building, in which are lodged the true *pholades*, as alſo chamæ and muſcles, in the ſame manner as in our ſofter ſtones. It is not to be ſuppoſed that theſe pieces of marble were ever any thing elſe but marble; and we have an account from Woodward of certain columns of marble which were dragged up out of the ſea, after their having been loſt there but a few years before, and theſe were all full of *pholades*. If any thing could be wanting after this to prove the certainty of the fact, that the *pholades* make themſelves the holes they live in, it might be added that they are often found lodged in wood, as well as in different kinds of ſtones; the bottoms of ſhips being frequently pierced by them. There is an opinion among the vulgar, that the *pholades*, after a time, change into butterflies; but this is too abſurd to need a refutation. The fiſh is very good to eat, and is taken in quantities on breaking the ſtones; for they never live ſingly, but many in the ſame ſtone.

In the memoirs of the academy of ſciences it is ſaid, that the ſhell of the *pholas* is compoſed of three pieces, two of which are equal in ſize and alike in ſhape; and the third, which is vaſtly ſmaller than theſe, is placed near the ſummit of the others, and fills up a little ſpace, which they leave empty: this is uſually of the figure of a lozenge, one of the ſharp ends of it coming in contact with the other ſhells at their tops; but ſometimes it is only pointed at both ends, and rounded in its intermediate part, and the external ſurface of it is uſually convex. The two large valves of the ſhell are twice or three times as long as they are wide, and the cardo, which joins them, is placed near one end; they grow gradually ſmaller to the other extremity, where they terminate in an oval. They are furrowed and channelled in the manner of a file, having many longitudinal ſtreaks croſſed by a great number of tranſverſe ones; theſe lines mark the age or different growths of the fiſh, and their ridges are often beſet with ſmall points like prickles. The two valves of the ſhell are uſually open, and are capable of expanding to a great width; but they do not expoſe, or leave naked the body of the fiſh on this occaſion; for they are connected together by a membrane which opens to give them room, and forms with the two ſhells a ſort of caſe for the body of the fiſh; and indeed this was the more neceſſary, as the figure of the ſhells is ſuch, that they cannot ever perfectly cloſe together, for when they come into contact in one part, another neceſſarily remains open from their ſhape. Mem. Acad. Par. 1712.

The holes in which the *pholades* lodge are uſually twice as deep, at leaſt, as the ſhell is long; and the figure of theſe holes is, that of a truncated cone, except that they are terminated at the bottom by a hollow rounded cavity, and their poſition is uſually ſomewhat oblique to the horizon. The openings of theſe holes are what betray the *pholas*'s being in the ſtone; but they are always very ſmall, in proportion to the ſize of the fiſh. There ſeems to be no progreſſive motion of any animal in nature ſo ſlow as that of the *pholas*; it is immerſed in the hole, and has no movement except a ſmall one toward the center of the earth; and this is only proportioned to the growth of the animal. Its work is very difficult in its motion, but it has great time to perform it in, as it only moves downward, ſinking itſelf deeper in the ſtone as it increaſes itſelf in bulk. The part by means of which it performs this, is a fleſhy ſubſtance placed near the lower extremity of the ſhell; it is of the ſhape of a lozenge, and is conſiderably large in proportion to the ſize of the animal; and tho' it be of a ſoft ſubſtance, it is not to be wondered at that in ſo long a time it is able, by conſtant work, to burrow into a hard ſtone. The manner of their performing this may be ſeen by taking one of them out of the ſtone, and placing it upon ſome ſoft clay; for they will immediately get to work in bending and extending that part allotted to dig for them, and in a few hours they will bury themſelves in the mud in as large a hole as they had taken many years to make in the ſtone. They find little reſiſtance in ſo ſoft a ſubſtance, and the neceſſity of their hiding themſelves evidently makes them haſten their work. The animal is lodged in the lower half of the hole in the ſtone, and the upper half is filled up by a pipe of a fleſhy ſubſtance and conic figure, truncated at the end: this they uſually extend to the orifice of the hole, and place on a level with the ſurface of the ſtone; but they ſeldom extend it any farther than this. The pipe, tho' it appears ſingle, is in reality compoſed of two pipes, or at leaſt it is compoſed of two parts ſeparated by a membrane. The uſe of this pipe or proboſcis, is the ſame with that of the proboſcides of other ſhell-fiſh, to take in ſea water into their bodies, and afterwards to throw it out again. In the middle of their bodies they have a ſmall green veſſel, the uſe of which has not yet been diſcovered; this, when plunged in ſpirit of wine, becomes of a purple colour; but its colour on linnen will not become purple in the ſun like that of the murex; and even if it would, its quantity is too ſmall to make it worth preſerving. Mem. Acad. Par. 1712.

The true or multivalve *pholas* is compoſed of two large ſhells, two other ſmall ones at the back, and one long narrow and crooked one at the cardo. The three ſmall ſhells always fall off as ſoon as the creature is dead; hence we uſually ſee the true *pholas*, with only two ſhells, in cabinets, and hence ſome have called it a bivalve, and others a trivalve ſhell, having found one of the three other valves. Some alſo pretend, that the Engliſh *pholades*, beſide the five pieces already mentioned, have another, which ſerves as an operculum. Many are of opinion, that the *pholades* bore their way into the ſtones, by means of their rough ſhells, but Bonani is of opinion, that they do it with certain teeth. *Liſter*'s Hiſt of Animal. Engl. p. 172. *Aldrovand* de Teſtac. l 3. *Bonani* Recreat. Ment. et Oculi. p. 36.

PHOLIS, in natural hiſtory, the name of a genus of foſſils of the claſs of the gypſums or plaiſter ſtones, the diſtinguiſhing characters of which are, that the bodies of it are conſiderably hard, compoſed of ſomewhat broad particles, and of a bright cryſtalline luſtre.

The word is derived from the Greek φολὶς, a ſcale, or ſmall flake, from theſe bodies being compoſed of particles of that form.

The ſpecies of this genus are the moſt valuable of all the gypſums, as burning to the beſt and fineſt plaiſter, but ſo far as is yet known there are but two of them. The fine plaiſter ſtone of Montmartre in France, called by us *plaiſter of Paris ſtone* and *Parget*; and the other the coarſer and ſomewhat reddiſh kind, common in many parts of England, and called *hall plaiſter*. *Hill*'s Hiſt. of Foſſ. p. 112. See the article PARGET.

PHOLIS, in zoology, the name of a ſmall anguilliform fiſh, the back of which is brown, the belly white, and the whole back and ſides ſpotted, and the ſkin ſoft and not covered with ſcales, but with a tough mucilaginous matter like the eel. This moſt of all approaches to the *alauda*, and tho' uſually ſomewhat larger, yet Mr. Ray doubts whether it really differs from it in any thing eſſential; its great diſtinction being its colour, which tho' a very obvious, is a very precarious one. *Rondelet.* de Piſc. p. 20. *Ray*'s Ichthyography, p. 135.

PHOLLIDES, a word uſed by the antient phyſicians for ſoft and fungous tumors of the legs, ſuch as thoſe of people in an anaſarca, or leucophlegmacy.

PHONASCI, in antiquity. See PHONASCIA, *Cycl.*

PHORBÆA, or PHORBEIA, in the muſic of the antients, a name given to a ſort of *frenum* or *bandage*, applied to the mouths of people who played on the pipe.

It was a ſort of leather band, which went firſt a-croſs the forehead, then behind each ear, and from thence making one or two turns round the head, it paſſed over the mouth, where its office was to reſtrain the lips from emiting too much breath at once, and cauſe them to diſcharge only juſt ſo much as would ſerve to inflate the pipe.

Simonides deſcribing the trial of ſkill between Marſyas and Apollo, mentions this *phorbeia* or *capiſtrum*, and ſome antique gems yet remaining among us, have the figure of a Marſyas's head, with the *phorbeia* upon it.

By the different ſtructure of the *phorbeia*, as expreſſed on the different coins, we find, however, that there were two ſpecies of it, the one was leſs complex, conſiſting only of a perpendicular piece down the cheek, and a tranſverſe one, runing a-croſs the lips, and covering the whole orifice of the mouth, only leaving a hole cut thro' it, at which the mouth-piece of the pipe was to be put in. The other conſiſted of ſeveral bandages, as at firſt deſcribed, and the lower tranſverſe piece of theſe did not come over the mouth, but only bore up the lower lip, in a forcible manner, againſt the upper. The old Greek writers diſtinguiſhed theſe by two different names added to the original word *phorbeia*; the firſt, or ſimple one, was called *monomeres*; and the other, or more complex one, *diemeres*: they were both called alſo by Soranus, and others, *epideſma*, and ſometimes ſimply *deſma*. *Soranus* de Epideſmis.

PHORIMOS, a name given by ſome authors to *roach alum*. See the article ALUM.

PHORINE, a word uſed by ſome authors to expreſs the ſkin of a hog; ſome alſo underſtand it to mean a skin of any kind, extending it even to the human cutis.

PHORMIX, among the antients, the ſame with *cithara*. See the article CITHARA, *Cycl.*

PHORMORAPHIS, in the materia medica, a name often uſed by the later Greek writers, and generally looked on as one of their unintelligible words, or the name of ſome drug not known at this time.

If we may gueſs at the reſt of their unintelligible words, however, by this, it is probable that ſomething might be done toward the explaining and underſtanding them, by conſulting the other medical writers neareſt their times, and particularly the Arabians.

Aviſenna mentions the drug called *carpeſium*, or *carpeſia*, which, he ſays, was a common ſubſtitute, in his time, for cinnamon. Galen alſo tells us, that the ſame uſe was made of the *carpeſium* in his days; they add deſcriptions of the drug, by which it appears probable, that it was either the young ſhoots of the cubeb tree, or of ſome ſuch ſhrub. The later Greek writers generally copy their accounts of things from theſe, and they give exactly the ſame deſcription of the *phormoraphis* as theſe do of the carpeſia: its uſe, as a ſubſtitute for cinnamon, is alſo mentioned by them. And upon the whole it appears, that it was the name the later Greeks gave to the *carpeſium*, or *carpeſia*, of their predeceſſors. It is to be obſerved here, that there is another very different ſubſtance given in the old Greek writers under the name of *carpeſium*; and this word is ſometimes written *carpeſium* and *carpeſia*. This was a gum reſembling myrrh in ſmell and colour, but of a poiſonous nature: the *carpeſia* here mentioned was, on the contrary, an aromatic medicine. See CARPESIA.

PHOS, a word uſed by ſome medical writers to expreſs a diſtemperature of the eye, in which there is ſeen a black circle wholly ſurrounding the pupil.

PHOSCAS, in zoology, the name of a freſh-water fowl of the duck kind, and of the ſize of the common wigeon. Its body is remarkably flat; its beak and legs are blue; its head and neck are of a browniſh colour, variegated all over with numerous triangular black ſpots; and on the top of the head theſe ſpots are larger than elſewhere, and are of a ſomewhat greeniſh hue; the back, wings, and tail are of a duſky brown, but the edges of the feathers are pale or whitiſh; the wings are variegated by two long white ſtreaks; the breaſt and ſides are of the ſame colour with the back, but paler; and the belly of a fine white, but with a few duſky ſpots under the tail. *Ray*'s Ornithol. p. 289.

PHOSPHORIA, φωσφορια, in antiquity, a feſtival in honour of Phoſphorus or Lucifer. *Potter*, Archæol. Græc. T. 1. p. 436.

PHOSPHORUS *(Cycl.)*—*Phoſphori* may be divided into ſeveral kinds; ſome ſhine of themſelves naturally, as the glow-worm and dates; or adventitiouſly, as the fleſh of animals, which moſt probably ariſes from a degree of putrefaction, ſometimes too ſlight to be obvious to our ſenſes. Other bodies become luminous by attrition, heat, the free action of air; and laſtly, by imbibing and retaining the rays of light. Thoſe bodies that are luminous by attrition, are, amongſt others, ſome diamonds, and the hairs of animals; by heat, ſeveral ſorts of gems, and mountain cryſtals; from the free acceſs of the air, the *phoſphori* of Kraft and Homberg; from the aſpect of light, the Bolognian luminous ſtone, the preparation by Chriſtian Adolphus Baldwin, of chalk diſſolved in ſpirit of nitre, as well as ſeveral others diſcovered by the late Monſieur du Fay, who found, that whatever ſubſtances would by calcination be converted into a calx, or whoſe concrete, from a ſolution in the acid of nitre, would bear fire enough to become red-hot, theſe bodies were adapted to imbibe and retain light.

The greateſt number of *phoſphori* are of the laſt mentioned kind. Some of theſe are natural, others artificial; but of theſe laſt the preparation is ſo ſlight, as not to change the nature of their conſtituent parts.

The natural *phoſphori* are either foſſile, vegetable, or animal. The foſſile are, though very different in degree, ſome ſorts of earths, white ſand, lime ſtones, ſtalactites, and ſeveral other figured ſtones, iſland cryſtals, flints, ſome ſpecies of agates, white arſenic; but no ſort of metals, metallic or ſulphureous bodies, as jet, amber, except the before-mentioned arſenic. On the other hand, ſalts imbibe light, provided they are diveſted of every metallic principle; otherwiſe not, though as pellucid as poſſible. For this reaſon none of the vitriols will imbibe light; but other ſalts will, tho' with a conſiderable difference as to quantity; for ſal gem and rock ſalt imbibe very little; ſea ſalt, if dry, and in cryſtals, much more; and in like manner, ſal ammoniac. ſal catharticum and nitre yet more. This power is weak in the natron of the antients, and alum; but brighteſt of all in borax.

In the vegetable kingdom we find very few *phoſphori*; that of dry rotten wood is weak and not laſting; it appears chiefly upon the edges and inequalities of the ſurface. But this is moſt remarkable in the rotten wood of the fir-tree, and ſome others, where, in the dark, you ſee ſhining ſpots as big as tares; whereas in full light the whole ſurface appears alike. Some few barks are luminous, but not conſiderably ſo; but no fruits, ſeeds, or their meals. Cotton and the cryſtals of tartar, appear very bright, but fine loaf ſugar appears the moſt luminous of all, both without and within: gums and reſins retain no light.

There is a vaſt variety of *phoſphori* in the animal kingdom, ſuch as the bones and teeth; to theſe may be added the ſhells of fiſh, egg-ſhells, the human calculus, bezoar, and in whatever parts of animals the terreſtrial principle is very predominant. But where there is a conſiderable quantity of oily matter, as in the hoofs, horns, and feathers, no light is manifeſt.

Beccari propoſes ſome queries concerning the natural *phoſphori*, of which the firſt is, In what and how great a light the object ought to be placed? He tried different *phoſphori* in different degrees of light, and found them imbibe moſt light from the ſun itſelf; next in quantity when the ſky was clear; and the leaſt in foggy weather. Theſe experiments ſhould be made in the open air, and not in a houſe with the glaſs-windows ſhut; becauſe many bodies appear luminous when the light has come directly to them, which will not have that appearance when the light has paſſed through the glaſs. He laſtly tried what light they would imbibe from very bright flame, and found that alabaſter itſelf, which is ſaturated more than any ſubſtance by the ſun's rays, imbibed exceedingly little. The next query is, How long theſe bodies ſhould remain in the light to be ſufficiently ſaturated? Four or five ſeconds were found the utmoſt length of time required for that purpoſe. The other query is, How long the received light will continue in theſe *phoſphori*? It does not laſt the ſame time in all; but continues more or leſs, from two ſeconds to eight, in proportion to the ſtrength of the *phoſphorus* and the quantity of light received.

Phoſphori are, it is well known, often produced by art; ſome are made by the maceration of plants alone, and without any fire; ſuch as thread, linnen cloth; but above all paper. The luminous appearance of this laſt is greatly increaſed by heat. This is confirmed by two experiments; the firſt is, by expoſing the paper, ſpread upon an iron-grate to the naked fire, yet not near enough to ſcorch it, and then laying a warm brick thereon to retain the heat; by which means it was obſerved, that where the paper was not skreened by the iron grate, it was moſt luminous; ſo that by the lights and ſhades you might diſtinguiſh in the dark the image of the iron-

iron-grate a conſiderable time. The other experiment is, the application of the paper to a plate of warm braſs; from which, when in the dark, you might very eaſily, by its being leſs luminous, diſtinguiſh the margin of the paper that had not been warmed by the braſs. The forementioned author takes notice alſo of thoſe *phoſphori* which become ſo by the aſſiſtance of fire; but the fire here ſpoken of is not great enough to diſſolve their conſtituent parts, but only ſuch as may affect the external parts of their texture, and that but gently; ſo that the proceſs here mentioned is only drying or roaſting. For it is not the watry or the ſaline parts in bodies which are torrified; but the oleaginous, wherewith many vegetables, and moſt animals abound. The white fleſh of animals, ſuch as that of chickens, becomes a *phoſphorus* by roaſting, as well as the tendons; and whatever parts of animals become glutinous by boiling, ſuch as carpenters glue, iſing-glaſs, *&c.* to theſe may be added cheeſe. Bones, though they imbibe light without any preparation, have that property in a much greater degree when burnt, and their luminous appearance is much more lively. But roaſting has not this effect upon feathers, hoofs, horns, or whites of eggs. The ſame operation which produces ſeveral *phoſphori* from the animal kingdom, gives alſo ſeveral from the vegetable. Thus, by gently toaſting gums, as myrrh, gum tragacanth, and others, they appear luminous tho' different in degrees; and this light is clear in proportion to the gentle evaporation of their aqueous parts. By this treatment nuts of every kind, pulſe, corn, coffee-berries, meal, bread, and wafers, alſo become *phoſphori*. Turpentine, amber, and ſome reſins, require more fire before they imbibe light; ſo that you muſt diveſt them of their acid, and their light etherial oil, to make them appear luminous. But here great care muſt be taken that they boil no longer than from being white they turn yellow; for if you proceed longer, your labour is loſt. Thoſe *phoſphori* produced by torrefaction, ſoon loſe their power, which, perhaps, neither time nor a thorough diſſolution of their parts can deprive the natural ones of. In general, as long as the *phoſphori* gained by torrefaction, preſerve their power, their light is more ſharp and ſtriking, but the natural more weak. Thoſe that are gained by calcination, and Baldwin's *phoſphorus*, ſeem to poſſeſs both the ſtriking light of thoſe gained by torrefaction, and the weaker light of the natural *phoſphori*: the laſt they preſerve a long time, but the former is loſt by degrees much ſooner. The well calcined aſhes of plants, or rather their terreſtrial parts remaining after the ſolution of their fixed ſalts by waſhing, and neutral ſalts, continue *phoſphori* after many years: ſo that, as far as we can judge, the luminating power which is gained by calcination, tho' not ſo intenſe, continues perpetual; whereas that gained by torrefaction always decreaſes, and in a very little while is no longer viſible. Some even by this method, continue to imbibe light much longer than others. Gum arabic, which continues longeſt, laſts ſix days; bread not one, and coffee only a few minutes. However, at any time, by a freſh torrefaction, you may recover theſe languid *phoſphori*; in which property they have great likeneſs to the Bolonian ſtone, and other *phoſphori* prepared by art. The *phoſphori* gained by torrefaction, as well as that of Bolonia, will not imbibe light while they are warm; and this laſt does not appear ſo luminous when firſt prepared, as when it has been ſo for ſome time. The natural *phoſphori* do not differ only in the before-mentioned particulars, but alſo in the colour of the light itſelf. The light of the natural generally appears either perfectly bright, or ſomewhat inclining to yellow; the artificial produces a red, and ſometimes a brown light; but there are ſome exceptions to both theſe rules. From theſe different appearances it may be conjectured, that there are two ſorts of fire ariſing from different principles; *viz.* that in torrified ſubſtances from a ſulphureous, and that of the natural from a terreſtrial principle. In obſerving a piece of lapis tutiæ, that was rough and unequal on its convex ſide, but ſmooth and ſomewhat poliſhed on the concave, Beccari, to his great ſurpriſe found, that the rough ſide was luminous, and the ſmooth one not: being very deſirous of inveſtigating the cauſe of this appearance, he remembered that ſome poliſhed marbles did not imbibe light, or very little, and that at their edges; but having loſt their poliſh, they did admit and retain it. He therefore conjectures, that bodies, according to the diſpoſition of their ſurfaces for the reflection of the light, either ſuffer or prevent its entrance into them. If this poſition hold good in the reflection, Why ſhould it not with regard to the refraction? The ſame author produces two experiments, which he apprehends not foreign to the preſent purpoſe. Expoſing a glaſs-bottle full of well water to the light, and, as ſoon as poſſible, obſerving it in the dark, it was found to have imbibed no light; upon pouring into it ſome oil of tartar, it became turbid and whitiſh, from the well-water being uſually impregnated with calcarious matter. Upon obſerving it then in the dark, after having been expoſed as before, it retained enough of a pale light to diſtinguiſh the ſhape of the bottle. In a bottle of rain water he diſſolved ſome talc; which ſtone, by rubbing, will diſſolve in water as ſalts do, without rendering it opaque; to this ſolution he added oil of tartar, and this mixture was luminous as the preceding. He therefore concludes, that ſo long as earthy corpuſcles are very ſmall, ſeparate, and agreeing in their ſurfaces with the water in which they float, they readily tranſmit the light they receive; for which reaſon 'tis impoſſible they ſhould retain light enough to appear luminous in the dark. But by the affuſion of the ſaline principle, the earthy corpuſcles unite with the water and ſalt; and from the union of theſe principles the mixture grows thick, whereby the ready tranſmiſſion of the light is prevented; ſo that if this mixture is without colour, or any thing metallic, the light will be ſtopped long enough to be viſible in the dark. But if, inſtead of oil of tartar, you add ſugar of lead, the mixture will be turbid, but retain no light. In theſe two experiments the water becomes a *phoſphorus*. Gems, cryſtal, and glaſs, whether whole, or powdered ever ſo fine, retain no light; ſo that neither their tranſparency nor whiteneſs contribute to their becoming luminous in the dark. Of ſeveral diamonds in all appearance perfectly the ſame, ſome were very luminous, others not at all. Of many opaque ſubſtances, whether rough, poliſhed, or finely powdered, ſome were luminous, others not: ſo that it appears that not only the external, but the internal texture of bodies alſo, may conduce ſometimes to their being luminous.

Almoſt all bodies, by a proper treatment, have that power of ſhining in the dark, which, at firſt, was ſuppoſed to be the property of one, and afterward only of a few. How this is brought about is not eaſy to ſolve. If we ſuppoſe with ſome, that the light from a luminous body, enters and abides in the *phoſphori*, we ſhall find ſomewhat new to admire in light itſelf. It is no new opinion, that this fluid conſiſts of very fine particles, which are continually darted forth from a luminous body in all directions, with a very great velocity: but it has by no body been laid down hitherto, that theſe particles are not diſſolved by the violence of their agitation, not diſperſed, nor immediately ceaſe to exiſt; but ſubſiſt ſtill, and adhere to what bodies come in their way, as heat does. If therefore the particles of light are not diſſolved as ſoon as they are emitted from a radiant body, but continue ſome time, what elſe is required but that we allow its atmoſphere to every lucid appearance? If the *phoſphori* ſhine with a borrowed light, but not with their own, and that only when put in motion, and fired by the rays of a ſhining body, which ſome experiments ſeem to confirm, then other new doctrines will ariſe. There muſt be then a hidden, a ſecret principle in bodies, to be lighted up by this moſt ſubtle fire. There will be in the univerſe a certain perpetual fire from theſe *phoſphori*; the matter of which, tho' conſtantly diſſipated by burning, does not waſte enough to be obvious to our ſenſes. See Phil. Tranſ. N° 478.

PHOSPHORUS *of urine.* The ſucceſsful method of making this famous ſubſtance is this: evaporate any quantity of freſh urine over a gentle fire, to a black and almoſt dry ſubſtance; then, with two pounds thereof, thoroughly mix twice its quantity of fine ſand; put the mixture into a ſtrong coated retort of ſtone, and having poured a quart or two of water into a large receiver with a long neck, join it to the retort, and work it in a naked fire: let the heat be ſmall for the two firſt hours, and then increaſe it gradually to its utmoſt violence, and continue thus for three or four hours; at the expiration of which time there will paſs into the receiver a little phlegm and volatile ſalt, much black fœtid oil, and laſtly, the matter of the *phoſphorus*, in form of white clouds; which will either ſtick to the ſides of the receiver, like a fine yellow ſkin, or elſe fall to the bottom, in form of a ſmall ſand. Now let the fire go out, but take not away the receiver before it is cold, for fear of ſetting the *phoſphorus* on fire by admitting the air. Take out the matter of the *phoſphorus*, and put it into a little tin ingot mould, along with water; heat the mould to make the matter all run into a maſs, then add cold water, till it is congealed into a ſolid maſs like bees-wax; cut this into long ſlender pieces, which put into a phial, and fill it up with water, and then cork it cloſe. *Shaw's* Lect. p. 403.

This *phoſphorus* is nothing but the animal ſulphur. Now all animals, on which experiments have been made, are found to contain more or leſs of the phoſphoreal principles; ſome inſects conſtantly ſhine, or emit light, in the open air; many ſorts of fiſh are luminous, if expoſed to the air a ſhort time; nay, even the bubbles of the ſea water appear like fire in the dark: ſome quadrupeds have been obſerved to emit light on very ſlight friction of their hair, as the necks of horſes, the backs of cats, and the like; and there are many inſtances in our own ſpecies of many parts of the body appearing luminous, and even of the exhalations from it adhering to the cloaths, cauſing them to ſhine likewiſe. We have ſeveral curious obſervations relating to this ſubject in the Phil. Tranſ. N° 476. p. 444, 445, 456, 457, *&c.*

Upon this principle of *phoſphorus* exiſting in animals, ſome attempt to explain the cauſe of thoſe accidental accenſions or burnings which have happened to ſome of the human ſpecies, as that of the lady at Ceſena in Italy, the carpenter in Hampſhire, and the woman lately at Ipſwich. It ſeems moſt probable, that they were all ſet on fire by lightening. It may be ſaid, many are ſtruck by lightening, but not ſet on fire. But it is to be remarked, that the lady at Ceſena had charged

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all her pores and abſorbent veſſels with a great quantity of camphor. The woman at Ipſwich had drank plenty of gin; which circumſtances muſt greatly promote the kindling the *phoſphoreal* fire in them: and as this pabulum was conveyed into the moſt minute capillary veſſels, it might produce an almoſt inſtantaneous deflagration and diſſolution of all the ſolid containing parts. Phil. Tranſ. N°. 476, p. 447. ſeq.

Ammoniacal PHOSPHORUS, in chemiſtry, the name of a *phoſphorus*, compoſed of ſal ammoniac and lime, which Mr. Homberg firſt diſcovered.

The method of preparing it is this: take one part of ſal ammoniac in powder, and two parts of lime extinguiſhed by lying in the air: mix them exactly together, and fill a crucible with the mixture; ſet it in a ſmall melting heat. As ſoon as the crucible grows red hot, the matter in it will melt, and it muſt be ſtirred with an iron rod, leſt it ſwell over the edges of the crucible: as ſoon as the whole is melted, pour it into a copper baſon; it will appear of a greyiſh colour and vitrified, and if it be ſtruck upon with any hard body, there will be ſeen a fire all over the place where the blow was given. As this matter is brittle, however, and the ſame maſs will not ſerve often for the experiment, the beſt method is to dip iron rods in it while melting, and theſe will be covered with the matter, and will anſwer the purpoſe eaſily and often. Mem. Acad. Par. 1693.

Antimonial PHOSPHORUS, in chemiſtry, the name of a ſubſtance having the qualities of the *phoſphorus* diſcovered by Mr. Geoffroy in his experiments on antimony. This gentleman had prepared a ſoap from pot-aſhes, quick-lime, and oil, with which he made ſeveral experiments on antimony; among others he was deſirous, by means of this, to reduce ſome diaphoretic antimony, which he had before made from two parts of the regulus of antimony, and three parts of nitre; but inſtead of the reduction which he was labouring after, his operation afforded him a much more ſingular phænomenon: the reſult of them being a *phoſphorus*, which he had never thought of; a matter, which after having remained perfectly quiet while cloſe ſtopped down, took fire as ſoon as ever it was expoſed to the air; and that with a violent detonation, and darting every way a ſhower of fire.

It is eaſy to ſee, that there are in the preparation all the requiſites for ſuch an effect; nitre, charcoal furniſhed by the burnt ſoap, and ſulphur both from the ſoap and from the regulus of antimony; and to all theſe, a ſort of calx, either from the ſoap, or from ſome earthy parts of the antimony. It is eaſy to conceive, that all theſe ſubſtances coming to a mixture together, ſhould be ready to catch fire and blaze upon a proper application; but it is not leſs difficult to account for this effect's being produced merely by the air, after the whole had been for a long time in a ſtate of reſt.

The method of preparing this new ſpecies of *phoſphorus* is this: Mr. Geoffroy mixed two ounces of his ſoap with one ounce of this diaphoretic antimony; this mixture being put by little and little into a red hot crucible, took fire, and ſwelled very much. After it had done flaming, the maſs ſubſided, and became a red or fire-coloured ſubſtance, of an even ſurface, but ſtill throwing up a vaſt quantity of bluiſh-green luminous vapours: and all this regularly happened on every freſh throwing in of the matter, without the leaſt variety. When the whole quantity was thrown in, and had ceaſed to give any flame or luminous vapour, it remained in the crucible in the form of an inverted muſhroom, being hollow, very porous, and of a black colour. When the crucible was taken out of the fire, the edges of this ſubſtance were beaten down into the middle, and the whole covered with an ounce of freſh ſoap. When this laſt ſoap was burnt, and a ſmall blueiſh flame appeared upon the ſurface of the maſs, the crucible was covered with a lid, and a large quantity of charcoal laid upon it, and the fire blowed up very briſkly, by an hundred blaſts of the bellows, or thereabouts; but notwithſtandig the fierceneſs of the fire, there was no fluid ſcoriæ formed, but the whole maſs remained ſpungy and porous. The fire was then ſuffered to go out, and the crucible placed in a corner of the elaboratory at reſt for five hours. In the evening, when the crucible was perfectly cold, Mr. Geoffroy went to examine the matter, and a ſervant went to uncover the maſs, by removing its ſurface with an iron inſtrument; but the moment the air was admitted, the whole maſs took fire, burning with a very conſiderable noiſe, and darting its flames every way to a great diſtance.

Mr. Geoffroy repeated the proceſs ſeveral times, and always with the ſame ſucceſs, whether he uſed his own diaphoretic antimony, or that made in the common manner. The great caution to inſure the ſucceſs, ſeems to be the taking care of not carrying the fire too far before the addition of the laſt quantity of ſoap. Mem. Acad. Scien. Par. 1736.

Aquatic PHOSPHORUS, a name given by Dr Leigh, in his hiſtory of Lancaſhire, to a water found near Wigan in that county, which takes fire on holding a lighted candle to it. It is not properly the water, however, that takes fire in this caſe, but a ſteam which burſts out of the ground with it. The author alſo calls it a ſulphurated water; but that very improperly, for it contains no ſulphur, but only iſſues out in company with this bituminous vapour.

PHOSPHORUS *of the bearne-ſtone*, in natural hiſtory, is a name given to a ſtone, (which, when heated, becomes a ſort of *phoſphorus*) from the place where it is found; as the famous one of Bologna is called alſo from its native region.

The *bearne-ſtone* is of a moderate hardneſs, conſiderably pellucid, and uſually colourleſs, or whitiſh, tho' ſometimes with a tinge of green, yellow, or ſome other colours: it is compoſed of numbers of plates, or flakes, laid one over another, in the manner of the iſland cryſtal; and therefore, like that body, is plainly a ſpar. It breaks into ſeveral faces, and has different angles; but of a ſomewhat determinate meaſure, the acute ones being of ſixty degrees, and the obtuſe ones of 120. Mem. Acad. Par. 1724.

This ſtone, when heated at one of its angles with the flame of a lamp or candle, ſplits by means of the flame's inſinuating itſelf into the interſtices of the plates that are leſs firmly united; and theſe ſeparate, and ſome fragments uſually fly off with conſiderable violence. One of theſe pieces carried into an obſcure place, appears ſurrounded with a blue flame, which laſts about a minute. And it is to be obſerved, that theſe pieces which fly off, have all the ſhape of an irregular pyramid, with an uneven baſe. If this ſtone be put into a crucible, and ſurrounded with coals, it becomes a very beautiful *phoſphorus*. The whole bottom of the crucible is ſeen, even tho' it be in broad day light, ſhining with a bright and beautiful blueiſh white; and if it be carried into a dark place, the light is ſeen much more beautifully. If, after it is cold, it be again heated in a crucible, in the ſame manner it ſhews the ſame bright appearance. After this, if it be tried a third time, it does not ſhine at all. According to all theſe phænomena, the effects of fire upon this ſtone ſeem to depend on a ſulphur contained in it, probably of the ſame nature with that which enters the compoſition of the metals. This may, by means of a heat, ſuch as that given by the candle or in the crucible, diſengage itſelf ſo far from the body of the ſtone as to take fire; and when it has burnt ſo long as to conſume itſelf, the luminous property of the ſtone ſeems to ceaſe.

The coloured gems are cryſtals of a peculiar kind, tinged with the ſulphurs of metals: this ſulphur gives them their colour, and conſequently it ought to give them the properties of the *bearne-ſtone*, if it were not too fixed to be diſſipated in the ſame eaſy manner, and to take fire in the diſſipation. And it appears on trial, that the baſtard emeralds of Auvergne and other places, the matrix of the amethyſt, the fragments of ſome of the accidental jaſpers, the jacynths, and ſome ſort of rubies, are all *phoſphoruſes* of the nature of the *bearne-ſtone*, but with different degrees of brightneſs. The mother of the emerald, the yellow jaſper, the water ſapphire, the malachite, the opal, and the garnet, have none of them any of this property. Mem. Acad. Par. 1724.

Since the ſame ſulphurs which take fire in the *bearne-ſtone*, are what give colour to theſe other ſtones, it ſhould ſeem, that thoſe which are not of this *phoſphorus* kind, nor give a light after being heated, ſhould not loſe their colours in the fire; and this is found to be true in the garnet, which does not loſe any part of its colour, nor is it at all luminous; whereas the hyacinth, and ſome of the jaſpers and other ſtones, which loſe a part of the colour, not the whole, in the fire, become alſo in part luminous, or more ſo, in degree, according to the quantity of colour which they loſe. This, however, is no certain rule, ſince the mother of the emerald, the topaz, and ſome other ſtones, loſe all their colour, and yet are not at all luminous. The reaſon of this ſeems to be, that the ſulphurs are driven out of theſe ſtones ſo ſlowly, and in ſuch minute quantities, that they are not at any time collected into body enough to be capable of flame. There is nothing to be objected as to the *bearne-ſtones* ſhining; tho' they are uſually white, they may poſſeſs no ſmaller portion of ſulphurs than the coloured ſtones; only in thoſe the ſulphurs may be colourleſs, or white in themſelves.

It may be poſſible alſo, that the ſulphurs, in a ſtone of this kind, may be diſperſed in ſuch ſmall molecules, as not to form a body ſufficient to give any colour; but when collected, in order to be driven off in the fire, they may then be ſufficient in quantity to give a blue tinge to the flame.

The iſland cryſtal, which is alſo a ſpecies of ſpar, and which greatly reſembles this *bearne-ſtone* in many particulars, flies to pieces alſo in the ſame manner, on being heated; and when carried into the dark, this alſo gives ſome ſparks of light, but they are few in number, and looſely ſcattered over the ſurface: when this ſtone is burnt a little in a crucible, there is ſome ſmall appearance of flame, with a ſmell of ſulphur, and the matter in the bottom of the crucible is found ſhattered to pieces; but all the pieces are regular parallelopipeds, as was the original maſs. Mem. Acad. Par. 1724.

It is to be obſerved, that the *bearne-ſtone*, and others of the ſame kind, which only ſhine in the dark, and that only for a few minutes, when firſt taken out of the fire, are, properly ſpeaking, endued with no other luminous quality, than that of a burning coal; but their light having been generally unobſerved, and requiring darkneſs to ſhew it, has obtained them the ſpecious title of *phoſphori*.

PHOSPHORUS *fæcalis*, a very fine kind of *phoſphorus*, exhibiting many wonderful phænomena, and prepared from human dung mixed with alum.

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Mr. Homberg, who was the inventor of it, gives the method of preparing it in the following manner: take four ounces of human dung newly made, mix it with the same quantity of roach alum grosly powdered; put the mixture into a small iron ladle, capable of holding about a pint; set it over the fire in a chimney, and it will melt together, and become as fluid as water; let it boil gently over a small fire, continually stirring it with an iron spatula, till it is dry: it will then be difficult to stir, but it must be kept stirring about, and all the lumps it runs into must be broken, and what adheres to the sides of the ladle stirred in and blended with the rest: this must be continued till it is perfectly dry, and the ladle must be now and then taken from the fire, and the matter stirred about in it that it may not grow red-hot. When the whole is thus perfectly dried, it will still be in little lumps, and when cold it must be rubbed to powder in a metal mortar; it must then be put into the ladle and set over the fire again, it will then become a little moist again, and run into clods and grumes, but it must be again stirred till dry; when cold it is to be powdered again, and a third time put into the ladle; and when perfectly dried this time, it is to be laid by in a paper in a dry place: thus is the first or preparatory operation finished.

Take two or three drams of this powder, put it into a small matrass, capable of holding an ounce and half of water, and which has a neck six or seven inches long; put a paper stopper lightly into the neck of the matrass, then take a small crucible of three or four fingers breadth high, put two or three spoonfuls of sand into it, then set the bottom of the matrass on the sand, and take care that no part of it touches the sides of the crucible; fill up the rest of the crucible with sand, and let the whole body of the matrass be covered with it; then set the crucible in one of the common little earthen furnaces, and make a charcoal fire about it; for the first half hour let the coals only reach up to the middle of the crucible, but afterwards lay them up to the rim of it; continue this fire about half an hour, or till the powder within the matrass is red-hot, then pile up more charcoal above the rim of the crucible, and continue this fire an hour, after which let the whole cool. There will arise a large quantity of fumes during the operation, and they will often throw out the stopper of the matrass; but this must be replaced, and the fire a little abated in that case: when these fumes cease, the fire may be raised without hurting the process, when the crucible is so cool that it may be taken out of the furnace without burning the hands. This is to be done, and the matrass is to be half raised out of the sand to make it bear the cold by degrees, and its mouth must then be stopped closely with a cork, instead of its paper stopper. If, on shaking the matrass about, the matter falls into powder, it is a proof that the operation has been well performed; but if it hang together in form of a cake, 'tis a sign that the matter was not well roasted in the ladle before the putting it into the matrass.

When the operation has been well performed, and the matter is in powder in the matrass, pour out a small quantity of it on a piece of paper, and immediately stop the matrass again: the powder upon the paper will immediately fume and take fire, burning the paper, and any other combustible matter that is in the way. If there has been too much of the powder poured out of the matrass, it must not be returned in again; for tho' that should be done before it begins to smoak, yet it will certainly set fire to all that is in the matrass; from this it may be easily seen also, that the matter cannot be emptied out of the matrass into a phial, but must always be in the vessel in which the calcination was made.

If too much alum be used, the powder will not take fire at all: it will be of different colours, according to the vessel the first calcination was made in, and according to the degree of fire that was used; hence it is sometimes black, sometimes brown, sometimes red, green, yellow, or white.

It takes fire equally well in the day-time and in the night, and that without the mixture of any other substance, or without the least rubbing, or any other circumstance beside the mere exposure to the air. In this it differs from all the other known artificial *phosphori*; for that of urine requires a small degree of heat, in order to its burning; the smaragdine *phosphorus* requires a considerable degree; the Bononian stone does not shine except after having been exposed to the day-light; and all the others require violent rubbing, or a smart blow to produce their light.

If it be desired to keep this powder good for any time, it must be put in a dry place where there is not too much heat: the mouth of the matrass must be kept close stopped, and its body covered with paper; and the place where it stands must not be in too strong a light, for the open day-light has been often known to weaken its power; and, in fine, wholly to spoil it thro' the glass. Mem. Acad. Par. 1711.

Fulgurating PHOSPHORUS. See FULGURATING.

PHOSPHORUS *metallorum*, a name given by some chemists to a preparation of a certain mineral spar, which is found in the mines of Saxony and other places, where there is copper. The spar to be used on this occasion is, that kind which is tinged green, and from its, in some degree, resembling the colour of the emerald, is called by some *pseudosmaragdus*, and by others *lapis smaragdi mineralis*. This is to be powdered very fine, and this powder is to be laid on a flat plate of copper, iron, or any other metal: this plate is then to be set over some lighted charcoal, and the whole placed in a dark place. The spar will receive its necessary degree of heat for shining long before the metal will, and, consequently, as soon as it begins to shine, the fire is not to be made any brisker. While the plate of metal is held in this degree of heat, and does not appear at all red, the powder upon it will shine like a lighted coal, and will continue so for some time. If it be removed away, and suffered to cool, it will be fit to repeat the experiment a second time with, but its light will not be so strong as before. Phil. Trans. N° 244. p. 365.

PHOSPHORUS *of sulphur*, the name given by the French academicians to a new-discovered species of *phosphorus*, which readily takes fire on being exposed to the open air.

The invention was Mr. Le Fevre's, and the process is this: The ingredients are two drams of common *sulphur*, half an ounce of steel filings, ten grains of colophony, and six drams of common water. These things being all weighed and set apart, powder about half a dram of the *sulphur* in a small mortar, then add the colophony, and afterwards the remainder of the *sulphur*. When this is all reduced to a fine powder, put in the filings of steel, and rub the whole together till it is so thoroughly mixed, that the steel does not appear; but the colour of the whole looks every where uniform and regular: then add about twenty drops of the water; and after beating the whole together add as much more, and continue to do so till the mass is of the substance of a paste, but not too moist. Put this paste into a small matrass that will contain about three ounces, and pour on it more of the water till it swim above the surface of the paste near a quarter of an inch. The matter of the paste will then break, and appear in form of a granulated powder under the water; put the matrass on a sand furnace, but give it no greater heat than that the hand can bear to lie upon the matrass. When it begins to heat, the mixture will ferment and swell, and become black; it is then to be stirred with an iron rod, and a little more water must be added every quarter of an hour, till the whole is used. The matter will then be very black and liquid; and it is to be then taken from the fire, and set by for the whole night. This is the first and most essential part of the operation, and in this great care is to be taken that the fire be not too violent; for if the *sulphur* be burnt, the operation will be spoiled, and the matter would ferment so high as to run over at the mouth of the vessel.

To finish the operation, a little water must be added to the matter, so as to swim over it, and the vessel must be again set in the sand, and a stronger fire given than before; this is known to be strong enough when there is any humid vapour observed to arise out of the mouth of the vessel. This fire is to be continued about two hours, that the greater part of the humidity may be evaporated; which is known by the iron rod finding some resistance when put into the vessel, and the matter it brings up being granulated and solid, or no longer moist; it must then be immediately taken from the fire, and the whole is then finished. It is necessary to be very exact in this last critical minute; for a very little longer standing on the fire will burn the *sulphur*, and render all the former care of no effect. The black matter remaining in the matrass is to be taken out, and the sides scraped clean with an iron rod; any piece of this that happens to fall upon a paper takes fire in a very little time, and burns away like the other *phosphorus*. The process is a very nice one, but by observing all the rules here laid down, several persons have succeeded in making the *phosphorus* to perfection: the whole intent of the operation seems to be to join together the minute particles of steel and *sulphur*; which when thus joined cannot fail to be very inflammable, and to take fire on receiving the smallest humidity from the air to make them ferment.

It cannot but be observed, that this *phosphorus* is founded on Lemery's experiments of steel and *sulphur*, taking fire together; but this is a greatly more nice and accurate operation, and a fine improvement on the original plan, which was only by mixing large quantities of steel-filings and *sulphur* together into a paste with water, and burying this in the earth to make it take fire of itself, and thus represent the natural phænomena of vulcanos, thunder, lightening, &c. Mem. Acad. Par. 1728.

Phosphorus may be kindled by the effluvia of electricity. See Phil. Trans. N° 475. Sect. 14.

PHOSSA, in zoology, a name understood by some to express the whole genus of pigeons, but more properly it is the name of one species only, the *palumbes*, *torquatus*, or *ring-dove*. See the article RING-*dove*.

PHOTINX, φωτιγξ, in antiquity, a kind of flute in use among the Greeks: it was the same with the *plagiaula* of the Romans. *Hofm.* Lex. Univ. in voc.

PHOXINUS, in zoology, a name given by some to the *rutilus*, or *common roach*. *Rondelet.* de Pisc. See the article RUTILUS.

PHOXINUS *squammosus*, in zoology, the name of a small fresh-water fish, called by some the *bambele*, by others the *riemling*, and by some the *pink*. It seldom is found beyond the length of two or three inches; its head is large in proportion to the rest of its body, and is blackish; and the roots of all its fins have something of a saffron colour; and the joint of the gill fins has a little prominence, which in some is yellow, and in others reddish; its scales are small and whitish, and the lines on its sides reaching from the gills to the tail are brown; its belly and sides are a little yellowish; it has one fin on the back, one behind the anus, a pair at the gills, and another pair on the belly; they love running waters; and when dressed have a bitterish taste. *Gesner*, de Aquat. p. 484.

PHRÆNIAN, in the botanical writings of the antients, a name given to a kind of *anemone*, used in making garlands and other ornaments.

The scholiast on Theocritus observes from Solibius, that the Lacedæmonians called the *anemone* in general *prænion*; and Nicander seems to comprehend under this title several beautiful species of the *anemone*, which he distinguishes from the *chelidonian anemones*; but Athenæus informs us, that others have made the *chelidonian* and *phrænian anemonies* the same. Some have supposed the *anemonies* of the antients used in garlands, and those used in medicine to be different, but the generality of authors do not warrant this.

PHRATRIARCHUS, φρατριαρχος, among the Athenians, a magistrate that presided over the *phratria*, or third part of a tribe. He had the same power over the *phratria*, that the *phylarchus* had over the tribe. *Potter*, Archæol. Græc. T. 1. p. 78. See the article PHYLARCHUS.

PHRENITIS *(Cycl.)* — The preceding symptoms of this disorder are, long watchings, troubled sleep, and very restless dreams, acute and terrible pains of the head, an entire forgetfulness of every thing, and a wandering of the mind, discovering itself by inconsistent answers to questions, a small desire of liquors, tho' the heat of the mouth plainly indicates all that can occasion the most intense thirst; large and slow respiration, a weak and slow pulse, and suppression of urine. All these signs predict an approaching *phrenitis*; but when it has already seized the patient, the blood-vessels of the head all swell, and the temporal arteries have so strong a pulsation, that they are seen to beat very forcibly; the eyes sparkle and look wild and fierce; the talk is all wild and raving; and at certain times the patient has usually violent fits of struggling to get out of bed; the extremities are cold, and the urine thin, white, and pellucid.

The persons most subject to a *phrenitis* are those of a sanguineous and plethoric habit, and much given to anger; such as are addicted to a hot diet, and the use of strong liquors; such as are many hours together exposed to the sun in hot weather in their daily occupations; and such as have been subject to violent head-achs, or have had habitual hæmorrhages at the nose stopped upon them, or have had the blood usually discharged by the hæmorrhoids thrown up into the head; and women who have had the menses stopped upon them, and the blood in the same manner thrown up into the head. These persons are, from such circumstances and accidents, subject to the *phrenitis* as an idiopathic distemper, dependant on no other. But besides these, others are also very subject to it as a symptom in other diseases. People in acute fevers are very often thrown into it by an incompleat critical congestion of blood about the head; and this principally happens to such as have been treated by apothecaries in an improper and injudicious manner. From the sudden checking of sweats many have also been thrown into it, and some from improper bleedings, and more than all these by a too hot regimen.

Method of cure. A clyster is one of the first things to be prescribed in this case; or if this cannot be given from the violence of the patient, the bowels must be gently relaxed by large draughts of warm emollient liquors, with a small addition of nitre; after this bleeding is to be ordered, where the pulse and condition of the patient shew it to be necessary, and gentle alexipharmics are then to be given in repeated small doses, such as the mixtura simplex highly camphorated, and the like; and in the intermediate times the violent emotions of the blood are to be quieted by the use of powders of nitre, tartar of vitriol, crab's eyes, and a small portion of cinnabar; these are to be given with cooling emulsions; a placid regimen must be observed, and the patient kept in a gentle perspiration; and external applications are sometimes of great service, such are spirit of wine and camphor, rubbed on the forehead and temples, and frictions, cataplasms of various kinds, and blisters laid to the soles of the feet. *Junker*'s Consp. Med. p. 304.

Others in this case apply epithems to the forehead, either of the absolutely repellent kind, such as vinegar of roses, or of lavender; these are most proper in the beginning; and if these do not succeed, the resolvents are left afterwards to be tried; such are spirit of wine and camphor, and spirit or tincture of saffron; bags of camphor and nitre in powder, may also be applied, and if these fail it is proper to put on leeches to the temples and behind the ears; bleeding in the jugular vein is another method; and blisters are to be applied to the legs and arms, and sinapisms to the feet, composed of yeast and strong vinegar, with mustard-seed, nitre, and other ingredients of that kind; and, finally, when all these fail, an irritation of the nostrils to promote an hæmorrhage, and bleeding in the nose, as practised in Egypt, and some other countries, is proper. *Heister*'s Consp. Med. p. 125.

Dr. Friend has recommended bleeding at the jugular veins, in a *phrenitis* coming upon a fever; but Dr. Langrish endeavours to prove the bleeding in this case to be rather hurtful; and he thinks the cases quoted by Dr. Friend to prove his opinion, either do it not, or may be turned against him. See Med. Ess. Abrid. Vol. 2. p. 457.

PHRICODES, a term used by the antients for a kind of fever which is attended with a coldness and shivering, not only at the beginning of the fit, but at different intervals throughout its whole continuance. The semitertian fever is of this kind. The usual symptoms of these fevers are a remarkable lowness of the pulse, which is scarce to be felt, but recedes as it were from the finger. The belly is tumified, and a rumbling noise is heard in it, and the tongue is very humid, and irrigated with a sharp acid humor, as with the saliva.

PHRONTIS, a word used by Hippocrates as the name of a peculiar disorder of the general nature of the melancholy affections. In this case the patient, he says, feels, as it were, a thorn pricking the abdominal viscera; he is extremely restless and uneasy, and always avoids light and company. He dreads being touched, and becomes timorous and afraid of every thing; he is molested with troublesome dreams, and imagines that he frequently sees spectres and frightful objects.

PHRYCTE, a word used by the antient physicians as a name for common resin.

PHRYGANIDES, in natural history, a name given by authors to the fly which is produced from the *phryganium*, or common cadosworm, found in ditches, and used as a bait for fish. This has a long body, four brown wings, and a forked tail, and is found in the month of August very frequent on waters.

PHRYGANICUS, in botany, a term used by Dioscorides and many other of the antient Greeks, to express such herbaceous plants as have hard and woody stalks, such are the garden thyme, and several others of that kind: they also called these plants *xylodes*, ξυλωδες, and ξυλωιδεα ποα.

PHRYGIAN, *(Cycl.)* in antient music, the third species of the *diapason*. See the article DIAPASON.

PHRYGIAN *stone*, *phrygius lapis*, in natural history, the name of a stone described by the antients, and used in their time in dying; probably from some vitriolic or aluminous salt contained in it, which served to enliven or fix the colours used by the dyers.

It was a light spungy mass, resembling a pumice, and the whitest and lightest were esteemed the best. Pliny gives us an account of their preparing it for use for dying, which was by moistening it with urine and then heating it red-hot, and suffering it to cool again: this calcination was repeated three times, and the stone was then fit for use; and Dioscorides recommends it in medicine after burning; he says it was drying and astringent.

PHTHIRION, in botany, a name used by some authors for the *pedicularis*, or *red rattle*. *Ger.* Emac. Ind. 2. See the article PEDICULARIS.

PHTHISIS *(Cycl.)*—This disease is properly an ulcerous disposition of the lungs, taking its origin from a stasis of blood in that viscus, which in time degenerates into matter, and which is attended with a very remarkable wasting of the flesh and loss of strength. A *phthisis* in different persons, and at different times, differs in degree; in some cases it is only a tendency to ulceration in the lungs, but in others it is an actual ulceration in that part.

In the first of these cases, where there is only a tendency to an ulceration, the lungs are only stuffed up with a quantity of tenacious and viscid matter, or of a mucous fluid, with a mixture of blood. This matter, by degrees, becomes more and more hard and tough, by the dissipation of its more fluid parts; and hence gives a schirrous hardness to that part of the lungs where it is contained, but is not easily changed into absolute matter. In this case the patient may live many years, and often there is no suspicion of his being in a *phthisis*.

In the second case, or an actual exulceration of the lungs, the disease cannot long remain unknown, but the hectic fever, which is its constant attendant, readily discovers it; and the wasting of flesh, and spitting of matter, soon bring the patient to his end, if speedy and efficacious remedies are not applied.

Many are very anxious about the distinguishing a true *phthisis* from an abdominal hectic; but this is a distinction of very little use in practice, since both cases require the same regimen: the gently resolvent and discutient medicines, and balsamics, which have nothing acid in them, are the proper method in a *phthisis*, and are equally necessary in this hectic. The principal differences, however, between them are these: The abdominal hectic always is attended with a fever, whereas the *phthisis* is often free from a fever, or at least is not attended with one of any consequence. If, in a strong inspiration, on drawing as much breath as may be into the lungs,

the cough is always brought on, and there is a pain and ſtraitneſs in the breaſt, that alſo declares the ſeat of the diſorder to be in the lungs.

Atrophies are alſo much of the ſame nature with a *phthiſis*, differing only in regard to the part they affect, and to the age of the patient. An atrophy is an injury of the glands of the meſentery, pancreas, or liver, and is common to infants; whereas the *phthiſis* is a like diſtemperature of the lungs, and affects perſons nearer the time of their growing to man's eſtate.

A true *phthiſis* is, however, to be carefully diſtinguiſhed from that maraſmus which frequently affects old perſons: this ariſes from many different cauſes, but never from that of a *phthiſis*, or diſtemperature of the lungs. The vomica pulmonum is alſo by ſome confounded with a *phthiſis*, but improperly; for tho' theſe diſtempers are nearly allied to one another, and often degenerate into each other, yet their origin is different. The *phthiſis* takes its origin from an ulcer, properly ſo called; the vomica is an abſceſs, or impoſthumation. The ulcer in a *phthiſis* affects the humid parts of the lungs, where there is leaſt blood; the vomica, on the contrary, is always ſeated in thoſe parts where there is moſt abundance of blood: ſince it generally happens, that a vomica is a ſhorter diſeaſe in its period, and carries the patient off earlier; the *phthiſis* does it more ſlowly and gradually. When a vomica, indeed, does not carry off the patient at firſt, it uſually degenerates into a true *phthiſis*; and on the other hand, when the matter lodged in the lungs in a true *phthiſis* is ſo acrid as to corrode the veſſels, then a vomica pulmonum often comes on in the courſe of that diſeaſe; but theſe are accidental degenerations of one diſeaſe into another, and tho' the firſt caſe is frequent, the other is more rare.

Signs of a phthiſis. This diſeaſe, when it begins ſlowly and gradually, has ſcarce any ſigns at all by which it may be known: the utmoſt ſymptoms of it in this caſe, is a cough, which, tho' not violent, will not be cured. This cough, by degrees, increaſes, and holds the patient always, in ſpite of medicines: in ſome caſes it is moderate, but in others it becomes in a little time very violent. This cough is in ſome attended with a conſiderable ſpitting, in others with very little, and in ſome perſons, both at the beginning and end of the diſtemper, with no ſpitting at all.

It is, however, a vulgar error to ſuppoſe every cough attended with ſpitting to be a conſumption, for very frequently the faults of the firſt concoction will give origin to coughs more violent, and attended with greater ſpitting than thoſe in a genuine *phthiſis*. Hence, for the proper diſtinguiſhing of a *phthiſis*, many other ſymptoms are neceſſary: theſe are, that the patient be of an age ſuited to this diſeaſe, in general, between fifteen and thirty-five: the cough alſo, in a true *phthiſis*, is continual, and always becomes much more violent on being expoſed to the cold, as alſo on drawing the breath very deeply, or taking the effluvia of any acrid ſubſtances: when the matter ſeems fetched up from very deep, and is ſtreaked with blood, or is of an ill ſmell, and approaching to the nature of matter; this alſo denotes the caſe to be a true *phthiſis*. This diſeaſe is always attended alſo with a decay of ſtrength, a ſenſation of a ſtraitneſs in the breaſt, a want of appetite, or a deſire for nothing but cold foods and drinks. The ſleep in this caſe alſo rather tires and weakens than refreſhes the patient, and the mouth is dry, the ſaliva glutinous, and the temper uſually peeviſh, and affected ſtrongly at trifles; the body alſo becomes extremely ſenſible of all changes of the weather. If theſe ſymptoms happen in a caſe where there is either an hereditary diſpoſition to a *phthiſis*, or where there has been any prior injury done to the lungs, there is no room to doubt but that the caſe is a true conſumption or *phthiſis*.

Theſe prior injuries of the lungs may be either from preceding diſeaſes, ſuch as a ſpitting of blood, a peripneumony, or the like; or from external contuſions or wounds of the breaſt; or finally, from frequently being among the vapours of corroſive medicines: and when theſe are attended with a hectic, or loſs of fleſh in the whole body, and particularly in the face, there is not the leaſt room to doubt but that the caſe is a dangerous *phthiſis*. The ſpitting of purulent matter is one of the moſt certain ſigns of a perfect *phthiſis*, but it is not an univerſal one; for there are ſome caſes in which the bronchia and membraneous portions of the lungs only are affected, in which a *phthiſis* may arrive at its greateſt degree without any ſuch ſpiting. It is alſo to be obſerved, that the common thick, yelloviſh, or greeniſh matter, which is frequently voided in large quantities in ſimple coughs, is not to be confounded with the purulent matter voided in a continued *phthiſis*.

The urine of people in this diſeaſe is uſually very like that of perſons in health, except that it retains its froth longer; this, however, is no certain ſymptom of the diſeaſe, for it frequently happens in caſes of ſimple colds, in people of phlegmatic habits.

If a vomica pulmonum comes on from a *phthiſis*, the fever, which was before a ſlow one, aſſumes the appearance of an acute one; and the pain that attends the cough becomes more violent, and reſpiration more difficult; finally, colliquative ſweats, and diarrhœas, are very fatal ſymptoms, uſually appearing towards the laſt ſtages.

Perſons ſubject to a PHTHISIS. Theſe are principally young people of a plethoric habit, accuſtomed to perfect health, and of florid conſtitutions, particularly ſuch as live idle lives. Thoſe who labour hard, or are of a ſcorbutic or phlegmatic habit, are more than all others free from this diſeaſe. Perſons who are ſubject to hæmorrhages of any kind, or to violent pains in the head, and thoſe who find their breath very ſhort after a little exerciſe, and particularly ſuch as have had at any time ſpitings of blood, are moſt ſubject to this diſtemper; as thoſe, on the contrary, who are ſubject to cattarrhal defluctions, to ſimple coughs, or to diarrhœas, or cutaneous eruptions, or external ulcers, are uſually free from it. Women in general are much more expoſed to *phthiſes* than men; and that for this plain reaſon: the ſuppreſſion of any habitual hæmorrhage, endangers the patient as to this diſeaſe; and women are well known to be more ſubject to evacuations of blood than men; and alſo to the ſuppreſſions of thoſe evacuations.

Old people are very ſeldom found to have *phthiſes*, unleſs they ariſe from violent external injuries; and very young perſons are as ſeldom liable to them, unleſs from ſuppreſſions of large and habitual hæmorrhages by the noſe.

Cauſes of a PHTHISIS. The remote cauſe of this diſeaſe, is a plethoric habit; the proximate cauſe is a congeſtion of florid, rarely of ſerous blood, in the breaſt. The occaſional, or accidental cauſes, are either external injuries from blows, falls, or bruiſes on the breaſt, a violent cough in the autumn, at which ſeaſon the air is peculiarly bad for all perſons inclined to a *phthiſis*; the abuſe of ſpirituous liquors, the immoderate uſe of venery, the receiving the fumes of corroſive medicines, and finally, the improper cure of other diſeaſes, particularly the ſuppreſſing of fevers and hæmorrhages by aſtringents, without any previous cautions. An hereditary diſpoſition is alſo frequently in fault; the cough which attends this diſeaſe is only an effort of nature, to break through the congeſtion in the firſt ſtages, and in the latter, to throw up the matter occaſioned by it.

Prognoſtics in it. A true *phthiſis*, even in its beginning, is a dangerous diſeaſe, and admits but of a very dubious prognoſtic; but when in an advanced ſtate, it is always fatal. The reaſon of this is evident, becauſe there are in this caſe real ulcers in the lungs, and we well know that no ulcer can be cured till it is firſt perfectly cleanſed, and that is not eaſy in an internal part; and after this, the healing up of a wound in the lungs is ſcarce to be expected, as thoſe parts are continually diſturbed by the very drawing in and voiding the breath, and greatly more ſo by the cough. There have been, however, inſtances of cures in the beginning of a *phthiſis*, in which there have been evident proofs of a reſtitution and cicatrization of the parts.

People of a dry habit are much ſooner carried off by it than thoſe of a moiſt one; as are alſo thoſe of a briſk diſpoſition, than thoſe of a more languid temper; and finally, younger perſons uſually die ſooner in it, than thoſe who are more advanced in years. Women, as they are more ſubject to a *phthiſis* than men, ſo they are more eaſily cured. This diſtemper is often brought upon them merely from a ſuppreſſion of the menſes, and in that caſe it is often cured only by regularly bringing them again to their proper periods. The hectic fever in theſe caſes is what haſtens the death of the patient; ſo that the leſs of that fever the patient has, the longer he lives under it.

When the ſpitting of true purulent matter is come on, and is attended with colliquative ſweats and a diarrhœa, there is no farther hope for the patient; and in general, what is reported of the curing of conſumptions, is founded on errors, and other caſes have been miſtaken for it. A catarrhal cough become habitual, and attended with a voiding of a thick, pulpy, greeniſh matter, is often miſtaken for a conſumption: as is alſo a ſlow fever, attended with copious ſweats, and an extenuation of the body; or a recent hectic, ariſing from a continued ſlow fever; or a merely aſthmatic diſorder of the breaſt; or finally, a hæmoptyſis has been miſtaken for a *phthiſis*. In all the caſes ſaid to have been *phthiſes*, and perfectly cured, either one of theſe has been the caſe, or the mere ſtrength of nature, aſſiſted by happy circumſtances in the conſtitution, not to be expected from one perſon in a thouſand, have carried the patient through it.

Method of Cure. The general method in a genuine *phthiſis*, is to reſpect firſt the reſolving, abſtergiog, and diſcuſſing the ulcerous matter in the lungs; and after this to attempt the cleanſing and healing of the ulcers; afterwards to reſtore the ſtrength by analeptics, and to give the weakened parts their due tone again: and during this, the ſeveral ſymptoms, ſuch as the cough, fever, *&c.* are to be palliated as much as may be.

To this end, in the beginning of the courſe, gentle laxatives are by all means to be given; ſuch as ſmall doſes of rhubarb, with manna, tamarinds, and the like: and in ſubjects abounding with bad humors, jalap, ſena, and, in ſome caſes, even mercurius dulcis are found neceſſary; but this laſt medicine is only to be given with the utmoſt caution, for fear of a ſalivation. After a few doſes of the laxatives, the reſolvent, abſtergent, and diſcutient medicines are to be given for ſeveral weeks together; ſuch are, decoctions of pimpernell, elecampane, florentine, iris, birth-wort, and freſh arum-

root,

root, with maidenhair, horehound, hyſſop, and daiſy-leaves: the gum-reſins are alſo to be given in ſmall doſes; ſuch as ammoniacum, ſagapenum, and the like; and mixtures of crabs eyes ſaturated with lemon juice, with vitriolated tartar diſſolved in the pectoral waters, are to be given every day three or four times: a little nitre cautiouſly given in the intermediate times, will alſo be of great uſe in abating or taking off the fever. After this, the healing the ulcerated parts is to be attempted by the more temperate balſamics; ſuch as boiled turpentine, maſtic, olibanum, balſam of Peru and capivi, and Lucatellus's balſam: with theſe there always muſt be joined ſuch things as will nouriſh and give ſtrength; ſuch are emulſions made rich with ſweet almonds, with jellies and conſerve of roſes.

If the violence of the diſorder is found to remit on this Method, it will be proper to give a mixture of ſpirit of ſal armoniac, with tincture of ſalt of tartar, in doſes of about twenty drops, three times a day: this is greatly ſerviceable in reſtoring the parts to their due tone; and if the cough ſtill continues violent, it will be proper to give ſmall doſes of the ſtorax-pill at night. If the diſeaſe is finally taken off by this method, it will be proper afterwards, by way of prevention, to bleed freely in the foot every ſpring and autumn; to recall, by all poſſible means, any habitual diſcharges of blood that had been ſtopped or ſuppreſſed; and particularly in men to promote a diſcharge by the hæmorrhoidal veins, by applying leeches to the part: the patient is not to be loaded with medicines in this caſe, but it will be ſufficient always to keep the bowels moderately open, and to uſe moderate, but not violent exerciſe, with diets that are ſoft and eaſy of digeſtion. *Junck.* Conſp. Med. p. 160, ſeq.

Mr. de Sault endeavours to prove, that a conſumption of the lungs always depends on tubercles, and that an ulcer there is only an effect of theſe tubercles; and when the diſeaſe is in its laſt ſtadium, and incurable, it then only becomes contagious, by ſmall worms, which it communicates to others. The cure which he propoſes for the conſumption, before it comes to the laſt ſtage, is to reſolve the tubercles with mercury, ſteel, millepedes, and the aperient and antiſcorbutic plants. He remarks, that the liver is generally hard in this diſeaſe; and therefore he applies a warm mercurial plaiſter to the right hypochondriac region, rubbing ſome mercurial ointment every night on the ſkin of that part; then continues in the uſe of tablets made with ſteel, millepedes, benzoin, coral and crabs-eyes, of each half an ounce; cinnamon, three drachms; ſugar, half a pound; mix all with the mucilage of gum-tragacanth, made with orange-flower water. The doſe of theſe tablets is two drachms, morning and evening, waſhing it down with a ptiſan made of the roots of nettles, two ounces of the juice of water-creſſes, and as much juice of cervill. Med. Eſſ. Edinb. He ſays this method, with riding, has often been ſucceſsful.

Dr. Cheyne thinks that a total milk and ſeed diet, with frequent phlebotomies, vomits, bark in the morning and rhubarb at night, will totally cure conſumptions. See his Nat. Method. of Cures, p. 264.

Morton reckons among the ſpecies of *phthiſis*, thoſe proceeding from the diarrhœa, dyſentery, gonorrhœa, hæmorrhage, and dropſy, and from many other diſeaſes; and perhaps there are many other remote cauſes which can produce a conſumption, without varying the common immediate cauſe of the diſeaſe, or the method of cure. Med. Eſſ. Edinb. V. I. p. 266.

This diſtemper, according to ſome, is principally to be cured by frequent bleedings in ſmall quantities. Med. Eſſ. Edinb.

PHU, in botany, a name by which ſome authors call the great garden valerian. *C. Bauh.* p. 164.

PHYCIS, in zoology, the name of a fiſh of the truttaceous kind, more uſually called *callarias*, or *aſellus callarias*, and *tinca marina*, or ſea-tench. *Geſner*, de Piſc. p. 819. See the article CALLARIAS.

PHYCIS, in ichthyology, is alſo a name given by Artedi, after Ariſtotle, Pliny, and the reſt of the antients, to a fiſh nearly allied to the genus of the *blenni*, and called by ſome *trebius* and *fuca*; and according to Rondeletius, the *tinca marina* of the Italians. Salvian, however, denies that it is the *tinca marina*, and the matter is yet undecided among the writers on this ſubject. See TINCA *marina*.

PHYCITES, in natural hiſtory, the name given by the antients to a ſtone which had the impreſſion of a ſea plant of the fucus or alga kind; probably in the manner in which our black coal ſlate is frequently found to contain the impreſſions of fern and other vegetables.

PHYLACISTÆ, among the antients, officers to whoſe keeping the ſlaves in priſons and work-houſes were committed. *Pitiſc.* Lex. Ant. in voc.

PHYLARCHUS, φυλαρχος, among the Athenians. The *phylarchi* were magiſtrates who had each of them the government of a tribe committed to his charge; and their buſineſs was to take care of the public treaſure belonging to each tribe, to manage all their concerns, and call them together as oft as any thing happened that required the preſence of the whole body. *Potter*, Archæol. Græc. l. 1. c. 13. T. 1. p. 78.

PHYLATERIA, a name given by ſome botanical authors to the *polium*, or poly-mountain. *Ger.* Emac. Ind. 2.

PHYLLA, among the antients, wreaths, or fillets, that hung from the womens head dreſs, in form of flowers. *Pitiſc.* Lex Antiq. in voc.

PHYLLANTHUS, in botany, the name of a genus of plants, called by Martin, in his centuries, *niruri*, as alſo in the hortus amſtelodamenſis, and malabaricus.

The characters are theſe: the flowers are ſome male and others female, produced on the ſame plant. In the male flowers the cup is compoſed of one leaf, of a campanulated form, and divided into ſix oval and obtuſe ſegments: theſe are coloured, and are the whole flower, for there are no petals. The ſtamina are three filaments, ſhorter than the cup, ſtanding cloſe at the baſe, and expanding towards the points. The antheræ are double in the female flower. The cup is the ſame as in the male, and there are no petals. The nectarium is a ſort of rim of twelve angles, ſurrounding the germen of the piſtil. This germen is roundiſh, but obtuſely trigonal. The ſtyles are three, they ſtand expanded, and are obtuſely bifid at the extremities. The ſtigmata are obtuſe. The fruit is a roundiſh capſule, marked with three furrows, and containing three cells, each compoſed of two valves. The ſeeds are ſingle and roundiſh, and do not wholly fill the cells of the capſule. *Linnæi* Gen. Pl. 447. *Martin*, Cent. 1. p. 9. Hort. Mal. Vol. 10. p. 27.

PHYLLEN, in botany, a name given by ſome of the old authors to the *mercurialis*, or male and female French mercury. *Ger.* Emac. Ind. 2.

PHYLLEREA, *phillerey*, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts only of one leaf, and is of a bell like ſhape, and divided into four ſegments at the edges. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower. This finally becomes a fruit of a roundiſh figure, containing roundiſh ſeeds.

The ſpecies of *phyllerey*, enumerated by Mr. Tournefort, are theſe: 1. The broad-leaved ſmooth *phyllerey*. 2. The broad-leaved prickly *phillerey*. 3. The *phyllerey* with lightly ſerrated leaves. 4. The privet-leaved *phyllerey*. 5. The common narrow-leaved *phyllerey*. 6. The longer narrow-leaved *phyllerey*. 7. The narrow-leaved prickly *phyllerey*. 8. The *phyllerey* with long and deeply ſerrated leaves. 9. The box-leaved *phyllerey*. 10. The Spaniſh bay-leaved prickly *phyllerey*. 11. The Spaniſh nerium-leaved *phyllerey*. 12. The dwarf American *phyllerey*, with thick yellow roots, and ſharp-pointed leaves. And, 13. The dwarf American *phyllerey*, with a thick roſe-coloured root and roundiſh leaves. *Tourn.* Inſt. p. 596.

PHYLLITIS, *hart's tongue*. The ſeveral ſpecies of this plant ſee enumerated under the word LINGUA *cervina*.

It is recommended by many as an aſtringent, and has a place in moſt of our diſpenſatories. The common kind is eſteemed the beſt for medicinal uſe; it is found in old wells, and under damp walls, ſometimes in the ditches under very thick hedges. It is given, in powder or decoction, in ſwellings and indurations of the ſpleen; as alſo in diarrhœas, and in ſpitting of blood, or other hæmorrhages, externally: it is accounted a good mundificative for old ulcers. Ray, in his hiſtory of plants, tells us alſo, that the powder of the dried leaves does wonders in palpitations of the heart, and hyſteric affections.

PHYLLITIS *marina*, *ſea-hart's tongue*, in natural hiſtory, a name given by ſome authors to a ſpecies of ſea-plant, the leaves of which, in ſome degree, reſemble thoſe of the common *hart's tongue*. It grows on the rocks at great depths, and is ſeldom ſeen, unleſs when taken up by the coral fiſhers. Its leaves are ſometimes ſingle, ſometimes they divide into two: they are of a duſky green colour, and are about two inches in length: they have each a nerve or rib running along their middle: they are very thin and tranſparent, and are of a ſort of cartilaginous ſtructure; and each has ſeveral rows of ſmall points on each ſide of the middle rib, which not unaptly reſemble the ſeed ſpots on the leaves of ſome of the capillary plants; but not on thoſe of the *phyllitis*, or hart's tongue in particular, becauſe they are in that plant not round but oblong, and ſtand only in a ſingle row on each ſide the rib. When this plant is viewed by the microſcope, it appears in all parts of the leaf full of little holes; and thoſe which are ſo plain to the naked eye, are no other way different from the imperceptible ones, but in that they are larger. The plant has no root, and therefore takes in its nouriſhment by theſe numerous holes in its ſurface. *Marſigli*, Hiſt. Mer.

PHYLLITIS *marina Triumfetti*, in natural hiſtory, the name of a ſea plant, deſcribed by count Marſigli and others, and taking its denomination from Triumfetti's judging it like the common *hart's tongue*, which grows on the ſides of wells, and in other ſuch places. It is found in great abundance on the coaſts of the Mediterranean in ſeveral places at different depths, and grows to the rocks and ſtones. It grows to about three inches in height, and its colour is a yellowiſh green; it is ſoft and tough while in the water, but when dried it becomes very brittle, and may be rubbed to powder between the fingers. It is very elegantly branched, and its leaves are diſpoſed with great ſymmetry and regularity, and are placed in a nice order for the properly receiving nouriſhment and conveying it all over the plant. On examining theſe leaves with a microſcope, they are found to be in reality only ſo many tubes, hollow all the way along, and having an aperture at the extremity,

tremity, by which they admit the ſea water: as theſe ſtand above one another on the main ſtalks, each receives its portion of fluid, and tranſmits it without mixing with the reſt, pure to that part of the ſtalk where it joins: they are all nicely jointed on to the main ſtalk or trunk, and that alſo is hollow as well as the leaves. The leaves of moſt of the ſea plants, on being examined by the microſcope, appear to be full of glandules and tubercles, which are in reality ſo many ſmall pipes deſtined to admit the ſea water; but in this plant, as that water is admitted in ſufficient plenty by the extremities of the leaves, the reſt of their ſurface is kept ſmooth and perfectly even. *Marſigli*, Hiſt. de la Mer, p. 76.

PHYLLOBOLIA, φυλλοβολια, in antiquity, a cuſtom that prevailed among the antients to ſtrow flowers and leaves on the tombs of the dead. The Romans adopted this cuſtom from the Greeks, and added likewiſe wool. See the article BURYING.

The *phyllobolia* was alſo uſed on occaſion of a victory obtained at any of the public games; when not only the victors, but likewiſe their parents, were ſtrowed with flowers and leaves. *Hofm.* Lex Univ. in voc.

PHYLOBASILES, φυλοβασιλεις, among the Athenians, magiſtrates, who, with reſpect to particular tribes, had the ſame office that the *baſileus* had, with reſpect to the commonwealth.

They were choſen out of the eupatridæ or nobility, had the care of public ſacrifices, and other divine worſhip peculiar to their reſpective tribes, and kept their court in the portico called *baſileion*, and ſometimes in the *buculeian*. *Potter*, Archæol. Græc. T. 1. p. 78.

PHYRAMA, in the materia medica, a name given by ſome of the old writers to the gum ammoniacum, particularly to that kind of it which was ſoft and ductile between the fingers. It is not clear that the gum ammoniacum of thoſe times was the ſame thing which we now know by that name; at leaſt it is certain, that the other kind of it, which they called *thrauma*, or *ammoniacum thrauſtum*, was not; for Dioſcorides deſcribes this as being of a reddiſh-brown colour, and very friable; and Aviſenna ſays, that it marked a fine yellow or gold colour upon paper. Theſe are properties by no means agreeing with our gum ammoniacum; and if juſtly applicable to that, muſt prove that it could not be the ſame; and the characters given by Aviſenna of its bitterneſs, and making a yellow ſtain upon paper, ſeems to make it the *gamboge*. This, however, by no means can agree with the other virtues attributed to it.

PHYSALUS, a name given by Rondeletius to a ſpecies of ſea inſect, of the *ſcolopendra marina* kind, ſuppoſed by ſome to be the ſame with the *ſcolopendra marina*, or *centipes* of the Iriſh ſea, deſcribed by Molyneux; but this does not appear to be the caſe, on a ſtrict enquiry. The *phyſalus* of Rondeletius has no mouth, whereas the ſea *centipes* of Ireland has a remarkably large one: that of Rondeletius is wider in the middle, and tapers at each end; but the Iriſh kind is largeſt at the head, and tapers from thence all the way to the tail. Rondeletius's has tubercles on the back, but the Iriſh one has only hairy ſtripes; and his is a poiſonous animal, whereas that of Ireland was found in the ſtomach of a cod-fiſh, which had eaten it as food. The figure given by Rondeletius agrees alſo very well with the account he gives, but not with the figure of that drawn upon the ſpot from the Iriſh fiſh, and given in the Philoſophical Tranſactions. On the whole, nothing is more plain than that theſe are two diſtinct ſpecies of animals, tho' of the ſame genus. Phil. Tranſ. N° 225. See the article SCOLOPENDRA.

PHYSETER, in ichthyology, the name of a genus of fiſhes of the *plagiure* kind, the characters of which are theſe: The teeth are crooked, and are placed only in the lower jaw There is one high fin or ſpine on the back, and a fiſtula or hole in the forehead. There are only two known ſpecies of this genus; theſe are, 1. The *phyſeter* with the upper jaw longer than the under one, and with a long ſpine on the back. The head of this fiſh is ſo large, that it is half as long as the body, and thicker than the thickeſt part of it. The lower part of the upper jaw runs out two foot beyond the under one, and its upper part more than five foot. The eyes are remarkably ſmall, ſcarce longer than thoſe of a haddock; the fiſtula or pipe, is placed a little above the center of the head; it is divided into two channels, and covered with one common operculum; the teeth are in number forty-four, and all of the ſhape of a reaper's ſickle, roundiſh and a little flatted, thickeſt and moſt arched in the middle; and at the end terminating in a cone very ſharp-pointed; the baſe is thinner than the middle of the tooth. 2. The *phyſeter* with a very high back-fin, with the tops of the teeth flat. This is a ſpecies of whale, deſcribed, as well as the former, by Sibbald The head is very large; the fiſtula, or pipe, is in the middle of the head; the fin ſtands ſo high in the middle of the back, that it has been compared to the mizzen maſt of a ſhip. *Artedi*, Gen. Piſc. See the article BALÆNA.

The name *phyſeter* is of Greek origin, and is derived from the verb φυσαω, to blow. It has this name from its quality of taking in a great quantity of ſea water, and then blowing it out again with great force and violence.

PHYSIOLOGI, in botany, thoſe authors whoſe writings tend to ſet that ſtudy in its cleareſt light, by explicating and enumerating the various diſpoſitions of the male and female parts in the flowers of plants. *Linnæi* Fund. Bot. p. 2.

PHYSOCELE, a word uſed by many authors to expreſs a *wind-rupture*.

PHYSTA, in ichthyology, a name given by Geſner, and ſome others, to the fiſh called by the Greeks, and many of the later authors, *ballerus* and *balerus*. Artedi denies its right to any general name, reducing it to the genus of the cyprini, to which it evidently belongs, and diſtinguiſhing it from the others of that numerous genus by the ſpecific name of the very broad and thin *cyprinus*, with forty rays in the pinna ani. See the articles BALLERUS and CYPRINUS.

PHYSTE, in the writings of the antient phyſicians, a word uſed to expreſs a maſs of meal macerated in a cloſe veſſel with wine, but not left to ferment.

PHYTALIA, a word uſed by the antients in two very different ſenſes; with ſome expreſſing the latter part of the winter ſeaſon, and with others a place where vines are planted, whither in ſtandard vineyards or otherwiſe.

PHYTOLACA, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the roſaceous kind, conſiſting of ſeveral petals arranged in a circular order; from its center ariſes a piſtil, which finally becomes a ſoft fruit or berry of an oval figure, or nearly round, and containing ſeveral ſeeds diſpoſed in a circular order.

The ſpecies of *phytolaca*, enumerated by Mr. Tournefort, are theſe: 1. The larger fruited American *phytolaca*, called by authors the *great red cluſter-fruited Virginian nightſhade*. 2. The American *phytolaca*, with ſmaller fruit. *Tourn.* Inſt. p. 299.

PHYTOLOGI, *phytologiſts*, authors who have written any treatiſe on botany, or the hiſtory or uſes of vegetables. *Linnæi* Fund. Bot. p. 4.

PIA *mater (Cycl.)* —According to Mr. Le Cat, the *pia mater* gives three membranes to the eye; the firſt lines the ſclerotic coat, and is joined to it; the ſecond is the choroid coat, and the third is the villous mammary one, proceeding from the choroid, and is commonly called *Ruyſche's coat*. Med. Eſſ. Edinb. abrid. Vol. II. p. 482.

PIABA, in ichthyology, the name of a ſmall freſh-water fiſh, caught in all the freſh rivers and brooks in the Braſils, and ſome other parts of America.

It is of the ſize of the common minow; its eyes have a fine black pupil, and a yellow iris; it is covered with ſmall ſcales, and has a triangular fin on its back, two under the belly, two at the gills, and one behind the anus; its tail is forked; its head is of a mixed yellow and white, and of the brightneſs of gold and ſilver; its back is of a ſilvery hue, with an admixture of green, and in ſome parts of a fine ſtrong blue; and the ſides of a ſilvery white and blue, without any admixture of green; and its belly of a mixed yellow and white, with only a ſlight caſt of blue; behind each of the gills it has a fine deep blue ſpot, and immediately behind that another of the ſame colour, but of a lunated ſhape; and two other oblong ones of the ſame colour, near the origin of the tail; its tail and back-fins are yellow; its belly-fins red; it is a well-taſted fiſh, and much eſteemed by the natives. *Willughby*'s Hiſt. Piſc. p. 269.

PIABUCU, in zoology, the name of an American fiſh eaten by the natives in many places. It is a ravenous fiſh, and ſo greedy of blood, that if a man goes into the water with a wound in any part of his body, this fiſh will make up to it to ſuck the blood. It is a ſmall fiſh, ſeldom exceeding four inches in length, and of no great breadth; its belly is ſomewhat protuberant, and the whole fiſh is covered with bright ſilver-coloured ſcales. The lines running one on each ſide from the gills to the tail are broad, and not ſhining like the reſt of the body; the back is of a greeniſh olive-colour, and the fins are white. *Marggrave*'s Hiſt. of Braſil.

PIAFFEUR, in the manege, is a proud, ſtately horſe, who, being full of mettle, or fire, reſtleſs and foreward, with a great deal of motion, and an exceſſive eagerneſs to go forwards, makes this motion the more that you endeavour to keep him in, and bends his leg up to his belly. He ſnorts, traverſes if he can, and by his fiery action ſhews his reſtleſsneſs; whence ſome, though very improperly, ſay, he dances. Such horſes as theſe, or ſuch as are bred to paſſage upon a ſtraight line, are much admired in carouſels and magnificent feſtivals. See the articles SNORT and PASSADE.

PIANISSIMO, in the Italian muſic, is uſed to ſignify that the part to which it is added ſhould be played very ſoftly, and ſo as that the ſound may ſeem at a great diſtance, and almoſt loſt in air. See *Corelli* Concerto VIII. in fine.

PIANO, in the Italian muſic, ſignifies ſoft and ſweet, by way of an echo.

PIANO PIANO, or PIU PIANO, in the Italian muſic, is nearly the ſame with *pianiſſimo*, or rather a degree between it and *piano*.

Piu PIANO, in the Italian muſic, ſignifies more ſlow, or more ſoft, and is much the ſame with *piano piano*.

PIC, an Eaſt Indian weight, containing 100 catis. See the article CATI.

PICA, the *pye*, or *magpie*, in the Linnæan ſyſtem of zoology, the name of one whole order of the bird kind; the character of which is, that they have a convex beak, flatted above. The birds of this order are, the bird of paradiſe, the magpie, the crow, the cuckow, the wood-pecker, the ſitta, the creeper, the hoopoe, and the iſpida. *Linnæi* Syſtema Naturæ, p. 44.

Of this genus of birds, authors enumerate the following ſpecies: 1. The *pica varia caudata*, or common *magpie*. 2 The *pica braſilienſis*, called *toucan*. (See the article TOUCAN.) 3. The *pica glanduria*, or common jay. 4. The *garrulus argentoratenſis*, or roller. (See the article ROLLER.) 5. The *pica marina*, or ſea *pie*, a very beautiful ſpecies, being all green except the head, neck, and feet, and a ſmall part of the wings; the head is cheſnut-coloured on the top, and yellow at the ſides, and its feet brown; its claws black and very ſharp, and it has a ſmall variegation of cheſnut colour on its wings. This Mr. Ray ſuſpects, however, to be no other than the *garrulus argentoratenſis*, or roller. 6. The *pica perſica*, or Perſian *pie*, variegated with yellow; and two others mentioned by Charleton, the *pica caudata indica*, or long-tailed Indian *magpie*; and the *mimus*, or *pica garrula indica*; a bird reſembling our jay, but much ſmaller: theſe two laſt, however, are mentioned by no other author, and have never been ſeen in Europe. *Ray*'s Ornithology, p. 87, 88, 89, 90.

PICA is alſo a name by which ſome have called the *lanius*, or butcher bird. *Ray*'s Ornithology, p. 52. See the article LANIUS.

PICA *marina*, in ornithology, the name of a bird called in Engliſh the *ſea pie*, and by Bellonius and ſome others, the *hæmatopus*. It is of the ſize of the common *magpie*; its beak is three fingers breadth long, ſtrait, and of a reddiſh, or a blackiſh colour, and ending in a point, and ſeeming well-fitted for its buſineſs of rooting up the limpets from the rocks, the bodies of this fiſh being its common food; its legs are red; it has no hinder toe, and has its other toes ſo far connected by a membrane, as to ſeem almoſt of a middle nature between the web-footed and other birds; its head, neck, back, throat, and half its breaſt are black, as is alſo its rump; its tail is half black, and half white, as are alſo its wings. It is common on the weſtern ſhores of England, and on the ſhores of Wales. *Ray*'s Ornithology, p. 230.

PICA *marina* is alſo uſed by Geſner very improperly for the bird commonly known by the name of *anas arctica cluſi*. *Aldrovand.* de Avib. T. 3. p. 315. See the article DUCK.

PICA *naſi*, in medicine, a name given by Cohauſen to the immoderate taking of ſnuff. It ſeems a whimſical term, but he chuſes to treat this habit as a diſeaſe, and has written an expreſs treatiſe concerning it. The word *pica*, in general, denotes an abſurd and unnatural appetite; and the deſire of taking the powder of tobacco in this manner, is called a diſtempered appetite of the part into which it is taken, that is, the noſe.

The conſequences of the taking ſnuff immoderately, are, that the ſenſe of ſmelling is either entirely deſtroyed, or at leaſt greatly impaired: for the nervous tubercles of the noſtrils being continually vellicated by this powder, are by degrees clogged up, or wholly deſtroyed, and the ſenſible membrane, which lines the noſtrils, is rendered callous, and wholly unfit for the diſcharge of its office in ſmelling. The voice is next affected by this powder; for it cauſes a ſort of aſtriction at the bottom of the noſe, which affects the palate, and conſequently the ſpeech; this gives the perſon who takes it a continual deſire of taking more and more, to rid himſelf of that ſtoppage. *Cohauſen*, de Pica Naſi.

PICACIA, a name given by the antients to that diſtempered appetite of women with child, and maidens at a certain time of life, which makes them long for things not fit for food. It is more uſually called *pica*.

PICACUROBA, in zoology, the name of a Braſilian ſpecies of pigeon, of a greyiſh colour variegated with a reddiſh brown, and with very red legs and feet. *Marggrave*'s Hiſt. of Braſil.

PICARDS *(Cycl.)* — PICARD, in our old writers, a kind of large boat, of about fifteen tons or upwards, uſed on the river Severn. Stat. 35 Hen. VIII. c. 9. 13 Eliz. c. 11.

PICICITLI, in zoology, the name of a bird of the Spaniſh Weſt Indies, deſcribed by Nieremberg. Its head and neck are black, and its whole body grey; it is a ſmall bird, and makes its appearance in Mexico after the rainy ſeaſons; it is a bird of paſſage, and it is not known where it breeds. *Ray*'s Ornithol. p. 305.

PICK, among miners, is a tool with which they uſe to cut down the cliſts and rocks of ſtone to make paſſages in the earth *Houghton*'s Compl. Miner in the Explan. of the Terms.

PICK-*ax*, in the military art, a tool carried by the pioneers to dig up ground that is too hard for the ſpade; they are of great uſe for mending the ways, and in fortification.

PICKER, or *horſe*-PICKER, in the manege, an iron inſtrument five or ſix inches long, bent or crooked on one ſide, and flat and pointed on the other. It is uſed by the grooms to cleanſe the inſide of the horſes feet, and to pick out the earth, ſand, or ſmall ſtones that get into them.

PICKERELL, in ichthyology, an Engliſh name uſed by ſome authors for the *jack* or *pike*.

PICOLOS, the name of an antient Pruſſian idol, to which human ſacrifice was offered. See the article POTRIMPOS.

PICOTA, a name given by ſome authors to a diſtemper which they deſcribe as conſiſting wholly in an eruption of a number of very minute pimples upon the ſkin, all over the body; it is attended with no danger, unleſs they are ſtruck in.

PICRIS, in botany, the name given by Linnæus to a genus of plants called by Vaillant *helminthotheca*; the characters of which are theſe: The common cup is double; the outer cup is very large, and compoſed of five cordated leaves; the interior is imbricated and of an oval figure, and is not cloſe at the mouth, as the other, but open. The flower is of the compound kind, it is imbricated and uniform; and the ſmall flowers of which it is compoſed, are equal and numerous; each is compoſed of one petal, and is narrow, ligulated, and truncated at the end, where it is divided into five ſegments; the ſtamina are five capillary filaments, ſo ſhort that they are hardly ſeen; the antheræ are cylindric and tubulate; the germen of the piſtil ſtands under the flower; the ſtyle is of the length of the ſtamina, and the ſtigmata are two in number, and reflex. The cups both remain when the flowers are fallen, and ſerve as capſules for the ſeeds, which are ſingle, ventricoſe, obtuſe, and crowned with a plume of down; the receptacle is naked.

In ſome of the ſpecies of this genus, the ſeeds are crooked, and have a ſeſſile down; in others they are ſtrait, and their down is placed on a pedicle. *Linnæi* Gen. Pl. p. 377.

PICTA *toga*, among the Romans. See TOGA *picta*.

PICTAVIENSIS *colica*, the name of a kind of very terrible nervous colic, more uſually called *colica pictonum*; and by the natives in the Weſt Indies, where it rages, the *dry belly-ach*. It is ſo popular a diſeaſe in the Leeward Iſlands, that it may be very juſtly reckoned endemic among them, moſt of the people there having been at one time or other ſubject to it in all its fury. See the article COLIC.

PICUIPINIMA, in zoology, the name of a Braſilian ſpecies of pigeon, very ſmall, ſcarce exceeding the lark in ſize. Its head, neck, and wings, are all of a pale-lead colour, with a black ſemilunar mark at the extremity of each wing; but its long wing feathers, which are ſeen when the wings are expanded in flying, are of a reddiſh-brown on one ſide, and blackiſh on the other, with black ends or tips; the tail is long, and is variegated with black, white, and brown; the belly is covered with white feathers, every one of which has a brown mark of the ſhape of a half moon at the end. *Marggrave*'s Hiſt. of Braſil.

PICUS, or PICUS *martius*, in zoology, the name of a large genus of birds, of the wood-pecker kind, the characters of which are theſe: They have a ſtrait, very hard, ſtrong and ſharp beak, proper for making holes in trees; and a very long cylindrical-ſhaped tongue, terminated by a rigid and ſharp bony ſpine, ſerrated or notched at each end, proper for the ſeizing on, and tearing to pieces, of worms and other inſects; and this they can, at pleaſure, thruſt out to a great length; and ſtriking it into the cliſts of trees, faſten it into inſects that lie there, and draw them out with it. Their thighs are very ſhort and ſtrong, and their toes four in number, placed two before and two behind; their tails are rigid, and bent downwards, and their feathers bare at the ends, the ſtumps aſſiſting the creature in climbing: they live only on inſects, and have only ten feathers in their tail. *Ray*'s Ornithology, p. 91.

Some underſtand the word *picus* in a larger ſenſe, making it take in the *ſitta*, *picus murarius*, *junco*, *certhia*, and all the birds that climb trees. In which caſe the characters of the genus are only, that they have very ſhort, thick, and ſtrong legs, adapted to the running up the bodies and branches of trees.

The *pici*, or wood-peckers, properly ſo called, however, are a very large and numerous family; they are, 1. The great black wood-pecker, which is all over black, except that the crown of his head is of a fine florid red. This is called the *picus niger maximus*, by authors, and is the largeſt of the whole genus: it is common in the woods of Germany, but not in England. 2. The *picus viridis*, or common green wood-pecker, well known by its beautiful colours, and its loud and diſagreeable noiſe. 3. The *picus varius major*, the great ſpotted wood-pecker. This is ſomewhat larger than the thruſh, and has a yellowiſh breaſt and beautiful redneſs near the tail. 4. The *picus varius minor*, called in Engliſh the *hickwall*. (See HICKWALL.) 5. The *picus varius Braſilienſis*, or ſpotted Braſilian wood-pecker, called the *ipecu*. (See IPECU.) 6. The *jynx*, or wry neck. (See JYNX.) 7. The *jacamaciri* of the Braſilians. 8. The *curucui*. 9. The *guira-acangatara*. 10. The *aracari*; and 11. The *guira-tangemia*; and 12. The *japu* of the ſame nation; all which ſee under their ſeveral names; and beſides all theſe, Aldrovandus deſcribes another ſpecies, which he calls the *picus luteus cyanopus perſicus*, or blue-footed yellow Perſian wood-pecker. This is of the ſame ſize with the common wood-pecker; but its head and neck are thicker, and its beak longer; its feet are blue, and its general colour yellow; but with

with a broad line of a ferrugineous brown down the back. *Ray*'s Ornithol. p. 96. *Aldrovand.* de Avibus, l. 12. c. 35.

In the Linnæan ſyſtem of zoology, the *picus* makes a diſtinct genus of birds, of the order of the pyes. The characters of this genus, according to this author, are, that the feet have two toes before; the tail is rigid and of the ſhape of a wedge; the bill is angular, and terminates in the form of a wedge; the tongue is pointed, hard, and ſharp.

Of this genus are the black, green, and variegated woodpecker, and the three-toed ſpecies, deſcribed in the acta literaria ſueciæ in 1740. *Linnæi* Syſtem. Natur. p. 45.

PICUS *imbrifœtus*, in zoology, the name of an American bird, deſcribed by Nieremberg, and called by the natives *quatotoni*. It is of the ſize of the hoopoe, and is variegated with black and brown. It is of the wood-pecker kind, having a beak three finger's breadth long, with which it perforates trees. Its head is ſmall and red, and has a fine red creſt; but the feathers are black on their upper ſide. It has on each ſide of the neck a broad white line, reaching to the breaſt. Its legs and feet are of a bluiſh colour. It builds in high trees, and is principally found near the ſhores of the ſouth ſea. It feeds on inſects. *Ray*'s Ornithol. p. 301.

PICUS *murarius*, in zoology, the name of a bird called in Engliſh the *wall-creeper*, and but improperly ranked among the *pici*, as wanting many of the characters of that genus. It is about the bigneſs of the common ſparrow; its bill is black, ſlender, and long; its head, neck, and back grey; its breaſt white, and its wings partly grey and partly red; its tail is ſhort and black; its long wing-feathers alſo, and the lower part of its belly, and its legs, are of the ſame colour; its legs are ſhort, but its feet are not placed as in the wood pecker; but are three before, and one behind: it is very common in Italy, Germany, and ſome parts of France; it is a very lively and chearful bird, and as the common wood-pecker climbs trees, and feeds on the inſects in their cracks; ſo this bird runs up old walls, and feeds on what it finds in the cracks of the ſtones. *Aldrovand.* de Avib. L. 12. c. 37.

PICUS *nidum ſuſpendens*, a name by which ſome authors have called the *galbula*; a yellow bird of the thruſh kind, very remarkable for its beauty, and for the ſtructure and manner of hanging its neſt. *Aldrovand.* de Avib. See GALBULA.

PICUS *ſalutiferus*, in zoology, a name under which Nieremberg has deſcribed a Mexican bird, called by the natives *henquecholtotol*.

It is of the ſize of the common black-bird, and has a long and black beak: its head and a great part of its neck are red: its breaſt and belly are grey, and it has a creſt of red feathers upon its head. It is of the wood-pecker kind, and has its name from the ſuppoſed virtues of its feathers, particularly thoſe of the creſt, in curing the head-ach. *Ray*'s Ornithol. p. 301.

PIEDRA *de la hyada*, in natural hiſtory, the name given by the Spaniards to a ſtone found in many parts of America, particularly in New Spain; and famous among the Indians for curing the colic on being applied to the navel.

It is green, and is a ſpecies of jaſper, approaching to the nature of the *lapis nephriticus*, and is called by many *colicus lapis*, from its virtues.

PIERRE *d'automne*, a French name tranſlated from the Chineſe. It is the name of a medicinal ſtone, famous throughout the eaſt for curing all diſorders of the lungs.

Many people ſuppoſe it had its name of the *autumn-ſtone*, from its being only to be made at that ſeaſon of the year; but it may be made equally at all times, and the origin of the name is to be farther ſearched into.

The Chineſe chemiſts, like thoſe of all other nations, delight in a ſort of gibberiſh. A part of this is, the referring the ſeveral parts of the body to the ſeveral ſeaſons of the year. The lungs are in this ſcheme referred to autumn. This appears in their writings; and thus the ſtone for diſeaſes of the lungs came to be called *autumn-ſtone*.

It is a tedious preparation of human urine, and made as follows: they put thirty pints of the urine of a ſtrong and healthy young man into a large iron pot, and ſet it over a gentle fire; and when it begins to boil, they add to it, drop by drop, about a large tea-cup full of rape-oil: it is then left on the fire till the whole is evaporated to a thick ſubſtance reſembling black mud; they then take it out of the pot, and laying it on a flat iron, they dry it ſo that it may be powdered very fine.

This powder they moiſten with freſh oil, and put the maſs into a double crucible, ſurrounded with coals; where it ſtands till thoroughly dried again. They finally powder this again, and putting it into a china veſſel, covered with ſilk cloth and a double paper, they pour on boiling water, which makes its way, drop by drop, thro' theſe coverings, till ſo much is got in, as is ſufficient to reduce it to a paſte. This paſte is well mixed together in the veſſel it is kept in, and this is put into a veſſel of water, and the whole ſet over the fire. The matter thus becomes again dried in balneo mariæ, and is then finiſhed. Obſerv. ſur les Cout. de l'Aſie, p. 258.

PIERIDES, among the antients, an epithet given to the muſes, upon account of their having been born in that part of the country of Macedon which was called *Pieria*. *Pitiſc.* in voc.

PIESMA, a word uſed by the antients to expreſs the remaining maſs after the expreſſion of any fluid ſubſtance from among its more ſolid parts. Thus the cake remaining in the bag after the expreſſion of oils, is called by this name: but there are inſtances of authors calling the expreſſed juice, inſtead of the reſiduum, by this name. Thus Dioſcorides calls the expreſſed juice of the bay-berries, the *pieſma laurinum*; and others, the expreſſed juice of roſes, *pieſma roſarum*, paying no regard to the roſe-cake left behind.

PIESTER, the name uſed by the antients for the preſs which they employed in preparing the ſeveral juices of plants, &c. hence the word *pieſma*, which ſee.

PIESTRON, a word uſed by Hippocrates to expreſs a ſort of forceps, which he recommends to be uſed in difficult labours, to break the bones of the cranium of the fœtus, when its head is too large to ſuffer it to paſs whole.

PIETERMAN, in zoology, the name uſed by ſome for a fiſh of the *cuculus* kind, approaching to the nature of the *draco marinus*, or weaver; and more uſually called among authors by its Braſilian name *niqui*. *Willughby*'s Hiſt. Piſc. p. 289. See Tab. of Fiſhes, N°. 49. and the article NIQUI.

PIETOSO, in the Italian muſic, ſignifies to play or ſing in a ſoft manner, fit to move pity or compaſſion.

PIETRA *emboſſata*, in natural hiſtory, a name given by the Italians to the Florentine marble, ſo remarkable for its delineations.

This marble is found in thin ſtrata, and is full of cracks; in theſe cracks there is uſually found a black mineral matter, which getting into the ſubſtance of the ſtone a little way on each ſide of the crack, forms there various delineations, or the figures of pieces of moſs buſhes, and the like: the paler pieces of the marble uſually have theſe delineations; the darker coloured having the forms of trees and houſes, or the ruins of old buildings. *Woodw.* Hiſt. Foſſ. V. II. p. 19.

PIEXE-*gallo*, in zoology, a name given by the Portugueſe to a fiſh caught about the ſhores of the Braſils, and much reſembling our *doree* or *faber piſcis*; more uſually known among authors by its Braſilian name, *abacatuaia*. *Willughby*'s Hiſt. Piſc. p. 295. See ABACATUAIA.

PIEXE-*porco*, in zoology, a name by which ſome authors have called the *monoceros*, or unicorn fiſh of Cluſius. The name is Portugueſe, and ſignifies hog-fiſh; this little creature having a mouth like a hog. *Willughby*'s Hiſt. Piſc. p. 150.

PIG *Guinea*. See GUINEA.

PIGAYA, in natural hiſtory, a word uſed by the natives of Braſil as a name for the famous *ipecacuanha*-root.

The firſt European who brought this root into uſe was an apothecary of Braſil, whoſe name was Michael Triſtaon. The book which this author publiſhed on this ſubject falling into the hands of the Engliſh, is tranſlated into our language, and ſtands, among a number of like accounts, among Purchas's pilgrims.

He ſays it is an excellent remedy againſt dyſenteries and fluxes of all kinds. He ſays alſo, in its deſcription, that the ſtalks are a quarter of a yard long, and the roots nearly as much; and that the leaves grow only four or five upon a plant.

This agrees very well with all that we have ſince diſcovered of this plant, and the method of uſing it at that time, we find, was not as a vomit; but they bruiſed the freſh root, and ſteeped it about twelve hours in water, at the end of which time, the patient drank the water early in the morning: it operated by ſtool; but after its operation, the natural purging and voiding of blood ceaſed. This ſeems the original account we have of this drug.

De Laet from this compiled his account; which is almoſt a literal tranſlation of this into Latin: from his hint Piſo and Marggrave enquired after it more carefully upon the ſpot, and from them came the firſt accurate accounts we had of it; ſo that all ſeems, *ab origine*, deduced from Michael Triſtaon's account of it.

PIGEON, in zoology. See COLUMBA.

PIGEON-*holes*, in brick-making. See BRICK.

Turbit PIGEON. See TURBIT.

PIGNOLETTI, in ichthyography, a name uſed by many for the *aphua cobites*, a ſmall fiſh of the *gobius*, or ſea-gudgeon kind, common in the Mediterranean, and brought to the markets of Rome and Venice. *Willughby*'s Hiſt. Piſc. p. 207. See the article APHUA.

PIGUS, in zoology, the name of a ſpecies of leather-mouthed fiſh, very much approaching to the nature of the carp.

It is of the ſame ſhape and ſize with the common carp, and its eyes, fins, and fleſhy palate wholly the ſame. From the gills to the tail there runs a crooked dotted line: its back and ſides are bluiſh, and its belly reddiſh: it is covered with large ſcales, from the middle of every one of which there riſes a fine, pellucid, and very ſharp prickle.

It is a finer fiſh than the carp for the table, and is in ſeaſon in the months of March and April. It is caught in lakes in ſome parts of Italy, and is mentioned by Pliny, tho' without a name.

It is a ſpecies of *cyprinus*, according to Artedi, and is diſtinguiſhed by that author under the name of the *cyprinus*, called *piclo* and *pigus*. He adds, that the tail is forked, and the ſcales large; and that in ſpring and autumn there grow out of them

them white pyramidal prickles, which remain about five or six weeks, and then fall off. The back is of a blackish blue, and the belly white, with a faint cast of red. It never grows to more than five or six pound weight: the flesh is well tasted. It is found in the lakes in the northern nations. *Willughby*'s Hist. Pisc. p. 247. *Rondelet* de Pisc. p. 64.

PIISSKER, in zoology, the name of a fish of the *mustela* kind, usually called the *mustela fossilis*, or *piscis fossilis*, the fossile fish.

This fish is usually found of a hand's breadth long, and as thick as one's finger; but they grow sometimes to be much longer. The back is of a grey colour, spotted with a great number of spots, and transverse streaks, partly black and partly blue. The belly is yellow, and is spotted with red and white and black; the white ones are the larger, and the others look as if made with the point of a needle; and there is on each of the sides a longitudinal black and white line. There are certain fleshy excrescences at the mouth, which in swimming they expand; and when out of the water, they contract them.

They run into caverns in the earth, in the sides of rivers, in marshy places, and penetrate a great way, and are frequently dug up at distances from waters; and often, when the waters of brooks and rivers swell beyond their banks, and they are again covered by them, they make their way out of the earth into the water, and when it deserts them, are left in vast numbers upon the ground, when they are eaten by the swine.

This seems very much of the kind of the *fisgum* fish, and possibly is no other than the same species; and possibly also the præcilia of Schonefeldt is the same. *Gesner* de Aquat.

PIKE, in ichthyology, a name given by us to the fish called by authors the *lucius* and *esox*, and by the old Greek writers *oxyrynchus*. See LUCIUS and ESOX.

This fish is the tyrant of the fresh waters, and is at once the most voracious and the longest lived of all fish, according to the generality of naturalists.

The very large *pike* are esteemed as a pompous fish at the tables of great people; but they are coarse, and the middling ones are in reality much the best.

The *pike* never swims in shoals, as most other fish do, but always lies alone, and is so bold and ravenous, that he will seize upon almost any thing less than himself. This fish breeds but once in a year, which is in March. It is found in almost all fresh waters, but is very different in goodness, according to the nature of the places where it lives. The finest *pike* are those which feed in clear rivers; those in ponds and meres are inferior to these, and the worst of all are those of the fen ditches. They are very plentiful in these last places, where the water is foul and coloured, and their food, such as frogs and the like, very plentiful, but very coarse; so that they grow large, but are yellowish and high-bellied, and differ greatly from those which live in the clearer waters.

The fishermen have two principal ways of catching the *pike*; by the ledger, and by the walking-bait.

The ledger-bait is fixed in one certain place, and may continue while the angler is absent: this must be a live bait, a fish or frog; and among fish, the dace, roach, and gudgeon, are the best: of frogs, the only caution is to chuse the largest and the yellowest that can be met with. If the bait be a fish, the hook is to be stuck thro' the upper lip, and the line must be fourteen yards at least in length: the other end of this is to be tied to a bough of a tree, or to a stick driven into the ground near the *pike*'s haunt, and all the line wound round a forked stick, except about half a yard. The bait will by this means keep playing so much under water, and the *pike* will soon lay hold of it.

If the bait be a frog then the arming wire of the hook should be put in at the mouth, and out at the side; and with a needle and some strong silk the hinder leg of one side is to be fastened by one stitch to the wire-arming of the hook. The *pike* will soon seize this, and must have line enough to give him leave to get to his haunt and poach the bait.

The trolling for *pike* is a pleasant method also of taking them: in this a dead bait serves, and none is so proper as a gudgeon This is to be pulled about in the water till the *pike* seizes it, and then it is to have line enough, and time to swallow it: the hook is small for this sport, and has a smooth piece of lead fixed at its end to sink the bait; and the line is very long, and runs through a ring at the end of the rod, which must not be too slender at top.

The art of feeding *pike*, so as to make them very fat, is the giving them eels, and without this it is not to be done under a very long time; otherwise perch, while small, and their prickly, tender fins, are the best food for them. Bream put into a *pike*-pond are a very proper food: they will breed freely, and their young ones make excellent food for the *pike*, who will take care that they shall not increase over much. The numerous shoals of roaches and ruds, which are continually changing place, and often in floods get into the *pike*'s quarters, are food for them for a long time.

Pike, when used to be fed by hand, will come up to the very shore, and take the food that is given them out of the fingers of the feeder. It is wonderful to see with what courage they will do this, after a while practising; and it is a very diverting sight when there are several of them nearly of the same size, to see what striving and fighting there will be for the best bits, when they are thrown in. The most convenient place is near the mouth of the pond, and where there is about half a yard depth of water; for, by that means, the offal of the feedings will all lie in one place, and the deep water will serve for a place to retire into and rest in, and will be always clean and in order.

Carp will be fed in the same manner as *pike*; and tho' by nature a fish as remarkably shy and timorous as the *pike* is bold and fearless, yet by custom they will come up to take their food out of the person's hand; and will, like the *pike*, quarrel among one another for the nicest bits. See the article FEEDING *of fish*.

Half PIKE, in the military art, is the weapon carried by an officer of foot. It differs from a *pike*; because it is but eight or nine foot long, and the spear is smaller and narrower.

PIKE, is also the name of an Ægyptian measure, of which there are two kinds, the large and the small.

The larger *pike*, called also the *pike* of Constantinople, is $27\frac{920}{1000}$ English inches. They measure all foreign goods with this, excepting only such as are made of flax and cotton: for these they use the small *pike*, called *pike belledy*, or the *pike* of the country; because they measure with it all the manufactures of the country. This *pike* consists of about $25\frac{576}{1000}$ English inches. *Pocock*'s Ægypt, p 175.

PILA *(Cycl.)*—PILA *marina*, the *sea-ball*, in natural history, the name of a substance very common on the shores of the Mediterranean, and in some other places. It is usually found in form of a ball, about the size of the balls of horse-dung, and composed of a multitude of fibrillæ, irregularly complicated.

Its origin has been very variously guessed at by different authors. John Bauhine says, that it consists of small hairy fibres and straws, such as are found about the sea-plant called *alga vitriariorum*; but he does not pretend to ascertain what plant it owes its origin to. Imperatus judged it to consist of the exuviæ both of vegetable and animal bodies. Mercatus doubts whether it be a congeries of the fibrillæ of plants, wound up into a ball by the motion of the sea-water; or whether it be not the workmanship of some sort of beetle living about the sea-shore, and analogous to our common dung-beetles ball, which it elaborates from dung for the reception of its progeny. Schreckius will have it composed of the filaments of some plant of the reed kind: and Welchius supposes it composed of the pappose part of the flowers of the reed. Maurice Hoffman thinks it the excrement of the hippopotamus: and others think it that of the phoca, or sea-calf.

But Klein, who had thoroughly examined as well the bodies themselves, as what authors had conjectured concerning them, is of opinion, that they are wholly owing to, and entirely composed of, the capillaments which the leaves growing to the woody stalk of the *alga vitriariorum* have, when they wither and decay. These leaves, in their natural state, are about the thickness of a wheat straw, and they are placed so thick about the tops and extremities of the stalks, that they enfold, embrace, and lie over one another; and from the middle of these clusters of leaves, and, indeed, from the woody substance of the plant itself, there arise several other very long, flat, smooth, and brittle leaves: these are usually four from each tuft of the other leaves, and they have ever a common vagina, which is membranaceous and very thin. This is the style of the plant, and the *pila marina* seems a cluster of the fibres of the leaves of this plant, which cover the whole stalk divided into their constituent fibres; and by the motion of the waves, first broken and worn into short shreds, and afterwards wound up together into a roundish or longish ball. *Klein*, de Tubul. Marin. p. 22.

PILARIS, or PILARIS *turdus*, in zoology, the name by which authors in general call the field-fare. See the article FIELDFARE.

PILATIO, a word used by the antients to express a minute fissure in the cranium, when not larger than a single hair of the head.

PILATRO, or PILATRO *di Levante*, a salt used in the glass trade in some particular cases. It is extracted from the froth of the sea, coagulated by heat in the hot countries. *Merret*'s Notes on Neri. p. 349.

PILCHARDUS, the common *pilchard*, in zoology, a fish much approaching to the nature of the common herring, but smaller and differing in several other particulars.

The distinguishing characters of it are these: it never exceeds six or seven inches in length: its body is thicker in proportion than that of the herring, and its belly less sharp: its scales are very large, round, and very thin: its back is of a bluish green, and its belly white; and near the upper angle of the gills, it has a black spot on each side; sometimes also there are four or five other smaller in a strait line behind these: the head is flatted, and the mouth large; but it has no teeth, neither in the jaws nor palate.

It is generally found swimming in vast shoals, and is caught on many parts of the English shores. Its flesh is better tasted than that of the herring.

PILE *(Cycl.)*—PILE *worms*, are a kind of *worms* found in the *piles* of the ſea dikes in Holland. Theſe *worms* are of various ſizes, ſome of the young ones are not above an inch or two in length; but others have been found of thirteen or fourteen inches long.

The heads of theſe creatures were covered with two hard ſhells, or hemicrania; which together form a figure reſembling an augur; and with which they bore the wood. The beſt remedy againſt them is, to perforate the *pile* with many ſmall holes, about an inch aſunder; then it muſt be done over with a varniſh in the hotteſt ſun; and while the varniſh is hot, brick duſt muſt be ſtrewed over it; and this being ſeveral times repeated, the *pile* will be covered with a ſtrong cruſt, impenetrable to all inſects. See a farther account of theſe creatures in Phil. Tranſ. N° 455. Sect. 5.

PILES, the popular name for the *hæmorrhoides*. See the article HÆMORRHOIDES, *Cycl.* and *Suppl.*

PILEÆ, a name given by ſome authors to a genus of *echinodermata*. See the article CONULUS.

PILENTUM, among the Romans, an eaſy kind of chariot, uſed by the Roman ladies at games and religious proceſſions. *Pitiſc.* in voc.

PILEUS *presbyteri*, in botany, a name given by ſome writers to the *euonymus* or *fuſanus*, a ſhrub which grows in our hedges, and bears a ſquare fruit ſomewhat reſembling the cap worn by ſome orders of prieſts.

PILHANNAW, a name given by the Indians to a bird found in the foreſts on the back of ſome our American plantations.

It is a bird of prey very large and bold; it is deſcribed by Joſſelin as four times as big as our goſhawk, and having a remarkably large head. All the birds are terrified at its approach; but it principally feeds on quadrupeds, as the young fawns and the like.

PILIMICTIO, a word uſed by ſeveral authors to expreſs a diſcharge of ſmall and long filaments, which reſemble hairs among the urine.

PILL (*Cycl.*)—*Aromatic* PILLS, *pilulæ aromaticæ*, a form of medicine in the New London Diſpenſatory, intended to ſtand in the place of the *pilulæ diambræ* of the former, and the *pilulæ alephanginæ*, or *aloephanginæ* of that, and ſome other Diſpenſatories.

The compoſition is this: Take ſocotrine aloes, an ounce and half; gum guaiacum, an ounce; the aromatic ſpecies and balſam of Peru, of each half an ounce; let the aloes and gum guaiacum be powdered ſeparately, and afterwards mixed with the reſt, and formed into a maſs with ſyrup of orange-peel. *Pemberton*'s Lond. Diſp. p. 326.

PILLS *of colocynth with aloes*, *pilulæ e colocynthide cum aloe*, a name given in the New London Pharmacopœia, to the purging-*pill*, commonly known by the name of *pilulæ cocciæ minores*.

As this is originally a preſcription of Galen's, and the manner of proportioning the ingredients has been altered for the worſe, ſince his time, by enlarging the quantity of that nauſeous ingredient the *colocynth*; the college have reduced it to its former proportions, and ordered it to be made in this manner: Take ſocotrine aloes and ſcammony, of each two ounces; pith of coloquintida, one ounce; oil of cloves, two drams; let the dry ſpecies be reduced to powder ſeparately, the oil mixed among them, and the whole formed into a maſs, with ſyrup of buckthorn. *Pemberton*'s Lond. Diſp. p. 327.

PILULÆ *e colocynthide ſimpliciores*, a name given in the late London Pharmacopœia, to the purging-*pill* commonly known by the name of *pil. ex duobus*. It is made of equal parts of colocynth and ſcammony, with a conſiderable proportion of oil of cloves; and is beat up to a conſiſtence with ſyrup of buckthorn. *Pemberton*'s Lond. Diſp. p. 327.

Mercurial PILLS, *pilulæ mercuriales*, a form of medicine preſcribed in the late London Pharmacopœia, and containing crude mercury mixed for internal uſe.

The compoſition is to be made as follows: Take of pure quickſilver, five drams; of Straſburg turpentine, two drams; of the cathartic extract, four ſcruples; rhubarb in powder, one dram; grind the quickſilver with the turpentine till it makes one uniform maſs, and then add the other ingredients, and beat up the whole into *pills*. If the turpentine be too hard, it muſt be ſoftened with a little oil of olives. *Pemberton*'s Lond. Diſp. p. 329.

Soap PILLS, *pilulæ ſaponaceæ*, a form of medicine preſcribed in the late London Diſpenſatory, and ordered to be made in the following manner: Take almond *ſoap*, four ounces; ſtrained opium, half an ounce; eſſence of lemons, a dram; ſoften the opium a little with wine, and beat that and the *ſoap* with the eſſence, till it be reduced to the form of a *pill*.

This is intended to ſtand in the place of the *pill*, commonly called *Mathew's pill*, and is very happily corrected in regard to the taſte of the *ſoap*, by the addition of the eſſence of lemons. *Pemberton*'s Lond. Diſp. p. 231.

Ward's PILL. See WARD'S *pill*.

PILLAR *(Cycl.)*—It ſeems not impoſſible for ſtone to be caſt into the ſhape of *pillars*. We find mention made in the Philoſophical Tranſactions, of two *pillars* of ſtone, at Fontevraud, in France, each about 60 feet high, all of one ſolid piece, which are ſaid to have been run. N° 481. p. 328. in Not.

Pillars of ſtone were antiently erected as ſepulchral monuments, near the highways; and alſo in memory of ſome victory. We find traces of this cuſtom in Cornwall and Wales, where theſe *pillars* are often found, and called *meinigwir*, a ſtone for play, perhaps in memory of funeral games; and ſometimes *llech*, that is, *tabula ſaxea*. Phil. Tranſ. N° 458. p. 471.

PILLVENKEGEN, in zoology, the name of a bird approaching to the ſnipe kind, deſcribed by Aldrovand, and ſuppoſed by ſome to be the bird we call the *knot*. See KNOT.

PILLOW *of a plough*, a term uſed by the farmers to expreſs that part of a *plough* which ſerves to raiſe or ſink the beam, and with it the ſhare, as the land is to be *ploughed* ſhallower or deeper.

This *pillow* is a croſs piece of wood, reaching from one of the crowſtaves or uprights, to the other; and as they are bored with two rows of holes, this *pillow* can be ſliped up or down to any height, and kept there by pegs or cords in the holes. *Tull*'s Huſbandry. See PLOUGH.

PILLOW, in a ſhip, is that piece of timber whereon the bowſprit reſts at its coming out of the hull aloft, cloſe by the ſtern.

PILOSE *leaf*, among botaniſts. See the article LEAF.

PILOSELLA, the common *mouſe-ear*, is eſteemed a great medicine by many, as abſtergent and aſtringent. It is preſcribed in dyſenteries, and all other hæmorrhages, and particularly in bleedings at the noſe. Some have given it a great character alſo in the cure of ruptures; and its juice is ſaid to be a very great remedy in the milliary herpes, rubbed on the part.

PILOTING, *in navigation*. See the articles NAVIGATION and PILOT, *Cycl.*

PILULARIA, *pepper-graſs*, the name of a very remarkable little plant, of which Mr. Bernard de Juſſieu has given a very accurate account in the Memoirs of the Academy of Sciences of Paris.

It is a low and creeping plant, always being procumbent upon the earth; its roots are long, ſlender, white filaments, which pierce perpendicularly down, and have at their extremities a few ſhort fibres. Every one of theſe roots is fixed to the baſe of one of the leaves that ſtand on the branches. The branches are divided and ſpread about, and are all ſo regular in ſize, and ſo oddly interwoven among one another, that it is not eaſy to ſay which of them is the main ſtalk, which the ramifications; but the ſeveral radicles which uſually go down very deep, keep the whole lengths of the branches cloſe down to the ground. The branches are round, green, and knotty; and their ramifications are placed alternately, and are terminated by a protuberance or ſoft button, or a ſmall leaf rolled up in a ſpiral form.

The leaves ſtand alſo alternately on the branches, and are ſtrait, narrow, and ſomewhat cylindric in ſhape, and pointed at the end; they reſemble, in ſome ſort, the young ſhoots of ruſhes, and are ſeldom more than four inches long; nor are the ſtalks uſually more than ſix.

The flowers of this plant ſtand in the alæ of the branches, and four flowers, each enveloped by its own peculiar membrane, which is very fine and delicate, are always contained in one common covering; which reſembles a ſphere ſet all over with prickles or hairs. This globule increaſes at length to the ſize of a pepper-corn; and when mature, it opens into four quarters, each of which has its peculiar pedicle, by which it adheres to the branch.

The membrane which envelopes each particular flower, or as it may be called, each quarter of the globule, is very fine and delicate; and each has three faces; one convex, and the other two in form of ſemi-circles. The inferior angles of theſe three faces terminate in one common point; and the ſemi-circular faces open a little at the oppoſite end, to diſcloſe the flower. See Tab. of Moſſes, N° 21.

Every quarter of the globule is hollow, and has the ſhape of a quarter of a regular hollow ſphere, and contains its perfect flower, which is of the hermaphrodite kind, containing ſtamina and piſtils, arranged on, and fixed to a common placenta. This placenta is a membranaceous band, faſtened to the inner ſpherical part of the membrane, which incloſes the flower; it occupies only about half the cavity, and is ſo formed as to repreſent, in ſome meaſure, two thirds of a creſcent; from which one of the points had been cut off. This placenta is, in a manner, ſurrounded with piſtils, having four ſeries of them on each ſide; ſome of which ſtand oppoſite to others, and ſome are erect, while others lie horizontally. The piſtils fill up two thirds of the cavity of the flower, and the reſt is occupied by the ſtamina; which are ſo many little horns all growing from a little head, which ſtands in the angle made by the ſides of the placenta. The ſtamina diverging from this point, form a ſort of pyramidal cluſter. The number of the piſtil is various in different flowers; ſome having twelve, others twenty; they are each of them of an oval figure, and are enveloped each in a fine thin membrane, which is folded and wrinkled. They have no ſtyle, but have only a downy prominence on their upper extremity, which may be properly called the ſtigma.

Theſe piſtils are ſo many embryo ſeeds; the ſtamina are uſually more than thirty in number, and are ſo ſmall as not to be eaſily diſcoverable to the naked eye; and 'tis from this minute-

minuteneſs of the ſeveral parts of the flower of this plant, that it has been generally ſuppoſed, by botaniſts, to have no flower at all; the globule at the root of the leaves having been uſually eſteemed merely a capſule for the ſeeds.

The pedicles, on which theſe globules ſtand, are not more than a twelfth of an inch long; and it has uſually, at its baſe, two or three ſmall leaves of the ſame ſhape with the other leaves of the plant. The globules uſually ſtand ſingly at the bottom of each leaf. The ſtamina of the flowers, examined by the microſcope, appear compoſed of a fine tender membrane, incloſing a number of ſmall round bodies; and the whole aſſuming a conic form: theſe put into a drop of water before the microſcope, received the humidity into them, and ſwelled into the figure of an oblong pearl, and ſoon after burſting open tranſverſely, they diſcharged their grains of fine powder with an elaſtic force: theſe grains, which are the globules of the farina, are regularly round and rough on the ſurface; they ſwell on lying in the water, but never burſt. The piſtils, on being put into water, looſe their folded and wrinkled figure, and ſwell into a ſort of bladder: theſe piſtils finally become each a perfect ſeed, which is rounded at the bottom, and terminates in a point at the top, and of a ſomewhat yelloviſh white colour.

The ſeeds of the *pilularia* ſend up ſingle leaves of the ſhape of thoſe which afterwards appear on the whole plant; and the herb is therefore of the order of the *monocotyledones*; and, according to the opinion of Mr. Juſſieu, approaches more to the nature of the *ferns* than to any other claſs of plants, tho' ſo widely different from them in the manner of growth: he is for allotting it a place, however, next the *ferns*, and that for the following reaſons:

1. Becauſe the *pilularia* imitates the diſpoſition and arrangement of the branches of many of the *ferns*, tho' in ſo extremely different a form, creeping over the ground with its horizontal roots, in the manner of the common female *fern*, and like it, having its leaves and branches placed in an alternate manner.

2. Becauſe the young leaves of the *pilularia* are enveloped like thoſe of the *ferns*, with a ſort of down, and are rolled up in the ſame manner, in a ſpiral form; from which they gradually expand.

3. Becauſe the taſte is the ſame with that of the *ferns*, viſcous, with a gentle aſtriction.

4. Becauſe the ſmell of the leaves, when bruiſed, is wholly the ſame with that of *fern*; and, finally, becauſe the ſummits of the ſtamina, when nicely examined, appear to have a great analogy with ſome parts of the fructifications of the *ferns*. Memoirs Acad. Scien. 1739.

PIMIENTA, in botany, the Jamaica *pepper-tree*; the characters of which are theſe: Its trunk is as thick as one's thigh, riſing ſtreight about 30 feet high, covered with an extremely poliſhed or ſmooth ſkin, of a grey colour, and branched out on every hand; having the ends of its twigs ſet with leaves of ſeveral ſizes; the largeſt being four or five inches long, two or three broad in the middle, where broadeſt; whence it decreaſes to both extremes, ending in a point, ſmooth, thin, ſhining, without any inciſures, of a deep green colour, and ſtanding on inch-long foot ſtalks; when bruiſed very odoriferous, and in all things like the leaves of a bay-tree. The ends of the twigs are branched into bunches of flowers, each footſtalk ſuſtaining a flower made up of four herbaceous pale-green petala, bowed back, or reflected downwards; within which are many ſtamina of the ſame colour. Theſe are followed by a bunch of crowned or umbilicated berries, (the crown being made up of four ſmall foliola or leaves) which are bigger, when ripe, than juniper-berries, at firſt when ſmall, greeniſh; but when ripe they are black, ſmooth, and ſhining, containing in a moiſt, green, aromatic, and biting pulp, two large *acini*, or ſeeds, ſeparated by a membrane lying between them, each whereof is a hemiſphere, and both joined make a globe or ſpherical *acinus*; whence Cluſius makes it one ſeed, diviſible into two parts.

It grows on the hilly parts of Jamaica, and is much cultivated there; becauſe of the great profit from the cured fruit ſent in great quantities yearly into Europe.

It flowers in June, July, and Auguſt, ſooner or later, according to its ſituation and the different ſeaſons for rain; and after it flowers, the fruit ſoon ripens.

There is little difficulty in curing and preſerving this fruit for uſe, which is done thus: the Negroes climb the trees and pull off the twigs with the unripe green fruit, and afterwards carefully ſeparate the fruit from the twigs, leaves, and ripe berries; which done, they expoſe them to the ſun from its riſing to ſetting, for many days, ſpreading them thin on cloaths, turning them now and then, and carefully avoiding the dews. By this management they become a little rugous or wrinkled, dry, and from a green change to a brown colour, and then they are fit for the market.

The ripe berries are very carefully ſeparated from thoſe to be cured; becauſe their wet and plenteous pulp renders them unfit for cure.

It is accounted the beſt and moſt temperate, mild and innocent, of common ſpices, and fit to come into greater uſe, and to gain more ground than it hath yet done. It ſurpaſſes moſt of the Eaſt Indian aromatics in promoting the digeſtion of meat, attenuating, tough humors, moderately heating, ſtrengthening the ſtomach, expelling wind, and doing thoſe friendly offices to the bowels we generally expect from ſpices.

Cluſius takes it to be the *garyophyllon* of Pliny; and by others it is ſuppoſed to be the *amomum* of the antients; but 'tis not likely that it was known to the antients, not being known to grow in the Eaſt, but Weſt Indies; whence it was brought to England, and ſent to Cluſius, who firſt deſcribed and figured it, giving it the name of *amomum quorundam*, or *caryophyllon Plinii*. Phil. Tranſ. N° 192. See the article PIPER.

PIMP-*tenure*, a kind of *tenure* mentioned in our old writers.—Willielmus Hoppeſhort, *Tenet dimidiam Virgatam terræ, per ſervitium cuſtodiendi ſex Damiſellos ſcil. Meretrices, ad uſum Domini Regis.* 12 Ed. 1. *Blount's* Ten. 39.

PIMPERNELL, *pimpinella*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one petal, which is of a rotated form, and is deeply divided into four ſegments, and contains a vaſt number of ſtamina, or a fimbriated ſtyle. The cup finally becomes a fruit uſually of a quadrangular figure, and pointed at each end: this is ſometimes divided into two cells, ſometimes it conſiſts only of one; and it contains numerous ſeeds, uſually of a longiſh figure.

The ſpecies of *pimpinella*, enumerated by Mr. Tournefort, are theſe: 1. The common greater *pimpinella*, called *Burnet ſaxifrage*; and by moſt authors *pimpinella ſanguiſorba major*. 2. The great rigid very tall *pimpinella*, with auriculated leaves. 3. The great Spaniſh *pimpinella*, with a pale-red ſpike. 4. The great Spaniſh *pimpinella*, with cluſtered flowers. 5. The American *pimpinella*, with long red ſpikes. 6. The greateſt American *pimpinella*, with white ſpiked flowers. 7. The ſweet agrimony-leaved *pimpinella*. 8. The ſmaller hairy *pimpinella*. 9. The ſmall ſmooth *pimpinella*. 10. The ſmall ſcentleſs *pimpinella*. 11. The ſmaller *pimpinella*, with large thick ſeeds. And 12. The prickly ever green *pimpinella*, called by ſome authors *poterium*, and by others *colchicum*. *Tourn.* Inſt. p. 157.

The ſeeds of this plant are warm, carminative, and diſcutient: they are given with ſucceſs in colics and flatulencies, and in ſuppreſſions of urine. The leaves and roots alſo poſſeſs the ſame virtues; and when the diuretic property only is expected from it, the root alone freſh taken up, cut ſmall, and boiled in water, is the beſt. The decoction is to be drank in large draughts, and often repeated.

Red PIMPERNELL, *anagallis*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is rotated and divided into ſeveral ſegments. The piſtil ariſes from the cup, and is fixed in the manner of a nail, to the lower part of the flower: this afterwards becomes a ſhelly fruit, of nearly a globular figure; which, when ripe, divides tranſverſely into two parts, and diſcovers a number of angular ſeeds affixed to a placenta.

The ſpecies of *anagallis*, enumerated by authors, are theſe: 1. The common red flowered *anagallis*. 2. The larger leaved red-flowered *anagallis*, with leaves growing four at a joint. 3. The common blue-flowered *anagallis*. 4. The blue-flowered *anagallis*, with two or three leaves at every joint. 5. The ferrugineous flowered *anagallis*. 6. The duſky purple-flowered *anagallis*. 7. The pale red-flowered *anagallis*. 8. The white-flowered *anagallis*. 9. The broad-leaved Spaniſh *anagallis*, with large blue flowers. 10. The round-leaved Portugal *anagallis*. 11. The broad-leaved Portugal *anagallis*, with a ſmall flower. 12. The great toad-flax-leaved *anagallis* of Portugal. 13. The narrower-leaved *anagallis* of Portugal. 14. The ſmalleſt *anagallis*. 15. The ſmall French, ſea, round-leaved *anagallis*.

Authors name, beſide theſe, ſeveral other plants *anagallis aquatica*, the *brooklime*, &c. but theſe are properly either of the genus of the *veronica*, or that of the *ſamolus*. *Tourn.* Inſt. p. 142. See the article SAMOLUS, *&c.*

PIMPILIM, in botany, a name by which ſome authors have called the plant which produces the long pepper, uſed in medicine. *Piſo*, Mant. 182.

PIMPINELLA. See PIMPERNELL, ſupra.

PIMPLE, in medicine, a ſmall puſtule ariſing on the face.

By mixing equal quantities of the juice of houſe-leek, *ſedum minus*, paſſed through paper, and of ſpirit of wine rectified by itſelf, a white coagulum of a very volatile nature is formed, which Dr. Burghart commends for curing *pimples* of the face; and ſays, that the thin liquor ſeparated from it, with ſugar-candy, is an excellent remedy for thick viſcid phlegm in the breaſt. Satyr. Sileſiac. Spec. 4. Ob. 2.

PINACOTHECA, among the antients, a place where pictures, ſtatues, and other curioſities were kept. *Pitiſc.* in voc.

PINACIA, πινακια among the Athenians, tablets of braſs, whereon the names of all the perſons in each tribe duly qualified, and willing to be judges or ſenators of the Areopagus, being ſeverally written, they were caſt into a veſſel provided on purpoſe; and into another veſſel were caſt the ſame number of beans, an hundred of which were white, and all the reſt black. Then the names of the candidates and the beans were drawn, one by one; and thoſe whoſe names were drawn out together with the white beans, were received into the ſenate. See the article PROBULEUMA.

In

In Solon's time there were only four tribes, each of which elected an hundred ſenators; ſo that the Areopagus conſiſted of four hundred members: but the number of tribes being afterwards encreaſed, the number of ſenators was conſequently augmented by ſome hundreds; but the manner of election remained the ſame. *Pott.* Archæol. Græc. T. 1. p. 97. See the article AREOPAGUS, *Cycl.*

PINARII, among the Romans, an order of under-prieſts belonging to Hercules, who offered ſacrifices to that god morning and evening. They were only ſervants to the *potitii*. *Danet.* in voc. See the article POTITII.

PINCHING *(Cycl.)*—PINCHING, in horſemanſhip, a term uſed to expreſs a method of trying a horſe's mettle, or vigour, and of ſhewing it to a purchaſer when the creature is on ſale. The whole method is, when the rider is on his back, he keeps him ſtanding ſtill, and keeping him faſt with the bridle-hand, he applies the ſpurs to the hair of the ſides. If the horſe is impatient under this, and draws himſelf up, and wants to go forward, it is a ſign of vigour and mettle. But the purchaſer ought to try the thing himſelf on the horſe's back; for the jockies have the art of making the dulleſt horſe ſeem to have mettle in theſe trials. The purchaſer muſt alſo diſtinguiſh between the reſtleſsneſs of the horſe under this treatment that ariſes from vigour, and that which ariſes from the horſe's being tickliſh, and which goes off immediately. See the article METTLED.

PINDAIBA, in botany, the name uſed by ſome authors for the tree which produces the cubebs of the ſhops. *Piſo*, p. 144.

PINE-*tree*, *pinus*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the amentaceous kind, being compoſed of a great number of ſtamina, but it is barren: the embryo fruit appear in other parts of the tree, and finally become a ſort of cone; between the ſeveral ſcales of which, eachhaving two hollows, there are found two ſeeds contained in a ſtony huſk, which is frequently alated. To this it is to be added, that the leaves grow more than one out of the ſame theca.

The ſpecies of *pine*, enumerated by Mr. Tournefort, are theſe: 1. The common manured *pine*. 2. The common wild mountain *pine*. 3. The tender fruited wild *pine*, called *cambro*. 4. The mountain *pine*, called by authors *mugho*. 5. The wild ſea-*pine*, with the cones growing firmly to the branches. 6. The Idæan ſea-*pine*. 7. The ſmall ſea-*pinaſter*. 8. The dwarf *pine*, with pale or greeniſh juli. 9. The dwarf *pine*, with purple juli. And, 10. The *pine* with erect cones, called by ſome the Auſtrian *pinaſter*. *Tourn.* Inſt. p. 585.

The leaves and tender tops of *pine* and fir are uſed for diet-drinks, and allowed to be antiſcorbutic and diuretic.

The reſinous exſudations of *pines* and firs are an important branch in the materia medica, and not only uſeful in the preſcriptions of phyſicians, but have alſo been thought otherwiſe conducive to health. Pliny tells us, that wines, in the time of the old Romans, were medicated with pitch and reſin. And Jonſtonus, in his dendrographia, obſerves, that it is wholeſome to walk in groves of *pine*-trees, which impregnate the air with balſamic particles. It is known that all turpentines and reſins are good for the lungs, againſt gravel alſo, and obſtructions: and it is ſaid, that the medicinal properties of thoſe drugs are found in tar-water, which operate without heating the blood or diſordering the ſtomach. See the article TAR-*water*.

Pitch, tar, roſin, and turpentine, are all made from theſe trees by a very familiar proceſs. In the ſpring time, when the ſap is moſt free in running, they pare off the bark of the *pine*-tree, to make the ſap run down into a hole which they cut at the bottom to receive it; in the way, as it runs down, it leaves a white matter like cream, but a little thicker: this is very different from all the kinds of reſin and turpentine in uſe, and it is generally ſold to be uſed in the making of flambeaux, inſtead of white bees-wax. The matter that is received in the hole at the bottom, is taken up with ladles, and put into a large baſket; a great part of this immediately runs thro', and this is the common turpentine. This is received into ſtone or earthen pots, and is ready for ſale. The thicker matter, which remains in the baſket, they put into a common alembic, and adding a large quantity of water, they diſtil this ſo long as any oil is ſeen ſwimming upon the water; this oil they ſeparate from the ſurface in large quantities, and this is the common oil or ſpirit of turpentine: the remaining matter at the bottom of the ſtill, is common yellow reſin. When they have thus obtained all that they can from the ſap of the tree, they cut it down, and hewing the wood into billets, they fill a pit dug in the earth with theſe billets; and ſetting them on fire, there runs from them while they are burning, a black thick matter: this naturally falls to the bottom of the pit, and this is the tar. The top of the pit is covered with tiles, to keep in the heat; and there is at the bottom a little hole, out at which the tar runs like oil: if this hole be made too large, it ſets the whole quantity of the tar on fire; but if ſmall enough, it runs quietly out.

The tar being thus made, is put up in barrels; and if it be to be made into pitch, they put it into large boiling veſſels, without adding any thing to it: it is then ſuffered to boil a while, and being then let out, is found, when cold, to be what we call pitch. Phil. Tranſ. N°. 243. p. 291.

Silver PINE, in botany. A branch of this tree being brought from the Cape of Good Hope, by Mr. Goddard, and preſented to the royal ſociety, Dr. Sloane gave the following account of it: The twig of this tree had a great many leaves ſet round it, very cloſe to one another, ſo as to hide the twig itſelf there where they grow; each of the largeſt being about four inches long, and three quarters of an inch broad in the middle where broadeſt, from whence they decreaſe towards both extremes, ending in a point; being like thoſe of the oſier willow, only broader, and all covered over with the thickeſt, fineſt, and longeſt, white ſilken hair, or down, that ever any plant the doctor remembers to have ſeen. The cones are of the bigneſs of thoſe of the cedars of Lebanon, and of the ſame ſhape; The cuticula, or ſmall ſkin of each ſcale, being covered over with a white ſhort down or wool, ſhining alſo like ſilk. Between the ſcales is lodged the ſeed, which is almoſt as large as the *pine* nut, near the ſame ſhape, of a dark brown colour, and having a riſing eminent line or belly running through the middle of it from end to end. This ſeed lies in a thin, reddiſh brown membrane, which has on its top four feathers, like thoſe belonging to the ſeed of the clematitis; which being between the ſcales, and riſing above them, adds a very great beauty to the cone, and may likewiſe ſerve for wings, by means of the wind, to looſen or carry the ſeed to diſtant places, thereby propagating itſelf. Dr. Plucknet calls it *leucodendros*. Phil. Tranſ. N°. 198.

Spunge-leaved PINE, in botany. A branch of this tree being brought from the Cape of Good Hope by Mr. Goddard, and preſented to the royal ſociety, Dr. Sloane gave the following deſcription of it: The bark was of a brown colour and ſmooth; its wood whitiſh and hard, with only a ſmall pith; the leaves were round it, without any order, very thick ſet, having no foot-ſtalks; being about two inches and an half long, and about one third of an inch broad near the farther end, where broadeſt; ſmooth, hard, and of a browniſh or dirty green colour: on the top of the branch comes the fruit, which is ſurrounded by three or four twigs overtopping it, and with their leaves almoſt hid in it: it is about five inches long, and is made up of many ſcales, hard and red, incloſing one another; the lowermoſt and outwardmoſt being very ſhort, the innermoſt four inches long, each of them ending in a point; ſome ſcales, having on their outſides a gummy piece: In the middle of theſe ſcales were the firſt rudiments of many ſeeds, the ſame not being fully ripe; each of which is ſet about with a great quantity of yellow, fine, ſilken down, about three quarters of an inch long, having a ſtylus, or ſtring, two inches long, and yelloviſh membranes incloſing the ſtylus and tomentum; being feathered at top for their better diſperſion, in order to propagate themſelves. Philoſ. Tranſ. N°. 198.

PINE-*apple*, a delicious fruit, called by authors *ananas*. See the article ANANAS.

There are ſeveral varieties of it, but the principal are five: 1. The oval *pine*-apple, with white fleſh. 2. The pyramidal kind, with yellow fleſh. 3. The ſmooth-leaved kind. 4. The ſhining-leaved kind, with ſcarce any ſpines on its edges. And, 5. The pyramidal olive coloured kind, with yellow fleſh. There are a multitude of other varieties of leſs note, and probably there might, by proper management in the ſowing, be raiſed as many kinds as we have of apples and pears in our orchards.

The plant grows wild in vaſt abundance in many parts of Africa, and has been long cultivated in the hotter iſlands of the Weſt Indies, where they are now very plentiful and very fine. It is now ſome time alſo ſince it has been introduced into the gardens of Europe, where, with proper management, it ſucceeds very well. There is an opinion, that there are none raiſed ſo good from the American plants, as from thoſe originally propagated by M. la Cour of Leyden, the firſt who ever ſucceeded in the bringing it to fruit in Europe; but this is an error, occaſioned by ſome of the indifferent kinds having been at firſt frequently ſent over from America; but of late we have had much finer from thence than ever M. la Cour knew. The firſt ſort is the moſt common in Europe, but the ſecond is greatly preferable to it; being much larger and better flavoured, and the juice being leſs aſtringent, the fruit may be eaten with leſs danger in large quantities. This uſually produces ſix or ſeven ſuckers alſo under the fruit, from whence it may be propagated, and therefore is the moſt fit for culture of any. The third ſort is propagated merely as a curioſity, the fruit being much inferior to that of the others. The fifth is the moſt valuable of all, and is had from Barbadoes and Montſerrat. The fourth is what is called in America, the *king-pine*; they are propagated by planting the heads or ſuckers: theſe are to be ſet in pots of five or ſix inches over at the top, filled with good freſh light earth, mixed with a little rotten dung; this mixture muſt be often turned, to make it mix the more perfectly, and the plants, when ſet, muſt have a little water, to ſettle the earth to their roots; and the pot then plunged into a well-tempered bed of tanners bark. See the article HOT-BED.

They

They must have frequent but gentle waterings, and if the heat of the bed decreases, new bark must be mixed with the old, which will make it ferment again, and renew the heat.

In August and September, as the nights grow cool, the covering must be increased over the glasses; and towards the latter end of October, the plants must be removed out of the bark-bed into the stove.

During the winter season, great care must be taken to regulate the heat in the stove, never suffering the spirit in the thermometer to fall below the degree for *pine* apples in the botanical ones, nor ever to rise above five degrees more. They must be frequently watered, and the water used to them must always be first kept four and twenty hours in the stove.

In the beginning of February the plants will shew in their center their bud for the fruit; and in the middle of February the hot-bed of tanners bark must be prepared, that the heat of it may be in some measure over before the plants are set into it, which must be about the middle of March. The pots must be at first but half way buried in the bark; about a month after this they should be raised up, and the bed stirred about with a fork; and after this, the pots are to be plunged into it, up to their rims. They are now to have frequent waterings during the summer season; they are to be frequently watered, and shaded from the violence of the sun, in very hot days, and the glasses are now and then to be raised a little, to give them air; the bark must be stirred from the bottom, and, if necessary, a little fresh bark added to it to encrease the heat; and this may be repeated two or three times in a summer. The time of the ripening of the fruit in greatest perfection, is from the beginning of July to the end of September: they are known to be ripe by their strong and agreeable smell, and by gently pressing the protuberances with a thumb and finger; which, if they feel soft and give way, afford certain signs that the fruit is ripe. When ripe, it ought to be gathered; for, in a day or two, it loses its high flavour: and when gathered, they ought to be eaten at the utmost within twenty-four hours. It is always best to keep the crown on till the time of eating the fruit.

Many make their hot-beds for the cultivating this fruit in frames of about three feet deep; but it is a much better way to erect a stove on purpose, with bark pits in it for the hot-bed. These stoves need not be higher than to admit a person to walk upright on the back side, and may be brought sloping down at the front till the glass touches the bed. *Miller*'s Gard. Dict. See the article STOVE.

PINE-*apple*, in metallurgy, a word used to express a sort of mould, used in the refining silver. It has this name from its shape, resembling the fruit of that name.

When the refiners have taken the mixture of the silver and mercury together out of the cauldron, and strain it through two coarse wetted cloths, to make it the thicker, they then beat it with a sort of battledoors, to drive out yet more of the quicksilver; and straining it again after this, they take out the remaining thick amalgame, and forming it into little pellets, they put these carefully into the moulds called *pine-apples*, pressing them down. The amalgame, when put into this vessel or mould, is usually so rich as to be about one fifth silver. The manner of divesting this of the quicksilver afterwards, is by means of fire; in which the quicksilver rises in vapour, and the silver is left pure behind: but the carelessness of the workmen in doing this, and particularly the using bad vessels, or the not luting them close, causes a waste of this mineral greater than could be conceived. Alonso tells us, that in the city of Potosi alone, at the time of his writing, when the trading in metals ran but low, above thirty thousand pieces of eight were wasted in quicksilver that was lost one year with another. To prevent this, they then principally studied the means of keeping the silver as dry of quicksilver as they could, in the *pine-apple*; but it then holding four fifths of the whole mass in quicksilver, the great waste was in the separating it afterwards. *Alonso Barba* de Metal.

PINE-*salt*, a name given to a preparation of the bark of the *pine*-tree, used as a sort of seasoning to food in the manner in which we use salt.

The Laplanders are very fond of this, and the manner of their preparing it is given in Scheffer's history of that country: they peel off the bark from the lower part of the bodies of those trees, and separating the outer rough part, they take the inner bark, which they carefully divide into its several thin coats: when they have thus reduced them to as thin pieces as they can, they expose them to the sun in their summer months to dry, and when thoroughly dried, they tear them into thin and narrow slips, and put them up in boxes made of the outer bark of other trees fresh taken off. They bury these boxes in deep holes dug in the sands, and let them remain thus one day; on the day following they bring together a number of stumps of trees, and other wood, and laying them over the place where the bark is buried, they set them on fire: the next day they take out their buried boxes, and the heat having penetrated so deep into the earth in a mild degree, the bark is found to have been greatly affected by it, and to have received a red colour, and a very agreeable flavour, somewhat sweetish. This is their general sauce; they eat it with all their food, as we do salt, but it has so little of the nature of salt, that the name is but ill adapted to it.

There is another vegetable substance, which, tho' of a disagreeable taste to us, yet custom teaches them to be fond of. This is the angelica petrosa: they cut the large stalks of this plant before it runs to seed, and roast them; they eat this in considerable quantities with their *pine-salt*, and esteem it not only an agreeable, but a more than ordinarily wholesome sort of food.

PINGUICULA, *butterwort*, in botany, the name of a genus of plants, the characters of which are these: the flower consists of one leaf, and is of a sort of bilabiated form, in some degree resembling the violet flower, and ending in a sort of heel: the pistil arises from the cup, and is fixed in the manner of a nail to the hinder part of the flower; and finally becomes a fruit or capsule, containing a great number of small seeds affixed to a placenta.

The species of *butterwort*, enumerated by Mr. Tournefort, are these: 1. The common *butterwort*, called also *mountain sanicle*, and *Yorkshire sanicle*. 2. The white flowered *butterwort*, with a very small flower and short heel. 3. The purple *butterwort*, with a very large flower and a very long heel. 4. The smaller *butterwort*, with a flesh-coloured flower. *Tourn.* Inst. p. 167.

The characters of this genus, according to Linnæus, are, that the cup is a small acute labiated perianthium, which remains when the flower is fallen; its upper lip being erect and trifid, its lower reflex and bifid: the flower is labiated, and made up of a single petal: the longer lip is strait, obtuse, trifid, and laid flat; the shorter is bifid, more obtuse, and spread more open: its nectarium is in the figure of a horn, and is produced from the bottom of the petal: the stamina are two cylindric filaments, crooked, and inclined upwards, and shorter than the cup: the antheræ are roundish: the pistil has a roundish germen, a very short style, and a stigma composed of two lips; the upper of which is large, plain, bent backward, and covers the antheræ; the lower is very narrow and short, and is placed erect, and is bifid: the fruit is an oval-shaped capsule, compressed at the top, and naturally opening there, and containing only one cell, full of very numerous and cylindric seeds placed loose in it. *Linnæi* Genera Plant. p. 5.

PINHONES, the name by which the Portuguese call the purging nuts, as they are called, of America; the fruit of a great ricinus, or palma-christi. *Piso*, 169.

PINIROLO, in zoology, the name of a bird of the tringa kind, somewhat approaching to the land-piper, but larger. Its beak is a little more than a finger's breadth long, and black: it is of a mixed chesnut colour, and brown on the back; and its belly and breast are perfectly white: it is common in the Italian markets, and very much resembles the common tringa: *Ray*'s Ornithol. p. 223.

PINK, *caryophyllus*, in botany, the name of a genus of plants, the characters of which are these: the flower is composed of several petals, disposed in a circular form, and produced out of a tubular cup, of a cylindric shape and membranaceous substance, and scaly at the bottom. The pistil arises also from the same cup, and finally becomes a cylindric fruit; which, when ripe, opens at the summit, and is surrounded by the cup, and filled with flat, and, as it were, foliaceous seeds, which adhere to a placenta. See Tab. 1. of Botany, Class 1.

The species of *caryophyllus*, enumerated by Mr. Tournefort, are these: 1. The common great red *pink*. 2. The broader-leaved great *pink*. 3. The great *pink*, with variegated flowers. 4. The great *caryophyllus*, with very double flowers, of a variegated red and white. 5. The great very double *caryophyllus*, with scarlet, red, and white flowers. 6. The great very double, deep red *caryophyllus*, with three white pointals in the middle. 7. The great round-flowered *caryophyllus*, with scarlet and white flowers. 8. The great *caryophyllus*, with blackish, purple, and snow-white flowers. 9. The great double *caryophyllus*, with violet and white flowers. 10. The great double *caryophyllus*, with vermillion and white flowers. 11. The common, tall, variegated, double *caryophyllus*. 12. The great white *caryophyllus*. 13. The red and blood-coloured *caryophyllus*. 14. The white *caryophyllus*, with dots and lines of red. 15. The double *caryophyllus*, with purplish red flowers. 16. The flesh-coloured and white double *caryophyllus*, with spots and lines of red. 17. The double *caryophyllus*, with every leaf of the flower half white and half red, and variegated with red spots. 18. The crimson and snow-white *caryophyllus*. 19. The great double whitish *caryophyllus*, with deep purple spots. 20. The great bright white and scarlet *caryophyllus*. 21. The great round-flowered double *caryophyllus*, of a deep red and white. 22. The great double flesh-coloured and white *caryophyllus*. 23. The great double white-flowered *caryophyllus*, with a mixture of bright red. 24. The great double *caryophyllus*, with dusky white flowers, and spots of a ferrugineous colour. 25. The great broad-leaved *caryophyllus*, of the colour of the peach-bossom. 26. The great double purple *caryophyllus*, with spotted leaves. 27. The great purple *caryophyllus*, with spots of a deeper purple. 28. The greenish-flowered *caryophyllus*. 29. The lesser white *caryophyllus*, with lines of scarlet or violet colour. 30. The red-lead-coloured *caryophyllus*, with flowers white in the center. 31. The double violet-coloured *caryophyllus*. 32. The double orange-

coloured *caryophyllus*. 33. The dappled *caryophyllus*, of a white and orange colour. 34. The middle-sized *caryophyllus* altilis, with pale violet-coloured flowers. 35. The small *caryophyllus* altilis, with pale yellowish flowers. 36. The little variegated *caryophyllus* altilis. 37. The common single garden-*caryophyllus*, with large flowers. 38. The common garden single *caryophyllus*, with flesh-coloured flowers. 39. The single garden-*caryophyllus*, with variegated flowers. 40. The great wild *caryophyllus*, with variegated flowers. 41. The common double small garden-*caryophyllus*. 42. The procumbent garden-*caryophyllus*, with double-red flowers, spotted with white. 43. The double-jagged garden-*pink*. 44. The double-jagged garden-*pink*, with flesh-coloured flowers. 45. The garden-*caryophyllus*, with very finely divided flowers. 46. The flesh-coloured finely divided garden-*caryophyllus*. 47. The white finely divided garden-*caryophyllus*. 48. The white scentless jagged-flowered wild *caryophyllus*. 49. The sweet-scented jagged-flowered wild *caryophyllus*. 50. The white-flowered sweet-scented jagged-flowered wild *caryophyllus*. 51. The jagged-flowered wild *caryophyllus*, with sweet-scented stamina. 52. The jagged-flowered sweet-scented *caryophyllus*, without stamina. 53. The cretic shrubby *caryophyllus*. 54. The single *caryophyllus*, with small pale-red flowers. 55. The small single *caryophyllus*, with spotted flowers. 56. The procumbent broad-leaved single *caryophyllus*. 57. The single procumbent narrow-leaved *caryophyllus*. 58. The double purple *sweet-william*, or *caryophyllus barbatus*. 59. The double white *sweet-william*. 60. The rose coloured *sweet-william*. 61. The single broad-leaved *sweet-william*, with flesh-coloured flowers. 62. The single broad-leaved *sweet-william*, with purple flowers, and with variegated leaves. 63. The purple broad-leaved single *sweet william*. 64. The white broad-leaved single *sweet-william*. 65. The single broad-leaved *sweet-william*, with variegated flowers. 66. The pale red-flowered narrow-leaved *sweet-william*. 67. The deep red-flowered narrow-leaved *sweet-william*. 68. The narrow-leaved *sweet-william*, with milk white flowers, with red spots. 69. The narrow-leaved *sweet-william*, with white flowers with red edges. 70. The narrow-leaved *sweet-william*, with plain snow-white flowers. 71. The narrow-leaved *sweet-william*, with a few pale-red flowers. 72. The narrow-leaved *sweet-william*, with purple flowers and white edges. 73. The narrow-leaved *sweet-william*, with snow-white and purple flowers. 74. The wild *sweet-william*, or common wild *pink*. 75. The wild proliferous, or childing *pink*. 76. The white flowered proliferous wild *pink*. 77. The single-flowered proliferous wild *pink*. 78. The common wild broad-leaved *pink*. 79. The many-flowered mountain-*pink*. 80. The Italian umbellated *pink*, with yellow and ferrugineous flowers. 81. The common narrow-leaved wild *pink*. 82. The wild *pink*, with large scentless hairy flowers. 83. The little creeping *pink*, with one flower on every stalk, called by many the *maiden-pink*. 84. The red wild *pink* of Caryntha. 85. The purplish blue woolly or hairy-flowered wild *pink*. 86. The wild *pink* with hairy white flowers. 87. The common little wall-*pink*. 88. The common wild *pink* of the warm climates. 89. The alpine *pink*, with rose-coloured flower and greenish umbilicus. *Tourn.* Inst. p. 330, seq.

PINNA *(Cycl.)*—PINNA, a *fin*, in natural history, the name of that part of a fish which distinguishes it from other aquatic creatures, no animal but a fish having *fins* and wanting legs.

The *fin* is properly a part standing out, or hanging from, the body of the fish, and consisting of a membrane supported by several rays or oblong bones; which are in some hard and firm, and in others cartilaginous.

This definition of a *fin* properly excludes all those other parts of a fish which may be prominent from the body, and may be of a membranaceous structure, and even carry the appearance of a *fin*, tho' they have none of the rays or little bony substances within them, and therefore cannot serve the creature in the office of *fins* in swimming; for the cartilages or bones, which support the membranes of the *fins*, are what give them their due and necessary strength and firmness to bear against the water for the motion of the body of the fish: those other membranaceous appendages to the bodies of fishes cannot do this; for wanting the support of these rays, the simple and soft membrane has no more power of moving the water, than the water has of moving it. Hence appears the use of the bones or rays, supporting the *fins*, and the truth of the definition, that nothing is properly a *fin* which wants them.

The *fins*, by their differences, make very obvious distinctions among the several species of fishes; and these differences are, in regard to number, situation, figure, and proportion.

The number of the *fins*, including the tail, is very different, in different fish. 1. In some there is only one *fin* to the whole fish. This is the case in the ophidium lumbriciforme, and in the muræna. 2. The *fins* are two in number in others, as in the petromyzæ and the like. 3. There are many which have three *fins*; as the conger, the eel, the common ophidium, the greenland whale, the sea-cow, and the like. 4. Many have four *fins*, of the number of which are the dolphin, the phocæna, and the second kind of the acus Aristotelis. 5. Several have five *fins*; as the ammodytes or sand-eel, the sword fish, the lupus marinus, the mola or sun-fish, and many others. 6. The lump-fish gives us an instance of six *fins*; for the seeming first *fin*, on the back of that fish, is not a real *fin*, but only a cutaneous prominence. 7. Many fish have seven *fins*; as the gudgeon, the pleuronectes, the cyprinus, the clupea, the coregones, the osmeri, the salmons, the cobites, the esoces, the cernua fluviatilis, the gasterosteæ, the spari, the labri, the silurus, the mugil alatus, the remora, the capriscus, the hippurus, the pompilus, and the accipenser. 8. Many fish also have eight *fins* each; of this number are some of the pearches, the clarea, the cottus, the mugil, the labrax, the sudis, the mulli, the ling, the trachurus, the scyæne, the trachinus, the uranoscope, and that little fish called the *anguella* by the Venetians. 9. The scorpæna of Rondeletius gives us an instance of the *fins* being nine in number; and, finally, the scombri and thynni, give us instances of eleven *fins* in the same fish.

The differences in situation are less numerous than these, as to number, but they are not less obvious and essential. 1. They are generally placed both on the back and belly, as we see in most of the species of fishes. 2. They are sometimes placed only on the back. This is the case in the petromyzæ, the acus lumbriciformis, and some others. 3. Some have them, on the contrary, only on the belly; of this kind are the Greenland whale, the sea-cow, and the like: and to this it is to be added, that the back and belly *fins* differ greatly in the several fish, in their being placed more or less backward or forward.

The differences of shape or figure in the *fins* of fishes, are also very obvious. 1. They are in some nearly triangular, as in the cyprini, and salmons, *&c.* 2. Some few fish have them round. And 3. Some have them of an oblong square, or parallellogram figure.

Finally, the difference in proportion is not to be omitted; for they are in some much shorter and smaller than the body; as is the case in the generality of fishes; but in others they are of an equal length with the body. Of this kind are the pectoral *fins* in some of the legyræ, and the ventral *fins* in the mugil alatus of Rondeletius, and other authors. *Artedi*, Ichthyol. p. 4.

Aculei PINNARUM, in ichthyology. Every apophysis or eminence on the head or body of a fish, which is so sharp at the end as to be capable of pricking, is called an *aculeus*; but the *aculei pinnarum* in particular, are those prickly *radii* or bones, which serve to support the fins; and being carried out beyond the rim of the membrane, end in so many points.

These *aculei* are simple cylindric ossicles, whereas the other ossicles, which sustain the fins, are less rigid, and are bent and not prickly: and these are not simple, but are composed each of two ossicles closely cohering one to another. Many of these *radii* are divaricated at their extremity into two, three or more branches; these when they are carried out beyond the rim of the membrane, are harmless, and are seen to be composed of two ossicles, as the body of the radius is. The *aculei* of the back and belly of all fishes are so far of the same nature, that they never stand single, as some have supposed them to do in particular instances; but they are always connected one to the other at the bottom, by a membrane, tho' that be ever so small and low, as in some it is scarce visible.

PINNARUM *radii*. See the article RADII *pinnarum*.

PINNA *marina*, in natural history, the name of a shell-fish, by the latest writers on these subjects referred to the genus of muscles. See the article MYTULUS.

This shell-fish is like the muscle, held in its place by a number of threads, which proceed from its body, and are fixed to any adjoining substance, and is one of those fish, which, like the muscle, has a power of spinning in the manner of the spider and caterpillar. See the article MUSCLE.

The threads which these fish spin, are infinitely finer and slenderer than those of the muscle, notwithstanding that the fish is vastly larger; its shells being often found two foot long. These threads are indeed scarce, less fine than the single silk threads of the silkworm, and like it have in all times been worked into use. The finest kind of the byssus of the antients was wrought out of these threads, and at present they are manufactured at Palermo, and at many other places, into gloves, stockings, and other sorts of wearing apparel.

It is easy to conceive, that threads so fine as these can be of no great strength; but what is wanting in the force of each, is made up in the number of them; which are spun by every fish, for this is almost infinite. They differ in nothing from the threads of the muscles, beside their fineness and their length; which is in these much greater, and therefore makes them greatly the more valuable. They are probably formed in the same manner with those of the muscles; and the *pinna* may be called, by way of distinction, the silkworm of the sea; and the muscle, the caterpillar. See Tab. of Shells, N°. 20. Mem. Acad. Par. 1711.

PINNARUM *dilatator proprius*, in anatomy, a name given by Santorini to one of the muscles of the face, which he has also called *myrtiformis nasi*, and which Cowper has called *depressor labii*

labii ſuperioris, ſive conſtrictor alæ naſi, and Albinus the *depreſſor alæ naſi*. See the article DEPRESSOR.

PINNATED *leaf*, among botaniſts. See the article LEAF.

PINNATIFID *leaf*, among botaniſts. See the article LEAF.

PINNATUS, in heraldry, a term uſed by the Latin writers on theſe ſubjects, to expreſs that ſort of line in arms which is called by our heralds the *embattled line*, or *crenelle*. It is alſo called by ſome *linea pinnis aſperata*, and by Sylveſter Petro Sancto *murales pinnulæ*. When this line is only embattled on one ſide, it is properly expreſſed by this word; but when it is embattled on both ſides, as in ſome arms, it is called *breteſſe* and *contre breteſſe*. See the article EMBATTLED.

PINT *(Cycl.)*—In the Engliſh beer meaſure, the *pint* is the eighth part of a gallon; conſequently contains $35\frac{1}{4}$ cubical inches. Tr. Pract. Geom. p. 112. See the article GALLON.

As to the *pint* uſed in Scotland, there are different opinions concerning the number of cubical inches it contains. Dr. Gregory makes them 109; others, from ſeveral careful menſurations of the ſtandard kept at Edinburgh, make the Scotch *pint* to contain $103\frac{4}{10}$; and thoſe in common uſe are ſaid to contain betwixt 105 and 106 cubical inches. Another experiment was made with a caſk, which was found to contain $46\frac{7}{8}$ Scotch *pints*, and $18\frac{1}{10}$ Engliſh ale gallons. Suppoſing this menſuration juſt, the Scotch *pint* will be to the Engliſh ale gallon as 289 to 750; and if the Engliſh ale gallon be ſuppoſed to contain 282 cubical inches, the Scotch *pint* will contain 108.664 ſuch inches. Tr. Pract. Geom. p. 114.

The Paris *pinte* is nearly equal to an Engliſh wine quart. Tr. Pract. Geom. p. 117.

PINTADO, or AFRA AVIS, in natural hiſtory, a name given by the antient Roman authors to the Guinea hen.

Varro, Columella and Pliny, with many others, make the *pintado* and the *meleagris* the ſame ſpecies of bird; but Suetonius, Scaliger, and ſome others, are of opinion, that the antients meant two very different birds by theſe names; and the latter of theſe authors endeavours to bring Varro over to his ſide, by altering the pointing in the paſſage of that author which relates to it.

The bird is of late become very common in England, and breeds with us in great plenty. The hen lays her eggs and ſits upon them in the ſame manner with the common hen; but the eggs are ſmaller and not ſo white as the hens eggs, but have a tinge of fleſh colour and ſome black ſpots. They are not ſo tame and domeſtic as our own fowls, and particularly they will not lay in houſes; but get into the hedges and among buſhes, where they lay and hatch; but this is the occaſion of great loſs among them, the wild vermin deſtroying a great part of their young brood. The female alſo is leſs careful about the great buſineſs of hatching and taking care of them, than any other bird we are acquainted with. She will often leave her neſt when the eggs are near hatching, and never return to it again; and often will deſert the young as ſoon as hatched, if ſhe remains at her neſt till that time. The beſt method, therefore, is to ſet other fowls upon the eggs of this kind. The young fowls of this kind are very beautiful; they look like ſo many partridges. Their beaks and legs are red, and their whole plumage is at that time of the colour of the partridge. See Tab. of Birds, N°. 21.

The hen, if her neſt is found, and the eggs at times taken away, but ſo as always to have one there, will continue to lay till ſhe has depoſited an hundred, or ſometimes an hundred and fifty eggs, which are very well-taſted. This is a very active and ſprightly bird, and of an unquiet and troubleſome diſpoſition to the owner. It runs very ſwiftly in the manner of the quail and partridge; but its wings are ſhort, and it is not made for flying; yet at night it will not rooſt among other fowl, but gets upon a houſe or tree, or any other high and ſafe place. The cry of the bird is ſharp and diſagreeable to many ears, and it is almoſt continually making it. It is of a quarrelſome diſpoſition, and will be miſtreſs of the yard: its agility, and the ſharpneſs of its beak, generally obtain it the victory with what ever bird it fights.

The *pintado* is ſo common in America, that many have ſuppoſed it native there; but this is not the caſe. The origin of the bird is in Guinea, and the firſt that were ever brought into America, were brought in the year 1508, with the cargoes of negro ſlaves. The Spaniards neither at that time nor ever ſince, have attempted to tame them, or render them a domeſtic uſeful bird, but let them go looſe and wild in the ſavanhas; where they have increaſed to ſuch prodigious numbers, that they may well appear native, and are ſeen in vaſt flocks together, and are called *marroon pintades*, by the Spaniards and French. Obſerv. ſur les Cout. de l'Aſie, p. 190.

PINUS, the *pine-tree*. See the article PINE.

PIONY, *pæonia*, in botany. See the article PÆONIA.

The ſeveral ſorts of this plant are all very hardy, and will grow in almoſt any ſoil and ſituation; they are propagated by parting the roots, which multiply very faſt. They ſhould be planted in Auguſt, or the beginning of September, and will then flower the ſucceeding ſummer. The off-ſets ſhould not be too ſmall, and ſhould all have a fair bud or eye. The ſingle kinds may alſo be propagated by ſowing their ſeeds in Auguſt in a light earth, and managing them in the method of all other ſeedling plants. There may probably be ſome good varieties of the flowers produced this way. The ſingle Portugal *piony* is of ſo ſweet a ſmell as to deſerve a place in any garden, tho' but a ſingle flower. *Miller*'s Gard. Dict.

Piony-root, is a celebrated medicine in nervous caſes. We have inſtances well atteſted, of epilepſies cured by it alone. It is good alſo in all diſorders of the head, in hyſteric complaints, and obſtructions of the viſcera.

PIPE *(Cycl.)*—The Turkiſh *tobacco-pipe* is very long, the tube is made of wood or reed, and the bowl of earthen ware; thoſe they carry with them when they travel, they have made in two or three joints, to put into a bag; they cover the tube ſometimes with cloath, and dip it in water to make it ſmoak cool. *Pocock*'s Egypt, p. 186.

PIPE, in mining, is where the ore runs forwards endways in a hole, and doth not ſink downwards or in a vein. *Houghton*'s Compl. Miner in the Explan. of the Terms.

PIPER, *pepper*. Baldæus tells us, that the *pepper* thrives beſt in the cooleſt and moſt ſhadowy places, and that the plant has a weak ſtem like that of the vine, which muſt be ſupported by ſomething to climb upon. Theſe commonly grow about ſix cluſters on every branch, each cluſter is a foot long, and in colour like unripe grapes. They gather it while green in October and November, and expoſe it to the ſun to dry, by which means it grows black in a few days. *Baldæus* de Ind. Orient. p. 99.

PIPER *chiapæ*, in botany, a name given by ſome authors to the clove berry-tree, or *caſſia caryophyllata*. *Redi*, Lat. p. 132.

PIPER *Jamaicæ*, the *pepper-tree* of Jamaica. See the article PIMIENTA.

PIPER *nigrorum*, *negro pepper*. The plant called at preſent by this name is the capſicum, or Guinea *pepper*, a remarkable herb, bearing large pods as red as coral, of which the Cayan butter is made in America. But this is not the plant that was antiently known by this name. Aviſenna and Serapion, both mention a plant which they call *fulful alſuaden*, the Engliſh of which is, the *pepper* of the black people. But this was properly what has been ſince called the *Ethiopian pepper*; a ſort of hot ſeeds approaching to the nature of the common *pepper*, and contained ſeveral together in pods. Aviſenna tells us, that the plant properly and rightly called *piper nigrorum*, had pods like thoſe of the kidney-bean, which were of a black colour, and that the ſeed was hot and biting to the taſte like *pepper*. There was alſo another thing called by the ſame name, that is, the *zelem* of theſe authors; this was brought from Barbary, and was a fruit of a high flavour, of the bigneſs of a vetch, and was yellow on the outſide and white within. Serapio abſolutely diſtinguiſhes this by the name of *zelem*, from the other *piper nigrorum*, properly ſo called; yet Guillandinus has been the occaſion of many errors in regard to theſe fruits, by attributing to the *zelem* the things which that author expreſsly ſays of the other *piper nigrorum*, or *Ethiopian pepper*: it is not eaſy from the accounts we have left, to ſay what it is; but they have left deſcription enough of it for us to ſay what it is not, and to find that they have all been miſtaken, who have ſuppoſed it to be either the root tarſi, or the bulbus of the Arabians, which laſt was as large as a pear.

PIPER *tavaſci*, in botany, the clove-berry-tree, or *caſſia caryophyllata*; a tree whoſe bark is uſed in medicine. *Hernand.* p. 30.

PIPERAPIUM, an old name of a plant found in Apuleius, and ſaid to have its name from its heat to the taſte; which was ſo offenſive to the bees, that if a piece of it were hung up in their hive it would drive them all out.

This is a very ſtrange account, and as we meet with nothing to countenance it in any other author, there is reaſon to ſuſpect it to be an error; and there ſeems this foundation for it. The acorus root is ſaid by Dioſcorides to be the root of a plant allied to the papyrus, or paper reed of the river Nile; and is thence called by that author *papyraceus*. Aviſenna and Serapion copy this, and liken the acorus plant to the papyrus; but in all the copies of the Greek author, it is often found written πεπεραχιον. This word *peperacion*, may have been formed by Apuleius into *piperapium*, by way of amendment, and all the reſt might be occaſioned by this.

PIPERITIS, in botany, a name given by ſome authors to the *momordica*, or male balſam apple. *Tourn.* Mat. Med. p. 357.

PIPERIVORA *avis*, in zoology, a name given by ſome authors to the *toucan*, or Braſilian magpye, from its feeding on pepper. *Ray*'s Ornithol. p. 88. See the article TOUCAN.

PIPRA, in zoology, a name given by Ariſtotle, and other antient writers, to the *picus varius major*, the great ſpotted wood-pecker, or witwall. See the article PICUS.

PIQUE, in natural hiſtory, a name given by the Spaniards to an inſect of the ſize of a flea, called by the Indians *tung*. It is common in the Eaſt and Weſt Indies, and eats its way into the fleſh under the nails, &c. See the article TUNG.

PIQUETTE, among the floriſts, a term uſed for a certain ſort of carnations, which have always a white ground, and are ſpotted, or as they call it, pounced with ſcarlet, red, purple, or other colours.

PIQUI-

PIQUITINGA, in zoology, the name of a ſmall American river-fiſh. It ſeldom exceeds two inches in length: its mouth appears very ſmall, but it can at pleaſure open it to a great width: its eyes are very large and black, with a ſilvery iris: it has ſix fins beſides the tail, which is forked; its head is of a ſilvery white: its back olive colour, and its belly and ſides are covered with ſilvery ſcales; the fins are all white, and the ſide-lines are broad, and very bright and ſhining. *Marggrave*'s Hiſt. Braſil.

PIRA-*aca*, in zoology, a name by which Marggrave and ſome other authors have called a little horned fiſh of the Weſt Indies, called by Cluſius and others, the *monoceros piſcis*, or unicorn fiſh. *Willughby*'s Hiſt. Piſc. p. 150. See the article MONOCEROS.

PIRA-*acangata*, in zoology, the name of a Braſilian fiſh, reſembling the perch in ſize and ſhape. It is of a ſmall ſize, ſeldom exceeding four or five inches in length: its mouth is ſmall: its tail is forked; and it has on the back only one long fin, which is ſupported by rigid and prickly ſpines. This it can depreſs at pleaſure, and ſink within a cavity made for it in the back. Its ſcales are of a ſilvery white, but have an admixture of a fine yellow and reddiſh gloſs, eſpecially on the back: the ſides are more purely white, and the belly is of a ſomewhat bluiſh green, mixed with the white: the back fin is very pellucid, and of a ſilvery white, and is variegated with brown ſpots: the ſide fins are white, and the belly ones, and the end of the tail, are blue. It is a wholeſome and well-taſted fiſh. *Marggrave*'s Hiſt. Braſil. *Willughby*'s Hiſt. Piſc. p. 338.

PIRA *bebe*, in zoology, a name uſed by ſome authors for the *milvus*, or kite-fiſh. *Dale*, Pharm. p. 376.

PIRA-*coaba*, in zoology, the name of an American fiſh of the truttaceous kind, much eſteemed for the delicacy of its flavour. It grows to about twelve inches in length: its noſe is pointed, and its mouth large; but without teeth: the upper jaw is longer than the other, and hangs over it in form of a cartilaginous prominence: its eyes are very large, and its tail forked: under each of the gill-fins it has a beard made of ſix-white filaments, and is covered all over with ſilvery ſcales. *Marggrave*'s Hiſt. Braſil.

PIRA-*jurumenbeca*, in zoology, the name of a Braſilian fiſh, called by many the *bocca molle*. It lives in the muddy bottom of the American ſeas, and is a long-bodied not flatted fiſh. It grows to a vaſt ſize, being ſometimes caught of nine, and ſometimes even of ten or eleven foot long, and two foot and an half thick. It has one long fin on the back, the anterior part of which is thin and pellucid; and has a cavity on the back, into which the creature can depreſs the fin at pleaſure: its tail is not forked: its ſcales are all of a ſilvery colour and brightneſs, and moderately large: it has a greeniſh caſt on the back, mixed with a ſhade of yellow; and it has a line running along the middle of each ſide, of the ſame ſilvery hue with the reſt of the body, but raiſed above the common ſurface of the part. It is a very well-taſted fiſh. *Marggrave*'s Hiſt. Braſil.

PIRA-*pixanga*, in zoology, the name of a Braſilian fiſh of the turdus or wraſſe kind, and called by ſome the *gat-viſch*. Its uſual length is four or five inches. its mouth is conſiderably large, and furniſhed with very ſmall and ſharp teeth: its head is ſmall, but its eyes large and prominent: the pupil of a fine turgoiſe colour, and the iris yellow and red in various ſhades: the coverings of the gills end in a triangular figure, and are terminated by a ſhort ſpine or prickle: its ſcales are very ſmall, and ſo evenly arranged and cloſely laid on the fleſh, that it is very ſmooth to the touch: its tail is not forked, but rounded at the end: its whole body, head, tail, and fins, are of a pale yellow, variegated all over with very beautiful blood-coloured ſpots; theſe are round, and of the bigneſs of hemp-ſeed on the back and ſides, and ſomething larger on the belly: the fins are alſo ſpotted in the ſame manner, and are all marked with an edge of red. It is caught among the rocks, and about the ſhores, and is a very well-taſted fiſh. *Marggrave*'s Hiſt. Braſil.

PIRANHA, in zoology, a name given to the American fiſh more commonly known by the name *piraya*. *Marggrave*'s Hiſt. Braſil. See the article PIRAYA.

PIRAQUIBA, or IPIRAQUIBA, in zoology, a name originally Braſilian, by which ſome authors expreſs the *remora*, or ſucking fiſh. *Marggrave*, 180.

PIRATIA-*pua*, in zoology, the name of an American ſea-fiſh, which grows to a very large ſize, and, while young, is eaten and accounted a delicacy; but, when full grown, is too coarſe, rank, and ſtrong. Its jaws are both well armed with teeth; the under all the way on both ſides, the upper only in the middle on each. The lower jaw is ſomewhat longer than the upper, and the mouth very large. It is of an oblong and rounded body. Its back is a little prominent, but its belly altogether flat and even. It has ſix fins beſides the tail, which is made of a very large fin, of a ſomewhat ſquare figure, and is not at all forked. It is all over of a duſky orange colour, but more obſcurely ſo on the back than elſewhere; and its ſides are variegated with grey ſpots, ſo diſpoſed as to repreſent a ſort of network. *Piſo*'s Hiſt. Braſil.

PIRATIAPIA, in zoology, the name of a Braſilian fiſh, approaching to the nature of the turdus or wraſſe. Its body is oblong, not flatted, and very thick. It is a large fiſh, and ſometimes grows even to fifty pound weight. Its lower jaw is conſiderably longer than the upper, and its teeth are very ſharp. Its mouth and tongue are red on the inſide, and its eyes are large and prominent. It has only one long back fin, the anterior rays of which are prickly, the hinder ſmooth. Its tail is not forked, its ſcales are ſmall, and its back and belly are of a fine bright red. Its ſides of a ſilvery grey, with a duſky caſt. It is all over ſpotted alſo with the ſame colour in large round ſpots. The fins are all red, with a line of white and a fringe of black at their edges. It is a very delicate and valuable fiſh. *Marggrave*'s Hiſt. Braſil.

PIRAUMBU, in zoology, the name of a Braſilian fiſh, ſomewhat approaching to the nature of the turdus, and called by the Portugueſe *chayquarona*. It is of the figure of the carp, and its uſual length is ſix or ſeven inches, and its breadth in the broadeſt part about three inches; but gradually diminiſhing to the tail. Its eyes are large and prominent. Its mouth like that of the carp. It has two fins on the back. Its ſcales are very broad, of a ſilvery whiteneſs, with a ſmall admixture of yellow. Its tail is forked. The upper half of every ſcale is, however, browniſh, and the fins are all grey. Its belly and the under part of the head, are of a fine ſilvery white. It is caught among the rocks, and near ſhores, and is a well-taſted fiſh. *Marggrave*'s Hiſt. Braſil.

PIRAYA, in zoology, the name of a fiſh caught in the American rivers. There are two kinds of it: the one growing to a foot long, and very broad in proportion; with a hunched back, and lips that cover its mouth cloſely and hide its teeth: its head is blunt and ſhort, and its back and ſides of a pale bluiſh grey, and its belly of a duſky yellow: this loves the muddy bottoms of rivers. The other is much of the ſame ſize, but has two fins on his back, whereas the other has but one; and has a fine yellowiſh and reddiſh caſt mixed among the bluiſhneſs on the back, and its belly of a fine clear and ſtrong yellow, between a gold and a ſaffron colour: this loves the ſandy bottoms of rivers. There is alſo a ſmaller ſpecies of this: all three are eatable fiſh. *Marggrave*'s Hiſt. Braſil.

PIRIT, in natural hiſtory, a name given by the people of the Philippine iſlands to a peculiar ſpecies of ſparrow, which is very common with them. It is much ſmaller than our common ſparrow, and feeds only on the ſeeds of the canary-graſs, which is very commonly wild there.

PISCES *(Cycl.)*—PISCES, *fiſhes*. According to the new Artedian ſyſtem, *fiſhes* in general are divided into five diſtinct orders. The generality of fiſhes have the tail placed perpendicularly, but a few of them have it horizontally. Of thoſe which have the tail perpendicular, ſome have the rays of the fins bony; and theſe either have the gills covered with a membrane, containing ſeveral bones, or they have no ſuch membrane: of thoſe which have this membrane, with the bones over the gills, ſome have the rays, tho' bony, yet not pungent; theſe are called the *malacopterygii*, or the ſoft-finned fiſhes. Others have them with the rays prickly; theſe are the *acanthopterygii*, or prickly-finned fiſhes. Thoſe which have no bones in the membrane over the gills, make only one genus, and are called the *branchioſtegi*. The other kind, which have not bony, but cartilaginous rays in the fins, are called *chondropterygii*. And finally, thoſe *fiſh* which have the tail placed not perpendicularly, but horizontally, are called *plagiuri*. See MALACOPTERYGII, &c.

The *fiſh* thus conſtituting the order of the *malacopterygii*, are again divided into ſeveral ſeries. 1. Thoſe which have only one fin on the back, and that placed nearly the middle of the back. 2. Thoſe which have one fin placed in the middle of the back, and another ſtanding farther behind. 3. Thoſe which have only one fin on the back, and that placed far backwards. 4. Thoſe which have one or more fins running all the way down the back. 5. Thoſe which have one long back fin, ſcarce diſcernible from the tail. 6. Thoſe which have either only one very ſmall fin on the extremity of the back, or have no fin at all there. Theſe are the principal diſtinctions of the *malacopterygii*.

The *acanthopterygii* are divided only into two ſeries: the one conſiſting of thoſe whoſe head is ſmooth; the other of thoſe whoſe head is rough.

Artedi has given a very ſhort definition of a fiſh, which ſevers it from all other creatures; and ſeparates from the fiſh kind many creatures which ſome authors have confuſedly treated of among them, as properly of the ſame claſs of animals. The definition is this: *A fiſh is a creature having no legs, and always having fins.* There is no other aquatic animal which has not legs, and has fins properly ſo called; and it is very improperly, that creatures, wanting the characters of this definition, are by ſome ranked among fiſhes; as the inſects which have legs, and the ſerpent kind, which have no fins. The definition may be rendered longer and more expreſs in the following form: A fiſh is an animal having fins, having no legs, always reſpiring either by means of lungs or gills; inhabiting the waters, except on extraordinary occaſions; and moving itſelf either ſolely by its fins, or by the additional help of a flexuous motion of the body, ſometimes coming out of the water on the earth; and ſometimes flying or riſing into the air, and continuing

tinuing there ſome time, carrying itſelf along by means of the pectoral fins. The laſt quality belongs only to the flying fiſh, and a very few others. *Artedi* Ichthyology, p. 1.

PISCIS *foſſilis*, in ichthyology, a name given by Jonſton to a kind of the cobitis, found buried in the ſand, and dug out by the people of many parts of Germany for food. It is called by many authors the *muſtela foſſilis*, and by ſome the *pæcilia*. It is properly a ſpecies of cobitis, and is called by Artedi the *bluiſh cobitis*, with five longitudinal black lines on each ſide of the body. *Artedi*, *Jonſton*, de Piſc.

PISCIS *ſancti petri*, in ichthyology, a name given by Jovius and ſome other authors to the faber or John Doree. It is properly a ſpecies of zeus. See ZEUS.

PISCIVOROUS *animals*, are ſuch as feed on fiſh. See the article BIRD.

PISMIRE, in zoology, See FORMICA.

PISONIA, in botany, the name given by Plumier, in honour of Piſo, to a genus of plants, called by Vaillant *pentagonotheca*. The characters are theſe: it produces ſeparate male and female flowers; in the male flower the cup is erect, very ſmall, and divided into five ſegments: the flower is of a funnel-ſhape, the tube is ſhort, and the mouth very wide: it is lightly divided into five ſegments, and lies open: the ſtamina are five pointed filaments, longer than the flower: the apices are ſimple. In the female flower, the cup is the ſame as in the male; but it ſtands on a germen: the flower is the ſame as in the male: from the germen there ariſes a ſingle, erect, cylindric ſtyle, which is longer than the flower, crowned with five oblong ſtigmata: the fruit is an oval capſule, compoſed of five valves, and having an obſcurely pentangular appearance, but having only one cavity within: the ſeed is ſingle, ſmooth, and of an oval or oblong figure. *Linnæi* Gen. Pl. p. 474. *Plumier*, Gen. 11. *Houſton*, 13. *Vaillant*, Act. Germ.

PISSASPHALTUM, in natural hiſtory, the name of a genus of foſſils, the characters of which are theſe: They are fluid mineral bodies, of a ſomewhat thick conſiſtence, duſky, and opake; of a ſtrong ſmell, and readily inflammable, but leaving a reſiduum of greyiſh aſhes after burning.

There are three known ſpecies of this genus: 1. A thinner blackiſh kind, called *oleum terræ*. 2. A thicker black one, called *piſſelæum Indicum*, or Barbadoes tar. And, 3. A black and viſcous one, called ſimply *piſſaſphaltum* in the ſhops. See the articles OIL *of the earth*, and PISSELÆUM.

Piſſaſphaltum is as tough and viſcous as bird-lime, and of the ſame conſiſtence when old. It very much reſembles the common black pitch, when ſoftened a little by heat; and has been generally thought to have ſomething of the ſmell of that ſubſtance: but this ſeems to have ariſen from its being too frequently adulterated by mixing pitch with it, and the true genuine ſubſtance has no other ſmell than the rank one of all the bitumens, which ſomewhat reſemble that of oil of amber. It is produced in ſeveral parts of the world, and there are large quantities of it in Germany, in Perſia, and in France. It yields a limpid oil by diſtillation, which very much reſembles the native petroleum, and is too often ſold with us under this name, being annually imported in large quantities from thoſe parts of Germany where it is manufactured, and having itſelf no particular name in the ſhops of our druggiſts. *Hill*'s Hiſt. Foſſ. p. 422.

Piſſaſphaltum was much recommended by the antients for external uſe, as an emollient, maturant and digeſtive: with this intention it was uſed in cataplaſms, for ripening all ſorts of tumors, and againſt the ſciatica and other pains of the limbs. They alſo had recourſe to it for ſtrengthening the limbs, after the reduction of diſlocations. It is little uſed at preſent, the petroleum being thought very proper to ſupply its place.

PISSELÆUM *indicum*, in the materia medica, a ſubſtance commonly known by the name of *Barbadoes tar*. It is a heavy, thick, and duſky-looking mineral fluid, of the colour and conſiſtence of common treacle, and of a very opake hue; it is of a diſagreeable ſmell, faintly approaching to that of oil of amber, and is very inflammable. It is found trickling down the ſides of the mountains at the back of ſeveral of our plantations in America, and is in great eſteem there for coughs and diſorders of the lungs. We meet with very little in England that is genuine, ſeveral different ſophiſtications of it being in common uſe, even upon the ſpot. *Hill*'s Hiſt. Foſſ. p. 421.

PISSEROS, the name of an ointment greatly recommended by Hippocrates in many caſes, as in burns, freſh wounds, *&c.* It was made of oil of roſes, bees-wax, and pitch, proportioned ſo as to give the whole a ſoft conſiſtence. It was of the nature of our modern black baſilicon, found a good ointment in many caſes.

PISSINUM. Pliny ſays it was cuſtomary for the antients to hold fleeces of wool over the ſteam of boiling tar, and ſqueeze the moiſture from them, which watery ſubſtance was called *piſſinum*.

Ray will have this to be the ſame with the *piſſelæum* of the antients; but Hardouin, in his notes on Pliny, thinks the *piſſelæum* to have been produced from the cones of cedars. What uſe they made of theſe liquors antiently is not known; but it may be preſumed they were uſed in medicine, tho' at preſent it does not appear they are uſed at all.

PISSITES, a name given by the antients to a wine impregnated with the virtues of liquid pitch or tar. To prepare it, the tar was ordered to be waſhed in ſea water or brine, and afterwards in freſh water many times; and after a tedious preparation of this kind, two ounces of it were ordered to be put to eight gallons of muſt, which is to be ſuffered to work together, and then the clear liquor to be bottled off.

This was accounted a warm wine, very aſſiſtant to concoction, and of an abſterſive faculty, and a good pectoral: on theſe accounts it was given in diſorders of the breaſt, and in obſtructions of the liver, ſpleen, and uterus, if not attended with a fever; and was a common medicine in coughs and aſthmas, of all kinds.

PISSOCEROS, a name given by the old naturaliſts to a ſubſtance found very frequently in the hives of bees, and conſiſting of a mixture of propolis and wax. The antients were well acquainted with the uſe of this ſubſtance, which was uſed for ſtopping up the cracks and chinks in the hives: they mention, indeed, three ſorts of matter uſed by the bees for this purpoſe; the metys, the *piſſoceros*, and the propolis: but later authors call them all by the general term propolis, the *piſſoceros* and metys being only the ſame ſubſtance, mixed with wax in different proportions. This propolis is a reſinous ſubſtance, of a ſoft and viſcous conſiſtence, collected from the beds of the poplar and other trees. *Reaumur*'s Hiſt. Inſ. Vol. 10. p. 84. See the article PROPOLIS.

PISSOSIS, a word uſed by the old writers on medicine for the depraved appetite of young women about the firſt eruption of the menſes, and of ſome women with child.

PISTACHIA *trifolia*, in botany, a name improperly given by ſome authors to the trifoliate American bladder-nut. See the article STAPHYLODENDRON.

Piſtachias are eſteemed reſtorative, and peculiarly recommended to prevent obſtructions of the liver: they are alſo found of ſervice in nephritic complaints, and are ſaid to be great provocatives to venery: the faculty, however, ſeldom preſcribe them.

PISTANA, in botany, a name by which ſome authors have called the *ſagittaria aquatica*, or water arrow-head. *Ger. Emac. Ind.* 2.

PISTATIO, among pharmaceutic writers, a word uſed to expreſs that preparation of ſimples which conſiſts in covering them with, or including them in, a paſte, and ſending them to a baker's oven till tender throughout. Squills are ſometimes prepared thus.

PISTIA, in botany, the name given by Linnæus to a genus of plants, called *kodda-pail* by Plumier; and in the hortus Malabaricus. The characters are theſe: There is no cup; the flower conſiſts of one unequal petal, which is cucullated and turbinated, with a ſingle, oblique, and long lip, bent and folded at the ſide; there are no ſtamina, but ſix double antheræ grow to the piſtil under the ſtigma; the germen of the piſtil is of an oval oblong figure; the ſtyle is ſhorter than the flower; the ſtigma is peltated, and obtuſely divided into ſix ſegments; the fruit is a capſule of an oval figure, attenuated at the baſe, and contains ſix cells; the ſeeds are truncated. This genus ſeems nearly allied to the birth-worts. *Linnæi* Gen. Pl. 438. *Plumier*, 39.

PISTIL, among botaniſts, the female organ of generation in flowers. It is compoſed of three parts, the germen, the ſtyle, and the ſtigma: the germen ſupplies the place of the uterus in plants; its ſhape is various, but it is always ſituated at the bottom of the *piſtil*, and contains the embryo ſeeds: the ſtyle is a part of various figures alſo, but is always placed on the germen; in ſome it is extremely ſhort, in others it ſeems entirely wanting: the ſtigma is alſo of various figures; its place, however, is certain, as it always ſtands on the top of the ſtyle, and if there is no ſtyle, on the top of the germen. See the article GENERATION *of plants*.

PISTIS, in the materia medica of the antients, a name given to the gum bdellium, particularly to that kind of it which was brought from Arabia, and was of a fine yellowiſh white, and in ſmall round drops, or lumps of a roundiſh ſhape, and firm conſiſtence.

PISTOLOCHIA, in botany, a name uſed by ſome authors for the plant of which the Virginian ſnake-root of the ſhops is the root. *Park.* Theat. 420.

PISUM, the *pea*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the papilionaceous kind, and from its cup there ariſes a piſtil, which finally becomes an oblong pod, containing roundiſh ſeeds: to this it is to be added, that the ſtalks are weak and hollow, and the leaves ſo ſurround them, that they ſeem perfoliate; the reſt of the leaves are placed two and two upon a middle rib, which ends in a tendril.

The ſpecies of *peaſe*, enumerated by Mr. Tournefort, are theſe: 1. The large ſquare *pea*, with brown fruit. 2. The large ſquare *pea*, with grey fruit. 3. The large ſquare *pea*, with yellowiſh fruit. 4. The upright *pea*, with cluſtered or umbellated pods. 5. The common garden *pea*, with a white flower and white fruit. 6. The common large garden *pea*, with purple flowers. 7. The common large garden *pea*, with variegated flowers and variegated fruit. 8. The great podded garden *pea*. 9. The great *pea*, with the fruit marked with a black

black line. 10. The *pea* with eatable huſks. 11. The dwarf *pea* with firm ſtalks. 12. The angular-leaved *pea*. 13. The garden *pea* with a crooked or foliated eatable pod. 14. The *pea*, with red ſtriated flowers. 15. The field-*pea*, with a greeniſh yellow fruit. 16. The field-*pea*, with a white fruit. 17. The field-*pea*, with a green fruit. 18. The field-*pea*, with a grey fruit. 19. The field-*pea*, with a blue fruit. 20. The field-*pea*, with black fruit. 21. The field-*pea*, with roſe-coloured flowers and variegated fruit. And 22. The wild Engliſh ſea-*pea*. *Tourn.* Inſt. p. 394.

PIT (*Cycl.*)—*Brine*-PITS, the name given by the people of Worceſterſhire and Cheſhire, to the wells or *pits* affording the ſalt water, out of which they extract the ſalt.

Theſe waters, tho' they all contain ſalt, yet have other things alſo in them, and theſe not in ſmall quantity. They all contain a very large proportion of ſtony matter; this is common to the whole ſet, but particular ſubſtances beſide this are found in the particular *pits*. At Northwich in Cheſhire, there are four *pits*, the water of all which ſtinks very ſtrongly of ſulphur, and contains ſo much vitriol, that it will turn black like ink, with a decoction of galls; yet this is boiled into a very fine and pure kind of ſalt, common at our tables under the name of baſket-ſalt, and having no ſuch properties.

There is a vaſt quantity of ſtony matter precipitated from theſe pans of *brine* in the boiling them to ſalt; this is partly ſaved in ſmall pans ſet at the ſide of the boiler, and partly precipitates to the bottom of the pan, where it forms a cruſt like that at the bottoms and ſides of our tea-kettles, which the workmen find it neceſſary to remove every week; but there is no vitriol or ſulphur ſeparated. Phil. Tranſ. N° 150.

In the country near where theſe *brine-pits* are, the inſtruments uſed in boring often bring up fine and hard ſalt; ſo that they give proofs of there being rocks of ſalt in many places. All along the river Weever, on each ſide, the earth affords *brine* wherever it is opened: but all theſe are not fit for boiling, many of the *pits* affording a *brine* too weak to be worked to any advantage. The very ſtrongeſt *pits* ſometimes alſo become at once too weak; this is owing to the irruption of freſh ſprings into them, and ſometimes the river itſelf makes its way into them, and overflows them with ſuch a quantity of freſh water, that they are utterly ſpoiled. The *brine-pits* at Weſton near Stafford, afford a *brine* that ſtinks like rotten eggs; this turns inſtantly to ink with galls, and purges and vomits violently, if taken even in a ſmall quantity. This in boiling depoſits a white flaky ſand, or ſtony matter, without ſmell or taſte, and the ſalt is pure and fine.

The *pit* at Droitwich in Worceſterſhire, affords no ſand in the boiling, nor any the leaſt ſediment of the ſtony matter at the bottom of the pan, and the ſalt is the pureſt of all the others: and by the people of the country it is eſteemed the moſt wholeſome; becauſe of its being without the ſand. This and the other *pits* hereabout, all have the ſmell of rotten eggs, eſpecially after a little reſt, as on the Monday morning after the Sunday's reſt. If meat be put to pickle in the brine of theſe *pits*, inſtead of being preſerved it will ſtink in twenty-four hours, ſometimes in twelve, yet they yield the beſt ſalt of any inland *pits* in the world.

The ſulphur ſpaws of Yorkſhire, which are very numerous in different parts of the county, all ſtink violently of rotten eggs; but if well drawn and worked, they would prove as inoffenſive as the reſt, and only ſo many weaker or ſtronger brine *pits*; and the ſmell is no other than that of the Cheſhire and Staffordſhire brine, when it has been left ſome time at reſt. It is remarkable, that tho' the ſtony matter is depoſited in ſuch vaſt plenty by the waters of all our ſalt ſprings, it is not found in any abundance in thoſe places where ſalt is made out of ſea ſand, as in Lancaſhire and ſome other places; ſo that it is much more than the natural quantity of ſpar contained in water that is thus depoſited; and indeed it appears from trial, that the brine of our ſalt ſprings, in general, contains more than twenty times the quantity of ſpar that common water does.

This ſtony matter ſeparates itſelf from the water before the ſalt does, and thus it appears in many other waters impregnated with mineral particles. The vitrolic waters all contain ochre and ſalt, and in all theſe the ochre ſeparates itſelf firſt in the boiling, and then the vitriol; and the ſtony matter precipitated from common ſalt ſprings affords, on an analyſis, the ſalt called *nitrum calcarium*, in conſiderable abundance. Phil. Tranſ. N° 156.

PIT-*fiſh*, or PIT-*viſch*, in zoology, the Dutch name of an Eaſt Indian fiſh, approaching very much to the nature of the European turdus, but that it has no ſcales. Its body is not flat but rounded, and is variegated with blue and yellow ſpots; its eyes ſtand very prominent, and the fiſh is able, at pleaſure, to thruſt them out or draw them in; its back-fin is prickly. It loves muddy and foul places, yet is a very well-taſted fiſh. *Ray*'s Ichthyogr. Append. p. 6.

PITANGUAGUACU, in zoology, the name of a Braſilian bird of the ſtarling kind, called by the Portugueſe there the *bemetre*. It is of the ſize of the common ſtarling; its beak is long, thick, and of a pyramidal figure; its head broad and flatted; its neck ſhort, which as it ſits it contracts alſo, ſo as to make it appear much ſhorter; its legs and feet are of a duſky brown; it has a very loud and ſhrill voice; its head, neck, back, wings, and tail, are all of a browniſh black, with a faint admixture of green; the lower part of the throat, the breaſt, and the belly, are yellow, the upper part of the throat white; its beak is very ſharp-pointed. *Marggrave*'s Hiſt. of Braſil.

PITCH (*Cycl.*)—The antients had a peculiar kind of *pitch* called *brutia*, which was inſpiſſated to a higher than ordinary degree for certain uſes; ſuch as the receiving a proper quantity of bees wax, to render it the zopiſſa uſed in coating the bottoms of ſhips; which the common *pitch* could not do, being of too ſoft a conſiſtence for this uſe. Pliny tells us, that it was made in this manner: The wood was cleaved and formed into a pile, with proper trenches cut in the earth to receive what run from it in burning. When the pile was lighted, the firſt thing that flowed into theſe trenches was a thin fluid liquor like water. This, he ſays, was called *cedrium* in Syria, and was uſed in Egypt in the preſerving dead bodies. The next liquor that ran out from the pile, he ſays, was thicker, and was *pitch*; and that a part of this was afterwards boiled in braſs veſſels, with an admixture of vinegar, and then became very ſolid and hard, and was called by this name of *brutia*.

However right this author may be in his account of the *brutia*, it is evident that he errs in making the firſt runnings of the wood the *cedrium*; for this was peculiarly the name of the tar of the cedar; and as there are plenty of turpentine trees in Syria, and the *pitch* and tar of that country were always made of thoſe trees, it is very improper to give the name *cedrium* to it: no one ever called the turpentine and cedar by the ſame name; nor is there any reaſon why their products ſhould be thus confounded. Vitruvius is very expreſs in aſcertaining the ſenſe of the word *cedria* to the produce of the cedar; he ſays, that the cypreſs and pine yield their ſeveral fat juices or reſins, and that the cedar in like manner yields its oil; which is thence called *cedrium*, or *cedria*, and has ſo much of the peculiar virtues of the wood, that it preſerved books and other things, on which it was rubbed, from being eaten by worms.

This author, however, tho' he diſtinguiſhes the product of the cedar from that of the cypreſs and pine, yet he confounds together the two ſubſtances, called by the Greeks *cedrium* and *cedrelæum*. The *cedrium* was properly the *pitch* of the cedar; this was the hard ſubſtance produced by burning the wood; but the thin liquid ſubſtance called *cedrelæum*, which was the only thing that could be uſed for rubbing over books, *&c.* was an oil ſeparated from this *cedrium*, or *pitch* of the cedar by melting.

PITCH *of Caſtro*, in the materia medica, the name given by Boccone and ſome other writers, to a thick kind of bitumen found iſſuing out of the cracks of ſome rocks near the village of Caſtro; from whence it has its name: it is famous in the eccleſiaſtical ſtate for its medicinal virtues. *Boccone* Muſ. de Fiſci.

PITCH is alſo uſed by architects and builders, for the angle which a gable-end, and conſequently the whole roof of a building is ſet to. If the length of each rafter be $\frac{3}{4}$ of the breadth of the building, then they ſay that roof is of a *true pitch*; but if the rafters are longer, they ſay 'tis a *high* or *ſharp-pitched roof*; if ſhorter, they call it a *low* or *flat-pitched roof*.

PITCHED, in the ſea language. They ſay the maſt is *pitched*, when it is put or let down into the ſtep; alſo the maſt is *pitched* too far aft, when placed too near the ſtern.

PITH, (*Cycl.*) in vegetation, the ſoft ſpungy ſubſtance contained in the central part of plants and trees. As the ſubſtance of the trunk in trees become more woody, the *pith* is compreſſed and ſtraitened to ſuch a degree, that it wholly diſappears.

It is plain from this, that the office of the *pith* in vegetation cannot be very great, ſince it is not of perpetual duration. By its ſpungy ſtructure, it ſeems fitted to receive any ſuperfluous moiſture that might tranſude thro' the pores of the woody fibres. If by the exceſs of ſuch moiſture, or from any other cauſe, it happens to rot and periſh, as frequently happens in elms, the tree is found to grow fully as well without it; a proof it is of no eſſential uſe in vegetation. *Boerhaave*'s Chem. p. 139.

The *pith* of trees is continued farther into their minute parts than is generally conceived; the ſmalleſt branches and pedicles of the leaves and flowers have their ſhare of it, according to the nature of the tree they belong to; and even the middle ribs of the leaves, when examined by the microſcope, are not without it: a tranſverſe ſection of one of theſe ribs of the leaf of a *pithy* tree, ſhews a very beautiful arrangement of veſſels, or little bladders, containing a quantity of clear liquor, and reſembling in all reſpects thoſe of which the *pith* in the branches is compoſed. The *pith* in theſe is not round, however, as in the others, but flat, and runs from one end of the pedicle to the other, in form of a thin white rib, gradually leſſening to a point.

The *pith* of plants, in fine, ſeems what the marrow is in animals, a congeries of an infinite number of veſicles, which

ſeem deſtined to ſeparate a finer juice than is neceſſary for the nouriſhment of the coarſer parts of the tree. It is obſerved of plants which have a larger than ordinary ſhare of *pith*, that they produce larger quantities of flowers than others; inſtances of this are ſeen in the roſe, the lilac, and the common elder: and in the ferulaceous plants, the quantity of flowers is not only profuſely large, according to the great quantity of *pith* in their ſtalks, but the *pith* ſeems carried up the ſtalks all the way to the ſeeds themſelves; the long ſeeds of the ſweet myrrhis, and other the like plants, while not ripe, being only *pith*. Mem. Acad. Scienc. 1709.

PITHECALOPEX, the *ſemivulpa*, or *ape-fox*, a name given by Aldrovandus and ſome others, to that ſtrange American animal which we call the *opoſſum*.

The name is compounded of that of the *fox* and the *ape*; of the natures of both which animals it is ſuppoſed by ſome to participate. See the article OPOSSUM.

PITHIAS, or PITHITES, with ſome writers, a ſort of comet, or rather meteor, in form of a tub. Of theſe it is ſaid there are divers kinds, *viz.* ſome of an oval figure, others like a tun or barrel ſet perpendicular, and ſome like one inclined, or cut ſhort off; others having a hairy train or buſh, *&c.*

PITHYUSA, in botany, a name uſed by many authors for a ſmall ſpecies of ſpurge. See the article TITHYMALUS.

PITUINA, in the materia medica, a name for the reſin of the pitch-tree.

PITYIDES, a name uſed by ſome authors for the kernels incloſed in the cones of the fir or pitch-tree; they are recommended by the old phyſicians, in diſorders of the breaſt.

PITYLISMA, a name of one of the exerciſes preſcribed by the antient phyſicians, as of great ſervice in chronic caſes. It conſiſted in a perſon's walking on tip-toe, and ſtretching his hands as high above his head as he could, keeping the whole body alſo as much upon the ſtretch as might be. In this condition the patient was to walk as far as he was well able, all the while moving about both hands as much as he could, in all directions.

PITYRIASIS, a name given by the antients to a ſcurfy diſorder of the head and eye-brows, and of any other part where there is hair. It makes the ſkin ſeem as if covered with bran, and is attended with a troubleſome itching.

PIVA, in the Italian muſic, a hautboy, or a cornet. See the articles HAUTBOY and CORNET, *Cycl.*

PLACAGNODIAUGIA, in natural hiſtory, the name of a genus of ſpars.

The word is derived from the Greek πλαξ, a cruſt, ἀγνὸς, pure, and διαυγὴς, pellucid.

The bodies of this genus are cryſtalline terrene ſpars, or ſparry bodies with much of the brightneſs and tranſparence of cryſtal, but debaſed by an admixture of earthy matter, and are imperfectly pellucid, and formed into thin plates with flat ſurfaces, but covered at times either in part or entirely, with tubercles or botryoide prominences, and are compoſed of arrangements of oblong concretions, of no determinately angular figure.

Of this genus there are only two known ſpecies, tho' theſe vary ſo much at times in figure, that they might lead an inaccurate obſerver into imagining there were many diſtinct ſpecies of each. 1. A hard ſemi-pellucid and yellowiſh brown one. This is found in many parts of England; in ſome places encruſting over the ſides of fiſſures of ſtone, and in others coating over vegetable bodies in ſprings, *&c.* 2. A brittle pellucid and whitiſh one, found on the ſides and tops of our ſubterranean caverns on Mendip hills and elſewhere, and in form of a roundiſh ball, ſeemingly compoſed of threads, in the neighbourhood of Eſperie in Hungary. *Hill*'s Hiſt. of Foſſ. p. 342.

PLACAGNOSCIERIA, in natural hiſtory, the name of a genus of ſpars.

The word is derived from the Greek πλαξ, a cruſt, ἀγνὸς, pure, and σκιερὸς, opake.

The bodies of this genus are dull and opake cryſtalline terrene ſpars, formed into cruſts, and of an irregular and not ſtriated texture within.

Of this genus there are three known ſpecies: 1. A hard whitiſh brown one, found very frequently on the roofs and ſides of caverns on Mendip hills, and in other parts of England. 2. A dull crumbly whitiſh one, found in many parts of England, encruſting the ſides of caverns, and of fiſſures of ſtone. And 3. A dull pale brown friable one, of a very coarſe texture. This is the moſt common of all the bodies of this genus, and is found in variety of forms, among others encruſting the ſides and bottoms of our tea-kettles, and other veſſels, in which water is frequently boiled. *Hill*'s Hiſt. of Foſſ. p. 346.

PLACE *(Cycl.)*—*Place* is uſed in the doctrine of artificial memory: and theſe *places* may be either ſuch in a proper ſenſe, as a door, a window, a corner, *&c.* or familiar and known perſons; or any other thing at pleaſure, providing they be placed in a certain order, animals, plants, words, letters, characters, hiſtorical perſonages, *&c.* tho' ſome of theſe are more and ſome leſs fit for the purpoſe; but ſuch kind of *places* greatly help the memory, and raiſe it far above its natural powers. *Bacon*'s Works Abr. Vol. II. p. 474, 475. See the article MEMORY, *Cycl.* and *Suppl.*

PLACE-*bricks*. See making of BRICK.

PLACENTA *(Cycl.)*—The *placenta* has generally been looked upon as an original part among the ſecundines; but according to Dr. Thomas Simſon of St. Andrews, it ſeems to have no place in the ovarium, nor in the uterus, till once the ovum becomes contiguous to the fundus, and then every contiguous part becomes really a *placenta*. He thinks the fundus uteri, a place peculiarly fitted for the growth of the *placenta*, as proper ſoils encourage the growth of the roots of trees and ſhurbs, many of which are propagated by the branches however placed; ſo that every part of them ſeems equally fitted to be root or branch. Hence he thinks extra uterine conceptions can have no *placenta*; and he ſays, there are no inſtances in authors to contradict his opinion. See Med. Eſſ. Edinb. Vol. IV. Art. 13.

The *placenta* does not increaſe in the ſame proportion which the fœtus does: for the ſmaller the fœtus is, the *placenta* is proportionally larger. *Monro*, in Med. Eſſ. Edinb. p. 145. from *Ruyſch*.

The *placenta* generally adheres to, or near the fundus of the womb, and is covered on the ſide next to the womb, with a fine membranous continuation of the chorion. Vid. *Monro*, Medic. Eſſ. Edinb. Vol. II. p. 128. and the authorities there quoted.

The ſeparation of the *placenta* from the womb muſt produce abortions, and this may be occaſioned by different cauſes operating in various manners, and requires very different treatment to prevent the loſs of the fœtus. See *Monro*, in Med. Eſſ. Edinb. Vol. II. Art. 11. or it's Abridgment, Vol. I. p. 338, ſeq.

PLACENTA, in botany, a term improperly given by Mr. Houſton, in the Philoſophical Tranſactions, N° 421, to what is uſually called *receptacle*. See RECEPTACULUM *ſeminum*.

PLACENTA, in natural hiſtory, the name of one of the claſſes of the echini marini. The characters of theſe are, that they are of a depreſſed or flatted form, and are wrought in various ſhapes, as the paſtry people make their cakes; they all have a cinquefoil flower at their top, and their mouth is in the middle of the baſe; the aperture for their anus is uſually near the edge. See Tab. 8. N° 9, 10.

Of this claſs there are three genera: 1. The *mellita*. 2. The *laganum*. And 3. The *rotula*. Which ſee under their ſeveral heads. *Klein*'s Hiſt. Echin. p. 30.

PLACENTA, among the antients, a kind of cheeſe-cake, the moſt ſimple kind of which was made of flower mixed with oil and cheeſe, to which honey was added: but the more luxurious ſort of people added likewiſe a great variety of herbs and fruits, as alſo ſugar, eggs, butter, *&c.* *Pitiſc.* Lex. Antiq. in voc.

PLAGIAULOS, πλαγιαυλος, among the antients, a kind of flute.

PLAGIOPLATEUS, in natural hiſtory, a term uſed by Artedi and others to ſignify depreſſed, in oppoſition to the term *cathetoplateus*, which ſignifies compreſſed. See both explained under the article CATHETOPLATEUS.

PLAGIURI, in natural hiſtory, the name of one of the great claſſes, or families of fiſhes. The characters of which are, that the tail is placed horizontally. They reſpire by means of lungs, and have uſually a double fiſtule in the head. They are viviparous, and the males have a penis and teſtes, the females the vulva, ovaria, mammæ, *&c.* and they bring up their young with milk.

The term is derived from the Greek πλαγίος, tranſverſe, and οὐρὰ, a tail. Vid. *Artedi*, Gen. Piſc. *Linnæi* Syſtema Naturæ, p. 31.

PLAGUE *(Cycl.)*—Dr. Dover ſays he cured the *plague* among ſome ſailors, in a voyage, by one very plentiful bleeding to the quantity of an hundred ounces, and with drink ſharpened with ſpirit and oil of vitriol. Med. Eſſ. Edinb.

PLAIN *(Cycl.)*—PLAIN *ſurface*, in geometry, that which lies evenly between its bounding lines; and as a right line is the ſhorteſt extenſion from one point to another, ſo a *plain ſurface* is the ſhorteſt extenſion from one line to another.

PLAISE, in ichthyology, the Engliſh name for the fiſh called by authors *plateſſa* and *paſſer lævis*, by ſome *quadratulus*.

It is, according to the Artedian ſyſtem, a ſpecies of the pleuronectes, and is diſtinguiſhed by that author by the name of the *pleuronectes* with ſmooth ſides, and with a ſpine near the anus, and the eyes and ſix tubercles placed on the right ſide of the head. This name carries a diſtinctive character with it; and it were to be wiſhed that we had ſuch names in common uſe among authors for all the fiſh that are known to us. See PLEURONECTES.

PLAN *(Cycl.)*—PLAN *of a baſtion*, in the military art, is the ſame with the face of a *baſtion*. See FACE.

PLANE-*tree*, *platanus*, in botany, the name of a genus of trees, the characters of which are theſe: The flower is of the amentaceous kind, and is of a glomerated ſhape, and compoſed of a great number of ſtamina with their apices. Theſe flowers are barren, and the embryo fruits are found on other parts of the plant; theſe finally become larger, and contain ſeveral ſeeds winged with down.

The

The ſpecies of *platanus*, enumerated by Mr. Tournefort, are theſe: 1. The true oriental *platanus*. 2. The occidental or Virginian *platanus*. *Tourn.* Inſt. p. 590.

PLANKS, in a ſhip, are the timbers which go fore and aft on each ſide of the ſhip, whereon lie the beams of the firſt orlop.

Garboard PLANK, in a ſhip. See GARBOARD.

PLANT *(Cycl.)*—The greater the degree of heat given to *plants* to a certain degree in the natural way, the ſooner they go through the whole buſineſs of their fructification. In the northern regions, where there are but a few ſummer months, the herbs all are ripened in them in a ſurprizing manner: in Lapland, for inſtance, where the greater part of the year is ſubject to intenſe and inceſſant froſts, and for a conſiderable time to the entire abſence of the ſun, the ſummer ſeaſon affords an exceſſive heat for two months, the ſun never ſetting in all that time. This ſeaſon comes on toward the latter end of June, and the graſs and other herbs then firſt begin to appear in their young ſhoots above the ground, and the trees bud; but all vegetation is, after this, carried on with ſuch ſpeed, that in a fortnight the flowers of the herbs and trees are expanded, and the leaves of their full ſize and maturity. *Scheffer*'s Hiſt. Lapon.

The virtues of *plants* are very variable; a change of climate will alter or deſtroy them, as we ſee in many of the medicinal *plants* of other countries, brought over hither, which, tho' they ſeem to flouriſh with us, never poſſeſs their virtues in the ſame degreee as in their native climate. The bodies of different animals alſo render the effect of the ſame *plant* different: the tithymals or ſpurges are all of them very violent cathartics, when taken by us; but yet they are eaten by goats and ſeveral other animals without hurt, or without any purgative effect, and ſeem to give them a particular ſhare of vigour and ſpirits. The fiſh are, on the other hand, more ſtrongly affected by it than we are; for the juice made into paſte with flower and honey, poiſons, or at leaſt intoxicates them ſo, that they may be taken out of the water with one's hand. Bitter almonds are of no ill conſequence to us, yet they kill all ſorts of birds. *Deſlande*'s Trait. Phyſiq.

Imperfect PLANTS, in botany, a name given to thoſe *plants* which ſeem to want both flower and ſeed. Theſe were once a very large tribe of *plants*, but the more accurate obſervations of the moderns have proved, that the moſt of theſe *plants* really contained ſeeds, and thoſe very numerous, tho' ſo ſmall as not to appear obvious to the naked eye: and probably the farther diſcoveries of the microſcope will in time leave us no one *plant* deſerving the appellation of *imperfect*. In Mr. Ray's time, many whole genera of *plants* were eſteemed imperfect; but he includes the ſeveral kinds he calls ſo, under three general heads: 1. The ſubmarine. 2. The funguſes. And, 3. The moſſes. Tho' many of all theſe kinds have by later authors been ſhewn to have true ſeeds, and it is ſcarce to be doubted of the reſt. *Ray*'s Synopſ. Stirp. Brit. p. 1.

Flowering of PLANTS. See the article FLOWERING.

Analyſis of PLANTS. The common method of attempting the *analyſis of plants*, by common diſtillations, gave hopes that it would prove very uſeful in determining their virtues; but experiment ſhewed it to fail of this intent, ſince the wholeſome *plants* and the poiſonous ones afforded by this means much the ſame ſort of principles; and on the whole, theſe appeared in a great meaſure to be creatures of the fire rather than parts of the ſubject. This ſet Mr. Boulduc of the Paris academy upon trying, whether there might not be ſome way invented at once more ſimple and more certain; and with this view he attempted to examine the juices and decoctions of ſeveral *plants*, to find their eſſential ſalts, which had not been procured in their natural ſtate by the chemical trials. The *plant* this gentleman choſe as the ſubject of his experiments in this view, was the common borage.

Firſt, he made a large quantity of a decoction of borage; this he divided into three equal parts: the firſt of theſe he evaporated to a pellicle, or to the conſiſtence of a ſyrup; it was then of a blackiſh colour, and was charged with a great quantity of oily particles. This being ſet by for ſome days in a warm time of the year, covered itſelf with a thick ſkin, which was again covered by a mouldineſs. When this ſkin was removed, there appeared underneath a large quantity of chryſtals, in fine ſlender filaments like needles, mixed among a large quantity of other cryſtals, which were ſmall, and of no regular figures; all theſe were ſwimming in a liquor of the thickneſs of a ſyrup. Theſe long cryſtals being taken out of the liquor, and laid upon a hot iron, took fire, and flamed in the manner of ſalt-petre when mixed with any ſulphureous ſubſtance; and, in truth, this was a ſalt-petre, yet loaded with the oily matter of the decoction.

Here, therefore, is a clear proof, not only of the nitrous acid being in this plant, but of plain nitre itſelf; for, on pouring oil of tartar on a ſolution of this ſalt, there was no precipitation made of any ſubſtance whatever; which would have been the caſe, had there been in this ſtate any earthy matter for its baſis.

The ſecond portion of this decoction was diveſted of its oil by means of lime, and then evaporated to a light pellicle over a very gentle heat. This was ſet by to reſt for ſome days, and finer and more perfect cryſtals were found, ſhot in the form of needles in it: theſe were truly nitrous, and occupied the upper part of the liquor; below theſe there were a great number of other cubic ones, which were eaſily known to be cryſtals of ſea ſalt.

The long cryſtals of this operation took fire on a lighted charcoal, and appeared plain nitre; and the others, when dry, crepitated in the fire exactly in the manner of ſea ſalt: and when a ſolution of them was poured upon a ſolution of ſilver, made in ſpirit of nitre, it immediately occaſioned a white curd to appear, which being ſeparated, waſhed, and put to the fire, became a true luna cornea, being tranſparent and eaſily cut with a knife. Here, therefore, are plain proofs of nitre and ſea ſalt in this *plant*. Mem. Acad. Scienc. Par. 1734.

The third portion of the decoction was poured upon ſome freſh wood aſhes, and being afterwards evaporated to a pellicle, and ſet by for ſome days, there was found in this more nitre than in any of the others; and that whiter and more clear, the others being uſually coloured browniſh or reddiſh by the decoction. The occaſion of this ſeems to be, that part of the nitrous acid, which in the other experiments neither joined with any earthy matter, nor with the fatty matter of the decoction, mixed with the ſalts of the lixivium, made by pouring the liquor which contained it on wood aſhes, and thus yielded a much larger quantity of ſaltpetre than before.

The fatty ſubſtance which covered the firſt decoction being dried, was found to contain a great quantity of nitre, which it had not ſuffered to ſhoot, or form itſelf into cryſtals: this dried cruſt being laid on a burning charcoal, took fire in the ſame manner as if nitre and powder of charcoal had been thrown into a crucible made red hot.

The ſalts of the *plant* being thus obtained from its decoction, it was determined to try whether the *plant* remaining after the decoction had any more to yield. To try this, it was gently dried in a ſhade, and burned in a covered veſſel to a black coal, and afterwards, in an open fire, to aſhes.

Of theſe aſhes there was made a lixivium in the common way, in order to be evaporated for the ſalt: this lixivium being mixed with ſyrup of violets, ſcarce at all altered it from its blue colours, only juſt bringing on a faint greeniſhneſs, which ſoon went off again, and left the ſyrup of as fine a blue as before; this made it evident, either that there was very little alkali ſalt there, or elſe that it was blended with ſalts of ſome other kind, which altered its effects: and this proved to be the true ſtate of the matter on farther experiment, for, evaporating the lixivium to a pellicle, there very ſoon ſhot in it regular and beautiful cryſtals of a ſalt, having all the characters of tartarum vitriolatum. A ſecond evaporation of the lixivium afforded more of the ſame ſalt, but in ſmaller cryſtals. Evaporating the liquor to about half its quantity, and ſetting it again to ſhoot, there appeared plain cubic cryſtals of ſea ſalt; which being ſtrictly examined, were found to be perfect ſea ſalt, no way altered, but having ſtood the force of the calcination.

After theſe ſalts had been ſeparated from the lixivium, it changed ſyrup of violets immediately to a beautiful green, which colour it always retained.

It is evident from theſe experiments, that this *plant* affords four different kinds of ſalts, *viz.* nitre, ſea ſalt, tartarum vitriolatum, and the common fixed alkali; and it is hence no trivial obſervation, that the three mineral acids are found here all in one *plant*. It is not to be ſuppoſed, indeed, that the tartarum vitriolatum was actually in the *plant* in that form, but it is very evident, that the vitriolic acid did always exiſt there, ready to form it; but that being, before the calcination, enveloped in the oily matter of the *plant*, it was not eaſy to diſcover it either by its properties or effects: but as ſoon as the oil was diſſipated by fire in the calcination, the vitriolic acid immediately became free, and finding the alcaline ſalt of the *plant*, or its fixed nitre, which had remained after the deflagration, it immediately united with it, and formed a tartarum vitriolatum in the ſame manner as a tartarum vitriolatum may be made from ſalt of tartar and common ſulphur, after the oily or inflammable part of the ſulphur is burnt away.

It is not only this *plant* that yields a vitriolated tartar from a lixivium with its aſhes, but great numbers of others of the aromatic and bitter kinds: whence it appears, that the vitriolic acid, tho' the moſt fixed of all the mineral acids, yet raiſes itſelf into the juices of a great number of *plants*; and on the reſult of great numbers of experiments, it appears, that there are very few *plants* which yield a pure alkaline ſalt, perhaps ſalt of tartar is the only perfectly pure known alkali of this kind, which retains no portion of any other ſalt.

Aſhes of PLANTS. The aſhes of a *plant* carefully prepared, retains its exact form till diſturbed by accidents. The way of preparing them is this: Take a whole *plant* which has been uſed for the diſtillation of the oil, water, *&c.* lay it evenly upon a flat plate of iron, and place this on a clear fire, that no ſmoak may prevent the ſucceſs of the operation; continue and raiſe the fire, till the whole ſubſtance of the *plant* appears perfectly ignited. There firſt ariſes a light ſmoak from it, this gradually becomes darker, and at length as black as pitch; the ſmell of burning increaſes as the ſmoak increaſes, at length the ſmoak breaks out into flame, and then the ſmell in a great mea-

meaſure ceaſes: the *plant* by degrees grows black, as the ſmoak ariſes, and as ſoon as perfectly black all over, it takes fire. When the flame ceaſes, the leaves appear white; but if any black ſpots remain, there are always ſeen ſparks of fire ſcattering themſelves about on them, till the blackneſs is perfectly conſumed. The aſhes being now become perfectly white, yield no ſmell nor the leaſt appearance of fire; and they yet retain, after all this violence of fire, the perfect form of the *plant*, even to a microſcopic obſervation: for, if examined by glaſſes, there will be found every feature and lineament of the *plant*, even the hairineſs of the ſtalks, or down upon the leaves; every riſing and cavity natural to the plant, appear alſo diſtinct, and every the ſmalleſt fibre. But this only remains while they are unmoved, the moment they are diſturbed, tho' but by breathing upon them, the whole falls to duſt, and the form is irrecoverably loſt.

The aſhes thus carefully prepared, are perfectly inſipid and ſcentleſs, and when lixiviated in the common way for making the fixed ſalt, afford no ſalt at all; but only on the evaporation leave a ſmall quantity of a matter reſembling lime: the remaining aſhes are wholly terreſtrial, and ſerve excellently for the making copels, for the uſe of aſſaying. *Boerhaave*'s Chem. P. 2. p. 19.

From this we learn, that the *plant*, by having been previouſly boiled in water in the diſtillation, was diveſted of all its ſalts; and that in general, water, with a great degree of heat, is capable of extracting from any vegetable all its ſaline particles, whether volatile or fixed. We find, however, that water can never ſeparate the fixed oil, which here ſhews itſelf to have wholly remained in the *plant*, by the ſmoak, ſmell, and flame it yields; and by the ſparks of fire in the remaining black parts of the *plant*, which were wholly owing to the remains of this oil, no fire being able to make the ſmalleſt ſpark afterwards appear in the aſhes.

Air, as well as fire, is neceſſary to this oil's taking flame; for in a covered veſſel it will not blaze till the cover is taken off.

This thick oil is extremely different from what we call the eſſential oil of a *plant*, and ſeems to be the ſame in all vegetables; and to this they owe their coheſion: while the eſſential oil and ſalt are extracted from the *plant* by boiling, it yet holds together in its native figure and ſtrength; but as ſoon as the black oil is diſſipated by burning, the whole firmneſs of the *plant* is loſt, and a breath of air blaſts it to duſt.

Face of a PLANT. See the article FACE.

Senſitive PLANT. See MIMOSA and SENSITIVE.

Sea PLANTS. See the article SEA-*plants*.

Food of PLANTS. See FOOD *of plants*.

Nouriſhment of PLANTS. See NOURISHMENT.

Propagation of PLANTS. See PROPAGATION.

Reſuſcitation of PLANTS. See RESUSCITATION.

Paſture of PLANTS. See the article PASTURE.

Juices of PLANTS. See JUICES *of plants*.

Oil of PLANTS. See the article OIL.

Salts of PLANTS. It has been obſerved by all who have examined the different eſſential *ſalts of plants*, that ſome of them, when thrown on the fire, have the effects of ſalt-petre, and others of common ſea-ſalt; and it has been concluded from hence, that they really contained particles of thoſe ſalts which their roots had taken in with their nouriſhment, and conveyed up into the ſtalk and leaves with the juices; and that theſe ſalts ſtill retained their original nature, and were no otherwiſe altered than by the mixture with other ſubſtances in the plant. But as two plants of different qualities, when ſet in the ſame earth cloſely by one another, ſhall out of the ſame juices make a medicine, a ſallad, or a poiſon; it cannot be, but that the ſubſtances abſorbed by the root, be they what they will, muſt be greatly altered in the plant; inſomuch, that a ſalt purely nitrous, when received into the root, might become of the nature of ſea ſalt, or of the volatile urinous kind, according to the different organs of the plants, and the different natural fermentations it might meet with there. To be perfectly informed of this, Mr. Homberg made the following experiment:

He took a large quantity of rich black garden mould, and waſhed it in ſeveral waters, to carry off all the ſalts it might contain: this done, he divided the earth into four boxes or caſes of wood, into each of which there was put about two hundred weight. Two of theſe caſes of earth he watered with a ſolution of ſalt-petre, ſo as to make each imbibe about two ounces of that ſalt; the other two caſes were left with the earth inſipid as the waſhing had made it, and care taken to water them with none but perfectly pure water, ſo that they might remain as ſimple as poſſible. In one of the caſes of nitrous earth, and in one of thoſe of ſimple earth, he ſowed fennel; and in the other two, garden creſſes.

The herbs in all the caſes grew very well, and when they were grown to about eight inches high, they were all gathered; and when the roots were cleanſed, and the whole product weighed, thoſe plants which had grown on the ſimple earth weighed twenty-five ounces, and thoſe in the nitrous earth twenty-ſix; their ſmell and taſte manifeſted no ſort of difference in either. In order to examine theſe plants, while yet quite freſh, by means of fire, he put a pound and an half of each, with their roots, into a retort of glaſs: he placed theſe retorts firſt in a balneum mariæ, and then in a ſand-heat, in order to drive over all the aqueous humidity. The quantity of water from each retort was within a few grains of the ſame weight; and from the beginning to the end of the diſtillation, there was not the leaſt appearance of any acid.

After this, the creſſes which had grown in the inſipid earth, yielded a drachm of volatile ſalt; and that which had grown in the earth which had imbibed ſalt-petre, yielded ſeventy-five grains.

The oil of each was very nearly the ſame in quantity; that from the plants in the ſalt-petre earth weighing ſix grains more than that of the plants of the inſipid earth.

The lixivial ſalt was two drachms from the plants in the nitrous earth, and one drachm and ſixty-ſeven grains from thoſe in the inſipid.

The differences between thoſe two parcels of plants upon the analyſis, appeared on the whole ſo little, that it could not be counted any thing; ſince the more or leſs cloſe luting of the veſſels, or many other accidents in the diſtillation, might have eaſily occaſioned as much in plants perfectly the ſame in all reſpects. If there be any thing, however, to be collected from the experiment, it is, that the earth moiſtened with a ſolution of nitre, yielded more of the principles than the other; probably from its actually affording a quantity of ſalt to the juices of the plant in the growth: but as the nitrous earth afforded a plant which yielded more oil than that from an inſipid ſoil, it muſt be from this that the lotions of the earth not being able to carry off any of the fatty parts, they remained in the ſame quantity in both; but that the nitre, where it was, had contributed ſomewhat to the breaking of them, and the rendering them more fit to be abſorbed by the plants. From the different weights of the plants when gathered, after the ſame time of growth, from the ſame ſeed, and with all the ſame advantages in common, proves, that the nitrous ſalts in the earth are not eſſentially neceſſary to vegetation, ſince the *plants* in the inſipid earth grew very well without them; yet that they are very uſeful, ſince the *plants* produced there were of a greater bulk, and according to the whole analyſis, if the differences are to be depended on as reſulting wholly from the nature of the ſubjects, they yielded more of all the active principles; and therefore, that they were to all purpoſes better *plants*.

The fennel in theſe boxes was not gathered with the creſſes, but left till it began to bud for flowering: at this time there was found a very great difference, both in the ſize and appearance of the *plants* of the two ſorts of earth. That in the inſipid earth was lank, weak, and of a yellowiſh green; and being gathered, weighed only nineteen ounces: whereas the fennel growing on the nitrous earth ſeemed in a very vigorous ſtate, its leaves were of a dark green, and it weighed full two pounds. Mr. Homberg weighed nineteen ounces of each of the *plants* freſh, and with their roots, to make the analyſis of them in the ſame manner as he had before done that of the creſſes. In the firſt diſtillation the water began to taſte acid in the firſt drops, and continued to increaſe in acidity as long as it ran; and the inſipid earth left by the fennel which grew in the nitrous earth, was an ounce more in weight than the reſiduum of the *plant* which had grown in the inſipid ſoil. That of the nitrous earth yielded one drachm and twelve grains of oil; that in the inſipid, only ſixty-three grains: neither one nor the other yielded any volatile ſalt, only the laſt ounce of the aqueous liquor made ſome little efferveſcence. The firſt ſalt was in the quantity of three drachms from he fennel of the nitrous earth, and two drachms and ten grains from the inſipid earth.

The *plants* had appeared above ground in the ſame time from their ſeeds in the nitrous and in the inſipid earth, and grew equally vigorous and well for a month; but after that time, tho' both were watered in the ſame manner, and the ſame care in all reſpects was taken of them, the *plant* on the inſipid earth became languid, and that on the nitrous earth continued to grow vigorouſly and well.

It ſeems that in the firſt ſtages of the growth of the *plants*, the two lobes of the ſeed furniſhed a proper nouriſhment to the ſtalk and leaves, and required no more than mere water, a pure ſimple fluid to divide its parts and carry it up from the root; but that when theſe lobes were wholly conſumed, and the *plant* was to find its whole nouriſhment in the earth, there an earth rendered inſipid by the carefully waſhing away all its ſalts, could not ſupply a proper and ſufficient nouriſhment, but that an earth, after it had been made to imbibe a certain portion of nitre could: whence the fennel in the inſipid earth could not continue to grow vigorouſly, after the lobes of the ſeed were deſtroyed, tho' that in the earth impregnated with an adventitious ſalt could.

It is true, indeed, that the *plant* in the inſipid earth did not entirely periſh, and it is reaſonable to conclude thence, that all the waſhing we can give with hot water cannot diveſt earth of all its ſalts, but only of thoſe which are moſt eaſily ſoluble; whence it takes away not all, but only the principal fund of nutrition. All the waſhings in the world muſt alſo leave earth impregnated with all the fatty particles it ever had, and theſe are very inſtrumental to the growth of *plants*; but theſe, without ſome ſalts, ceaſe to be of their proper uſe, ſince they cannot be broken or divided into parts ſmall enough to enter

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the veſſels of *plants*, otherwiſe than by theſe ſalts. Mem Acad. Par. 1693.

It is very obſervable, in the courſe of theſe experiments, that the creſs, tho' planted in an earth containing ſalt petre, which is well known to be an acid ſalt, yet yielded, on the analyſis, alcaline principles, and not the leaſt mark of an acid in any part of the proceſſes, and this juſt in the ſame manner as if it had grown upon an earth impregnated with dung; and that the fennel, whether growing on the nitrous earth, or on the inſipid, afforded a large quantity of acid in all its principles, not excepting even its fixed ſalt, which was very little of the alkali; and by the mixture of the acid of the plant was converted almoſt into the nature of a neutral ſalt. Hence it appears that a ſalt, tho' acid in itſelf when abſorbed into the veſſels of an alkaline *plant*, ſuch as the creſs, ceaſes to be any longer an acid; and that a *plant* naturally acid, whether it grow in an earth impregnated with an acid ſalt, or wholly diveſted of ſalts, yet it retains its acid nature, and gives proof of it in all its principles on an analyſis; whence it is very reaſonable to conclude, that the ſalts found in *plants* are made what they are in thoſe *plants*; and that the ſalts of the earth, in which the *plant* grows, be they of what nature they will, will change that nature in the veſſels of the *plant*, according to the diverſity of its organs, and of the different fermentations they undergo in the courſe of their alteration there.

The weights above mentioned are French, the word *gros* being tranſlated drachm, tho' really exceeding it by twelve grains. See WEIGHT, *C. cl.*

Tracheæ of PLANTS See the article TRACHEÆ *of plants.*

Tranſportation of PLANTS. See TRANSPORTATION *of plants.*

PLANTS *in Amber*. The cabinets of the curious afford numerous inſtances of ſmall animals, ſuch as flies, beetles, and the like, buried in *amber*; but the parts of *plants* are more rarely found thus preſerved; yet we are not without inſtances that the ſame accident may happen to them. The learned Hartman mentions a piece of *amber* in his own poſſeſſion, in which there were preſerved ſome leaves of the common alga, and another in which a ſeed of the common lime-tree, with part of its pedicle, and others in which the capſule with its ſeeds and pedicle were preſerved; the pedicle ſtanding out at the end of the piece of *amber*.

Some have given accounts of whole pinnated leaves of *plants* thus preſerved, and the moſſes are ſo common, that there is no doubt of the reality of their being naturally buried there. They are generally found only in ſingle leaves and ſmall fragments, but ſometimes in whole branches; in which caſe *amber* can ſhew no greater beauty. Pieces of ſtraws, ſticks, and the barks of trees are often found in it alſo; but the greater part of theſe, when ſtrictly examined, are found to be fragments of foſſile wood, or of the matter called by Hartman the *matrix* of *amber*; which is a fibroſe ſubſtance, and much of the appearance of wood, but is really only a bituminous earth. Theſe all muſt have been received into the *amber* in the ſame manner that the inſects were; that is, while the *amber* was yet moiſt or ſoft. Theſe things falling into its way might bury themſelves in it, and then muſt be preſerved in it in the hardened ſtate. See SUCCINUM.

Foſſile PLANTS. Many ſpecies of tender and herbaceous *plants* are found at this day, in great abundance, buried at conſiderable depths in the earth, and converted, as it were, into the nature of the matter they lie among; foſſile wood is often found very little altered, and often impregnated with ſubſtances of almoſt all the different foſſile kinds, and lodged in all the ſeveral ſtrata, ſometimes firmly embedded in hard matter, ſometimes looſe: but this is by no means the caſe with the tenderer and more delicate ſubjects of the vegetable world. Theſe are uſually immerſed either in a blackiſh flaty ſubſtance, found lying over the ſtrata of coal, or elſe in looſe nodules of ferrugineous matter of a pebble-like form, and they are always altered into the nature of the ſubſtance they lie among; what we meet with of theſe are principally of the fern kind; and what is very ſingular, tho' a very certain truth, is, that theſe are principally the ferns of American growth, not thoſe of our own climate.

The moſt frequent *foſſile plants* are the polypody, ſpleenwort, oſmund, trichomanes, and the ſeveral larger and ſmaller ferns; but beſide theſe there are alſo found pieces of the equiſetums, or horſe-tails, and joints of the ſtellated *plants*, as the clivers, madder, and the like; and theſe have been too often miſtaken for flowers; ſometimes there are alſo found compleat graſſes, or parts of them, as alſo reeds and other water *plants*; ſometimes the ears of corn, and not unfrequently the twigs or bark, and impreſſions of the bark, and fruit of the pine or fir kind, which have been, from their ſcaly appearance, miſtaken for the ſkins of fiſhes; and ſometimes, but that very rarely, we meet with moſſes and ſea-*plants*.

Many of the ferns not unfrequently found, are of very ſingular kinds, and ſome ſpecies yet unknown to us; and the leaves of ſome appear ſet at regular diſtances, with round protuberances and cavities. The ſtones which contain theſe plants ſplit readily, and are often found to contain, on one ſide, the impreſſion of the plant; and on the other the prominent plant itſelf: and beſide all that have been mentioned, there have been frequently ſuppoſed to be found with us ears of common wheat, and of the maiz or Indian corn; the firſt being in reality no other than the common endmoſt branches of the firs, and the other the thicker boughs of various ſpecies of that and of the pine kind, with their leaves fallen off; ſuch branches in ſuch a ſtate cannot but afford many irregular tubercles and papillæ, and in ſome ſpecies, ſuch as are more regularly diſpoſed.

Theſe are the kinds moſt obvious in England; and theſe are either immerſed in the flaty ſtone which conſtitutes whole ſtrata, or in flatted nodules, uſually of about three inches broad, which readily ſplit into two pieces on being ſtruck. They are moſt common in Kenton coal-pits, near Newcaſtle, and the foreſt of Dean, in Glouceſterſhire; but are more or leſs found about almoſt all our coal-pits, and many of our iron mines. See Tab. of Foſſils, Claſs 6.

Tho' theſe ſeem the only ſpecies of *plants* found with us, yet in Germany there are many others, and thoſe found in different ſubſtances. A whitiſh ſtone, a little harder than chalk, frequently contains them: they are found alſo often in a grey flaty ſtone, of a firmer texture, not unfrequently in a blackiſh one, and at times in many others: nor are the bodies themſelves leſs various here than the matter in which they are contained: the leaves of trees are found in great abundance, among which thoſe of the willow, poplar, whitethorn, and pear-trees, are the moſt common; ſmall branches of box, leafs of the olive-tree, and ſtalks of garden thyme, are alſo found there; and ſometimes ears of the various ſpecies of corn, and the larger as well as the ſmaller moſſes in great abundance.

Theſe ſeem the tender vegetables, or herbaceous *plants*, certainly found thus immerſed in hard ſtone, and buried at great depths in the earth; others of many kinds there are alſo named by authors, but as in bodies ſo imperfect, errors are eaſily fallen into, theſe ſeem all that can be aſcertained beyond mere conjecture. *Hill's* Hiſt. of Foſſ. p. 640.

Ice-PLANT See the article ICE.

PLANT-*root*, a term uſed by Dr. Grew to expreſs the radicle in ſeeds: he by this name diſtinguiſhes it from what he calls the ſeminal root; which is a very different ſubſtance diſtributed throughout the parenchyma of the ſeed, but wholly different from it, and preying upon it as the *plant-root* does upon the earth. *Grew's* Anat. of Plants. See the article SEMINAL-*root*.

PLANTAGINELLA, in botany, a name given by Dillenius to a genus of plants ſince called by Linnæus *limoſella*. *Dillen.* See the article LIMOSELLA.

PLANTAGO, *plantain*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is wide, expanded at the opening, and uſually divided into four ſegments; from the bottom of this flower riſes a piſtil ſurrounded with ſtamina of conſiderable length: the piſtil becomes afterwards an oval or conic ſeed-veſſel; which when ripe ſeparates tranſverſely into two pieces, and is divided by an intermediate ſeptum into two cells, filled with oblong ſeeds.

The ſpecies of *plantain*, enumerated by Mr. Tournefort, are theſe: 1. The ſmooth broad-leaved *plantain*. 2. The broad-leaved *plantain*, with ſinuated leaves. 3. The broad-leaved *plantain*, with blood coloured leaves. 4. The broad-leaved hoary *plantain*. 5. The broad-leaved hoary *plantain*, with a white ſpike. 6. The broad-leaved roſe *plantain*, with an expanded flower. 7. The broad-leaved roſe *plantain*, with flowers diſpoſed in tufts. 8. The broad-leaved *plantain*, with a buſhy panicle. 9. The broad-leaved hoary *plantain*, with various ſpikes. 10. The ſmaller broad-leaved ſmooth *plantain*. 11. The ſmaller broad-leaved hoary *plantain*. 12. The hairy or woolly *plantain*. 13. The great narrow-leaved *plantain*. 14. The ſmall proliferous narrow-leaved *plantain*, with foliaceous tops to the ſtalks. 15. The common narrow-leaved proliferous *plantain*. 16. The narrow-leaved ſilvery *plantain*. 17. The narrow-leaved ſerrated *plantain*. 18. The ſhrubby narrow-leaved *plantain*. 19. The great broad-leaved hoary *plantain*, with three ribs to each leaf. 20. The leſſer narrow-leaved *plantain*. 21. The hairy bulboſe rooted *plantain*. 22. The narrow-leaved *plantain*, with tufts like the lagopus. 23. The narroweſt-leaved three ribbed *plantain*. 24. The alpine *plantain*, with long, narrow and blackiſh leaves. 25. The three-ribbed mountain-*plantain*. 26. The narrow-leaved and white Spaniſh *plantain*. 27. The narrow-leaved white French *plantain*. 28. The great narrow-leaved ſea-*plantain*, called by ſome the ſea *coronopus*. 29. The leſſer narrow-leaved ſea-*plantain*. 30. The ſmalleſt ſea-*plantain*, with rigid graſſy leaves. 31. The greater graſſy-leaved *plantain*. 32. The ſmaller graſſy-leaved *plantain*. 33. The ſmalleſt narrow leaved *plantain*, with heads like the hare's foot. 34. The one-flowered graſſy-leaved marſh-*plantain*. 35. The hairy ſea-*plantain* of Portugal, with a very long ſpike. 36. The hairy ſea-*plantain* of Portugal, with a ſhort ſpike.

Theſe are properly *plantains*; but the large plants commonly called by authors water *plantains*, are ſpecies of ranunculus. *Tourn.* Inſt. p. 127. See RANUNCULUS.

PLANTAGO, in the Linnæan ſyſtem of botany, is made the name of a large genus of plants, taking in, beſide the ſeveral ſpecies of *plantains*, uſually ſo called, the pſyllium, or fleawort, the coronopus or buckſhorn, and the gramen junceum, or ruſh-graſs.

The characters of this genus are these: The cup is an erect very short perianthium, divided into four at the edges, and remaining after the flower is fallen. The flower consists of one petal, in form of a cylindraceo-globose tube, with the limb cut into four parts; the segments being depressed, of an oval figure and pointed; the stamina are four extremely long, erect capillary filaments; the antheræ are oblong, flatted, and lean upon the stamina; the germen of the pistil is of an oval figure; the style is slender, and but of half the length of the stamina; and the stigma is simple; the fruit is an oval capsule, containing two cells, parting horizontally; the seeds are numerous, and oblong. *Linnæi* Genera Plant. p. 46.

PLANTE-*ver*, in natural history, the name of an herb sent over from China, where it is called *hiatsaotonetchom*; that is to say, a plant which at a certain time of the year changes into a worm. The Chinese say, that this is a plant during the summer season; but that in winter its stalk dies, and the root becomes a worm. Mr. Reaumur has well observed, that in the present improved state of natural knowledge, we can give no credit to such marvellous accounts; and of the roots sent over to the Academy at Paris, it appeared, that only a certain part of each was to undergo this change: this, however, if true, was no less a marvel than that the whole should.

Father Parenin, who sent it to France, observes, in his account of it, that it was a very scarce plant even in China; being found only at the palace of Pekin there, where also it was not native, but brought from the mountains of Tibet, and some other places on the confines of the Chinese dominions. This father had never seen the leaves or flowers of the plant, but only its roots, which were in high esteem their, not only because of their miraculous changes, but from there possessing the virtues of the famous ginseng; but with this advantage, that the use of them was not subject to be attended with those hæmorrhages which frequently affected the persons who take large quantities of that famous root. The roots of this *plante-ver* are usually about a quarter of an inch thick, and from an inch to three inches in length; but there are much larger in the places where they grow.

These roots had nothing particular in their figure or appearance; but with these the father sent some of those which were supposed to be changed into worms, concerning which he observed, that nothing could more exactly express a worm or caterpillar; the head, the eyes, the feet, and the mouth, being all plainly distinguishable, as well as the several folds and cuttings in of the body. This account was found to be perfectly true; but the mistake was the want of proper accuracy in the observation; for this body, which was supposed to be the root transformed, had in reality never been any part of the plant, but was found to be really and truly a caterpillar. This was one of the under-ground kind, or at least of those which go into the ground to pass their transformation: of these we have a great many different species in all parts of Europe, and some of them, when they are entering into their nymph state, have a custom of fastening themselves to the roots of plants. Of this kind was the Chinese insect, which when the time of its change approached, always selected the roots of this plant as of a proper size and dimension for its purpose; and gnawing off the end hollowed away the stump, so as to introduce its tail into the cavity; where it remains covered with the bark of the root, which so nicely joins to it, that people who observe it in a slight way cannot but mistake it to be a part of the root, or the remainder of the root, a continuation of its body. The more accurate naturalists will, however, easy distinguish the vegetable fibres, which make up the root from the animal ones of the caterpillar; and to an eye accustomed to such researches, the nice joining of the tail to the remainder of the root will easily discover itself. Mem. Acad. Par. 1720.

PLANTED-*coat*, in the manege. See HAIR, *Cycl.*

PLASHING, a term used by our farmers to express an operation performed at certain times upon their quickset-hedges, in order to assist their growth and continuance. This operation is performed sometimes in October, but more usually in February; and this is by much the better season for it. Suppose a hedge to be of twenty or thirty years growth, and full of old stubs as well as young shoots, this is the kind of hedge that requires *plashing* most of all.

The old stubs must be cut off within two or three inches of the ground, and the best and longest of the middle sized shoots must be left to lay down. Some of the strongest of these must also be left to answer the purpose of stakes. These are to be cut off to the height at which the hedge is intended to be left; and they are to stand at ten foot distance one from another: when there are not proper shoots for these at the due distances, their places must be supplied with common stakes of dead wood. The hedge is to be first thinned, by cutting away all but those shoots which are intended to be used either as stakes, or the other work of the *plashing*: the ditch is to be cleaned out with the spade: the ditch must be now dug as at first, with sloping sides each way; and when there is any cavity on the bank on which the hedge grows, or the earth has been washed away from the roots of the shrubs, it is to be made good by facing it, as they express it, with the mould dug from the upper part of the ditch; all the rest of the earth dug out of the ditch is to be laid upon the top of the bank, and the owner should look carefully into it that this be done; for the workmen, to spare themselves trouble, are apt to throw as much as they can upon the face of the bank; which being by this means overloaded, is soon washed off into the ditch again, and a very great part of the work undone again, whereas what is laid on the top of the bank always remains there, and makes a good fence of an indifferent hedge.

In the *plashing* the quick, two extremes are to be avoided; these are, the laying it too low, and the laying it too thick: this makes the sap run all into the shoots, and leaves the *plashes* without sufficient nourishment; which, with the thickness of the hedge, finally kills them. The other extreme of laying them too high, is equally to be avoided; for this carries up all the nourishment into the *plashes*, and so makes the shoots small and weak at the bottom, and, consequently, the hedge thin. This is a common error in the north of England. The best hedges made any where in England, are those of Hertfordshire; and they are *plashed* in a middle way between the two extremes, and the cattle are by that prevented both from croping the young shoots, and from going thro'; and a new and vigorous hedge soon forms itself.

When the shoot is bent down that is intended to be *plashed*, it must be cut halfway thro' with the bill: the cut must be given sloping, somewhat downwards, and then it is to be wound about the stakes, and after this its superfluous branches are to be cut off, as they stand out at the sides of the hedge. If for the first year or two the field where a new hedge is made can be ploughed, it will thrive the better for it; but if the stubs are very old, it is best to cut them quite down, and to secure them with good dead hedges on both sides, till the shoots are grown up from them strong enough to *plash*; and wherever void spaces are seen, new sets are to be planted to fill them up. A new hedge raised from sets in the common way, generally requires *plashing* about eight or nine years after. *Mortimer*'s Husbandry, p. 10.

PLASTER (*Cycl.*)—PLASTER, in pharmacy, an external application of a harder consistence than our ointments: these are to be spread according to the different circumstances of the wound, place, or patient, either upon linnen or leather. If the part upon which they are to be laid be naturally hairy, it must be shaved; but that they may stick the better, the natural shape of the part must be consulted, and the *plaster* spread and formed accordingly, either round, square, triangular, elleptical, in a lunar form, or in shape of the letter T. Some also are divided at both ends, and others are perforated in the middle; these last are of frequent use in fractures attended with a wound; for by this contrivance the wound may be cleansed and dressed without removing the *plaster*. These *plasters* are of different forms, according to the part they are laid on; but they are usually square, or round; and indeed there is almost no part of the body which a *plaster* of one of those forms may not be made to serve for, if it be notched about the edges with a pair of sciffers.

The uses of *plasters* are various; they are serviceable in securing the dressings, they also forward the maturation of the pus, agglutinate and heal wounds, unite broken bones, heal burns, assuage pain, and strengthen weak parts. *Heister*'s Surg. p. 18.

PLASTER *of Paris*. The method of representing a face truly in *plaster of Paris*, is this: The person whose figure is designed is laid on his back, with any convenient thing to keep off the hair. Into each nostril is conveyed a conical piece of stiff paper, open at both ends, to allow of respiration. These tubes being anointed with oil, are supported by the hand of an assistant; then the face is lightly oiled over, and the eyes being kept shut, alabaster fresh calcined, and tempered to a thinnish consistence with water, is by spoonfuls nimbly thrown all over the face, till it lies near the thickness of an inch. This matter grows sensibly hot, and in about a quarter of an hour hardening into a kind of stony concretion; which being gently taken off represents, on its concave surface, the minutest part of the original face. In this a head of good clay may be moulded, and therein the eyes are to be opened, and other necessary amendments made. This second face being anointed with oil, a second mould of calcined alabaster is made, consisting of two parts joined lengthways along the ridge of the nose; and herein may be cast, with the same matter, a face extremely like the original. *Boyle*'s Works, abr. Vol. I. p. 132.

If finely powdered alabaster, or *plaster of Paris*, be put into a bason over a fire, it will, when hot, assume the appearance of a fluid, by rolling in waves, yielding to the touch, steaming, &c. all which properties it again loses on the departure of the heat; and being thrown upon paper, will not at all wet it, but immediately discover itself to be as motionless as before it was set over the fire; whereby it appears, that a heap of such little bodies, as are neither spherical, nor otherwise regularly shaped, nor small enough to be below the discernment of the eye, may, without fusion, be made fluid, barely by a sufficiently strong and various agitation of the particles which compose it; and, moreover,

over, loſe its fluidity immediately upon the ceſſation thereof *Boyle*'s Works abr. Vol. I. p 313.

Two or three ſpoonfuls of burnt alabaſter, mixed up thin with water, in a ſhort time coagulate, at the bottom of a veſſel full of water, into a hard lump, notwithſtanding the water that ſurrounded it. Artificers obſerve, that the coagulating property of burnt alabaſter will be very much impaired or loſt, if the powder be kept too long, eſpecially if in the open air, before it is made uſe of; and when it hath been once tempered with water, and ſuffered to grow hard, they cannot by any burning or powdering of it again, make it ſerviceable for their purpoſe as before. *Boyle*'s Works abr. Vol. I. p. 341.

This matter, when wrought into veſſels, &c. is ſtill of ſo looſe and ſpungy a texture, that the air has eaſy paſſage thro' it. Mr. Boyle gives an account among his experiments with the air-pump, of his preparing a tube of this *plaſter*, cloſed at one end and open at the other, and on applying the open end to the cement, as is uſually done with the receivers, it was found utterly impoſſible to exhauſt all the air out of it; for freſh air from without preſſed in as faſt as the other, or internal air, was exhauſted, tho' the ſides of the tube were of a conſiderable thickneſs. A tube of iron was then put on the engine; ſo that being filled with water, the tube of *plaſter of Paris* was covered with it; and on uſing the pump, it was immediately ſeen, that the water paſſed through into it as eaſily as the air had done, when that was the ambient fluid. After this, trying it with Venice turpentine inſtead of water, the thing ſucceeded very well; and the tube might be perfectly exhauſted, and would remain in that ſtate ſeveral hours. After this, on pouring ſome hot oil upon the turpentine, the caſe was much altered; for the turpentine melting with this, that became a thinner fluid, and in this ſtate capable of paſſing like water into the pores of the *plaſter*. On taking away the tube after this, it was remarkable that the turpentine, which had pervaded and filled its pores, rendered it tranſparent, in the manner that water gives tranſparency to that ſingular ſtone called *oculus mundi*. In this manner, the weight of air, under proper management, will be capable of making ſeveral ſorts of glues penetrate *plaſter of Paris*; and not only this, but baked earth, wood, and all other bodies porous enough to admit water on this occaſion. Philoſ. Tranſ. N°. 122.

PLASTERING. The modern taſte runs greatly into *plaſtering*; and it were much to be wiſhed that this art could be again brought to its antient perfection. In our beſt buildings the *plaſtered* walls and ceilings crack and fly, and in a little time grow damp, or moulder to decay. The Romans had an art of rendering their works of this kind much more firm and durable, and there is no reaſon to deſpair of reviving this art by proper trials.

The antient *plaſtering* of theſe people, preſerved to this time, where it has not met with violent blows or injuries from accidents, is ſtill found as firm and ſolid, as free from cracks or crevices, and as ſmooth and poliſhed on the ſurface, as if made of marble. The bottoms and ſides of the Roman aqueducts were made of this *plaſtering*, and endured many ages without hurt, unleſs by accidents; witneſs that whereof ſome yards are ſtill to be found on the top of the Pont de Garde, near Niſmes, for the ſupport of which that famous bridge was built to carry water to the ſaid town. The roofs of houſes, and the floors of rooms at Venice are covered with a ſort of *plaſter*, made of later date, and yet ſtrong enough to endure the ſun and weather for ſeveral ages, without cracking or ſpoiling, and without much injury from people's feet.

The ſecret of preparing this Venetian *plaſter* is not among us; but it would be worth while to try whether ſuch a ſubſtance might not be made by boiling the powder of gypſum dry over the fire, for it will boil in the manner of water; and when this boiling or recalcining was over, the mixing with it reſin, or pitch, or both together, with common ſulphur, and the powder of ſea-ſhells. If theſe were all mixed together, and the water added to it hot, and the matter all kept hot upon the fire till the inſtant of its being uſed, ſo that it might be laid on hot, it is poſſible this ſecret might be hit upon.

Wax and oil of turpentine may be alſo tried as additions: theſe being the common ingredients in ſuch cements as we have accounts of as the firmeſt. Strong ale-wort is by ſome directed to be uſed, inſtead of water, to make mortar of lime-ſtone be of a more than ordinary ſtrength. It is poſſible, that the uſe of this tenacious liquor to the powdered ingredients of this propoſed *plaſter*, might greatly add to their ſolidity and firmneſs. Phil. Tranſ. N°. 93.

PLAT *(Cycl.)*—PLAT-*veins*, in the manege, called in French *arx*, are the veins in which we bleed horſes, one in the lower part of each ſhoulder, when we blood a horſe in the ſhoulders; and in the flat part of the thighs.

PLATS, in a ſhip, flat ropes made of rope-yarn, and weaved one over the other: they ſerve to ſave the cable from galling in the hawſe, or to wind about the flukes of the anchors, to ſave the pennant of the fore-ſheet from galling againſt them.

PLATANUS, the *plane tree*. See PLANE-*tree*.

PLATÆ, a word uſed by ſome anatomical writers to expreſs the ſcapulæ.

PLATAMON, a word uſed to expreſs a low and ſmooth rock, juſt appearing above water.

PLATANARIA, in botany, a name by which ſome authors have called the *ſpargarium*, or burr-reed, from its round echinated fruit, which in ſhape and ſize much reſemble thoſe of the *platanus*.

PLATE, *(Cycl.)* a term uſed by our ſportſmen to expreſs the reward given to the beſt horſe at our races.

The winning a *plate* is not a work of a few days to the owner of the horſe, but great care and preparation are to be made for it, if there is any great dependance on the ſucceſs. A month is the leaſt time that can be allowed to draw the horſe's body clear, and to refine his wind to that degree of perfection that is attainable by art.

It is firſt neceſſary to take an exact view of his body, whether he be low or high in fleſh; and it is alſo neceſſary to conſider, whether he be dull and heavy, or briſk and lively when abroad. If he appear dull and heavy, and there is reaſon to ſuppoſe it is owing to too hard riding; or, as the jockies expreſs it, to ſome greaſe that has been diſſolved in hunting, and has not been removed by ſcouring, then the proper remedy is half an ounce of diapente, given in a pint of good ſack; this will at once remove the cauſe, and revive the creature's ſpirits. After this, for the firſt week of the month, he is to be fed with oats, bread, and ſplit beans, giving him ſometimes the one, and ſometimes the other, as he likes beſt; and always leaving ſome in the locker, that he may feed at leiſure when he is left alone. When the groom returns at the feeding time, whatever is left of this muſt be removed, and freſh given; by this means the creature will ſoon become high ſpirited, wanton, and full of play. Every day he muſt be rode out an airing, and every other day it will be proper to give him a little more exerciſe; but not ſo much as to make him ſweat too much.

The beans and oats in this caſe are to be put into a bag, and beaten till the hulls are all off, and then winnowed clean; and the bread, inſtead of being chipped in the common way, is to have the cruſt clean cut off.

If the horſe be in good fleſh and ſpirits when taken up for its month's preparation, the diapente muſt be omitted; and the chief buſineſs will be to give him good food, and ſo much exerciſe as will keep him in wind, without over ſweating or tiring his ſpirits. When he takes larger exerciſes afterwards, towards the end of the month, it will be proper to have ſome horſes in the place to run againſt him. This will put him upon his mettle, and the beating them will give him ſpirits.

This, however, is to be cautiouſly obſerved, that he has not a bloody heat given him for ten days or a fortnight before the *plate* is to be run for; and that the laſt heat that is given him the day before the race, muſt be in his cloaths: this will make him run with greatly more vigour, when ſtripped for the race, and feeling the cold wind on every part. In the ſecond week the horſe ſhould have the ſame food and more exerciſe, and in the laſt fortnight he muſt have dried oats, that have been hulled by beating; after this they are to be wetted in a quantity of whites of eggs, beaten up, and then laid out in the ſun to dry; and when as dry as before, the horſe is to have them. This ſort of food is very light of digeſtion, and very good for the creature's wind. The beans in this time ſhould be given more ſparingly, and the bread ſhould be made of three parts wheat, and one part beans. If he ſhould become coſtive under this courſe, he muſt then have ſome ale and whites of eggs beaten together: this will cool him, and keep his body moiſt.

In the laſt week the maſh is to be omitted, and barley-water given him in its place, and every day, till the day before the race: he ſhould have his fill of hay, then he muſt have it given him more ſparingly, that he may have time to digeſt it; and in the morning of the race-day, he muſt have a toaſt or two of white bread, ſoaked in ſack, and the ſame juſt before he is led out to the field. This is an excellent method, becauſe the two extremes of fullneſs and faſting are at this time to be equally avoided; the one hurting his wind, and the other occaſioning faintneſs, that may make him loſe. After he has had his food, the litter is to be ſhook up, and the ſtable kept quiet, that he may be diſturbed by nothing till he is taken out to run.

PLATES, in gunnery. The *priſe-plates* are two *plates* of iron on the cheeks of a gun-carriage, from the cape-ſquare to the center, through which the priſe-bolts go, and on which the hand-ſpike reſts when it poiſes up the breech of the piece. Breaſt-*plates* are the two *plates* on the face of the carriage, one on each cheek. Train-*plates* are the two *plates* on the cheeks at the train of the carriage. Dulidge-*plates* are the ſix *plates* on the wheel of a gun-carriage, where the fellows are joined together, and ſerve to ſtrengthen the dulidges.

PLATE-*longe*, in the manege, a woven ſtrap, four fathom long, three fingers broad, and as thick as one. It is uſed for raiſing a horſe's legs and ſometimes for taking him down, in order to facilitate ſeveral operations of the farrier. Some improperly give the name of *plate-longe* to a martingale. See the article MARTINGALE, *Cycl.*

PLATEA, in zoology, the name of a bird of the long-necked kind, approaching to the nature of the ſtork and heron, and called

called in Engliſh the *ſpoon-bill*, from the remarkable figure of its beak, which is different from that of all other birds; being broadeſt at the extremity, and terminating in a large rounded, flat proceſs, reſembling a ſhovel; or, if it were hollow, a ſpoon. See Tab. of Birds, N°. 42.

This bird has been called *lucoredius*, *albardeola*, and *le'elaer*, and by ſome very improperly the *pelecanus*. It is all over very white, like the ſwan; but that there is ſome blackneſs in the wings. It builds in high trees in ſome parts of Holland. *Ray*'s Ornithology. p. 212.

PLATESSA, in zoology, a name by which Auſonius and ſome other authors have called the paſſer-fiſh, or common plaiſe. *Willughby*'s Hiſt. Piſc. p. 96.

PLATFORM *(Cycl.)*—All practitioners are agreed, that no ſhot can be depended on, unleſs the piece be placed on a ſolid *platform*; for if the *platform* ſhakes with the firſt impulſe of the powder, it is impoſſible but the piece muſt likewiſe ſhake; which will alter its direction, and render its ſhot uncertain. To prevent this accident, the *platform* is uſually made extremely firm to a conſiderable depth backwards, ſo that the piece is not only well ſupported in the beginning of its motion, but likewiſe through a great part of its recoil. However, it is ſufficiently obvious, that when the bullet is ſeparated from the piece, it can be no longer affected by the trembling of the piece or *platform*; and by a very eaſy computation it will be found, that in a piece ten feet in length, carrying a bullet of 24 lb. and charged with 16 lb. of powder, the bullet will be out of the piece before it has recoiled half an inch; whence if the *platform* be ſufficiently ſolid at the beginning of the recoil, the remaining part of it may be much ſlighter, ſince its unſteadineſs beyond the firſt half inch will have no influence on the direction of the ſhot: and hence a more compendious method of conſtructing *platforms* may be found out. New Princip. of Gunn. p. 42.

PLATIASMOS, a word uſed by many authors to expreſs a fault in pronunciation, owing to a perſon's opening his mouth too wide, and thence ſpeaking indiſtinctly.

PLATICORIA, a word uſed by medical writers to expreſs a preternatural dilatation of the pupil of the eye, uſually owing to a paralytic diſorder.

PLATONIA, in natural hiſtory, a name given by the modern Greeks to the *prox* of Ariſtotle, and of other antient writers in that language. This is the *cervus platyceros*, or broad-horned ſtag. Some have tranſlated this *dama*, but they are to be underſtood in this as meaning the *dama* of their own times, not that of the antients; that being the *iſarus*, or chamoy-goat, not any animal of the ſtag kind, nor by any means meriting that title.

PLATYCERCOS *ovis*, in natural hiſtory, the name given by Geſner and ſome others to a ſpecies of ſheep, commonly called *ovis laticauda*, or the broad-tailed ſheep.

The tail of this creature is very thick, broad, and heavy, weighing often thirty pounds. We ſometimes ſee it brought over hither as a ſhew, and find that authors have deſcribed the ſhape of its tail very inaccurately. Caius, in Geſner, ſays it is of the ſhape of the tails of other ſheep, broad at the inſertion, and growing gradually ſmaller to the end; but it is exactly the contrary of this, being narroweſt at the inſertion, and growing ſomewhat larger and broader to the extremity; ſo that on the whole, it repreſents a ſort of bag or purſe. The creature is not uncommon in Ægypt, Africa, and Arabia, and in ſome parts of Syria. *Ray*'s Syn. Quad. p. 74. See the article MACROCERCOS.

PLATYOPHTHALMON, a name given by ſome to antimony, from its uſe among the ladies of old time, to make their eye brows broad and black

PLATYSTERNOS a word uſed by the old phyſicians to expreſs a perſon with a very broad cheſt or ſternum.

PLATYRYNCHOS, in zoology, a name given by ſome to the *naſus*, or *neſe*, a freſh water fiſh, caught in the Danube, and moſt of the large rivers in Germany, and much reſembling the chub *Geſner* de Piſc. p. 213. See the article NASUS.

PLATYSMA *myodes*, in anatomy, a name given by Fallopius to one of the muſcles called by Albinus *latiſſimus colli*, and by others *quadratus genæ*.

PLAUSUS, among the Romans. See ACCLAMATION.

PLEA *(Cycl.)*—PLE, in abatement. See the article ABATEMENT, *Cycl.*

PLEADING. Among the Athenians, an equal time was allowed both parties to *plead*, which was meaſured by a water hour-glaſs; and in order to ſee juſtice done in this reſpect, there was an officer appointed to diſtribute the water to each, whence he was called *ephydor*. *Potter* Arch. Græc. l. 1. c. 21 See EPHYDOR.

PLEASURE-*boat*, among the antients. See THALAMEGUS.

PLECHAS, a word uſed by Hippocrates, to expreſs that region of the body which is terminated backward by the anus, forward by the pudenda, and ſideways by the hips.

PLECTÁNÆ, a word uſed by ſome to expreſs the cornua uteri, and by others for any plexus of veſſels.

PLECTRONITÆ. See the article CONICTHYODONTES.

PLECTRUM, a word uſed by ſome anatomical writers, to expreſs the ſtyloide proceſs of the os petroſum; by others for the uvula; and by others for the tongue.

PLECTRUM, among the antients, an inſtrument uſed in playing upon the lyre. We have a deſcription of it in Mem. Acad. Inſcrip. Vol. V. p. 168, 169. See LYRE, *Cycl.*

PLEMMYROS, a word uſed by the old Greek writers to expreſs a redundance of humors: its proper ſignification is the flowing in of the tide.

PLENNA, a word uſed by ſome writers to expreſs any mucous humor.

PLEROSIS, a word uſed by the old Greeks to expreſs the repletion or reſtoring the body to its natural ſtate, after it has been emaciated by ſickneſs.

PLESMONE, a word uſed by the antients to ſignify plenitude or ſatiety.

PLESTYA, in zoology, a name given by Bellonius to a freſh water fiſh of the leather-mouthed kind, appearing to be no way eſſentially different from the more common kind of carcaſius, called by authors *carcaſſii tertium genus*. *Ray*'s Ichthyogr. p. 250. See CARCASSIUS.

PLETHORA *(Cycl.)*—Medical writers now uſually diſtinguiſh four kinds of a *plethora*. 1. The ſimple *plethora*, which is that ſtate of the body in which the blood is too abundant in quantity, but is as yet of no bad quality. 2. The cacochymious *plethora*, which is that where the blood is abundant in quantity, and at the ſame time is ſubject to a too great thickneſs, or ſome other dyſcracy. 3. The *plethora ad vaſa*, whereby the blood, from its over great quantity, renders the veſſels turgid, without any farther ill effect. And, 4. The *plethora ad vires*, in which there is joined to too great a plenitude of the veſſels, a laſſitude, and torpor, or numbneſs of the limbs.

The ſigns of a *plethora* are, 1. A florid conſtitution of the body. 2. A tolerable uſe of the non-naturals, a good appetite to food, and a ſound ſleep: this is the caſe while the *plethora* is ſimple and unmoved, but when any commotion happens from without, the ſigns are inquietude at night, dreams of bleeding, and of wounds from ſwords or other weapons, rubicund looks in the face, and a general turgeſcence of the veſſels, a heavineſs of the limbs, an inaptitude to motion, and difficulty of breathing, a vertiginous diſorder of the head, a ſenſe of a pricking or tingling in the fleſh from the ſlighteſt heat, an eaſy heating of the body from the weather, a moiſture of the eyes, and in hyſteric women a ſenſation as if a piece of cold ice were ſuddenly laid on ſome part of the head.

Perſons moſt ſubject to a PLETHORA, are, 1. People of ſedentary lives, who live high. 2. The younger rather than perſons more advanced in years. 3. The female ſex rather than the men. 4. All perſons who have been accuſtomed to large evacuations, and have haſtily ſuppreſſed them. And, 5. Thoſe perſons who have ſuddenly changed a life of labour or exerciſe to a ſedentary one, without making the neceſſary changes in the non-naturals.

Prognoſtics from a PLETHORA. 1. *Plethoric* perſons are more ſubject to diſeaſes in general than others. 2. They are particularly ſubject to hæmorrhages, inflammations, and acute fevers. 3. The lighter diſeaſes coming upon perſons of a *plethoric* habit, are uſually more ſtubborn and dangerous than on others. 4. The *plethora* itſelf can ſcarcely be called a diſeaſe, but it is the parent of many diſeaſes. Chronic diſeaſes are with more difficulty cured in *plethoric* patients than in others, becauſe they are always averſe to exerciſe. 6. A *plethoric* habit, diſturbed by violent motion, by paſſions of the mind, or by ſtimulating medicines, is capable of producing very terrible conſequences. 7. The diſeaſes ariſing from a *plethora*, from ſtopping ſome accuſtomed evacuation, are with difficulty cured; and *plethoras* are more efficaciouſly relieved by natural hæmorrhages than by any artificial means.

Method of cure in a PLETHORA. A ſimple *plethora* is eaſily removed by bleeding and gentle exerciſe, and by a more ſpare diet; to theſe may be added, gentle purging once a month. The *plethora* with a cacochymy requires gentle purging, bleeding, and cuping, diaphoretics and diuretics. If a violent commotion of the blood happen with a *plethora*, temperance is to be firſt preſcribed, then the uſe of nitre, and crabs-eyes ſaturated with lemon juice; and other cooling and alterative remedies. *Junker*'s Conſpect. Medic. p. 4.

PLEURISY *and* PERIPNEUMONY *(Cycl.)*—Theſe are two diſeaſes which have ſome reſemblance in their general ſymptoms, and are thence ſometimes miſtaken one for the other. They are, however, extremely different in their place of origin, as well as in their ſeveral ſymptoms: the *pleuriſy* being a ſtaſis of blood in the *pleura*; and the *peripneumony* a ſtaſis of the ſame fluid in the lungs. They are both attended with an acute, continuous, and inflammatory fever, by means of which nature is labouring to break through the obſtruction made by the ſtaſis of the blood in thoſe parts.

The ſpurious *pleuriſy* is to be carefully diſtinguiſhed from theſe two diſeaſes. In the true *pleuriſy*, or *peripneumony*, a pain is felt either about or a little below the nipple; but the ſpurious *pleuriſy* generally ſhews itſelf higher, uſually about the clavicle. In the genuine diſeaſes the pains are equal and regular, anſwering to the pulſe: in the ſpurious *pleuriſy* they are vague, and wholly irregular. In the true, they are alſo continual; but in the ſpurious, they have frequent intermiſſions and remiſſions. The true have always a cough attending them, and

that

that uſually attended with a ſpitting of coloured matter, often ſtreaked with blood; but the ſpurious often has no cough at all attending it; or if it has, there is no difference ſeen in the matter voided by ſpitting. The true has always an acute continuous fever, which attacks the patient at firſt with a ſhivering; the ſpurious either has no fever at all with it, or it is at the utmoſt a ſlight and irregular one.

The true diſeaſes do not terminate in leſs than ſeven days; the others much ſooner. The true uſually attack young people; the ſpurious are common to young and old. The difference between the true and ſpurious diſeaſes, are determined by the obſervation of theſe ſymptoms; but it yet remains to diſtinguiſh juſtly the true diſeaſes from one another. This is done by the following obſervations:

The *pleuriſy* is a very rare diſeaſe; and the *peripneumony* a very common one; but this is exactly contrary to the common opinion, from theſe diſeaſes being too generally confounded with, and miſtaken for one another.

In a *peripneumony*, a ſpitting of blood uſually happens about the cloſe of the ſecond day: this is a primary ſymptom in a *peripneumony*, but is uſually erroneouſly attributed to a *pleuriſy*, tho' reaſon ſhews how eaſily ſuch a ſpitting may happen from an inflammation of the lungs; and it is very different to conceive how it ſhould happen ſo readily from an inflammation of a part ſo remote from having any communication with the organs of expectoration as the pleura.

In the *peripneumony*, the pain extends itſelf farther, affecting the whole breaſt, whereas in the *pleuriſy* it is rather fixed to the right ſide, and felt a little below the breaſt. Theſe are the ſymptoms by which theſe diſeaſes are diſtinguiſhed from one another, and the uſe of the diſtinction is principally this, that in the *pleuriſy* the application of external remedies often is of great ſervice, whereas it is of no effect in the other caſe, tho' the miſtake is of no great conſequence in this reſpect as the applications in the *peripneumony* can do no harm: but in an unhappy termination of theſe diſeaſes by ſuppuration, the diſtinction becomes of ſome conſequence; ſince in the *pleuriſy* the matter may be evacuated by a paracenteſis, or the letting in a canula; which in the *peripneumony* can by no means be done, unleſs in ſuch an accidental caſe that the diſeaſe terminates in an external *vomica pulmonum*: then indeed the matter being diſcharged from the abſceſs into the cavity of the thorax, may be let out in the ſame manner as in the ſuppurated *pleuriſy*; but this is a caſe that does not occur in an age.

The uſual opinion of medical writers, in regard to this caſe, is, that the *peripneumony* is always a diſorder affecting only the external ſurface of the lungs; and they obſerve, that even its name expreſſes this, the ſignification of it being a diſtemperature ſpreading round about the lungs: this, however, is not agreeable to obſervation or experience; for in diſſections of bodies that have died of this diſeaſe, the very internal part of the lungs is always found affected; and indeed if the ſurface only were ſo, it is not eaſy to conceive how the ſpitting of blood ſhould come on ſo ſoon as the ſecond day.

Signs of theſe diſeaſes. Theſe are in general common to both, and are the following: A vertiginous diſorder of the head uſually precedes all the other ſymptoms; this is ſucceeded by a ſhivering and chillneſs all over the body; this increaſes by degrees, and uſually brings on with it cardialgias, nauſeas, and anxieties: after this there comes on a very remarkable heat, with very intenſe thirſt, and a violent pain in the head; this is accompanyed with a ſtraitneſs of the breaſt, and difficulty of reſpiration; and the patient feels a violent and ſevere pain in the breaſt: and this becomes continual, and is always greatly exaſperated by the cough that attends the diſeaſe. The urine in the firſt days is red, and after a few days more it becomes turbid, when it has ſtood to be cold; and finally depoſits a thick pale-red ſediment. The peculiar ſymptoms of each diſeaſe are already enumerated.

Perſons ſubject to them. Theſe are diſeaſes not equally common to all ages, but they principally affect young people: they are moſt frequent in the beginning of the ſpring ſeaſon, and moſtly affect ſuch as are of a ſanguine plethoric habit. Perſons who have been ſubject to bleeding at the noſe, but have been for ſome time free from returns of them, often fall into theſe diſeaſes; and in general men are much more ſubject to them than women.

Cauſes of them. Theſe diſeaſes are brought on by any thing that gives a violent commotion to the blood, ſuch as immoderate exerciſe, the abuſe of ſpiritous liquors, and violent fits of anger. The ſuddenly cooling the body when very hot, has alſo often occaſioned them, by ſhutting the pores and forcing the blood inwards. The neglect of habitual bleedings may alſo occaſion them; and they have been ſometimes occaſioned by blows, or other external injuries on the breaſt, and by the endeavouring to lift great weights.

Prognoſtics in them. All inflammatory fevers are dangerous; but the *pleuriſy* and *peripneumony*, when they attack young perſons, or ſuch as are under thirty years of age, are attended with the leaſt danger of any, provided that they are properly treated: when they affect perſons advanced in years, they uſually prove very dangerous, in ſpite of all the care and caution that they can be treated with.

When they have been treated in a judicious manner, they uſually go off on the ſeventh, or at the utmoſt the eleventh day in copious ſweats, which come on of themſelves; after this criſis, the pulſe in a very little time returns to its natural ſtate, the violent heat goes off, and the ſtrength, appetite, and ſleep, return. When they go beyond the days of their criſes, which is often the caſe in old people, they then become very dangerous. If the urine is obſerved to be turbid before the fourth day, and afterwards depoſits a ſediment, and the reſt remain clear at the top, there is great hope that the diſeaſe will terminate happily, on the critical day, by a ſweat. When a yellowiſh matter is thrown up by coughing, and is neither very viſcid nor frothy, and particularly when in a *peripneumony* it is ſtreaked with blood, there is great reaſon to expect that the diſeaſe will go happily off: but, on the contrary, when the patient cannot ſpit at all, and the urine continues crude, there is great reaſon to fear the diſeaſe will have a fatal period.

Finally, when a diſcuſſion and reſolution of the ſtaſis cannot be effected by nature, or obtained by art, a corruption and ſuppuration follows, and often an ulcerous diſpoſition of the lungs, or true phthiſis is the conſequence.

Method of cure. The bowels are to be kept gently lax, during the whole courſe of the diſeaſe; but no irritating medicines muſt by any means be given to promote this. When there is a remarkable plethora with a narrowneſs of the breaſt, and a ſenſible ſtuffing up of the lungs, then bleeding is neceſſary; but a ſmall quantity only ſhould be taken away, and the ſame repeated the next day or oftener, if the ſame ſymptoms continue to require it: always after bleeding the patient muſt take ſome gently diaphoretic medicines, and drink plentifully of warm and weak liquors. In the uſual and more common caſes, bleeding is not neceſſary in theſe diſeaſes, tho' ſo greatly recommended by ſome. Every day before noon it is proper to give two doſes of the mixtura ſimplex, or ſome other ſuch temperate diaphoretic, with large draughts of warm liquors; and in the afternoons the antiſebrific powders of nitre, diaphoretic antimony, crabs eyes ſated with lemon juice ſhould be given; and emulſions are alſo very proper, made of ſweet almonds and barley water, or of the ſeeds of carduus mariæ. When theſe medicines have been given for ſome days, if the pain continues ſtill violent, the tincture of caſcarilla muſt be taken; and in caſes of the *pleuriſy*, cloths four or more times doubled and wetted in camphorated ſpirit of wine, are to be applied to the part. Plaſters may alſo be applied occaſionally, but they muſt not be ſuffered to remain on too long, leſt they ſtop reſpiration; an equal regimen and perfect quietneſs is to be obſerved during the whole time of the diſeaſe; but particularly on the critical days, on which nature muſt be by no means ruffled or diſturbed.

Authors differ greatly in their opinions about bleeding in this diſeaſe: ſome judge it abſolutely neceſſary in all caſes; and others wholly reject it in all. Etmuller obſerved, that bleeding in theſe diſeaſes always gave the ſtaſis a tendency to ſuppuration; others are of opinion, that it is to be done, or omitted, according to the peculiar indications in the caſe; and ſome throw aſide all the diſſolvent and diſcutient medicines, and rely on the volatile ſalts alone for the promoting ſweats, and accompliſhing the cure by that means alone, only obſerving, that if the diſeaſe will not yield to theſe, bleeding is to be added.

But the more rational practice ſeems to determine, that it is a raſh attempt to endeavour to diſcuſs a ſtaſis already formed by hot medicines, which expand the blood, and ſeem calculated only to add to it; and that the natural ſtate of the diſeaſe does not indicate bleeding, tho' the urgency of certain ſymptoms, ſuch as ſtraitneſs of the breaſt and infarctions of the lungs, in perſons of plethoric habits, may render it neceſſary and beneficial.

Perſons of very plethoric habits, who have died of theſe diſtempers, on diſſection, have been found to have one ſide of the lungs ſo ſtuffed up with blood, that it would ſink in water; and unqueſtionably in ſuch caſes bleeding is neceſſary.

Sydenham's method of curing by large and often repeated bleedings, and the uſe of gentle expectorants, is found very dangerous in its effects, and ſeems the only reproachable thing in the works of that excellent writer. And tho' Riverius gives an inſtance of a perſon cured of a *pleuriſy* in a few hours, by bleeding alone, the account does not ſeem wholly to be depended upon; for ſome circumſtances in the relation ſeem to ſhew, that the diſeaſe was not properly either a *pleuriſy*, or a *peripneumony*, but an inflammation of the liver or ſtomach. Some people recommend the flowers of the common red poppies in theſe caſes, as a ſpecific remedy; but Etmuller allows them no ſuch quality, but ſays they act in this caſe merely as a gentle opiate and anodyne; a ſort of medicines very dangerous in theſe caſes.

The ſeeds of carduus mariæ, or the milk thiſtle, are alſo by ſome recommended as ſpecifics: it is very evident that they mitigate the pain; but the fever will always continue to its regular period on the ſeventh day.

Expectorating medicines, in general, are of no uſe in theſe caſes, only if the ſpitting of a bloody matter do not ſucceed

ſufficiently by the fourth day, it may be neceſſary to give a doſe or two of ſomething of this kind; and to this purpoſe a decoction of hyſſop is preferred by many before all other medicines. Nitre is to be given boldly for the four firſt days; but after this, if the diſeaſe go on regularly, it is to be given in ſmaller quantities, and not oftener than twice in a day. All oily and fatty ſubſtances are to be excluded from external uſe, but camphor in any form is found to do ſervice.

Opiates in theſe caſes are dangerous; for as there is in all of them a tenacity of the blood, this ſtate of it requires concuſſion, reſolution, and excretion, but opiates effect the exact contrary of all theſe. Caſcarilla properly given, will almoſt always mitigate the pain; and when that fails of it effect, it is certain that opiates cannot procure it, but muſt inevitably do harm. *Junck.* Conſp. Med. p. 297, ſeq.

Mr. Du Hamel found the polygala vulgaris of ſervice in promoting expectoration in *pleuriſies*. Med. de l'Acad. Science. 1739.

Bliſters too, on the part affected, are ſaid to give great relief.

PLEUROCYSTUS, in natural hiſtory, the name of one of the general arrangements of the echini marini.

The word is derived from the Greek πλευρον, the ſide, and κυστις, the anus.

The echini of this diviſion are diſtinguiſhed from the others, by having their anus neither on the ſummit, nor in any part of the baſe, but in ſome part of the ſuperficies of one of the ſides. *Klein*'s Echin. p. 32.

PLEURONECTES, in ichthyology, the name of a genus of fiſhes of the malacopterygious kind, the characters of which are theſe: The branchioſtege membrane, on each ſide, contains ſix bones of a cylindric figure; and in the middle between theſe, but lower down, there are two others joined together at the end, but theſe are ſcarce conſpicuous. Both the eyes are placed in one ſide of the head; in ſome they are in the right ſide, and in others in the left. The eyes are covered with a ſkin. One ſide of the fiſh is always white, the other is ſpotted or obſcure.

Of theſe fiſh there are ſome which have a very ſhort ſpine at the anus, and the eyes uſually on the right ſide. The ſpecies of this ſort, enumerated by Artedi, are theſe: 1. The *pleuronectes oculis et tuberculis ſexa dextra capitis, lateribus glabris, ſpina ad anum:* this is the *plaiſe*. 2. The *pleuronectes* with the eyes on the right ſide, with rough ſcales, a ſpine at the anus, and obtuſe teeth. This is the fiſh we in England call the *dab*. 3. The *pleuronectes* with the eyes on the right ſide, altogether ſmooth. This is the *hippogloſſus* of Rondeletius; it is about a foot long. 4. The *pleuronectes* with the eyes on the right ſide, with the lateral lines rough, with obtuſe teeth, and with little ſpines at the origin of the fins. This is our *flounder*. 5. The *pleuronectes* with the eyes on the right ſide, with ſharp teeth and with the anus on the left ſide. This is the fiſh called *linguatula* at Rome, and the *pola* of Bellonius. 6. The oblong *pleuronectes* with the upper jaw longeſt, and ſcales rough on each ſide. This is the *bugloſſus* of authors, or the *ſole*. 7. The *pleuronectes* with the eyes on the right ſide, with a rough hoary body, and the lateral fins ſcarce viſible. This is brought from Amboina.

The other ſeries of the *pleuronectæ* have their eyes on the left ſide of the head, and have no ſpine, or ſcarce any at the anus. Of theſe Artedi enumerates the following ſpecies: 1. The ſmooth *pleuronectes*, with the eyes on the left ſide. This is the *rhombus non aculeatus* of Willughby, and is called the *pearl* in ſome parts of England, in Cornwall the *lugaleaf*. 2. The rough-bodied *pleuronectes*, with the eyes on the left ſide. This is our common *turbott*. 3. The left ſide-eyed *pleuronectes*, with prickly lateral lines. This is the *rhombus aculeatus* of authors. The lines on the ſide where the eyes are, are only prickly. *Artedi*, Gen. Piſc. 14.

The name is of Greek origin, and is derived from the words πλευρον, the ſide, and νηχω, a ſwimmer; and expreſſes the peculiar and diſtinctive character of theſe fiſhes; which is, that they all ſwim on one ſide, not as other fiſhes.

PLEUROPNEUMONY, a name given by medical writers to a diſeaſe approaching to, and partaking of the nature of both the pleuriſy and peripneumony.

PLEURORTHNOPŒA, a term uſed by medical writers to expreſs that kind of pleuriſy in which the patient cannot breathe, unleſs in an erect poſture.

PLICARIA, in botany, a name uſed by ſome for the club-moſs. *Dale*, Pharm. 60.

PLICATED *leaf*, among botaniſts. See LEAF.

PLINIA, in botany, the name of a genus of plants, deſcribed by Plumier and Linnæus, the characters of which are theſe: The perianthium is ſmall, plane, and conſiſts of one leaf; the flower conſiſts alſo of one petal, which is plane, and is divided into five equal parts; the ſtamina are numerous filaments, very ſlender, and of the length of the flower; the antheræ are ſmall; the germen of the piſtil is ſmall; the ſtyle is ſubulated, and of the length of the ſtamina; the ſtigma is ſimple; the fruit is a large globoſe berry, of a ſtriated or ſulcated ſurface, containing only one cell, in which is a very large, ſmooth and globoſe ſeed. *Linnæi* Gen. Pl. 239. *Plumier*, Gen. 11.

PLINTHITIS, a kind of alum found in ſome of the iſlands of the Archipelago, and called alſo *placitis*, from its uſually being found in thin cakes.

PLINTHIUM, a name given by the antients to a machine invented for the making extenſion of diſlocated or fractured limbs. Oribaſius deſcribes ſeveral kinds.

PLITE *of lawn*, in our old writers, ſeems to be an antient meaſure, as a yard or ell, at this time: 'tis mentioned in the Stat. 3 Ed. IV c. 5. *Blount.*

PLOMO, in metallurgy, a name given by the Spaniards, who have the care of the ſilver mines, to the ore of that metal when it is found adhering to the ſurface of ſtones, and incruſting their cracks and cavities in the form of ſmall and looſe grains of gunpowder. Tho' theſe grains be but few in number, and the reſt of the ſtone have no ſilver in it, yet they are always very happy in meeting with it, as it is a certain token that there is a very rich vein ſomewhere in the neighbourhood. And if in digging forwards they ſtill meet with theſe grains, or the *plomo* in greater quantity, it is a certain ſign that they are getting more and more near the good vein.

PLONKETS, in our old writers, a kind of coarſe woollen cloth. 1 Rich. III. c 8. *Blount*, *Cowel*.

PLOTTING (*Cycl.*)—PLOTTING-*table*, in ſurveying, is uſed for a plain *table*, as improved by Mr. Beighten, who has obviated a good many inconveniencies attending the uſe of the common plain *table*. See Phil. Tranſ N° 461. Sect. 1.

PLOVER, *pluvialis*, in zoology. See the article PLUVIALIS.

This bird uſually flies in exceedingly large flocks in the places they frequent; people talk of twenty or thirty thouſand being ſeen in a flock. They generally come to us in September, and leave us about the end of March. In cold weather they are found very commonly on lands lying near the ſea, in queſt of food; but in thaws and open ſeaſons, they go higher up in the country.

They love to feed in ploughed lands, but never remain long at a time on them, for they are very cleanly in their nature; and the dirt which lodges on their beaks and feet, gives them ſo much uneaſineſs, that they fly to the neareſt water to waſh themſelves. When they rooſt, they do not go to trees or hedges, but ſit ſquatting on the ground like ducks or geeſe, far from trees or hedges, when the weather is calm; but when it is ſtormy they often get under ſhelter. In wet weather they do not ſleep in the night at all, but run about picking up the worms as they crawl out of the ground: during this feeding they are continually making a ſmall cry, that ſerves to keep them together, and in the morning they take flight. If in their flight they ſpy any others on the ground, they call them up; and if they refuſe to come, the whole body deſcends to ſee what food there is in the place that detains them.

The *plover* are very eaſily taken at the time of their firſt coming over, when they have not got any other birds mixed among them; but when they afterwards pick up the teal and other ſhy birds among them, it becomes more difficult. The beſt ſeaſon for taking them is in October; eſpecially in the beginning of that month: after this they grow timorous, and are not eaſily taken again till March, which is the time of their coupling. The ſevereſt froſts are not the beſt ſeaſon for taking them in neſts, but variable weather does better. The north weſt wind is found diſadvantageous to the taking of them; and in general great regard is to be paid to the courſe of the wind in the ſetting of the nets. All ſea-fowl fly againſt the wind when the land lies that way; and the nets for the taking them are therefore to be placed in a proper direction accordingly.

PLOVER-*ſtone*, in zoology, a name uſed in ſome parts of England for the godwit, or *ægocephalus* of authors. See the article ÆGOCEPHALUS.

PLOUGH (*Cycl.*)—The advantage of digging with the ſpade, or ſuch other inſtrument, very naturally led men to the invention of the *plough*, as a greatly more expeditious way of doing the ſame thing; that is, cutting and breaking the earth into ſmall pieces; but in this the ſpade has the advantage of the common *plough*, as it goes deeper, and divides the earth more minutely; but the improvement of the common *plough* into the four coultered one, ſhews that it is eaſy to make the *plough* perform this office as much better, as it uſually does it worſe than the ſpade.

The *plough* deſcribed by Virgil had no coulter; and at this time the *ploughs* in Italy and the ſouth of France, have none; and the *ploughs* in Greece, and in the eaſtern nations in general, are of the ſame kind. Neither is it indeed poſſible to uſe a coulter in ſuch a *plough*; becauſe the ſhare does not cut the bottom of the furrow horizontally, but obliquely: in going one way it turns off the furrow to the right hand, but in coming back it turns it off to the left; therefore if it had a coulter, it muſt be on the wrong ſide every other furrow.

It is a great miſtake in thoſe who ſay that Virgil's *plough* had two earth-boards, for it had really none at all; but the ſhare itſelf always going obliquely, ſerved inſtead of an earth-board; and the two ears, which were the corners of a piece of wood lying under the ſhares, did the office of ground-wriſts. This faſhion of the *plough* continues to this day in thoſe countries; and in Languedoc this ſort of *plough* performs tolera-

bly

bly well when the ground is fine, and makes a ſhift to break up light land. This is the ſort of land that is common in the Eaſt, and the arable lands about Rome, being never ſuffered to be fallow ſo long as to come to turf: this *plough* ſucceeds very well in ſuch places, but it would be wholly impoſſible to turn up what in England we call ſtrong land, with it.

The Engliſh *ploughs* are therefore different from theſe, as the ſoil is different. Our *ploughs*, where well made, cut off the furrow at the bottom horizontally; and therefore, it being as thick on the land ſide as on the furrow ſide, the *ploughs* cannot break it off from the whole land at ſuch a thickneſs (being ſix times greater than what the eaſtern *ploughs* have to break off) and for this purpoſe it muſt have, of neceſſity, a coulter to cut it off: by this means the furrow is turned perfectly whole, and no part of the turf of it is broken; and if it lie long without new turning, the graſs from the edges will ſpread, and form a new turf on the other ſide, which was the bottom of the furrow before the turning; but is now become the ſurface of the earth, and will ſoon become greener with graſs than it was before *plughing*.

If whole, ſtrong, turfy furrows are *ploughed* croſs-ways, as is too commonly practiſed, the coulter cannot eaſily cut them; becauſe being looſe underneath, they do not make a proper reſiſtance or preſſure againſt its edge, but are apt to be drawn on heaps, and turned in all directions, but without cutting.

Some of our *ploughs* have heavy drags, with long iron tines in them; and tho' theſe broken pieces of furrows, being now looſer than before, require keener edges to cut them, theſe tines have no edges at all. Thus the clods of earth are toſſed into heaps again, and the ſurface left bare between them, and great labour and expence is uſed to very little purpoſe: all this is owing to the one coulter.

If the ſoil be ſhallow, it may be broken up with a narrow furrow, which will the ſooner be brought into tilth; but if it be a deep ſoil, the furrows muſt be proportionably enlarged, or elſe a great part of the good mould will be left unmoved, and ſo be loſt. The deeper the land is, the worſe it is broke by one coulter; that is, it is broke into larger furrows, and it requires ſuch repeated labour to conquer this, that often the beſt land will ſcarce pay the tillage.

This gives an opportunity to ſervants to cheat their maſters. They *plough* ſuch deep land with a ſmall furrow, and ſhallow, to the end that the turf and furrows may be broken the ſooner, and the ſuperficial part made fine. They pretend the *plough* will go deeper the next time; but this is never the caſe.

This ſort of land muſt not be *ploughed* the ſecond time in wet weather; for this will cauſe the weeds to multiply, and the earth will be formed into thick and heavy clods where trodden: and in dry weather, the reſiſtance of the untouched earth below, and the ſlight preſſure of the *plough* above, will always be reaſons why the *plough* will enter no deeper the ſecond time than it did the firſt.

Another way to conquer a ſtrong turf, is to plow it up firſt with a breaſt-*plough*, very thin; and when the ſward is rotten, then it is to be *ploughed* to the proper depth: but this method is liable to great objections; it is very troubleſome and expenſive, and if the turf be pared off in the winter, or early in ſpring, it is a chance but the rains come on, and ſet it to growing faſter than before: if, on the other hand, it be pared later in the year, tho' the turf be thoroughly killed by the ſucceeding dry weather, yet the time is loſt, and the farmer loſes the ſowing ſeaſon for wheat, which is the proper corn for ſuch ſtrong land.

The four-coultered *plough* is the proper inſtrument for the farmer to have recourſe to on this and many other the like occaſions. This is an improvement on the common *plough*, that makes it cut the pieces of earth into four; that is, it thus divides the earth four times as ſmall as the common *plough*.

The common two-wheeled *plough* has of late years become univerſally uſed in many counties, and is found greatly preferable to the *ploughs* they uſed before; there is an objection to it, indeed, in regard to ſome ſtiff and miry lands, in which the wheels become clogged up, and cannot turn. This, however, is eaſily remedied by twiſting thumb ropes of ſtraw about the iron circle and ſpokes of the wheels; theſe ſpreading as they turn, and as the circle twiſt bears upon the ground, throw off the dirt, and never clog. The two principal parts of this *plough* are the head and the tail: the *plough*-head contains the two wheels and their axis, or ſpindle, paſſing through a box, and turning round both in it and in the wheels. There are fixed perpendicularly in this box, two crow-ſtaves, as they are called, which are flat and narrow boards, each having on it two rows of holes, whereby to raiſe or ſink the beam of the *plough*, by pinning up or down the pillow, to increaſe or diminiſh the depth of the furrow. Behind are a pair of gallows, through which the crow-ſtaves paſs at the top by mortaiſes, into which they are pinned; and to theſe are faſtened what are called the wilds, which are rings and crooks of iron, by which the whole *plough* is drawn in the working. From the box to the center of the beam there is carried an iron-chain, conſiſting of four, five, or more long links, and called the tow-chain: this faſtens the *plough*-tail to the *plough*-head. It is fixed to an iron collar, faſtened in the beam at one end, and at the other paſſes through a hole in the middle of the box, and is pinned in with a wooden pin.

From the ſame iron-collar to which the tow-chain is fixed, there is alſo another chain faſtened, called the bridle-chain: this runs above the beam, as the tow-chain does below it, and is compoſed of ſmaller and more numerous links. At the upper end, as the tow-chain enters the box of the *plough*, this bridle-chain is fixed to the top of what is called the ſtake of the *plough*: this is a perpendicular ſtick, carried up parallel with the left crow-ſtaff, and pretty near it, and faſtened to it by a wyth or rope, or by the end of the bridle-chain itſelf, when that is long enough. This ſtake is alſo faſtened in its lower part, under the gallows, to the ſame crow-ſtaff, by another wyth or piece of rope.

Theſe are the parts of which the head-part of the *plough* is compoſed. The *plough*-tail conſiſts of the beam carried from the head to the very extremity, and ſerving as the ſupport and baſe of all the reſt. A little below the collar to which the tow-chain and bridle-chain are faſtened, this beam is pierced with a large hole, which lets through the coulter: this is a long and narrow piece, terminating in an edge, and reaching juſt to the ſhare; and it is fixed immoveably in its place by means of a wedge which is driven into the hole of the beam with it: the office of this coulter is to cut the earth as it is thrown up by the ſhare. Behind theſe, the ſame beam is pierced with two more holes, one very near its end: theſe give paſſage to two oblong pieces, called the fore-ſheat and hinder-ſheat, by which the *plough*-ſhare is ſupported in its place. To the top of the hinder-ſheat there is faſtened a ſhort handle by a wooden pin. Parallel to the hinder-ſheat there runs up a piece of wood of much the ſame form, called the drock; and to this is faſtened another horizontal piece, called the ground-wriſt: theſe are all on the right hand ſide of the *plough*, and parallel with the fore-ſheat. There runs another piece of much the ſame form with it, on the right hand; and the bottom of this is the earth-board. The long handle of this, which reaches as far that of the ſheat, is faſtened to the drock by a pin, the other end of which goes into the beam Near the lower end of the fore-ſheat, there are two flat pieces of iron, which paſs from the two ſides of it up to the beam; and being let through it, are faſtened to the upper part by ſcrews and pins. Theſe keep the ſheat in its place.

The ſtructure of the four-coultered *plough* is different, in ſome reſpects from this, tho' in general founded on it Its beam is ten foot long, whereas that of the common *plough* is but eight. The beam is ſtrait in the common *plough*, but in this it is arched in one fourth part of its length, near the *plough*-head. At the diſtance of three feet two inches from the end of the beam at the *plough*-tail, the firſt coulter, or that next the ſhare, is let through; and at thirteen inches from this, a ſecond coulter is let through: a third at the ſame diſtance from that; and, finally, the fourth at the ſame diſtance from the third, that is thirteen inches.

The crookedneſs of the upper part of the beam in this *plough* is contrived to avoid the too great length of the three foremoſt coulters, which would be too much, if the beam was ſtrait all the way; and they would be apt to bend and be diſplaced, unleſs they were vaſtly heavy and clumſy. Aſh is the beſt wood to make the beam of, it being ſufficiently ſtrong, and yet light.

The ſheat in this *plough* is to be ſeven inches broad. The fixing of the ſhare in this, as well as in the common *plough*, is the niceſt part, and requires the utmoſt art of the maker; for the well going of the *plough* wholly depends upon the placing of this. Suppoſing the axis of the beam, and the left ſide of the ſhare, to be both horizontal, they muſt never be ſet parallel to each other; for if they are, the tail of the ſhare bearing againſt the trench as much as the point, would cauſe the point to incline to the right hand, and it would be carried out of the ground into the furrow. If the point of the ſhare ſhould be ſet ſo, that its ſide ſhould make an angle on the right ſide of the axis of the beam, this inconvenience would be much greater; and if its point ſhould incline much to the left, and make too large an angle on that ſide with the axis of the beam, the *plough* would run quite to the left hand; and if the holder, to prevent its running quite out of the ground, turns the upper part of his *plough* toward the left hand, the pin of the ſhare will riſe up, and cut the furrow diagonally, leaving it half *unploughed*. To avoid this and ſeveral other inconveniences, the ſtrait ſide of the ſhare muſt make an angle upon the left ſide of the beam; but that muſt be ſo very acute a one, that the tail of the ſhare may only preſs leſs againſt the ſide of the trench than the point does.

The great thing to be taken care of, is the placing the four coulters; for on this the ſucceſs of the whole depends. Theſe muſt be ſo ſet, that the four imaginary planes deſcribed by their four edges, as the *plough* moves forward, may be all parallel to each other, or very nearly ſo; for if any one of them ſhould be very much inclined to, or ſhould recede much from either of the other, then they would not enter the ground together. In order to the placing them thus, the beam muſt be carefully pierced in a proper manner. The ſecond coulter-hole muſt be two inches and an half more on the right hand than the firſt; the third muſt be as much more to the right of the

ſecond,

ſecond, and the fourth the ſame meaſure to the right hand of the third: and this two inches and an half muſt be carefully meaſured from the center of one hole to the center of the other. Each of theſe holes is a mortaiſe of an inch and quarter wide, and is three inches and an half long at the top, and three inches at the bottom. The two oppoſite ſides of this hole are parallel to the top and bottom, but the back is oblique, and determines the obliquity of the ſtanding of the coulter, which is wedged tight up to the poll.

The coulter is two foot eight inches long, before it is worn; the handle takes up ſixteen inches of this length, and is allowed thus long, that the coulter may be driven down as the point wears away. *Tull*'s Horſe-hoeing Huſbandry, p. 132, ſeq. See COULTER.

Trenching-PLOUGH. See the article TRENCHING.

PLOUGH-*bote*, in our old writers, a right of tenants to take wood to repair *ploughs*, carts, and harrows, and for making rakes, forks, *&c.*

PLOUGH-*head*, a name given by the farmers to the foremoſt half of the *plough*, or that part containing the two wheels and their ſpindle, the box, the crow-ſtaves, the pillow, the wilds, the tow-chain and bridle chain, and the ſtake: all which, ſee under their ſeveral heads, and under the article PLOUGH. *Tull*'s Huſbandry.

PLOUGH-*tail* a name given by the farmers to that part of a *plough* which contains the beam, the coulter, or coulters, the ſhare, the ſheat and under-ſheet, the earth-board and handles, as alſo the drock, the ground-wriſts, and the retches: all which ſee under their ſeveral heads, and under the article PLOUGH. *Tull*'s Huſbandry.

PLUKNETIA, in botany, the name of a genus of plants deſcribed by Plumier, and called by this name in honour of Pluknet, the great Engliſh botaniſt.

The characters are theſe: It produces male and female flowers on the ſame plants. The male flowers have no cup, but are compoſed of four expanded petals of an oval figure, and in the place of ſtamina, there is placed in the center of the flower a ſhort pyramidal hairy body. The female flowers have no cup, and the petals in theſe are diſpoſed as in the male. The germen of the piſtillum is ſquare. The ſtyle is ſlender, very long, and crooked. The ſtigma is peltated and divided into four parts. The ſegments are obtuſe and flat, and each has a remarkable ſpot in the center. The fruit is a depreſſed ſquare capſule, hollowed at all the angles: it contains four bivalve cells: the ſeeds are ſingle, roundiſh, and compreſſed, and bluntly pointed at one end.

Linnæus obſerves, that this fructification is very ſingular, and is very deſirous that ſome perſon ſhould examine carefully the growing plant, ſince Plumier, who was not over curious about the nicer parts of the fructification of plants, may have in ſome ſort miſrepreſented this. *Plumier* 13. *Linnæi* Gen. Pl. p. 517.

PLUM-*tree*, *prunus*, in botany. See PRUNUS.

All the ſpecies of *plums* have within their fruit a hard ſtone, within which there is contained a ſoft and tender kernel: this kernel contains the ſeminal plant, from which would be produced another tree of the ſame kind, if it were ſet in the ground; and it is very natural to ſuppoſe, that the only uſe of the thick ſtone or huſk of this, was only to preſerve its tender ſubſtance from rotting too ſoon in the earth, and to give it a proper time for developing its parts, to preſerve its natural oilyneſs during that time, and to furniſh from its own ſubſtance a proper nouriſhment to the growing plant; for obſervation ſhews, that it finally breaks into a very fine powder.

There has not been found any ſpecies of *plum* which had not its kernel contained in a ſtony coat of this kind, from whatever grafts they have been propagated; nor is there any art known by which the kernel of this ſort of fruit can, while growing, be deprived of its coat.

Mr. Marchand, however, in the year 1735, ſhewed before the academy of ſciences at Paris, certain *plums*, whoſe kernels had no ſtone or ſhell round them; and found that they grew upon a tree which never had produced any others, and which had been known to produce ſuch for twenty years. The kernel in theſe was covered with a reddiſh ſkin, which was rough to the touch; and within that, with another which was thinner and white. The kernel had nothing particular in it, except that it carried on one ſide of its outer ſurface, and that always in the ſame place, a little ſtony prominence, more or leſs dented on its convex part: this is uſually a twelfth of an inch broad, and two thirds of an inch long, and has no other appearance but that of a diſtempered part of the kernel, only that all the kernels have it.

The thick wrinkled ſkin which ſurrounds the kernel, ſeems in this caſe to ſupply the place of the ſtone or hard ſhell; and in this alſo it reſembles it, that the pulp of the fruit parts eaſily and readily from it; and the hard oblong body, which is placed on one ſide of the kernel, is by no means proper for this purpoſe. Mem. Acad. Scienc. Par. 1735.

All the ſorts of *plums* are propagated by budding, or grafting them upon ſtocks of the muſcle-*plum*, the white pear-*plum*, the St. Julian, or the bonum magnum. See the article INOCULATING.

Budding is much properer than grafting for theſe trees, as they are apt to throw out a great deal of gum from the wound: and the trees ſhould be no more than one year's growth from the bud, when they are tranſplanted; for if they are more they ſeldom ſucceed well, being very ſubject to canker; and if they eſcape that, they uſually produce only two or three luxuriant branches. The whole management of planting and pruning them is the ſame with that of peaches. See the article PEACH.

If the walls againſt which they are planted are low, they ſhould be ſet eighteen feet aſunder; if they are higher, then fourteen or ſixteen.

Plums ſhould have a middling ſoil, for they ſeldom ſucceed well either in too moiſt or two dry a one; and when planted againſt walls, ſhould have an eaſt or a ſouth-eaſt proſpect. If they have one at full ſouth, they are apt to ſhrivel up, and mealy.

Plums in general ſucceed very well with proper care on eſpaliers; they will alſo bear very well as ſtandards, but the fruit will not be ſo well taſted. *Plums* do not only produce their fruit on the laſt year's wood, but alſo on ſpurs that come out of the wood of two or three years old. It is a common error to be too free with the knife in the winter-pruning, cutting off the extremities of all the branches; the conſequence of which is, that there are an over quantity of young ſhoots produced, and the fruit is ſmall and poor. *Miller*'s Gard. Dict.

PLUMBAGO, *leadwort*, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts of one leaf, and is of a funnel-ſhape, and divided into ſegments at the edge. The cup is tubular, and from it ariſes a piſtil, which is fixed like a nail to the lower part of the flower, and afterwards ripens into an oblong pointed ſeed, which remains in the cup to ripen.

The ſpecies of *plumbago*, enumerated by Mr. Tournefort, are theſe: 1. The ordinary *plumbago*, called by ſome *lepidium* and *dentillaria*. 2. The white flowered *plumbago*. 3. The American *plumbago*, with a large beet-like leaf. 4. The prickly climbing American *plumbago*, with a ſmaller beet-like leaf. *Tourn.* Inſt. p. 140.

PLUMBAGO, in the hiſtory of the gems, a word uſed by the Roman authors to expreſs a blemiſh common to their worſe kinds, and greatly debaſing their value. It was a ſort of bluiſh or blackiſh deadneſs in the ſtone, which mixed itſelf with the other colour, be that what it would, and rendered it dull and dead. The emerald was of all the other gems the moſt ſubject to this fault; and in this caſe, its fine green colour was always rendered cloudy and bluiſh; and in ſome lights the ſtone appeared of a duſky greyiſh blue, with no green at all in it. The Bactrian emeralds, which were in great eſteem with the antients, were often ſubject to this imperfection; and thoſe of Cyprus, taken out of the coppermines, tho' ſubject to many other imperfections, were uſually quite free from this.

PLUMBAGO, in mineralogy, a name given by many authors to a ſort of foſſil, having very much the appearance of a lead-ore, but not ſuch in reality.

It is called alſo *galena*, *blende*, and *mock-lead*. It is uſually of a plated texture, and dark blackiſh blue colour, like the lead-ores; but on trial yields no metal. See BLACK-*lead*.

PLUMBATA, among the antients, a kind of ſcourge, the thongs of which were armed with leads. *Pitiſc.* in voc.

PLUMBATÆ likewiſe ſignified leaden balls, uſed by ſoldiers to annoy the enemy with; whence the ſoldiers were called *martiobarbuli*. *Pitiſc.* in voc.

PLUMBUM *(Cycl.)*—PLUMBUM *nativum*, *native lead*. It is pretended by ſome, that the famous *lead*-mineral, found near Freyung, in the Upper Palatinate, is *native lead*: but this is an error; we have an account of it in the philoſophical tranſactions, which does not give any ground for this thought. All that is there ſaid of it is, that it was at that time much eſteemed among the aſſayers of metals, as containing no mixture of any other metal with the *lead*: this might well recommend it to them, as ſaving much confuſion, or much trouble in ſeparating its heterogene contents; but it is ſaid expreſly there, that it is an ore, not a *native* metal: there being two kinds of it, one a chryſtalline ſtone, almoſt all pure *lead*; the other not ſo rich, but of a more rough and coarſe texture. Neither of theſe could be *native lead*; and it is remarkable, that they had leſs appearance of being ſo than many of our common ores. Phil. Tranſ. N°. 3. See the article LEAD.

PLUMBUM *uſtum*. See LEAD, *Cycl.* and *Suppl.*

PLUMERIA, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts of one leaf, and is of the funnel-ſhaped kind, and divided into ſeveral ſegments at the edges. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower. This finally becomes a podded fruit, uſually double; and when ripe, opening in the middle, and diſcharging a number of oblong foliated ſeeds, which were placed like ſcales over one another in the ſeed-veſſel, and affixed to a placenta.

The ſpecies of *plumeria*, enumerated by Mr. Tournefort, are theſe: 1. The *plumeria* with a roſe-coloured and very ſweet flower. 2. The ſnow-white-flowered *plumeria*, with long, narrow, and pointed leaves. 3. The *plumeria* with ſnow-white flowers, and ſhort obtuſe leaves. *Tourn.* Inſt. p. 659.

PLUMMER's *Æthiops*. This medicine is compoſed of the ſulphur auratum antimonii and calomel, commonly in equal parts; but this may be varied occaſionally, according to the phyſician's diſcretion. Theſe two powders muſt be well levigated together, by which the bright red colour of the ſulphur is changed into a duſky brown. We refer to the Medical Eſſays of Edinburgh, for the doſe, regimen to be obſerved, and effects of this medicine; as alſo for the manner of preparing the ſulphur of antimony according to Angelus Sala, which is ſaid to be preferable to the common method. See Med. Eſſ. Edinb. abridg. Vol. I. p. 205. and ſeq.

This medicine has been found greatly beneficial in cutaneous eruptions, in venereal infections, and in gleets remaining after the cure of a gonorrhœa. It operates by carrying off the excrements of diſtempers by inſenſible perſpiration or ſweat. It has alſo been found ſucceſsful in obſtinate glandular ſwellings. See Med. Eſſ. abrid. ibid. and alſo Vol. II. p. 433.

PLUMMING, among miners, a term uſed to expreſs the uſing a mine dial, in order to know the exact place of the work where to ſink down an air ſhaft, or to bring an adit to the work, or to know which way the load inclines when any flexure happens in it.

It is performed in this manner: A ſkilful perſon with an aſſiſtant, and with pen, ink, and paper, and a long line and a ſun dial, after his gueſs of the place above ground deſcends into the adit or work, and there faſtens one end of the line to ſome fixed thing in it, then the incited needle is let to reſt, and the exact point where it reſts is marked with a pen: he then goes on farther in the line ſtill faſtened, and at the next flexure of the adit he makes a mark on the line by a knot or otherwiſe; and then letting down the dial again, he there likewiſe notes down that point at which the needle ſtands in this ſecond poſition. In this manner he proceeds from turning to turning, marking down the points, and marking the line till he comes to the intended place; this done, he aſcends and begins to work on the ſurface of the earth, what he did in the adit, bringing the firſt knot in the line to ſuch a place where the mark of the place of the needle will again anſwer its pointing, and continues this till he comes to the deſired place above ground, which is certain to be perpendicularly over the part of the mine into which the air ſhaft is to be ſunk.

PLUMOSE *antennæ*, in natural hiſtory, a term uſed to expreſs the *antennæ*, or horns of certain moths and butterflies, which are formed in the manner of feathers, being compoſed of a ſtem and fibres, iſſuing on each ſide from it: theſe are jointed and moveable any way, and even the ſmall fibres, at their ſides, are jointed at their bottom, and are moveable, but they move all together. *Reaumur*'s Hiſt. of Inſects. See the article FEELERS.

PLUNGE, in the manege. See the article ESTRAPADE.

PLURIES, a writ that iſſues in the third place after two former writs have been diſobeyed; for firſt goes out the original writ or *capias*, which if it has not effect, then iſſues the *alias*; and if that alſo fails, then the *pluries*. Old Nat. Br. 33.

It is uſed in proceedings to outlawry, and in great diverſity of caſes. *Tabl. Reg. Writs. Blount, Cowel.*

PLUVIALIS, in zoology, the name by which Latin authors call the *plover*, a bird of which there are two kinds, the green and the grey.

The *green plover* is ſomewhat larger than the lapwing, and is all over, on the upper parts, of a blackiſh colour, variegated with very numerous ſpots of a yellowiſh green; its breaſt is of a mixed browniſh and yellowiſh green, and its belly is white: this is very much eſteemed at table.

The *grey plover* is of the ſame ſize with the green, and is, on the upper parts, of a black colour, variegated with a pale greyiſh green; and its breaſt, belly, and thighs, are white. This is very common in Italy, as well as in England, and is eſteemed nearly equal to the green at table. *Ray*'s Ornithology, p. 229.

PLUVIALIS *major*, in zoology, a name given by ſome authors to the *limoſa*, a bird in ſome reſpects reſembling our redſhank, but larger and longer legg'd. *Aldrovand.* l. 20. c. 66. See the article LIMOSA.

This bird is alſo called the *glottis* and *totanas*.

PLUVIALIS *levis*, in zoology, a name given by many to the common green *wood-pecker*, the *picus viridis* of authors, called alſo in Engliſh the *rain-fowl*, from an obſervation of its always being moſt clamorous when rain is coming on. *Ray*'s Ornithology, p. 93.

PLYMOUTH *marble*, among our artificers, a term uſed for a ſort of *marble* dug in great plenty about Plymouth, and in ſome other parts of Devonſhire, where it lies in very thick ſtrata, and whence it is brought in large quantities to us; and when wrought looks little leſs beautiful than ſome of the Italian *marbles*.

It is very hard and firm, and of a beautiful texture; its ground is a bluiſh white, and its variegations are principally a pale red, and in ſmaller quantities brown and yellow: theſe lie in very orderly beds, and often there is a very agreeable glow of a faint red diffuſed thro' the whole ſubſtance. It is remarkably even in its whole ſtructure, and is therefore capable of a more than ordinarily elegant poliſh.

PLYNTERIA, πλυντηρια, in antiquity, a feſtival in honour of Aglaurus, the daughter of king Cecrops, or rather of Minerva, who had from that lady the name of Aglaurus. For the ceremonies obſerved at this ſolemnity, ſee *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 425.

PNEUMATODES, a word uſed by Hippocrates to expreſs a perſon who fetches his breath ſhort and quick; and ſometimes for one who has his belly or ilia much diſtended by flatulencies. *Pneumatias* is alſo uſed in the ſame double ſenſe.

PNEUMATOMPHALOS, a word uſed by Hippocrates to expreſs a perſon who has a windy or flatulent rupture of the navel.

PNEUMONANTHE, in botany, a name given by many botanical writers to a ſpecies of *gentiana*, called alſo by ſome the *calathian* violet. See the article GENTIANA.

PNEUMONICS, in medicine, a term uſed for ſuch things as are good for the lungs.

PNIGITIS *terra*, in the materia medica of the antients, a name given at different periods of time, to two different ſpecies of earth; the *terra pnigitis* of Dioſcorides and Pliny, being a grey marle, and the *pnigitis* of Galen a black clay.

The laſt of theſe is a very valuable aſtringent, and is found in many parts of this kingdom, particularly in the neighbourhood of London, and well deſerves to be introduced into the practice of phyſic. *Hill*'s Hiſt. of Foſſ. p. 35.

PNIGMOS, in medicine, any kind of ſuffocation, from whatever cauſe; it is very often uſed to expreſs that of hyſteric fits in women.

PNIX, a word uſed by phyſicians to expreſs the ſuffocation from hyſteric fits, or any other cauſe.

POA, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants of the graſs kind, the characters of which are, That the calyx is a glume compoſed of two valves, containing ſeveral flowers diſpoſed in a two-rowed oval, or oblong ſpike; the valves oval and pointed, but without awns. The flower is compoſed of two oval and pointed valves; theſe are hollowed, compreſſed, a little longer than the valves of the cup, and without beards or awns; the ſtamina are three capillary filaments; the antheræ are ſplit at their ends; the germen of the piſtillum is roundiſh; the ſtyles are two, reflex and hairy; the ſtigmata are hairy alſo; the flower adheres cloſely to the ſeed, and does not open to let it out; the ſeed is ſingle, oblong, and pointed at both ends, and ſomewhat flatted. *Linnæi* Genera Plant. p. 20.

POAKE-*root*, in Virginia, is uſed to denote the ſolanum baciferum. The Indians uſe it for a purge, tho' commonly deemed a poiſon. Phil. Tranſ. N° 454. Sect. 1.

POCHARD, in zoology, the name of a ſpecies of wild duck, called by ſome the *penelops* and *rothals*, and by many in Engliſh the red-headed *widgeon*.

It is larger than the common *widgeon*, and is ſhorter and thicker bodied. The back and wings are grey, and beautifully variegated with grey and black ſtreaks. The lower part of the neck, as alſo the rump, are black, but the whole head, and a great part of the neck, are reddiſh; the throat is white, variegated with yellow; and the breaſt and belly ſomewhat brown: but the great diſtinction of this bird from all the other ducks is, that the wings are all of the ſame colour without variegation. *Ray*'s Ornithol. p. 288.

POCKET *(Cycl.)*—POCKET, in the wool trade, a word uſed to expreſs a large ſort of bag, in which wool is packed up to be ſent from one part of the kingdom to another.

The *pocket* contains uſually twenty-five hundred weight of wool.

POCKET *inſtruments*, in ſurgery, are ſuch as a ſurgeon ought always to have in readineſs, and may conveniently carry about him in a proper caſe: theſe are two lancets of different ſizes; the one proper to open abſceſſes, the other ſmaller, for bleeding; a pair of ſtrait ſciſſars, uſeful on many occaſions; a pair of crooked ſciſſars, proper to be uſed in dividing fiſtulæ, and in ſeveral other caſes; a pair of forceps with teeth at one end, to remove dreſſings, and upon occaſion to extract ſplinters or thorns; theſe are alſo ſerviceable to the ſurgeon in his anatomical exerciſes; they are commonly made of ſteel, but thoſe of ſilver are much neater; a razor; a ſtrait inciſion knife; a crooked inciſion knife; a ſtrait double-edged inciſion knife; a probe with one end broad and thin, proper for diſcovering a fiſſure in the cranium, and of many other uſes; and the other end rounded, to examine the depth and ſituation of wounds and ulcers. The neateſt probes are made of ſilver, tho' they are frequently made alſo of ſteel, ivory, or whalebone; a grooved probe or director, to direct the edge of the knife or ſciſſars in opening ſinuſes or fiſtulæ; that by this means the ſubjacent veſſels, nerves, and tendons, may remain unhurt. The upper end of this inſtrument, ſometimes, is ornamented, and ſerves only for a handle; ſometimes it is made in form of a ſpoon, to contain powder to ſprinkle upon wounds or ulcers; ſometimes alſo this is made forked at the end, to divide the frænum of the tongue; a ſpatula to depreſs the tongue, in order to examine the ſtate of the tonſils, uvula, and fauces, when they are affected with any diſorders; it is alſo uſed to ſuſpend the tongue when the frænum is to be divided; for which purpoſe it is to be made

with a fiſſure at its extremity, and ſhould therefore rather be made of ſilver than of any other metal. Beſide theſe, there ſhould be an ordinary ſpatula for ſpreading plaiſters, ointments, and cataplaſms; and ſometimes by means of their ſulcated extremity they are of ſervice in raiſing up fractured bones of the cranium; ſeveral needles muſt alſo be kept here, ſome ſtrait and others crooked, for the ſtitching up of wounds, taking up of arteries, and many other uſes. *Heiſter*'s Surg. p. 12.

POCKET *medicines*. See the article MEDICINE.

POCO *allegro*, in the Italian muſic, is not ſo faſt as *allegro*.

Poco *largo*, intimates to play or ſing a little ſlow. See LARGO.

POCO-*meno allegro*, is uſed to ſignify that the part it is joined to ſhould be placed or ſung in a little leſs gay manner than *allegro* requires.

Poco *preſto*, ſerves to let us know that we ought to ſing or play the part to which it is annexed, not quite ſo quick as *preſto* requires it ſhould.

POCUMMA, in botany, a name given by the people of Guinea, to a ſpecies of plant which they uſe as an aſtringent. Their manner of taking it is very ſingular; for they put the leaves among their dough, and bake them into a maſs with the bread, and then eat the whole together in their food. Phil. Tranſ. N° 232.

POD, among botaniſts, a ſpecies of *pericarpium*, conſiſting of two valves which open from the baſe to the point, and are ſeparated by a membranaceous partition, from which the ſeeds hang by a kind of funiculus umbilicalis. See PERICARPIUM.

PODAGRA, a ſpecies of the gout. See the article GOUT.

PODAGRA *lini*, in botany, a name given by ſome of the later Greek writers to *cuſcuta*, or *dodder*, when found growing on the linum or flax. The Latins have called this *epilinum*, as they do the dodder growing on thyme *epithymum*; the earlier Greeks called this *linozoſtes*. Where this dodder takes root in a field of flax, it generally occupies many plants; and where it twines round them it cauſes protuberances and ſwellings, and has therefore been reſembled to the gout on that plant.

PODAGRARIA, in botany, a name given by many authors to the leſſer wild *angelica*, called alſo *herba Gerardis*. *Parkin.* Theat. p. 943.

PODERIS, in antiquity, a robe hanging down to the feet; but it is chiefly uſed to expreſs a linnen garment, a ſurplice, a ſhirt. The Jewiſh prieſts were covered with this kind of long ſurplices, during the time of their attendance in the temple; and this was the proper habit of their order. *Calmet*, Dict. Bibl.

The word is Greek ποδηρης, from πους, pes, and αἰρω, apto. Vid. *Hederic.* Lex. man. Græc. in voc.

PODICEPS, in zoology, a name given by many to the ſeveral kinds of *colymbi*, or *divers*, as they are alſo called in Engliſh *arſe foots*; from their legs being placed very backward on their bodies, by which means they have great advantages in ſwimming and diving. *Ray*'s Ornithol. p. 256. See the article COLYMBUS.

PODISMUS, ποδισμος, among the Greeks, a certain ſpace, or number of feet laid out by ſurveyors; it was the ſame with what the Romans called *pedatura*. *Pitiſc.* in voc. See the article PEDATURA.

PODIUM, in the theatre of the antients, the wall that ſeparated the orcheſtra from the ſcene. Mem. de l'Acad. Vol. I. p. 190. See ORCHESTRA and SCENE, *Cycl.*

POEANOPSIA, ποιανοψια, in antiquity, a name ſometimes given to the feſtival Pyanepſia. See PYANEPSIA, *Cycl.*

POENITENTES, in the church of Rome, a deſignation given to heretics, who being admoniſhed by the eccleſiaſtical judge, have abjured their errors, and given ſufficient ſatisfaction to the biſhop or inquiſition. Confiſcation of goods is a puniſhment common to all heretics; but if they confeſs and abjure of their own accord, without being formally proſecuted, this part of their puniſhment is uſually remitted. *Hofm.* Lex. Univ. in voc. See INQUISITION, *Cycl.*

POGGE, or CATAPHRACTUS, in zoology, the name of a ſmall ſea-fiſh, caught in the Engliſh and ſome other ſeas.

It ſeldom grows to more than five inches in length; its head is of a triangular figure, and flatted, and is very broad, and is ſurrounded at the ſides with a number of tubercles; the forepart toward the mouth has a number of extremely fine hairs, and the hinder part armed with a number of prickles; the points of which are directed backwards. Its ſnout is ſhort, and armed with four points; the two anterior ones reſembling a horned moon, and the others being prickles with their points turned backwards. The mouth is in the lower part of the head, and is of a ſemi-circular form, and has two beards at its angles, and a number of hairs under its chin.

The body of this fiſh, near its head, is flatted and of an octangular form; near the tail it is hexangular, and is of a browniſh colour variegated with black ſpots. It is covered all over with bony ſcales, in the middle of which there riſes a crooked tumor; which being continued thro' the whole number, makes the body of an angular form: toward the tail it grows very ſlender. It has two fins at the gills, two more on the belly, and two on the back, all ſpotted with black ſpots; and its tail ends in a ſmall rounded fin. It has no teeth, but very rough and rigid lips, and lives on ſhrimps and other ſuch food. It is a very well taſted fiſh.

It is caught not unfrequently on the coaſts of Yorkſhire, and in great plenty in the mouth of the Elbe. *Willughby*'s Hiſt. Piſc. p. 212. See Tab. of Fiſh. N°. 30.

There is an American *cataphractus*, much reſembling this, but having three angles on the hinder part of its head, one on each ſide, and the third in the middle; and its upper chap elliptic, and its mouth a little prominent. Its head is covered with a brown and bony helmet; and its back, ſides, and tail, with ſcales of the ſame colour, engraven with ſmall parallel lines, and of a rhomboidal figure. Its belly is covered with a thin limber ſkin. *Grew*'s Muſeum, Soc. Reg. p. 117.

POGO, a name by which the inhabitants of the Philippine iſlands call their *quail*: it is very like our common quail, but ſmaller.

POINCIANA, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the roſaceous kind, and is uſually compoſed of five petals arranged in a circular form, and filled up in the middle with a larger number of crooked ſtamina. The cup is divided into five leaves, the lower of which is crooked and imbricated: from this ariſes the piſtil, which finally becomes a hard pod of a flatted ſhape, which when ripe opens into two parts, and contains a number of roundiſh ſeeds divided from one another by a ſort of membranaceous partitions.

There is only one known ſpecies of the *poinciana*, which is the plant called by many *criſta pavonis*, and purple-flowered *acacia*. *Tourn.* Inſt. p. 619.

POINSON, in the manege, is a little point or piece of ſharp-pointed iron, fixed in a wooden handle, which the cavalier holds in his right hand when he means to prick a leaping horſe in the croupe, or beyond the end of the ſaddle, in order to make him yerk out behind.

POINT, (*Cycl.*) in geometry, is the termination of a line, and cannot be conceived to have parts. See SURFACE.

Hobbes defines a *point* to be a body whoſe magnitude is not conſidered. But his falſe notions of a *point*, line, and ſurface, have led him into many errors. Monſieur de Crouzas alſo has ſuppoſed a line to be compoſed of *points*, in his geometry and comment on the analyſe des infiniment petits. This ſuppoſition only tends to confound learners. See *Jo. Bernoulli* Oper. Vol. IV. p. 161, ſeq.

Conjugate POINT, in geometry, is uſed for that *point* into which the *conjugate* oval, belonging to ſome kinds of curves, vaniſhes. *Mac Laur.* Algebr. p. 308.

POINT *of contrary flexure*. The *points of contrary flexure* and reflexion of curves, are uſually determined by ſuppoſing the ſecond fluxion of the ordinate to be nothing or infinite, that is, $\dot{y}=0$, or ∞, or *ddy*$=0$, or ∞. See *L'Hopital* Analyſe des Inf. petits.

But this rule is liable to ſeveral exceptions, as is ſhewn very fully and clearly by Mr. Mac Laurin in his Treatiſe of Fluxions, B. i. ch. 9. and B. ii. ch. 5. art. 866.

The ordinate *y* paſſes thro' a point of contrary flexure, when, the curve being continued on both ſides of the ordinate, $\dot{y}$ is a maximum, or minimum. But this does not always happen when $\dot{y}=0$, or ∞. Mr. Mac Laurin obſerves, in general, that if $\ddot{y}$, $\dddot{y}$, $\ddddot{y}$, &c. vaniſh, the number of theſe fluxions being odd, and the fluxion of the next order to them having a real and finite value; then *y* paſſes thro' a *point* of contrary flexure; but if the number of theſe fluxions that vaniſh be even, it cannot be ſaid to paſs thro' ſuch a *point*; unleſs it ſhould be allowed that a double infinitely ſmall flexure can be formed at one *point*. Lib. cit. art. 866.

The curve being ſuppoſed to be continued from the ordinate *y*, on both ſides, if $\dot{y}$ be infinite, the extremity of the ordinate is not therefore always a *point* of contrary flexure, as $\dot{y}$ is not always, in this caſe, a maximum, or minimum; and the curve may have its concavity turned the ſame way on both ſides of the ordinate. But theſe caſes may be diſtinguiſhed by comparing the ſigns of $\dot{y}$ on the different ſides of the ordinate; for when theſe ſigns are different, the extremity of *y* meeting the curve is a *point* of contrary flexure.

The ſuppoſitions $\dot{y}=0$, or ∞, and of $\ddot{y}=0$, or ∞, ſerve to direct us where we are to ſearch for the maxima and minima, and for *points* of contrary flexure; but we are not always ſure of finding them. For tho' an ordinate or fluxion that is poſitive, never becomes negative at once, but by increaſing or decreaſing gradually, yet after it has decreaſed till it vaniſh, it may thereafter increaſe, continuing ſtill poſitive; or after increaſing till it becomes infinite, it may thereafter decreaſe without changing its ſign. See *Mac Laurin*, art. 262, 867.

POINT *of reflexion*, in geometry, is commonly uſed inſtead of *point* of retrogradation, or retrogreſſion. See the article RETROGRADATION, *Cycl.*

The general rule given by the Marquis de L'Hopital, for finding the *point of reflexion* in curves whoſe ordinates are parallel, is the ſame as that for finding the *point* of contrary flexure, and conſiſts in taking the ſecond fluxion of the ordinate of the curve, and ſuppoſing it nothing or infinite: but this rule admits of many exceptions. See *Mac Laurin*'s Fluxions, B. i. ch. 9. and B. ii. ch. 5.

POINT, in the manege. A horſe is ſaid to make a *point*, when in working upon volts, he does not obſerve the round regularly; but pulling a little out of his ordinary ground, makes a ſort of angle or *point* by his circular tread This fault is prevented by haſtening the hand. See HASTEN.

POINT is alſo uſed to denote the toes of a bow of aſaddle. See the article BOW.

POISON *(Cycl.)*—We are apt to extend the ſignification of this word very far, our common acceptation of it taking in every thing which, taken into the body, is capable of deſtroying or highly injuring it. Hence the number of *poiſons* is greatly increaſed upon the world, and the abuſe of many things, naturally wholeſome or uſeful in food or phyſic, brings them into the claſs of hurtful things. This, however, brings great confuſion into the writings or diſcourſe of ſuch who uſe it; and the ſenſe of the word *poiſon* becomes very vague and uncertain from it. A draught of cold water drank by a perſon while very hot, has been known to cauſe inſtant death; and according to this rule, cold water ſhould therefore be a *poiſon*.

Poiſons are diſtinguiſhed by ſome authors by ſeveral names, according to the different time and manner of their taking effect.

Some are called *venena terminata*. Theſe are ſuch *poiſons* as perform their fatal office, according to the opinion of the world, at certain ſtated or determinate periods of time: thus, according to the quantity given, or the nature of the ſpecies of *poiſon*, a man muſt be killed by it at the pleaſure of the giver, either in an hour, a day, a week, a month, many months, or years; the *poiſon* in this laſt caſe operating like a chronical diſeaſe, and carrying off the patient by a very tedious train of ſymptoms.

Others are called *venena temporanea*, temporary *poiſons*. Theſe will kill a man by degrees, every minute of his life growing worſe and worſe, from the time of taking them to the final period; but this is not at any ſtated or certain time.

Others are called *delibutoria venena*. Theſe are ſuch as kill without being taken internally, and are ſurely fatal if rubbed upon the ſkin, put into gloves, or the like.

As to the firſt of theſe kinds, it is very much to be doubted whether there be in nature any ſuch thing as a *venenum terminatum*, or a *poiſon* which ſhall kill at the fixed time at which the giver pleaſes; ſince all the known *poiſons* are only relatively ſuch, and depend for their effect on the peculiar ſtate of the body: the different conſtitutions of men muſt therefore vary the period of time at which death muſt happen from the taking the ſame doſe. At leaſt, if it be poſſible to contrive a terminatory *poiſon*, it muſt require the ſkill of the ableſt phyſician to prepare it, ſince he muſt at once know the true ſtate of the perſon's body who is to take it, and the exact power of the *poiſon*, in its ſeveral doſes, on other bodies.

Much, therefore, is required in the phyſician who is to cure a perſon who has ſwallowed *poiſon*; ſince the nature of the medicine, and the true knowledge of the ſtate of the patient's body, are both neceſſary in order to know what ſymptoms to expect and guard againſt.

Of the number of thoſe *poiſons* which take a long time to kill, and that different, according to their doſe and the habit of the perſon, are the venom of the toad and of the mad dog, whether the ſaliva be communicated immediately to the blood by a wound, or ſwallowed with food or with the ſpittle. The *poiſon* of the tarantula is alſo of this number; and to theſe may be added, that of the ſmall pox, meaſles, and other diſeaſes of that kind, which is evidently long dormant in the body, till certain peculiar occaſions and accidents call it forth to appear in its proper form. The *poiſon* of the hectic fever is alſo by ſome referred to this, it being accounted an alkaline virus, mixed with a viſcid matter. The *poiſon* of the French pox, *lues venerea*, is alſo of this kind, and is eſteemed highly acrid and alkaline. The *poiſon* of cantharides, the acid ones of nitre, ſalt, vitriol, ſulphur; the ſolutions or cryſtals of gold, ſilver, and the other metals; and the precipitates of mercury, and the very fatal common arſenic. To theſe are added many others, and among them ſome which act merely mechanically, by their numerous ſharp points and edges; ſuch as the powder of diamonds, glaſs, and the like: and to this claſs belong many of the delibutory *poiſons*. *Stentzel* Toxicolog.

Of the temporaneous *poiſons* many are taken under the common denominations of food and drink, and ſeem at firſt to be of no injury; but by degrees they impair the conſtitution, and bring on diſeaſes and death. Coffee, Tea, and all the ſpirituous liquors are accounted of this kind.

We may perhaps aſcribe the prodigious multiplicity of *poiſons*, and that equally numerous tribe of antidotes treated of by the antients, to the love of the marvellous: however, it cannot be denied, that ſome things are very ſuddenly and ſtrangely deſtructive to animal life, and that in very ſmall quantities. Among the reſt, there is a *poiſon* made uſe of by the Indians, ſome of which was ſent over to the royal ſociety by Mr. de la Condamine: Dr. Brockleſby has given us ſome accounts of its effects on cats, dogs, and birds, who were ſoon killed by it, only by ſprinkling a few drops of the ſolution of this *poiſon* on wounds made by a lancet. The doctor gave alſo two drachms of ſugar to a bird, and ſhortly afterwards poured a little of the ſolution into its mouth; but two drops had ſcarce touched its tongue, before the creature was convulſed, and could with difficulty be laid down before all motion was taken away.

Hence it appears, that ſugar is no ſpecific againſt this *poiſon*, even when only taken at the mouth. Phil. Tranſ. N°. 482, Sect. 12.

The negroes uſe a *poiſon* of an extraordinary nature. The doſe is very ſmall, and it hath no ill taſte; ſo that, mixed with meat or drink, it is not perceivable. It cauſes divers ſymptoms, and the effects are various, according as the doſe is large or ſmall. It kills ſometimes in very few hours, ſometimes, it is ſaid, in ſome months, and at others in ſome years. The ſymptoms are according to the quantity given; if great, it cauſes evacuations upwards and downwards; of excrements firſt, then of humours, and laſtly of blood with fainting fits and ſweatings. Death follows in ſix or ſeven hours. The negroes turn white. Phil. Tranſ. N°. 462. p. 3.

The antidote to this *poiſon* is the root of the ſenſible weed, as it is commonly called, or *herba ſenſitiva*, in decoction. Id. ibid. p. 4.

Vegetable POISONS. It has been a general complaint, and indeed too juſt a one, that the qualities of plants are much leſs ſtudied than their external appearances; and the beſt modern authors have contented themſelves with nicely characteriſing plants according to their flowers and ſeeds, and aſcertaining the proper names to each, without at all enquiring how they might be beneficial or hurtful to mankind, or diſtinguiſhing whether they were ſafe medicines or deſtructive *poiſons*. Nor, indeed, is the inveſtigating the virtues of plants, yet untried as medicines, any eaſy taſk; ſince neither chemical analyſes, nor experiments on brutes, nor even the taſte and ſmell, and other ſenſible qualities of plants, can ever certainly aſſure us what effects they will have on the human body.

Chemical analyſes alter the ſubſtance too much to give any certain knowledge; and the effects things have on one animal are no aſſurance of what they will do to another, as is familiar to us in a thouſand inſtances. Bitter almonds, and many other things, wholly harmleſs to us, kill birds; and goats will eat the tithymals, to give them an appetite when they want it, while thoſe very plants are fatal to fiſhes, and very dangerous to man. The ſenſible qualities as often deceive us, of which we ſhall give many inſtances; and what ſome have obſerved of the botanical characters of plants, telling us their virtues, or that all of the ſame claſs poſſeſs the ſame qualities, is the moſt erroneous, and, if truſted to, might prove the moſt fatal of all opinions; ſince the known *poiſons*, hemlock, phellandrium, and water-dropwort, with the *poiſonous* juice, are all umbelliferous plants, and conſequently of the ſame family with fennel and angelica.

Nothing can, indeed, aſſure us with any degree of certainty of the virtues of plants, but experiments made on ourſelves; but few are to be found who wiſh ſo well to the public, as to venture their own lives for its ſervice: and perhaps the honeſt Geſner is the only man who ever carried theſe attempts to any degree, and he unhappily died a martyr to them, periſhing by the doſe he took of the ſcorpion-rooted doronicum; the very root which has of late with us been ſo fatal, by being accidentally mixed with our gentian.

What we learn of the vegetable *poiſons* muſt therefore be either by the conſequences of the raſh preſcriptions or miſtakes of the ignorant pretenders to medicine, or by the misfortune of thoſe who have unwarily eaten them.

We have accounts in the memoirs of the academy of ſciences of Paris, of many things of this kind. An apothecary, a very honeſt man, but of no knowledge in botany, had made his extract of black hellebore from the roots of the chriſtophoriana, or bane-berries, a plant always accounted a *poiſon*, and a ſingle berry of which is capable of killing ſeveral animals; yet ſo far had the fire diveſted the roots of their *poiſonous* qualities, that twelve grains of this given as extract of hellebore, proved of no ill effect. Mem. Acad. Scienc. Par. 1739.

Another apothecary having learned, that hermodactyls were the roots of a ſpecies of colchicum, dried the roots of the common colchicum, and ſold them in its place; yet there is no knowledge of any ill effects from them.

The enquiry into things of this kind has its uſe, and that no ſmall one; ſince *poiſons* often differ only in doſe from medicines, and many of the vegetables eſteemed *poiſonous*, may perhaps be found uſeful remedies, with proper management and in proper quantities.

The laurel-leaves are well known to afford a *poiſonous* water in diſtillation, yet it is as well known that they have been long uſed in cookery, to give a taſte like that of bitter almonds to creams, *&c.* and that without any ill effect. The roſe-bay, or oleander, is well known to be a *poiſon* to goats, yet is taken by the country-men of ſtrong and robuſt habits as a purge, and that with very good ſucceſs. Nay, opium, one of the greateſt of all medicines, if it had firſt been diſcovered by perſons taking over-doſes of it, and dying by it, as they naturally muſt have done, might very naturally have been recorded to us as a very fatal *poiſon*.

The plumbago, or dentillaria of Rondeletius, is ſo violent a cauſtic, that a poor girl who once anointed herſelf with it, to

cure her of the itch, was flead alive by it; yet this properly managed, and infused in oils, has proved one of the greatest of all remedies for cancers.

The shrub used in dying, and called by the French *redoul*, by some authors *coriaria*, and by others the myrtle-leaved *rhus*, is generally known to to the world only as a drug useful in the dressing of leather; but Pliny, and some other old writers, have given it the character of an useful external medicine, and a remedy against *poisons*; yet with all this inattention of the moderns, and all the praises of the antients, this plant is truly a very terrible *poison*. The grown cattle refuse to feed upon it, but the young lambs and kids often eat of it in those parts of Europe where it is common; and if they eat the full-grown leaves, they are killed by it; if the young shoots only, which is more usually the case, they are then only affected with spasms and a sort of drunkenness, of which, after a few hours, they recover. Nor is this singular to this *poisonous* plant, since it is well known, that many plants, of very improper kinds for food, are yet eaten in their young shoots: and Linnæus has recorded it of the Laplanders, that they even eat the young shoots of the *poisonous* blue aconite, or wolf's-bane; and even in France they eat the first shoots of the clematitis, or flammula repens, the full-grown leaves of which are of so acrid a nature, that they serve the beggars to eat ulcers in their arms and legs, to give them a pretended title to charity.

The *redoul* is not only a *poison* to animals, but its fatal effects have been seen on the human species. A girl in France, where it is very common, gathering its fruit among blackberries, eat of them, and died epileptic, in spite of all the assistance that could be given her: and another instance is given from the Hotel Dieu at Paris, where an unhappy traveller, a robust man, was brought in epileptic, and died so; tho' the cause was not known, except by a vomit which was given him bringing up some of the berries of this pernicious plant, and some more of them having been found in his stomach when dissected. Mem. Acad. Scienc. Par. 1739.

POISON-*wood*, in botany. See TOXICODENDRON.

POLA, in zoology, the name of a flat fish, something resembling the soal; but shorter and smaller, commonly called *cynoglossus* and *linguatula*. See CYNOGLOSSUS.

It is caught in the Mediterranean, and sold in Rome and Venice for the table. *Bellon.* de Aquat. Vol. I. p. 37.

POLAEDRASTYLA, in natural history, the name of a genus of crystals. The word is derived from the Greek πολὺς, many, ἕδρα, sides, the privative particle α, not, and στύλος, a column; and expresses a crystal composed of many planes and having no column.

The bodies of this genus are crystals composed of two octangular pyramids, joined base to base, and consequently the whole body consisting of sixteen planes. Of this genus there are only two known species: 1. A brown kind with short pyramids, found in considerable plenty in Virginia on the sides of hills; and, 2. a colourless one, with longer pyramids. This has yet been found only in one place, which is the great mine at Gosselaer, in Saxony, and there usually lies at great depths. *Hill*'s Hist. of Foss. p. 171.

POLE *(Cycl.)*—*Hop*-POLES, the upright pieces of wood that serve for the hops to twist round and grow upon.

The number, length, and bigness of the *poles* are to be regulated according to the bigness of the hills, and their distance, and the nature of the ground, and strength of the plants.

If the hills are wide, there must be the more *poles*, sometimes four or five to a hill, or more than that; but if they stand near, two may serve for every hill. In hot, dry, and hungry ground, the *poles* should stand nearer than in rich mellow land, where they are more subject to grow gross and heavy.

If the plants are strong, and the ground rich, the *poles* must be both large and long, or else the crop will suffer greatly: if the crop be poor, it is best to have but few, and those small and short *poles*, otherwise the hop will easily run itself out of heart, and the root will be impoverished.

The *poles* should never be made over long the first year. The propereſt wood for *hop-poles* is the ash or the alder, and if they have a sort of fork at the top, they will keep up the *hop* the better. The *poles* are to be dispersed between the hills, to be in readiness; but they must not be set up till the plants begin to appear, that it may be known where they ought to be placed. This may be continued till the plants are a yard high, but it ought to be finished by that time, because the plants will be stunted or injured in their growth, if they have not something to support them when arrived at that heighth.

The *poles* must be placed not in the hill, but near that part of it out of which each plant to be supported grows. They must be driven far enough into the ground, so that they may rather break than be torn up. Their depth is to be judged by the nature of the ground, their own height, and their exposure to the wind. Let all the *poles* lean outward one from another, that they may seem to stand at an equal distance at the top, to prevent the choaking up the plants below; and they should always lean towards the south, that the sun may the better shine in among them. A sloping *pole* is always more ready to bear a quantity of *hops* than an upright one, and the sun shines on more of the plants at once by means of it. It is always necessary to keep some spare *poles*, by way of reserve, to be ready in case of the others breaking; for in this case, the *hops* are soon spoiled with lying on the ground. If a *pole* be over-burthened with *hops*, they may be unwound, and wrapped round a stronger *pole* put in the place of the other.

The largest sort of *hop-poles* should be twenty foot long, and nine inches in circumference, for hops at full growth; and they should be polled about fourteen days after the dressing in of rich land. An acre of *hop* ground generally requires about three thousand *poles*.

When the *hops* are grown to three foot high, they are to be conducted to such of the *poles* as are nearest, or have fewest *hops* on them; and they are to be wound about these *poles* according to the course of the sun, and tied to them loosely with some rushes, or with soft yarn: two or three strings are sufficient to each *pole*, and great care is to be taken that the young shoots are not broken in the doing this; they are much more brittle in the morning than the heat of the day. During the months of April and May the plants are to be carefully attended, and kept turned round the *poles*; and when out of reach, a fork, stick, or ladder are to be used to this purpose.

About Midsummer they usually leave running at length, and begin to branch; such as do not, should have the end broke off, to incline them to it, it being much to the advantage of the owner that they should branch out. From the middle of May to the end of summer, the ground between the *poles* should be dug or turned up with a plough, to kill the weeds; and the earth about the hills raised higher, to keep them moist. *Mortimer*'s Husb. p. 177. See HOP.

POLEMARCHUS, Πολεμαρχος, among the Athenians, a magistrate who had all the strangers and sojourners in Athens under his care, over whom he had the same authority that the archon had over the citizens.

It was the duty of the *polemarchus* to offer a solemn sacrifice to Enyalus, said by some to be the same with Mars, but by others to have been only one of his attendants; and another to Diana, surnamed Αγρότερα, in honour of the famous patriot Harmodius. It was also the business of the *polemarchus* to take care that the children of those who had lost their lives in their country's service, should have a competent maintenance out of the public treasury. *Potter*, Archæol. Græc. l. 1. c. 12. T. 1. p. 77.

POLEMONIUM, *polemony*, in botany, the name of a genus of plants, the characters of which are these: the flower consists of a single leaf, and is of a rotated form, and divided into segments at the edge. From the cup there arises a pistil, which is fixed in the manner of a nail to the middle part of the flower, and finally becomes a roundish fruit, or case, divided into three cells, which are full of oblong seeds.

The species of *polemonium*, enumerated by Mr. Tournefort, are these: 1. The common blue-flowered *polemonium*, called by some *Greek-valerian*, with blue flowers. 2. The common white-flowered *polemonium*, or *Greek-valerian*, with white flowers. 3. The *polemonium* with variegated flowers, or *Greek-valerian*, with flowers striped with blue and white. *Tourn.* Inst. Bot. p. 146.

POLETÆ, Πολῆται, among the Athenians, ten magistrates, who together with three that had the care of the money allowed for shews, had the power of letting out the tribute money, and other public revenues, and selling confiscated estates; all which bargains were ratified in the name of their president. Besides this, it was their office to convict such as had not paid the tribute called Μετοικιον, and sell them by auction. *Potter*, Arch. Græc. l. 1. c. 14. T. 1. p. 80.

POLGAHA, in botany, a name by which some authors have called the cocoa-nut tree, or *palma Indica nucifera* of other writers. *Herm.* Mus. Zeyl. p. 50.

POLIA *lithargyrus*, a term used by Dioscorides to express the white litharge, which we call litharge of silver.

The proper sense of the word *polia*, is hoary, or grey, and it very well expresses the colour of this substance; but the commentators have not been satisfied with this obvious meaning, but have made it *pelia*, and some of them *ficelia*. See the article LITHARGE.

POLIEIA, Πολιεια, in antiquity, a solemnity of Thebes in honour of Apollo, surnamed πολιος, *i. e.* grey, because he was represented in this city (contrary to the practice of all other places) with grey hairs. *Potter*, Archæol. T. 1. p. 426.

POLIIFOLIUM, in botany, the name of a genus of plants described by Buxbaum, the characters of which are these: the flowers are monopetalous, of the bell-fashioned globose kind; the seed-vessel is divided into five parts, and contains a number of roundish seeds; the leaves are like those of the poly-mountain, whence the name; the flowers resemble those of the arbutus, or strawberry tree; and the fruit that of the cistus.

The plant has been known among authors before, tho' ill-

named and confounded with other genera; Ray has called it *ſedum arbuti flore*. It properly belongs to the plants of the ſhrub-kind, with dry fruits, and ought to be placed after the chamærhododendros, in the regular arrangements of plants.

Beſide the common kind of this, there is an African one, the leaves of which are ſhorter and rounder than thoſe of this ſpecies, and which may be called the ſhort-leaved African ſhrub-*poliifolium*.

POLIOPUS, in zoology, a name given by Aldrovand, and ſome other authors, to the *grinetta*; a ſmall bird of the moor-hen kind. See GRINETTA.

POLISHING (*Cycl.*)—POLISHING *of ſhells*. This is an art of no long ſtanding in the world, in its preſent perfection; and as the love of ſea-ſhells is become ſo common among us, it may not be diſagreeable to the reader to find ſome inſtructions in executing ſo pleaſing a method of adding to their natural beauty, and the rules for which are at preſent ſo little known, tho' the effect of them be ſo much eſteemed.

Among the immenſe variety of ſhells, which we are acquainted with, ſome are taken up out of the ſea, or found on its ſhores in all their perfection and beauty; their colours being all ſpread by nature upon the ſurface, and their natural *poliſh* ſuperior to any thing that art could give. Where nature is in herſelf thus perfect, it were madneſs to attempt to add any thing to her charms; but in others, where the beauties are latent, and covered with a coarſer outer ſkin, art is to be called in, and the outer veil being taken off, all the internal beauties appear.

Among the ſhells which are found naturally *poliſhed*, are the porcelanes, the caſſanders, the dolia, or conchæ globoſæ, the buccinums, the cornets, and the cylinders, or as they are generally, tho' improperly called, the rhombi; excepting only two or three, as the tiara, the plume, and the buttertub-rhombus; where there is an unpromiſing film on the ſurface, hiding a very great ſhare of beauty within.

Tho' the generality of the ſhells of theſe genera are taken out of the ſea in all their beauty, and in their utmoſt natural *poliſh*, there are ſeveral other genera in which all, or moſt of the ſpecies are taken up naturally rough and foul, and covered with an epidermis, or coarſe outer ſkin, which is in many rough and downy, or hairy. The tellinæ, the muſcles, the cochleæ, and many others are of this kind. The more nice collectors, as naturaliſts, inſiſt upon having all their ſhells in their native and genuine appearance, as they are found when living at ſea; but the ladies who make collections, hate the diſagreeable outſides, and will have all ſuch *poliſhed*: it would be very adviſeable, however, for both kinds of collectors to have the ſame ſhells in different ſpecimens, both rough and *poliſhed*; the naturaliſt would by this means, beſide knowing the outſide of the ſhell, be better acquainted with its internal characters than he otherwiſe could be, and the lady would have a pleaſure in comparing the beauties of the ſhell in its wrought ſtate, to its coarſe appearance as nature gives it. How many elegancies in this part of the creation muſt be wholly loſt to us, if it were not for the aſſiſtance of an art of this kind! many ſhells in their native ſtate are like rough diamonds, and we can form no juſt idea of their beauties till they have been *poliſhed* and wrought into form.

Tho' the art of *poliſhing* ſhells is a very valuable one, yet it is very dangerous to the ſhells; for without the utmoſt care the means uſed to *poliſh* and beautify a ſhell will often wholly deſtroy it. When a ſhell is to be *poliſhed*, the firſt thing to be examined is, whether it have naturally a ſmooth ſurface, or be covered with tubercles or prominences.

A ſhell which has a ſmooth ſurface and a natural dull *poliſh*, need only be rubbed with the hand, or with a piece of chamoy leather, with ſome tripoli or fine rottenſtone, and it will become of a perfectly bright and fine *poliſh*. Emery is not to be uſed on this occaſion, becauſe it wears away too much of the ſhell. This operation requires the hand of an experienced perſon, that knows how ſuperficial the work muſt be, and where he is to ſtop; for in many of theſe ſhells the lines are only on the ſurface, and the wearing away ever ſo little of the ſhell defaces them. A ſhell that is rough, foul, and cruſty, or covered with a tartarous coat, muſt be left a whole day ſteeping in hot water: when it has imbibed a large quantity of this, it is to be rubbed with rough emery on a ſtick, or with the blade of a knife, in order to get off the coat. After this, it may be dipped in diluted aqua fortis, ſpirit of ſalt, or any other acid; and after remaining a few moments in it, be again plunged into comm n water. This will greatly add to the ſpeed of the work. After this it is to be well rubbed with linnen cloths, impregnated with common ſoap; and when by theſe ſeveral means it is made perfectly clean, the *poliſhing* is to be finiſhed with fine emery and a hair bruſh. If after this the ſhell when dry appears not to have ſo good a *poliſh* as was deſired, it muſt be rubbed over with a ſolution of gum arabic; and this will add greatly to its gloſs, without doing it any ſort of injury. The gum-water muſt not be too thick, and then it gives no ſenſible coat, only heightening the colours. The white of an egg anſwers this purpoſe alſo very well; but it is ſubject to turn yellow. If the ſhell has an epidermis, which will by no means admit the *poliſhing* of it, it is to be dipped ſeveral times in diluted aqua fortis, that this may be eaten off; and then the ſhell is to be *poliſhed* in the uſual way with putty, fine emery, or tripoli, on the hair of a fine bruſh. When it is only a pellicle that hides the colours, the ſhells muſt be ſteeped in hot water, and after that the ſkin worked off by degrees with an old file. This is the caſe with ſeveral of the cylinders, which have not the natural *poliſh* of the reſt.

When a ſhell is covered with a thick and fatty epidermis, as is the caſe with ſeveral of the muſcles and tellinæ: in this caſe aqua fortis will do no ſervice, as it will not touch the ſkin; then a rough bruſh and coarſe emery are to be uſed; and if this does not ſucceed, ſeal-ſkin, or as the workmen call it *fiſh skin* and *pummice-ſtone*, are to be taken in to aſſiſt.

When a ſhell has a thick cruſt, which will not give way to any of theſe means, the only way left is to plunge it ſeveral times into ſtrong aqua fortis, till the ſtubborn cruſt is wholly eroded. The limpets, auris marina, the helmet-ſhells, and ſeveral other ſpecies are of this kind, and muſt have this ſort of management; but as the deſign is to ſhew the hidden beauties under the cruſt, and not to deſtroy the natural beauty and *poliſh* of the inſide of the ſhell, the method of uſing the aqua fortis muſt be this: A long piece of wax muſt be provided, and one end of it made perfectly to cover the whole mouth of the ſhell; the other end will then ſerve as a handle, and the mouth being ſtopped by the wax, the liquor cannot get in to the inſide to ſpoil it; then there muſt be placed on a table, a veſſel full of aqua fortis, and another full of common water.

The ſhell is to be plunged into the aqua fortis; and after remaining a few minutes in it, is to be taken out and plunged into the common water. The progreſs the aqua fortis makes in eroding the ſurface is thus to be carefully obſerved every time it is taken out: the point of the ſhell, and any other tender parts, are to be covered with wax, to prevent the aqua fortis from eating them away; and if there be any worm-holes, they alſo muſt be ſtopped up with wax, otherwiſe the aqua fortis would ſoon eat thro' in thoſe places. When the repeated dippings into the aqua fortis ſhew that the coat is ſufficiently eaten away, then the ſhell is to be wrought carefully with fine emery and a bruſh; and when it is *poliſhed* as high as can be by this means, it muſt be wiped clean and rubbed over with gum-water, or the white of an egg. In this ſort of work the operator muſt always have the caution to wear gloves, otherwiſe the leaſt touch of the aqua fortis will burn the fingers, and turn them yellow; and often if it be not regarded, will eat off the ſkin and the nails.

Theſe are the methods to be uſed with ſhells, which require but a moderate quantity of the ſurface to be taken off; but there are others which require to have a larger quantity taken off, and to be uncovered deeper; this is called entirely ſcaling a ſhell. This is done by means of an horizontal wheel of lead or tin, impregnated with rough emery; and the ſhell is wrought down in the ſame manner in which ſtones are wrought by the lapidary. Nothing is more difficult, however, than the performing this work with nicety: very often ſhells are cut down too far by it, and wholly ſpoiled; and to avoid this, a courſe vein muſt be often left ſtanding in ſome place, and taken down afterwards with the file, when the cuting it down at the wheel would have ſpoiled the adjacent parts.

After the ſhell is thus cut down to a proper degree, it is to be *poliſhed* with fine emery, tripoli, or rotten ſtone, with a wooden wheel turned by the ſame machine as the leaden one, or by the common method of working with the hand with the ſame ingredients, when a ſhell is full of tubercles, or protuberances, which muſt be preſerved. It is then impoſſible to uſe the wheel; and if the common way of dipping into aqua fortis be attempted, the tubercles being harder than the reſt of the ſhell, will be eat thro' before the reſt is ſufficiently ſcaled, and the ſhell will be ſpoiled: in this caſe induſtry and patience are the only means of effecting a *poliſh*. A camel's hair pencil muſt be dipped in aqua fortis, and with this the intermediate parts of the ſhell muſt be wetted, leaving the protuberances dry: this is to be often repeated, and after a few moments the ſhell is always to be plunged into water to ſtop the eroſion of the acid, which would otherwiſe eat too deep, and deſtroy the beauty of the ſhell. When this has ſufficiently taken off the foulneſs of the ſhell, it is to be *poliſhed* with emery of the fineſt kind, or with tripoli; by means of a ſmall ſtick, or the common *poliſhing* ſtone uſed by the goldſmiths may be uſed.

This is a very tedious and troubleſome thing, eſpecially when the echinated oyſters and murexes, and ſome other ſuch ſhells are to be wrought; and what is worſt of all is, that when all this pains has been taken, the buſineſs is not well done; for there ſtill remain ſeveral places which could not be reached by any inſtrument; ſo that the ſhell muſt neceſſarily be rubbed over with gum-water, or the white of an egg afterwards, in order to bring out the colours and give a gloſs; in ſome caſes it is even neceſſary to give a coat of varniſh.

Theſe are the means uſed by artiſts to brighten the colours, and add to the beauty of ſhells; and the changes produced

by *poliſhing* in this manner are ſo great, that the ſhell is often not to be known afterwards for the ſame it was; and hence we hear of new ſhells in the cabinets of collectors, which have no real exiſtence as ſeparate ſpecies, but are the *poliſhed* appearance of others well known. To caution the reader againſt errors of this kind, it may be proper to add the moſt remarkable ſpecies thus uſually altered.

The onyx-ſhell, which in its natural ſtate is of a ſimple pale brown, when it is wrought ſlightly, or *poliſhed* with juſt the ſuperficies taken off, is of a fine bright yellow; and when it is eat away deeper, it appears of a fine milk-white with the lower part bluiſh: it is in this ſtate that it is called the onyx-ſhell; and it is preſerved in many cabinets in its rough ſtate, and in its yellow appearance as different ſpecies of ſhells.

The violet ſhell, ſo common among the curious, is a ſpecies of porcelane, which does not appear in that elegance till it has been *poliſhed*; and the common auris marina ſhews itſelf in two or three different forms, as it is more or leſs deeply wrought. In its rough ſtate it is duſky and coarſe, of a pale brown on the outſide and pearly within; when it is eaten down a little way below the ſurface, it ſhews variegations of black and green, and when ſtill farther eroded it appears of a fine pearly hue within and without.

The nautilus, when it is *poliſhed* down, appears all over of a fine pearly colour, but when it is eaten away but to a ſmall depth, it appears of a fine yellowiſh colour with duſky hairs.

The burgau, when entirely cleared of its coat, is of the moſt beautiful pearl-colour; but when only ſlightly eroded, it appears of a variegated mixture of green and red; whence it has been called the *parroquet*-ſhell. The common helmet-ſhell, when wrought, is of the colour of the fineſt agate; and the muſcles in general, tho' very plain ſhells, in their common appearance, become very beautiful when *poliſhed*, and ſhew large veins of the moſt elegant colours. The Perſian ſhell, in its natural ſtate, is all over white, and covered with tubercles; but when it has been ground down on a wheel, and *poliſhed*, it appears of a grey colour with ſpots and veins of a very bright and highly *poliſhed* white. The limpets in general become very different when *poliſhed*, moſt of them ſhewing very elegant colours; among theſe the tortoiſe-ſhell-limpet is the principal; it does not appear at all of that colour or tranſparence till it has been wrought.

That elegant ſpecies of ſhell called the junquil-chama, which has deceived ſo many judges of theſe things into an opinion of its being a new ſpecies, is only a white *chama* with a reticulated ſurface; but when this is *poliſhed*, it loſes at once its reticular work and its colour, and becomes perfectly ſmooth and of a fine bright yellow: and the violet-coloured *chama* of New England, when worked down and *poliſhed*, is of a fine milk-white with a great number of blue veins diſpoſed like the variegations in agates.

The aſſe's ear-ſhell, when *poliſhed*, after working it down with the file, becomes extremely gloſſy, and obtains a fine roſe-colour all about the mouth. Theſe are ſome of the moſt frequent among an endleſs variety of changes wrought on ſhells by *poliſhing*; and we find there are many of the very greateſt beauties of this part of the creation which muſt have been loſt but for this method of ſearching deep in the ſubſtance of the ſhell for them.

The Dutch are very fond of ſhells, and are very nice in their manner of working them: they are under no reſtraint, however, in their works, but uſe the moſt violent methods, ſo as often to deſtroy all the beauty of the ſhell. They file them down on all ſides, and often take them to the wheel when it muſt deſtroy the very characters of the ſpecies; nor do they ſtop at this, but determined to have beauty at any rate, they are for improving upon nature, and frequently add ſome lines and colours with a pencil, afterwards covering them with a fine coat of varniſh; ſo that they ſeem the natural lineations of the ſhell: the Dutch cabinets are by this means made very beautiful, but they are by no means to be regarded as inſtructors in natural hiſtory. There are ſome artificers of this nation who have a way of colouring ſhells all over with a different tinge from that which nature gives them; and the curious are often deceived by theſe tricks into the purchaſing them as new ſpecies.

There is another kind of work beſtowed on certain ſpecies of ſhells, particularly the nautilus; this is the engraving on it lines and circles, and figures of ſtars, and other things: this is too obvious a work of art to ſuffer any one to ſuppoſe it natural. Bonani has figured ſeveral of theſe wrought ſhells at the end of his work, but it is miſerably throwing away labour to do them; the ſhells are ſpoiled as objects of natural hiſtory by it, and the engraving is ſeldom worth any thing. They are principally done in the Eaſt-Indies.

Shells are ſubject to ſeveral imperfections; ſome of theſe are natural, and others accidental: the natural ones are the effect of age, or ſickneſs in the fiſh. The greateſt miſchief happens to ſhells by the fiſh dying in them. The curious in theſe things pretend to be always able to diſtinguiſh a ſhell taken up with the fiſh alive, from one found on the ſhores: they call the firſt a living, the ſecond a dead ſhell, and ſay that the colours are always much the fainteſt in the dead ſhells.

When the ſhells have lain long dead on the ſhores, they are ſubject to many injuries, of which the being eaten by ſea-worms is not the leaſt: age renders the fineſt ſhells livid or dead in their colours.

The fineſt ſhells are thoſe which are fiſhed up at ſea, not found on the ſhores. The other natural defects of ſhells are there having morbid cavities, or protuberances, in parts where there ſhould be none. When the ſhell is valuable theſe faults may be hid, and much added to the beauty of the ſpecimen, without at all injuring it as an object of natural hiſtory, which ſhould always be the great end of collecting theſe things. The cavities may be filled up with maſtic, diſſolved in ſpirit of wine, or with iſinglaſs; theſe ſubſtances muſt be either coloured to the tinge of the ſhell, or elſe a pencil dipped in water colours muſt finiſh them up to the reſemblance of the reſt, and then the whole ſhell being rubbed over with gum-water, or with the white of an egg, ſcarce any eye can perceive the artifice: the ſame ſubſtances may alſo be uſed to repair the battered edge of a ſhell, provided the pieces chipped off be not too large. And when the excreſcences of a ſhell are faulty, they are to be taken down with a fine file. If the lip of a ſhell be ſo battered that it will not admit of repairing by any cement, the whole muſt be filed down to an evenneſs, or ground on the wheel.

POLITICAL *(Cycl.)*—POLITICAL *arithmetic*. According to Mr. Kerſeboom's computation, the inhabitants of Holland and Weſtfriezeland, in the year 1738, amounted to 980000. He has given us a table of the particulars, exhibiting the number of people of all ages, living at the ſame time, from their birth to extreme old age. This table having the chances of mortality within the ages mentioned, he calls the table of contingency of life and death.

This table is calculated upon three principles: 1. On correct obſervations upon the tables of aſſignable annuities in Holland, which have been kept there for above 125 years; wherein the ages of the perſons dying are truly entered. 2. Upon a ſuppoſition that there are yearly born in the two provinces 28000 living children. 3. That the whole number of inhabitants, in any country, is to the number of births as 35 to 1.

From this table it appears, 1. That more than half the number of people in the two provinces are above 27 years old. 2. That by the obſervations made in England, out of 35 children born, 18 of them are boys, and 17 girls: the inhabitants of Holland and Weſtfriezeland, conſiſt of 504000 males, and 476000 females, the ſum of which is 980000.

Here follows the table of contingency of life and death.

Of above 90 years old			500	
Of 90	to 86	incl.	2500	
85	81		6500	
80	76		13000	
75	71		20300	
70	66		27300	
65	61		34300	
60	56		40800	
55	51		47000	
50	46		53000	
45	41		57800	
40	36		62500	
35	31		67600	
30	27		58400	
			491500	ſum above 27 years old.
Of 26	21		94300	
20	16		83400	
15	11		87200	
10	6		91800	
5	to birth		131800	
			488500	ſum under 27 years old.
			491500	
			488500	
			980000	ſum of all the inhabitants.

Mr. Kerſeboom obſerves from the aſſignable annuities for lives before-mentioned, that females, one with another, live about three or four years longer than the ſame number of males.

He alſo thinks there is no reaſon to differ from the proportions aſſigned by Mr. King (in Davenant's eſſays) of the ſtate and condition of the inhabitants of England; which is, that for every 100000 inhabitants there is

Married men and women	34500
Widowers	1500
Widows	4500
Unmarried youth and children	45000
Servants	10500
Travellers, ſtrangers, *&c.*	4000
	100000

If this propoſition be admitted, then the number of each ſort in Holland and Weſtfriezeland, will be as in the following table:

In the two provinces of Holl. and Weſt.		Amſter.
Married men and women	338100	86156
Widowers ——	14700	4218
Widows — —	44100	13858
Unmarried youth and children	441000	93990
Servants — —	102900	28318
Travellers, ſtrangers, &c.	39200	14460
Total	980000	241000

The mortality of the ſeveral quarters of the year.

Spring to ſummer	307 dead.
Summer to the autumnal equinox	286
Autumn to winter	287
Winter to ſpring	286

The mortality of the different months of the year obſerved for 31 years, one with another.

Dead in	
January	102
February	88
March	95
April	77
May	112
June	100
July	92
Auguſt	95
September	99
October	93
November	95
December	99

Hence it appears, that April is the leaſt, and May the moſt fatal Month in the year; their proportion of mortality being nearly as 2 to 3: and that of the four ſeaſons of the year, moſt deaths happen in the ſpring; that is, from the vernal equinox to the ſummer ſolſtice.

Mr. Kerſeboom adds, that theſe provinces may raiſe 220000 men able to bear arms, and ſeveral other curious obſervations. His book is intitled, *Verhandeling tot een proeve, om te weeten de probable menigte des volks in de proventie van Holland en Weſtfriezlandt.* Hage 1738. 4°.

POLITICAL *diviſion of antient Egypt.* See NOME.

POLIUM, *poley-mountain*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is of the labiated kind; but the place of the upper lip is ſupplied by the ſtamina. The under lip is divided into five ſegments. The piſtil ariſes from the cup; it is fixed in the manner of a nail to the hinder part of the flower, and ſurrounded by four embryos, which afterwards become ſo many ſeeds remaining in the flower-cup, which ſerve them as a capſule. The flowers of this plant are collected into heads, and grow at the tops of the ſtalks.

The ſpecies of *poley-mountain*, enumerated by Mr. Tournefort, are theſe: 1. The lavender-leaved *poley*. 2. The narrower-leaved lavender-*poley*. 3. The yellow-flowered common *poley*. 4. The common white-flowered *poley*. 5. The narrower-leaved longer-headed white-flowered *poley*. 6. The creeping *poley*. 7. The French erect ſea-*poley*. 8. The procumbent Venetian ſea-*poley*. 9. The purple-flowered tender woolly-leaved *poley*. 10. The white tender procumbent *poley*. 11. The ground ivy-leaved tender procumbent Pyrenean *poley*. 12. The purple-flowered, germander-leaved Spaniſh *poley*. 13. The ſmoother procumbent Portugal *poley*, with purple ſtalks and white flowers. 14. The purple-flowered ſhort-headed broad-leaved Spaniſh *poley*. 15. The great white Spaniſh *poley*. 16. The great yellow Spaniſh *poley*. 17. The white-flowered roſemary-leaved ſea-*poley* of Spain. 18. The red-flowered ſhrubby ſea-*poley* of Spain, with roſemary leaves. 19. The red-flowered, roſemary-leaved, dwarf mountain-*poley* of Spain. 20. The yellow-flowered procumbent Spaniſh *poley*. 21. The longer-headed Spaniſh *poley*, with variegated flowers. 22. The white-flowered, ſhort-headed, narrow-leaved erect *poley*. 23. The white-flowered Spaniſh *poley*, with hoary leaves, reſembling thoſe of toad-flax. 24. The white-flowered ſhorter-leaved Spaniſh *poley*, with toad-flax leaves. 25. The red-flowered dwarf-*poley-mountain*, with narrow green leaves and hoary ſtalks. 26. The little narrow-leaved erect *poley*, with greeniſh white ſerrated leaves 27. The leſſer procumbent white narrow-leaved *poley*, with ſerrated leaves. 28. The red-flowered erect ſmall *poley*, with ſhort, narrow, and thick cluſtered leaves. 29. The procumbent red-flowered cudweed-like mountain-*poley*, with divided leaves. 30. The white-flowered cudweed-like ſea-*poley*. 31. The whole-leaved white Spaniſh *poley*. 32. The larger erect, broad-leaved white *poley*, with ſerrated leaves. 33. The great procumbent broad-leaved *poley*, with ſerrated leaves. 34. The leſſer procumbent broad-leaved white *poley*, with ſerrated leaves. 35. The yellow Spaniſh *poley*, with marjoram-like leaves. 36. The purple-flowered ſerpyllum-leaved Spaniſh *poley*. 37. The purple-ſpiked thyme-leaved Spaniſh *poley*. *Tourn.* Inſt. p. 206.

POLLACK, in ichthyology, a name which we give to two different fiſh of the aſellus or gadus kind, with the different epithets of *raw* and *whiting*. The *raw-pollack* is the ſame ſpecies that in ſome parts of England is called the cole-fiſh, and is the aſellus niger of authors. The other is called the *whiting-pollack*; and is the *aſellus vireſcens* of Willughby and others.

Both theſe fiſh are, according to the new Artedian ſyſtem, of the genus of the gadi; and as the names taken from their colours, black and green, are very little expreſſive, the colours being not perfect, permanent, or entire, Artedi has deviſed others for them, by which they may be diſtinguiſhed at ſight from one another. The *raw-pollack*, or cole-fiſh, he diſtinguiſhes by the name of the *gadus* with three fins on the back, with no beard at the mouth, with the lower jaw longer than the upper, and the lateral line ſtrait. The other, or *whiting-pollack*, he diſtinguiſhes by the name of the *gadus* with three fins on the back, with no beard, with the lower jaw longer than the upper, and the lateral line crooked. Theſe two kinds of *pollack* are by theſe names not only diſtinguiſhed from one another, but from all the other ſpecies of the ſame genus, as the codfiſh, &c. *Artedi* Gen. Piſc. p. 35.

POLLARD *(Cycl.)*—POLLARD is a name given by ſome hiſtorians to a ſort of baſe money current at one time in Ireland, and called more uſually *crocards*.

Theſe were coins of France, and other nations, which paſſed in Ireland as pennies, tho' really not worth quite half ſo much. They were made of copper, with a very ſmall admixture of ſilver. See the article CROCARDS.

It was in the reign of Edward I. appointed lord of that kingdom in the life-time of his father Henry III. that the uſe of falſe and counterfeit money of this kind was ſo extremely common in Ireland. While his father reigned in England this prince never extended his power ſo far as to ſet up any mint, or coin any money in Ireland; but at his acceſſion to the crown he found his treaſury empty, and the current coin of his kingdoms in a very bad condition: his abſence of near two years after his father's death, having ſo encouraged the clippers and coiners of money, that little but clipped, or counterfeit money of the kingdom was to be met with; and five or ſix different ſorts of baſe and mixed money had been imported privately, and uttered in England and Ireland as pennies, tho' they were not half the value of the penny ſterling.

Theſe were the *crocards* and *pollards*, called alſo *mitres lizonnes*, *roſaries*, and by the like names, according to the things marked in the impreſſions. To remedy this evil, and reſtore the current coin of the kingdom to its antient purity and value, this prince eſtabliſhed a certain ſtandard; and as the baſe money was an admixture of a very ſmall quantity of ſilver, with a great deal of copper, he ordered that there ſhould be in every pound of money weighing twelve ounces, eleven ounces and two penny weight and a quarter of pure ſilver, and only ſeventeen pence halfpenny farthing allay.

The ſaid pound to weigh twenty ſhillings and three pence in account; the ounce twenty pence, and the penny twenty-four grains and a half. According to this regulation, the money of Ireland was alſo ordered to be made, and a new kind of money was ſtruck there in the year 1279, under Stephen de Fulbourn, biſhop of Waterford, and lord deputy of Ireland. The pieces coined at this time in Ireland were groats, or four pennies, halfpence, and farthings; and as theſe were the ſame in value, as to weight, with the Engliſh coins, they would go equally in England and Ireland: and in the twenty-ninth year of the reign of the ſame prince, that is, in 1300, the *crocards*, *pollards*, and other baſe money were decried; and it was made death, with confiſcation of goods, to import any of them.

By this means the circulation of the baſe and mixed money was in a great meaſure ſtopped, and four new furnaces were erected in the mint of Dublin, to ſupply the great demand that there was for good money; and Almander Norman de Line was appointed maſter of the coiners. This was a beginning of good money in Ireland; and in the year 1304, there were ſent over from England twenty-four ſtamps for coining of money there, *viz.* three piles with ſix croſſes, for pennies; three piles with ſix croſſes, for halfpence; and two piles with four croſſes, for farthings. In the old way of coining with the hammer, before the mill and ſcrew were invented, two kinds of punchions were in uſe, the one called the croſs, whereupon was engraved the head of the prince; and this was ſo called becauſe, antiently, a croſs was the figure ſtruck on this ſide of coins inſtead of the head of the prince: the other called the pile, contained the arms, or ſome other figure, to be ſtruck with an inſcription on the back, or reverſe of the coins. The pennies and halfpence ſtruck in this king's reign, have the king's head in a triangle full-faced. The beſt preſerved of them, found at this time, weigh twenty-two grains the penny; and the halfpence from ten grains to ten and a half. The farthings are ſo ſcarce, that it is very rare to meet with one in the collections of the moſt curious. *Simon's* Hiſt. of Iriſh Coins, p. 15.

POLLARD, in zoology, a local name for the young and ſmall fiſh of the cole-fiſh, or rawling-pollack kind. It is uſed in Cornwall, &c. *Willughby*'s Hiſt. Piſc. p. 169.

POLLEN *thuris*, in the materia medica, a term uſed by the Latin writers, to expreſs the *manna thuris*, or *manna libanotis*, of the Greeks, but that very improperly; for the word *pollen thuris* properly ſignifies the frankincenſe reduced to a powder, but this was not what the antient Greeks called *manna thuris*, but the ſmall fragments which were broken off from the large pieces, in the gathering or packing up.

The *manna* uſed in medicine by the Greeks and Arabians was not formed into large flakes, as ours is; but was compoſed of ſmall fragments or grains, and therefore they called by the ſame name the ſmall granulæ or fragments alſo of other things: it was thus that the broken frankincenſe was called *manna thuris*.

The cuſtom of the times of ſaving all the fragments of this drug, made them collect even what was in ſo ſmall pieces as to reſemble powder; but this, tho' mixed with the reſt, was not properly the *manna thuris*. This gave occaſion to the adulterating this commodity, and Dioſcorides tells us, that even in his time they had learned the trick of putting the powder of the reſin of the pine tree among it; and this growing worſe and worſe, they at laſt diſcarded it, and would purchaſe only the fragments without the powder. Theſe fragments they called *thus minutum*, to diſtinguiſh them from what was then called *manna thuris*, tho' improperly, and which was the adulterated maſs of reſin and fragments of olibanum.

POLLICIPES, the *toe-ſhell*, in natural hiſtory, the name of a genus of ſhells, the characters of which are theſe: they are multivalve flat ſhells, of a triangular figure, each being compoſed of ſeveral laminæ, which end in a ſharp point. They ſtand upon pedicles, and are furniſhed with a great number of hairs. We have only one known ſpecies of this genus, and this always found in large cluſters. See Tab. of Shells, N° 27.

POLLINCTORES, among the antients, an appellation given to thoſe who waſhed and anointed the dead. *Pitiſc.* in voc.

POLLINCTURA, a word uſed by ſome authors to expreſs the embalming dead bodies.

POLLING, in gardening, the operation of diſperſing the worm-caſts all over the walks, with long aſh-poles: this, beſides deſtroying worm-caſts, is very beneficial to the graſs of the walks. See GRASS-*walks*.

POLLUCTUM, among the Romans, a feaſt kept in honour of Jupiter Dapalis, Hercules, &c. at which ſacrifices were offered to the Gods. *Pitiſc.* in voc.

POLLUTION *(Cycl.)*—POLLUTIO *nocturna*, in medicine, the name of a diſeaſe, which conſiſts in an involuntary emiſſion of the ſeed in the night, in time of ſleep. This, in different perſons, is very different in degree; ſome being affected with it only once in a week, a fortnight, three weeks, or even a month, and others being ſubject to it almoſt every night.

The perſons moſt ſubject to this, are young men of a ſanguineous temperament, and who feed high, and lead a ſedentary life. When this happens to a perſon but once in a fortnight, or a month, it is of no great conſequence; but when it happens almoſt every night, it greatly injures the health; the patients look pale and ſickly. In ſome the eyes become weak and inflamed; ſometimes they are affected with violent defluxions, and uſually, at laſt, are circled round with a livid appearance of the ſkin.

This diſtemper is to be cured rather by a change of life than by medicines. When it has taken its riſe from high diet and a ſedentary life, a coarſer food, and the uſe of exerciſe, will generally cure it; but if any medicines are to be given, nitre alone will do more than almoſt all the reſt. This may be taken in large doſes, a ſcruple at a time, with very little liquid with it, and muſt be continued for ſome time at night going to reſt. The root of the water-lilly is greatly recommended by ſome in this caſe; and by others, the ſeeds of the agnus caſtus; but it is very doubtful, whether they have either of them any effect.

Perſons ſubject to this diſeaſe muſt never take any ſtimulating purges, and muſt avoid, as much as poſſible, all violent paſſions of the mind: and tho' exerciſe is recommended in moderation, yet if this be too violent, it will rather increaſe the diſorder than do any thing towards its cure. *Junck*'s Conſp. Med. p. 486.

POLPHOS, a word uſed by ſome authors to expreſs a bulb or bulbous root.

POLPOCH, in zoology, a ſpecies of ſerpent ſaid to be found in Jucatan, a country bordering upon New Spain. It can bite with the mouth and ſting with the tail. *Hoffm.* Lex. univ. in voc.

POLVERINE, the calcined aſhes of a plant; a ſubſtance of the nature of our pot-aſhes, or pearl-aſhes.

It is brought from the Levant and Syria; but in the glaſs trade, tho' it be of the nature of the other aſhes they uſe, it is always to be preferred to any other. The barillia, or pot aſhes of Spain, yield more pure ſalt than the *polverine* of the Levant, but the glaſs made with it has always ſome tinge of bluiſhneſs: that made with the *polverine* is ever perfectly white, and this is the ſubſtance that ought always to be uſed for the fineſt cryſtal.

The method of procuring the pure ſalt from theſe aſhes, is to ſift them and throw them in a proper quantity into a large copper of boiling water, continuing the boiling till all the ſalt of the aſhes be diſſolved by the water, and adding to the water, before the *polverine* is put in, about ten pound of tartar calcined to a blackneſs. The lee or water thus impregnated with the ſalt, muſt ſtand a conſiderable time to ſettle; and when perfectly clear, muſt be evaporated till it thicken, and begin to ſhew a white dry ſalt about its edges: then the fire muſt be kept very ſlow, and a ſkimmer full of holes being ſunk in to the bottom of the copper, the ſalt will gather and harden upon it; and this muſt be taken out every now and then, and the ſalt taken off and dried for uſe. Three hundred pound of *polverine* thus yield eighty or ninety pound of clear ſalt. When this is dried, it muſt be ſlightly calcined in the glaſs furnace, and then powdered and ſifted through a coarſe ſieve, and kept dry. *Neri*'s Art of Glaſs, p. 2.

POLYADELPHIA, in botany, a claſs of plants, whoſe ſtamina are formed into three or more ſeparate bodies.

The word is formed of the Greek πολὺς, many, and ἀδελφὰ, communities. Among the plants of this claſs are orange-trees, St. John's wort, &c.

POLYANDRIA, in botany, a claſs of plants with hermaphrodite flowers, and a large number of ſtamina, or male parts, in each. See Tab. 1. of Botany.

The word is derived from the Greek πολὺς, many, and ἀνὴρ, male. The hermaphrodite flowers of this claſs have a large number of ſtamina on each, always more than twelve, and thoſe growing to the receptacle of the future ſeeds.

Of this claſs are the water-lilly, poppy, celandine, &c.

POLYANTHEMUM, in botany, a name given by ſome authors to the water-crowfoot, from its great number of flowers. *Ger.* Emac. Ind. 2.

POLYCEPHALON, Πολυκεφαλον. in antiquity, a kind of poetry, for the nature and origin of which, ſee Mem. de l'Acad. Roy. des Inſcrip. Vol. 14. p. 438.

POLYCOMBUS, in botany, a name given by Neophytus and others to the common knot-graſs, more uſually called *polygonum*.

The name *polycombus* is formed of the Greek πολυς, many, and κομβος, a joint; and as it is uſually applicable to this, and all the other jointed plants, it is uſed by ſome for the name of the ſeveral ſpecies of equiſetum, or horſetail, as the word *polygonum* is.

Neophytus deſcribes one ſpecies of this, which he ſays is called *oreon*, from its growing in mountainous places. This, he ſays, looks like a young reed, and has ſeveral joints in the main ſtalk, which are received into one another as ſo many cups or boxes. He adds, that the leaves are like thoſe of the pine-tree: what he calls the leaves, are probably the tender branches; and then this deſcription will agree very well with our great marſh horſetail, which grows in wet places in mountainous countries, and about the ſprings in our hills. This is the horſetail to which the greateſt virtues are attributed by this author; but the whole account of the hippuris, polygonum, and equiſetum, is ſo confuſed, that there is little to be learnt from what the antients ſay of them, without repeating the trials of their virtues.

POLYCROTA, in the naval architecture of the antients, a word uſed to expreſs ſuch of their gallies as had three, four, five, or more tires of rowers, ſeated at different heights; they were diſtinguiſhed by this term from the *monocrota*, or thoſe which had only ſingle rows of oars.

The number of rows of rowers in the *polycrote* gallies has given occaſion to ſome to ſuppoſe thoſe veſſels of ſuch a height from the water as is ſcarce credible; we have, however, no warrant for this, but the commentators have given occaſion to the opinion, from their not having been able to ſtow the rowers in leſs room, and have meaſured the height of the veſſel by their own ſkill in this ſort of architecture, not by that of the people who built them. Meibom has found a way to take off a great deal from the imaginary height of theſe gallies. He has two inventions to anſwer this purpoſe: by the firſt of them, he ſhews how the lateral rowers may be ſo placed, that he who ſits behind another may move his hands and oar under the ſeat of the rower who ſits next before him; by which means three lateral rowers, which, according to Scaliger's way of reckoning, would require thirteen feet and an half, will be placed in the heighth of ſeven feet and an half.

By the ſecond invention, he finds out a place in the veſſel for almoſt half the number of rowers; foraſmuch as on the ſides of the aforeſaid rowers, he places others in the middle of the ſhip, upon tranſtra or tranſverſe ſeats, which he imagines thruſt out their oars under the ſeats of the lateral rowers; by this contrivance he has gained no leſs than nine feet in the heighth of a quinqueremis.

The different ſeries of rowers were called by different names; the *thalamitæ* were thoſe who ſat in the loweſt row; the *zygitæ* were thoſe who ſat in the tranſtra, or croſs ſeats; and the *thranitæ* thoſe who ſat uppermoſt of all in the veſſel.

The moſt ſurprizing account of a *polycrote* veſſel among the

antients, is that said to have been built for Philopater, of forty tires of rowers. The next to this is that of Ptolomy Philadelphus, which is said to have had thirty tires; and in these there sat more than three thousand rowers. It has been disputed by many, whether such immense vessels as these were ever built, or ever could be used if built. The monstrous heighth they have been calculated to be of, according to the schemes of the generality of commentators, has rendered it incredible that there ever were any such; but Meibom has found out such convenient ways of placing the rowers in them, and has taken off so great a part of this imaginary heighth necessary in them, that he is clearly of opinion, that there were such vessels actually built and used.

The triremis, according to the computation of this author, contained two hundred men; of which one hundred and eighty were rowers, and the rest were mariners: so that the Athenian fleet, of which Conon was commander, consisting of one hundred and eighty triremes, there were in it six and thirty thousand men. The quinqueremis of these times contained four hundred and twenty men, three hundred of whom were rowers, and the rest soldiers; so that there are three stupendous things to be observed in regard to the Roman fleet at Messina, and the Carthaginian at Lilybæum: one is, that the former consisted of three hundred and thirty, and the latter of three hundred and fifty vessels, most of which were quinqueremes, which, according to the most accurate computation, were a hundred and fifty feet long; the number of men they contained was, in the Roman, one hundred and thirty thousand, and in the Carthaginian, one hundred and fifty thousand. The apparatus and provisions necessary for such a numerous host, is wonderful in these early days of shipping, and the accounts would be doubted, were they not given by one of the best of historians, Polybius, who wonders, as indeed he very well may, at such an amazing equipage for sea service at such a time.

POLYEIDÆ *sphragis*, the name of a sort of troches or pastils greatly used among the antients. It consisted of alum, four drachms; myrrh and aloes, of each five drachms; pomegranate-peel, and bull's gall, of each six drachms: all which were rubbed to fine powder, and made into troches with the bull's gall, mixed with a sufficient quantity of the most austere wine.

POLYGALA, *milkwort*, in botany, the name of a genus of plants, the characters of which are these: the flower is of the personated kind, consisting of one leaf, not perforated behind, and divided before into two lips; the upper lip is bifid, and the lower one elegantly fimbriated. The pistil arises from the lower part of the flower, and ripens at length into a fruit or capsule of a compressed figure, divided into two cells, and full of oblong seeds. The fruit is usually found surrounded with the cup of the flower, which consists of five leaves, two large and three small ones, which clasp round the seed vessel in the manner of so many wings.

The species of *polygala*, enumerated by Mr. Tournefort, are these: 1. The great blue-flowered *polygala*. 2. The great purple-flowered *polygala*. 3. The great white-flowered *polygala*. 4. The common or smaller blue-flowered *polygala*. 5. The common purple-flowered *polygala*. 6. The common *polygala*, with white flowers. 7. The painted-leaved *milkwort*, with purple flowers. 8. The painted-leaved *milkwort*, with blue flowers. 9. The narrow-leaved erect annual *polygala*, with dusky-coloured flowers, variegated with streaks of pale red. 10. The short-leaved pointed *polygala*. 11. The little mountain myrtle leaved *polygala*. 12. The shrubby Portugal *milkwort*, with very small leaves, and large flowers. 13. The greater African narrow-leaved shrubby *polygala*. 14. The lesser African shrub-*polygala*, with very narrow leaves. 15. The flax-leaved American *polygala*, with very large flowers. 16. The box-leaved shrubby African *polygala*, with very large flowers. 17. The box-leaved shrubby *polygala*, with yellow flowers. 18. The box-leaved shrubby *milkwort*, with purplish red flowers. *Tourn.* Inst. p. 147.

The virtues of this plant have been very happily enquired into by the gentlemen of the royal academy of sciences at Paris, on occasion of the trials they made of the virtues of the Senekka rattle-snake root, recommended by Dr. Tennent; and their judging, that as his was the root of a species of *polygala* or *milkwort*, the roots of our common *polygala* might possibly have the same effects.

Dr. Tennent gives his rattle-snake root, or Virginian *polygala*, in the dose of thirty-five grains in substance, or in three or four ounces of a strong infusion, or in a yet stronger, in a proportionably smaller dose. The effects of this root being found very great, it was supposed that its place might possibly be supplied by this species of our own growth. It is very certain, that the place of growth may, in some plants, make a very great alteration in their virtues; and that the different species of the same genus may, in other instances, produce different effects in the human body, some species of plants agreeing in their external forms and generical characters, while they differ in their virtues and qualities.

There appeared on trial a considerable difference to the taste between the American and the European *polygala*-roots, that of Virginia being very aromatic, acrid, and bitter, and the European only slightly acrid, with a very feeble bitterness. Another thing that gave great suspicion as to the parallel virtues of the roots of these two species was, that Gesner was found, in his account of the virtues of the European *polygala*, to call it a very brisk cathartic; a quality which might render its use very improper in many of the diseases in which Mr. Lemery and Jussieu found the Virginian kind to prove a serviceable medicine. This last was found always very speedily to allay fevers of the pleuretic kind, without increasing in any great degree the discharges by stool.

The roots of the European *polygala* being very small and slender, gave also some trouble as to the procuring them in sufficient quantity; and in hopes it might become a general medicine, it was determined to try the effects of the whole plant, root, leaf, and branch, in the disease in which the Virginian kind had been given with the greatest success, that is, in pleurisies; and this was accordingly fairly tried.

The principal instances of their trials were two; the first to a woman of twenty-two years old, who had a violent fever, with a sizy blood, and pain in the side. She was twice blooded, and had immediate but not lasting relief from it, and was ordered the common ptisans given on these occasions. The malady increased, and the expectoration was but small, and that of a thick yellow matter: a third bleeding finally was judged necessary, but was of no more service than the others; and after this she had the same ptisan continued, but with the addition of a large quantity of the common European *polygala*, stalk, root, and leaf. This took place in two or three hours, the expectoration became vastly plentiful, and the matter thin and white from being thick and yellow. The woman, in fine, was cured, and the medicine was not observed to occasion any nausea, nor did it prove, as supposed, a violent purge.

The second instance was in a man of a stout robust habit, and of twenty-five years of age. He was violently attacked with a pleurisy, he was bled seven times, and was brought into one of the hospitals delirious, and seemingly very near death: he was there blooded in the foot, which restored his senses; and he took a large quantity of the decoction of the *polygala*, which caused him to expectorate in great abundance. The matter was first blackish, then reddish, and finally white, and the patient was perfectly cured. Mem. Acad. Scien. Par. 1739.

These are such remarkable instances of the good effect of an herb to be had every where in our own country, that they seemed very worthy to be recorded. The plant grows with us on dry grounds and heaths, and is about four inches long, not erect, but trailing upon the ground: the leaves are long and narrow, of a pale green, and the flowers are large and look beautiful: they stand in spikes, and are usually blue; but very often white, and sometimes red. The herb should be pulled up root and all for drying.

POLYGAMIA, in botany, a class of plants, which have a diversity of combinations of the male and female parts of their flowers, and many ways of fructification in the same species; some having male flowers, others female, each distinct and perfect in its kind; and others mixed, or hermaphrodite, with both male and female organs of fructification in each. See Tab. 1. of Botany, Class 1.

The word is formed of the Greek πολυς, many, and γαμος, marriage.

Among the plants of this class are the orach, pellitory of the wall, the ash, &c.

POLYGAMY, (*Cycl.*) is the marriage of one man to more than one wife, or the marriage of one woman to more than one husband.

The last of these is the greater crime, as being most incompatible with the being of society, and might therefore be punished with greater severity.

It has been much disputed among the Doctors of the civil law, whether *polygamy* be adultery. In the Roman law it is called *stuprum*, and punished as such, that is, in some cases, capitally. See STUPRUM. But a smaller punishment is more consistent with the Jewish law, wherein the prohibition of adultery was perpetual, but that of *polygamy* temporary only. See Selden, L. 1. c. 9. de uxore Hebraica.

In Germany, Holland, and Spain, this offence is differently punished. By a constitution of Charles V. it was a capital crime. In England it is felony, by stat. Jac. 1. but with benefit of clergy. In Scotland it is punished as perjury. See the article BIGAMY.

POLYGLOTTA *avis*, in zoology, the name of a bird described by Nieremberg, and which, he says, he saw and heard with admiration, singing in all tones. It is of the size of our starling.

Its back is brown, and its breast and belly white; and near the neck and tail it is variegated with spots and streaks of white. Its head has a streak of white, which represents a sort of crown of silver. It is mightily esteemed, and kept in cages by the Spaniards, as infinitely superior to all other birds in melody. It feeds on almost any thing that is given it, and is most fond of the warmer climates; but endures the more temperate ones without harm. *Ray*'s Ornithology, p. 305.

POLYGONATUM, *Solomon's ſeal*, in botany, the name of a genus of plants, the characters of which are, that the flower conſiſts of one leaf, formed in the ſhape of a bell; but having a long tube, having no cup, and being divided into ſeveral ſegments at the end. From the bottom of this flower riſes a piſtil, which ripens into a ſoft roundiſh fruit, which contains a great number of roundiſh ſeeds.

There are a great many ſpecies of this plant 1. The common broad-leaved one. 2. The red ſtalked broad-leaved one. 3. The great broad leaved one. 4. The white hellebore-leaved one. 5. The red-ſtalked white hellebore-leaved one. 6. The large ſweet-flowered one. 7. The double-flowered ſweet broad-leaved one. 8. The little broad-leaved one, with large flowers. 9. The low Engliſh ſingle-ſtalked kind. 10. The narrow-leaved ſingle-ſtalked kind. 11. The narrow-leaved branched kind. And, 12. The climbing American kind. *Tourn.* Inſt. p. 78.

The root of *Solomon's ſeal* is a vulnerary of the very firſt rank; it is famous in bruiſes for taking away the marks, and for healing up freſh wounds; in both which caſes, it is applied in form of a pultice. It has alſo been greatly celebrated in the cure of hernias, and for aſſiſting in forming a callus in broken bones.

POLYGONUM, *knot graſs*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the apetalous kind, being compoſed only of a number of ſtamina ariſing from a funnel-ſhaped cup, divided into many ſegments at the edge. The piſtil finally becomes a triangular ſeed, which is covered by a capſule that was originally the cup of the flower. To this it is to be added, that the flowers grow in the alæ of the leaves, and that the roots are fibrous.

The ſpecies of *knotgraſs*, enumerated by Mr. Tournefort, are theſe: 1. The common broad leaved *knotgraſs*. 2. The white-flowered broad-leaved *knotgraſs*. 3. The long and narrow-leaved *knotgraſs*. 4. The ſhort and narrow-leaved *knotgraſs*. 5. The ſtone-*knotgraſs*. 6. The great *knotgraſs*, with long ſtalks and long leaves. 7. The broad-leaved ſea-*knotgraſs*. 8. The broad-leaved white flowered ſea-*knotgraſs*. 9. The Spaniſh ſea-*knotgraſs*, with very long ſtalks, and white flower-cups. 10. The broad-leaved ſhrub ſea-*knotgraſs*. 11. The round-leaved creeping Portugal ſea-*knotgraſs*. 12. The little hoary, ſea-*knotgraſs*. *Tourn.* Inſt. p. 510.

The antients as well as moderns have deſcribed the common kinds of *knotgraſs* under the name *polygonum*; but as they have alſo given the ſame appellation to another plant, much error has ariſen by miſtaking theſe ſynonyms. Pliny began the miſtake, and others have ſince in great numbers fallen into it, and thought Pliny's example a ſufficient excuſe.

The word *polygonum* being formed of the Greek πολὺς, many, and γονυ, joint, or knot, ſignified properly any plant that had ſeveral joints or knots. It was originally given to the *knotgraſs* very properly, ſcarce any plant having more joints; but it was afterwards given alſo to a kind of equiſetum or horſe-tail.

The deſcription of this was, that the ſtalks were hollow; the branches long, ſlender, and reſembling ruſhes, or the twigs of the broom, but without any leaves; and that they were ſo brittle, that they could not be uſed as wyths, to bind things with, which ſeems to have been a uſe the common *knotgraſs* was very frequently put to, and for which it was found very proper, becauſe of the toughneſs of its branches. This kind of *polygonum* of the antients is ſaid to grow in woods, at the roots of trees, as the horſe-tails of ſeveral kinds do at this time; and tho' the deſcriptions of this and the other *polygonum* are ſo extremely different, this having no leaves, and the other being deſcribed by all to have ſmall, oval, and pointed leaves, yet Pliny has confounded the two plants together, becauſe both called by the ſame name; and has formed out of the deſcription of different authors of theſe different plants, one general account, which he gives under the head of *polygonum*, and which can ſerve no plant at all. He ſays, it grows at the roots of trees, and climbs up them; and that it has long, ruſh-like, and brittle ſtalks, beſet with ſmall oval leaves. He even compares the branches to the hairs of a horſe's tail, and yet did not find out at the time, that he was blending the deſcription of the hippuris, or horſe-tail, called by ſome the *female polygonum*, with the common *knotgraſs*, or *polygonum* originally ſo called; a plant as different from it as one plant can well be from another. *Pliny*, l. 26. c. 13.

The common great *knotgraſs* is eſteemed a very powerful aſtringent. It is generally uſed in infuſion, and is ſaid to have great virtue in ſtopping hæmorrhages of all kinds. *Dale* Pharm.

POLYGRAM, in geometry, a figure conſiſting of many lines.

POLYHEDROUS *figure*, in geometry, a ſolid contained under, or conſiſting of many ſides. See POLYHEDRON, *Cycl.*

POLYHISTOR, is uſed for a perſon of great and various erudition. See POLYMATHIA, *Cycl.*

POLYMORPHOS, variouſly ſhaped, an epithet often given to the os ſphenoides.

POLYNOMIAL *(Cycl.)*—To raiſe a *polynomial* to any given power, may be done by Sir Iſaac Newton's binomial theorem. Among other methods of demonſtrating this, we have one by Signior Caſtillioni in the philoſophical tranſactions, numb. 464.

POLYOSTEON, a name given by authors to that part of the foot which conſiſts of a great many bones.

POLYPE, or POLYPUS, in zoology, a ſmall freſh water inſect, which, when cut into a number of ſeparate pieces, becomes in a day or two ſo many diſtinct and ſeparate animals; each piece having the ſurprizing property of producing a head and tail, and the other organs neceſſary for life, and all the animal functions. See Tab. of microſcopical Objects, Claſs 1.

The firſt diſcovery of this animal was owing to Mr. Leuwenhoek, who, in the year 1703, preſented to the royal ſociety of London, a deſcription of it, and an account of its uncommon way of producing its young: but the diſcovery of its amazing property of reproducing the ſeveral organs from its various pieces, was not made till the year 1739, by Mr. Trembley, at the Hague.

The production of its young is, indeed, different from the common courſe of nature in other animals; for the young one iſſues out from the ſide of its parent, in form of a ſmall pimple or protuberance, which lengthening and enlarging every hour, becomes, in about two days, a perfect animal, and drops from off its parent to ſhift for itſelf: but before it does this, it has often another growing from its ſide; and ſometimes a third from it, even before the firſt is ſeparated from its parent. They breed quicker in hot than in cold weather; and what is very extraordinary is, that there never has yet been diſcovered among them any diſtinction of ſex, or appearance of copulation; every individual of the whole ſpecies being prolific, and that as much if kept ſeparate, as if ſuffered to live among others.

If the method of this little animal's producing its young be very amazing, its reproduction of the ſeveral parts, when cut off, is much more ſo. The diſcovery of this was perfectly accidental; for Mr. Trembley, who had often met with the creature in the water, and from its fixed reſidence in one place, and ſome other obſervations, not being able to determine whether it were an animal or a vegetable, made the trial by cutting it aſunder, when, to his amazement, he found, that in a few days each of theſe pieces was become a perfect animal, the head part having ſhot forth a tail, and the tail a head. A thouſand other trials, by cutting the animal in different manners, firſt by Mr. Trembley, and afterwards, at his requeſt, by Monſ. Reaumur at Paris, and Mr. Folkes, Mr. Baker, and the other naturaliſts in England, were the reſult of this; and all ſucceeded in the ſame manner, by whoever they were tried.

It is not eaſy to ſay what is the ſize of this creature; for it can contract or extend its body at pleaſure from the length of an inch or more, and the thickneſs of a hog's briſtle, to the ſhortneſs of a ſingle line, with a proportionable increaſe of thickneſs. Its body is round and tubular, at one end of which is the head, ſurrounded with ſix, eight, ten or more arms, with which it catches its prey; and at the other, the anus and tail, by which it fixes itſelf to any thing it pleaſes.

There have been many different ſpecies of it diſcovered, the moſt elegant of which, the *polype a panache*, or plumed *polype*, of Mr. Trembley, ſeems much to reſemble the wheel-animal (ſo called from having the appearance of two wheels in its head) which Mr. Leuwenhoek diſcovered living in a ſheath or caſe, and affixed to the roots of duckweed.

All the ſpecies are found in clear and ſlowly running waters, adhering by the tail to ſticks, ſtones, and water-plants, and live on ſmall inſects. They are eaſily kept alive a long time in glaſſes, often changing the water, keeping the glaſſes clean, and feeding them with a ſmall red worm, common in the mud of the Thames, or with other ſmall inſects.

The creature has its name from the Greek πολὺς, many, and πὲς, a foot, ſignifying an animal with many feet; but a more appoſite one might eaſily have been invented, ſince it has in reality no feet at all. What were originally taken for feet, are what have ſince been called its horns, and of late more properly its arms, their office being to catch its prey.

The ſeveral ſtrange properties recorded of this animal, tho' very ſurpriſing, are, however, none of them peculiar to it alone. The Surinam toad is well known to produce its young not in the ordinary way, but in cells upon its back. Mr. Sherwood has very lately diſcovered the ſmall eels in ſour paſte to be each, without exception, full of living young ones. And as to the moſt amazing of all its properties, the reproduction of its parts, we know the crab and lobſter, if a leg be broken off, always produce a new one: and Mr. Bonet, Mr. Lyonet, Monſ de Reaumur, and Mr. Folkes, have all found on experiment, that ſeveral earth and water worms have the ſame property, ſome of them even when cut into thirty pieces. The *urtica marina*, or ſea-nettle, has been alſo found to have the ſame: and the ſea-ſtar-fiſh, of which the *polype* is truly a ſpecies, tho' it had long eſcaped the ſearches of the naturaliſts, was always well known by the fiſhermen to have it alſo.

Cluſter

Cluſter-POLYPE, the name of a ſpecies of ſmall inſect of the *polype* kind, called by the French naturaliſts *polype a bouquet*.

There is found on ſeveral of the water-plants, and on other ſubſtances, as ſticks, boards, and the like, accidentally fallen into the water, a whitiſh ſubſtance that at firſt ſight appears to be only a ſort of mouldyneſs; but if the bodies on which this is found, be put into a veſſel of clear water, and the matter examined with a magnifying glaſs, it is ſoon ſeen that this whitiſh ſubſtance is really a vaſt number of ſmall animals, which are almoſt continually in motion. When this is brought before the microſcope, the form and ſtructure of the creatures is very evidently diſtinguiſhed, and they are found to be minute roundiſh creatures, ſeverally affixed to the end of a ſort of ſtem or tail; and many of the ſtems are ſo interwoven and united together, that they form *cluſters*, which have occaſioned the name of the *cluſter-polype* to be given to the animal, tho' in itſelf it is really and properly ſingle from the beginning. There are ſeveral ſpecies of *polype* of this minute kind, that *cluſter* themſelves in this manner together; and according to theſe and other circumſtances, the *cluſters* are found larger or ſmaller, and more or leſs complex. Phil. Tranſ. N° 474. p. 171.

The ſmaller *cluſters* ſhould always be choſen for obſervation, as in the larger the bodies of the ſeveral animals that compoſe them are apt to hide and obſcure one another; but the moſt beautiful and accurate of all obſervations is to be formed when they are ſingle, as they are ſometimes found; and this is the only opportunity of ſeeing diſtinctly in what manner the *cluſters* are formed.

One of theſe ſingle animals is not in length above the 240th part of an inch, and is of a ſhape nearly reſembling that of a bell: the anterior part of this generally appears open when it preſents itſelf properly; and the poſterior part is fixed to the ſtem or pedicle, by the other extremity of which the creature faſtens itſelf to any ſolid body that it meets with. The body is of a browniſh colour, except at the ſmaller end, which as well as the tail is whitiſh and tranſparent; and when the anterior part is open, there may always be perceived about its edges, a very lively motion; and when the creature preſents itſelf in a better manner, there may be ſeen on either ſide of the edges of the anterior part, ſomewhat reſembling the wheels of a mill, continually moving with great velocity.

Theſe creatures are able to contract their bodies, and often do it very ſuddenly, eſpecially if any thing diſturb the ſubſtance on which they are fixed: when they are thus contracted, the edges of their anterior parts are drawn juſt into their bodies; and when the fright is over, it is a very agreeable ſight to behold theſe edges turning out again, and putting themſelves in motion as before. If the edges of the anterior parts of the bodies of theſe animals be ſtrictly obſerved while in motion, the water about them will be found to be full of extremely minute round bodies which are brought together by means of that motion, and ſerve the creature for its food: theſe may be often ſeen going down into the cavities of the body of the *polype*, and that very ſuddenly, as if forcibly driven down; and when ſwallowed too voraciouſly, are often thrown up again. Theſe obſervations are beſt made when a ſmall *cluſter* of the *polypes* are examined together.

If theſe *polypes* are kept ſome time in the rain-water, they by degrees loſe their brown colour, and become white and tranſparent throughout, except that a few ſpots of a duſky colour remain in their bodies; but if after this they are removed into other water of the ſame kind with the firſt, but newly taken out of the ditch, they in a little time recover their brown colour. When they become white, they plainly appear to be in a ſickly condition, and ceaſe to multiply; but when they have freſh water and recover their colour, they immediately begin to multiply again.

Theſe creatures are not abſolutely and immoveably fixed to the bodies on which they are placed, but they can at pleaſure quit them and ſwim about: in this ſwimming ſtate they are always found ſingle and not in *cluſters*; and they do not then appear in the ſame form as when they are fixed and open at their anterior ends. When they have ſwam about as long as they pleaſe, they either return to their *cluſters* from which they ſeparated themſelves, or affix each ſingly to any thing they meet with: and this is a circumſtance that merits to be carefully watched, becauſe it is by means of this that we ſee in what manner the creature multiplies itſelf, and the *cluſters* are formed.

As ſoon as a ſingle animal of this kind is fixed to a ſtick, a ſtone, or any other ſubſtance, it begins to lengthen its ſtem or tail, which tho' very ſhort while ſwimming, and when firſt fixed, very ſoon becomes of its priſtine length while in the *cluſter*; and after this the creature begins immediately to multiply by the moſt amazing means in the world; that is, by ſpliting itſelf to pieces lengthways. The firſt motion towards this operation is the drawing in the lips or edges; this is ſoon done, and the body then loſes its bell-like ſhape, and becomes round; the motion which was before perceived at the edges ceaſes, and there is only a ſlight tremulation to be ſeen within the body; after this the anterior part of the body becomes flat and broad, and the whole body ſhortens in proportion; and ſoon after this the whole body gradually ſplits itſelf regularly into two, from the center of the anterior part to the center of the hinder end, where it joins the tail or pedicle, and there ſoon appear two round and perfect bodies joined to that pedicle which before ſupported only one. The anterior parts of the two bodies ſoon begin to open, and gradually ſhew their edges, which perform the ſame motion the ſingle one did before. The motion is at firſt very ſlow, but it grows quicker by degrees as they open; and when they are perfectly expanded, it is as quick as it was in the original ſingle body: it is at this time that the two bodies may be eſteemed quite perfect. They are at firſt indeed leſs than the original *polype*, from which they were formed, but they grow to the ſame ſize in a very little time: the whole operation of dividing itſelf, takes up the creature about an hour; but to form a true idea of the manner in which it is performed, there muſt be many obſervations made, and the creatures muſt be examined in all views and lights while about it.

The lips of theſe *polypes*, when cloſely examined, appear to be compoſed of four or five tranſparent bands, all which have an undulatory motion. And when the newly divided *polype* is but ſlow in its motions, it is eaſy to diſcover that what afterwards appear to be like the wheels of a mill, are, in reality, only four or five oblong bodies, reſembling a ſort of fingers which alternately bend down, and extend themſelves every inſtant. Theſe are faſtened to the bands of the lips on each ſide of the mouth; and when they are put into ſwift motion in the time of the full growth and vigour of the animal, they are not to be diſtinguiſhed, as to form, nor can their motion be otherwiſe diſcovered than by its ſwiftneſs, which makes it reſemble the quick turning of a wheel.

When the ſeparation of the body of a ſingle *polype* of this kind is compleat, one ſees two regular and perfect bodies adhering ſide by ſide to the ſame pedicle, but ſoon after each of the new formed bodies begins to ſhew a pedicle of its own; theſe grow in a day's time to a moderate length, and unite at their bottoms to the end of what was the original ſingle pedicle of the body while but one; they grow to this in the manner of the branches growing to the trunk of a tree. Twenty-four hours after the ſeparation of the original body into two, theſe two begin to ſeparate themſelves in the ſame manner, each into two again; and theſe after a like time again ſeparate: each of theſe ſeparated animals has its own tail formed in a like period of time with the firſt; and the conſequence is, that the firſt ſeparation producing two, the ſecond gives four, the third eight, and ſo the ſixth ſixty-four, the ſeventh 128, and ſo on; by which means a ſingle animal, in a very few days, forms out of itſelf an immenſe *cluſter*; each animal of which is perfect in itſelf, and independent of all the reſt, and can, when it pleaſes, ſwim away and form a new *cluſter*. They will multiply as faſt in glaſs jars, as in their native free ſtate in the waters, and *cluſters* of them, begun near one another, will often join in ſuch a manner as to form one complex *cluſter* of an inch diameter: from theſe ſeveral *cluſters* there detach themſelves ſingle *polypes* from time to time, which go off and faſtening themſelves to other bodies, become the authors of new progenies. Phil. Tranſ. N° 474. p. 175.

The original branch or ſtem of the firſt *polype*, remains always in the center of the *cluſter*; but it is of no uſe, never afterwards having any body fixed to it.

There are, beſide this ſpecies here deſcribed, four other known kinds of *polypes*, which divide themſelves in the ſame manner by ſpliting into two lengthwiſe: thoſe which come neareſt to the firſt are ſlenderer, and their ſtems are more tranſparent. They are of a bluiſh colour, when many of them are ſeen together, and their ſtems or tails very aptly reſemble ſpun glaſs. When this ſpecies is perfectly formed, the motion of its lips is leſs diſtinct than in the other; but it may be diſcovered in the ſame manner while they are newly ſeparated and are but growing toward perfection, when it gradually becomes leſs and leſs diſtinct.

Another ſpecies of theſe *polypes* is ſmaller than the laſt, but more open at the mouth and deeper hollowed; and theſe are particularly diſtinguiſhed from all the others, by having a motion in their ſtems and branches, which all the others want. The ſtems draw themſelves up, and ſhorten all at once into the appearance of a ſpiral ſcrew, and in a moment can dart themſelves ſtrait out to their full length again. All theſe multiply very ſpeedily, but they have all enemies that deſtroy them in a very terrible manner, whole *cluſters* making but ſingle mouthfuls. The *funnel-polypes* are nearly allied to theſe creatures. Phil. Tranſ. N° 474. p. 180.

Funnel-POLYPE, a name given by naturaliſts to a ſmall water-inſect, in ſome reſpects approaching to the nature of the cluſter-*polype*. See *Cluſter* POLYPE, ſupra.

The *funnel polype* nearly reſembles a funnel, from which it has its name. It is long and hollow, and very wide at the anterior end. Theſe little animals are of three ſpecies, a green, a blue, and a white one: they are all too minute for the obſervation of the naked eye, and muſt be viewed with great caution, and in ſeveral different directions and attitudes, before their true form can be diſcovered; and their anterior end, particularly, when carefully obſerved, is of a much more

compound ſtructure than might at firſt be imagined; there may always be obſerved, round the edges of this part, a ſenſible motion, reſembling that of an indented wheel, or rather that of a ſcrew turned very nimbly about. Theſe, tho' they approach to the ſhape of the cluſter-*polypes*, and reſemble them in their having this motion about their mouths, yet never have any tendency to form cluſters, but are ever found looſe and ſingle. There are always a number of little round bodies, which ſeem to be animals of a very minute ſize ſwimming about in the water in which theſe *polypes* live; and theſe are continually drawn into the mouths of the *polypes*, and ſerve them for food.

The manner of theſe creatures propagating themſelves, is very amazing; they do it by dividing their own body into two; but this is not done longitudinally, as in the cluſter-*polypes*, nor tranſverſely, but diagonally from the edge of the head to the oppoſite edge of the tail; ſo that of the two thus formed out of one, the one has a head and no tail, the other a tail and no head; but theſe deficiencies are ſoon made up, and the head ſoon grows out of one, and the tail out of the other.

Mr. Trembley, in his account of this inſect, calls that of the two which has the old head, the ſuperior *polype*; that which has the old tail the inferior. The firſt particulars obſervable in a *funnel-polype* that is going to divide, are the lips of the inferior *polype*, or thoſe tranſparent edges that are ſo very conſpicuous in the creature when perfectly formed. Theſe new lips firſt diſcover themſelves upon the *polype* that is going to divide, from a little below the old lips to about two thirds of the length of the *polype*, reckoning from the head: but theſe new lips are not diſpoſed in a ſtrait line, according to the length of the *polype*, but run ſloping near half way round about. Theſe lips are diſtinguiſhed by their motion; but it is to be obſerved, that this motion is at firſt very ſlow, and requires an attentive eye and good glaſſes to diſcover it. Phil. Tranſ. N° 474. p. 180.

That portion of the body of the *polype*, which is bounded by theſe new lips, then gathers up itſelf, and theſe lips inſenſibly draw cloſe together, and finally they cloſe themſelves. By this means there is formed a ſwelling at the ſide of the *polype*, which is found, on a cloſe examination, to be the head of the new *polype*, bounded by the lips before-mentioned. Before this ſwelling is become very remarkable, it is eaſy to diſcover the true *polypes* that are forming themſelves; and after this, when the ſwelling is greatly increaſed, theſe two diſtinct animals will be found joined to one another only by a very ſmall part of their bodies. The ſuperior *polype*, in this caſe, no longer adheres to the inferior one but by its poſterior extremity, which is ſtill fixed on one ſide of the inferior one. The ſuperior one then begins to make motions, which tend to the ſeparating itſelf from its fellow; and theſe ſoon finiſh the work, and he becomes perfectly diſengaged, and ſwims away whither he pleaſes, and ſoon fixes on ſome other place. The inferior *polype* remains fixed in the place where both were before, and becomes a perfect animal; and the ſuperior one, after taking a tour in the water, ſometimes returns to the old place, and fixes himſelf by the tail to the body of the inferior one. All theſe animals are extremely minute, and are not to be ſeen diſtinctly, much leſs are their operations obſerved without the help of glaſſes; and as there is no taking them out of the water to bring them before the microſcope in the common way, without abſolutely deſtroying them, Mr. Trembley, who has obſerved them with more accuracy, than perhaps any other perſon ever did, has contrived to view them in a glaſs veſſel, in their own water, by bringing them ſo near the ſides of the glaſſes, that the microſcope glaſſes are able to reach them properly from the outſide. The ſubſtances on which they are fixed, are to be brought cloſe to the edges of the veſſel, by means of a ſet of quills framed properly together; and the microſcope glaſſes to be ſupported on a moveable arm made for that purpoſe. Phil. Tranſ. N° 474. p. 183.

Ver-POLYPE. See VER-*Polype*.

POLYPODES, a word uſed by ſome as a name for the millepedes.

POLYPODITES, a name given by the antients to a wine impregnated with polypody, and ſometimes for the juice of millepedes, expreſſed with wine.

POLYPODIUM, *polypody*, in the Linnæan ſyſtem of botany, the name of a genus of the capillary plants, comprehending the *polypodium* and *lonchitis* of Tournefort; the *lonchitis* of Linnæus being a very different genus of plants. The character of the *polypodium* is, that the fructifications are diſpoſed in round ſpots on the under part of the diſk of the leaf.

The characters of this genus, according to Mr. Tournefort, are theſe: The flowers are not diſcovered, but the ſeeds grow on the back of the leaf: theſe are contained in membranaceous capſules, of a roundiſh figure, which are placed together in cluſters, and have nothing round them, as thoſe of the trichomanes have, but are left to be burſt by the contraction of their own fibres.

The *polypodies* are not branched, but conſiſt of ſingle leaves, divided almoſt to the middle rib into oblong jags or ſegments.

The ſpecies of *polypody*, enumerated by Mr. Tournefort, are theſe: 1. The common *polypody*. 2. The common great *polypody*, with ſerrated leaves. 3. The leſſer *polypody*. 4. The large *polypody*, with pointed leaves. 5. The broad thin-leaved *polypody*, called by Muntingius, and others, ſenſitive *polypody*. 6. The narrow-leaved *polypody*, commonly called *lonchitis aſpera*, and rough *ſpleenwort*. 7. The Welch *polypody*, with leaves jagged at the edges of the pinnules. 8. The finely divided African *polypody*. 9. The great golden *polypody*. 10. The *polypody* with ſlender creeping roots. 11. The finely divided black *polypody*. 12. The *polypody* with leaves like the aſplenium. 13. The thin-leaved pendulous *polypody*. 14. The *polypody* with pointed and rigid pinnules. 15. The pendulous *polypody*, with a reddiſh hairy down. 16. The ſmooth pendulous *polypody*. 17. The leaſt pendulous *polypody*. 18. The curled *polypody*, reſembling the oſtrich's feathers. 19. The rough dentated *polypody*. 20. The ſlender undulated *polypody*. 21. The curled *polypody*, with cups. 22. The ſweet *polypody*, with the taſte of liquorice. 23. The *polypody* covered with ſilvery ſcales. 24. The brown finely ſerrated *polypody*. 25. The pellucid *polypody*. 26. The *polypody* with bluiſh punctated roots. *Tourn.* Inſt. p. 540.

The common *polypody* is the kind uſed in medicine; it is uſually found about the roots of old trees, in woods, and by hollow road ſides. There is a vulgar opinion, that ſuch of it as grows upon the ſtump of an oak, is preferable to what grows on any other tree; but there is no foundation for this.

The root is the part uſed in medicine; it is a gentle cathartic, and is particularly recommended in diſorders ariſing from obſtructions of the liver and ſpleen. It is by many eſteemed an excellent medicine in ſcorbutic and hypocondriac complaints. The country people take it in infuſion alone, but phyſicians uſually preſcribe it in compound decoctions and medicated ales. It has alſo been made an ingredient in many of the purging electuaries in the old diſpenſatories.

POLYPOSIA, a term uſed by the antients to expreſs a copious drinking of wine.

POLYPUS (*Cycl.*)—POLYPUS, the *polype*, in zoology. See the article POLYPE.

POLYPUS, in natural hiſtory, a name given by ſome of the earlier writers to the thin-ſhelled nautilus, or nautilus papyraceus. The body and arms of this creature ſomewhat reſembling thoſe of the polype, it was ſuppoſed to be a ſpecies of polype incloſed in a ſhell, which it could quit occaſionally, and go on ſhore to feed.

POLYPUS, in medicine.—Mr. Le Dran cured a *polypus* of the noſe, which he could not extract wholly, in the following manner, which may be practiſed for deſtroying all ſuch exceſcences. He introduced one end of a large ſeton, put on the point of the fore-finger of the left hand, into the patient's mouth, till he brought it behind the velum pendulum; then ſliding a pair of thin crooked forceps into the affected noſtril, he catched hold of the ſeton, after covering what was to be introduced into the noſe with a ſuppurant medicine. While he drew the cord, he endeavoured to preſerve the velum pendulum from being hurt, by introducing his finger into the mouth, and ſupporting the cord upon it. He continued the ſuppurant till he was ſenſible, by the patient's breathing freely through the noſtril, that the remains of the *polypus* was deſtroyed, and then he injected deſiccatives to cauterize the ulcer. *Le Dran*, Tom. 1. obſ. 6. ap. Med. Eſſ. Edinb.

Though Kerkringius, and others, have endeavoured to explode the notion of the formation of true *polypi* in the heart and blood veſſels, yet Malpighi, Bartholine, Tulpius, Pecklin, and others, have given us inconteſtable inſtances of the exiſtence of true *polypi* in the heart, in the ſtricteſt ſenſe; and we have three unqueſtionable evidences of the like nature, in Phil. Tranſ. N° 464. Sect. 6.

POLYSACTINODOS, in natural hiſtory, a name given by Linkius, and ſome other authors, to thoſe ſtar-fiſh whoſe body is divided into more than five rays, that being the more uſual and general number.

POLYSCHIDES *fucus*, a ſea-plant, called in Engliſh *ſea-hanger*. It is one of the largeſt ſea-plants we know, growing often to ten foot or more in length. Its root is not flat in the manner of moſt of the other ſea-plants, but is compoſed of ſeveral little hooks, all which lay faſt hold of the ſtone on which it grows: theſe, in ſome meaſure, reſemble the tendrils of the vine, and are ſomewhat broad and flatted at the end, where they are faſtened to the ſtone, tho' round elſewhere, and are about half an inch long: theſe hooks grow from a broad flattiſh part at the bottom of the ſtalk, which is often four or five inches in diameter, and is uſually hollow, being compoſed only of two membranes conſiderably tough and firm, with a cavity between them; from the center of this riſes the ſtalk, which is often twiſted and undulated at the edges; from the top of this ſtalk grows the leaf, which is divided into eight or ten ſegments; each of which is often again divided into two. Theſe ſegments are very long; and as the plant floats in the water, give it much of the appearance of a broad piece of leather cut into ſeveral thongs: theſe all terminate in ſharp points, and their colour is a browniſh green. The niceſt eye cannot diſtinguiſh the leaſt nerve or fibre, either in the ſtalk or leaf of this plant; but on great numbers of theſe plants, that curious enquirer Mr. Reaumur, found flowers of the ſame kind with thoſe which he originally diſcovered on the

the common fences: they are compoſed of ſlender filaments, not exceeding the twentieth part of an inch in length; and theſe were the more eaſy to be overlooked, as they are of the ſame colour with the leaves of the plant. Thoſe plants on which Mr. Reaumur found theſe flowers, were not, however, entirely covered with them, but they ſtood at about a twelfth of an inch diſtance from one another: it was in the month of July that Mr. Reaumur examined this plant; and at that time there were no ſeeds diſcoverable upon it; but doubtleſs at a proper ſeaſon, and with proper care in the obſerver, they will hereafter be diſcovered as plainly in this as in many other of the ſea-plants, uſually ſuppoſed by authors to have wanted them. Mem. Acad. Par. 1712.

POLYTHALAMIUM, in natural hiſtory, a name by which ſome authors have called the *tubuli marini concamerati*, a ſort of ſea-ſhell found frequently foſſile, with other ſhells, in Sweden, and brought over to us in the ſtones uſed for pavements, but not known in its recent ſtate.

It is of the ſame general ſtructure with the cornu ammonis, and thick nautilus, being compoſed of ſeveral cells or cavities, communicating with one another, by means of a ſiphunculus or pipe; but it is uſually ſtrait, tho' ſometimes its end is twiſted exactly in the manner of the cornu ammonis.

POLYTHALAMIUS, in natural hiſtory, a term invented by Breynius, to expreſs a claſs of ſhells, the character of which is, that they are hollow, ſhelly bodies, either ſtrait or regularly twiſted into a ſpiral form, always wide at the mouth, and growing narrower to the other extremity; they are divided within into ſeveral cells or chambers, which are called *thalami*, each ſeparated from the other by a diaphragm, or partition of ſhelly matter. The upper or largeſt chamber, contains the body of the animal, but all the others are perforated by a ſiphunculus, which gives them communication one with another, and which runs from the mouth to the very apex, growing ſlenderer all the way.

Of this claſs he diſtinguiſhes four genera, the orthoceros, lituus, ammonites, and nautilus, each of which ſee under their ſeveral heads. The two laſt of theſe, he obſerves, have been long well known to the world; the two firſt he gives as new, and of his own diſcovery.

Of the orthoceratitæ, which are ſtones caſt in the ſhells of the orthoceros, there are at preſent diſtinguiſhed nine kinds: theſe differ from one another principally in the poſition of the ſiphunculus, or in their external form; the cone which they deſcribe, running quicker or more gradually to a point; or, finally, by the thalami or chambers being wider or narrower. *Breynius* de Polythalam.

POLYTHRIX, the *hair-ſtone*, a name given by ſome writers to thoſe German agates which have received into their maſs, while yet ſoft, either the branches of the confervæ, or other capillary water-plants, or elſe have thin ſtreaks of a coarſer matter frequent in them, and running in the form of hairs.

POLYTRICHUM, in botany, the name of a genus of moſſes, the characters of which are theſe: The ſtalks are not much branched, and the capſules have calyptræ to cover them till mature. This calyptra is always hairy, and in many of the ſpecies is compoſed merely of long hairs, ranged lengthwiſe together, without any membrane; the others have membranaceous calyptræ, but covered with erect hairs. The leaves of thoſe kinds are rigid, and have a membranaceous appendage, by which they touch the ſtalks and ſurround them; thoſe of the others are ſofter, and have not this appendage. The baſis of the pedicle which ſupports the head, is alſo in theſe ſurrounded by a ſort of tube, round which there ſtand a number of membranaceous leaves; this is more viſible in the larger than in the ſmaller ſpecies. The capſules in ſome of theſe moſſes are ſquare, in others they are roundiſh; and the ſquare ones have uſually an apophyſis, by which they are joined to the pedicle, which the round ones never have, or at leaſt very ſeldom. See Tab. of Moſſes, N° 12.

The *polytrichum* of the firſt order, are thoſe which have ſquare capſules, which are joined to the pedicles by a round apophyſis; of theſe the following are all the known ſpecies: 1. The common large, ſquare-headed, great-leaved *polytrichum*, or great goldilocks. This is very common in woods, in boggy places, and on heaths. 2. The leſſer and ſtiffer ſquare-headed juniper-leaved heath-*polytrichum*. The leaves of this are ſhort, and the whole plant much ſmaller than the former. It is very common on heaths. 3. The ſmall hairy ſquare-headed *polytrichum*; the leaves of this are of a bluiſh green in winter, and of a reddiſh brown in ſummer. It grows in dry barren places.

The ſecond order of the *polytrichum* comprehends thoſe which have round capſules, and uſually want the apophyſis, by which the others are joined to the ſtalk. The following are all the known ſpecies of this kind: 1. The branched alpine *polytrichum*, bearing heads from its tops. The leaves of this are narrow and ſomewhat hollowed, and when viewed by a microſcope, appear ſerrated at the edges. It grows on the Welch mountains. 2. The branched *polytrichum*, bearing heads from its ſides. This grows to two inches high, and is found in the ſame places with the former. 3. The dwarf round-headed aloe-leaved *polytrichum*. This has ſcarce any ſtalk, but lies upon the ground; it is frequent by way ſides, and ripens its capſules early in the ſpring. 4. The dwarf long-headed aloe-leaved *polytrichum*. The ſtalks of this are a little longer than thoſe of the former. It grows in wet places on heaths. 5. The larger ſhort-ſhanked *polytrichum*. This is branched, tho' very low, and reſembles at firſt ſight one of the bryums, growing in round tufts. The leaves are of a deep green, and very pellucid; they have a middle rib viſible in them, and are diſpoſed in ſomewhat of a ſtellate manner at the ends of the branches. It grows in woods on the barks of old trees, and ſometimes on walls. 6. The leſſer ſhort-ſhanked *polytrichum*. This is much ſmaller than the former, and produces its capſules a little later. It grows on trees and walls, and ſometimes on the earth. 7. The ſhort-ſhanked *polytrichum*, with ſtrait and plaited leaves. This grows in tufts. Its ſtalks are an inch high, and its leaves of a dark green. It grows on rocks and old walls. 8. The fine-leaved curled *polytrichum*, with ſharp hairy calyptræ. This is found in tufts compoſed of thick branches, ſurrounded with very numerous leaves, each ending in a hair at the end. It grows in woods, and ripens its capſules in March and April. 9. The dwarf fine-leaved *polytrichum*, with cylindric heads. This grows on ſandy places in north America. *Dillen.* Hiſt. Muſc. p. 430.

Old writers are very full of the praiſes of this plant for its virtues in making the hair grow thick; but this ſeems to have been an opinion taken upon no better reaſon than the likeneſs of the ſtalks of the plant to hairs. They make a decoction of it in ſome parts of Germany, and waſh the head carefully with it in the increaſe of the moon; but there is no great reaſon for ſuppoſing this liquor does any thing more than warm water would do.

POLYTROPHEROS, a name given by the Greeks to coarſe bread, from its conveying much more nouriſhment to the body than the finer kind; which they called, by way of diſtinction, *oligotropheros*.

POLYZONOS, in natural hiſtory, a name given by the antients to a ſpecies of onyx, which had a dark or blackiſh ground, with a great number of white zones.

POMA, in the writings of the old Greek phyſicians, a word which has given the commentators a great deal of trouble rightly to explain. Dioſcorides, in deſcribing the *onyx indicus*, which we improperly call *blatta byzantia*, tells us that it was like the part of that ſhell uſually called by the name of *byzantine blatta*, but that it was in reality the *poma* of another ſhell.

Some have underſtood Dioſcorides, as if he meant that the whole ſhell of the fiſh, which he deſcribes as being like the purpura, was what he called *onyx indicus*; but it is not eaſy to ſay why ſo correct an author ſhould call a whole ſhell *poma conchyli*, nor what reſemblance there could be between a ſhell like the purpura and a human nail, *onyx?* Actuarius, and many others, ſenſible that a part of a ſhell only was meant by this name, have tranſlated it the *os naſi*; but the bone of the noſe of a ſhell-fiſh is ſo odd an expreſſion, that one ſcarce knows what to underſtand by it.

The purpura of the antients has a long tongue, with which it pierces the ſhells of the chamæ, and other fiſh that it feeds on; but whether this or the operculum, which all ſhells of this kind have, is meant by the word, is not to be aſcertained by this phraſe *os naſi*.

The true meaning of the word is to be made out before any thing can be judged of what is meant to be expreſſed by it here, where it is evidently uſed in a metaphorical ſenſe.

Braſſavolus ſays, that it means all ſorts of ſhelly or cruſtaceous coverings of fiſhes; but this is an abſolute error; for even the medical authors do not extend its ſenſe ſo far as that. The Greeks called all ſhells by the name *oſtraca*, and this author attributing a different virtue to the whole ſhell of the purpura, ſufficiently ſpeaks this *poma* to have been but a part of it.

The Arabian writers were ſenſible of this, and rendered it by the words *adfor althaib*, which ſignify fragments like nails. Serapio calls it *mukatha*, which ſignifies a morſel or piece of any thing cut from a ſolid body. The original ſenſe in which the Greeks uſed the word *poma*, was to expreſs the thing that cloſed the mouth of any veſſel with a long and narrow neck. The Latins expreſſed this by the word *operculum*, and ſometimes, as in Sulpicius Severus, by the word *umbo*.

The antients alſo uſed the word *poma* to expreſs the lid or covering of a well, or of any hole. Now the purpuræ buccina, and all thoſe other ſhells which the Greeks have called *ſtromboide*, may in ſome ſort be compared to narrow and deep veſſels, and they have all of them a ſort of *poma*; or, as the Latins have expreſſed it, an *operculum*, to ſtop the mouth of the ſhell, and prevent the ingreſs or egreſs of any thing at the creature's pleaſure. This *operculum* being what Ariſtotle has called *epicalymma*, is certainly alſo what Dioſcorides means by the word *poma*; Ariſtotle has been very expreſs in his deſcription of it, and ſays that the tongue lies under it, and that all the *ſtromboide* ſhells gave it. The *onyx indicus*, therefore, was only the *poma*, or *operculum* of an Indian *ſtromboide* ſhell, of the buccinum or purpura kind, and was of a ſweet ſmell, and thence had the term *aromaticus*, or *odoratus*. The name *onyx* is eaſily accounted for, as the *poma* of every ſhell of this kind is flat and thin, and does not unaptly reſemble the human nail.

POMATIA, in natural hiſtory, the name of a large ſpecies of garden-ſnail, ſo called from its feeding on apples and other fruit. It is originally a native of Italy, but is become of late years as familiar with us in England, as if a native with us. It is a noble remedy in conſumptive decays; and a perſon of diſtinction in England having occaſion to take great numbers, had ſeveral large parcels brought carefully alive from Italy, and turned looſe in his garden, where they multiplied to ſuch a degree, that the neighbouring woods and hedges ſoon became full of them, and they have ſince been propagated in many other places.

The *pomatia* is much larger than our common ſnail, and of a paler colour: it is of a roundiſh figure, and has five ſpires or twiſts at the head; theſe are placed very cloſe, and its mouth is large and almoſt circular, and has no duplicature or fold ſurrounding it, but it is as thin as the reſt of the ſhell.

POMEGRANATE, in botany. See PUNICA.

POMERIUM, in antiquity. See POMOERIUM.

POMOERIUM, among the Romans. Authors are not agreed as to particular circumſtances relating to the *pomoerium*; ſome will have it to be a ſpace of ground without the walls; others a ſpace within them; and others again think it was both within and without. But which ever of theſe is true, the *pomoerium* was a place eſteemed ſacred, and kept free from houſes and every other kind of obſtruction. Hiſt. Acad. Inſcr. Vol. II. p 91, ſeq.

POMPEION, Πομπειον, in antiquity, a ſtately edifice at Athens, in which were kept the ſacred utenſils, made uſe of at feſtivals, and all things neceſſary for the ſolemn proceſſions prepared. It ſtood at the entrance of the old city, which looked towards Phalerum, and was adorned with many ſtatues of the Athenian heroes. *Potter*, Archæol. Græc. l. 1. c. 8. T. 1. p. 34.

The word *pompeion* is derived from πομπευω, *cum pompa incedo*, and was likewiſe uſed for any utenſil employed on theſe occaſions.

POMPILUS, in zoology, the name of a ſea-fiſh, remarkable for following the rudders of ſhips to vaſt diſtances. It has no ſcales: it has a very broad line from the gills to the tail, under which are a number of dotted tranſverſe lines, reaching to the belly, above the line on the ſide; the back is ſpotted with different colours. The mouth is moderately large, but the teeth very ſmall. Its forehead, between the eyes, is of a gold colour, and it has four fins, two at the gills and two on the belly; and beſide theſe, one long one running all the length of the back, and another anſwering it from the anus to the tail. It tail is not forked. *Rondelet.* de Piſc. p. 250. *Geſner* de Piſc. p. 887.

POMPILUS is alſo uſed by ſome authors for the nautilus, as well of the papyraceous, as the camerated kind. See the article NAUTILUS.

POMPION, in botany. See the article PEPO.

POMPONA, a name given by the Spaniards in America to a ſort of *vanilla*, the pods of which are ſhorter and thicker than thoſe of the common kind, and of a ſtronger ſmell, tho' leſs agreeable. The pulpy matter alſo in theſe pods is more liquid than that in the common kind, and the ſeeds much larger, being as big as thoſe of muſtard. This is never brought to market alone; but the Indians who gather it, cunningly mix it among the right kind; but this ſhould be taken care of by the buyer, ſince this kind is very prejudicial, occaſioning violent head-achs in men, and in women vapours and diſorders of the womb.

It is not yet certainly known whether this be the fruit of a different ſpecies of the *vanilla* plant, or whether it be only different from the common in age, or in the place of growth of the plant.

POMUM, *apple*, a well known fruit. See APPLE.

Among the various kinds of *apples*, ſome are uſed for the deſert, ſome for the kitchin, and ſome for cyder-making.

Thoſe uſed for the deſert, are the following, placed as they ſucceſſively ripen after one another: The white juncating, the margaret *apple*, the ſummer pearmain, the ſummer queening, the embroidered *apple*, the golden reinette, the ſummer white calville, the ſummer red calville, the ſilver pippen, the aromatic pippen, la reinette griſe, la haute bonte, the royal ruſſetting, Wheeler's ruſſet, Sharp's ruſſett, the ſpine *apple*, the golden-pippen, the nonpareil, the l'api, or pomme d'api.

Thoſe for the kitchin uſe, in the order of their ripening, are theſe: The codling, the ſummer marygold, the ſummer red pearmain, the Holland pippen, the Kentiſh pippen, the courpendu, Loan's pearmain, the French reinette, the French pippen, the royal ruſſet, the monſtrous reinette, the winter pearmain, the pome violette, Spencer's pippen, the ſtone pippen, and the oaken pippen.

Thoſe moſt eſteemed for cyder are, the Devonſhire royal wilding, the redſtreak *apple*, the whitſour, the Herefordſhire under leaf, and the John *apple*, or deux annes.

The ſeveral ſorts of *apples* are deſigned either for ſtandards, or in dwarfs or eſpaliers; thoſe that are deſigned for ſtandards ſhould be grafted on crab-ſtocks, and thoſe for dwarfs or eſpaliers, on the codling, or ſome other ſpecies, which does not ſhoot freely. See the article GRAFTING.

The beſt ſeaſon for planting out theſe trees is, if the ſoil is dry, in October; but in a wet ſoil 'tis beſt to defer it till February. The diſtance at which they ſhould be planted, is forty feet ſquare, that the ſun and air may have room to come every way at them. And 'tis a very good method in large orchards, to plough and ſow the ground between them, till they are grown up. Good thriving trees of about three years grafting, are to be choſen for planting; and they ſhould be taken from a ſoil as nearly as poſſible of the ſame nature with that they are to be planted into, or rather from one that is ſomething poorer. In preparing theſe trees for planting, all the broken or bruiſed roots are to be taken off, as alſo all ſuch as croſs and gall one another, and all ſmall fibres; for theſe ſeldom ſurvive a remove. Some of the moſt luxuriant branches muſt be alſo taken off at the ſame time, and others ſhortened, but the head ſhould by no means be cut off. The holes for the planting them ſhould be made about two foot deep, and of a breadth proportioned to the extent of the root; the bottom muſt be made even, and the clods and lumps all broken. The tree is then to be ſet in the middle of the hole, and placed as upright as poſſible, and the earth carefully placed about its roots; and, finally, trod down about it with the feet; and if the weather be dry, every tree ſhould have a good watering, which will fix the earth to the roots. A ſtake ſhould alſo be fixed by the ſide of each tree to tie it to, that the wind may not ſhake it and looſen the roots. The foot of each tree ſhould be then ſurrounded with turf newly cut, with the green ſide downwards; which will greatly help to keep the earth moiſt; and if the ſeaſon be very dry, the waterings muſt be repeated at different times; but it is a very common error to water new-ſet trees too much; and this ſhould be carefully avoided. The year afterwards dig in the earth about the roots, and bury the rotted turff, which was laid about the root when planted, and there needs no farther care; the orchard will then thrive of itſelf.

Dwarf ſtandards are of the leaſt value of all *apple*-trees, never producing well-taſted fruit; and are therefore the worſt way of managing this tree.

Eſpaliers are commonly planted to ſurround the quarters of kitchin gardens. Theſe quarters ſhould be made as large as the garden-room will permit. The trees ſhould be planted at ſixteen or eighteen feet aſunder, if on crab-ſtocks, but if on paradiſe-ſtocks, twelve feet will be ſufficient; when theſe are planted in the manner above-deſcribed, they ſhould be headed to about four eyes above the graft, and they ſhould never be of more than two years old from the grafting when planted. The ſummer after they are planted, a number of ſmall ſtakes muſt be provided, of about three feet long, to drive into the ground on each ſide of the trees, four to each tree; and to theſe ſtakes the new ſhoots muſt be faſtened as horizontally as poſſible. If the trees have taken kindly, probably about Michaelmas all the four eyes will have made ſhoots; if ſo, at Michaelmas, which is the right time for pruning, the two upper ſhoots ſhould be cut off to four eyes each, but the undermoſt may be left with ſix or eight; but the branches ſhould never be ſhortened in ſummer, unleſs on occaſion of filling up ſome vacancy in the eſpalier, and then this muſt not be done after May.

In the ſecond year, all the ſhoots muſt be trained horizontally, except the fore right ones, which muſt be diſplaced as faſt as they are produced: at Michaelmus, the branches in the middle of the tree, or wherever there is want of wood, muſt be ſhortened; but after this be very careful of any great lopping, or ſhortening of branches, but leave them at full length, training them all horizontally. *Miller's* Gardners Dict.

POND *(Cycl.)*—POND-*weed*. See POTAMOGEITON.

Fiſh POND. See the article FISH.

PONENDUM *in ballium*, in law, a writ commanding that a priſoner be *bailed*, in caſes bailable. Reg. Orig. 133. *Blount*, *Cowel*.

PONENDUM *ſigillum ad exceptionem*, a writ by which juſtices are required to put their ſeals to *exceptions* exhibited by the defendant againſt the plaintiff's evidence, verdict, or other proceedings before them, according to Stat. Weſtm. 2. *Blount*, *Cowel*.

PONENDIS *in aſſiſis*, a writ granted by the ſtatute of Weſtm. 2. c. 38. which ſtatute ſhews what perſons ſheriffs ought to impanel upon *aſſiſes* and juries, and what not. Reg. Orig. 178. F. N. B. 165. *Blount*, *Cowel*.

PONTAGIA, a term uſed by Paracelſus, and his followers, to expreſs a mixing ſaline ſubſtances, with thoſe which are bitter or ſtyptic.

PONTEE, in the glaſs trade, an iron inſtrument uſed to ſtick the glaſs at the bottom, for the more convenient faſhioning the neck of it. *Neri's* Art of Glaſs, Appendix.

PONTEE-*ſtake*, in glaſs making, is the iron whereon the under ſervants place the irons from the upper workmen, when they have knocked off the broken pieces of glaſs. *Neri's* Art of Glaſs, Appendix.

PONTICA *gemma*, a name given by the antients to a ſtone of the agate kind, with a white ground and red and black ſpots, irregularly placed, and making a beautiful variegation in it. This ſeems to have been the ſame ſtone which ſome of the moderns have called the *ſmall pox ſtone*, from its ſpots reſembling the eruptions in that diſeaſe. The antients mention ſeveral kinds of it, as they were ſpotted with various colours.

PONTICA *vina*, a term uſed to expreſs acid, fæculent, and tartarous wines.

PONTICUM *mel*, a name given to a ſort of poiſonous honey

PONTICUS *mus*, in zoology, the name of a creature deſcribed by the antients, and ſuppoſed to be the ſame with our ſquirrel. See SCIURUS.

PONTLEVIS, in the manege, a diſorderly reſiſting action of a horſe, in diſobedience to his rider; in which he rears up ſeveral times, and riſes ſo upon his hind legs, that he is in danger of coming over. It is cured by clapping ſpurs ſmartly to him, as the fore feet are returning to the ground.

POOL *(Cycl.)*—POOL-*ſnipe*, in zoology, a name given in many parts of England to the redſhank.

POOR, or POWER, in ichthyology, a name given by the people of Cornwall to a ſpecies of bearded gadus. See the article GADUS.

POOSPANSCUM, in natural hiſtory, the name of a peculiar ſpecies of foſſil in the Eaſt Indies. It is of the nature of the blende, or mock-lead, with us; but is not formed into ſo large flakes, but more reſembles the ſteel-grained lead ores. It is found in the beds of rivers, and when calcined, it is uſed with the juices of certain herbs, for ulcers and other cutaneous diſorders. Before calcination it is alſo uſed by the women to make their hair of a fine gloſſy black colour, which it performs very neatly.

POPÆ, among the Romans, were ſuch perſons as attended the ſacrifices, whoſe buſineſs it was to provide victims, and to kill them after they had knocked them down. They were half naked, their ſhoulders, arms, and upper parts of their bodies being uncovered as far as their navels, and the reſt covered to the mid-leg with a linnen apron, or the ſkins of the ſacrifices; and they wore crowns of laurel upon their heads. *Danet* in voc. See POPE, *Cycl.*

POPE, in zoology, a name by which the people in many parts of England call the *anas arctica clufii*. See the article DUCK.

POPLAR, *populus*, in botany, the name of a genus of trees, the characters of which are theſe: the flower is of the amentaceous kind, being compoſed of a number of ſmall leaves, furniſhed with a great quantity of apices; but theſe are barren. The embryo fruits are produced on thoſe trees which produce none of theſe flowers; theſe are ſpiked, and conſiſt of many leaves, under which there lies a ſort of bell, which contains the embryo ſeed veſſel, which finally becomes a membranaceous pod of a compreſſed figure. Theſe are diſpoſed in a ſpiked form, and open into two parts, containing ſeeds winged with down. To this it is to be added, that the *poplar* has a peculiar and appropriated general appearance, by which it is obviouſly diſtinguiſhed from the willow. See Tab. 1. of Botany, Claſs 19.

The ſpecies of *poplar* enumerated by Mr. Tournefort, are theſe: 1. The common white *poplar*, with large leaves. 2. The common white *poplar*, with ſmaller leaves. 3. The common black *poplar*. And, 4. The *poplar* with trembling leaves, called the *aſpen-tree*. *Tourn.* Inſt. p. 592.

The *poplar*, whether black or white, may be eaſily propagated, either by layers, cutings, or ſuckers, of which the white kind always produces a great many from the root. The beſt ſeaſon for the tranſplanting theſe ſuckers is in October, when the leaves begin to decay; and they ſhould be removed into a nurſery for two or three years, at the end of which time they will have got ſtrength enough to be tranſplanted into the places where they are to remain.

When they are to be propagated by cuttings, it is beſt to do that in February, cutting off large truncheons of eight or ten foot long; which being thruſt down a foot deep in the ground, will take root very quickly, and if the ſoil be moiſt, will grow to a conſiderable ſize in a very few years.

The black *poplar* is not ſo eaſily raiſed from theſe large truncheons, but ſhould be planted in cuttings, of about a foot and a half long, planting them a foot deep in the ground. This will grow on almoſt any ſoil; but does much better on a moiſt one than on any other. They are the fitteſt of all trees for raiſing a ſhade quickly, as they will grow fourteen foot in heighth ſometimes in one ſeaſon, and in four or five years will be large trees. *Miller*'s Gard. Dict.

POPLAR-*galls*. The black *poplar* is famous among naturaliſts for producing a ſort of *galls* or protuberances, of various ſhapes and ſizes, on its leaves and branches, which have been uſually miſtaken for the lodgments of worms hatched from the eggs of an ichneumon-fly; but they are in reality produced by the operation of a viviparous inſect, called the *puceron*, for the bringing up of its off-ſpring. See PUCERON.

Theſe *galls* are of the bladder kind, being uſually ſkinned over, and more or leſs hollow within, not woody, as thoſe of the oak, &c. They proceed from different parts of the plant, ſome from the pedicles of the leaves, and many from the young ſhoots. They are very various in figure, ſome being roundiſh, others oblong, others crooked and contorted in various directions, and ſome of them are in the figure of horns, like thoſe of the turpentine tree, and of the ſame origin.

When any of theſe *galls* are opened at a proper ſeaſon, there is found in them a vaſt number of inſects of the puceron kind, all the family of one female parent, who formed the bladder or *gall* for their reception: if they are opened a little earlier than this, there is only one, that is the female parent, found in them: and finally, if they are examined later, they are found empty, the young brood having made their eſcape out of them; and at this time the ſtalks of the leaves are found twiſted about and ſwelled; and in theſe ſwellings, which are a new ſort of *gall*s, are found the young pucerons, which had eſcaped out of the larger *gall* or bladder, which had ſerved for their common home.

Mr. Malpighi obſerved theſe ſpiral tubercles on the pedicles of the leaves of this tree, and has given a figure of them in his twenty-ninth plate; but he had no knowledge of this animal which occaſions them, nor, indeed, any idea of a viviparous creature being at all concerned in the formation of *gall*s on vegetables; his whole ſyſtem being founded upon their being the effect of the eggs of a fly depoſited in them: he has therefore deſcribed theſe ſpiral ones among the reſt, as being of the ſame origin, and filled with eggs; but if he had accurately examined the bodies themſelves, he would have found them filled with real living inſects, not eggs of any kind.

Beſides theſe *gall*s on the ſtalks and pedicles of this tree, there are alſo others found on the leaves themſelves; and theſe are always joined to and prolonged from the middle rib of the leaf, which is properly only the continuation of the pedicle, and ſeem only to be the middle rib diſtended and ſwelled, the rib being wanting in the part where they are, on the upper ſide of the leaf, and on the under ſide there being only a little ſlit or crack, but with its edges nicely joined in the place of it; and if the leaf be preſſed between the fingers, this crack will open wider, and ſhew the internal cavity of the *gall* or bladder that appears on the upper ſide, and the little pucerons are ſeen living in it; but as ſoon as the leaf is left to itſelf again, the edges of this ſlit cloſe, and the creatures find themſelves as well defended from all injuries as before. There is great reaſon for theſe little creatures thus hiding themſelves, for they are, when expoſed to the view of other inſects, fed upon by many little animals; and it is a common thing, on taking one of them out of its cell, and ſetting it on the ſurface of the leaf, to ſee a little yelloviſh bug immediately come up, and ſeize upon it, and ſuck it to death with its trunk, which is extremely fine, but is eaſily introduced into the body of this creature.

The care the pucerons take to hide themſelves, and their young, from theſe enemies, is not, however, always ſufficient; for it is a very common thing to find a ſmall red inſect, of an oblong form, and endued with a very long trunk, lodged in the very cells, and eating them up in their habitations. This is ſuppoſed by Reaumur to be the bug before mentioned in its nymph ſtate, and had doubtleſs been lodged in this place by its parent in the egg, in order to feed upon the young animals.

The pucerons which live upon the poplar have another method of ſecuring themſelves from injuries. They have a method of forming a bladder of the very ſubſtance of the leaf itſelf, and this is very capacious, its cavity being much larger than that of any other kind: this is done by bringing the two edges of the leaf together, ſo that the leaf has its whole length, tho' only half its breadth, and the edges are every where faſtened together, while the whole ſpace within remains free, and is a fit receptacle for the animals. The cavity is much largeſt near the rib, and the leaves which are thus folded have not the colour or the gloſs of the others; but are covered with a vaſt number of little tuberoſities of a reddiſh colour, and of the bigneſs of a pin's head. This is uſually effected while the leaves are young and green, and at firſt there are only found a few ſmall pucerons in them; by theſe may be ſeen the true cauſe of the joining together of the leaf into a ſort of ſack or caſe. If two or three of theſe are found, as is very frequent on the under ſide of the leaf of this tree, they are always found fixed in their ſucking poſture, near the middle rib; and if the upper ſide of the leaf be examined, there will be found on it a yelloviſh or pale green tubercle, juſt oppoſite to every one of the inſects. Theſe tubercles are ſo many ſmall bladders or leaf *gall*s; and as they continually increaſe in ſize, and by that increaſe force out the middle part of the leaf on which they are placed into a ſwelling upwards, the conſequence is, the drawing together of the edges, ſo as to form a caſe or bag, of which the outſide of the leaf makes the external covering, and the inſide the lining. The regularity of the placing of theſe tubercles in the center of the leaf is the reaſon of the edges falling evenly together; and ſometimes, when the tubercles are leſs regularly ſituated, the joinings have ſeveral empty or open ſpaces between them. Theſe two or three firſt tubercles are afterwards ſurrounded by a vaſt number of new ones, which are the effects of the progeny of the firſt obſerved inſects; and thus the generality of the larger leaf or bladder-*gall*s are formed, as well on the *poplar* as on the elm, the apple, and the other trees on which they are ſo frequently found.

The pucerons which are found inhabiting the leaves of the *poplar* thus curled up, are of the ſame ſhape and figure with thoſe of the other parts of the ſame tree, and probably are the very ſame ſpecies; tho' ſome ſuppoſe them different from the dif-

different manner of their working. *Reaumur*'s Hiſt. Inſ. Vol. VI. p. 39, ſeq.

POPLITÆUS, *(Cycl.)* a ſmall muſcle, obliquely pyramidal, ſituated under the ham. It is fixed above, by a ſtrong narrow tendon, to the outer edge of the inner condyle of the os femoris, and to the neighbouring poſterior ligament of the joint; from thence it runs obliquely downward, under the inner condyle of the os femoris; its flat and pretty thick fleſhy body increaſing gradually in breadth, till it is fixed in the backſide of the head of the tibia all the way to the oblique line obſervable on that ſide. *Winſlow*'s Anat. p. 216.

POPPY, *(Cycl.)* PAPAVER, in botany. See PAPAVER.

We have many ſpecies of this plant cultivated in gardens for the beauty of the flowers. They are all eaſily propagated by ſowing the ſeeds in autumn. When the young plants come up, they are to be cleared from weeds, and thinned to a proper diſtance by pulling ſome up where they ſtand too thick; for they never thrive well if they are tranſplanted. They are to be left, according to their ſizes, at ſix, eight, or ten inches diſtance.

They are very ſhowy flowers, and make a ſplendid appearance in gardens; but they are but of ſhort duration, and are of an offenſive ſmell, which makes them leſs valued at preſent than they have been.

Some ſow theſe plants in ſpring, but it is not ſo well; becauſe they then have not time to get ſtrength before autumn, when they are to flower; and for that reaſon thoſe ſown in ſpring uſually flower weakly. *Miller*'s Gard. Dict.

Red-POPPY. The common wild red *poppy* is one of the moſt troubleſome and miſchievous weeds the farmers are plagued with among their corn, and it is the moſt difficult to thoroughly deſtroy of almoſt any other. Its ſeed will lie a long time in land unploughed, without ever ſhooting; but they will be ſure to grow with the firſt crop of corn. Mr. Tull gives an inſtance of the ſeeds of this plant being buried four and twenty years in a field of ſaint-foin, and at the end of that time, the land being ploughed for wheat, they all grew up among the corn, tho' they had lain dormant ſo long before. *Tull*'s Horſehoing Huſbandry.

It has been the general opinion of authors, that the narcotic quality of the *red poppy* lay in its flowers; but Mr. Boulduc, in his courſe of experiments for the finding out an European plant which ſhould yield us a juice of the nature of the opium of the Eaſt, without its bad effects, found that the virtue of this plant, which is very great, lay much more in the heads than the flowers; and from four ounces of theſe heads, while freſh and green, he obtained five drachms of a ſolid extract, of the nature of opium, two, three, or four grains of which were a full doſe; and which poſſeſſed the virtues of opium, and might be given with great ſucceſs and ſafety in obſtinate coughs and other ſuch caſes. Hiſt. Acad. Par. 1712.

It is ſaid, that the extract of Britiſh *poppies* is, in ſome caſes, preferable to the opium brought from Turkey. We have, in the medical eſſays of Edinburgh, the method of preparing an extract and ſyrup of *poppies*, by Mr. Arnot. See Vol. 5. Art. 11.

Yellow POPPY. The yellow horned *poppy*, called by authors *papaver corniculatum luteum*, is one of thoſe vegetable poiſons of our own growth, which may be very miſchievous by their not being generally known, or ſuſpected to be ſo. We have an account of the effects of this plant in the philoſophical tranſactions, in an inſtance of a family in Cornwall, who eat of a pye made of the roots of this inſtead of thoſe of eryngo, or ſea-holly, which it is the cuſtom of the poorer people there to make into a coarſe ſort of pye for their food.

The man of the houſe, on eating of this pye while hot, was ſeized immediately with a violent delirium, one effect of which was his thinking every thing he ſaw of a yellow colour, and taking every utenſil of the houſe to be made of gold. The man and maid ſervant eat of the pye after their maſter, and were ſoon after as mad as he, coming into the room where his friends were attending him, ſtripped naked, and dancing together. Theſe people alſo took every thing they ſaw to be gold; and a child in the cradle, to whom a ſmall piece of the pye had been given, was thrown into a drowſy diſorder, and convulſed about the mouth; but, after a few days, it recovered.

The grown people were all ſeized with moſt violent purgings, and by that means eſcaped, after being miſerably worn down by this complaint.

The ſymptom of ſuppoſing every thing gold, which ran through the whole family, and went even ſo far as to the ſuppoſing their ſtools gold, and ordering them to be ſaved, may poſſibly be in ſome meaſure owing to the idea they had of the plant whoſe roots they had been poiſoned by; its flowers being as large as a roſe, and of a fine yellow, and the juice of the whole plant being alſo yellow. Phil. Tranſ. N°. 242.

Horned POPPY. See GLAUCIUM.

POPPY-*ſeeds*. The *poppy-ſeed* is of a more delicious taſte than ſweet almonds; it is oily and farinaceous. Dr. Alſton ſays, he has eaten large quantities of the black as well as the white ſeed, and never found it ſomniferous or noxious. See Med. Eſſ. Edinb. Vol. 5. Art. 12.

Theſe ſeeds are uſed in food in ſome places, as is their expreſſed oil, which is as wholeſome as olive oil. Vid. Matthiol. p. 746. *Geoffr.* Mat. Med. Vol. 2. p. 713.

POPULAGO, *marſh-marygold*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the roſaceous kind, being compoſed of ſeveral petals arranged in a circular form; from its center ariſes a piſtil, which afterwards becomes a membranaceous fruit, conſiſting as it were of ſeveral thin capſules collected into a head. Theſe capſules all bend a little downwards, and contain oblong ſeeds.

The ſpecies of *populago*, enumerated by Mr. Tournefort, are theſe: 1. The common large flowered *populago*. 2. The ſmaller flowered *populago*. And, 3. The *populago* with double flowers. *Tourn.* Inſt. p. 273.

POPULARIA, among the Romans, were ſteps or places where the people ſat and beheld the games and horſe-races. *Pitiſc.* Lex. Ant. in voc.

PORCALA, a name given by ſome of the later Latin writers to the herb purſelain, as if it had its name from being loved by the hogs.

PORCELAIN *(Cycl.)*—The moſt juſt and regular idea we can form of the *porcelain* or china-ware is, that it is an half vitrified ſubſtance or manufacture, in a middle ſtate between the common baked earthen ware of our vulgar manufactures, and true glaſs. This is the eſſential and diſtinctive character of *porcelain*, and it is only by conſidering it in this light, that we are to hope to arrive at the perfect art of imitating it in Europe.

This attempt is to be made on theſe principles in two different manners: the one by finding ſome appropriated matter on which fire acts with more than ordinary ſtrength in the time of its paſſing from the common baked ſtate of earthen ware into that of glaſs. The other is, to compoſe a paſte of two ſubſtances reduced to powder; the one of which ſhall be of force to reſiſt a very violent fire, ſo as not to become vitrified in it; and the other a matter very eaſily vitrifiable. In the firſt caſe, the matter is to be taken out of the fire at the time when it is imperfectly vitrified; and in the other, the compound maſs is to remain in the furnace till the one ſubſtance, which is the more eaſily vitrifiable, is truly vitrified; and being then taken out, the whole will be what *porcelain* is, a ſubſtance in part vitrified, but not wholly ſo.

The firſt method is that by which the European *porcelain* has generally been made, and tho' that of St. Cloud, and ſome other places, has been very beautiful, yet it is always eaſy to diſtinguiſh even the fineſt of it from the china-ware, and the nature of the two ſubſtances appears evidently different: theſe owing all their beauty to their near approach to vitrification, are made to endure a long and violent fire, and are taken from it at a time when a very little longer continuance would have made them perfect glaſs; on the contrary, the china-ware being made of a paſte, part of which is made of a ſubſtance in itſelf ſcarce poſſible to be vitrified, bears the fire in a yet much more intenſe degree than ours, and is in no danger of running wholly into glaſs from it.

The two ſubſtances uſed by the Chineſe are well known by the names of *petunſe* and *kaolin*, and on examining theſe it appears very evident, that we have in Europe the very ſame ſubſtances, or at leaſt ſubſtances of the very ſame nature, and capable of being wrought into a *porcelain* equally beautiful and fine. Mem. Acad. Scienc. Par. 1739. See the articles KAOLIN and PETUNSE.

Theſe are the two different ſemi-vitrifications, on one or other of which all the European manufactures have hitherto been founded; and it is eaſy from the knowledge of theſe principles to determine, on breaking a piece of the china of any of our manufactures, by which of the two proceſſes it is made. If it is made by fiezing the half-vitrified maſs of a ſubſtance which would ſoon after have been wholly vitrified, then the putting it in a crucible, into an equal degree of fire, will ſoon turn it wholly into glaſs. This is the caſe of moſt of our European *porcelain*; but if it be made of two ingredients, the one of which is not vitrifiable, or at leaſt not by ſuch fires, then the matter will melt, but will not vitrify: this is the caſe with the Chineſe *porcelain*, which, if kept in fuſion a long time, yet when cold is china-ware ſtill; ſo that this is evidently made of two ſuch different ingredients.

Beſides theſe methods, there is yet another, of late invention, which makes a very beautiful china; and which, if it does not afford veſſels equal to thoſe of China, yet will afford them nearly approaching to thoſe, and at a conſiderable ſmaller price. This method conſiſts in reducing glaſs to china. See the article GLASS-*porcelain*.

The fine deep blue of the old *porcelain*-ware of China, is much valued by the curious; and it is much lamented, that the ſame colour is not uſed at this time. The art ſeems at preſent to be loſt; but perhaps it might be recovered by trials. It is certain that the Chineſe have cobalt among them, and very probably they uſed a blue colour prepared from this before they had any commerce with us: notwithſtanding all the con-

conjectures about their materials for colouring, this ſeems the moſt probable ſubſtance; and there is a way of preparing a colour from this, much ſuperior to that now in uſe, which we call ſmalt.

Cobalt is a mineral containing arſenic and a blue vitrifiable earth. The common way of preparing ſmalt is, by roaſting this cobalt in a reverberatory fire. This diſpoſes it to vitrify, and drives off the arſenic it contains in fumes, which collecting at the top, form true flowers of arſenic. It is very certain, however, from experiments, that if this arſenic could be preſerved in the cobalt, the ſmalt would be of a much finer colour; for there are ſome kinds of cobalt which yield ſmalt without previous roaſting; and as the arſenic is in a great meaſure contained in theſe, the ſmalts are much finer coloured. Arſenic added to ſmalt, while in fuſion, greatly exalts its colour alſo; and there is a way of procuring ſmalt from cobalt without fire, only by diſſolving it in an acid, and precipitating that ſolution with oil of tartar. The ſmalt thus precipitated to the bottom, is of a much finer colour than any prepared by fire; but it is much more expenſive, and prepared in leſs quantity. It is very poſſible, that the Chineſe might have the art of making this kind of ſmalt before they knew us, and that to this was owing the fine blue of their *porcelain* ware: but when we trafficked with them, and they purchaſed ſmalt ſo much cheaper of us than they could make it themſelves, they naturally diſcontinued the manufacture of their own finer kind, without conſidering how greatly inferior the colour was which the other yielded. If this be the caſe, it will be eaſy to revive this art, and the adding the true old china blue to our European manufactures, in imitation of *porcelain*, may give them a value which they have not at preſent.

The Chineſe had once a method of painting the figures of fiſhes and other things on the inſides of their veſſels, in ſuch a manner that they did not appear till the veſſel was filled with water, or ſome other clear liquor. They called this ſort of china-ware *kiatſim*, that is to ſay, the concealed blue china. The art is now in a great meaſure loſt; but there may be ſome gueſs made as to the manner in which it might be done at this time. The veſſels which are to be made in this manner, muſt be very thin: the colour muſt be laid on in form of the fiſh or other animals or figures, on the inſide, after the veſſel has been once baked. After this colour has had time to dry, the inſide of the veſſel muſt have a ſecond coat of the ſame earth, or ſtone-ware, of which the veſſel is made; and over this a varniſh of the common kind. The conſequence of this will be, that the figures of the fiſh, in a very ſtrong colour, will be buried between two coats of the ware, which together form a compleat veſſel. The outſide is then to be ground down almoſt to the figures, and when they begin to appear, a new coat of the varniſh muſt be laid over this. The figures will then be obſcure, and ſcarce, if at all perceivable; but on filling the veſſel with water, the tranſparence of the ſides will be taken off, and the liquor will make a ſort of foil behind, which will throw out the figures of the fiſh. This might be done in any ware tolerably clear and tranſparent. The *porcelain* of China would ſucceed beſt with it; but the pains and nicety required are too great, and all the attempts lately made by them have miſcarried. See the article STAINING of *porcelain*.

The Chineſe make a great variety of figures on the ſurfaces of the vaſes of white china-ware, and there is one kind of this greatly in eſteem among them, in which there are flowers and other figures; yet the ſurface is quite ſmooth, and the ſubſtance extremely thin. The manner of making it is this: they firſt form the veſſel of the fineſt materials, as thin as they can; then, when they have poliſhed it inſide and out at the wheel, they put into it a ſtamp of its own ſhape, but cut with all theſe figures: they preſs this down ſo firmly on the yet moiſt veſſel, that the impreſſion is received in a very perfect manner; and if the ſhape of the veſſel be at all hurt, they take it to the wheel again to reſtore it. They then finiſh it with the knife and ſciſſars; and when they have made it as perfect as can be, they cover it with the fine white varniſh within and without. This fills up all the cavities of the impreſſion, and gives a perfectly ſmooth and even ſurface; yet the thickneſs of this varniſh in the traces of the figures gives it a different white, and the whole figures are as finely and accurately ſeen, as if painted on the outſide. This is an artifice that might eaſily be brought to bear among us, and ſeveral of our finer wares would make a pretty figure with it.

There is a current opinion among the Chineſe themſelves, that the *porcelain*-ware of former times was greatly ſuperior to that which they make at preſent; and that the burying china in the earth for a long time, adds to its beauty; but all this is founded on error. The truth is, that our merchants beat down the price of the ware, and thereby compel them to make a worſe kind in general; but they are able to do as fine things now as ever. What gave birth to the opinion, that burying *porcelain*-ware made it good, was, that finer pieces than ordinary are ſometimes found buried. Theſe are all precious vaſes, which the poſſeſſors buried by way of ſecurity in the times of civil war; and it is no wonder, that there are none but of the fineſt kind found buried on theſe occaſions. Obſerv. ſur les Coutum. de l'Aſie.

PORCELLANA, in natural hiſtory, the *porcelain-ſhell*, or *concha venerea*, the name of a genus of ſhell-fiſh, the characters of which are theſe: they are of the univalve kind, and have for their mouth a long and narrow ſlit, dentated on each ſide, and are of a conglobated, oblong, gibboſe, or umbonated form.

This genus of ſhells originally had the name *porcellana* and *concha venerea* from the reſemblance of its mouth to the *pudendum muliebre*, called by ſome of the Roman writers, *porculus* and *porcellus*, and always alluded to under the word *Venus*. We have of late ſo far miſunderſtood the name as to ſuppoſe it derived of the word *porcelain*, from an imagination, that the Chineſe porcelain-ware was made of it. Geſner has fallen into the opinion, and Aldrovand ſeems to have been miſtaken in regard to its other name, *concha venerea*, ſuppoſing it ſo called becauſe of its beauty, and therefore ſacred to Venus. Rondeletius calls it the *remora Mutiani*; and the murex of the ſame author. *Aldrovand* de Teſt. L. 3. p. 352. *Geſner. Rondelet.* de Teſt. L. 2. p. 101.

The name *concha venerea* may be apt to create confuſion, becauſe there is another ſhell of a very different kind, a bivalve, called *concha veneris*. This genus is therefore much better diſtinguiſhed by the name *porcellana*. There is a prodigious difference among the ſpecies of this genus; ſome are heavy, others very light; ſome have the mouth placed in a longitudinal, others in a tranſverſe direction. The gibbous *porcelain* is a very remarkable ſpecies, as is alſo the egg-*porcelain*, which has two buttons at the extremities; and the egg-*porcelain* called the *navel* is not leſs remarkable than theſe; this has, inſtead of a button, a long beak at each end.

The mouth of the *porcelain* muſt be narrow and oblong; this is the great characteriſtic, and is uſually dentated either on both ſides or on one.

The ſpecies of *porcelain* are ſo numerous, that it may be proper, in the enumeration of them, to arrange them under ſome regular heads. See Tab. of Shells, N°. 16.

Some *porcelaines* are conglobated, and thick; of theſe the cabinets of the curious afford us the following ſpecies: 1. The map-*porcelain*, ſo called from its lineations, reſembling the ſtrokes of a map. 2. The lettered or Arabian *porcelain*: this is ſuppoſed in its lineations to bear ſome reſemblance to Arabic characters. 3. The tyger's ſkin *porcelain*. 4. The ſerpent's ſkin *porcelain*. 5. The ſea-louſe *porcelain*. 6. The millepede *porcelain*, 7. The punctuated *porcelain*. 8. The grey *porcelain*. 9. The Chineſe *porcelain*. 10. The *porcelain* whoſe end terminates in a ſpire; or the violet *porcelain*: this is but the former ſpecies with its outer coat taken off. 11. The reddiſh *porcelain*. 12. The variegated *porcelain*. 13. The tortoiſe-ſhell *porcelain*. 14. The guttated *porcelain*. 15. The *porcelain* with its middle divided into four zones. 16. The blue oval *porcelain*.

Some *porcelains* are thin, and of a pyriform figure. Of theſe we have the following: 1. The pear-*porcelain*, with an arched mouth, and variegated with yellow ſpots. 2. The pear-*porcelain*, with an arcuated mouth and two zones. 3. The egg-*porcelain*, with numbers of ſmall protuberances, or obtuſe umbos: this is called by ſome writers *ovum Rumphii*, or Rumphius's egg. 4. The cloth-web *porcelain*. 5. The oblong and thick *porcelain*. 6. The great Argus *porcelain*, ſo called from its being variegated with round ſpots, reſembling eyes. 7. The leſſer Argus *porcelain*. 8. The pſeudo-argus, or baſtard-eye *porcelain*. 9. The leveret *porcelain*. 10. The greeniſh ſmall-pox *porcelain*. 11. The whitiſh *porcelain*, with rough protuberances. 12. The millepede *porcelain*. 13. The mouſe *porcelain*. 14. The mole-*porcelain*. 15. The yellow *porcelain*, with four red zones. 16. The brown *porcelain*, with four yellow zones 17. The Panama *porcelain*, with amathyſtine circular ſtreaks. 18. The green ſpotted *porcelain*. 19. The virgated agate *porcelain*. 20. The blue *porcelain*. 21. The blue ſpotted *porcelain*.

Some of the *porcelains* are gibbous. Of theſe we have the following ſpecies: 1. The milky *porcelain*, with roſe-coloured protuberances and a dentated lip. 2. The white gibboſe *porcelain*, with a ſmooth lip and no tubercles. 3. The yellow *porcelain*, with a ſmooth lip and no tubercles. 4. The *porcelain* called *Congo money* and *Guinea money*: this has a dentated mouth, and has ſix protuberances on the back. 5. The great gibbous *porcelain*. Hiſt. Nat. Eclairc. p. 308.

PORCELLIONES, in the materia medica, a name given by ſome to the millepedes.

PORCELLO, in the glaſs trade, the inſtrument with which the workman, after having made the opening for the bowl of a drinking glaſs or other ſuch veſſel, with his paſſage, widens and renders it more capacious at pleaſure. *Neri*'s Art of Glaſs, p. 247.

PORCELLUS *Caſſovienſis*, in medicine, the name of a diſeaſe to which the people of Hungary and Poland are very ſubject. It is a hard tumour of the belly, attended with wind and violent pains. It is truly an infarction of the ſpleen, and is to be cured by aperitives. Phil. Tranſ. N°. 243. See SPLEEN.

PORCELLUS *Indicus*, in zoology, a name given by authors to the animal called with us the *Guinea pig*.

It is a creature properly of the rat kind, and is not improperly called by Mr. Ray *mus Americanus et Guinienſis porcelli pilis et voce*: the American or Guinea rat, with the hair and voice of a pig; tho' the ſame author ſeems to doubt, whether it has not ſomething of the rabbit kind in it, by adding after the word *mus*, that of *cuniculus*.

It is ſmaller than the rabbit, and has a ſhorter and thicker body; its ears are roundiſh, low, thin, pellucid, and very wide open, and are almoſt ſmooth; and are obſerved to be very nearly as large in the new brought forth creatures as in the full grown.

Its noſe and beard are very much like thoſe of the hare; the long hairs which ſerve for whiſkers being diſpoſed in much the ſame manner, and its upper lip is like that of the rabbit. It has no tail; its teeth are diſpoſed exactly as in the rat kind, and its hairs and grunting voice are wholly like thoſe of the pig.

It is ſometimes all over white, ſometimes all over of a reddiſh tawney; but moſt frequently it is mottled with large ſpots of both. Its fore feet have four claws, its hinder ones only three, of which the middle one is much longer than the others. It ſits often upon its buttocks, in the manner of the rabbit, but it does not walk in the leaping manner of the rabbit kind; but as the hog, by ſetting one foot before the other; and in walking bears upon the heel in the manner of the bear. It does not burrow in the earth; it brings forth ſix, ſeven, or eight young ones at a time; and theſe are not blind at firſt, as in the rabbit. It feeds on vegetables, and its fleſh is very well taſted, and much reſembles that of the hog. *Ray*'s Syn. Quad. p. 222.

PORCO, a name by which ſome authors have called the fiſh more uſually known by the name of *capriſcus*, ſuppoſed to be the *porcus* of Pliny. *Willughby*'s Hiſt. Piſc. p. 153. See the article CAPRISCUS.

PORCUPINE, *hiſtrix*, in zoology. See HISTRIX.

American PORCUPINE, *cuanda*, in zoology, the name of a ſpecies of *porcupine* very different from the European kind.

It is of the ſize of the larger monkeys, and is covered all over, except on its noſe, the lower part of its legs, and the extremity of its tail, with ſpines of two or three inches long, and has no other hair but theſe. Theſe are yellowiſh for that half which is next the body, thence they are of a deep blackiſh brown, and at the very extremity they are white: they are hollow in the manner of quills; and Hernandez affirms, that the creature has a power of throwing them from its body to a conſiderable diſtance. The body is about a foot long, the tail ſomewhat longer than that, and its farther half covered thinly with hairs much reſembling hog's briſtles. The ears are ſmall, and are hid by the ſpines which cover the head. It has two long teeth in each jaw before; the noſtrils are very wide, the eyes round, prominent, and very bright and ſparkling; the feet are like thoſe of the monkey kind, and divided into four toes. See Tab. of Quadrupeds, N°. 15.

It climbs trees, but ſlowly and with difficulty, for want of a heel or hinder toe. It uſually twiſts its tail about a bough, to keep it ſafe from falling. It makes a grunting like that of a hog. It feeds on poultry, and its fleſh is very well taſted. *Ray*'s Syn. Quad. p. 208.

PORCUS *aculeatus*, in zoology, the name of an animal, of which there are two ſpecies, both of the porcupine kind; the one with a ſhort, the other with a long tail. Each of them have alſo five toes on each foot, in which they differ from the European porcupines, which have but four. *Seba*. Vol. I. p. 81. and p. 84.

PORCUS *fluviatilis*, in ichthyology, a name given by the old Latin authors to the fiſh we at this time call the *cornua* and *aurata*, and in Engliſh the *ruffe*. It is a ſpecies of the perca or pearch kind, and is diſtinguiſhed by Artedi by the name of the *pearch* with only one fin on the back, and with the cavernous head. See Tab. of Fiſhes, N°. 20.

PORCUS *Guinienſis*, in zoology, the name of the Guinea hog.

This creature is of the ſame ſhape and make with our hog, and of a reddiſh tawney colour. Its head, however, is ſomewhat more depreſſed than in our kind, and its ears longer, and running into narrow points. Its tail is naked; but ſo long, that it reaches almoſt to its heels. Its hair is all ſhort and ſhining. It has no briſtles on the back, but only near the rump; and on the ſhoulders the hair is a little longer than elſewhere. It is a tame domeſtic creature. *Ray*'s Syn. Quad. p. 96.

PORELLA, in botany, the name of a genus of moſſes, the characters of which are theſe: the capſules contain a powder like thoſe of the other moſſes; and they have neither operculum, calyptra, nor pedicle; and their manner of ſhedding their powder is not by ſeparating into two parts, like thoſe of the ſelago and lycopodium, but by opening into ſeveral holes on all ſides. See Tab. of Moſſes, N°. 17.

Of this genus of moſſes there is only one known ſpecies; this is called by Dillenius the bluntly pinnated *porella*, and grows in wet places in Virginia, Penſilvania, Maryland, and other parts of North America. *Dillen*. Hiſt. Muſc. p. 459.

PORFILIGON, a word uſed by ſome of the chemical writers to expreſs the ſquammæ martis, or the ſcales of iron which fly off in the ſmith's hammering of it.

POROCELE, a word uſed by chirurgical writers for a callous hernia.

POROMPHALON, a word uſed by Hippocrates to expreſs a callous concretion, or a ſort of tophus formed in the region of the navel.

POROTICKS, a term uſed by the antients for ſuch medicines as would conſume calluſes.

PORPESSE, an Engliſh name given indiſcriminately to two different fiſhes, the phocæna and the dolphin.

Artedi, who has been very careful in bringing together the ſynonyma of authors, tells us, that this is properly the Engliſh name only of that ſpecies of the dolphin, the characters of which, according to his ſyſtem, is, that the body is almoſt of a conic form, the back broad, and the body ſubacute. This ſpecies is the phocæna of Ariſtotle, and the tirſio or turſio of Pliny and Rondeletius. Schoneveldt calls it the ſmall northern or oriental *dolphin*, and the Swedes the *marſuin*. See the article DELPHINUS.

We have from Dr. Liſter an account of the tooth of this creature, after death, giving an envenomed wound. The accident happened to the Doctor himſelf, and he relates it thus: in diſſecting a *porpeſſe*, which had been four days dead, he ſcratched accidentally the inſide of one of his fingers; but that not ſo deep as to fetch blood, or to occaſion any great pain. He diſregarded the accident; but at the end of four days the whole joint of the finger became tumid, and inflamed ſoon after the whole finger. After this the malady increaſed, and in ſpite of the aſſiſtance of ſurgeons, the four next fingers were in four days more affected; and after theſe the whole hand up to the wriſt, and the pain became violent. This was firſt abated by the following fomentations: frog ſpawn-water, ſix ounces; bole armeniac, an ounce and half; white vitriol, four ounces. And afterwards this: burnt white vitriol and bole armeniac, of each four ounces; camphor, an ounce; and common water, a gallon. The waſhing the hand continually with theſe, took off the pain; and after this the unguentum nutritum, and a plaiſter of diaphalma over the whole hand, perfected the cure. The Doctor obſerves, that beſide the blue look of the parts, which ſufficiently indicated the poiſon, there was a continual itching and burning heat, which was conſtant day and night. The ſkin of the whole hand and fingers came off, and the fingers did not ſo far recover, as to have their full uſe for ſeveral months after. Phil. Tranſ. N°. 231.

The fins of this fiſh are cartilaginous and flexible, not ſharp or prickly, as the antients have repreſented them. There is only one fin on the back, which is placed ſomewhat below the middle: on the belly there is only one pair of fins; and the tail is formed into the figure of a creſcent by its forkedneſs; and this tail lies parallel to the horrizon, when the fiſh ſwims, in the ſame manner that the tails of all the other cetaceous fiſhes do; whereas the tails of all other fiſh ſtand perpendicular to the horizon. The great contrivance of nature in this poſition of the tail in theſe fiſhes is, that it may ſupply the place of the hinder pair of belly-fins in other fiſh, thoſe of the cetaceous kind having none ſuch. Theſe fins in other fiſh ſerve to balance the body, and keep it under water, and anſwers alſo in many reſpects to the hinder legs of a quadruped; and hence we ſee, that thoſe fiſh which have long bodies, and have not this hinder pair of fins, nor the horizontal tail, cannot ſuſpend themſelves quietly in the water, but are forced to keep groveling at the bottom. This is the caſe of eels, and all other fiſh of that kind. The uſe of reſpiration being as neceſſary to the *porpeſſe* as to quadrupeds, and it wanting this pair of hinder fins, to poize or elevate itſelf with, nature has abundantly provided againſt the miſchiefs that would attend that defect, by giving it this tranſverſe tail; by a ſudden jerk of which it can in a moment throw itſelf up to the ſurface from the deep water. The whale, and all the cetaceous fiſhes requiring the uſe of reſpiration, have alſo this manner of raiſing their unweildy bodies allotted them by nature, inſtead of the hinder pair of fins, which muſt have been inconveniently large to be capable of this office.

The blood of the *porpeſſe* is as warm to the touch as that of quadrupeds, and the blubber, or fat, which lies in great quantity under the ſkin, covering the muſcular fleſh of the back and ſides, is to keep up the natural heat, and prevent the cold of the ſea water from chilling the circulating fluid.

The ſtomach of this fiſh is of a very ſtrange make; it is divided into two large bags, and has ſeveral other ſmaller ones annexed to them. The food of the fiſh ſeems to beſpeak its living at the bottom of the water; for the common matter found in its ſtomach, is the remains of fiſh that live in or on the bottom. The young *porpeſſes* are generally found to feed on the ammodytæ, or ſand-eels.

The kidneys in this fiſh are large, and adhere cloſely to the back; and the urinary bladder is oblong, but very ſmall in proportion to the ſize of the animal. The penis in the male is long and ſlender, and has a very ſlender and ſharp glans. This part does not appear externally; but lies buried in its ſheath in the body, and is there doubled up in the ſhape of the letter S; and the teſticles lie within the cavity of the abdomen, as they do in the hedge-hog. The diaphragm is muſcular, as in quadrupeds. The heart is large, included in a pericardium,

ricardium, and has two ventricles; and this part, as well as the lungs, agree in all reſpects with thoſe of quadrupeds. The fiſh having no neck, the larynx is conſequently very ſhort. The pipe in the head, thro' which theſe ſort of fiſhes draw in their breath, and ſpout out water, lies before the brain; it terminates outwardly in one hole, but it is within divided into two parts by a bony ſeptum, ſo as to repreſent two noſtrils; but at its lower end it again becomes one hole, and opens into the mouth by a common orifice furniſhed with a very ſtrong ſphincter muſcle, by means of which it may be ſhut and opened at pleaſure. Above this ſphincter, the ſides of the pipe are lined with a glandulous fleſh; from which when preſſed, a glutinous liquor is forced out of certain little holes in it into the inſide of the pipe: above the noſtrils is a ſtrong valve or membrane, which ſerves to ſtop the pipe at pleaſure, and prevent any water from getting into it, but when the fiſh requires it within. The fiſtula are ſix blind holes, having no outlet, four tending toward the ſnout, and two placed above the valve, which ſtops the noſtrils, and two beneath it; and two tending toward the brain, having a long and narrow cavity which ſeems intended for the uſe of ſmelling, tho', on opening the brain, no ſuch olfactory nerves or proceſſus mamillaris, as other animals are furniſhed with for this purpoſe, are to be found. The eyes are ſmall, and the ſnout is very long, and furniſhed with ſtrong muſcles; the uſe of theſe is to enable it to root up the ſand and dirt at the bottom of the ſea, and feed on the ſand-eels and other creatures it finds buried in it. The brain is large, and reſembles that of man, and probably it has been an obſervation of this that has given occaſion to the opinion of this animal having ſo great a ſhare of will and underſtanding, and has given riſe to the ſtory of Herodotus, that Arion was carried to ſhore on the back of one; and that of Pliny the elder, of one of theſe fiſh ſo fond of a certain boy, that he uſed to carry him daily from Baiæ to Puteoli, acroſs the ſea to ſchool, and wait to carry him back again at a certain time. Pliny the younger gives us alſo a ſtory of this kind in his epiſtles.

The teeth of the *porpeſs* are in each jaw forty-eight in number; they are ſhort and blunt, and reſemble ſo many pegs. The antients, particularly Ariſtotle, have ſaid that the tongue of the *porpeſs* or dolphin is tied down faſt to the lower jaw, all along the middle. Rondeletius has diſputed and contradicted this obſervation; but Mr. Ray proves it to be true, and that the modern author is in an error. Ariſtotle denies this fiſh ear-holes, and experience ſhews that he is in the right; nor has it any noſtrils, except thoſe within the fiſtula. The breaſt bone is remarkably ſmall. The name *porpeſs* is given it becauſe of its reſembling a hog; which it does in the ſnout, the fat, the viſcera, and many other particulars. Phil. Tranſ. N° 74.

PORPHYRIO, in zoology, the name of a bird figured and deſcribed by all the natural hiſtorians from one another, but which, it ſeems, none of them ever ſaw; and there is ſome room to doubt whether there be in nature any ſuch bird. According to the accounts we have of it, it appears to be of the gallinula or moor-hen kind, and is all over of a fine deep blue, only the middle of the tail is at the extremity of a greyiſh white. Its legs and feet are of a fine ſhining purple. There have been ſome fabulous things related of it, as its having five toes on each foot, and the like; but if there be any ſuch creature, it ſeems to be a moor-hen of theſe remarkable colours. *Geſner* de Avib. *Ray*'s Ornithol. p. 238.

PORPHYRIO *Americanus*, in zoology, a name by which ſome have called the *quachilto*, a very beautiful ſpecies of Braſilian moor-hen. See the article QUACHILTO.

PORPHYRY, *(Ccyl.) porphyrita*, in natural hiſtory, the name of a genus of foſſils generally, but improperly, added to the marbles, and called by us *porphyry*. They are ſtones of a plain uniform maſs, ſpotted or veined, with ſeparate concretions of great hardneſs, giving fire with ſteel, not fermenting with acids, and very ſlowly and difficultly calcining in a ſtrong fire. *Hill*'s Hiſt. of Foſſ. p. 494.

Of this genus there are only three known ſpecies: 1. The purple kind, commonly known by the name of *porphyry*, among the workmen. 2. The hard red-lead-coloured kind, variegated with black, white, and green. And 3. The very hard fleſh-coloured one, variegated with white, green, and black.

The *purple porphyry* is a ſubſtance which has been well known, and highly eſteemed in all ages of the world. It has its name from the Greek πορφύρος, purple, as that remarkable colour always afforded a very obvious diſtinction for it, from the other kinds. It is of an extreme firm and compact ſtructure, remarkably heavy, and of a fine ſtrong purple, variegated more or leſs with pale red, and white, and with a ſmall number of little, and generally diſregarded black flaky ſpecks. Its purple is of all degrees, from the deep tinge of the violet to a pure claret colour; and its variegations are uſually diſpoſed in ſmall ſpots, uſually ſmall and diſunited, but ſometimes running into one another, and making large blotches. It is very difficultly cut, becauſe of its very great hardneſs; but is capable of a very fine poliſh. It is found in great quantities in Egypt; and we find was had thence alſo in very early times. It ſerves us for ſtones for the apothecaries and colourmen, to grind or levigate their powders on, and on any other occaſion where great hardneſs is required.

The *red-coloured porphyry* is alſo an extremely beautiful and valuable ſubſtance, but is hitherto unknown among our lapidaries. It has the hardneſs, and all the other characters of the purple *phorphiry*, and greatly exceeds it in the variety of its colours. Its ground is exactly of the bright fine red of our minium or red lead, but is ſomewhat deeper or paler in the different parts of the maſs: this is beautifully veined with green, in broad and regular lines; there are alſo ſome conſiderably narrow, and among theſe ſeveral perfectly white ſtreaks, and a multitude of ſmall black ſpecks. It is of extreme hardneſs, and capable of a poliſh equal to that of the ſemi-pellucid gems. It is found in great plenty in the iſland of Minorca, but has never yet been regarded as a ſtone worth importing into England.

The *fleſh-coloured porphyry*. This is another very little known, but extremely beautiful ſtone: it is of an irregular, but very compact and firm texture, and of a pale fleſh colour, often approaching to white, and variegated with black, green, and white in large blotches, from half an inch to an inch broad; and ſometimes, tho' very ſeldom, diſpoſed in regular veins. It appears very livid and gloſſy where freſh broken, and is capable of an extremely elegant poliſh; and is ſo very tranſparent, eſpecially in its green parts, that when poliſhed one may ſee deep into its ſubſtance. It is found in immenſe ſtrata, in Arabia Petræa, and in upper Egypt, and in detached nodules is common to almoſt all parts of the world: Germany abounds with them; and we have of them in many parts of England and Ireland. They are found in many places on our ſhores, and in ſome parts of Devonſhire far from the ſea. *Hill*'s Hiſt. of Foſſ. p. 494 to 498.

Mr. Boyle tells us, that he cauſed *porphyry* to be cut by means of emery, ſteel ſaws, and water. He obſerves, that in his time, the workmen in England were ignorant of the manner of working upon *porphyry*, and that none of them would undertake to cut or poliſh it. See Works abr. Vol. I. p. 111.

PORPHYRY-*ſhell*, in natural hiſtory, a name given by authors to a ſpecies of ſea-ſhell of the *purpura* kind, with a ſhort clavicle and beak. See PURPURA.

PORPITES, the *hair button-ſtone*, in natural hiſtory, a name given by authors to a ſmall ſpecies of foſſile coral; which is uſually of a rounded figure conſiderably flatted, and ſtriated from the center every way to the circumference. Theſe are of different ſizes, and of different colours, as greyiſh, whitiſh, browniſh, or bluiſh, and are uſually found immerſed in ſtone. See Tab. of Foſſ. Claſs 7. and *Hill*'s Hiſt. of Foſſ. p. 641.

PORRUM, the *leek*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the lilliaceous kind, being compoſed of ſix petals, and of a bell-like ſhape. The piſtil which ſtands in the middle of this flower, finally becomes a roundiſh fruit divided into three cells, and containing roundiſh ſeeds. To this it may be added, that the ſtamina are broad, and are terminated by three filaments, the middle one having an apex. The flowers alſo are uſually collected into round heads, and the roots are long, cylindric, and tunicated, the ſeveral cruſts often running up into flat or hollowed leaves.

The ſpecies of *leek*, enumerated by Mr. Tournefort, are theſe: 1. The common headed *leek*. 2. The *leek* with variegated leaves, elegantly ſtreaked like thoſe of the painted graſs. 3. The broad-leaved ſectile *leek*. 4. The wild vineyard *leek*. 5. The double-headed wild *leek*. And 6. The vitigineous wild *leek* of Gerrard. *Tourn.* Inſt. p. 382.

PORT *(Cycl.)*—PORT-*laſt*, in a ſhip, the ſame as the gunwale; therefore they ſay a yard is down a *port-laſt*, when it lies down on the deck.

PORT-*ropes*, in a ſhip. See ROPES.

PORTABLE *laboratory*. See LABORATORY.

PORTE-*etrier*, in the manege. See STIRRUP.

PORTEGLO, in the glaſs trade, the inſtrument with which the founder, or conciator, ſcums the glaſs while melting. *Neri*'s Art of Glaſs, p. 241.

PORTER *(Cycl.)*—PORTER, in the manege, ſignifies to direct or puſh on a horſe at pleaſure; whether forewards or upon turns, *&c.*

PORTERAGE, a kind of duty paid at the *cuſtom-houſe*, to thoſe who attend the water ſide, and belong to the package-office. Theſe *porters* have tables ſet up, aſcertaining their dues for landing of ſtranger's goods, and for ſhipping out the ſame. Merch. Dict.

PORTISCULUS, among the Romans, an officer who had the direction of the rowers in a galley. He was otherwiſe called *pauſarius* and *hortator remigum*. *Pitiſc.* Lex. Ant. in voc. See PAUSARIUS and HORTATOR.

PORTIUS *piſcis*, in zoology, a name given by ſome to a fiſh called by others the *mugil ater*, or black mullet. It is a very ſcarce fiſh, much reſembling the common mullet in ſhape, but all over of a fine black, and having ſeveral lines of a deeper black than the reſt, running longitudinally from the gills to the tail. It has a very wide mouth, and has ſeven or eight prickles on the back, ſeparate from one another, and joined into a fin by a membrane in the uſual way; theſe are placed immediately before the back fin. *Willughby*'s Hiſt. Piſc. p. 276.

PORTOISE, aboard a ſhip, is the ſame with *port-laſt*, or the *gun-wale*; and as they ſay *the yard is down a port-laſt*, when it lies down on the deck, ſo for a ſhip *to ride a portoiſe*, is to ride with her *yard a port-laſt*, or ſtruck down to the deck.

PORTORARIUM, in anatomy, a name given by ſome authors to the duodenum.

PORTULACA, *purſelain*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is roſaceous, or compoſed of ſeveral leaves diſpoſed in a circular form. The cup conſiſts of one leaf, and is bifid; from this ariſes the piſtil, which afterwards becomes, together with the cup, a fruit or ſeed-veſſel of an oval form, and uſually containing very ſmall ſeeds: this ſeed-veſſel has two ſhelly ſubſtances at its top, the outer of which has been the bifid part of the cup; the inner is no other than the piſtil enlarged; theſe ſeparate tranſverſely when the ſeed is ripened, the lower part of the cup ſtill remaining fixed to the ſtalk.

The ſpecies of *purſelain*, enumerated by Mr. Tournefort, are theſe: 1. The broad-leaved, or garden *purſelain*. 2. The narrow-leaved, or wild *purſelain*. 3. The broad-leaved garden *purſelain*, with gold yellow leaves. 4. The broad-leaved ſea-*purſelain*, with beautiful red flowers. 5. The red-flowered procumbent *purſelain* of Curaſſo, with long, thick, and ſhining leaves. 6. The procumbent *purſelain* of Curaſſo, with leaves like thoſe of the caper's buſh and red moſſy flowers. 7. The taller upright woolly *purſelain* of Curaſſo, with leaves like thoſe of kali, and pale red flowers. 8. The woolly procumbent *purſelain* of Curaſſo, with beautiful red flowers, and ſeed-veſſels ſomewhat pointed at the ends. 9. The woolly, procumbent, kali-leaved Curaſſo *purſelain*, with ſeed-veſſels hollowed at the ends.

The ſeveral ſpecies of *purſelain*, may be known when not in flower, by their having thick and fleſhy leaves placed alternately on their ſtalks. *Tourn.* Inſt. p. 236.

PORTUGALLICA *terra*, *earth of Portugal*, in the materia medica, the name of a fine aſtringent bole, dug in great plenty in the northern parts of Portugal, and eſteemed a remedy againſt poiſons and venomous bites, and good in malignant fevers. Whatever may be its virtues of this kind, however, it is manifeſtly an aſtringent of the very firſt claſs, and is uſed with great ſucceſs in fluxes of all kinds. It is well known in ſome parts of the world, beſide the kingdom where it is produced; but is not known in the Engliſh ſhops. The cheapneſs of our ſophiſticated bole armenic, having excluded this whole valuable claſs of medicines from our practice.

The characters by which the *Portugueſe earth* is known from the other red boles, are theſe: It is of a cloſe, compact, and regular texture, conſiderably heavy, and of a fine florid red, of a ſmooth and ſhining ſurface, eaſily breaking between the fingers and a little ſtaining the hands. It adheres firmly to the tongue, melts freely and readily in the mouth, and has a ſtrongly aſtringent taſte, but leaves a little grittyneſs between the teeth. It does not ferment with acids, and ſuffers ſcarce any change of colour in the fire. *Hill*'s Hiſt. of Foſſ. p. 13.

PORTUMNALIA, among the Romans, a feſtival in honour of Portumnus, which was celebrated on the ſeventeenth of Auguſt. *Pitiſc.* in voc.

PORUS, (*Cycl.*) in natural hiſtory, a name given by authors to a peculiar kind of foſſile coral, of which there are many different ſpecies; theſe are all of a beautifully laminated ſtructure, and ſeem allied to the mycetitæ or fungitæ: they are ſeldom found looſe, but uſually bedded in hard marble, and with their pores filled up with ſparry or mineral matter. See Tab. of Foſſ. Claſs 7.

PORUS *cervinus*, in natural hiſtory, a name given by authors to a ſpecies of ſea-plant, found among the rocks in the coral fiſheries, and in other places. It grows at different depths, and ſeems to adhere to the rocks by a ſimple baſe, having no root, nor any thing in the place of one. It is branched in ſuch a manner, that with the help of a little imagination it has been forced into the reſemblance of a ſtag's horn. Its height is about an inch and half, often leſs when newly taken out of the ſea; it is of a fine ſnow white colour, but when it has lain ſome time to dry, it becomes of a duſky yellow. It is very thin, perfectly tranſparent, and ſeems compoſed of ſeveral fine membranes. When examined by the microſcope, an admirable ſtructure is diſcovered in it: the whole being compoſed of a membranous matter, in which are an infinite number of holes, and all theſe arranged into regular lines.

Count Marſigli has diſtinguiſhed this, which is the common kind of *porus cervinus*, or buckſhorn *porus*, by the name of *minor*, in order to prevent its being confounded with another leſs common kind, which Ferrante Imperato has deſcribed under the name of *porus cervinus*.

This larger kind is found alſo growing on the rocks in the coral fiſheries; but it always is found at great depths, never near the ſurface, as the other often is. It grows to the rock by a ſmall baſe, and from thence riſes to a ſhort trunk, which ſpreads itſelf out into ſeveral flat branches, divided every where into two, as thoſe of moſt of the ſea-fucuſes are; and theſe are ſo expanded as to form what people imagine, a reſemblance of a ſtag's horn. This grows to a little more than two inches in height, and is of a beautiful pale yellow, or ſtraw colour, even while growing, and looks gloſſy and ſhining, as if covered with a thin coat of varniſh. It is as thin as the fineſt paper; and when viewed by the microſcope, is found to be of a particular texture. It is ſometimes found growing to the ſhells of ſea-fiſhes; but of thoſe only which live in great depths of water. Count Marſigli has given elegant figures both of this and the ſmaller kind, not only in their natural ſtate, but as they appear to the microſcope. *Marſigli*, Hiſt. de la Mer.

POSCENIUM, or POSTSCENIUM, among the Romans, the back part of the theatre, where the actors retired to undreſs themſelves. *Danet.* in voc.

POSCENIUM was ſometimes uſed to ſignify a lady's dreſſing-room, where the paint and waſhes were kept and uſed, and where men were not allowed admittance. *Pitiſc.* in voc. See the article PARASCENIUM, *Cycl.*

POSIDIA, Ποσειδια, in antiquity, a feſtival in honour of Neptune, called Ποσειδων. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 426.

POSIDIUM, Ποσειδεων, in chronology, the ſeventh month of the Athenian year. It conſiſted of thirty days, and anſwered to the latter part of our December and the beginning of January. See MONTH.

It had this name from the feſtival Poſidonia celebrated in it.

POSIDONIA, Ποσειδονια, in antiquity, the ſame with *poſidia*. See POSIDIA.

POSIQUIT, in natural hiſtory, a name given by the people of the Philippine iſlands to a ſmall bird very common among them, and approaching to the nature of the canary bird, but ſmaller, and wanting its harmonious voice.

POSITI, among the Romans, an appellation given to the dead when placed at the door with their feet outwards, till the time of their interment. See BURIAL and BURYING. *Hofm.* Lex. in voc.

POSITION, *poſitio*, in muſic, is uſed for the putting down the hand in beating time. See THESIS.

POSITIONAL *libel*. See ARTICULATED *libel*.

POSSESSIO *fratris*, in law, is where a man hath a ſon and a daughter by one woman or *venter*, and a ſon by another *venter*, and dies, if the firſt ſon enters and dies without iſſue, the daughter ſhall have the land as heir to her brother, although the ſecond ſon by the ſecond *venter* is heir to the father: but if the eldeſt ſon dies without iſſue, not having made an actual entry and ſeiſin, the younger brother by the ſecond wife, as heir to the father, ſhall enjoy the eſtate, and not the ſiſter. 1 Inſt. 11, 15. Terms of Law.

POSSESSION *(Cycl.)*—POSSESSION, in mining, is the right to a meer of ground, which the miners enjoy, by having ſtones upon that ground; and it is taken generally for the ſtones themſelves; for it is the ſtones that give *poſſeſſion*. *Houghton*'s Compl. Miner in the Explan. of the Terms.

POSSUM, a name by which many have called the *opoſſum*. See the article OPOSSUM.

POSTERIOR *(Cycl.)*—POSTERIOR *penis*, in anatomy, a name given by many authors to a muſcle more generally known at this time by the name of the *erector*. See ERECTOR.

POSTICUM, in architecture, the poſtern gate or back door of any fabric.

POSTOMIS, among the antients, a barnacle or iron inſtrument fixed on the noſe, or put into the mouth of a horſe to make him quiet. *Pitiſc.* in voc.

POSTURE *(Cycl.)*—POSTURES *of the body*. The continued unnatural *poſtures* of the body, are the occaſions of many very unhappy effects in the human frame; crookedneſs in ſhape, is very frequently the conſequence of them. See DISTORTION. And it is no uncommon thing to ſee ſchool-boys, who are forced to be continually bending to write upon their knee, or upon a low form, very terribly afflicted by means of the compreſſion which that unnatural and continued *poſture* has given the lower part of the breaſt and the viſcera contained in the epigaſtrium; and particularly thoſe unhappy youths, who, from being ſhort-ſighted, are expoſed to a greater degree of ſtooping than the reſt, have been found terribly afflicted with diſorders of the breaſt and of the lower belly.

On applying for relief in theſe complaints, the phyſician uſually forgets to enquire into the cauſe, and hearing nothing of the continued bending *poſture* of the body, which is the occaſion of all the diſorders, the medicines he gives prove ineffectual with ſome, and with others greatly heighten the diſorder. But when the preſcriber will be at the pains of informing himſelf of the cauſe in theſe caſes, and forbid the continuance of the *poſture* which has been the ſole occaſion of them; nature alone will often make the cure, or if not alone, yet very often with this caution the methods will prove ſucceſsful, which were ineffectual, or even hurtful without it.

Other ſchool-boys have been found ſubject to ſeveral diſorders of the head, the breaſt and eyes, and to many other complaints from which the uſual methods in the like caſes have been found wholly ineffectual to relieve them; or if they have been cured from time to time, they have been always found ſubject to relapſes: and in many of the ſchools of France, no remedy could be found for theſe complaints, till Mr. Winſlow found, on enquiry, that it was a common cuſtom among theſe youths to ſleep all night with their heads thrown back,

and lying over the bolſter; and the giving orders, that they ſhould be watched, and not ſuffered to ſleep in that manner for the future, proved with moſt of them ſufficient for the cure, without any further aſſiſtance, and that in many caſes, even in maladies which had been of ſo long ſtanding as to become in a manner habitual.

How frequently does it happen, that the not regarding things of this kind, which has been the cauſe of diſeaſes, occaſions the moſt unhappy events in the courſe of their cure? nay, ſometimes irrecoverable misfortunes happen, without the phyſicians being able to gueſs why; and this ſometimes after a ſeemingly perfect cure. A very remarkable inſtance of a thing of this kind Mr. Winſlow gives, in the caſe of a woman to whom he was called to examine the cure of a fracture of the thigh. The perſon was lame after the cure, notwithſtanding that there were all the common proofs of the fracture's having been perfectly well reduced, and that the bone had united in its proper ſhape and dimenſions, and no way differed from that of the other thigh. He cauſed the perſon to be laid flat down, and when ſhe was in that poſition, placing the knees, legs, and feet perfectly even, the thigh which had been ſet appeared perfectly like the other; but obſerving, that in a moment afterwards, the leg on the fractured ſide thruſt itſelf up, as if of its own accord, out of the level of the other, and appearing then ſhorter than the other, he examined the hips; and perceiving that they were perfectly even while the leg was thus a little elevated, he again depreſſed it to the level of the other, and then the hips became uneven and oblique. It appeared very plain from this, that the thigh-bone had loſt ſomewhat of its original length from the irregular coaleſcence of the fracture; and that the ſurgeon who had ſet it, for want of examining the attitude of the hips at the ſame time with that of the thighs, had deceived himſelf, by truſting the common method of examination, into a belief that the thigh was of the proper length: what adds greatly to the occaſion of error in the common way of examining theſe reduced fractures, by comparing the length of the two legs is, that the patient, dreading pain, always gives into the deceit, and naturally depreſſes the hip, without conſidering why, till the leg, tho' really much ſhorter, appears of the ſame length with the other. Mem de l'Acad. Scienc. Par. 1740.

POT *(Cycl.)*—Pot, in our old writers, a head-piece of war. It is mentioned ſtat. 13 Car. II. c. 6. *Blount.*

Glaſs-Pots. See Glass-*pots.*

Pot-*aſh* *(Cycl.)*—The art of reducing vegetables to this ſtate is a very valuable one; the ſoap-maker, fuller, ſcowerer, dyer, and glaſs-man, as well as the chemiſt and apothecary, depending greatly on it in many particulars.

The authors who are farther to be conſulted in this caſe, are Glauber, in his proſperity of Germany; but the chemical foundation of the whole appears in Boerhaave's chemiſtry, and the papers of Stahl on this ſubject.

This ſalt has been made in New England in conſiderable quantities from rotten wood. What gave the occaſion of knowing it, was, that a white oak in that province decayed, and a third part of its ſubſtance became rotten. This rotten part was tried to burn, and was found to turn almoſt wholly into a fine alkali ſalt, or pot-aſh, much ſtronger than that which is made in the uſual way. What was moſt obſervable in the making of this ſalt was, that while the wood was burning, it would melt of itſelf, and run down into hard lumps of ſalt; and this, none of the wood of the ſame tree, which was ſound, would do, but only the rotten part: and what was moſt rotten of all, yielded the greateſt quantity of ſalt, and that the moſt readily; whereas all the common alkali ſalts of wood, made by incineration, are blackiſh at firſt; and a lixivium made of them, altho' often filtered, will ſtill be of a brown colour, occaſioned by ſome of the charcoal of the wood ſo cloſely united to the ſalt as not to be eaſily ſeparated from it. This alkali made from rotten wood was very white, even before ſolution; and the lixivium made with it was not at all tinged with brown, but clear like pure water, only a very ſmall quantity of aſhes ſubſided to the bottom. The lixivium was eaſily decanted from this, without the trouble of filtration; and when evaporated to a drineſs, left the ſalt perfectly fine and pure. In the making this ſalt, as the fire grows more intenſe, the wood is ſeen to run together into great lumps, and bubble with a hiſſing noiſe.

The weight of the *pot-aſh* prepared in the common way is very inconſiderable, in proportion to the wood uſed; but in this, the ſalt nearly equals the whole weight of the wood. In the common way of making the *pot-aſh*, the ſalt is never diſtinguiſhed by the eye among the aſhes, nor even cauſes them to run into lumps; but in this caſe the ſalt always runs into large lumps, and is as eaſily diſtinguiſhed from the reſt of the aſhes, tho' white, as ſalt of tartar of the pureſt kind would be.

It is very certain, that rotten wood in many places has been found, on trial, to yield much leſs ſalt than ſound wood; but the ſound wood of this tree being tried, was found to yield no more ſalt than other wood, and conſequently much leſs than the rotten part of it. On examining this tree on the ſpot, it was thought by good judges, that it had been at ſome diſtance of time ſtruck with lightening, it being evidently torn from the top to the bottom: on that ſide where the decayed part ſeparated from the ſound, there had been a channel of about five inches wide all the way down; but this was cloſed over by ſucceeding bark, and ſhewed no trace of the accident till on examining underneath, where the tree was found black for ſuch a ſpace, and the bark not of a piece with the reſt.

From this it may be conjectured, that the wood having been for ſo long a time, as till the growth of this bark, expoſed to the wind and weather, naturally became rotten from the wet it received; and that the lightening having penetrated the wood, had ſo altered and diſpoſed the parts and pores of it, that they attracted and retained the nitrous ſalts of the air in great abundance, even as ſalt of tartar, and other the like ſalts, do; which, as Glauber obſerves, will be reduced, in continuance of time, to an abſolutely nitrous ſalt, and the quantity alſo conſiderably increaſed.

The parts of this rotten wood were of a very different ſtructure from thoſe of ordinary wood in this condition; and tho' the lightening had not calcined it into a ſalt, yet it had, as appears, ſufficiently altered it to give that tendency to imbibe, and a power to retain the nitrous particles from the air, as well as the alkalies of vegetables perfectly calcined will do. If it ſhould be objected, that nitre alone will not calcine into an alkali, it is eaſily anſwered, that nitre with charcoal will; and the remaining wood might very well ſerve as charcoal in this proceſs. Phil. Tranſ. N°. 366. p. 121.

Some ſort of *pot aſhes* have been found to contain a large quantity of ſea-ſalt, which is probably mixed with them by the makers; not only as it is much cheaper, but as it makes them whiter, and more eaſily run into large maſſes. Med. Eſſ. Edinb. abr. Vol. I. p. 165. Not.

The French have two kinds of *pot-aſh*, the produce of their own manufactures; the method of making which M. du Fay, of the academy at Paris, deſcribes in the following manner.

The firſt which is the common or coarſer kind, is made of the beech or elm; the firſt of which trees they always find to yield the largeſt quantity.

They cut down the largeſt and moſt full grown trees, and cutting them into pieces of ten or twelve foot long, they lay them together in form of a pile, and burn them to aſhes in the open air. They gather up the aſhes, and make a very ſtrong lixivium of them in water; into this liquor they throw pieces of old rotten and ſpungy wood, which is, from its texture, capable of imbibing a great quantity of humidity: they uſe ſo many of theſe pieces as are ſufficient to ſoak up the whole quantity of their lixivium. When this is done, they dig a ſquare pit in the earth; over this they lay ſome iron bars, to ſuſtain a quantity of dry wood, to ſerve as fuel. When they have laid together a ſufficient quantity of this, they pile upon it the rotten billets which have imbibed the lixivium; and when the dry wood underneath is ſet on fire, and heats the top of the pile, the lixivium loſes its water by the heat, and the ſalt contained in it is ſeen running down through the fire, in form of a ſhower: this is received in the pit made on purpoſe for it. When all is melted out of the billets at firſt laid on, they bring others, which the fire acts upon in the ſame manner; and ſo on, till the whole pit is filled with *pot-aſh*.

When this is done, they remove the fire as quickly as they can; and with rakes clear the ſurface of the *pot aſh* as well as they can from pieces of charcoal and aſhes which have fallen into it: but with all their care, they are not able to prevent a great deal, both of coals and aſhes, remaining in it; as is eaſy to conceive from the manner of the proceſs. The ſalt after this forms one ſolid cake or maſs, and this they dig up out of the pit while it is yet hot; and barrel it up for fear of its receiving damage from the humidity of the air, which it is very ready to imbibe. This is the French *pot-aſh* of the common or coarſe kind.

The finer or purer kind is made of the ſame wood with the other, and the proceſs is conducted in the ſame manner, ſo far as to the making of the lixivium; but, when this is prepared, inſtead of ſoaking it up with rotten wood, they pour it off into an iron caldron of a large ſize, and evaporate it, ſtill adding more lixivium as the former boils away, till they have employed all they have made; they then continue the fire till the whole humidity is evaporated: they then take the dry maſs of ſalt out of the bottom of the veſſel, and put it into a furnace made with a cloſe arched top; by means of which the flame is reverberated from all parts upon the ſalt. They here give it ſo much fire as ſerves to calcine it to a whiteneſs, and then the whole operation is finiſhed.

It is ſeldom, however, quite white; but uſually retains ſomewhat of the colour it had before its calcination. This the workmen ſay is owing to the nature of the wood the aſhes were made from. They ſay that thoſe trees which grow on the tops of high hills, yield a *pot-aſh* of a pale blue colour; and thoſe which grow in wet marſhy places, yield a reddiſh ſalt. Trees which have ſtood in other ſoils and ſituations, they ſay, yield a white *pot-aſh*; but they obſerve, that none yield it in ſo large a quantity as thoſe which grow on the tops of mountains. Mem. Acad. Par. 1727.

POTAMOGEITON, *pondweed*, in the Linnæan ſyſtem of botany, a genus of plants, the characters of which are theſe:

the flower has no calyx or cup; but is compoſed of four obtuſe, roundiſh, hollow, and open petals, which fall off before the ripening of the ſeeds. The ſtamina are four plane, obtuſe, and very ſhort filaments; the antheræ are double and ſhort; the piſtillum has four germina, which are all oval and pointed: theſe have no ſtyle, but obtuſe ſtigmata. There is no other fruit than four ſeeds ſucceeding each flower; theſe are of a roundiſh, but flatted figure, gibboſe, and pointed. *Linnæi* Gen. Plant. p. 55.

The characters of this genus, according to Tournefort, are theſe: the flower conſiſts of four leaves, diſpoſed in form of a croſs, and having no cup; the piſtil becomes at length a congeries of four ſeeds, of an oblong figure, collected into a ſort of head.

The ſpecies of *potamogeiton*, enumerated by Mr. Tournefort, are theſe: 1. The roundiſh-leaved *potamogeiton*. 2. The long-leaved ſerrated *potamogeiton*. 3. The plantain-leaved alpine-*potamogeiton*. 4. The broad ſhining-leaved *potamogeiton*. 5. The curled-leaved *potamogeiton*, called *frog's lettuce*. 6. The narrow undulated-leaved *potamogeiton*. 7. The leſſer *potamogeiton*, with denſe ſharp-pointed, and not ſerrated leaves. 8. The narrow-leaved branched *potamogeiton*. 9. The graſſy-leaved *potamogeiton*, with flatted ſtalks. 10. The ſmall graſſy-leaved *potamogeiton*, with round ſtalks. 11. The *potamogeiton* with flowers at the knots of the ſtalks, called *water-milfoil*. 12. The pennated-leaved *water-milfoil*, called by ſome *feathered water-milfoil*. *Tourn.* Inſt. p. 233.

POTAMOPITYS, in botany, a name given by Buxbaum to a new genus of plants, ſomewhat reſembling the limnopeuce in its general external appearance; but greatly differing from that plant in its flower and fruit.

The ſtalk is about four inches high, and is made up of ſeveral joints, fixed in the manner of ſo many cups one into another. The leaves ſtand in form of a ſtar, eight, or thereabout, at every joint: theſe are narrow at the lower part of the plant; but toward the top, they are broader, and ſtand fewer at a joint, ſometimes only two. The flowers grow out of the alæ of the leaves, and are white and compoſed of four petals, diſpoſed in form of a croſs: they ſtand in a four-leaved cup, and have no pedicle. The piſtil occupies the center of the flower, and is ſurrounded by four ſtamina. The ſeed veſſel is round, divided into four cells, and filled with ſlender and lunated ſeeds. It flowers in May, and is common in the marſhy grounds in Thrace, near the Boſphorus. Act. Petrop. Vol. 1. p. 243.

POTATOE. The moſt advantageous way of propagating *potatoes* is, the planting them at large diſtances, and digging or horſehoeing the ground ſeveral times between them.

Mr. Tull gives an example of this, in which the hoeing ſucceeded much better than dung, and without the expence of it. A piece of ground was planted with *potatoes*, the greater part of it in the common way; but in one part, worſe than the reſt, they had been ſet at a yard diſtance every way. The reſt of the ground was dunged; this poor part had no dung, but was ploughed deep at ſeveral times four different ways, ſo that the ground was ſtirred and broken thoroughly every where about the *potatoes*. The conſequence was, that tho' no dung was uſed here, and tho' the plants appeared much weaker than in the dung part, yet the crop was greatly better than that of the other part of the field. The roots here were all large, and in the other parts of the field, where the dung had been uſed without ploughing, they were ſo ſmall, that the crop was ſcarce worth taking up.

This is one of many inſtances of the no great uſe of dunging land, without properly ſtirring it up; and ſerves to prove, what the crops of corn and every thing elſe confirm upon trial, that the ſtirring the earth ſufficiently, without any farther trouble, will anſwer better without any other manure, than all the manure in the world without it. *Tull*'s Horſehoeing Huſbandry.

POTENTILLA, in botany, a name given by many authors to the argentina, or ſilver weed; and by ſome with the addition of the epithet major, or the greater *potentilla*, to the ulmeria, or meadow-ſweet. *Ger.* Emac. Ind. 2.

POTERIUM, a word uſed by many for the prickly pimpernell. See PIMPINELLA.

POTHOS, in botany, a name uſed by Theophraſtus, and ſome other of the old writers, for the aquilegia or columbine. *Ger.* Emac. Ind. 2.

POTINCOBA, in botany, a name by which ſome authors call water-pepper, or the ſharp arſmart. *Piſo*, 221.

POTIRONE, in botany, a name given by the people of Burgundy to a ſtinking kind of fungus, found about the roots of trees. They have alſo extended the name much farther, and uſe it for a ſort of touchwood, or rotten wood of the oak, and other trees common in the foreſts of thoſe countries, which ſhines in the night, and has the ſame ſmell with that fungus.

POTRIMPOS, the name of an antient Pruſſian idol, worſhiped under oaks, and to which human ſacrifices of enemies were offered. Mem. de l'Acad. de Berlin, Tom. 2. p. 358. Percunos and Picolos were idols of the ſame kind.

POTTERN-*ore*, a kind of lead ore. See LEAD-*ore*.

POUCH, in the military art. A grenadier's *pouch* is a ſquare caſe or bag of leather, with a flap over it, hanging in a ſtrap of about two inches broad over the left ſhoulder, in which he carries his granadoes.

POUDRE *des Chartreux*. See KERMES *mineral*.

POUNCE *(Cycl.)*—POUNCE, among writing-maſters, a powder made of gum-ſandarac, which being rubbed on the paper, makes it leſs apt to imbibe the ink: it is therefore uſed in this manner by thoſe who are curious in the art of the pen, by which means the writing appears more preciſe, ſharp, and determinate.

The varniſh-makers alſo uſe to diſſolve it in oil of turpentine, or in linſeed oil, or in ſpirit of wine; from which mixture is produced a kind of liquid varniſh.

POUND *(Cycl.)*—In Scotland the *pound* is divided into two marks, or ſixteen ounces, the ounce into ſixteen drops, and a drop into thirty-ſix grains. Tr. Pract. Geom. p. 153.

POUND *averdupois*. The Engliſh *averdupois pound*, taken from the reputed ſtandard, is about 7000 Troy grains, and the ounce about 437 and an half ſuch grains. But it is to be obſerved, that the ſtandards kept at the Exchequer differ a little from each other.

The Scotch, Paris, or Amſterdam *pound*, is to the *pound averdupois* as thirty-eight is to thirty-five. Tr. Pract. Geom. p. 153.

POUND *breach*, in law. If a diſtreſs be taken, and impounded, though without juſt cauſe, the owner cannot *break* the *pound*, and take away the diſtreſs; if he doth, the party diſtraining may have his action, and retake the diſtreſs wherever he finds it: and for *pound breaches*, &c. action of the caſe lies, whereon treble damages may be recovered. 1 Inſt. 161. 2 W. & M. c. 5.

Alſo it is ſaid, that all *pound breaches* may be enquired of in the ſheriff's turn, as they are common grievances, in contempt of the authority of the law. 2 Hawk. P. C. 67. *Blount.*

POUND *land*, of old extent. This is alſo called *librata terræ*, and is uſed in Scotland to denote a certain portion of arable land, containing four oxengate, or fifty-two acres. Tr. Pract. Geom. p. 87. See Ox-*gang*.

POUND *Troy*, in Scotland, which by ſtatute is to be the ſame as the French *pound*, is commonly ſuppoſed equal to fifteen ounces and three quarters Troy Engliſh weight, or 7560 grains. But by a mean of the ſtandards kept by the dean of gild of Edinburgh, it weighs 7599$\frac{1}{2}$, or 7600 grains.

POUR *fair proclaimer, que null inject fines ou ordures en foſſes ou rivers pres cities*, &c. in law, an antient writ, directed to the mayor or bailiff of a city or town, requiring them to make proclamation, that none caſt filth into the ditches or places near ſuch city or town, to the nuſance thereof; and if any be caſt there already, to remove the ſame. It is founded on the ſtatute 12 Rich. II. c. 13. F. N. B. 176. *Blount, Cowel.*

POUR *ſeiſer terres la femme que tient en dower*, in law, an antient writ, whereby the king ſeized the land which the wife of his tenant *in capite* had for her dowry, after his diſeaſe, if ſhe married without the king's leave; by virtue of the ſtatute of the king's prerogative c. 3. F. N. B. 174. *Blount. Cowel.*

POUSSE-*pied*, in natural hiſtory, the French name for a genus of ſhell-fiſh, called by writers of other nations the *policipes*. See POLICIPES.

Rondeletius has very improperly confounded this genus of ſhells with the balani marini; but the two genera are extremely different, as well in their general figure as in this, that the *pouſſe-pied* always has a pedicle to which it is affixed, and the balanus never has any. Every *pouſſe-pied* is compoſed of ſeveral pointed ſhells or valves; the baſes of the larger of theſe are affixed to the pedicles. The outer ſurface of the ſhell is of a mouſe colour, and is rough like chagrin; but the inſide is filled with a white fleſh, which, when boiled, becomes very red, and is of a fine taſte and good nouriſhment, being in nothing inferior to the fleſh of cray-fiſhes.

The *pouſſepied* differs from the concha anatifera in this, that the anatifera is only compoſed of five pieces; and the pedicle is longer and ſlenderer, and rarely adheres to that of any other ſhell of the ſame kind; and the ſhell is only filled with a mucous fluid, and a few plumoſe ſubſtances. On the contrary, the *pouſſepied* is never found ſingle; it is always ſeen in cluſters, the pedicles joining and adhering to rocks under water, ſo that it is bare only at the time of the tide being out. The union of the baſes of the pedicles of theſe ſhells forms a ſort of tree, of which the looſe part of each pedicle makes a ſort of branch; and the tops of theſe are furniſhed with ſeveral triangular pieces, each of which has its plume belonging to it. This pedicle is ſhorter and thicker than that of the concha anatifera, and is eatable; and, indeed, is the only part of the animal that is ſo. The fiſh contained in the ſhell, is nearly the ſame with the fiſh in the concha anatifera, excepting the difference in the length and thickneſs of the arms, or branches of feathers. Hiſt. Nat. Eclairc. p. 359.

POUST, an Indian name for a very poor and coarſe kind of opium, made by boiling the ſtalks and leaves of the opium poppy in water, and then evaporating the clear liquor to the conſiſtence of a ſolid extract.

POUTING, or *whiting*-POUT, in ichthyology, a name given to a ſpecies of bearded gadus. See GADUS.

POWCHES,

POWCHES, in a ſhip. The ſeamen call by this name the ſmall bulk-heads made in the hold, to ſtow corn, goods, or the like, that it may not ſhoot from one ſide to the other.

POWDER *(Cycl.)*—*Gun*-POWDER. See GUN.

POWDER-*flasks*, in artillery, are moſt commonly made of horn, of any convenient ſize and figure, to carry *powder* for priming of cannon: this is their chief uſe in armies.

Sometimes they are ſo made as to have a meaſure for the charge of the piece at top, but this is of more uſe to gentle men in fowling, *&c.* than to ſoldiers, who have the charges of their piece put into cartridges, which they bite off, and firſt prime, and then load.

POWDER-*room*, in a ſhip, that part of the hold wherein the *powder* is ſtowed.

POWER *(Cycl.)*—If any *power* of a quantity be divided by a greater *power* of the ſame quantity, the quotient muſt be negative. For the rule for dividing any *power* of a quantity by another *power* of the ſame, is to ſubtract the exponent of the diviſor from the exponent of the dividend, and make the difference the exponent of the quotient.

For inſtance, $\frac{a^6}{a^4} = a^{6-4} = a^2$ and $\frac{a^m}{a^p} = a^{m-p}$. Hence if p be greater than m, the exponent $m-p$ muſt be negative. Thus if $p=m+n$, then $\frac{a^m}{a^p} = \frac{a^m}{a^{m+n}} = a^{-n}$.

It is obvious that $\frac{a}{a} = a^{1-1} = a^0$. But $\frac{a}{a} = 1$; and therefore $a^0 = 1$. In like manner $\frac{1}{a} = \frac{a^0}{a^1} = a^{-1}$; $\frac{1}{aa} = \frac{a^0}{a^2} = a^{0-2} = a^{-2}$; $\frac{1}{aaa} = a^{0-3} = a^{-3}$, ſo that the quantities a, 1, $\frac{1}{a}$, $\frac{1}{a^2}$, $\frac{1}{a^3}$, $\frac{1}{a^4}$, *&c.* may be expreſſed thus, a^1, a^0, a^{-1}, a^{-2}, a^{-3}, a^{-4}, *&c.*

This change of expreſſion is often of great uſe in the computation of fluxions and infinite ſeries.

When the quantity to be raiſed to any *power* is poſitive, all its *powers* muſt be poſitive. And when the radical quantity is negative, yet all its *powers*, whoſe exponents are even numbers, muſt be poſitive. For $- \times -$ gives $+$.

The *power* then can only be negative, when the exponent is an odd number. Thus the *powers* of $-a$ are $-a$, $+a^2$, $-a^3$, $+a^4$, $-a^5$, *&c.* Thoſe whoſe exponents are 2, 4, 6, *&c.* are poſitive, but thoſe whoſe exponents are 1, 3, 5, 7, *&c.* are negative. *Mac. Laur.* Algebr. p. 37, 38.

Hence if a *power* have a negative ſign, no root of it denominated by an even number, can be aſſigned; ſince no quantity multiplied into itſelf an even number of times can give a negative product. Thus the ſquare root of $-aa$ or $\sqrt{-aa}$ cannot be aſſigned, and is what mathematicians call an *impoſſible*, or *imaginary* quantity or *root*. See ROOT.

Obſerve, that every *power* has as many roots, real and imaginary, as there are units in the exponent of the *power*. This holds true of unity itſelf. *Mac. Laur.* Algebr. p. 128. See the article UNITY.

Imperfect POWER, in algebra, is uſed for a *power* that has a fractional exponent; thus $a^{\frac{1}{2}}$ $a^{\frac{2}{3}}$ $a^{\frac{3}{5}}$ $a^{\frac{7}{8}}$, *&c.* are imperfect *powers*. *Mac. Laur.* Algebr. p. 44.

Theſe are otherwiſe expreſſed by placing the given *power* within the radical ſign $\surd$, and placing above the radical ſign the number that denominates what kind of root is required. Thus, $a^{\frac{1}{2}} = \sqrt[2]{a}$; $a^{\frac{2}{3}} = \sqrt[3]{a^2}$; $a^{\frac{m}{n}} = \sqrt[n]{a^m}$.

Theſe imperfect *powers* are alſo called *ſurds*. See SURD, *Cycl.*

Negative POWER, in algebra. See NEGATIVE *power*.

POWTER, *or Engliſh* POWTER, the name of a peculiar ſpecies of pidgeon, called by Moore the *columba gutturoſa Anglica*.

It was firſt bred in England, and is of a mixed breed, between what is called the horſeman and the cropper. It is a very beautiful ſpecies, and is valued for its length of legs and body, neatneſs of crop, and ſlenderneſs in girth, added to the beauty of its feathers. This ſpecies is often eighteen, ſometimes twenty inches long from the end of the bill to the extremity of the tail. Its legs, from the upper joint of the thigh to the toe-nail, is ſometimes ſeven inches; the crop is large and round, eſpecially toward the beak, filling alſo behind, and making almoſt a perfectly orbicular figure. They are either blue-pied, black-pied, red-pied, or yellow-pied; the laſt colour is moſt valued. *Moor's* Columbarium, p. 35.

Pariſian POWTER, a ſpecies of pidgeon called by Moore *columba gutturoſa Pariſiorum*.

It was firſt bred at Paris, and thence ſent to Bruſſels, whence it was afterwards brought into England. It reſembles the Engliſh *powter*, but is ſhort-bodied, ſhort-legg'd, thick in the girth, and long-cropp'd. It is admired for the beauty of its feathers, which is peculiar to itſelf; it reſembling in this a fine piece of that ſort of needle-work which the ladies call the Iriſh ſtitch, being chequered with various colours in every feather, except the flight, which is white. It has generally a good deal of red intermixed with the other colours, and the more it has of this the more it is eſteemed.

Horſeman POWTING, a name given to a mixed breed of pidgeons, produced between thoſe two kinds known by the names of the *cropper* and the *horſeman*, according to the number of times that the young are bred over from the *cropper*. They are diſtinguiſhed by the names of the firſt, ſecond, or third breed.

Theſe are a very agile and nimble pidgeon; and by their continually flying up and down about the dove-houſe, are apt to bring in other ſtray pidgeons, which cannot find their houſes. They are obſerved to breed often, and take great care of their young ones. *Moore's* Columbarium, p. 38.

POX *(Cycl.)*—*Small* POX. Dr. Hahn endeavours to prove, that the *ſmall pox* was deſcribed by the old Greek phyſicians under the name of carbuncle.

Dr. Hahn's treatiſe on the antiquity of the *ſmall pox*, has been criticized by Dr. Werlhoff, who endeavours to ſhew, that Dr. Hahn's quotations from the old Greek writers concerning the carbuncle, cannot be underſtood of the *ſmall pox*, which is a diſeaſe we have no account of till the Saracens diſperſed it. Med. Eſſ. Edinb.

Dr. Hilſcher recommends cutting off the hair in the *ſmall-pox*, by which perſpiration may be increaſed. This method was practiſed on the king of Spain's ſon Don Carlos, and on a Saxon prince with ſucceſs. Med Eſſ.

Dr. Martin of Lauſaunne, recommends bathing the face and body with cloths dipped in tepid water every four hours during the eruption of the *ſmall pox*; aſſuring that it has excellent good effects. Hiſt. de l'Acad. des Sciences, 1737.

Dr. Haller tells us, that camphor aſſiſts greatly to fill the puſtules of the *ſmall pox* of the confluent kind with petechiæ. Commerc. Norimb. 1736. Hebd. 10. § 1.

Dr. Lobb diſapproves entirely of blood-letting in the *ſmall pox*, and thinks the diſeaſe may be prevented, or cured, without any eruption, and that a ſpecific may be found: he propoſes the Æthiops mineral as ſuch, and relates ſome examples of the diſeaſe being, in his judgment, prevented by the timely uſe of it. The biſhop of Cloyne ſeems to aſcribe the ſame virtues to tar-water. See TAR-*water*.

Dr. Wintringham ſays, he never obſerved antiphlogiſtic medicines, which open the belly, diluting clyſters or ſuch like, to have any bad effects in this diſtemper; but on the contrary, has always ſeen them ſerviceable to young, vigorous, plethoric patients; while too bound a belly frequently at laſt produces a dangerous diarrhœa. He propoſes in urgent caſes of the confluent *ſmall pox*, where from the reſorption of the variolous matter there is great danger of increaſing the ſecondary fever, that the puſtules ſhould all be opened, and treated as ſo many ulcers. See his Commentar. Noſologicum.

Bloody urine is looked upon as a forerunner of death in the *ſmall pox*; but we have inſtances of perſons recovering under ſuch ſymptoms. See Phil. Tranſ. N° 470. Sect. 11.

Great POX. For the cure of the *lues venerea*, Dr. De Sault, in his treatiſe on this diſeaſe, recommends frequent frictions with large quantities of mercurial ointment made with one third of quick-ſilver; to wit, from two or three drams to an ounce, or an ounce and an half every night, or every other night, taking care to keep the belly in a purging way, by clyſters, laxatives, or the ſtronger purgatives, if the mercury begins to affect the mouth. He ſays this method is ſure, and altogether ſafe, and he relates ſeveral hiſtories of cures performed by it, not only in the *lues venerea*, but in many other diſeaſes, particularly in obſtructed hardned glands, the liver, teſtes, *&c.* Med. Eſſ. Edinb.

Mr. Douglas greatly commends De Sault's method, and it is ſaid that it has been practiſed with ſucceſs in ſome of the hoſpitals in London. See A Letter on the cure of the venereal diſeaſe.

Dr. Werlhoff prefers frequently repeated ſmall doſes of mercury to a ſalivation, for the cure of the *lues venerea*. Commerc. Norimb. 1235. Hebd. 13. § 4.

Mr. Macky, profeſſor of hiſtory in the univerſity of Edinburgh, ſent the Royal Society a voucher for the grandgor *(lues venerea)* raging at Edinburgh in 1497. It is a royal proclamation, ordering all who had the diſeaſe, or who had attended people under it, to repair forthwith to an iſland in the Frith of Forth. Phil. Tranſ. N° 469. § 5.

PRACTORES, πρακτορες, among the Athenians, officers appointed to receive the money due to the city from fines laid upon criminals. *Potter*, T. 1. p. 81.

PRÆBIUM, a name uſed by medical authors to expreſs a doſe of any thing, or the quantity of a medicine to be exhibited at one time.

PRÆCIÆ, among the Romans, the ſame with *præclamitatores*; which ſee.

PRÆCIPE *(Cycl.)*—PRECIPE *in capite*, a writ iſſuing out of the chancery, for a tenant holding of the king *in capite*; *viz.* in chief, as of his crown. Magn. Chart. c. 24. Reg. Orig. 4. *Terms of law.*

PRÆCLAMITATORES, among the Romans, officers that went along the ſtreets of Rome before the *flamen dialis*, to oblige all people to give over their work on public holydays;

for if the *flamen* ſaw any one at work, the ſervice of the gods could not be performed. *Danet.* in voc.

PRÆCLAVIUM, among the Romans, was uſed to ſignify the *prætexta*. See PRÆTEXTA, *Cycl.*

PRÆCO, among the Romans, the public crier, an officer whoſe buſineſs it was in the aſſemblies of the people to call the claſſes and centuries according to their order, and to order ſilence to be kept in the temples during the time of ſacrificing.

The aſſiſtance of the *præco* or public crier, was uſed on many other occaſions, as at public ſales or auctions, funerals, games, in courts of juſtice, to publiſh things loſt, *&c.* *Pitiſc.* Lex. Ant. in voc. See CERYX.

PRÆCOCIA *mala*, *apricocks*. The method of cultivating and propagating the ſeveral ſorts of this fruit, is this: They are all to be propagated by grafting them on plumb-ſtocks, and will readily take with almoſt any ſpecies of plumb, provided that the ſtock be in a thriving condition. See GRAFTING.

The Breda and Bruſſels *apricocks*, are beſt to be made ſtandard trees, all the reſt are to be propagated againſt walls, and ſhould have an eaſt or weſt aſpect. The borders under theſe walls ſhould be four feet wide at leaſt, and ſhould be two feet deep in earth. If the place where they are planted be a loamy ſoil, the beds are to be raiſed pretty high above the level of the ground, and if chalk or gravel, it muſt be removed to a conſiderable width, to make room for freſh ſoil to be put in, but it need not be dug more than two feet deep. The beſt ſoil for them is freſh earth from a paſture ground, taken to ten inches deep, and laid with the turf among it to rot together, for a twelvemonth before it is uſed.

Such trees ſhould be choſen for planting as are but of one year's growth from the budding, and where the ſoil is dry or moderately ſo, October is the beſt ſeaſon for planting. For the manner of planting, ſee the article APPLE-*tree*.

No part of the head ſhould be cut off at this time, unleſs there are ſome foreright ſhoots which will not come near the wall. In a good ſtrong ſoil, or againſt a low wall, theſe trees ſhould be planted at eighteen feet aſunder; the ſtem is to be placed four inches from the wall, and the head inclined toward the wall, the branches ſhould be then nailed up to the wall, and the ſurface over the earth muſt be covered with rotten dung, to keep out the froſts. In February the dung is to be removed, and the tree being held very ſteady the top is to be cut off to about three eyes above the bud, leaving the ſloping ſide toward the wall. If the weather proves dry after this, they muſt be gently watered, and ſome turf or mulch laid round the root to keep off the ſun's heat; and what branches are produced muſt be nailed up, except ſuch as are produced foreright, which muſt be cut off.

At Michaelmas, when the trees have done growing, the branches muſt be again unnailed and cut off to a proper length, the ſtronger ſhoots being left of nine or ten inches long, the weaker five or ſix inches. After they are thus ſhortened, they muſt be again nailed up, and that as much in an horizontal direction as poſſible. The ſecond and third ſummer the ſame rules muſt be obſerved, all the foreright ſhoots muſt be diſplaced as they are produced, nailing in the others horizontally to the wall; ſo that the middle of the tree may be kept open; and never ſhorten any of the ſhoots in ſummer, unleſs to furniſh branches to ſome vacant ſpaces on the wall; and this ſhould never be done later than April. The *apricock* produces its bloſſom buds not only on the laſt year's wood, but alſo on the curſons or ſpurs from the two year old wood; great care muſt therefore be taken not to injure or diſplace theſe.

The Bruſſels and Breda *apricocks* being planted for ſtandards, require very little management, only in autumn or ſpring cut away all the dead wood, and ſuch branches as croſs one another. The Bruſſels *apricock* is the fineſt of all the kinds: it is ripe in the middle of Auguſt. *Miller's* Gardner's Dict.

PRÆCONISSUS, in natural hiſtory, the name given by Ludovicus Dulcis, and other writers of his time, to a gem famous for its imaginary virtues: it is deſcribed to have been of the nature of the ſapphire, but ſomewhat approaching to the colour of the chalcedony: this ſeems to make it the leucoſapphirus of other authors.

PRÆFECTURÆ, among the Romans, towns in Italy, which were neither municipal, nor had the privilege of chooſing magiſtrates of their own, like the colonies; but were governed by a magiſtrate ſent from Rome, who was called *prefectus*, and his government a *præfectura*. *Pitiſc.* in voc.

PRÆFERICULUM, among the Romans, a vaſe with a large prominent mouth uſed in the ſacrifices of Ops. *Pitiſc.* in voc.

PRÆFICÆ, among the Romans, were mourning women hired to attend funeral ſolemnities; where they praiſed the deceaſed, made a lamentation, beat their breaſts, and diſtorted their faces, to excite others to mourn. *Danet.* and *Pitiſc.* in voc.

PRÆFINE, in law, that fine which upon ſuing out the writ of covenant on levying *fines of lands*, is paid before the time is paſſed. 22 and 23 Car. 2. *Blount.*

PRÆFURNIUM, a word uſed by chemical writers to expreſs the anterior part of a furnace, by which the coals, or fuel are put in, and the aſhes taken out.

PRÆMORSUM *folium*, among botaniſts. See LEAF.

PRÆNOTION is uſed by Lord Bacon for breaking of an endleſs ſearch, which he obſerves to be one of the principal parts of the art of memory. For when one endeavours to call any thing to mind, without ſome *previous notion* or perception of what is ſought for, the mind exerts itſelf and ſtrives in an endleſs manner: but if it hath any ſhort notion before hand, the infinity of the ſearch is preſently cut off, and the mind hunts nearer home, as in an incloſure. Thus verſe is eaſier remembered than proſe; becauſe if we ſtick at any word in a verſe, we have a *previous notion* that it is ſuch a word as muſt ſtand in a verſe. Hence alſo, order is a manifeſt help to memory; for here is a *previous notion* that the thing ſought for muſt be agreeable to order. *Bacon's* Works, abrid. Vol. I. p. 136. and Vol. II. p. 474. See PRÆNOTION, *Cycl.*

PRÆPOSITUS *ſacri cubiculi*, among the Romans, an officer who was to take care of the emperor's bed-chamber. His office was the ſame with that of our lord chamberlain, and he had the privilege of marching next to the captain of the horſe-guards. *Danet.* in voc.

PRÆSALTOR, among the Romans, an appellation given to the chief director of the *ſalii*. *Pitiſc.* in voc. See SALII.

PRÆSEPIA, a word uſed by authors to expreſs the ſockets of the teeth.

PRÆSICIA, in antiquity, thoſe parts of the intrails of ſacrifices which were cut off, and offered to the gods. *Hofm.* Lex. Univ. in voc.

PRÆSUL, among the Romans, the name of the chief of the *ſalii* or prieſts of Mars. He was ſo called *a præſiliendo*; *i. e.* dancing at the head of the *ſalii*. *Hofm.* Lex. Univ. in voc. See SALII, *Cycl.*

PRAMNION, in natural hiſtory, the name of one of the ſemipellucid gems, ſo diſtinct from all the others as to make properly a peculiar genus of foſſils. It is called by many of the antients *morio* or *morion*, and by our lapidaries the *black agate*.

It is a ſtone of a very great concealed beauty. Our lapidaries, who know it by the name of the *black agate*, are very indeterminate in the application of that name, calling by it not only this, but every black ſtone capable of a good poliſh by the ſame name, and never looking for its great character, its hidden colour. It is found in the ſhape of our common flints and pebbles, but ſeldom larger than an egg; it appears on a ſlight inſpection, to be of a fine deep black, but held up againſt the ſun, or the light of a candle, it diſcovers itſelf to be of a fine ſtrong red, without the leaſt admixture of any other colour. It is moſt frequently of a purpliſh tinge, like the amethyſt, but is at times found of all the degrees of red, from the pale flower colour of the hyacinth to the deep red of the carbuncle. It is of great hardneſs, and capable of an elegant poliſh.

It is produced only in the Eaſt Indies; and we ſometimes have it thence among other ſtones, but it is not much regarded with us. The Romans were fond of it for engraving on, as we find by Pliny, and by a much more undeniable proof, many of the valuable antiques being cut on it. *Hill's* Hiſt. of Foſſ. p. 471.

PRAMNOS, a name given by the antients to a ſort of auſtere wine which looked of a black colour till held up againſt the light, and then appeared of a deep purple: it is recommended by Hippocrates in hæmorrhages.

PRASINUM *viride*, a word uſed by the antients for verdigreaſe.

PRASION. The antient Greek writers have expreſſed three very different plants by this name.

The moſt common ſignification of the word is the common *marrubium* or horehound. It is in many places uſed alſo to ſignify the leek, and often for that ſort of marjoram which we call *origanum onitis*, or pot-marjoram. Pliny deſcribes this plant, and ſays that it was called *onitis* and *praſius*, and had the appearance of hyſſop. This is but a bad deſcription of the plant, and much inferior to the Greek epithet, which calls it the *capitated*, or *corymbous praſium*, for it bears its flowers in a ſort of heads or corymbi.

Heſychius tells us, that the ſea-weeds of the fucus and alga kinds, the ſea-oaks, and ſea-wracks, are called by ſome of the Greek writers *praſia*; and Theophraſtus in one part of his works ſeems to have given this name to thoſe plants.

The antients having uſed the word *praſion* in this ſenſe, explains a paſſage in Galen which cannot otherwiſe be well underſtood, that is, where he calls the *empetrum marinum*, *praſioides*, like the *praſion*.

Dioſcorides had called it *fucoides*, like the ſea-fucus, and he was very well underſtood; but Galen coming after him, and expreſſing his ſenſe by the word *praſioides*, which was ſuppoſed to ſignify reſembling leeks, or horehound, or origanum, his readers were perplexed to find out what alliance the epithet he had choſen to uſe could have, either to the plant, or to the epithet of Dioſcorides; but when it is found that *praſion* ſignifies the ſame as *fucus*, the whole is very intelligible.

PRASIS, a word uſed by ſome authors to expreſs what they call green chalk, an earth uſed by the painters, and known among us by the name of *terre verte*.

PRASIUM, in botany, the name of a genus of plants, the characters of which are theſe: the perianthium conſiſts of one leaf, and is of a turbinated bell-like ſhape, and divided at the end into two lips; theſe ſtand erect, and are permanent; the upper

upper one is broad, and divided into three acute ſegments; the under one is ſomewhat ſmaller, and is divided only into two. The flower is compoſed of one petal, and is of the labiated kind. The upper lip is erect and hollow, of an oval figure and emarginated; the under lip is broad and reflex, and is divided into three ſegments, of which the middle one is the largeſt. The ſtamina are four ſubulated filaments preſſed cloſely under the upper lips of the flower; they ſtand expanded, one pair of them are ſhorter than the other, and the longeſt do not reach to the verge of the flower. The antheræ are oblong and lateral. The germen of the piſtil is ſquare. The ſtyle is ſlender, and is of the length and ſituation of the ſtamina. The ſtigma is acute and bifid, one of the ſegments being ſhorter than the other. The fruit conſiſts of four roundiſh berries, which lie in the bottom of the cup, and each contain one ſeed. *Linnæi* Genera Plant. p. 280.

PRASIUS, in natural hiſtory, the name of a gem much approaching to the nature of the emerald, but of a coarſer green, and wanting its hardneſs, and having in its green a caſt of yellow.

It is the ſtone which the antients called *praſites*; and when of a greater than ordinary admixture of yellow, the *chryſopraſus*, and of which the gem diſtinguiſhed by later authors under the name of the *ſmaragdopraſus*, is only one of the varieties.

The *praſius*, even in its moſt perfect ſtate, is much leſs beautiful than moſt of the other gems: it is found of various ſizes, and not unfrequently conſiderably large: it is ſeldom met with ſmaller than a pea; from that to the ſize of a horſe bean is its moſt uſual ſtandard, from this to the ſize of a nutmeg it is more rarely found; and the larger ſpecimens are coarſer and leſs frequent than theſe.

It is of various figures, but is never found in a columnar or cryſtal-like form; this is declaring againſt the ſenſe of our dealers in gems, indeed, who frequently buy and ſell columns of the ſhape of ſprig cryſtal, under the name of the *ſmaragdopraſus*; but theſe are all truly no other than cryſtals tinged to a coarſe and dead green, and without any mixture of yellow; ſo that they are more properly *pſeudoſmaragdi*, or baſtard-emeralds, than any thing of the *praſius* kind.

The *praſius* is frequently of an orbicular form, flatted on one ſide and convex on the other, and often oblong or oval; but more uſually it is of a perfectly irregular ſhape, made up of a number of flat faces, as we often ſee ſome of the coarſer nodules of the debaſed cryſtals from the German mines; and it is uſually of an obſcure or much leſs poliſhed ſurface than many other of the native gems. Its colour is a duſky green, with a mixture of yellow, and often of bluiſh; and its moſt valuable pieces are of the hardneſs of the garnet; and its worſt, which are truly *praſii*, are conſiderably harder than cryſtal; the columnar *praſii*, as they are called, are, on the contrary, often as ſoft, or ſofter than pure cryſtal. It is like the other gems, found in the different ſpecimens of all degrees of colour, from its uſual duſky green to the mere colour of water; it is at times found alſo with more or leſs yellowneſs in the different ſpecimens, or in the different parts of the ſame ſpecimen, and has ſometimes a milky caſt among the green: authors have diſtinguiſhed it according to theſe its different appearances, by four names.

1. The *praſius* or *praſites*, ſimply ſo called. This is the name given to the gem in its moſt perfect ſtate, in which it has a conſiderable ſhare of yellow with the green, and the green is of a more pure and graſſy colour.

2. The *ſmaragdopraſus*. This is the name given it when there is leſs yellow in the colour and ſome mixture of blue with the green.

3. The *chryſoberyllus*. This is the name given to the *praſius* when it has the ſame bluiſh caſt, with a greater admixture of yellow.

4. The *chryſopraſius*. This is the name given it when it has a large admixture of yellow, and its green is a pure but a very pale one.

And, finally, De Boot mentions another ſpecies, as he calls it, of *praſius*, which was more opake than the reſt, and had but little green, and a large admixture of white among the yellow; but this is in reality only a ſpecies of nephriticus.

The fineſt of the *praſii* are found in the iſland of Ceylon; but there are many of them in New Spain. We have them alſo from Sileſia and Bohemia; but theſe are very poor ones. *Hill*'s Hiſt. of Foſſ. p. 597.

PRECATORES, in church hiſtory, a ſect of heretics, who under the pretence of praying always, refuſed to work. *Hofm.* Lex. Univ. in voc.

PRECEDENCY. See the articles PRECEDENCE, *Cycl.* and CEREMONIAL, *Suppl.*

PRECIPITATION, *(Cycl.)* in aſſaying, is the ſeparation of any part of a compound body while melting in the fire, or when cooling from fuſion from the reſt of the maſs, in ſuch manner that it ſinks to the bottom, while the remainder continues at top and makes the ſurface. The heavy part thus *precipitated* from the reſt, is called the *regulus* of that body.

This is an operation which almoſt always requires the addition of ſuch ingredients as ſerve to take away the mutual connection and coherence of the parts of the body to be ſeparated; that is, ſuch as have a menſtrual virtue, and keep others in a ſtate of diſſolution. For inſtance, the regulin part of antimony, and mineral ſulphur, diſſolve each other mutually, and conſtitute crude antimony; nor can they be ſeparated from each other by fire alone without deſtroying the regulus; but if you add iron, copper, ſilver, *&c.* which are more thoroughly penetrated by ſulphur, and are thus reduced to the ſtate of ore, then the regulus of antimony is freed of its ſulphur, and ſinks to the bottom, as it is heavier than the additional bodies, when joined to the ſulphur.

Such a *precipitation by fuſion* happens in vitrifications, ſcorifications, and coppelings, while one part of the body turns into droſs, or *ſcoriæ*, and the other metallic part, if there be any, keeping ſtill its metallic form, is collected at the bottom of the ſpherical veſſel. Therefore ſilver and gold, which are hardly ſubject to a perfect vitrification, conſtantly remain and ſhew themſelves in their own form; and on this account, tho' they were in ever ſo ſmall a quantity in a *coppel*, they always ſhew themſelves very clearly to the eye when the *ſcoriæ* are abſorbed; whereas ſo ſmall a regulus of the other metals would have been as it were buried and hidden under ſo great a quantity of *ſcoriæ*.

Nor is *precipitation by fuſion* leſs neceſſary to obtain almoſt all the other metals, which on this account are called leſs perfect, unleſs perhaps you except a very ſmall quantity of native metal, which nevertheleſs can ſcarce be properly called pure. Beſide, they are all to be had either in form of earth, or of that of a ſolid ore. In the firſt caſe you may make a glaſs by a bare fuſion: in the ſecond, if the ſulphur and arſenic, which, together with the metallic part, conſtitute an ore, are diſſipated in roaſting; the ore deſtitute of the oily phlogiſton, becomes glaſs in a pure fire, which glaſs may be mixed with unmetallic ſtones and earths; but by adding a phlogiſton or inflammable principle to it, this metallic glaſs is again reduced to its metalline form; and ſo long as it keeps under this form it cannot be united with the glaſs of the other ſpecies, but ſinks to the bottom of it, except only a very ſmall quantity of it, which is detained by the clammineſs of the glaſs. The *precipitating* body in this caſe, therefore, is truly the phlogiſton, or inflammable principle: any body that takes away the connection, by the removal of which a *precipitation* is made, is properly called the *precipitating* body. *Cramer*'s Aſſ. p. 187.

Precipitation of ſolid bodies from fluid menſtrua, is performed either by extracting, or evaporating over a gentle fire the diſſolving menſtruum out of the diſſolved fixed body, or by adding ſuch a body, as is greedily diſſolved by that menſtruum: as if one metal diſſolved by an acid is *precipitated* by another metal, or by an alkaline ſalt: for inſtance, ſilver diſſolved in aqua fortis is *precipitated* by copper, copper by iron, iron by zink, and all metals and ſemi-meals, either partly or entirely by pot-aſhes, volatile, and urinous ſalts.

A *precipitation* is alſo made by pouring on a ſolution, ſuch things as either cannot diſſolve the body in hand, whether alone, or joined to a menſtruum that contains the ſaid body; or diſſolve it in another manner; or in a leſſer quantity than if the menſtruum had been uſed pure. In the firſt caſe a total *precipitation* is performed, as may be ſeen in the *precipitation* of ſilver out of aqua fortis, by means of ſpirit of ſalt. In the ſecond a great deturbation and *precipitation* is made, but a ſecond ſolution ſoon follows, as it happens when iron being diſſolved in aqua fortis, you add to it in a proper manner a liquor perfectly free from alkaline fixed ſalt; but then there remains uſually a certain part which is not perfectly diſſolved a ſecond time. In the third caſe there is but a partial *precipitation* made. You have an inſtance of this, if mercury diſſolved in aqua fortis, and the menſtruum thoroughly ſaturated with it, is *precipitated* either by common ſalt, or ſal armoniac, or by their acid ſpirit. A *precipitation* is alſo ſometimes made only by adding a large quantity of fair water to dilute; ſuch is that made on the regulus of antimony diſſolved in ſpirit of common ſalt, or in aqua regia, when a large quantity of cold water is poured on this ſolution; for theſe menſtrua do not diſſolve this ſemi-metal, unleſs concentrated.

All theſe *precipitations* are promoted greatly by a gentle heat, by means of which the *precipitating* body enters more eaſily into the menſtruum, and a conſiderable quantity of water is next neceſſary to dilute with, except in the *precipitations* of the firſt kind; for moſt commonly the more concentrated diſſolutions aſſume the conſiſtence of a paſte ſo ſoon as the *precipitating* body is added to them, which hinders this from mixing equally with the ſolution. Id. ibid. p. 196.

Boerhaave makes the following obſervations on the different manner in which *precipitation* is performed by ſeveral different agents.

Thus 1. By water poured on oils diſſolved in alcohol, where the liquor turns milky.

2. By water poured to ſolid reſins diſſolved in alcohol, where alſo the liquor turns milky.

3. By water in the diſtillation of oily ſpirits, if any water run after the ſpirit is drawn off.

4. By acids on acids; thus ſilver and mercury are *precipitated* out of ſpirit of nitre, in which they had been diſſolved by adding ſpirit of ſalt.

5. By metals with metals, and other bodies. Thus for example, dilute an ounce of ſilver diſſolved in ſpirit of nitre,

with twelve times the quantity of rain water; put poliſhed plates of copper into this liquor, and the ſilver will be precipitated and the copper diſſolved: then put this ſolution of copper into another glaſs, and add to it poliſhed plates of iron; the copper will be precipitated and caſe over the iron; finally the copper falls to the bottom, and the iron diſſolves. Pour this ſolution of iron into a freſh glaſs, and drop upon it oil of tartar, per deliquium; the diſſolved iron immediately falls to the bottom, and the alkali unites with the acid, and regenerates true nitre, after ſo many changes.

Thus does this ſalt travel from one body to another almoſt unaltered, tho' it is more attracted by one than another, till at length it reſts in that which in this reſpect is the ſtrongeſt, and is only thence expelled when oil of vitriol is poured upon the nitre thus regenerated. On theſe two principles *precipitation* depends, and is the true, and often abſtruſe cauſe of numberleſs wonderful operations, both in art and nature. Take a grain of white or red *precipitate*, rub it upon a poliſhed and heated copper-plate, and wherever the matter has paſſed the copper will immediately look like ſilver; for the copper attracts the acid of the nitre from the calx of the mercury, and thus preſently makes an amalgam upon the ſurface of the copper, and then acquires a ſilver colour.

6. Alkalies often *precipitate* things diſſolved by acids. This happens frequently, but not always, nor in perfection: alkali *precipitates* copper diſſolved by an acid, but the copper is afterwards diſſolved by a ſalt made of the two.

7. Acids generally *precipitate* things diſſolved by alkalies; but in this caſe alſo there are ſome proceſſes which ſhew us exceptions.

8. Sharp ſalts, without being changed, and lying perfectly concealed, have ſtrange and unexpected effects by means of *precipitation*. If an ounce of luna cornea, which is perfectly ſcentleſs, inſipid, and unactive, and affords no ſign of acrimony in the fire, be ground, and united in a ſtrong heat in a glaſs retort with half an ounce of inodorous and perfectly inſipid regulus of antimony, there inſtantly ariſes an extremely ſtrong poiſon, or an exceedingly corroſive butter of antimony, the exhalation of which proves mortal. We ſee in this one inſtance how dangerous the art of mixing is, and with what care we ought to go about the compounding of bodies. *Boerh.* Chem. P. II. p. 338.

PRECIPITATE *(Cycl.)*—The different abſorbent ſalts which are commonly uſed for the *precipitations* of metals, from their ſolutions in acid menſtrua have no effect upon thoſe metals as to the colour of the *precipitate*; but when the ſolution is clear and limpid, and the matter left on the evaporation of it would have been white, the *precipitate* in this caſe, by whatever ſalt it is made, will be white alſo. And when that ſolution has any particular colour, whether it be that of the metal alone, as in ſolutions of gold; or a colour that is the reſult both of the metal and menſtruum, as is the caſe in the ſolutions of copper and iron, the *precipitate* obtained from the ſolution will always be of the colour the ſolution was of, whatever was the ſalt employed to make it. Tho' this is, however, the caſe in regard to the metals in general, yet it is to be obſerved that mercury diſſolved in ſpirit of nitre, or reduced to the ſtate of corroſive ſublimate, and afterwards diſſolved in water, affords phænomena perfectly different from all theſe: for tho' it gives no colour to the menſtruum in which it is diſſolved, but lets it remain limpid; and if the ſolution be evaporated to a drineſs, leaves only a white reſiduum, in the manner of the ſolutions of ſilver, tin, or lead; yet inſtead of giving a white *precipitate*, in the manner of thoſe metals, it affords a differently coloured one, through a great many varieties, according to the nature of the ſalt uſed to make it. As mercury is ſoluble in more acids than one, and as the experiments made on one of the ſolutions of this metal often have different phenomena from the ſame experiments made on other ſolutions, Mr. Lemery, who has employed himſelf very nicely on this ſubject, choſe the ſolution in ſpirit of nitre as the baſis of a long ſeries of experiments.

As this ſolution was a mixture of two bodies, it was firſt neceſſary to conſider them ſeparately, as to their colours. In this examination it is to be obſerved,

1. That ſpirit of nitre, when firſt made, and while it yet contains a great quantity of fiery particles, is of a red colour; and that afterwards, as theſe gradually evaporate and fly off, the ſpirit by degrees loſes that colour.

2. That crude mercury, when expoſed a long time to the action of the fire, becomes of a red colour.

3. That when a ſimple ſolution of ſpirit of nitre is evaporated, and the matter which remains after the evaporation is calcined, it changes from its white colour, which it had at firſt, to red, after paſſing through all the ſhades of yellow. Now ſince, in the change of its ſtate from the white to the red colour, the mercury loſes a great part of the acid particles which it had carried away from the ſolution, we might at firſt be apt to conclude, that its change of colour proceeded from this; but on the contrary, experience proves, that of whatever quantity of its acids mercury is diveſted after ſolution, provided that no freſh particles are admitted in their room, it always continues white ſo long as it contains acid enough to preſerve it in this form, or keep it in the condition of a *precipitate*.

As we know that fire is itſelf a fluid of a peculiar nature, and which has a power like other fluids of inſinuating itſelf into the pores of the other bodies, and there, like them, preſerving its eſſential properties; and as we alſo know, that the mixture of the particles of fire, either ſingly with mercury, or with ſpirit of nitre, gives to either a red colour; it is very natural to conclude, that the quickſilver, when it has been penetrated by the acid of ſpirit of nitre, and afterwards acted upon by calcination, is not changed from white to yellow, and from yellow through all its changes to red, by any other means than by the particles of fire which introduce themſelves into the *precipitate* as they drive the acid particles out: and this is evinced the more clearly by this experiment, that if freſh acid be added to this *precipitate*, now become red, in ſuch proportion as to diveſt it again of the fiery particles, and lodge its own in their places, then the whole loſes its red colour, and either becomes colourleſs, or elſe white as it was before.

The common white *precipitate* acted upon by a ſlow fire, thus loſes its white colour, and advancing through all the degrees of yellow, becomes at laſt red, as in the former inſtance; but if, inſtead of this ſlow heat, there is a ſtronger fire employed, and that continued ſo long as to raiſe this *precipitate* in a matraſs into the form of a ſublimate, in this caſe it preſerves its white colour, notwithſtanding the violence of the fire and the loſs of its acid particles, which in this proceſs cannot but be very conſiderable; nay, and tho' the ſublimation be repeated ſeveral times, the whiteneſs of the matter will not be altered by it. From this obſervation it may be ſeen, that when nothing is added to the matter in the place of the acid particles which are driven off, it ſuffers no change of colour by their loſs; and that in caſes where larger fires are uſed, and conſequently the fiery particles are driven through the body of the *precipitate*, there is no change of colour made in it by them; but that in order to make this change of colour, the fire muſt be ſlow, and the particles muſt be driven in with a force that is not ſufficient to drive them out again, and conſequently muſt remain there. It is evident, that the deprivation of the acids alone, does not change the white *precipitate* red; becauſe in this caſe, where there is no ſuch change of colour, there is, however, a manifeſt deprivation of a great part of thoſe acids; ſince there are always many globules of revived mercury found among the maſſes of the ſublimate.

Experiment proves, that mercury becomes more or leſs able to reſiſt the force of fire, as it is more or leſs highly impregnated with acids: and hence the ſame degree of fire applied to two quantities of mercury, differently charged with acids, ſhall have different effects, and ſhall give a red colour to that which is ſo fated with acids that it will not be raiſed in ſublimation; and the other, which is leſs charged with them, ſhall be ſublimed and left white. The white *precipitate* made in the common way, is at the utmoſt only able to bear a much ſmaller degree of fire than that neceſſary to make the common red *precipitate*; and crude mercury itſelf can only bear a much weaker than either, as is ſeen in the making the common calcined mercury, improperly called *precipitate per ſe*.

There is this, however, very remarkable in the making this calcination, that after the mercury has been calcined ſome time with the neceſſary gentle heat, it becomes able to bear a much ſtronger degree than it could at firſt. This is exactly the contrary of what is found in making the common red *precipitate*; in doing which the fire muſt neceſſarily be gradually diminiſhed, for the ſame degree of fire which it at firſt bore, nay, which was neceſſary to it, if continued, would certainly ſublime and evaporate it. The explanation of this is, that in each caſe the mercury becomes able to reſiſt the force of the fire in proportion as it receives particles which increaſe its weight. This both fire and the acid are capable of doing to it; but the acid does it in ſo greatly ſuperior a degree, that while in the one caſe crude mercury, receiving particles of fire into its body, becomes by their means capable of reſiſting a ſtronger heat; in the other, theſe particles of fire being only received in the place of acid ones before diſſipated, which added much more to its weight than they, it becomes much leſs able to reſiſt a violent heat by the change, and gradually, as it receives the fiery in the place of the acid particles, requires the heat to be decreaſed, otherwiſe it muſt be evaporated.

In fine, we ſee that crude mercury requires a long time to be reduced into a red powder by means of calcination; whereas the ſame mercury, when loaded with acids, may be converted into this red powder in a few hours; the one bearing a tolerably ſtrong heat, the other only a very weak one.

It appears that the mercury loaded with acids yields, therefore, a more eaſy acceſs to the particles of fire than the crude; and what proves this, and evidently ſhews that the acids accelerate the effect of the fire on this body is, that if the common white *precipitate* be expoſed to the ſame gentle degree of heat with crude mercury, it becomes red much ſooner; and as the difference here is only, that the one is plain mercury, the other mercury penetrated by acids, there can evidently be no reaſon for the latter turning red ſooner, but its being ſo penetrated.

After thus examining the effects of fire on ſolutions of mercury, this author proceeds to examine the effects of the differ-

ent ſalts on the ſolution in aqua fortis; and in theſe diſquiſitions it appeared, that thoſe ſalts which gave the mercury a yellow or a red colour, only produced this effect, as they had been expoſed to a longer or a ſhorter calcination, by which their acids had been driven out, and particles of fire received in their places, and retained there, inſomuch that theſe all heat water on being put to diſſolve in it, as they contain a larger or ſmaller quantity of theſe particles. Now as it is evident that theſe ſalts give a heat to water, by no other means than by the fiery particles they contain, it is very naturally ſuppoſed, that they give the yellow or red colour to the diſſolved mercury, by the ſame means as we know that theſe are the colours that fire itſelf gives to this body. Theſe ſalts, before their calcination, make no ſuch change in mercury: and it appears, that they act upon it as alkalies only, or bodies which have paſſed a violent calcination; and that the fiery particles they contain make them act upon it as fire would; and upon the whole, that fire and alkalies produce the ſame effects on the ſolution of mercury in aqua fortis.

On the other hand, thoſe ſalts which have not been expoſed to the action of fire, and which cool, inſtead of heating the water they are diſſolved in, or ſuch as having been calcined have acquired but little of an alkaline nature by the proceſs; that is, have collected few particles of fire in the place of the few acid particles which they have loſt; theſe do nothing to the diſſolved mercury but carry off a part of its acids, its whiteneſs being not at all affected by them: nay, even ſalt of tartar, which is a very powerful alkali, if there be acids mixed with it to drive off the fiery particles it contains, and place themſelves in their room, becomes wholly like one of theſe ſalts, and makes no change in the colour of the mercury.

In fine, the volatile ſalts, if they are pure, always give a white *precipitate* from the ſolution of mercury; but as theſe ſalts uſually contain a large portion of oil, this generally becomes ſeparated from them in the operation, and mixing itſelf with the *precipitate*, makes it of a mixt colour between its own natural white and the natural colour of the oil. As theſe oils in the ſalts have paſſed a ſtrong fire, they are uſually burnt, and naturally of a blackiſh colour; and therefore the reſult of their mixture, with the white *precipitate*, is a dirty grey. On the other hand, when urine is uſed, as the oily matter attending its ſalts has not been burned by fire, and as it naturally, by becoming exalted, by fermenting with the ſolution, acquires a deep blood-red colour, the conſequence is, that the *precipitate* is of the middle colour between this blood-red and its own natural white, and ſhews itſelf of a pale damaſk roſe colour.

Theſe are the effects of the abſorbent ſalts, when added ſingly to the ſolution of mercury; the next thing to be enquired into is, how they act when added one after another to the ſame quantity of the ſolution? When we have given this ſolution a yellow colour, by adding ſalt of tartar, which, as an alkali, occaſions that effect; if we afterwards pour upon this ſpirit of ſal armoniac, or other volatile ſalt diſſolved in phlegm, and raiſed by diſtillation, the yellowiſh or reddiſh colour immediately diſappears, and the whole becomes of a dirty greyiſh colour, which afterwards becomes blackiſh; but if oil of tartar, per deliquium, or any other powerful alkali be added, it does not again deſtroy this colour, and produce what it naturally would, if ſimply mixt with the ſolution, but only extends the dark or blackiſh colour which the mixt matter before had received from the ſpirit of ſal armoniac.

If ſalt of tartar, or any other fixed alkali be added to a ſolution of mercury, which has before been rendered white by amixture of common ſalt, or any other ſalt that has little alkali in it, the liquor becomes immediately yellow, and that colour remains unalterable by any freſh addition of ſalt whatever. Salt of tartar is therefore in this caſe to the other ſalts what the ſpirit of ſal armoniac is to ſalt of tartar. If oil of tartar and ſpirit of ſalt be alternately added to a ſolution of mercury, the ſolution becomes alternately yellow and white, according to the laſt liquor that was added; ſo that theſe two oppoſite liquors ſeem to be of equal force, each making the ſolution of the colour it naturally gives, when ſuperior to the other in quantity. Thus far, however, only two different liquors have been mentioned; it is poſſible to employ ſeveral others in the ſame manner one after another, and by that means to produce many more changes of colour in the ſolution. All that is to be taken care of in this experiment is, that the weaker liquors be uſed firſt, ſince otherwiſe they cannot produce any change; and what is to be concluded from the whole is this: 1. That mercury when it is penetrated by acid ſpirits, is naturally of a white colour. 2. That when it is changed to a red or yellow colour, it is wholly owing to particles of fire introduced into it. 3. That it never changes from white to red, or from red to white again, otherwiſe than by receiving or parting with the fiery particles it had before received. 4. That when the ſolution acquires a colour, the mercury loſes its acids, or part of them. 5. That every time it changes its colour it either loſes it acids, or gains freſh ones; and that this loſing and gaining its acids, is a condition without which the mercury can neither admit, or throw off the particles of fire. 6. That when an abſorbent does nothing to the ſolution but take away the acids, without communicating any thing to the mercury in their place, it always gives a white colour to the *precipitate*, or to ſpeak more properly, it makes the *precipitate* appear in its proper colour. 7. That it makes ſome other colour appear, when in the place of the acids, of which it has robbed the mercury, it gives it other ſubſtances which colour it according to their nature and quantity. 8. That in ſeveral abſorbents calculated to produce ſeveral colours, that which is the moſt powerful alkali is always capable of deſtroying all the reſt; but that there does not neceſſarily follow a change of colour, on the liquor becoming altered from a leſs alkaline to a more ſtrongly alkaline nature. 9. That a liquor of a very ſtrongly alkaline nature, added to the ſolution after one which was a weaker alkali, will make no change in the colour of the liquor, if it have no other effect than the abſorbing more of the acids from the *precipitate*, and does not give it other particles in the room of thoſe acid ones which it takes away; and, finally, that weak acids are capable of changing the *precipitate* from red to white, but that ſtrong ones utterly deſtroy all colours. Mem. Acad. Par. 1714.

PREDY, a ſea word ſignifying the ſame as *ready*. Thus, *predy the ſhip*, or *predy the ordnance*, is as much as to make things ready for a fight. *Predy the hold*, is to lay or ſtow every thing there in its due order and proper place.

PREGNANCY, *graviditas*, *(Cycl.)* the ſtate of a woman going with child. This is a time in which women ſuffer many diſorders, which tho' no way to be cured abſolutely but by childbirth, yet may be greatly mitigated by medicines. Before any one venture to do any thing, however, in theſe or the like caſes, it is very neceſſary to be perfectly aſſured, whether the patient is with child or not; and this is known by the following ſymptoms, in caſes where there is no occaſion for diſſimulation, or no other diſtemperature joined with this; but when the woman chuſes to conceal it, and there is a complication of diſorders, the utmoſt proofs amount but to preſumptive ones.

The ſtoppage of the menſtrual diſcharges is the firſt ſign of it, provided that there be no other apparent cauſe. But this, tho' the moſt plain and obvious ſymptom, is by no means a certain one; for a ſuppreſſion of this kind may happen from latent cauſes. A ſecond ſymptom is, a particular nauſea at the ſight of meat, or even the ſmell of it, while the perſon is otherwiſe well in health, and can eat heartily of other foods. A third ſymptom is, a ſwelling of the belly; which appears regularly round or globoſe, not irregularly protuberant, as is the caſe in diſorders of the liver, and other viſcera. This ſwelling, alſo, increaſes placidly, and without the legs ſwelling, or any other ſymptom, if the perſon is otherwiſe in health. After this, the twentieth week of *pregnancy* gives the moſt certain of all the ſigns, the motion of the fœtus; but this is to be carefully diſtinguiſhed from motions of the bowels in flatulencies, which often ſo much reſemble it as to deceive the unwary.

If the mother has a mind to hide the ſymptoms, the thing may, however, uſually be found out at this period; for if a cold hand be laid upon the belly when warm, or a warm hand when it is cold, the fœtus uſually ſoon ſtirs, and the very figure and appearance of the belly will give very probable aſſurances to a perſon accuſtomed to ſuch inſpections. In caſes of a certain conception, a living fœtus is only to be diſtinguiſhed from a mole or falſe conception by its moving; therefore when a perſon grows toward the full time, without ever perceiving the child to ſtir, it is very much to be ſuſpected that it is a mole; which alſo is the more probable, if the menſtrual diſcharges have come on at times and irregularly, during the time, and the ſwelling of the belly be irregular, the woman ſubject to violent flatulencies, and eſpecially if ſhe go beyond the natural period of nine months.

Theſe ſymptoms are not all, however, to be expected in every *pregnant* woman; for many of the laborious people of the lower claſs of life, go thro' their whole time in the midſt of fatigue and trouble, and that without any of theſe ſymptoms; ſo that they are in a great meaſure to be attributed to the courſe of life, not the courſe of nature, in the *pregnant* women of better fortunes. Thoſe women are moſt ſubject to them who are of a tender and delicate frame, and thoſe who are of a plethoric habit, an idle life, or given to intemperance, or ſubject to paſſions of various kinds, fear, anger, grief, or the like.

Theſe are the more natural and leſs troubleſome ſymptoms of *gravidation*, but this time is frequently attended with others more troubleſome or hurtful, which art is able in ſome degree to mitigate. Some are ſubject to violent hæmorrhages at the noſe, which are to be treated in the common way, and are uſually as eaſily cured as any other complaints of that kind. In others the hæmorrhoidal diſcharges are very large during the time. Theſe are to be aſſwayed by giving powders of nitre, cinnabar and crab's eyes, once or twice a day. Some are alſo ſubject to an hæmorrhage of the uterus itſelf, but this very rarely happens; when it does it may be owing to two cauſes, and therefore appear in two manners. In the

firſt it flows as in the common way of the menſtrual diſcharges, during the firſt months of *pregnancy*, and by that means greatly diſturbs the regular calculation of the time. In the other caſe it ſtops during the firſt months, but comes on again about the middle of the time, or later than that, and in this caſe it uſually continues regularly to the time of delivery; both theſe caſes bring on great danger of miſcarriages. In theſe caſes nitrous cinnabarine and abſorbent medicines are to be given; to theſe are to be added corroborating ones, and bleeding in the arm muſt never be omitted.

Head-achs often alſo attend women during their *pregnancy*: theſe are principally owing to occaſional cauſes; ſuch as violent emotions either of the body or mind, an improper cooling of the lower parts of the body, or the drinking ſpirituous liquors. The method of taking off this troubleſome ſymptom is, by giving the attemperating and nitrous medicines, with laxatives of the moſt gentle kind, and externally the head ſhould be rubbed with ſpirit of wine and camphor, if the perſon can bear the ſmell of it, which often in this caſe they cannot.

A wearineſs and laſſitude of the limbs is another very common and very troubleſome accident attending *pregnancy*, and is to be remedied by proper bleedings and gentle exerciſe; and if theſe fail, the nitrous powders before given may be added to quiet the emotions of the blood, and this uſually takes effect.

A dry cough and difficulty of breathing are alſo not unfrequently attendant on this ſtate: theſe require the ſame methods; but when the difficulty of breathing comes on after meals, the ſaline and digeſtive powders may be given in ſmall doſes; ſuch as the vitriolated tartar, with the nitrous and abſorbent powders; and when it comes on only in the latter months, and ariſes merely from the preſſure of the diſtended uterus, there is no cure but patience till the time of delivery; when the ſymptom always goes off of itſelf on the ſubſiding of the womb. *Junk.* Conſp. Med. p. 701.

The French memoirs give us an account of a very unhappy ſtate of *pregnancy* in a young woman of ſeventeen, attended with ſymptoms not common to that ſtate. The child lay on the right ſide, and grew to ſo conſiderable a ſize that ſhe could not ſtir; it died ſoon after, and was taken from her dead and in ſeparate pieces. In the latter months of her *pregnancy* ſhe was troubled with a terrible oppreſſion in the breaſt and difficulty of reſpiration, attended with violent palpitations of the heart: her delivery gave her no eaſe as to theſe ſymptoms, but they continued increaſing in violence for five years. In this time, as ſhe was young ſhe grew in height, and had two children, which both lay on the right ſide alſo, and of which ſhe was delivered without any particular bad ſymptoms. After theſe five years the bad ſymptoms of her diſeaſe became at a ſtand, and in her thirty-ninth year ſhe died.

The body being opened after her death, the round and the broad ligament of the uterus were both found much ſhorter on the right ſide than on the other, and were more compact and thick on that ſhort ſide. The uterus was larger than uſual, and inclined a little to the right ſide; and the great lobe of the liver, which ought to be hollow behind, convex before, and narrow and ſtrait at the bottom, large and thick at the top, and wholly included in the cavity of the belly, was in this ſubject of a conic figure, nine inches long, and four inches broad at the baſe, which was its lower part, and two at the point; and half its quantity was depoſited in the cavity of the breaſt, and all the parts on the ſame ſide. The kidney, the diaphragm, and the lungs, appeared, as well in regard to one another as to the neighbouring parts, to have been all conſiderably puſhed upwards by the matrix. The too great force of the ligaments of the uterus on the right ſide, had drawn the uterus itſelf to that ſide, and determined the fœtus to that part; and unhappily that had been particularly large, and had extended the influence of its preſſure upon the viſcera above it, even to the lungs. The duration of the ſymptoms was owing to this, that the parts having been diſplaced for a long time together during the latter months of the firſt *pregnancy*, could not reſtore themſelves to their places again, even when the obſtacle was removed; ſo that the ſymptoms continued, even tho' the firſt cauſe was removed; and the growth of the young woman only increaſed them. Mem. Acad. Par. 1709.

The miſcarriage of *pregnant* women is principally owing to a plethora, and is moſt frequent with young plethoric women, in the firſt months of their firſt *pregnancy*. There are, however, ſeveral other cauſes which concur to it; ſuch are, any violent paſſions of the mind, as ſudden anger, fear, or the like; an habitual great diſcharge at the time of the menſes, a high-ſeaſoned diet, with much wine or other ſtrong liquors; the taking of ſtrong purges, or violent emetics; diarrhœas, eſpecially when of long continuance and of the aromatic kind, as they drain off the nouriſhment from the fœtus; a teneſmus, or violent motion to ſtool, and hence the uſe of ſtimulating glyſters may alſo bring on abortion; as alſo any commotions of the body, ſuch as running, leaping, the carrying heavy burthens, falls, or blows on the abdomen: a too frequent uſe of venery may alſo occaſion it, as may the effect of ſtrong emmenagogues, copious bleeding in the foot, the ſmell of burning oil or any other ſtinking ſubſtance, nephritic complaints, cachexies, a fluor albus, or other diſorder of the womb; the taking opiates, and the death or great debility of the fœtus while in the womb. The beſt methods of preventing abortion, are the uſe of the attemperating and particularly the nitrous medicines after every commotion of the blood; bleeding at proper times, corroborating medicines, and the milder carminatives; and to theſe are to be added a temperance in diet, and placid motion of the body. Egg-ſhells are by ſome greatly recommended, and by others the ſtones of reſins, which are, indeed, manifeſtly aſtringent.

Coſtiveneſs in the time of *pregnancy* is very common, and is uſually owing to the want of drinking and exerciſe; ſometimes, indeed, it is owing to the immediate preſſure of the womb upon the rectum; but this caſe is known from the others, as it is always attended with a teneſmus. This complaint is to be relieved by a lubricating diet, the drinking more liquids than before, and the uſing placid motion of the body, or gentle exerciſe. Gum ammoniacum is alſo found a very uſeful medicine in this caſe, and ſometimes gentle infuſions of ſenna are neceſſary; but theſe can only be given in very ſmall doſes. Some uſe ſuppoſitories that are not acrid or pungent, and others glyſters of water-gruel.

Flatulencies are another very frequent complaint with *pregnant* women: theſe are removed by the milder carminatives, ſuch as, orange-peel, pimpernel-root, and the ſeeds of aniſe, ſweet fennel, &c. taken in powders or in decoctions.

Diarrhœas, in *pregnant* women, are uſually from the ſame cauſes with thoſe in other perſons; but they require in this caſe a very peculiar regard, as they, when long continued and accompanied with a teneſmus, uſually bring on abortion. They are to be gently reſtrained, and finally ſtopped, in the following manner: ſtrengthening, carminative and ſtomachic medicines are to be given, ſuch as candied orange-peel, preſerved ginger, calamus aromaticus, galengals and zedoary, and the marmalade of quinces; and while theſe are taken internally, balſams and ſtomachic plaiſters applied to the ſtomach have alſo a very great effect.

The fluor albus. This is a complaint that very rarely affects women with child, eſpecially if their huſbands be honeſt; but when it does, it is very difficult of cure, becauſe the purging medicines neceſſary to be given in it are by no means to be allowed of in the time of *pregnancy*. In this caſe it can only be reſtrained by the uſe of correctives, depuratives, and carminatives: of this kind are infuſions of the bitter herbs, with pimpernel-root, balm, ſouthernwood, and white dead nettle-flowers; or theſe ingredients may be made into powders, and taken in red wine.

Beſides all theſe complaints, women in their *pregnancy* are ſubject to ſeveral others which depend upon the mere weight and preſſure of the uterus. Of this kind are:

Pains in the loins and back. Theſe are principally felt in the laſt months, when the belly is greatly ſwelled and drawn forwards; in others, at the ſame period, the belly itſelf is pained, and looks red in many places, as if it threatened to burſt. Theſe complaints are made worſe by all motion, and they admit of no cure but child-birth, which immediately takes off the whole pain.

Varicous tumors of the legs. Theſe are alſo very common and very troubleſome, and in phlegmatic habits have alſo very frequently œdematous tumors joined with them; and in other perſons livid marks appear upon them, ſuch as are ſeen in others after bruiſes. Theſe diſtemperatures of the legs attend *pregnant* women at all times from the ſecond month to the time of delivery, and are owing to the preſſure of the uterus upon the iliac or crural veſſels. Theſe always go off on delivery, but in many perſons return again at every *pregnancy*: in ſome caſes they are ſo ſlight as not to be worth regard in others they are very violent and painful; theſe are to be treated in the following manner: the common antiſpaſmodic powders are to be given internally once or twice every day, and externally, a moderate bandage, with camphorated medicines and friction; and if theſe fail, a liniment made of lime-water, oil of elder, and ſugar of lead, will be found of great ſervice; and when the perſon is delivered, gentle ligatures are to be uſed all up the leg, from the ankle to the knee. In order to prevent theſe tumors for the future, early in the time of *pregnancy* the perſon ſhould be blooded, the bowels are to be kept from coſtiveneſs; and it is a thing of the greateſt conſequence, that the perſon uſe herſelf to ſit upon a high ſeat, the low chairs in which *pregnant* women uſually love to ſit making the belly preſs greatly more on the crural veſſels than it would otherwiſe. Too much exerciſe alſo is to be avoided, and particular care taken that the womb is well cleanſed before the month of a former lying in is over.

Frequent deſire of voiding the urine often attends, and is very troubleſome to *pregnant* women; but eſpecially in the later part of their time, particularly in the laſt weeks: if it happen ſooner, as it ſometimes does, it is owing to the womb's hanging too much downward, from a laxity of the ligaments. This is a complaint of no ill conſequence, and therefore, tho' troubleſome, is to be borne with patience, delivery being its proper cure.

A Strangury and temporary ſuppreſſions of urine happen alſo frequently

quently to *pregnant* women. In theſe caſes powders of nitre and cinnabar are to be given internally, and externally emolient cataplaſms are to be applied warm till the diſorder ceaſes.

Hæmorrhoides. Theſe in *pregnant* women often ſwell into a ſort of bladders, and are attended with a violent burning pain, and ſometimes with an ulcerous eroſion, and are uſually a very troubleſome complaint to perſons of plethoric habits. They are to be cured by giving internally nitrous and other attemperating medicines, and applying externally the unguentum linariæ, made of the herb toad-flax, cut and boiled in lard. A decoction or extract of yarrow is alſo a good medicine.

Swellings of the feet are another of the troubleſome complaints that attend *pregnant* women. Theſe, when they are confined to the feet, or do not extend above the knees, are of no great harm; but they ſometimes reach up to the abdomen, and there leave the ſymptoms of an aſcites: but even in this caſe, it is beſt to let the tumor alone during the time of *pregnancy*, or at the utmoſt only to attempt mitigating and allaying its ſymptoms; for the cure requires ſuch medicines as cannot be ſafely given at that time. The patient muſt avoid ſtanding as much as poſſible, and after delivery the cure is to be attempted in the common way. When women in their *pregnancy* loſe their fleſh, and become extenuated and thin, the child is uſually found to be the luſtier and more robuſt for it: the woman in this caſe ſhould feed on jellies, and other the moſt nouriſhing foods, and ſhould uſe very little exerciſe, avoiding all fatigue of body and mind. Others, on the other hand, are ſubject to grow remarkably fat during their *pregnancy*: theſe generally bring forth ſmall and lean children. Women to whom their fat grows troubleſome in this time, ſhould bleed, uſe moderate exerciſe, a thin diet, and now and then take a very gentle doſe of ſome laxative medicine.

Many are very weak and ſubject to frequent faintings during *pregnancy*: theſe ſhould take at times a gentle doſe of ſome laxative medicine, and in the intermediate days, the ſtrengthening and ſtomachic medicines, with the milder carminatives.

A voiding of the waters too ſoon always threatens abortion, or an untimely delivery, which are to be guarded againſt by ſtrengthening medicines of all kinds. Many women during *pregnancy* are troubled with large brown ſpots, or lichenes, in the neck and face: theſe principally happen to perſons of bilious habits, and are in ſome attended with a continual paleneſs, in others with frequent fluſhings of heat and redneſs: the good women apply many remedies to theſe, but they are much better wholly let alone; for they always go off of themſelves after delivery.

The too great motion of the fœtus is a complaint not uncommon with *pregnant* women; but this is principally owing to themſelves, and is brought on by the violent paſſions of the mother, eſpecially thoſe of anger: the keeping the abdomen too hot will alſo occaſion this, and ſometimes it is owing to ſome indiſpoſition of the fœtus itſelf. If any medicines are to be given in this caſe, it muſt be the attemperating ones, and ſuch as can correct the acrimony of the bilious juices; nervous epithems may alſo be externally applied, and the perſon is to be kept in as tranquil a ſtate as poſſible, both as to bodily motion and the paſſions of the mind.

The child's kicking in the uterus is a complaint very frequent in the laſt months of *pregnancy*, and in perſons of tender habits it often occaſions tears, and ſometimes faintings. Some ſuppoſe that this threatens abortion; but this is wholly erroneous, for the fœtus has no power of contributing to its own birth. This is a ſymptom for which there is no remedy but patience, but it goes off before the time of delivery.

Weakneſs of the fœtus is known by its feeble motion in the womb, and uſually depends on the bad conſtitution of the mother, or elſe on her having been ſubjected to violent frights, or to great ſorrow. Internal medicines of the ſtrengthening kind are proper in this caſe, and externally, balſamic and aromatic plaiſters may be applied.

The ſecundines ſometimes concrete or grow to the uterus, out of their proper order and place: this is a diſorder we have but very ſlender opportunities of gueſſing at, and is principally cauſed by too much ſitting ſtill during the latter part of *pregnancy*. When this is ſuſpected to be the caſe, internal medicines are of no uſe; and the externals are only the fat of tender animals, or ſpirit of wine impregnated with oils of anniſe or caraway, frequently rubbed in on the belly.

The winding of the navel-ſtring about the neck of the child is often a very unhappy accident and proves fatal to it: the good women ſuppoſe this to be owing to the mother's reaching upwards, and ſtraining her arms above her head near the time of her delivery; but this is an idle opinion, and the caſe is owing to no ſudden accident, but is probably an unlucky turn of the ſtring from the beginning. *Junker*'s Conſp. Med. p. 708. See LYING-*in*.

PRENANTHES, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the compoſite kind; the common cup is of a cylindric figure, and has a wide mouth; there are five equal ſquammæ, and three unequal ones, which are ſmaller, and placed at the baſe. The flower is compound, not imbricated; it is compoſed of equal flowers of the hermaphrodite kind, placed in a ſingle circle; each ſingle flower is compoſed of one petal, and is ligulated, truncated, and divided into five ſegments at the edge; the ſtamina are five very ſhort and capillary filaments; the antheræ are cylindric and tubular; the germen of the piſtil is placed below the flower; it is ſmall; the ſtyle is capillary and longer than the ſtamina; the ſtigma is bifid and reflex; the cup, after the flower is fallen, joins its ſeveral ſegments lightly at the top; and the ſeeds are ſingle, of a cordated figure, and winged with a ſlender downy filament; the receptacle is naked. There is one ſpecies of this plant in which the down has a pedicle. *Linnæi* Gen. Pl. p. 374.

PREPARATION *(Cycl.)*—PREPARATION, in anatomy, is uſed for the art of preſerving the parts of animal bodies for anatomical uſes.

It is alſo uſed to ſignify the parts themſelves ſo preſerved. Mr. Monro has given us an eſſay on the method of *preparing* and preſerving the parts of animal bodies for anatomical uſes. Med. Eſſ. Edinb. Vol. III. Art. 10.

The manner of preſerving anatomical *preparations*, is either by drying them thoroughly in the air, or putting them into a proper liquor.

In drying parts which are thick, when the weather is warm, care muſt be taken to prevent puttefaction, fly-blows, inſects, *&c.* This is eaſily done by the uſe of a ſolution of corroſive ſublimate in ſpirit of wine, in the proportion of two drachms of ſublimate to a pound of ſpirit: the part ſhould be moiſtened with this liquor as it dries, and by this method the body of a child may be kept ſafe even in ſummer. Dried *preparations* are apt to crack and moulder away in keeping; to prevent this their ſurface ſhould be covered with a thick varniſh, repeated as often as occaſion requires. Med. Eſſ. Edinb. abr. Vol. II. p. 8.

Tho' ſeveral parts *prepared* dry are uſeful, yet others muſt be ſo managed as to be always flexible, and nearer a natural ſtate. The difficulty has been to find a proper liquor for this purpoſe. Mr. Monro ſays, the beſt he knows is a well rectified colourleſs ſpirit of wine, to which is added a ſmall quantity of the ſpirit of vitriol or nitre. When theſe are properly mixed, they neither change their colour nor the conſiſtence of the parts, except where there are ſerous or mucous liquor contained in them. The brain, even of a young child, in this mixture grows ſo firm as to admit of gentle handling, as do alſo the vitreous and chryſtaline humours of the eye. The liquor of the ſebaceous glands and the ſemen are coagulated by this ſpirituous mixture; and it heightens the red colour of the injection of the blood veſſels, ſo that after the part has been in it a little time, ſeveral veſſels appear which were before inviſible. If you will compare theſe effects with what Ruyſch has ſaid of his balſam, you will find the liquor above mentioned to come very near to it.

The proportion of the two ſpirits muſt be changed according to the part *prepared*: for the brain and humours of the eye, you muſt put two drachms of ſpirit of nitre to one pound of ſpirit of wine. In preſerving other parts which are harder, thirty or forty drops of the acid will be ſufficient; a larger quantity will make bones flexible, and even diſſolve them. The part thus preſerved ſhould be always kept covered with the liquor, therefore great care ſhould be taken to ſtop the mouth of the glaſs with a waxed cork and a bladder tied over it, to prevent the evaporation of the ſpirit; ſome of which, notwithſtanding all this care, will fly off; therefore freſh muſt be added as there is occaſion. When the ſpirits change to a dark tincture, which will ſometimes happen, they ſhould be poured off, and freſh put in their room; but with ſomewhat leſs acid than at firſt.

The glaſſes which contain the *preparations* ſhould be of the fineſt ſort, and pretty thick; for through ſuch the parts may be ſeen very diſtinctly, and of a true colour, and the object will be ſo magnified as to ſhew veſſels in the glaſs which out of it were not to be ſeen.

As the glaſs when filled with the liquor has a certain focus, it is neceſſary to keep the *preparation* at a proper diſtance from the ſides of it, which is eaſily done by little ſticks ſuitably placed; or by ſuſpending it by a thread in a proper ſituation. The operator ſhould be cautious of putting his fingers in this liquor oftener than is abſolutely neceſſary; becauſe it brings on a numbneſs on the ſkin, which makes the fingers unfit for any nice operation. The beſt remedy for this is to waſh them in water mixed with a few drops of oil of tartar per deliquium. Med. Eſſ. Edinb. abr. Vol. II. p. 9.

Dr. Chriſt. Jac. Trew prefers the rectified ſpirit of grain for preſerving anatomical *preparations* to ſpirit of wine, or compoſitions of alcohol, amber, camphor, *&c.* becauſe theſe ſoon change into a brown colour; whereas the ſpirit from malt preſerves its limpid appearance. When any part is to be preſerved wet, waſh it with water till it is no more tinctured. The water is next to be waſhed away with ſpirits, and then the *preparation* is to be put among ſpirits in a glaſs, the mouth of which is to be cloſely covered with a glaſs head, over which a wet bladder and leaf-tin are to be tied. Com. Lit. Norimb. 1731. Semeſt. 1. Specim. 9.

PREPARATION *of inſects*, in anatomy. See INSECTS.

PRESA, in the Italian muſic, is in general a character which ſhews when and where a performer in a concert is to begin to

ſing or play: but in particular, in fugues or canons it is thus marked + over the note at which the ſecond part, which is to follow or imitate the firſt, muſt begin. If the mark be repeated a ſecond time, it is to ſhew the place where the third part muſt begin, to imitate the ſecond; and ſo on through all the parts. See USUS.

PRESBYS, in zoology, a name uſed by many of the antient naturaliſts for the *regulus criſtatus*, or golden-crowned wren. *Ray*'s Ornithol. p. 163. See REGULUS *criſtatus*.

PRESERVATION *of Corn.* A ſucceſsful method of *preſerving corn*, for the uſe of armies, and againſt times of ſcarcity, is a moſt uſeful and curious object of enquiry.

It is well known that accident often preſerves *corn* very long, when all the care in the world ſuffers it to decay in a few years, the owner knows not why. One very remarkable inſtance we have recorded in the memoirs of the academy of ſciences at Paris, in 1708, of ſome *corn* laid up in the citadel of Metz, in the year 1578, which had kept good to that time without any particular care. It was on this occaſion that the ſubject of *preſerving corn* in general became the employment of the thoughts of the members of the academy, and Mr. Reneaume obſerved,

1. That *corn* can never be too dry when it is brought into the granary, if intended for long keeping; and that in order to keep, it muſt be preſerved quite dry and quite clean.

2. That tho' ſome have imagined that *corn* increaſes in ſize in the granary, and therefore ſhould be cut after a wet ſeaſon, and in dewy mornings; yet on the contrary, *corn* never ſwells, if well preſerved, but always ſhrinks and wrinkles up a little: and that the *corn* of dry ſeaſons is always obſerved to keep much better than that of wet ones, which uſually heats and decays. And that as to dewy mornings, they are never to be choſen for reaping, unleſs on particular occaſions; as when the ſeaſon has been ſo remarkably dry, that the *corn* is looſe in the ears: then, indeed, there is danger of its being loſt by falling out while the reaper cuts the ſtalk, and this is prevented by cutting it while the dew has wetted the huſks, or the grains of *corn*, and retains them in their places.

4. It is very certain, that any *corn* which is dry will, on laying it in a moiſt place, ſwell and increaſe in bulk, and will become larger by this means. The merchants generally are able to find this out, however, and do not care to buy ſuch *corn*, well knowing that it is very ſubject to mould and decay. There is another yet more artful method than this in too common uſe among the petty merchants, who buy up *corn* to ſell it to the larger dealers, which is this: they heat a large piece of freeſtone, and incloſing it in an iron box, they thruſt it under the heap of *corn*, and carefully remove it about to every part, at the ſame time gently moiſtening the *corn*; the effect of this is a very conſiderable ſwelling of the *corn*, inſomuch that what they buy as ſixteen buſhels, they ſell after this for ſeventeen; but there is no wonder that *corn*, treated in this manner cannot keep. This is an artifice often practiſed alſo on oats, and is more profitable in that, as the oats will gain at leaſt twice as much in quantity by it as wheat or barley.

5. If it is abſolutely neceſſary at any time to lay up *corn* in a place that is damp, it is beſt to lay it up in the ear, not in the looſe ſtate, ſince in that caſe the ſtalk and huſks will abſorb a great quantity of the moiſture, and preſerve the *corn* in ſome degree from it. The leaving the chaff with the *corn*; that is, the threſhing, but not fanning it, may alſo be of uſe in many caſes, and this takes up but little room in a magazine, and it is much the ſame thing to the proprietor, whether it be all fanned together, or be only fanned in quantities ſufficient for a certain number of days, as it is wanted to be uſed; but tho' the trouble is the ſame, the advantage is not ſo, but is greatly on the ſide of the latter practice: we all well know the uſe of chaff, and the like dry ſubſtances in preſerving fruits for the winter; and this might alone give a hint that *corn* might fare the better for it; but we have alſo this additional mark of its uſe in preſerving *corn*, that the zea or ſpelta, called ſpelt *corn* and white *corn*, and uſed for food in many parts of Germany, is always preſerved in the huſk, and is found the leaſt ſubject to decay of all *corns*.

From theſe conſiderations it is eaſy to learn, what are to be the principal objects of our care in the preſerving *corn* for the uſe of armies, *&c.* The granary muſt be a well choſen place; and according to Vitruvius's rules, ſhould always be at the top of a houſe, and have its openings only to the north or eaſt, that the *corn* may not be expoſed to the damp winds from the ſouth and weſt, which are very deſtructive to it; whereas the contrary ones are very neceſſary and wholeſome to it, ſerving to cool and to dry it from all external humidity, from whatever cauſe. There muſt alſo be openings in the roof to be ſet open in dry weather, partly to let in freſh air, and partly to let out the warm effluvia which are often emitted by the *corn*. The covering of the roofs ſhould always be of tiles, becauſe in the worſt ſeaſons, when the other openings cannot be ſafe, there will always be a conſiderable inlet for freſh air, and a way out for the vapours by their joinings, which are never cloſe. If there happen to be any windows to the ſouth, great care muſt be taken to ſhut them up in moiſt weather, and in the time of the hot ſouthern winds.

There muſt never be a cellar, or any other damp place under a granary, nor ſhould it ever be built over ſtables; for in either of theſe caſes the *corn* will certainly ſuffer by the vapours, and be made damp in one and ill-taſted in the other. Mem. Acad. Par. 1708.

The accidents that attend *corn* in public granaries, are of the utmoſt importance, and ought to be well underſtood and guarded againſt. See GRANARY.

Dantzic is the grand ſtorehouſe, or repoſitory of all the fruitful kingdom of Poland. The wheat, barley, and rye, of a great part of the country are there laid up in parcels of twenty, thirty, or ſixty laſts in a chamber, according to the ſize of the room; and this they keep turning every day or two, to keep it ſweet and fit for ſhiping. A thunder ſtorm has ſometimes been of very terrible conſequence to theſe ſtores. All the *corn* of the growth of former years having been found ſo much altered by one night's thunder, that tho' over night it was dry, fit for ſhiping or keeping, and proper for uſes of any ſort, yet in the morning it was found clammy and ſticking. In this caſe there is no remedy, but the turning all ſuch *corn* three or four times a day for two months or longer; in which time it will ſometimes come to itſelf, tho' ſometimes not.

This effect of thunder and lightning is only obſerved to take place in ſuch *corn* as is not a year old, or has not ſweated thoroughly in the ſtraw before it was threſhed out. The latter inconvenience is eaſily prevented by a timely care; but as to the former, all that can be done is carefully to examine all ſtores of the laſt year's *corn* after every thunder ſtorm, that if any of this have been ſo affected, it may be cured in time; for a neglect of turning will certainly utterly deſtroy it. Phil. Tranſ. N°. 96.

PRESERVATION *of other vegetables.* This is to be done ſeveral ways in the ſeveral kinds, and many more might certainly be invented; for we are not yet arrived at the perfect method of *preſerving vegetables* with their colours, odours, and all their ſenſible qualities, as well as their natural form for a number of years. Fruits may be long *preſerved* in ſpirit of wine, firſt well ſaturated with the ſkins and tinging parts of thoſe fruits; and many may be tolerably *preſerved* in perfectly fermented liquors, which generate no more air. The more ſolid *vegetable* ſubſtances may be *preſerved* by gently drying in the ſun ſhade, or other ſlack heat. Thus peas or beans may be dried young in a ſlack oven in their proper ſeaſon, and may afterwards be boiled in the winter, and will eat young and tender, as if juſt gathered. The ways of *preſerving* fruits both dry and moiſt, with ſugar, are now univerſally known; and there are in the ſeveral ways many ſecrets in the hands of particular artiſts, which it would be well to have generally known. *Shaw*'s Lectures, p. 196.

PRESS *(Cycl.)*—PRESS, in the manege. A horſe is ſaid to reſiſt, or *preſs* upon the hand, when either through the ſtiffneſs of his neck, or from an ardour to run too much a head, he ſtretches his head againſt the horſeman's hand, refuſes the aid of the hand, and withſtands the effects of the bridle.

If your horſe is too fiery, and *preſſes* upon the hand, endeavour to pacify him, by making him go more ſoftly, and pulling him backwards; and if it proceeds from a ſtiffneſs of the ſhoulders and neck, you muſt ſupply him with a caveſſon made after the Duke of Newcaſtle's way. See HEAVY.

PRESS is alſo uſed for puſhing a horſe forewards, by aſſiſting him with the calves of your legs, or even ſpurring him, in order to make him go on.

PRESS, or PRESSING, in the ſea language. See MANNING.

PRESTER, *(Cycl.)* a word uſed by ſome to expreſs the external part of the neck, which is uſually inflated in anger: with others it is a name for the ſerpent *dipſas*.

PRESTESSE, in the manege, is uſed to denote the readineſs and diligence of a horſe in working a manege.

PRESTISSIMO, in the Italian muſic, intimates to perform extremely quick, haſtily, and with fury.

PRESTO, in the Italian muſic, is uſed to ſignify that the part it is joined to ſhould be performed gayly, faſt and quick, yet not with rapidity.

Non tropo PRESTO, or *men* PRESTO, in the Italian muſic, ſignifies not too quick, or leſs than *preſto*.

Piu PRESTO, in the Italian muſic, is uſed to intimate that we ſhould ſing, or play the part to which it is annexed, a little briſker and quicker than the *preſto* alone requires. When *piu* is added to other words, as *adagio*, *grave*, *vivace*, &c. it adds in like manner to the ſlowneſs, or quickneſs of the movements, reſpectively.

PRESTO, PRESTO, in the Italian muſic, the ſame with *preſtiſſimo*. See PRESTISSIMO.

PRESUMPTION, *præſumptio*, in rhetoric, the ſame with *prolepſis*. See PROLEPSIS.

PRETERNATURAL *rains*. See the article RAINS.

PRIAPE *de mer*, in natural hiſtory, a name given by the French to a peculiar ſpecies of canalis, or tubulus marinus, called alſo by ſome authors of that nation, the *arroſoir*.

It is an oblong, and thick-ſhell of this kind, with a large head, which is pierced thro' with a great number of holes, ſo as at once to reſemble, in ſome ſort, the glans of the penis, and the head of a common gardener's watering-pot. This ſpecies is found at Amboina. See CANALIS.

PRIAPEIA, *(Cycl.)* in botany, a name given by John Bauhine and ſome other authors, to the ſmall ſpecies of tobacco called by Mr. Tournefort and others, *nicotiana minor*. See the article NICOTIANA.

PRIAPOLITHUS, a name given by ſome authors to a ſtone found about Caſtro in Italy, which very aptly reſembles the figure of the human penis.

PRICK *(Cycl.)*—PRICK, or PINCH, in the manege, is to give a horſe a gentle touch of the ſpur, without clapping them hard to him. To *prick* or *pinch*, is an aid; but to *appuyer*, or bear hard with the ſpur, is correction.

PRICKING *(Cycl.)*—PRICKING *of a horſe's foot*, in the manege, is the hurt received by a nail driven too far into the foot, ſo as to reach the quick, or preſs the vein in the horſe's foot when he is ſhod.

PRICKLE *back*, in natural hiſtory, a ſmall fiſh ſo called from the *prickles* on its ſides and back. Vaſt numbers of theſe little fiſh are to be found in almoſt all freſh waters, wherever it is poſſible for fiſh to live, as Mr. Arderon informs us, Phil. Tranſ. N°. 482. ſect. 15. who gives us ſome account of theſe creatures. They are very deſtructive to the ſpawn of all ſorts of fiſh; and they themſelves are tormented to death by a kind of louſe of an oval figure, with eight legs and a very tranſparent body. This louſe has little fins always in motion, whether it be ſwimming about or fixed on the fiſh.

PRIDE *of the Iſis*, a name given by Dr. Plot to the common lampern, from its being found very plentifully and very delicate in that river.

It is to be obſerved, that we diſtinguiſh between the lampern and lamprey, which, tho' words very nearly the ſame in ſound, are yet the names of two different fiſhes: what we call the lampern, is the *lampetra parva fluviatilis* of Willughby; this is the fiſh found in the Iſis. The lamprey is the *lampetra* of Willughby, and others: they are both ſpecies of the petromyzon of Artedi. See the articles PETROMYZON and LAMPETRA.

PRIDE *gavel*, a cuſtom in the manor of Rodely in the county of Glouceſter; by which to this day a rent is paid to the lord, by certain tenants, in duty and acknowledgement to him for their liberty and privilege of fiſhing for lampreys or lamprids in the river Severn. *Tayl.* Hiſt. Gavelk. 112. *Blount.*

PRIMIER *(Cycl.)*—PRIMIER *ſerjeant*, the King's firſt ſerjeant at law.

PRIMING *(Cycl.)*—PRIMING-*iron*, in gunnery, a ſmall ſharp iron, which is thruſt into the touch-hole of a great gun, and pierces into the cartridge that holds the powder, that ſo they may put in the *prime*-powder, or touch-powder, to fire off the piece.

PRIMO *(Cycl.)*—PRIMO, in the Italian muſic, is often abridged thus, P°. or I°. and added to other words, as, *primo canto*, the firſt treble; *alto primo*, the firſt counter tenor; *tenore primo*, the firſt tenor; *baſſo primo*, the firſt baſs; *fagotto primo*, the firſt baſſoon; *choro primo*, the firſt chorus, *&c.*

PRIMULA, *or* PRIMULA *veris*, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is a general involucrum, ſmall, compoſed of many leaves, and containing ſeveral flowers. The ſeparate perianthium of every flower is tubular, and of a pentagonal figure, compoſed of one leaf, divided into five ſegments, placed erect, and remaining when the flower is fallen. The flower is compoſed of only one leaf, in form of a cylindric tube, of the length of the cup, terminated by a ſmall hemiſphere neck. The margin is ſpread open, and divided into five ſegments, which are obtuſe, inverted in the ſhape of a heart at their ends, and have a rim round their edges. The ſtamina are five very ſhort filaments, ſituated within the tube of the flower. The antheræ are erect, pointed, and converge toward one another at their ends. The germen of the piſtillum is globoſe. The ſtyle is ſlender, and of the length of the cup, and the ſtigma is globoſe. The fruit is a cylindric capſule, nearly of the length of the cup, covered, containing only one cell, and ſplitting open. Its top is dented into ten ſegments. The ſeeds are numerous and round. The receptacle is of an oblong oval figure and free. *Linnæi* Genera Plant. p. 63.

The characters of this genus, according to Mr. Tournefort, are theſe: the flower conſiſts of only one leaf, which is expanded wide at the mouth, and divided into ſeveral ſegments. The cup is tubular, and from it ariſes a piſtil, which is fixed like a nail into the hinder part of the flower, and afterwards becomes a fruit, or an oblong caſe, cloſely ſurrounded by the cup, and containing ſmall roundiſh ſeeds, affixed to a placenta.

The ſpecies of *primula*, enumerated by Mr. Tournefort, are theſe: 1. The ſweet yellow-flowered ſingle *primula*, commonly called the *cowſlip*. 2. The taller ſingle *primula*, with a paler flower. 3. The ſcentleſs *primula*, which has no cup to the flowers. 4. The ſcentleſs *primula*, with double flowers. 5. The ſweet *primula*, with indented or diſſected cups. 6. The *primula*, with a foliaceous head inſtead of flowers. 7. The yellow, mountain, hairy *primula*. 8. The red-flowered *primula*. 9. The white-flowered *primula*. 10. The great ſcarlet umbellated *primula*, with a foliaceous ſtalk and foliaceous flower. 11. The leſſer yellow umbellated *primula*, with a foliaceous ſtalk and flower. 12. The garden umbellated yellow *primula*. 13. The garden white umbellated *primula*. 14. The garden red umbellated *primula*. 15. The ferrugineous umbellated garden *primula*. 16. The common wild many-flowered *primula*. 17. The double many-flowered ſpring *primula*. 18. The ſweet proliferous *primula*. 19. The large-flowered proliferous *primula*. 20. The white-flowered proliferous *primula*. 21. The purple-flowered proliferous *primula*. 22. The ferrugineous-flowered proliferous *primula*. 23. The great-flowered, pale, whitiſh, ſingle *primula*. 24. The pure white ſingle-flowered *primula*. 25. The green-flowered ſingle *primula*. 26. The double green-flowered *primula*. 27. The green and white ſingle-flowered *primula*. 28. The double-flowered ſeparately divided *primroſe*, called *Heſket's primroſe*. 29. The deep green-flowered *primula*, with fimbriated edges. 30. The Conſtantinople *primula*, with a pale purple flower. 31. The Conſtantinople *primula*, with a large purple flower. 32. The Conſtantinople *primula*, with ſmaller purple flowers. 33. The Conſtantinople *primula*, with a ſcarlet flower. 34. The Conſtantinople *primula*, with a ferrugineous flower with white ſpots. 35. The Conſtantinople *primula*, with white flowers. 36. The Conſtantinople *primula*, with pale fleſh-coloured flowers. 37. The Conſtantinople *primula*, with yellow flowers. 38. The Conſtantinople *primula*, with pale lemon-coloured flowers. 39. The Conſtantinople *primula*, with a ruſty whitiſh flower. 40. The Conſtantinople *primula*, with a browniſh flower.

The flowers of this plant are eſteemed greatly cephalic and nervine. They are recommended in palſies, apoplexies, and all nervous diſorders.

The *primula* may be known when not in flower, by their having rugged and wrinkled leaves of a thin conſiſtence. *Tourn.* Inſt. p. 124, 125.

PRIMUS *(Cycl.)*—PRIMUS *Brachii moventium*, in anatomy, a name given by Veſalius, and ſome others who have copied from him, to a muſcle generally known under the name of the *pectoralis*. See the article PECTORALIS.

PRIMUS *communium laryngis*, in anatomy, a name given by Caſſerius and ſome others to the muſcle more generally known by the name of the *ſternothyroidæus*, or *ſterno-thyroides*. See the article STERNOTHYROIDÆUS.

PRIMUS *hyoidis oſſis muſculus*, in anatomy, a name given by Fallopius and ſome others to the muſcle of the *os hyoides*, called by Albinus *ſternohyoidæus*.

PRIMUS *oculum movens*, in anatomy, a name given by Veſalius to one of the four *muſculi recti* of the eye, called by Albinus and others the *adductor*. It is called by Fabricius the *rectus interior*, and by ſome the *bibitorius*.

PRIMUS *propriorum auriculæ muſculus*, in anatomy, a name given by Caſſerius to one of the muſcles of the head, called by Albinus the *auriculam attollens*, and by Cowper and Winſlow *ſuperior auriculæ*, which ſee.

PRINCE *(Cycl.)*—PRINCE *of the Senate*. There was one member of the Roman Senate diſtinguiſhed always from the reſt by the title of *Prince of the Senate*. This title was given of courſe to that perſon whoſe name was called over the firſt in the roll of the Senate, whenever it was renewed by the cenſors. He was always one of conſular and cenſorian dignity.

After the inſtitution of the cenſors, it became a cuſtom to confer this title of *Prince of the Senate* on the oldeſt ſenator then living of cenſorian dignity. Yet there were no peculiar rights annexed to this title, nor any other advantage, except an acceſſion of authority, from a notion which it would naturally imprint of a ſuperior merit in thoſe who bore it. *Middleton* of Rom. Sen. p. 147, 149. See SENATE.

PRINCE *of pleaſantry*, *prince de plaiſance*, in the cuſtoms of Flanders. See SPORTS.

PRINCE *of the horſe-comb*, in the cuſtoms of Flanders. See SPORTS.

PRINCES *feather*, in botany, a name given to the amaranth. See AMARANTH.

PRINCES *metal*. Copper, tho' one of the leſs precious *metals*, yet has been found of ſo great uſe in the common affairs of life, that ſcarce any other has been ſubject to ſo many trials for its improvement, or the rendering it either more beautiful or more fit for certain purpoſes.

One of the firſt diſcoveries in theſe attempts was the making it into braſs, by means of an addition of lapis calaminaris; and tho' it was not at that time known to be a ſtone which contained any *metal*, yet the braſs was always found to weigh one third more than the copper which had been uſed in the proceſs.

This yellow metal gave many people hopes of making copper approach yet nearer to gold, and without knowing that zink was the ſeparated metalline part of lapis calaminaris, the experimenters ſoon found, by happy accident or repeated chance mixtures, that it would give copper a yet finer and purer yellow; but it was alſo found, that this mixed *metal* was much more brittle than braſs made in the common way. This, however, did not prevent the world from ſtill valuing it for ſuch works as were to be finiſhed by caſting, and did not require the hammer: and we, who firſt had it in perfection,

called

called it *princes metal*, from Prince Rupert, whom ſome ſuppoſed to have been the inventor of it; but the greateſt perfection this *metal* was ever brought to, was by two Frenchmen, Mr. La Croix and Mr. Le Blanc. Their methods of making the compoſition, tho' both beautiful, were very different. Mr. Le Blanc's was the brighteſt, and of the moſt elegant and lively colour; but Mr. La Croix's was greatly ſuperior to that in ductility and ſoftneſs, ſo that it was very eaſily malleable.

Mr. La Croix invented a ſort of varniſh or lacquer for his *metal*, which added a ſomewhat deeper tinge to it, as it was naturally rather too pale; and had this farther advantage, that while it remained on the *metal*, it preſerved it from ruſt or decay. This is a very material point in regard to a *metal* of which copper is the baſis, ſince that is, of all other *metals*, moſt ſubject to be injured by the air, or by the contact of liquids of almoſt any kind. Mr. Le Blanc's *metal* is of a deeper, yet equally lively colour, and remarkably bright; and is of ſuch a temper as to be admirably fitted for working. The whole hiſtory of theſe *metals* is certainly, that they are compoſed of zink and copper in different proportions the one to the other; but it is not eaſy, without the help of numerous experiments, to determine what is to be the true proportion for either.

The microſcope, however, ſhews a manifeſt difference, which may lead ſomewhat towards it; for the *metal* of La Croix is ſeen to be compoſed merely of a number of irregular ſtriæ, while the other is diſcovered to conſiſt of always two regular beds of them, which meet in the center of the piece; hence it is that this is always brittle, and will not well poliſh. The fabrick of theſe *metals* was long kept a ſecret; but it was always to be diſcovered by melting it in a crucible in a ſtrong fire, when it always ſent up plain flowers of zink, and the remaining *metal* appeared no other than copper altered by calamine; that is, common braſs. Mem. Acad. Par. 1732.

PRINCIPALIS, in ſome antient Latin writers of muſic, is uſed for the chord or note called ὑπάτη by the Greeks. See the articles HYPATE, TETRACHORD, and DIAGRAM.

PRINCIPIUM *recti abdominis*, in anatomy, a name given by Veſalius to a muſcle generally known at this time under the name of the *pyramidalis*.

PRINCIPLE *(Cycl.)*— Some antient philoſophers diſtinguiſhed between *principles*, ἀρχαὶ, and elements στοιχεῖα. *Principles* according to them, were neither compoſed nor produced; but the elements were complex or compounded beings. *Plutarch*, ap. Eller. in Mem. de l'Acad. de Berlin, 1746.

It would be endleſs to enumerate all the opinions of philoſophers concerning the elements of bodies. A late author has given us a ſummary of many of theſe opinions; and, laſtly, adds his own, that fire and water are the only things which properly deſerve the name of elements, or *principles* of natural bodies; fire being the active, and water the paſſive *principle*. According to him, water is convertible into air, and into earth, by means of fire. Hence the four, vulgarly called elements, may be reduced to two. He endeavours to eſtabliſh his doctrine on the experiments of Boyle, Hales, and Muſchenbroek. Vid. *Eller*, in Mem. de l'Acad. de Berlin, 1746.

Original PRINCIPLE, *principium originale*, a name given by Tachenius and ſome other authors, to ſalt, without conſidering it as acid, alkali, or of any other particular kind, or any mode of exiſtence. The ſalt of wood or vegetables, not being alkali till after burning, and ſo on; but ſalt that is the baſe of theſe, being evidently exiſtent in the bodies, and, in regard to wood, ſeeming indeed to conſtitute its character as ſuch, ſince the evaporation of it cauſes the wood to looſe all its ſtrength and to decay: for we find that in rotten wood there is no alkali at all; and the Venetians, who ſink their timber for ſhip-building into water while it is green, prevent, by that means, the evaporation of thoſe ſalts, and leave the wood little leſs durable than ſtone. On theſe and the like principles, Tachenius ſuppoſes ſalt to be the true *original principle* of bodies; but many others allow this name only to water, or at leaſt that water is, in almoſt all natural bodies, the moſt copious, the moſt active, and the moſt influencing part; yet even this is found to agree much better with ſome bodies than with others. The birch and elder feed more kindly on a thin uliginous moiſture; the elm, the pine, the fir, and cedar, chuſe a ſtronger liquor; yet theſe and many more, the moſt widely different that can be from one another, are often ſeen to draw their whole ſuſtenance and bulk, whether annual or perennial, from the ſame piece of ground, impregnated ſo far as is poſſible to be judged of with the ſame ſort of juices, and from the ambient air and dews, when as yet by our beſt diligence we cannot diſtinguiſh the liquors or ſalts approaching cloſely to their ſeveral roots; and if we wholly take away, and exchange all the earth from the roots of trees whoſe barks, ſap, and fruit, have very much differing ſalts, and are of very different kinds, yet we ſhall find each tree to proſper better by the exchange, inſtead of being injured by it.

Hence we may ſuſpect, that the very contextures of the bodies of plants, from the firſt germination of the ſeed, and as they form gradually from the inviſible *principles* of their ſeeds, are, however ſmall and imperceptible, the natural alembics, where the common water and air are changed into the different juices, gums, reſins, *&c.* as the animal organization in the body of the cow changes the juices of every ſort of graſs and eſculent vegetable, into one and the ſame milk.

The ſea-plants growing on ſhells, or affixed to yet harder ſtones, taking no nouriſhment from the thing they grow on, but being as it were all root, and taking the whole from the ambient water; yet that water giving to different ſpecies of them, tho' itſelf the ſame to all, the different textures of herbaceous to ſome; tough and horny to others; and to ſome, abſolutely ſtony; as to the corals, many of which have been eſteemed by the generality of authors, abſolute ſtones.

Trees of ſeveral different kinds are found in America growing out of the ſame dry and hard rock, and the various kinds of ſucculent plants; the poiſonous ones and their oppoſites, or remedies, as the euphorbium and the antieuphorbium; the moſt acrid and pungent, and the moſt ſoft and emollient, out of the ſame barren lands of Arabia, where it could not be expected that any plant could grow at all. Hence it is eaſy to apprehend, how the ſeeds in their time, and after them the roots, ſtems, and leaves of trees, may be the proper ſtrainers to ſeparate and prepare the ſeveral ſaps and juices, and to ferment the liquors into their ſeveral particular ſalts. See the article VEGETATION and SALT.

PRINCIPLE, in chemiſtry. It is impoſſible to diſcover the virtues of any body, or to find how mixed bodies of different kinds ſtand related to the human body, either for the preſervation of its functions entire, or the reſtoring them when loſt or impaired; or, finally, for the total deſtruction thereof; till we know the *principles* of which they conſiſt, and likewiſe the mixture and proportion of ſuch *principles* in bodies to which their effects are chiefly owing. Wherefore having diſcovered by various ways the parts into which a true chemical analyſis reſolves bodies, we muſt look upon ſuch ſimple parts into which all mixts are reſolvable, and of which they ſeem to be compounded, as their true and genuine *principles*.

The antient chemiſts having obſerved, that in analyſing all bodies whatever, they obtained a ſpirit, or mercury, ſulphur, ſalt, water, and earth, concluded the number of *principles* to be five. If wine, for inſtance, be diſtilled in a proper alembic, a burning water or ſpirit will firſt ariſe, and next an inſipid water, which they call phlegm; a thick viſcid maſs alone remaining in the ſtill; this put into another veſſel, or retort, and expoſed to a more intenſe and violent heat, a ſmall portion of phlegm comes over firſt, then an acid water, which according to them is ſtill ſpirit or mercury, and next a fat oily ſubſtance, called ſulphur: what remains ſtill in the retort is next burnt to aſhes in an open fire; theſe aſhes are thrown into an earthen veſſel, with a proper quantity of boiling water, which they impregnate with their ſalt; this water being filtred thro' cap paper, and afterwards evaporated, leaves the ſalt at the bottom of the veſſel; and the other part of the aſhes, which the water could not take up, or have any effect on, is termed the earth of the ſubſtance, or its caput mortuum.

Of theſe five *principles* the chemiſts have reckoned two to be paſſive, water and earth; and three to be active, ſpirit, ſulphur, and ſalt; and on theſe laſt they have thought the whole virtue of the mixed body depended. In this analyſis we may obſerve, that there is a twofold ſpirit; one oily and inflammable, which riſes firſt by a gentle heat, and is termed ſpirit of wine, another acid penetrating like that of vinegar. Beſide theſe, the chemiſts give the name of ſpirit to other penetrating volatile, or urinous liquors, obtained from the parts of animals; ſuch as the ſpirit of urine, hartſhorn, and ſuch like ſubſtances: but the later chemiſts have baniſhed theſe ſpirits from the number of their *principles*, as being nothing elſe than ſulphur and ſalt diſſolved in water. Thus ſpirit of nitre, and others of that kind, are only acid ſalts in water; ſpirit of hartſhorn, or urine, alkaline ſalts; and ſpirit of wine, or of turpentine, an æthereal attenuated oil.

Some of the moderns deny likewiſe, that either ſulphur or ſalt deſerve the names of *principles* or elements, as not being the moſt ſimple ſubſtances producible by chemiſtry. For ſulphur, when heated with due care, may be reſolved into ſalt, water, and earth; as is evident by diſtilling fetid diſtilled oils ſeveral times with quick-lime, which by this treatment yield in large quantities a volatile ſalt, diſſolved in phlegm, together with a caput mortuum or earth. Æthereal oils alſo are only fat thick oils, like that of olives, attenuated by ſalts and diſſolved in water; as may be proved by theſe two experiments. If oil of olives, or any other of that kind be mixed with a fermenting liquor, ſuch as a ſolution of honey in water; the whole may be converted into an inflammable ſpirit. And if a quart of ſpirit of wine, diluted with ſix quarts of common water, be expoſed in a cold place to the open air, the volatile ſalts will fly off and leave drops of oil ſwimming at top, which are in every reſpect the ſame with oil of olives or almonds.

Salt is no more a *principle* than ſulphur; becauſe it may, by proper management, be at length reduced to earth and water.

Thus

Thus nitre by diſtillation may be almoſt wholly reduced to an acid ſpirit; but if it be burnt with tartar, or charcoal duſt, it becomes an alkali ſalt, called fixed nitre: this, if ſuffered to run per deliquium, and afterwards filtred thro' cap paper, will leave a large quantity of earth behind; and if the ſame liquor be diſtilled to dryneſs, an inſipid water will come over, and the ſalt remaining at the bottom of the retort, will be found to have loſt a great part of its quantity; and if the operation be often repeated, nothing will at length remain but earth. Again, the vitrification of alkaline ſalts ſeems to be nothing but the converſion of them into earth; for glaſs has no qualities different from thoſe of earth.

What we have proved by experiments, in reſolving bodies, may be farther confirmed by others relating to the formation and compoſition of them; and particularly by Van Helmont's famous experiment of the willow. He took about two hundred pounds of earth dried in an oven, and put it into a veſſel covered with an iron-lid full of holes: in this earth he ſet a branch of willow, weighing about five pounds; which ſoon took root, and grew ſo much, that in eight years time it weighed one hundred and ſixty pounds; the earth it ſtood in having, during all this time, loſt only a few ounces; ſo that the whole increaſe of the tree muſt have been owing to rain water, with a very ſmall proportion of earth; and the ſalts and ſulphurs therein muſt have been compoſed of two elements alone. The experiments of this kind, made by the illuſtrious Mr. Boyle on ſmall ſprigs of mint, marjoram, balm, pennyroyal, *&c.* ſet in ſmall vials filled only with pure water, are yet more to be depended on. Theſe increaſe in a ſhort time to double their firſt weight; and being afterwards diſtilled, they yielded the very ſame principles they would have done, had they grown in the moſt proper ſoil. From all this it cannot but be allowed, that ſalt and oil owe their original to water and earth.

Water and earth do indeed, in the ſtricteſt ſenſe, deſerve the name of *principles*; but in the formation of mixed bodies a third *principle* muſt neceſſarily concur with them; for as they are of themſelves wholly unactive, ſomething muſt be ſuppoſed to give them their motion and activity: without this, water would immediately turn to ice; and as there are few bodies out of which fire may not be drawn, it is evdient that there muſt be ſome active, moveable *principle* in them all, to which the motion of the other parts is owing. Therefore, tho' this *principle* ſhould not fall under our ſenſes in the ſame manner as the others do, that can be no reaſon for doubting its exiſtence, ſince it muſt concur in the compoſition of all bodies; which, if they were made of water and earth alone, would remain for ever without any virtue or energy. This they muſt receive from another *principle*; and according to the different combinations of all the three, bodies are formed with different properties and powers. We acknowledge, therefore, three ſimple ſubſtances in bodies, which are properly elements or *principles*; one active, which may be termed fire; and two paſſive, water and earth. From the moſt ſimple union, or connection of theſe three, ſalt ariſes; which conſequently is to be looked upon as the moſt ſimple of all mixed bodies. The next to that in ſimplicity is ſulphur or oil, made by an union of theſe three *principles*, and of ſalt. *Geoffroy*, Tract. p. 5.

Elementary earth is the ſame with the *terra damnata*, or *caput mortuum* of the chemiſts; being a ſimple, friable, porous ſubſtance, without ſmell or taſte, conſiſting of particles of no regular figure, and altogether unfit for motion. The poroſity of earth ſeems to ariſe from the irregular figure of its particles; and as theſe particles oftentimes touch one another only by their angles, the whole maſs muſt neceſſarily be friable, and the want of taſte and ſmell may be owing to the inaptitude of the particles of earth to motion.

In any analyſis of bodies, the laſt thing is always this *principle* earth; and in their compoſition it ſeems to ſerve as a baſis or foundation to the other parts of the mixture, and to it the dryneſs, ſolidity, and hardneſs of bodies is in a great meaſure to be aſcribed. *Geoffroy*, Tract. p. 11.

Elementary water is a ſimple liquid, inſipid, inodorous, pellucid ſubſtance: its fluidity is owing entirely to the action of fire, and when that action is very great, its parts are actually divided, and the whole turned to vapours; but when it is very ſmall, they cohere ſtrongly, and turn to ice. This element ſome chemiſts call *phlegm*, and it may be conceived to conſiſt of ſmall ſmooth particles, of an oblong or oval figure, and perfectly rigid and inflexible. From the minuteneſs of its particles it eaſily penetrates the pores of almoſt all bodies. An oval figure ſeems more agreeable to the fluidity of waters, as alſo to its motion, than a ſperical one; and likewiſe to the ſolidity we obſerve in ice, the points of contact in ſpherical bodies being too few to form ſo ſtrong a coheſion. Were its particles angular and flexible, they would be too weak to penetrate and diſſolve ſalts, and would likewiſe be too much reſiſted; but as their ſurface is ſmooth, they can eaſily enter the ſubſtance of ſalts, and afterwards as eaſily ſeparate their parts, that is, diſſolve them by their rigidity and oval figure. The want of taſte and ſmell in water ſeems to be owing to the ſmoothneſs, obtuſeneſs, and ſmallneſs of its particles, which cannot vellicate the nerves of the tongue and noſtrils. The fluidity of the water ariſes from the ſmallneſs, ſmoothneſs and figure of its particles, and from their eaſy motion by the fire contained in their interſtices. Without the action of fire ſeparating theſe particles, and keeping them in continual motion, their fluidity would preſently be loſt, how much ſoever their natural figure may diſpoſe them to it, and they would become one ſolid maſs. On the other hand, if the action of fire upon them be very great, they are farther ſeparated from one another, and fly off in vapour and ſmoke. In fine, water is tranſparent, becauſe its pores are ſo diſpoſed, as readily to tranſmit the rays of light. *Geff.* Tract. p. 10.

We reckon elementary fire the firſt *principle* of bodies, as being that from whence all the reſt receive their activity: it is a ſimple and moſt ſubtle body, in a continual ſwift motion, filling and eaſily penetrating the pores of all other bodies. Its immenſe ſubtlety is evident from this, that it pervades all bodies whatſoever, and its ſwift motion from that rapidity which it is capable of communicating to them. Its force is in proportion to the quantity of it any where collected. In the ſun, which may be looked upon as a vaſt congeries of this ſubſtance, its motion is moſt violent. In culinary fires, the quantity and motion of it are not ſo great, but ſtill greater than in ſpirituous and volatile liquors, where it is hardly to be perceived, except when they are ſet on fire. Not only all motion, but alſo heat is owing to fire, which as it exiſts in bodies, is nothing elſe but the exceſſive motion of their parts. It is too ſubtle and active ever to be collected pure in chemical analyſes; wherever it is found it is always united with water and earth in ſalts and ſulphurs; and is ſometimes concentred in bodies in ſo great quantities, as conſiderably to increaſe their weight; as is evident in calcined antimony, in which there is in the operation an addition made of almoſt a fifth part. *Geoffroy*, Tract. p. 9.

What the chemiſts call oil or ſulphur, is not a ſimple ſubſtance, but a body compounded of earth, fire, water, and ſalt; but as it is uſually ſeparated entire in chemical analyſes, it has been uſually eſteemed a chemical *principle* or element of bodies; and is, indeed, tho' a real compound, yet not without conſiderable difficulty to be reduced to its *principles*. It may be defined to be a fluid, viſcid, inflammable, tranſparent body, without taſte or ſmell, (tho' by mixing it differently with ſalts theſe different qualities are produced) compounded of fire, water, earth, and ſalt; and it may be conceived to conſiſt of many flakes, or flocculi, each of which is again made up of very ſmall flexible filaments, formed of the four *principles* before mentioned, by fermentations, as well in the bowels of the earth, as in the bodies of vegetables and animals; thus an aromatic plant growing in water will, by diſtillation, yield an oil, which could never have been obtained from the water in which it ſtood; and all oils may by art be reſolved into water, earth, and ſalt: from theſe filaments variouſly concreted ariſe the flakes already mentioned, which are of different thickneſſes; and in the pores thereof is lodged the element of fire, which alſo runs in little ſtreams thro' their interſtices. On theſe depend the ſpecific levity, inflammability, and fluidity of oil; but as notwithſtanding the inteſtine motion cauſed by the element of fire, the flocculi ſtill adhere, in ſome meaſure, together; this fluid muſt neceſſarily be more viſcid than any other.

From what has been ſaid concerning the nature of alkaline ſalts, and the figure and ſtructure of the oily flocculi, it is eaſy to conceive why all alkalies diſſolve ſulphurs; for ſince the alkaline particles are ſpherical and prickly, they cannot enter the interſtices of theſe flocculi, without carrying away ſome of them from the reſt, and thus by degrees thoroughly diſſolving them. But the denſe, rigid, and pointed moleculæ of acids being laid into theſe interſtices, increaſe the denſity, and ſtrengthen the texture of the flocculi; and from the diverſity of theſe and of the acid ſpicula mixed with them, ariſe the different kinds of ſulphurs.

Sulphurs formed in the earth, of fire, acid ſalt, water, and a very fine earth, are termed ſimple bitumens, and theſe bitumens diſſolved in a large quantity of water, form the mineral oils or petrolea; but if they are mixed with earth and ſalt, the common ſolid bitumens are produced, differing from one another in degrees of purity, according to the quantity and groſsneſs of the earth, or different degrees of mixture. Thus foſſile or pit-coal, jet, amber, and the common bitumens, and bituminoſe earths are produced. If there be but a ſmall quantity of earth and much acid ſalt, the common mineral ſulphur or brimſtone is formed: if the mineral original bitumen is joined to a fuſible earth, capable of vitrification, it communicates to it a metallic form, that is the ſound, brightneſs, ſoftneſs, ductility, malleability, and all the other ſenſible qualities of metals.

This origin of mineral bitumens may be confirmed by many experiments. If a mixture of equal parts of oil of vitriol, and oil of turpentine, be digeſted together for a conſiderable time in a very gentle heat, and afterwards diſtilled in a retort, there will come over firſt a yelloviſh liquor reſembling petroleum both in ſmell and conſiſtence; and what remains in the retort is at firſt a ſoft bitumen, and afterwards turns into a hard black maſs, eaſily inflammable, and ſmelling in the burning exactly like foſſile coal. But if the diſtillation be continued, a white acid liquor will next be obtained, which

by ſtanding lets fall a grey powder, which is true common brimſtone; a yellow ſubſtance of the like nature adhering likewiſe to the neck of the retort; what is left behind being a black, ſhining, light, ſubſtance, diſpoſed in thin diſgregated ſtrata or plates, like ſome of the foliaceous talcs, and in theſe iron may be diſcovered by the help of the loadſtone. Thus therefore all theſe bitumens may be artificially produced; and the moſt accurate analyſes of the natural ones, confirm the manner of their formation.

Thus the chemiſts have ſhewn, that metals are nothing but bituminous ſubſtances, which have undergone a long digeſtion; for by depriving them of their ſulphur they are firſt reduced to aſhes, and afterwards to glaſs; this is eaſily ſeen in the imperfect metals; for if any of them be expoſed to a long heat, and eſpecially if to the rays of the ſun collected by a large burning glaſs, the ſulphureous *principle* flies off, and only a calx or aſhes will be left behind; which in a more vehement degree of fire are preſently vitrified, and by reſtoring the ſulphur this glaſs may be again reduced to metal.

The inflammable ſubſtances in animals and vegetables, conſiſt of a different combination of the *principle* of ſulphur and acid ſalt; for the oil or ſulphur in theſe is formed by a ſmall portion of earth joined to the elementary fire, water, and acid ſalt; this oil when joined to an acid ſalt produces gums; when joined to a fine acid, and a new acceſſion of fiery particles, it produces eſſential oils and inflammable ſpirits; but if the acids are more groſs, by reaſon of a larger quantity of earth joined to them, it forms reſins, as we learn from the artificial compoſitions of all theſe ſubſtances. By mixing ſpirit of wine with volatile ſpirit of urine, we obtain a mucilaginous concretion, or thin gum: oil of olives and ſalt of tartar melted together, make a kind of ſoap or thick gum; and if ſpirit of wine be digeſted for a long time with oil of vitriol, and then diſtilled, an inflammable oil is obtained, reſembling in ſmell and other qualities the eſſential oils of plants, a true reſin being left behind in the retort.

In animals this ſame oleaginous *principle* forms the fat and other glutinous or gelatinous ſubſtances; theſe laſt being compoſed of an acid volatile ſalt and oil, as appears from their analyſis: but fat is made of the ſame oil and acid ſalt; for, if oil of olives and ſpirit of nitre be mixed together, and digeſted, a ſubſtance will be formed in all particulars reſembling the fat of animals.

Sulphureous ſubſtances found in bodies are either fixed or volatile. The fixed ſulphurs are either ſolid, ſuch as, fat, reſin, and the bitumens; or fluid, as oils. Volatile ſulphurs are ſuch as fly off with a ſmall degree of fire, and have an appearance compounded of that of oil and water. Such are inflammable ſpirits obtained from the fruits and flowers of plants. *Geoff.* Tract. p. 17.

Tho' ſalt be in reality a mixed body, yet in the common analyſis of bodies it is obtained intire, and has therefore paſſed with many for a true chemical *principle*: a great deal of pains is neceſſary to decompoſe and reduce it to its natural *principles*, but with accuracy and caution it is reduced to water and earth. It is the ſole origin of taſte, ſmell, and many other of the moſt obvious properties of bodies, and may properly be defined to be a mixed body, formed by the concretion of fire, water, and earth, into a ſolid, rigid, ſubſtance, ſoluble in water, and fuſible by fire. As its particles may be conceived to cohere by large ſurfaces only, ſalt cannot be friable, like earth; but requires a conſiderable force to ſeparate its parts, which fly off from one another with a ſenſible noiſe like thoſe of glaſs. It becomes the cauſe of taſte and ſmell, becauſe its particles terminate in ſtrong points, which vellicate the nervous membranes of the tongue and noſe.

Salt is properly of three diſtinct kinds, acid, acrid or alkaline, and neutral, or ſal ſalſus, compounded of the other two. *Geoff.* Tract. p. 12.

Acid ſalt is a congeries of inflexible ſolid parts, of an oblong figure, pointed at both ends. That its particles are rigid and hard, appears from the force with which it divides and diſſolves ſolid bodies; and their ſharpneſs and pungency are evident from the effect they have on the tongue, different from the corroſion of the acrid or alkaline ſalts. Acid ſalt is eaſily diſſolved by water; and after this ſolution, its parts are equally diſperſed through that fluid, and have the ſame motion with it. Hence it appears, that the particles of both theſe ſubſtances have nearly the ſame ſpecific gravity; and likewiſe, that the motion of the aqueous parts is great enough to overcome the coheſion of the parts of the ſalt.

Concerning the manner in which the particles of acid ſalt are compounded of fire, water, and earth, nothing can with certainty be determined. It may be conjectured, however, that ſeveral particles of water being collected into one little maſs, are cemented together by ſome particles of fire and earth, lodged in the interſtices left between them; and that all theſe taken together are diſpoſed in one oval form, or that of two cones joined by their baſes. This configuration, however, is not the ſame in all acid ſalts; but the differences may all be reduced to three, the nitrous acid, the muriatic, and the vitriolic. *Geoff.* Tract. p. 13.

Salt alkali has its name from the Arabian *kali*, a plant, from whoſe aſhes a ſalt proper for glaſs-making was obtained; and from thence it came to be uſed for the fixed ſalts got from the aſhes of all plants, and afterwards for all ſalts and other ſubſtances whatever, that will ferment with acids.

Acrid or alkaline ſalt ſeems to be a congeries of ſpherical particles, with rough, prickly ſurfaces; becauſe of their great diſpoſition to motion, and their corroſive burning taſte. The points of their ſurfaces act on the nervous papillæ of the tongue like ſo many files; whereas acid ſalt is only pungent. But then by theſe points a larger ſurface is expoſed to the action of the fire than could otherwiſe be, and thus the particles of ſome alkaline ſalts are very volatile, or eaſily raiſed by a gentle heat. The origin of this ſalt is probably from a connection of acid points and terreſtrial particles; becauſe, in many operations in chemiſtry, ſuch ſalts ariſe from the mixture of acid ſalts and earth; as we ſee particularly in the preparation of fixed nitre and fermentation of urine.

Nitre being diſtilled, leaves a compound fixed ſalt behind, of the ſame nature with ſea-ſalt; out of which, by a nicer diſtillation, an acid liquor may be extracted without any volatile ſalt, or at leaſt but a very ſmall quantity: but if the ſame fixed ſalt be previouſly fermented, and then diſtilled, it yields a large quantity of volatile ſalt, and a very little fixed ſalt or acid; becauſe by fermentation or calcination, the acid and terreſtrial particles are intimately mixed, the acid ſpicula entering the pores of the earth, and ſo forming new molecules, which are denſe and cloſe toward the center, and prickly on the ſurface by the acid points ſticking out. Such are the particles of volatile alkalies, of which, if a great number be joined together, they muſt cohere very ſtrongly by means of their points, and form maleculæ of irregular figures; in the pores of which, watery, ſulphureous, earthy, or acid particles may be received and abſorbed.

Hence it is, that theſe ſalts are ſeldom pure; and as they are very often filled with particles of earth, they reſiſt the moſt violent degree of fire, and will ſooner melt than be raiſed by it. This is the true nature of fixed alkaline ſalt, ſuch as ſalt of tartar, or the ſalts got from the aſhes of plants, called lixivial ſalts. If they be impregnated with ſulphureous particles, they continue very volatile, and are raiſed by a ſmall degree of fire; as we ſee in ſalt of urine, hartſhorn, and others got from animals.

Acrid ſalts eaſily melt, when expoſed to a moiſt air, becauſe the particles of water contained in ſuch air readily enter their pores: when thus melted, they become properly lixivia, and are commonly termed oils, as oil of tartar per deliquium. Volatile alkaline ſalts, diluted with water, are called volatile urinous ſpirits; ſuch as the volatile ſpirit of urine, of hartſhorn, of blood, and others. *Geoff.* Tract. p. 14.

Neutral ſalt is a kind of ſalt compounded of acid and alkaline moleculæ united together, and the figure of its particles is chiefly owing to the kind of acid that enters its compoſition. The impreſſion theſe particles make on the tongue is more dull and languid than that made by acid or acrid particles alone; becauſe the moleculæ formed by the union of theſe are larger in bulk, and conſequently leſs diſpoſed for motion; and therefore, tho' there is a greater quantity of aculei, or points, in one of theſe moleculæ than in one of the former; yet their bulks make them leſs capable of entering the pores of the ſkin, and vellicating the nervous papillæ, than when they are in a disjoined ſtate. The taſte of theſe ſalts is termed ſaline, and varies according to the differences both of the acid and alkaline particles that compoſe them, according to the thickneſs of the ſpicula, their number, and the other parts that may be mixed with them. That this is the true original of this kind of ſalts, is evident from the artificial compoſition of ſuch a ſalt from acid and acrid particles blended together, and from the reſolution of them into the ſame. Thus by pouring ſpirit of nitre, of ſea-ſalt, or of vitriol, on ſalt of tartar, new ſalts are produced exactly of the ſame appearance with nitre, ſea-ſalt, and vitriol; and by analyſing theſe three ſalts, the eſſential ſalts of plants, ſal armoniac, and others of the neutral ſalts, an acid and an alkaline ſalt may be obtained, in ſome fixed, in others volatile. *Geoff.* Tract. p. 15.

PRINOS, in botany, the name of a genus of plants, the characters of which are theſe: the perianthium is very ſmall and permanent; it is compoſed of one leaf, lightly divided into ſix ſegments. The flower conſiſts of one petal, and is of the rotated kind; it has no tube, but its edge is divided into ſix oval ſegments. The ſtamina are ſix erect tubulated filaments, ſhorter than the flower. The antheræ are oblong and obtuſe. The germen of the piſtil is oval, and terminates in a ſtyle, which is ſhorter than the ſtamina. The ſtigma is obtuſe. The fruit is a roundiſh berry, containing ſix cells, and is much larger than the cup. The ſeeds are ſingle; they are very hard and obtuſe, convex on one ſide, and angular on the other. In ſome ſpecies the ſtamina are but five inſtead of ſix. *Linnæi* Gen. Pl. p. 151. *Plukenet*, p. 452. *Gronov.*

PRINTING *(Cycl.)*—The arts and ſciences, eſpecially ſtatuary and ſculpture, were arrived at ſo great perfection among the Romans, at the time when that empire was in its greateſt glory,

glory, that it is much to be wondered at that the art of *printing* was not found out among them; an art ſo nearly allied to that of the cutting ſeals and the dies of medals.

The making theſe dies, and the ſtamping their coins with them, was, in reality, no other than *printing* on metal; and their impreſſing their ſeals, cut in cornelians, agates, &c. on wax, was another ſpecies of *printing* on this ſubſtance. And finally, a third ſort of *printing* among them, was the impreſſing the name of the workman on their pieces of fine earthenware.

Mountfaucon, in his antiquities, gives the figures and deſcriptions of ſeveral very large ſigilla of the Romans, in which the names were all cut in hollow, in capital letters; and he imagines, that the uſe of theſe was to mark large earthen veſſels with, while the clay was ſoft, and particularly thoſe large veſſels in which the Romans kept their wines. It does not ſeem that this diligent enquirer into antiquity ever met with any of theſe ſigilla with the letters or characters in relief, or ſtanding out in the manner of our modern types for *printing*, ſince he mentions none ſuch; yet the remains of the Roman antiquities in terra cocta, or earthen-ware, ſhew that they had ſome ſuch, tho' they were leſs common than the others; theſe veſſels ſometimes being marked with letters going in, tho' in general they have them all ſtanding out, as muſt be the caſe when the impreſſion was given from a ſigillum cut in creux.

There is now, in the collection of the Duke of Richmond, a ſigillum of the other more rare kind, which brings the diſcovery very near to that of *printing*: on this all the letters are raiſed, as is alſo the verge or rim of the ſeal, in the manner of our types uſed this day in *printing*. The ſtamp is made of true antient braſs, and has on it the common green coat of ærugo which diſtinguiſhes the true antique medals. The plate is near two inches long, and near an inch in breadth, and has on the back part a ring for the convenience of holding it for making the impreſſion. The letters ſtand in two rows; they are the common Roman capitals, very well made, and their faces all ſtand exactly on the level with one another, and with the ſurface of the verge of the ſeal. This ſeal was exactly of the nature of our method of *printing* ſo many letters at once. It contains the name of one Caius Julius Cæcilius Hermias, ſome private man, as we have no account of any perſon of this name upon record. It ſerved him probably to ſet his name to any thing, to ſave him the trouble of writing; and the name being that of ſome private man ſeems alſo to prove, that theſe ſigilla were very common among that people. It was evidently made to be uſed on parchment, or ſome other ſuch thin ſubſtance; and the manner of uſing it muſt have been by firſt dipping it into ink, or ſome other coloured matter, not plunging it ſo far as to touch the ground, ſo that the letters only became marked, and gave their figures on the paper. The ground of this ſeal is very rough and uneven, and thence alſo it is plain, that the uſe of it was not to preſs down any ſoft ſubſtance, ſuch as clay, or the like; becauſe the imperfection of the ground would, in that caſe, have been ſeen, whereas in the uſe it was really intended for, the ground never gave any impreſſion, and therefore there was no reaſon for beſtowing any pains in the working it even.

The firſt uſe of *printing* among the later ages, was by wooden blocks in this very manner; and it was not till long after this invention, that we learned the way of uſing ſeparate types for the letters; and theſe were then called *typi mobiles*, in oppoſition to the blocks, where the whole page was contained together, which were called *typi fixi*. This ſignet of the Duke of Richmond's, which was found near Rome, is truly and properly one of thoſe *typi fixi*, and prints off its impreſſion on paper with our modern printer's ink, as well as any ſet of letters cut in this manner can be expected to perform. This ſeems, therefore, the moſt antient ſample of *printing* that we know of; for, by the appearance of the metal, it ſeems to be of the higher empire.

It is plain, by this ſtamp, that the very eſſence of *printing* was known to the Romans; for they had nothing to do, but to have made a ſtamp with lines three or four times as long, and containing twenty lines inſtead of two, to have formed a frame of types that would have *printed* a whole page as well as Coſter's wooden blocks, uſed in *printing* the book called *ſpeculum ſalutis*, which was the firſt book *printed*, in the year 1440, and conſiſted of pictures of ſtories out of the bible, with ſome of the verſes underneath each page; being *printed* from a block of wood, like a wooden cut. This was the firſt eſſay of the fixed types, from which the moveable, or common ſeparate types were ſoon deduced; and it ſeems ſtrange, that the Romans, who were as ſagacious a people as any in the world, ſhould not as eaſily have fallen upon the uſe of ſeparate types, in which the whole art of modern *printing* conſiſts, from ſuch ſignets as theſe, as the later ages from Coſter's wooden blocks, which were plainly no other than larger works of the ſame kind.

Cicero, in his book *de natura deorum*, has a paſſage from which Toland ſuppoſes that the moderns took the hint of *printing*. That author orders the types to be made of metal, and calls them *formæ literarum*, the very words uſed by the firſt *printers* to expreſs them. It is plain from Virgil, that brands, with the letters of the owner's name, were in uſe in his time for the marking of cattle. And we have an account of the ſame artifice that is now uſed for the painting of cards being uſed by the emperor Juſtin, who could not write. There was a ſmooth board, with holes cut through it, in form of the letters of his name; and when he had occaſion to ſign any thing, this was laid on the paper, and he marked the letters with a pen or ſtylus dipped in red ink and directed through the holes. Philoſ. Tranſ. N°. 479, p. 393.

PRINTS. To take off printed cuts, ſo that the outlines and principal ſtrokes may be exactly copied for graving, may be thus performed: if the *print* be not above a year or two old, the paper need only be moiſtened with water in the manner uſually practiſed for *printing* cuts; but if it be more antient, it ſhould be laid to ſoak all night in water, and afterwards hung in the air till it becomes dry enough for the preſs. The paper thus prepared, is to be laid with its *printed* ſide next the plate, thinly caſed over with white wax, which is thus to be committed to the rolling preſs, whereby an impreſſion of the cut will be obtained. *Boyle*'s Works abr. Vol. 1. p. 136.

PRIORITES, in botany, a name given by the antient Greeks to a plant which they recommend in medicine; but they do not clearly explain what it was. It is the ſame with the ceſtrum and pſuchrotrophon of the ſame writers; and they ſay it was called *betonica*, *ſerratula*, or *roſmarinus*, by the Romans. It is evident, from a ſtrict enquiry into their accounts, that the ſerratula was the plant they meant; for Pliny ſays, that the betonica was only a Gauliſh name for this plant, and the place of growth, which is deſcribed to be wet ſhady places, evidently excludes what we call *roſemary* from any title to the name.

Apuleius has greatly perplexed the cauſe by ſaying, that the *pioites*, or betony, has leaves like the docks; but he does not diſtinguiſh between the betonica and britannica, which laſt plant is the hydrolapathum, or great water dock, and has leaves like the other docks; and it is plain, that both Apuleius and Pliny borrow the account of the dock-like leaves from this paſſage, and attribute them to a plant the original author never meant them for.

PRISMATIC *antennæ*, in natural hiſtory, a term uſed to expreſs the horns or *antennæ* of a peculiar genus of butterflies. As thoſe of the common kind are ſlender and buttoned at the end, theſe become very thick a little way from their origin, and continue of that diameter through their whole length, till juſt at the extremity they turn a little and terminate in a ſharp point. The anterior part of theſe is rounded, as in the other kinds; but behind they are made up of two planes meeting in an angle, and each of theſe has a row of hairs on it: theſe meeting at their ſummits, form an angular vacant ſpace or alley below. *Reaumur*'s Hiſt. Inſ. See FEELERS.

PRISON *(Cycl.)—Breaking of priſon*, by the law of Scotland, is a puniſhable offence; but there are no particular laws againſt it in that country, ſo they are guided by the Roman laws in ſuch caſes. But tho' this law ſeems to make the puniſhment of this crime capital, yet this is thought too great ſeverity in Scotland, where an arbitrary puniſhment, greater or leſs, according to the circumſtances of the eſcape, and the violence with which it was accompliſhed, is thought ſufficient and adequate. *Math.* de Crimin. Carpz. Part 3. *Bayne*'s Crim. Law.

PRISTIS, the *ſaw-fiſh*, a fiſh of very large ſize, and armed with a very remarkable weapon like a ſaw, at his noſe, from whence he has his name. See Tab. of Fiſhes, N°. 5.

This fiſh, from its large ſize, is generally reckoned a kind of whale, but erroneouſly; for it is truly of the ſame genus with the galei or hound-fiſhes. It is aſh-coloured on the back, and white on the belly; its head is of a heart-like ſhape, and flatted; its mouth is placed far below the end of the ſnout, and in the under part of the head, as in the zygæna; its lips are rough and ſharp, like a file, but it has no other teeth; its head is terminated by a long and flat, bony ſubſtance, furniſhed on each ſide with jaggs or points like deep teeth of a ſaw. There are from twenty to thirty of theſe teeth on each ſide. The body is round, and grows ſmall towards the tail. The ſword of this fiſh is ſometimes five feet long. It is found in the weſtern ocean.

PRIVET, *liguſtrum*, in botany. See LIGUSTRUM.

The leaves and flowers of *privet* are cooling, drying, and aſtringent, and conſequently good in ulcers and inflammations of the throat and mouth, bleeding of the gums, and relaxation of the uvula.

PRIVET-*fly*, in natural hiſtory, the name of a ſpecies of *fly* very common on the ſhrub from whence it has its name. It is called the *erinopterus*, and is remarkable for having its wings deeply divided into ſegments, ſo that they ſeem compoſed of feathers like bird's wings. The creature as it ſits looks like a ſmall feather.

PRIZES *(Cycl.)*—The officers and ſeamen of the king's ſhips, and of other Britiſh ſhips having letters of marque, are intitled to the ſole intereſt, and property of all ſhips and goods by them taken, and adjudged lawful *prizes* by the court of admiralty. Stat. 13 Geo. II. c. 4. ſect. 1 and 2.

The *prize* is to be divided among the officers and ſeamen of the

the king's ſhips, as he ſhall appoint by proclamation. Among privateers, the diviſion is according to the agreement between the owners. *Ibid.*

The court of admiralty are to finiſh the examination of the perſons to be examined to prove the lawfulneſs of the *prize*, in five days after requeſt for that purpoſe made. The monition is to be executed in three days. And in caſe no claim of the capture be duly entered, giving twenty days notice after the execution of the monition; or if there be a claim, and the claimant does not give ſufficient ſecurity to pay double coſts to the captors, if the *prize* be adjudged lawful, then the court are to proceed to ſentence in ten days. *Ibid.* ſect. 3.

In caſe of doubt, or of witneſſes being remote, the court may releaſe the *prize*, on the claimant's giving good ſecurity to the captors for the payment of the full appraiſed value, in caſe the *prize* be adjudged lawful. *Ib.* ſect. 3. fin.

Judges and officers, on failure of their duty, in reſpect to the condemnation of *prizes*, forfeit 500 l. with full coſts of ſuit; one moiety to the king, and the other to the informer. *Ib.* ſect. 6.

The judges and officers of the court of admiralty in the king's plantations or dominions abroad, ſhall not receive above 10 l. in caſe the *prize* be under an hundred tons burthen; nor above 15 l. if it be of greater burthen. *Ib* ſect. 7.

Commiſſioners of appeals in cauſes of *prizes* are to be appointed under the great ſeal: and appeals may be made to them within fourteen days after ſentence. *Ib.* ſect. 8.

Agents for *prizes* are to be choſen by the captors. *Ib.* ſect. 10.

The treaſurer of the navy is to pay to the officers and ſeamen on board ſhips of war, or privateers, in any action where any ſhip of war, or privateer, ſhall have been taken from the enemy or deſtroyed, 5 l. for every man on board ſuch *prize* or ſhip deſtroyed, at the beginning of the engagement. *Ib.* ſect. 15.

The captures of Flota ſhips, or galleons, or regiſter ſhips bound from Buenos Ayres, or Honduras, can be tried only in the high court of admiralty. *Ib.* ſect. 17.

This ſtatute enacts ſeveral penalties and forfeitures for taking *prizes* by colluſion. Privateers forfeit the *prize*, half to the king, and half to the informer; and the commander of a man of war forfeits 1000 l. to be divided between the king and the informer. *Ib.* ſect. 19.

PRO *(Cycl.)*—PRO *partibus liberandis*, in law, an antient writ for the partition of lands between co-heirs. Reg. orig. 316. *Blount*, *Cowel.*

PROBOLIUM, among the Romans, a kind of ſpear, which hunters uſed in hunting boars. *Pitiſc.* in voc.

PROBOSCIPLECTANUS, in natural hiſtory, a name given by ſome authors to a peculiar and very elegant ſpecies of penicillus marinus, which has ſomewhat of a funnel-like ſhape, and has its mouth ſurrounded by a number of thin hair-like filaments. See PENICILLI *marini*.

The firſt who has deſcribed this particular ſpecies, is the accurate Fabius Columna, from whom Klein has engraved a figure of it. *Klein* de Tub. Mar. p. 1.

PROBOSCIS, *(Cycl.)*—PROBOSCIS *of flies*. See the article TRUNK.

PROBULEUMA, προβεβλευμα, among the Athenians, a decree or vote of the Areopagus, or ſenate of Athens.

It was ſo called becauſe agreed upon by the ſenate, with a deſign to have it afterwards propounded to an aſſembly of the people, that it might receive from them a farther ratification, without which it could not be paſſed into a law, nor have any force or obligatory power after the end of that year, when the ſenators and other magiſtrates laid down their commiſſions. *Potter*, Archæol. Græc. l. 1. c. 18. T. 1. p. 100.

PROCERS, in glaſs-making, iron inſtruments hooked at the extremity, uſed to ſettle the pots in their places, whether ſet too near or too far off. *Neri*'s Art of Glaſs, Append.

PROCESSUS *(Cycl.)*—PROCESSUS *majoris muſculus*, in anatomy, a name given by ſome of the writers of the ear to one of the muſcles of that part, called by Cowper and others the *internus auris*, and by Albinus, more properly, the *tenſor tympani*.

PROCESSUS *minimi muſculus*, in anatomy, a name given by ſeveral authors to one of the muſcles of the ear, called by Cowper and others *obliquus externus*, and by Albinus *tranſverſus auriculæ*. See TRANSVERSUS *auriculæ*.

PROCESTRIA, among the Romans, buildings adjoining to camps, eſpecially winter quarters or ſtanding camps, where ſutlers, ſtrangers, traders, and others that followed the army, reſided; for they were not permitted to mix with the ſoldiers, unleſs when the enemy was near. *Pitiſc.*

PROCHARISTERIA, προχαριστηρια in antiquity, a ſolemn ſacrifice which the Athenian magiſtrates yearly offered to Minerva, when the ſpring firſt began to appear. *Potter*, Archæol. Græc. T. 1. p. 427.

PROCHEILA, a word uſed by ſome authors to expreſs the extremities of the lips.

PROCHYMA, a word uſed by the antients to expreſs that kind of muſt which flows ſpontaneouſly from the grapes without their being preſſed.

PROCICADA, in natural hiſtory, a name given by ſome to the inſect which the French call *procigale*. It reſembles the cicada in moſt reſpects, but it has not the power of making the noiſe that inſect does. See PROCIGALE.

PROCIDENTIA *(Cycl.)*—PROCIDENTIA *uteri*. The firſt ſtep towards a cure of a *procidentia uteri*, or falling down of the womb, is to reduce it to its natural ſituation, and to keep it there by means of peſſaries. But as ſome diſadvantages attend the uſe of common peſſaries, Dr. Thomas Simſon has contrived one, and given us the deſcription and figure of it in the medical eſſays of Edinburgh, Vol. III. art. 18. See alſo the abridgment of this work, Vol II. p. 224.

PROCIDENTIA *ani*. See the article TENESMUS, under which this is treated of.

PROCIGALE, in natural hiſtory, a name given by Reaumur, and from him by all the French naturaliſts, to a ſpecies of four-winged fly, greatly reſembling the cigale, or cicada, but wanting its power of making a noiſe.

This creature has a trunk of the ſame form with that of the cicada, very long, and laid cloſely upon the belly, and contained in a caſe or ſheath of the ſame ſtructure with that of this inſect. The female alſo has the ſame inſtrument at its tail, prepared for boring holes in wood, and called in that creature the *piercer*, and it uſes it to the ſame purpoſe, depoſiting its eggs by means of it in the branches of trees.

There is alſo another very ſmall inſect mentioned by Reaumur, as reducible to this claſs, if properly of the fly-kind; but its ſmallneſs makes the ſtructure of its wings ſcarce diſtinguiſhable with any degree of accuracy; and it is hard to determine whether it has four wings, or two wings, and two caſes of wings: this little fly is extremely common on roſe-trees; its wings are yelloviſh, and its body white; and it can hop as well as fly. It is hardly poſſible to find a roſe-tree in the ſummer-months that is not loaded with theſe inſects, and they are principally found about the extremities of the young branches. The trunk of this ſmall fly is of the ſame kind with that of the cicada, and its buſineſs on the roſe-tree is the laying its eggs, in the ſame manner as the cicada, in the wood of the branches. This operation, however, is performed by a very different inſtrument; for inſtead of the piercer which the female cicada has at the end of her body, this little fly has a ſaw placed on the third ring of the body, and as much differing in ſhape as in poſition from the ſaw of the ſerrate roſe-fly, for it is leſs elegantly faſhioned; it is pointed, however, at the end, and the creature preſſing upon it with the whole weight of its body, forces it into the wood, by which means it makes a cavity, in which to depoſite its eggs. Theſe eggs are ſo ſmall and ſo tender, that they are not to be taken out of their place without breaking them. They finally produce ſmall worms, of a white colour and tenderer nature than the eggs themſelves: theſe, after they have fed a proper time on the juices of the branch, leave their holes, and become transformed into nymphs, which yet have the power of moving and feeding, and greatly reſemble the nymphs of the cicada in that they perfectly ſhew the lineaments of the fly contained within them, differing ſcarce in any thing from it, except that they have caſes over their wings, which are ſo ſmall as to leave the rings of the body almoſt entirely bare. *Reaumur*'s Hiſt. Inſ Vol. IX. p. 241.

PROCINDYNEUONTES, προκινδυνευοντες, among the Romans, a deſignation given to the Velites, becauſe they were moſt expoſed to danger. The term anſwers to what we call the *forlorn-hope*. See VELITES and FORLORN-HOPE, *Cycl.*

PROCONNESIUM *marmor*, a name given by the antients to a ſpecies of marble called alſo *neuris* and *elaphoneſus*, and by ſome *Cyzicus*, from the works of a famous ſtatuary of that name, many of which were made of it. It was of a bluiſh white, lightly variegated with black; this colour uſually running in ſmall veins, and not unaptly reſembling in many inſtances the courſe of the veins of a human body in the naked ſtatues. It was alſo uſed in the ſumptuous buildings of the Romans.

PROCUBITORES, among the Romans, an appellation given to the Velites, becauſe when the enemy was near, they always formed the outguard. *Pitiſc.*

PROCYON, in aſtronomy, a fixed ſtar of the ſecond magnitude, in the conſtellation canis minor.

PRODUCTION *(Cycl.)*—*Marine* PRODUCTIONS. To inveſtigate the nature of *marine productions*, Count Marſigli moiſtened in ſea-water ſome branches of coral, newly taken up, and found that the tubercles ſo frequent on its branches, after a little time all opened themſelves into regular flowers, each terminated by eight points. Theſe were white, and were ſuſtained by a cup divided into the ſame number of ſegments; and on the taking the branches again out of the water, he found theſe flowers all immediately cloſe themſelves up again, and only make red irregular tubercles; and the vigorous branches of coral retained this property of opening and cloſing their flowers for ſeven or eight days after they were taken out of the ſea. The tubercles, when wounded, yield a milky juice, in which, doubtleſs there is contained the ſeed of the coral.

When this curious naturaliſt had found coral to be a true plant in its organizations, it appeared a very deſirable thing to enquire whether it would yield vegetable principles, or thoſe of another kind, in a chemical analyſis. This experiment

ment he carefully tried, not only on coral but on many other of the ſtony plants, and found all of them yielded the ſame principles with vegetables. All of them yielded on this trial, a phlegm, a volatile urinous ſpirit, with always more or leſs of a ſea-water ſmell, and a thick reddiſh black fœtid oil; and the remainder in the retort being calcined, always yielded a fixt alkaline ſalt like that of plants.

The ſea *productions* all afforded more or leſs of every one of theſe principles; but thoſe of which ever kind that had been kept a long time after they were taken out of the ſea, afforded always much leſs fluid matter than thoſe which were freſh. Mr. Geoffroy was very deſirous of following the Count in theſe reſearches; and as he had no opportunity of procuring any freſh coral from the ſea, he put into a retort a pound of the common red coral, ſold by the druggiſts, which is what wants the outer bark, and has uſually been a long time out of the ſea. This yielded two drams and ſix grains of a reddiſh volatile urinous ſpirit, and two or three grains of a fœtid oil, and the remainder in the retort by the common treatment, yielded afterwards near two drams of a lixivial ſalt of a ſaline taſte: the matter remaining after the lixiviation appeared a ſort of lime.

The ſpirit appeared to Mr. Geoffroy to be wholly the ſame with that which the Count had himſelf ſent to the academy under the title of the ſpirit of old coral; and it appeared ſcarce at all different from ſpirit of hartſhorn. It turned ſyrup of violets green, and made a white coagulation with the ſolution of corroſive ſublimate. Tho' this was much the ſame with the Count's ſpirit, the ſalts drawn from the caput mortuum were, however, different; that made by Mr. Geoffroy making a white coagulation with a ſolution of corroſive ſublimate, and that of Count Marſigli having no ſuch effect; both the ſalts, however, turned the ſyrup of violets green, and Mr. Geoffroy judged the difference in the other trial to be only from the Count's ſalt having been leſs carefully made, and containing ſome quantity of earth which weakened its power and prevented this effect from it. It follows from all this, that the corals and all the other ſea *productions* of that claſs are properly plants, tho' of the hardneſs of ſtones: and in the internal uſe of coral it may be proper to conſider it not as a mere abſorbent, but as a ſubſtance which contains alſo a volatile ſpirit and oil, which may well be ſuppoſed to poſſeſs virtues above thoſe of mere abſorbent earth; and that there is great difference between the virtues of ſuch coral as has been long kept, and ſuch as is newly taken up from the ſea. The Count, after analyſing coral in this manner, tried the ſame proceſs on ſeveral parts of the rocks on which the coral grew; but he found this to yield none of theſe active principles; ſo that altho' the hardneſs of corals and of ſtones ſeems the ſame, there is great difference between them in their principles, their nature, and effects.

There is yet one queſtion remaining to be determined in this point, which is, what is the nature of this milky juice contained in the tubercles or flowers, and perhaps not leſs in the other parts of coral. The Count has ſaid nothing as to its qualities, but Boccone ſays it is hot, acrid, and almoſt cauſtic; whence perhaps it is the natural ſap of the plant, and is analogous to the milky juice of the ſpurges and ſome other plants. It were to be wiſhed that this liquor could be tried with acids and alkalies, and in other ways, and its analyſis known: this perhaps would make our knowledge of the nature of this ſtony vegetable perfect. Mem. Acad. Par. 1708.

PROEDRI, Προεδροι, among the Athenians, magiſtrates whoſe buſineſs it was to propoſe to the people the things they were to deliberate upon and determine at every aſſembly, after which their offices expired. *Potter*, Archæol. Græc. l. 1. c. 17. T. 1. p. 93.

They were ſo called from the privilege they enjoyed, of always having the firſt ſeats at aſſemblies.

PROEROSIA, Προηροσια, in antiquity, the ſame with *preroſia*. See PREROSIA.

PROFUNDUS, in anatomy, a name given by Albinus, Hunaud, and others, to a muſcle of the wriſt, generally known by the name of the *perforans*. Theſe authors called, in the ſame manner, the *perforatus* of others the *ſublimis*.

PROGALL-INSECT, an animal nearly approaching to the gall-inſect claſs, but differing from it in ſome reſpects, and called by this name from its reſemblance to thoſe creatures; as the creatures ſomewhat approaching to the ſcarab or beetle claſs, but not regularly of it, are called *proſcarabs*.

This claſs of animals paſs a great part of their lives in the ſame manner with the gall-inſects, faſtened to the bark of a tree, and there remaining motionleſs; ſome of them alſo in the manner of the gall-inſects cover their young brood with their bodies; but they are eaſily diſtinguiſhable as animals, in all the ſtages of their lives, and in that they differ from the others. The annular depreſſions of their bodies may in all their ſtates be diſtinguiſhed, eſpecially with the help of a magnifying glaſs; whereas thoſe of the gall-inſects all diſappear as they grow towards their utmoſt bulk.

If the gall-inſects are worthy of obſervation on account of the great value of one ſpecies of them, the kermes; the *progall-inſects* are at leaſt equally ſo on the ſame account, ſince the cochineal belongs to this claſs.

The moſt common and obſervable ſpecies of the *progall-inſect* claſs, is that of the elm, and a deſcription of that alone may give a ſufficient light into the hiſtory of the whole claſs, and ſhew what characters are to be found in the inſects properly reducible to it.

This inſect is principally found in the forked branches of the elm, and commonly in thoſe of one, or at the utmoſt of two years growth; it is ſometimes found in other parts of the branches and twigs, but that is much leſs frequently. It is in the months of June and July that this inſect is at its full growth; at this time, however, it appears to the naked eye only as a ſmall oval convex maſs, of a dirty browniſh red colour, ſurrounded with a ſmall downy white thread. This reddiſh oval maſs is the back of the animal, and by the help of glaſſes we may ſee the annular ridges and depreſſions that characterize the inſect claſs. This is all that gives an idea of its being an animal; for it is at this time in a ſtate of perfect immobility, and ſhews neither head, legs, or any other part that might give a proof of what it is; all theſe parts are enveloped and hid by the cottony band that ſurrounds it, which ſuffers no part but the convex ſurface of the back to be ſeen.

It is giving but a very imperfect idea of this downy rim, to call it only a border or pad laid round the body of the animal. This matter, in reality, makes a kind of neſt in form of a baſket, in which the body of the inſect is in a great meaſure lodged. Its belly, which is placed on this neſt, is ſeparated by it from the bark of the tree, and lodged on a ſort of downy bed; the threads of this down are ſomewhat thick and ſtrong. The principal uſe this bed or neſt ſeems deſtined for, is, the reception of the young, which are produced in the end of June or in July. If the animal be removed from its bed at this ſeaſon, a vaſt number of ſmall living animals are found in the bottom and ſides of the neſt. Theſe are of a yellowiſh white, and have two ſmall horns; their ſhape much reſembles that of the young gall-inſects; their hinder part is more ſharp than their fore part, and they run about very ſwiftly on ſix very ſhort legs.

At whatever time however the *progallinſect* is removed from its neſt, there are never found any eggs; the creature is viviparous, and the young animal ſeems to be born with its head foremoſt, which is contrary to the manner of the pucerons and ſome other ſmall animals.

If the body of the parent *progall-inſect* be cruſhed in the month of June, a great number of ſmall oblong bodies are always protruded; theſe are probably the embryo animals, tho' all that the niceſt attention can in this ſtate diſcover in them, is, two ſmall black ſpecks, which afterwards prove to be the eyes.

The neſts of theſe inſects are ſeldom found ſo full of young ones as might be expected; but that is probably owing to the length of time taken up in bringing forth ſo great a number, probably eight or ten days, and the young ones in a day or two are perhaps fit to eſcape and run away; ſo that one finds only the laſt born there.

The branches of the elm examined with the help of glaſſes at this ſeaſon, ſhew us multitudes of the young *progall-inſects* running about them; theſe, however, continue in this ſtate but a little while, they ſoon chooſe their place for fixing for life, and there remain without motion afterwards. They do not loſe the power of moving, however, till the month of April following; for till that time, if the branch on which they are be cut off, when it becomes dry, and furniſhes them no more juices, they will leave it and go in ſearch of another; but after April, if the branch be cut off, they die upon the place when it dries, being no longer able to remove themſelves.

Theſe inſects, like the gall-inſects, do not grow much till after the winter is over: toward the end of April they have uſually arrived at their deſtined bigneſs; their bodies in the beginning of this month, and in ſome part of March, are ſomewhat reddiſh; but this colour is the leſs to be diſtinguiſhed, as the rings are all bordered with ſhort grey hairs. Theſe hairs are conſiderably thick, but the animal is found abſolutely without them again, when it has its cottony bed under it, having then diveſted itſelf of them in quitting its ſkin, which it changes for one whoſe pores are more proper to give paſſage to the matter of which that bed is to be made. At all ſeaſons their belly is of a redder colour than their back; and that is in a great meaſure owing to the belly being always free from thoſe grey hairs. The legs are very ſmall and ſlender, in proportion to the ſize of the animal; they are ſix in number. Its trunk or ſucker is not eaſily diſcovered, but is placed however in the ſame manner with that of the gall-inſect, and is like it in ſhape.

The cottony matter forming itſelf by tranſpiration from the ſeveral parts of the animal, forms by degrees the neſt, and as this increaſes, the animal itſelf increaſes alſo in bulk, and becomes gradually more and more red. No obſervation has yet been able to determine the manner of the fecundation of theſe inſects; they are never ſeen to couple one with another, and moſt probably the male of this claſs, as of the gall-inſects, is a ſmall fly. *Reaumur*'s Hiſt. of Inſects, Tom. 4. p. 83.

PROGALL-INSECT, otherwiſe called COCHINEAL. There have been many conjectures about *cochineal*; but the moſt probable ſeems to be, that it is an animal of the *progall-inſect* claſs.

The *cochineal*, in the ſtate in which it is brought to us, is in ſmall bodies of an irregular figure, uſually convex, and ridged and furrowed on one ſide, and concave on the other. The colour of the beſt is a purpliſh grey, powdered over with a ſort of white duſt. All that the world knew of it for a long time, was, that it was gathered from certain plants in Mexico, and therefore it was naturally ſuppoſed to be a ſeed. *Reaumur*'s Hiſt. of Inſects, Tom. 4. p. 88.

In the year 1692, Father Plumier gave Pomet, the French author of a hiſtory of drugs, an account of its being an animal: this, however, was diſregarded; but Meſſrs. Hartſoeker, De La Hire, and Geoffroy, afterwards evidently proved it to be one; and after this there were printed the depoſitions in form of a number of perſons upon the ſpot, who all declare it to be a viviparous animal, and that it paſſes a great part of its life fixed to the vegetable body on which it feeds; and that it was a creature ſubject to no change, nor ever appearing in any other ſtate. Theſe and many other qualities found in the *cochineal*, all analogous to thoſe of the claſs of *progall-inſects*, give great room to believe that it is truly and properly an inſect of this claſs.

There are two kinds of *cochineal*, the finer called *meſtique*, the other termed the wild *cochineal*. The firſt is gathered from ſuch plants of the opuntia as are prepared and managed properly on purpoſe for the production of the animal, the other is found wild on the wild plant, and is much inferior to the *meſtique* in value. The *meſtique* has its name from the name of the place, where it is propagated in the greateſt quantity, Meſtique, in the Province of Honduras. As to the other, it is not yet determined whether it be another ſpecies of the animal, or whether the ſame ſpecies in a leſs thriving condition. Ibid. p. 91.

The Indians plant about their habitations the opuntias, on which they propagate and raiſe the *cochineal*; they gather ſeveral quantities of it in the year, and what they are moſt afraid of in regard to it, is, a cold or a wet ſeaſon. In ſuch caſes they cut off the leaves of the plant ſtored with the inſects, and take them into their habitations. Theſe are of ſuch a nature as not to dry and wither immediately, like the leſs ſucculent plants, but often keep their juices long enough to furniſh the creatures a ſufficient nouriſhment, till the dangerous ſeaſon is over. The inſects are at this time in a ſtate to produce their young; and the Indians place them in a ſort of little neſts, twelve or fourteen together, on different parts of the opuntias of their plantation. Ibid. p. 93.

The animal is ſeldom more than three or four days in this condition, before it produces its young ones; each produces many thouſands, each ſcarce ſo large as the ſmalleſt mite; the young brood ſoon quit their neſt, and like the other gall and *progall-inſects*, wander about the plant for a little time, and then fix themſelves upon it in ſeveral places. They do not eat the plant, but only introduce their trunks and ſuck the juice, and wherever they fix themſelves, which is uſually in the more ſucculent parts of the plant, there they remain till they have acquired their full growth, and are in a condition themſelves to produce young ones. Ibid. p. 94.

The figure of this inſect is oval, and its utmoſt ſize is that of a ſmall pea. It has ſix legs armed with claws, two eyes, and a trunk by which it ſucks its nouriſhment. Ibid. p. 95.

The ants, and many other little animals, are very fond of eating the *cochineals*; and it is with great difficulty that the Indians defend the young brood from thoſe devourers. Ibid.

The firſt of the gatherings of the *cochineal*, is at the time the Indians carry the parent animals to the plants; when theſe have produced their young they die in the neſts, and the Indians take down the neſts and take them out. The ſecond gathering is three or four months after this, a little ſooner or later, according to the ſeaſon. The young ones produced from the former crop, have now acquired their full growth, and are ready to produce their young. In this ſecond gathering they take care not to take off the whole generation, but leave enough on the plant to multiply and give them a new crop afterwards. About three or four months after this, they have another gathering from theſe. Soon after this the rainy ſeaſon comes on, and the young ones produced from what are left on the plants from this gathering, are what the Indians houſe, for the parents of the next year's crops. The laſt of theſe crops is the leaſt valuable, being generally foul and full of ſmall inſects of the new brood, among the right and full grown ones. Ibid. p. 96.

After the Indians have gathered the *cochineal* they kill it, otherwiſe they would looſe a great part of their harveſt; for the parent race would live ſome days after their being taken from the plant, and would produce their young, which would be nimble enough to run away in great numbers. Some to kill the creatures plunge them in hot water, and afterwards dry them in the ſun; others kill them by a proper degree of heat. Ibid. p. 97.

The living *cochineals* are covered, like all other inſects of this kind, with a kind of white powder; but in the water uſed to kill them they looſe much of this powder, and are therefore of a different colour from thoſe killed by heat. Ibid. p. 98.

The accounts from the place where the *cochineal* is produced, give us all theſe particulars; but to decide the long diſputed point, whether they are of the animal or vegetable kingdom, we have the means in our own hands even in this part of the world. We need only moiſten and ſoak in water, or in vinegar, a number of *cochineals* till they are ſwelled and diſtended, to know that every one is the more or leſs perfect body of an inſect; the moſt imperfect and mutilated ſpecimens always ſhew the rings of the body, and from obſerving others it will be eaſy to find the number and diſpoſition of the legs; parts, or even whole ones being left on ſeveral, and often compleat pairs. Ibid. p. 100.

People of warm imaginations no ſooner knew it to be an inſect, but before they were perfectly acquainted with its form, they were for alloting it its proper claſs. Some would have it to be a worm, others a ſpider, and others a beetle. Petiver is of the number of the laſt, and has been ſanguine enough to figure it in all the ſtates he ſuppoſed it to have paſſed, the hexapode worm, the nymph, and the perfect beetle; tho' we now find by poſitive accounts from the place, that it undergoes no change at all, and from its whole figure and hiſtory, that it is properly of a claſs of animals then not known. Many have alſo been of opinion, that it was only a part of an animal, but a cloſer and repeated obſervation would have ſhewn them that it comes to us often more perfect than is imagined, and frequently wants only its horns and a leg or two, of being a perfect animal.

It is eaſy to ſee in ſome of theſe the head, and ſometimes a tubercle on each ſide of it, which may very naturally be ſuppoſed the eyes, or elſe the roots of the antennæ or horns. The firſt pair of legs are thus found to be very near the head of the animal, and placed exactly as in all the gall-inſect and *progall-inſect* claſs; a little above theſe one may diſtinguiſh alſo the remainder of the trunk ſituated exactly as in the gall-inſects and *progall-inſects*; the anus is alſo eaſily diſtinguiſhed. Ibid. p. 101.

As the manner of the fecundation of the gall-inſects was ſo long unknown in Europe, it is no wonder that that of the *cochineal* ſhould not be very early diſcovered in Mexico: but we have an account among Mr. Ruyſche's pieces from whence almoſt all the true hiſtory of this animal is had, that at the ſeaſon of the *cochineals* becoming big, there is ſeen continually among them a ſmall butterfly, which is bred upon the ſame plants, and by means of which the *cochineals* conceive. This is ſo ſtrictly analogous to the manner of the gall-inſect claſs, that there is no room to doubt the fact; and it is a farther great proof, how little truth was before in the gueſſes concerning the claſs of animals this belonged to. Ibid. p. 103.

It would be an eaſy miſtake for any one not profeſſedly a naturaliſt to miſtake the male gall-inſect for a butterfly, as it has white opake wings; and aſſuredly the male *cochineal* is an animal of the ſame ſpecies, a true two winged fly.

If a full grown *cochineal* be ſoaked a conſiderable time in water or vinegar, and afterwards gently preſſed, there will frequently be protruded from its hinder part a number of ſmooth oblong bodies, which might be eaſily miſtaken for eggs; but a good microſcope will ſhew in theſe the traces of the legs and other lineaments ſufficient to prove it to be a true embryo fœtus. Ibid. p. 104.

The wild *cochineal* differs from the *meſtique* in being leſs pure, and conſiſting of animals of all ages and ſizes, as being gathered with leſs care, and without the intent of propagating future crops; the larger ſpecimens in this ſometimes exceed the finer *cochineal* in ſize, and when moiſtened and ſqueezed, ſend forth vaſt numbers of the ſame oblong bodies. Ibid. p. 105.

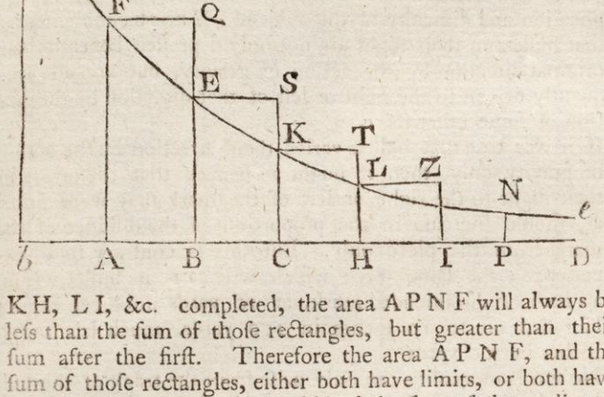
Duhamel, while he reſided at St. Domingo, found in that iſland the ſame animal which Father Plumier had before obſerved there, and accounted the ſame creature with the *cochineal* inſect; he gathered ſome of theſe animals from off the opuntias there, and ſent them over to Paris; they were found to have all the exterior marks of *cochineal*; but it is much to be feared they are really no more than that to the *cochineal*, which the common peach and vine gall-inſects are to the kermes of the ilex. Poſſibly, however, a proper care and attention, and the bringing over the very creatures from Mexico to other parts of the world, might, with many tryals to determine what ſpecies of the opuntia it is that they moſt thrive on, be a means of propagating them to vaſt advantage. Ibid. p. 108.

Joſſelin, in his account of the products of New England, mentions a particular kind of ſun-flower, called by ſome a ſpecies of *golden-rod*; the ſtalks of which are covered about the knots in the ſummer months with inſects of the ſize of large fleas. Theſe preſerved in a proper manner, yield a very elegant ſcarlet colour, and the author thinks might be made to ſupply the uſe of *cochineal*.

PROGRESSION *(Cycl.)*—As a right line, or figure, may increaſe continually, and never amount to a given line or area; ſo there are *progreſſions* of fractions which may be continued at pleaſure, and yet the ſum of the terms be always leſs than a given number. If the difference between their ſum and this number decreaſe in ſuch a manner, that by continuing the *progreſſion* it may become leſs than any fraction how ſmall ſoever, that can be aſſigned; this number is the limit of the ſum of the *progreſſion*, and is what is underſtood by the value

of the *progreſſion*, when it is ſuppoſed to be continued infinitely. Theſe limits are analogous to the limits of figures, and they mutually aſſiſt each other. The areas of figures can, in many caſes, be no otherwiſe expreſſed than by ſuch *progreſſions*; and when the limits of figures are known, they may ſometimes be advantageouſly applied for approximating to the ſums of certain *progreſſions*.

Thus, for inſtance, let the terms of any *progreſſion* be repreſented by the perpendiculars A F, B E, C K, H L, &c. ſtanding at a given diſtance on the baſe A D; and let P N be any ordinate of the curve, F N *e* paſſing over the extremities of thoſe perpendiculars. Suppoſe A P to be produced; then according as the area, A P N F, has a limit to which it may approach continually, but never exceed, or may be produced till it exceed any given ſpace; there will alſo be a limit of the ſum of the *progreſſion*, or it may be continued till it exceed any given number. For ſuppoſing the rectangles F B, E C,



K H, L I, &c. completed, the area A P N F will always be leſs than the ſum of thoſe rectangles, but greater than their ſum after the firſt. Therefore the area A P N F, and the ſum of thoſe rectangles, either both have limits, or both have none. The ſame is to be ſaid of the ſum of the ordinates A F, B E, C K, H L, &c. and of the ſum of the terms of the *progreſſion* repreſented by them. If the curve, F N *e*, for example, be the common hyperbola, *b* its center, *b* P the aſymptote; and A B being equal to *b* A, if A F repreſent unity, the ſeries of ordinates will repreſent the *progreſſion* 1, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, &c. which may therefore be continued till it exceed any given number, as the hyperbolic area may be produced till it exceed any given ſpace[a]. But if F N *e* be an hyperbola of any higher order, ſo that the ordinate P N be reciprocally as any power of the baſe *b* P, whoſe exponent is greater than unity, the area A P N F[b], and the ſum of the *progreſſion* repreſented by the ſeries of ordinates, will have limits. Hence there is always a limit of the ſum of the fractions that have unity for their common numerator; and the ſquares, cubes, or any other powers of the numbers, 1, 2, 3, 4, &c. whoſe exponents exceed unity for their ſucceſſive denominators[c]. [[a] See HYPERBOLA. [b] Ibid. [c] See *Maclaurin*'s Fluxions, B 1. p. 290.]

When the area A P N F has a limit, we may not only conclude, that the ſum of the *progreſſion* repreſented by the ordinates has a limit; but when the former limit is known, we may by it approximate to the value of the latter: and *vice verſa*, when the limit of the *progreſſion* is given, the limit of the area may be found. See *Maclaurin*, Lib. cit. Art. 352, 353.

Progreſſions of fractions may be found at pleaſure, that ſhall have aſſignable numbers equal to the limit of the ſum of the terms. Thus a ſeries or *progreſſion* of any number of quantities continually decreaſing being given, their ſucceſſive differences form a new ſeries of terms, the ſum of which from the beginning is always equal to the exceſs of the firſt term of the firſt ſeries above its laſt term. For inſtance, if A, B, C, D, E, &c. be the terms of the firſt ſeries, it is manifeſt that the ſum of the difference of A and B, B and C, C and D, D and E, is the exceſs of A above E. If the terms of the firſt ſeries decreaſe in ſuch a manner, that by continuing the *progreſſion* they may become leſs than any quantity that can be aſſigned, then the firſt term of the firſt ſeries is the limit of the ſum of the ſecond ſeries. In like manner, the difference of the alternate terms of the firſt ſeries, as of A and C, B and D, C and E, &c. form a new *progreſſion* of terms, the ſum of any number of which is equal to the exceſs of the ſum of A and B, the firſt and ſecond term of the ſeries, above the ſum of the laſt and penultimate terms; and the ſum of A and B is the limit of the ſum of the new ſeries. In general, if a *progreſſion* is formed by taking the difference of the firſt term A, and the term whoſe place in the ſeries is expreſſed by any number n; of the ſecond term B, and that whoſe place is $n+1$; of the third term C, and that whoſe place is $n+2$, and ſo on; then will the limit of the ſum of this new *progreſſion* be equal to the ſum of the terms A, B, C, D, &c. which precede that term whoſe place is expreſſed by n. In this manner *progreſſions* may be found at pleaſure, which may be continued without end, and have given numbers for the limits of their ſums.

For example, let the firſt ſeries be 1, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, &c. the ſucceſſive differences of the terms of which are $\frac{1}{2}$, $\frac{1}{6}$, $\frac{1}{12}$, $\frac{1}{20}$, &c. and the limit of the ſum of this *progreſſion* will therefore be 1. If we multiply each term of this laſt ſeries by 2, that the firſt term may be unit, we ſhall have 1, $\frac{1}{3}$, $\frac{1}{6}$, $\frac{1}{10}$, &c. the denominators of which are the triangular numbers, unity being the common numerator, and the limit of the ſum of this *progreſſion* is 2. The ſucceſſive differences of the terms of this latter ſeries being each multiplied by $\frac{3}{2}$, that the term of the new ſeries may be unity, give 1, $\frac{1}{4}$, $\frac{1}{10}$, $\frac{1}{20}$, &c. which have the pyramidal numbers for their ſucceſſive denominators; and the limit of the ſum of this *progreſſion* is $\frac{3}{2}$. In the ſame manner, the limit of the ſum of the fractions having unity for their common numerator, and the figurate numbers of any order denoted by m for their ſucceſſive denominators, is found to be $\frac{m-1}{m-2}$.

The ſame ſeries 1, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, &c. being again aſſumed, the differences of the alternate terms are $\frac{2}{3}$, $\frac{2}{8}$, $\frac{2}{15}$, $\frac{2}{24}$ &c. the limit of the ſum of which *progreſſion* is $1\frac{1}{2}$. Dividing each term by 2, the limit of the ſum of $\frac{1}{3}$, $\frac{1}{8}$, $\frac{1}{15}$, $\frac{1}{24}$, &c. is $\frac{3}{4}$. If we take the differences of the firſt term, and that whoſe place is m, the ſecond term and that whoſe place is $m+1$, &c. the common numerator of thoſe differences will be $m-1$; and their ſucceſſive denominators, the products of $1\times m$, $2\times m+1$. $3\times m+2$, &c. and the limit of the ſum of this *progreſſion* is the ſum of as many terms $1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}$, &c. as there are units in $m-1$. Now if each term of the new *progreſſion* be divided by $m-1$, that unity may be the common numerator, the terms $\frac{1}{m}$, $\frac{1}{2\times m+1}$, $\frac{1}{3\times m+2}$, &c. will ariſe, the limit of which is equal to the ſum of the fractions 1, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, &c. (continued till their number be $m-1$) divided by $m-1$. In like manner, by aſſuming other alternate, or any equivalent terms of the ſeries 1, $\frac{1}{2}$, $\frac{1}{3}$ $\frac{1}{4}$, &c. we may form new *progreſſions*, the value of which may be found. Thus, if we take the terms 1, $\frac{1}{5}$, $\frac{1}{9}$, $\frac{1}{13}$, &c paſſing over three terms, and divide the ſucceſſive differences of theſe terms by 96, we ſhall have the ſeries $\frac{1}{5.24}$, $\frac{1}{5.9.24}$, $\frac{1}{9.13.24}$, $\frac{1}{13.17.24}$, &c. which is equivalent to the ſeries C, given by Monſ. de Monmort, in the philoſophical tranſactions, N°. 353, p. 651. viz. $C=\frac{1}{1.2.3.4.5}+\frac{14}{5.6.7.8.9}+\frac{55}{9.10.11.12.13}+\frac{140}{13.14.15.16.17.}$ + &c. The ſum of which will therefore be $\frac{1}{96}$. And if we take the alternate terms of the ſeries $\frac{1}{2}$, $\frac{1}{12}$, $\frac{1}{30}$, $\frac{1}{56}$, &c. above mentioned, and divide the ſucceſſive differences of the terms by 2, we ſhall have the ſeries $\frac{5}{2.12}$, $\frac{9}{12.30}$, $\frac{13}{30.56}$, &c. which is equivalent to the ſeries $\frac{5}{1.2.3.4.}$, $\frac{9}{3.4.5.6}$, $\frac{13}{5.6.7.8}$, $\frac{17}{7.8.9.10}$, &c. mentioned in the ſaid philoſophical tranſactions, and marked A, the ſum or limit of which, by the foregoing rule, will be $\frac{1}{4}$. So the limit of Mr. Monmort's ſeries $B=\frac{1}{1.2.3.4.5}+\frac{4}{4.5.6.7.8}$, &c. will be $=\frac{1}{108}$ See *Maclaurin*'s fluxions, art. 356, where there is an error of the preſs, in p. 296. l 11. and 15. for the ſeries which in line 11. is ſaid to be Mr. Monmort's ſeries B, is the ſeries A, p. 651. of the philoſophical tranſactions, N°. 353 aforeſaid; ſo in line 15, for A, read B.

This may ſuffice to ſhew how the ſums of *progreſſions* ſo derived may be found. We refer for the farther application of theſe principles to the aforeſaid treatiſe of fluxions, art. 357, &c. Mr. Stirling's [a] treatiſe of the ſummation of ſeries, ought alſo to be conſulted, as he has improved the method of approximating to the value of *progreſſions*, which often ariſe in the ſolution of problems. See alſo Mr. de Moivre's *miſcellanea analytica*, and particularly the ſupplement to that work. [[a] *Methodus differentialis*: ſive *tractatus de ſummatione et interpolatione ſerierum infinitarum*. Lond 1730. 4°.]

PROGYMNASMATA, Προγυμνασματα, in antiquity, certain preparatory exerciſes performed by all thoſe who offered themſelves to contend in the Olympian games. *Potter*, Archæol. l. 2. c. 22. T. 1. p. 448.

PROHIBITO, in the Italian muſic, is a term applied to ſuch parts of a piece as are not proper, or according to juſt rule. Thus *intervallo prohibito* is every interval in melody that does not paſs the ear eaſily or naturally, to give it ſome pleaſure; ſuch are the tritone, the ſixth major, the ſeventh, ninth, &c. though under certain circumſtances, even theſe have pleaſing effects, in that by their harſhneſs they render the ſubſequent concords more agreeable.

PROJECTILE *(Cycl.)*—The theory of *projectiles*, as delivered under this head in the Cyclopædia, and by almoſt all writers on gunnery ſince Galileo, proceeds on the ſuppoſition, that the flight of ſhot or ſhells is nearly in the curve of a parabola. Galileo, indeed, has ſhewn, that independently of the reſiſtance of the air, all *projectiles* would in their flight deſcribe a parabola; and did propoſe ſome means of examining what inequalities would ariſe from that reſiſtance. So that it might have been expected, that thoſe who came after him would have tried how far the real motions of *projectiles* deviated from a parabolic tract, in order to have decided how far

far the reſiſtance of the air was to be attended to, in the determinations of gunnery. But inſtead of proceeding thus cautiouſly, ſubſequent writers have boldly aſſerted, that no conſiderable variation could ariſe from the reſiſtance of the air, in the flight of ſhells and cannon-ſhot; and it is now become an axiom almoſt generally acquieſced in, that the flight of theſe bodies is nearly in the curve of a parabola.

This hypotheſis was ſupported by Anderſon in his Treatiſe *of the genuine uſe and effects of the gun*, publiſhed in 1674; alſo by Monſ Blondel in his *Art de jetter les Bombes*; and the ſame ſubject being treated of by Dr Halley in the Phil. Tranſactions, N°. 216. this learned gentleman, ſwayed by the conſideration of the great diſproportion between the denſity of bullets and of the air, thinks it reaſonable to believe, that the reſiſtance of the air to large metal ſhot is ſcarcely diſcernible, although in light ſhot he acknowledges it ought to be accounted for. But though this hypotheſis was readily admitted by thoſe who contented themſelves with ſpeculation only, yet Anderſon himſelf found it impoſſible to reconcile it to experience, without ſome modification. This led him to ſuppoſe that a bullet at its firſt diſcharge, flew a certain diſtance in a right line, from the end of which line only it began to bend into a parabola. By this means he defended, as he thought, the hypotheſis of a parabolic motion: but ſo ſtrange a ſuppoſition as that of the ſuſpenſion of the action of gravity, needs no confutation. Anderſon was deceived, by his not knowing how greatly the primitive velocity of the heavieſt ſhot is diminiſhed in the courſe of its flight by the reſiſtance of the air.

Practical gunners alſo unanimouſly agree, that every ſhot flies in a ſtreight line to a certain diſtance from the piece, which imaginary diſtance they call the extent of the point-blank ſhot. This flight in a ſtreight line, indeed, ſuppoſing it fact, would be not only a refutation of the parabolic hypotheſis, but a moſt unaccountable difficulty in itſelf, as implying a ſuſpenſion of the action of gravity. But the great velocity of cannon-ſhot, aſſigned by Mr. Robins, ſeems readily to clear up this affair. We need only ſuppoſe, that within the diſtance thus determined by practical gunners, the deviation of the path of the ſhot is not very perceptible in their way of pointing. Now as a ſhot of 24 lb. fired with two thirds of its weight in powder, will, at the diſtance of five hundred yards from the piece, be ſeparated from the line of its original direction, by an angle of little more than half a degree; thoſe who are acquainted with the inaccurate methods often uſed in the directing of cannon, will eaſily allow, that ſo ſmall an aberration as this, may, by the generality of practitioners, be unattended to, and the path of the ſhot may conſequently be deemed a ſtrait line, eſpecially as other cauſes of error will often intervene, much greater than what ariſes from the incurvation of this line by gravity. See new princip. of Gunnery, p. 82.

How raſh and erroneous the opinion of the inconſiderable reſiſtance of the air is, will eaſily appear from what is eſtabliſhed by that ingenious author, who has ſhewn that this reſiſtance to a cannon ball amounts to more than twenty times the weight of the ball. What errors may not be expected from an hypotheſis which neglects this force as inconſiderable? In effect, it will not be difficult to ſhew, that the track deſcribed by the flight of ſhot or ſhells, is neither a parabola nor nearly a parabola. For by that author's experiments it appears, that a muſket ball of three fourths of an inch diameter, fired with half its weight of powder from a piece 45 inches long, moves with the velocity of near 1700 feet in a ſecond. Now, by the common parabolic theory if this ball flew in the curve of a parabola, its horizontal range at 45°, would be found to be about 17 miles. But from practical writers, as Diego, Uſano, and Merſennus, it appears, that this range is ſhort of half a mile; ſo that a muſket ſhot at 45° elevation, with a reaſonable charge of powder, flies not the $\frac{1}{34}$ part of the diſtance it ought to do if it moved in a parabola.

Nor is this great diminution of the horizontal range to be wondered at, when it is conſidered that the reſiſtance of the air to this bullet, when it firſt iſſues from the piece, amounts to 120 times its gravity.

Again, if the flight of the heavieſt ſhot, in common uſe for land ſervice, as of iron bullets of 24lb. weight, be examined, it will appear, that ſuch a ſhot made with a full charge of powder has a velocity of 1650 feet in 1″. And the horizontal range at 45° of this ſhot, would, according to the parabolic hypotheſis, be about 16 miles; but by the experiments of St. Remy it appears, that the range is really ſhort of three miles; which is not one fifth of the diſtance it ought to fly, if it deſcribed the curve of a parabola

And this deviation from the parabola, happens not only in theſe great velocities, but in ſuch as are much leſs; thus in velocities of about 400 feet in 1″; by ſeveral experiments it appears, that the range of a leaden bullet of three fourths of an inch in diameter, fired at different elevations with this velocity, did not at all anſwer the common theory. So that it ſufficiently appears that this theory, or the ſuppoſition of the inconſiderableneſs of the air's reſiſtance to *projectiles*, is falſe.

Indeed the falſeneſs of this hypotheſis almoſt appears at ſight, even in *projectiles* ſlow enough to have their motion traced by the eye; few there are who do not deſcend thro' a curve manifeſtly ſhorter and more inclined to the horizon than that in which they aſcended, and the higheſt point of their flight, or the vertex of the curve, is much nearer to the place where they fall on the ground than from whence they were at firſt diſcharged. Theſe things cannot be a moment doubted of by any one, who in a proper ſituation views the flight of ſtones, arrows, or ſhells, thrown to any conſiderable diſtance. See new princip. of Gunnery, Part 2. Prop. 6.

What is here advanced may be confirmed from the conſtant obſervation of all who are converſant in the practice of throwing bombs, *viz.* that the ranges at elevations below 45°, conſtantly exceed the ranges at elevations above 45°, which are reſpectively at an equal diſtance from 45°. Thus the range of ſhells at 15°, will go farther than one at 60°, and ſo a range at 20° exceeds one at 65°, &c. but it is known that in the parabolic hypotheſis theſe ought to be equal, which hypotheſis is therefore falſe.

There is an odd phænomenon in the motion of bodies projected with conſiderable force, which ſhews the great complication and difficulty of this ſubject. The phænomenon is, that bullets in their flight are not only depreſſed beneath their original direction by the action of gravity, but are alſo frequently driven to the right or left of that direction by the action of ſome other force.

If it was true that bullets varied their direction by the action of gravity only, then it ought to happen that the errors in their flight to the right or left of the mark they were aimed at, ſhould increaſe in the proportion of the diſtance of the mark from the piece only. But this is contrary to all experience; the ſame piece which will carry its bullet within an inch of the intended mark, at 10 yards diſtance, cannot be relied on to 10 inches in 100 yards, much leſs to 30 inches in 300 yards.

Now this inequality can only ariſe from the track of the bullet being incurvated ſideways as well as downwards; for by this means the diſtance between the incurvated line, and the line of direction, will increaſe in a much greater ratio than that of the diſtance; theſe lines being co-incident at the mouth of the piece, and afterwards ſeparating in the manner of a curve from its tangent, if the mouth of the piece be conſidered as the point of contact.

This is put beyond diſpute from the experiments made by Mr. Robins; who informs us, that having taken a barrel carrying a ball of three fourths of an inch diameter, and fixing it on a heavy carriage, he ſatisfied himſelf of the ſteadineſs and truth of its direction, by firing at a board one foot and a half ſquare, and miſſing it but once in 16 ſucceſſive ſhot. Now the ſame barrel being fixed on the ſame carriage, and fired with a ſmaller quantity of powder, ſo that the ſhock on the diſcharge would be much leſs, and conſequently the direction leſs changed, he found that at 760 yards diſtance the ball flew ſometimes 100 yards to the right of the line it was pointed on, and at other times 100 yards to the left. He found too that its direction in the perpendicular line was not leſs uncertain, it falling one time above 200 yards ſhort of what it did at another; altho' by the niceſt examination of the piece after the diſcharge, it appeared not to have the leaſt ſtarted from the poſition it was placed in. New principles of Gunnery, Part. 2. Prop. 7.

If it be aſked what can be the cauſe of a motion ſo different from what has been hitherto ſuppoſed? It may be anſwered, That the deflection in queſtion muſt be owing to ſome power acting obliquely to the progreſſive motion of the body, which power can be no other than the reſiſtance of the air. And this reſiſtance may perhaps act obliquely to the progreſſive motion of the body, from inequalities in the reſiſted ſurface; but its general cauſe is doubtleſs a whirling motion acquired by the bullet about its axis; for by this motion of rotation, combined with the progreſſive motion, each part of the bullet's ſurface will ſtrike the air in a direction very different from what it would do if there was no ſuch whirl; and the obliquity of the action of the air ariſing from this cauſe will be greater, according as the rotatory motion of the bullet is greater in proportion to its progreſſive motion.

PROLAPSUS *oculi*, in ſurgery, a diſtemperature of the eye, in which it is ſo violently inflamed and ſwelled, that it cannot be retained in its orbit or ſocket, but protrudes itſelf out of its natural ſeat. This diſorder is not only attended with great deformity, but alſo intenſe pains, blindneſs, and too often an obſtinate cancer are the effects of it. This is ſometimes ſo violent in degree, that the eye burſts out of its coats.

This diſorder ſometimes ariſes from inflammations, or redundancy of humors; and ſometimes from external violence, or from a cancer. Sometimes, when the diſorder is recent, and but in a moderate degree, it may be carried off by bleeding, bliſtering, and purging, with external applications, as fomentations and the like. When it will give way to none of theſe, the tumor muſt be opened, and the humors diſcharged, and this repeated as often as neceſſary; after every dreſſing, binding on a plate of lead hollowed in a proper degree.

When the natural figure of the eye, and its office of viſion are wholly deſtroyed by this diſeaſe, and the pains become more

more intenſe, there is no way left but to make a large inciſion and let out the humors of the eye, and afterwards cut away ſo much of it, that the remainder may be covered with the eye-lid. *Heiſter*'s Surg. p. 427.

PROLAPSUS *uvulæ*. The *uvula* is ſometimes ſo much enlarged and elongated, as to reach the larynx and pharynx, and obſtruct the actions both of reſpiration and deglutition, as well as of ſpeech. If it proceed from a recent inflammation, the patient may be relieved by bleeding and cooling gargles, with ſal armoniac and alum; ſcarifications are alſo very uſeful in this caſe, to prevent its ſpreading and inflammation.

When, on the other hand, this part is too much enlarged and elongated by phlegmatic humors, it appears white and free from pain and inflammation, and is moſt relieved by a gargle of ſpirit of wine and water warm, or a decoction of red roſes, or the like aſtringent ſubſtances with ſpirit of wine, or ſpirit of ſal armoniac added in ſmall quantities to them.

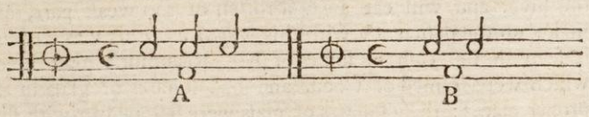
A powder of ginger, pepper, and pomegranate peel, may alſo be applied; but when all theſe methods prove ineffectual, the only remaining one is, to take off as much of the *uvula* as is neceſſary, either by ligature or by the ſciſſars. This latter is much the eaſier and better way; and the great caution neceſſary in it is, neither to take off too much nor too little of the *uvula*. For if too much be taken off, the patient's voice will be the worſe for it afterwards; and if too little, he will be very little the better for the operation.

This is a very common diſorder among the peaſants in Norway, and they have invented a machine with a hole in it, to let thro' a proper portion of the *uvula* when the whole is thruſt into the mouth, and a ſpring knife, which cuts off juſt as much as is let thro'. The ſurgeons have copied and improved on this invention. *Heiſter*'s Surg. p. 470.

PROLATION, *(Cycl.)* in muſic. The ſigns by which the modern antients uſed to ſignify a *prolation* to be made on any note, was a point in a circle or ſemi-circle, thus, ⊙, ☾. This point was the length of a ſemi-breve and minim.

Prolation was either *perfect* or *imperfect*. *Perfect prolation* was marked after the cleff as above, and then the ſemi-breve contained three minims, for which reaſon they placed the figure 3, or $\frac{3}{2}$, or $\frac{3}{1}$, after the circle, to ſignify that three ſuch notes were required to a bar. See example A.

Imperfect prolation was marked with the ſame characters, but without points, and then the ſemi-breve contained but two minims. See example B.



Theſe characters are almoſt entirely diſuſed in the modern practice; but as they are often met with in antient muſic, 'tis therefore neceſſary that a muſician ſhould have ſome knowledge of them. Tho' even now the Italians have two ſorts of *prolation* in muſic, which are ſignified by characters reſembling thoſe above deſcribed in the example A. The firſt they call *prolatione maggiore perfetta*, and it is marked thus, ⊙ and $\frac{3}{2}$. The ſecond they call *prolatione minore perfetta*, the characters of which are, ☾, or $\frac{3}{1}$, or $\frac{3}{2}$, but oftener C and $\frac{3}{2}$; but in both caſes the ſemi-breve contains a whole bar, and its pauſe the ſame; the minim one third of the bar, and its pauſe the ſame; and ſo of the reſt in proportion.

Prolation is alſo uſed for a ſeries of ſeveral ſounds or notes on the ſame ſyllable or vowel.

PROLECTATIO, a word uſed in chemiſtry to expreſs an extraction of the finer ſubſtances of a mixed body by the attenuation of the ſubtler particles; ſo that theſe being rarefied, ſeparate ſpontaneouſly from the reſt, and leave the groſſer and leſs valuable part in form of a reſiduum behind.

PROLEPTICOS, an epithet uſed by the antients to expreſs a fever the fits or exacerbations of which were apt to return before their regular time.

PROLOGIA, Προλογια, in antiquity, a feſtival celebrated by the inhabitants of Laconia, before they gathered their fruits. *Potter*, Archæol. Græc. T. 1. p. 427.

PROMACHIA, Προμαχια. in antiquity, a feſtival in which the Lacedæmonians crowned themſelves with reeds. *Potter*, Archæol. T. 1. p. 427.

PROMALACTERION, the name of the firſt apartment in the hot baths of the antients; this was a hot and cloſe room, in which the perſon was kept a while before he plunged at once into the warm water.

PROMETHEIA, Προμηθεια, in antiquity, an Athenian ſolemnity celebrated in honour of Prometheus, with torch-races, in remembrance that he was the firſt that taught men the uſe of fire. *Potter*, Archæol. Græc. T. 1. p. 427.

PROMYTHION, Προμυθιον, in rhetoric. See FABLE, *Cycl.*

PRONATOR *(Cycl.)*—PRONATOR *quadratus, ſive tranſverſus*, a ſmall fleſhy muſcle nearly as broad as it is long, lying tranſverſely on the inſide of the lower extremity of the fore arm. It is fixed by one ſide or edge in the long eminence, at the lower part of the internal angle of the ulna, and by the other in the broad concave ſide of the lower extremity of the radius. It is wholly fleſhy, without any mixture of tendinous fibres. It is ſituated tranſverſely, but that extremity which lies on the radius is nearer the carpus than that on the ulna. It is of a moderate thickneſs; the fibres neareſt the ſurface are longeſt, the reſt decreaſing in proportion as they lie nearer the interval between the two bones, and the interoſſeous ligament. It has a ligamentary or tendinous frænum belonging to it, one end of which is fixed in the interoſſeous ligament, the other in the inner edge of the baſis of the radius. *Winſlow*'s Anatomy, p. 190.

PRONATOR *teres ſive obliquus*, a ſmall muſcle broader than it is thick, ſituated on the upper part of the ulna, oppoſite to the ſupinator brevis, with which it forms an angle like the letter V.

It is fixed to the internal condyle of the os humeri, partly by fleſhy fibres, and partly by a tendon common to it with the ulnaris internus; from thence it paſſes obliquely before the extremity of the tendon of the brachiæus, and reaches to the middle part of the convex ſide of the radius; where it becomes flat, and is inſerted below the ſupinator brevis, by an extremity almoſt wholly fleſhy.

It is called *teres*, to diſtinguiſh it from the quadratus; but the name of *pronator ſuperior* is much more proper; but that of *pronator obliquus* is certainly propereſt of all. *Winſlow*'s Anatomy, p. 190.

PRONG-*hoe*, in huſbandry, a term uſed to expreſs an inſtrument uſed to *hoe* or break the ground near, and among the roots of plants.

The ordinary contrivance of the *hoe* in England is very bad, it being only made for ſcraping on the ſurface; but the great uſe of *hoeing* being to break and open the ground, beſide the killing the weeds, which the antients, and many among us have thought the only uſe of the *hoe*, this dull and blunt inſtrument is by no means calculated for the purpoſes it is to ſerve.

The *prong-hoe* conſiſts of two hooked points of ſix or ſeven inches long, and when ſtruck into the ground will ſtir and remove it the ſame depth as the plough does, and thus anſwer both the ends of cutting up the weeds and opening the land. The antient Romans had an inſtrument of this kind, which they called the *bidens*; but they were afraid of its uſe in their fields and gardens, and only uſed it in their vineyards. The *prong-hoe* comes into excellent uſe even in the horſehoing huſbandry; in this the *hoe*-plough can only come within three or four inches of the rows of the corn, turneps and the like; but this inſtrument may be uſed afterwards, and with it the land may be raiſed and ſtirred, even to the very ſtalk of the plant. *Tull*'s Huſbandry.

PRONOMÆA, a word uſed by ſome naturaliſts to expreſs what is uſually called the trunk, or proboſcis in inſects; an inſtrument ſomewhat reſembling the trunk of an elephant, which moſt of thoſe ſmall animals are provided with for the extracting the juices of plants, &c. deſtined for their food.

PRONTIA *lapis*, a name given by the writers of the middle ages to a foſſile of which they relate ſeveral extraordinary things; but their reſembling it to the head of a tortoiſe, and giving it the virtue of preſerving people from injuries by lightning, ſeem to make it plain that the word is only a corrupt ſpelling of the *brontia* of the antients, of which Pliny has related the ſame things.

This was a ſpecies of echinites, ſuppoſed to fall from the clouds in thunder ſtorms. See BRONTIA.

PROOF *(Cycl.)*—PROOF, in the ſugar trade, a term uſed by the refiners of ſugar for the proper ſtate of the diſſolved ſugar when it ſhould be ſet to harden.

The proceſs in the bringing ſugar to this ſtate may be underſtood by performing the whole work in little in this manner: Take ſix pounds of coarſe, or unrefined ſugar, diſſolve it over the fire in ſix pints of lime water; add to this the whites of four eggs beat up to a froth, ſtir the whole together; then boil the liquor to a higher conſiſtence than a ſyrup, or till, when expoſed to the cold it will concrete into grains. This is what the ſugar-bakers call *proof*. Pour this ſyrup into an earthen mould, with a hole at its bottom, ſtop the hole and ſet the veſſel in a moderately warm place.

The ſugar in a few days will ſet and harden, then open the hole at the bottom, and lay over the top of the ſugar ſome tobacco-pipe clay, made into a ſoft pap with water. The clay muſt be afterwards weted at times, and the water from among it will gradually be ſoaked up by the ſugar, and running thro' it will waſh away the treacle, without diſſolving the grained part. And thus all the treacle will by degrees be drained out of the maſs, and a loaf of white ſugar procured. *Shaw*'s Lectures, p. 149.

PROOF *ſpirits*, among diſtillers. See SPIRITS.

PROPAGATION *(Cycl.)*—PROPAGATION *of plants*. The number of vegetables that may be *propagated* from an individual, is very remarkable, eſpecially in the moſt minute plants.

It has been recorded, that in ſo large a plant as the common mallow, the annual product of one ſeed was no leſs than 200,000; but it has been ſince proved, by a ſtrict examination into the more minute parts of the vegetable world, that ſo deſpiſed a plant as the common wall maſs produces a much more numerous offſpring. In one of the little heads of this

plant there have been counted 13824 ſeeds. Now alloting to a root of this plant eight branches, and to each branch ſix heads, which appears to be a very moderate computation, the produce of one ſeed is 6×13824=82944; and 8×82944, gives 663552 ſeeds, as the annual produce of one ſeed, and that ſo ſmall that 13824 of them are contained in a capſule, whoſe length is but one ninth of an inch; its diameter but one twenty third of an inch, and its weight but the thirteenth part of a grain. Phil. Tranſ. N°. 478. ſect. 12.

PROPEMPTICON, προπεμπτικον, in poetry, a poem wherein are expreſſed ardent wiſhes and ſolemn vows for the ſafety of a perſon going upon a journey or voyage. Such is that of Horace, L. 1. Od. 3. addreſſed to Virgil on his ſetting out for Athens. It was otherwiſe called *apopemptic*on. *Hofm.* Lex Univ. in voc. See APOPEMPTIC, *Cycl.*

The word is derived from προπεμπω, I ſend forward, or accompany on the way.

PROPHECY *(Cycl.)*—The *prophecies* in the Old Teſtament, particularly thoſe relating to the Meſſiah, are allowed by all Chriſtians to have been accompliſhed in Jeſus Chriſt; but the diſpute is, as to the ſenſe or manner wherein they have received their accompliſhment.

Oppoſite ſyſtems have been framed on this head; Grotius, Vitringa, Le Clerc, Whiſton, Collins, Chandler, *&c.* Some hold the *prophecies* to have been accompliſhed in one ſenſe, ſome in another, and ſome in both. Mr. Whiſton's opinion is mentioned in the Cyclopædia.

A modern learned advocate for Chriſtianity ſhews, that it was the cuſtom of Jewiſh writers to ſay a thing was accompliſhed when they only made alluſions to it, more or leſs remote; that however there are ſome formal *prophecies* which literally relate only to the Meſſiah; other typical *prophecies* which are alſo to be applied in a literal ſenſe to the Meſſiah; and that others are only cited as accompliſhed allegorically, by way of *argumentum ad hominem*, to the Jews only who admitted this way of reaſoning. *Chandler*'s Defence of Chriſtian. paſſim. Bibl. Angl. T. 12. p. 458, ſeq.

Grotius's method is to look for a literal accompliſhment in the Jewiſh affairs about the time when the prophets wrote; or in the affairs of the neighbouring nations with whom they had wars. This method, diſapproved by Vitringa and many others, is defended by Le Clerc, Maſſon, L'Enfant, *&c.* who even carry it further, ſo as to maintain that there is no *prophecy* in the Old Teſtament which has not had a literal accompliſhment, and that if there be any wherein this is not known, 'tis thro' the defect of hiſtory. Vid. Hiſt. Crit. Rep. Lett. T. 6. Art. 2. p. 43, ſeq.

Grotius allows that the *prophecies* applied to the Meſſiah in the New Teſtament, tho' they had a literal accompliſhment before, had another more ſublime and peculiar accompliſhment in Chriſt. This appears from his notes on Matthew and Iſaiah, where he ſays expreſly, that what he interprets literally of Jeremiah, agrees in a more ſublime manner, and even more literally to Jeſus Chriſt. See alſo his notes on Pſalm XXII. 1. and his Treat. de Veritat. Relig. Chriſt. l. 5. c. 14. §. 17.

This opinion touching the double ſenſe of *prophecies* is not new. The greateſt allegoriſts, even thoſe among the Jews who make uſe of this manner of interpreting, have allowed a double ſenſe, as is ſhewn by Surenhuyſius; nor does Vitringa himſelf reject it. In lib. Conciliat. Vid. Bibl. Choiſ. T. 25. p. 411.

The diſpute then between Grotius and his adverſaries, is not whether there are two ſenſes in the *prophecies*, but whether ſeveral *prophecies* of the Old Teſtament, which relate to Chriſt, had a literal, leſs ſublime, and leſs perfect accompliſhment before they were accompliſhed in Chriſt. The affirmative is maintained by him, the negative by them. Vid. Le Clerc. Bibl. Choiſ. T. 27. p. 391, ſeq

As to the accompliſhment of particular *prophecies*, we find endleſs diſputes among critics and interpreters, concerning thoſe of the conception of a virgin, the ſeed of a woman, the ſceptre's departure from Juda, the root of Jeſſe, out of Egypt have I called my ſon, he ſhall be called a Nazarine, Daniel's ſeventy weeks, the Babyloniſh captivity, the diſperſion and reſtoration of the Jews. Matth. xxii. 23. *Surenhuſ.* Liber Conciliat. Bibl. Choiſ. T. 25. p. 414. *Jaquelot* Diſſ. ſur le Meſſie. Ouv. des Scav. Dec. An. 1698. p. 538. *Marſhal* Tabul. Chron. Jour des Scav. T. 56. p. 325. *Saurin.* Diſſ. 41. Obſ. Halenſ. T. 11. Obſ. 12. §. 7. p. 304. *Whitby*, Comment. ad loc. Works of the learned, T. 5. p. 232. Hoſ. c. 11. v. 1. *Olear.* Obſ. Sacr. Bibl. Univ. T. 2. p. 342. Mem. de Trev. An. 1719. p. 1243. Matth. c. 2. v. 23. *Olear.* ubi ſupra, p. 343. *Witſ.* Melet. Leidens. Mem. de Trev. An. 1711. p. 1895. Ayrol. Liber LXX. Hebdom. reſign. Giorn. de Letter, d'Ital. T. 19. p. 309. *L'Enfant*, Reflex. ſur Diſput. du Martianay. Nouv. Rep. Lett. T. 47. p. 492. *Limborch.* de Verit. Relig. Chriſt. Bibl. Univ. T. 7. p. 304. *Menaſſ. Ben. Iſrael.* Hope of Iſrael, Sect. 29. p. 36.

Few modern events of any conſiderable note, but one interpreter or other finds to be the accompliſhment of ſome Scripture *prophecy*. The late war and death of the king of France, and numerous others are pretended to be found in Holy Writ.

The viſions in the Old and New Teſtament, have been more tortured for accompliſhments than the *prophecies* themſelves. Such is the caſe of Ezechiel's temple, the temporal reign of Chriſt on earth, the deſtruction of antichriſt, the looſening the great dragon, the opening of the ſeals, and many others. *L'Enfant* and *Beauſobre* Verſ. du Nouv. Teſt. Jour des Scav. T. 65. (Ed. Amſt.) p. 350. *Vintring. Anacriſ.* Apocalyps. Jour. Liter. T. 10. P. 2. p. 474. *Meyer.* Diſſ. Theol. de Prophet Viſion. Ezek. Jour. des Scav. T. 40. p. 3, ſeq. Nouv. Rep. Lett. T. 42. p. 269. *Witſ.* Exerc. Acad. Ouv. des Scav. An. 1695. p. 17. *Whiſt.* Vind. Apoſt. Conſtit. p. 45. on Revelat Nouv. Rep Lett. T. 39. p. 586. Ouv. des Scav. Marſ. 1689. p. 277. *Harmonie & accompliſſement des propheties ſur la durée de l'Anti Chriſt & les ſouffrances de l'Egliſe*, p. 5. *avec un journal pour l'accompliſſement de ces propheties pour let quatre derniers mois de l'année* 1687, *& les deux premiers de l'année* 1688. 12°. Amſt. An. 1688. Bibl. Univ. T. 9. p. 354, ſeq. *Uſher* de Chriſt. Eccleſ. Contin. Succeſs. Bibl. Univ. T. 9. p. 13. *Harmonie & accompliſſement*, ubi ſupra, p. 356, ſeq. *L'Enfant* and *Beauſobre*. l. c.

PROPOLIS, *(Cycl.)* a name given by authors to a certain ſubſtance more glutinous and tenacious than wax, with which the bees ſtop up all the holes or cracks in the ſides of their hives. Beſide the wax and the honey which the bees gather in their daily travels, they have occaſion for this third ſubſtance at times, and that eſpecially when they are placed in a new hive.

They very well know that it is neceſſary to their well being, that they ſhould be kept perfectly warm in their hives, and ſtrongly defended againſt the injuries of weather: to keep out wind and rain they ſtop every little chink in the ſides of their habitations with this matter; nor is this the only reaſon for it, they have other enemies of the inſect tribe, which are on different occaſions eternally ſeeking a way into their habitations; ſome of them feed on their honey, others on the wax, and others on their young offspring. To be guarded againſt theſe, they as firmly as poſſible block up all the accidental holes or cracks in the hive, and guard the principal opening, which ſerves as the gate of their city, by numbers which are always placed round about it, ſo that no enemy can come in that way. *Reaumur*'s Hiſt. of Inſects, V. 10. p. 76.

Theſe wary animals not only ſtop up in this manner all the cracks they can find, but even examine all the weak places of the hive, and will eat away a rotten or too weak part, and make up the deficiency with this *propolis*. This was elegantly ſeen in the caſe of ſome of Mr. Reaumur's glaſs hives, which were framed of wood, and had ſquares of glaſs in the proper places: theſe ſquares of glaſs were faſtened in with ſlips of paſted paper. The bees finding this a much weaker part of the hive than any other, and capable of being eaten thro' by their enemies, ſoon gnawed to pieces all the paper and paſte, and covered thoſe parts with the *propolis* in the place of that matter.

It might ſeem that the bees might uſe wax on this occaſion; but this would be no defence againſt thoſe of their enemies, which devour and feed on wax; and nature has guarded them againſt theſe, by ſupplying them with a matter which ſpreads more eaſily, is of greater tenacity, and fixes itſelf much more ſtrongly in the ſmall crevices than wax could do. It has been known from the earlieſt times, that the bees made uſe of this ſubſtance; Pliny mentions it, and tells us, that the authors of his time diſtinguiſhed three kinds of it, the firſt they called *metys*, the ſecond *piſſiceron*, and the third *propolis*. The laſt of theſe names is only retained among the later writers, and ſeems to have ſtood with the antients for the pure ſubſtance, the other kinds differing from it only as they were more or leſs mixed with wax.

The *propolis* itſelf is a ſubſtance perfectly different from wax; it is found to be ſoluble in ſpirit of wine, or in oil of turpentine; and is ſoft when laid on by the bees, but grows hard afterwards; it may, however, even in its hardeſt ſtate, be ſoftened by heat. By all theſe obſervations it appears very plainly, that the *propolis* is a true genuine vegetable reſin, of the nature of many others which we have in common uſe. The authors who have treated of this ſubſtance, have deſcribed it very differently; George Pictorius, who has written of bees, ſays, that it is of a yellow colour and an agreeable ſmell, like that of ſtorax, and that it would ſpread when warmed properly. Pliny and the old authors deſcribe it as being of a rank and ſtrong ſmell, and being uſed as a ſuccedaneum for galbanum; and at preſent we uſually find it of an aromatic and agreeable ſmell, inſomuch that ſome rank it among the perfumes. The apothecaries, in ſome places, keep it as a medicine in their ſhops; but it is to be obſerved, that it is very various in its nature; for according to the deſcriptions of authors, it is ſometimes ſweet and ſometimes ſtinking. The truth is, that the bees who collect it as a thing to be uſed for a cement, not for food, are not over curious of what plants they gather it from; and hence in different hives it is found of very different colours and conſiſtences. In general, the *propolis* is of a browniſh red colour on the ſurface; the red ſometimes predominating, ſometimes the brown; but when broken it is yelloviſh, or approaching to the

the colour of wax. It very readily diſſolves in ſpirit of wine or oil of turpentine, and this ſolution is of a fine gold colour, and will ſerve extremely well as a varniſh to colour ſilvered picture-frames, or other the like work, into the appearance of gold. It gives a fine gold-like appearance, indeed, to any white metal of a poliſhed ſurface; all that it wants is a little more brilliancy, which is eaſily given it by mixing a ſmall quantity of maſtich, or of ſandarach in the ſolution. *Reaumur*'s Hiſt. Inſ. Vol. X. p. 77.

The bees having much leſs frequent occaſion for this ſubſtance than for wax, are very ſeldom to be met loaded with it; they never bring any of it home, except when they are eſtabliſhed in a new hive, or when there happens ſome crack or flaw in an old one. The morning is the time of their gathering the matter of which they make their wax; but the evening is the time of their going out for the *propolis*. When there is occaſion for this ſubſtance in the hive, the bees will be found to return loaded with it in lumps placed upon the third joint of their hinder legs, in the very ſame manner in which they carry their wax. It differs greatly from the rough wax which they carry, as that is made up of ſmall round or oval granules; and this is one uniform ſubſtance of the nature of a ſoft reſin or gum. This ſubſtance is not to be eaten firſt, in the manner of the rough wax, in order to its being rendered fit for uſe; but is of immediate readineſs for ſervice. It is one of the moſt troubleſome offices of the bees, to bring it home and apply it to the places where it is wanted. It is ſo tough and viſcous, that it muſt be with infinite difficulty that the poor bee gets it upon her leg; but the getting it off again, is a taſk left to others. As ſoon as one of the ſwarm enters the hive loaded with this, ſeveral others immediately gather about her, and bite out pieces of a very minute ſize from the lumps ſhe is loaded with. This is a work of great trouble and difficulty for them; for their teeth are ſo faſtened in by the tenacity of the matter, that it is with the utmoſt labour that they get off the little portion they have thus ſeized upon. This piece draws out, in the pulling it away, into a long thread, as any of the ſoft gum-reſins would do. Often the matter is ſo tenacious, that the bee which ſeizes on it, in order to ſeparate a piece, is not able to do it; but remains hung faſt by the teeth to the leg of the other. Often two bees are at work at a time, one at the lump of *propolis* attached to each leg of the bee that brought it in: as ſoon as they have any of them diſlodged a piece, tho' ever ſo ſmall, they immediately fly with it to ſome place where there is a crack to be ſtopped, and the moment theſe are gone, others ſupply their place at the lumps; ſo that both legs of the bee who brought in the load are very ſoon perfectly cleared of it, when the whole is employed to the proper purpoſe. The great trouble of working and ſeparating this matter, and the ſmall quantity that one bee is able to bring at a time, might ſeem to prove, that it would be an endleſs work to ſtop the large holes ſometimes found in the hives with it: but the great number of bees employed in this work at the ſame time, are what makes it go off tolerably well, tho' each has unqueſtionably a very hard taſk to perform in it.

It is the general opinion of thoſe who have ſtudied bees, that the willow and the poplar are the trees which principally furniſh them with this reſin, which, when it has paſſed through their management, we call *propolis*. It is very certain, however, that theſe are not the only trees which afford it, ſince the bees are not found to want this neceſſary material for their work, in places where there are no trees of that kind in the neighbourhood of the hives. *Reaumur*'s Hiſt. Inſ. Vol. X. p. 80.

Mr. Reaumur was very deſirous of ſeeing the manner in which the bees collected this tenacious matter; but watched them in vain in the fields and upon the trees: although an accident gave him an opportunity of obſerving them at their work on this occaſion. He had taken off the cover of one of his glaſs hives on ſome occaſion, and as there was much of the *propolis* ſticking to its edges, which the bees had uſed to ſtop the crevices when it was fixed in, the bees of a neighbouring hive ſoon found that here was this ſubſtance ready for them in large quantities together, and that they could have it at a very eaſy rate: they therefore immediately detached a party to bring it off; and in conſequence of this, it was eaſy to obſerve any one of them, during the whole courſe of his work. The manner of ſeparating it from the ſubſtance it lay upon, was by detaching very ſmall pieces at a time with the teeth; theſe, when they had been with great labour looſened from the reſt, were delivered to the foot of one of the fore-legs: they were here moulded into a roundiſh lump, and, after a little working, delivered to the foot of a ſecond leg; and finally, by this to the flat triangular piece which makes the third joint of the hinder legs, the part deſtined in their common labours to receive the lumps of rough wax. It is here preſſed down with ſome violence, and afterwards fixed in its place by three or four ſtrokes from the ſame foot; and then another is ſeparated by the teeth in the ſame manner, and by the ſame means carried to the ſame place, and added to the firſt piece; and ſo on till the whole work is finiſhed. The bees which found this treaſure loaded themſelves to an immenſe degree, carrying of a lump larger than a pea on each leg, and the time to take up theſe large parcels was at leaſt half an hour: after carrying this load to the hive, and being relieved from it by the joint labours of ſeveral others, the bee which has been at all the pains of collecting it, joins a cluſter of others in ſome quiet part of the hive, where it reſts for the remainder of that day.

The *propolis* is not only uſed by theſe animals for ſtopping up holes and cracks in the ſides of their hives; they often cover with it the ſurface of thoſe croſs pieces which ſupport the combs, and when they can find it in ſufficient plenty, they cover over the whole inner ſurface of the hive with it, to defend it from the entrance of enemies of any kind which might eat their way through the ſhell of the hive. The antients who obſerved this lining of the hives, ſuppoſed that the bees uſed the *propolis* to faſten their combs to the hive; but later obſervation has proved this to be an erroneous opinion, the combs being always faſtened with lumps of wax only.

Beſides the uſes of the *propolis* already mentioned, there is another very ſingular one, which muſt by no means be paſſed over in ſilence: this is the embalming and preſerving, by means of it, certain bodies which they know not to diſpoſe of otherwiſe. Notwithſtanding the care that the bees take to guard the entrances of their hives, enemies of one kind or other will often get in: theſe uſually fare very ill; for the bees ſting is a weapon very capable of puniſhing ſuch an intruſion, and the ſwarm is ſo numerous, that it is not eaſy for the intruder to eſcape repeated wounds. When a creature of ſmall ſize has thus entered, and thus been killed for it, the bees with great care and pains carry him out; for they will bear no ſort of foulneſs in the hive. It ſometimes happens, however, that an unlucky ſnail, particularly of the large naked kind, crawls into the hive; in this caſe he never ceaſes crawling over the combs ſo long as he lives. It is no wonder that ſo cleanly creatures as the bees are highly enraged at this naſty viſiter: they ſoon ſurround and kill him with their ſtings; but then as he is a load too heavy to allow a poſſibility of their carrying him out, they prevent the miſchiefs attending the ſtinking of the carcaſe, by covering it over with a thick coat of this *propolis*, which perfectly well preſerves it from putrefaction. *Reaumur*'s Hiſt. Inſ. Vol. X. p. 84.

The common garden ſnail, with the ſhell, ſometimes alſo viſit theſe induſtrious and cleanly animals; and this creature they ſecure in a different manner, and that at the expence of only a very ſmall quantity of the *propolis*: but Reaumur had an opportunity of obſerving their method of deſtroying this enemy in a very accurate and eaſy manner, in one of his glaſs hives. The ſnail had entered the hive early in the morning, and after crawling about for ſome time, had fixed itſelf to one of the glaſs ſquares by the ſame glutinous matter by means of which it is frequently found fixed to old walls and trees; when the bees found their enemy thus fixed, they ſurrounded him, and in a few minutes formed a border of *propolis* round the verge of the mouth of the ſhell: this they continually added more and more to, till they had formed ſo thick a coat round it, that the ſnail could never move from the place again.

The ſnail is eaſily able to looſen the faſtening which it gives itſelf to any place, becauſe this is done by means of a gum, which water will diſſolve; therefore the firſt ſhower of rain, or the moiſture which the animal is able to ſecrete from its own body, releaſes it in this caſe; but the faſtening which the bees uſe to fix the ſhell to the glaſs being a reſin, this remains untouched by water, and muſt keep the animal fixed in its place till death, and even long afterwards.

It ſeems probable, that the bees are not over curious in the choice of the matter of the *propolis*; but that many vegetable reſins indifferently ſerve for this purpoſe: it has been tried, however, whether they would uſe common turpentine, and ſome other of the reſins in uſe among us, by laying them before their hives; but without ſucceſs. This is an experiment, however, that requires frequent repetition; ſince there are many ſeaſons at which the bee has no occaſion for this matter. *Reaumur*'s Hiſt. Inſ. Vol. X. p. 80.

PROPOMA, a name given by the antients to a potion prepared of honey and wine boiled together: the proportions were four parts of wine to one of honey.

PROPTOSIS, in ſurgery, a name by which ſome authors have called that diſtemperature of the eye commonly called a *prolapſus oculi*. *Heiſter*'s Surg. p. 427. See PROLAPSUS *oculi*.

PROSCHÆRETERIA, Προσχαιρήτηρια, in antiquity, a day of rejoicing, kept when a new-married wife went to cohabit with her huſband. *Potter*, Archæol. Grec. T. 1. p. 427.

PROSCLYSMA, a word uſed to expreſs an irroration, or ſprinkling of any part with a fluid, as the throwing water in the face in caſes of fainting, &c.

PROSECUTION. To make men liable to criminal *proſecutions* by the law of England, it is required that they have the uſe of reaſon, and that they be *ſui juris*. On the firſt account the law indulges infants under the age of diſcretion, ideots, and lunatics, whatever the nature of the fact may be; and even againſt the perſon of the king, as it has been held of late: neither will it ſuffer one who becomes *non compos*, after he has committed a capital offence, to be either arraigned or executed. See LUNATIC and INFANT, *Cycl.*

As to an offender's being *ſui juris*, it is to be obſerved, that neither a ſon, nor a ſervant, nor any other perſon, except a feme covert, is excuſed on the account of acting by command or coercion of another. *Hawk.* P. C. B. 1. c. 1. See the article FEME *covert*.

PROSERPINA, in botany, a name given by ſome authors to chamemile *Ger.* Emac. Ind. 2.

PROSEUCHE, in antiquity, properly ſignifies prayer; but it is taken for the places of prayer of the Jews, and was pretty near the ſame as their ſynagogues. But the ſynagogues were originally in the cities, and were covered places; whereas, for the moſt part, the *proſeuches* were out of the cities, and upon the banks of rivers, having no covering, except, perhaps, the ſhade of ſome trees, or ſome covered galleries. *Calmet.* Diction. Bibl.

The word is Greek, Προσευχη. petitio, precatio, oratio. Vid. *Hederic.* Lex. Man. Græc. in voc. Juv. Sat. 3 v. 296. In qua te quæro *proſeuchâ*.

PROSLAMBANOMENOS, in the antient Greek muſic, was the firſt note of their ſcale, whether aſcending or deſcending. Phil. Tranſ. N°. 481. p. 269.

It was uſual among the Greeks to conſider a deſcending as well as an aſcending ſcale; the former proceeding from acute to grave preciſely by the ſame intervals as the latter did from grave to acute. The not diſtinguiſhing theſe two ſcales has led ſeveral learned moderns to ſuppoſe, that the Greeks, in ſome centuries took the *proſlambanomenos* to be the loweſt note in their ſyſtem; and in other centuries to be the higheſt. But the truth of the matter is, that the *proſlambanomenos* was the loweſt or higheſt note, according as they conſidered the aſcending or deſcending ſcale [a]. The learned author of this remark [b], thinks this diſtinction of the aſcending or deſcending ſcales conducive to the variety and perfection of melody; but he ſays, he never met with above one piece of muſic, where the compoſer appeared to have any intelligence of that kind: and this piece was above 150 years old. [a Phil. Tranſ. ibid. b Dr. *Pepuſch*, ibid.]

The *proſlambanomenos* was one of thoſe ſounds which the antients called *ſtabiles*, from their remaining fixed throughout all the genera and ſpecies. Phil. Tranſ. N°. 481. p. 270.

PROSODIA, Προσοδια, in antiquity, a ſacred ſong, or hymn, ſung in honour of the gods. It differed from the *proſodia* with an omega, προσωδια, which was a ſong ſung in concert with ſome muſical inſtrument. Mem. Acad. Inſcript. Vol. 14. p. 352.

PROSTATES, Προσταλες, among the Athenians, was uſed to ſignify any patron to whoſe protection ſojourners in that city committed themſelves.

He was allowed to demand ſeveral ſervices of them, in which, if they failed, or neglected to chooſe a patron, an action was commenced againſt them before the polemarchus, and their goods were confiſcated. *Potter*, Archæol. Græc. l. 1. c. 10. T. 1. p. 56. See SOJOURNERS.

PROSTYPA, Προστυπα, in the ſculpture of the antients, images carved in ſuch a manner as to be only half raiſed above the ground, or plain, on which they were formed.

They ſeem to adhere to it, and have only one ſide expoſed to view. To *proſtypæ* is oppoſed *ectypa*. *Hoffm.* Lex. in voc. See ECTYPA.

PROTEA, in the Linnæan ſyſtem of botany, a genus of plants which takes in the lepidocarpodendron, and the hypophyllocarpodendron of Boerhaave.

The characters of this are, that the calyx is a common perianthium, containing ſeveral flowers; it is made up of ſeveral little leaves laid in a looſe manner over one another, and the inner ones very long, expanded, coloured, and remaining when the flowers are fallen. The flower is monopetalous, or made of one leaf, in form of a ſimple tube, divided at its ſummit into four ſegments, each as long as the tubular part, and all ſtrait, obtuſe, and bent backward. The ſtamina are four extremely ſhort filaments, inſerted on the ſegments of the flower, near its ſummit; the antheræ are laid cloſely on theſe. The germen of the piſtil is below the proper receptacle of the flower. The ſtyle is ſlender and very long, and the ſtigma ſimple. The fruit is one common large receptacle, which is flat and divided by hairy ſcales. The ſeeds are ſingle. *Linnæi* Gen. Plant. p. 22.

PROTELARII, among the Romans, were the poorer ſort of citizens, whoſe eſtate did not exceed fifteen hundred pieces of ſilver. They were diſtinguiſhed from thoſe who were worth little or nothing; theſe laſt being called *capite cenſi*. *Pitiſc.* in voc. See CAPITE *cenſi*.

PROTHESIS, Προθεσις, among the Greeks, the ceremony of laying the dead near the door till the time of their interment, with their feet outwards; on which account the Romans called them *poſiti*. *Hoſm.* Lex. in voc. See POSITI.

The word is derived from προτιθημι, *I expoſe to view*.

PROTIPULA, in natural hiſtory, a name given to a ſpecies of fly reſembling the tipula, or long-legs, in many reſpects; but differing in regard to the eſſential character, which, in the tipula, is the having two beards growing on the anterior part of the head, and occaſionally falling over the mouth, and cloſing its aperture; theſe the *protipula* wants. See the article TIPULA.

PROTOGALA, the term uſed by the antients for what we call *beeſtings*, the firſt milk of a cow or other animal after her having brought forth young.

PROTOMEDIA, in botany, a name given by ſome authors to the pimpinella or burnet. *Ger.* Emac. Ind. 2.

PROTOPASCHITÆ, Πρωτοπασχιται, in church hiſtory, Hereties, who after the manner of the Jews, celebrated the feaſt of Eaſter with unleavened bread. They were likewiſe called *Sabatiani*. *Hoffm.* Lex. univ. in voc. See SABATIANI.

PROTRUSORIS *ordo exterior*, in anatomy, a name given by Santorini to certain faſciculi of the great zygomatic muſcle, running under the fleſhy part of the lower lip. See the articles ZYGOMATICUS *major*, and LABIORUM *attollens*.

PROTRUSORIS *interior ordo*, in anatomy, a name given by Santorini to a muſcle of the face, called by Albinus *orbicularis oris*; and by Cowper and Douglaſs *conſtrictor labiorum* and *ſphincter labiorum*.

PROTRYGIA, Προτρυγεια, in antiquity, a feſtival in honour of Neptune, and of Bacchus, ſurnamed Προτρυγης, or Προτρυγαιος, απο της τρυγος, *i. e.* from new wine. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 427.

PROVER, *(Cycl.)* among jewellers, an inſtrument by which they examine the ſize and depth of diamonds. It is a ſpring in ſhape not unlike a pair of caliber compaſſes, kept at the proper diſtance by means of a ſpring. *Jeffreys* on diamonds, p. 18, and plate 6.

PROX, in natural hiſtory, a name given by Ariſtotle to the *cervus platyceros*, or broad-horned ſtag. The modern Greeks have called it *platonia*, and the interpreters of the oldeſt writers have rendered the word by *dama*; but this we are to underſtand as meant of the dama of our times, for the dama of the antients was our iſarus, or ſarrius, a kind of goat, whoſe ſkin affords us the true chamoy leather. This has no title to the name platonia, or the platyceros; nor is the creature that Ariſtotle deſcribes under the name *prox*, nor of the ſtag kind, as that certainly was.

PRUNELLA, or BRUNELLA, in botany, the name of a genus of plants, the characters of which are theſe: the flowers conſiſt of one leaf, which is of the labiated kind. The upper lip is galeated, and the lower is divided into three ſegments, the middle one being hollowed like a ſpoon. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower, and ſurrounded by four embryos, which afterwards become four ſeeds, ripening in an open capſule which was the cup of the flower.

To theſe characters it may be added, that the ſtamina have not that reſemblance of the os hyoides that thoſe of ſage, clary, and the reſt have; and that the flowers are always arranged in cloſe ſpikes. See Tab. 1. of Botany, Claſs 4.

The ſpecies of *prunella*, enumerated by Mr. Tournefort, are theſe: 1. The broad-leaved Italian *brunella*, with fleſh-coloured flowers. 2. The common blue-flowered *brunella*, with undivided leaves. 3. The common *brunella*, with undivided leaves and purple flowers. 4. The common *brunella*, with undivided leaves and white flowers. 5. The great flowered *brunella*, with blue flowers. 6 The great flowered *brunella*, with fleſh coloured flowers. 7. The great flowered *brunella*, with white flowers. 8. The greateſt Pyrenean *brunella*, with very large flowers. 9 The Portugal *prunella*, with a larger flower and ſpike. 10. The narrow-leaved, or hyſſop-leaved *brunella*. 11. The *brunella* with diſſected leaves. 12. The cut-leaved *brunella*, with white flowers. 13. The leaſt white-flowered cut-leaved *brunella*. 14. The cut-leaved *brunella*, with roſe-coloured flowers. *Tourn.* Inſt. p. 182.

PRUNUS, the *plum*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the roſaceous kind, being compoſed of ſeveral petals, arranged in a circular form. From the cup of the flower there ariſes a piſtil, which finally becomes a fruit of a roundiſh or oval figure. This is ſoft and fleſhy, and includes a ſtone pointed at each end, within which is the kernel. *Tourn.* Inſt. p. 622.

The ſpecies of *plum* enumerated by Mr. Tournefort, are theſe: 1. The double-flowered *plum* tree. 2. The *plum* with large, ſweet, bluiſh black fruit. 3. The *plum* with ſmall ſweet, bluiſh black fruit. 4. The *plum* with large fleſhy and ſoweriſh fruit. 5. The *plum* with oblong blue fruit. 6. The *plum* with hard black fruit. 7. The *plum* with very large bluiſh-red, ſweet, and ſugar-like fruit. 8. The *plum* with the large, bluiſh red, late ripening fruit, called by the French the *imperatrice*. 9. The *plum* with large, oval, red fruit, called the *red imperial plum*. 10. The *plum* with a large, oval, yellow fruit, called ſimply the *imperial plum*. 11. The *plum* with a very large, oval, yellow fruit. 12. The wax-coloured *plum*. 13. The *plum* with large, round, red fruit. 14. The *plum* with a large, round, yellow, ſweet-taſted fruit. 15. The almond *plum*. 16. The *plum* with oblong, white, acid fruit. 17. The ſweet-taſted Brignole *plum*. 18. The *plum* with a remarkably red and ſweet fruit. 19 The *plum* with large, round, blackiſh, and very ſweet fruit. 20. The *plum* with ſmall, round, blackiſh, and very ſweet fruit. 21. The *plum* with a ſmall auſtere fruit. 22. The *plum* with ſmall and early ripe fruit. 23. The *plum* with ſmall, yellowiſh green fruit. 24. The common wild *plum*. 25. The tall,

early

early ripe, wild *plum*. 26. The wild *plum*, with large white fruit. 27. The wild *plum*, with red, harſh, and unpleaſant fruit, called in England the *hedge-plum*, or *horſe-plum*. *Tourn.* Inſt. p. 612. See PLUM.

PRUSSIAN *blue*. In a paper of Dr. Woodward's, communicated to the royal ſociety from another hand, there is given a ſhort way of making the *Pruſſian blue*, which when tried over again by Mr. Brown the chemiſt, was found to anſwer perfectly well; and gave hints and occaſions to ſeveral experiments which gave great light into the true nature of the bodies uſed in that preparation.

The method was this: four ounces of blood dried, and four ounces of ſalt of tartar were calcined together; two hours after which, a black ſpungy ſubſtance remained in the crucible, weighing four ounces; a ſolution of which being made in rain water, and afterwards filtered, left a remainder which when dried weighed nine drachms. An ounce of Engliſh vitriol was diſſolved in ſix ounces of rain water, and eight ounces of crude alum in two quarts of water. Theſe being mixed hot with the blood, became green; and on adding two or three ounces of ſpirit of ſalt, they became of a fine blue, which will ſubſide, and leave the water clear at top. Mr. Brown found the proceſs exactly anſwer, and the product was an ounce of a very fine colour, and perfectly fit for the painter's uſe.

Among the ſeveral experiments which were made by mixing, in different manners and proportions, the ſeveral liquors of which this colour was to be prepared, all produced a blue; but that in different degrees, ſome being deeper, and others much paler. In one experiment the alum was wholly left out, and a very pale blue was produced; in another, the alum and vitriol were uſed in equal quantities, and then the product was an extremely deep blue.

Upon the whole, the preſcription ſeems given after repeated trials, and appears to be that very combination of the ſeveral ingredients, which muſt give the very fineſt colour they are capable of giving.

It would be curious to know what gave the firſt hint for the production of ſo fine a colour from a combination of ſuch materials, eſpecially when we come to conſider, that the blood has the principal ſhare in this ſurpriſing change. Blood of any kind, or fleſh of any kind, would produce the ſame effects; but it is probable that fleſh would not yield ſo ſtrong or fine a colour. Beef has been tried, and found to yield a *blue*, but not ſo fine as the blood. Phil. Tranſ. N°. 381. p. 17.

The ſolution of alum, mixed with that of vitriol, produces no change of colour. If to theſe the ſpirit of ſalt is added, there is ſtill no change; but as ſoon as ever the blood is added, the blue is produced. If inſtead of the lixivium with blood, there be added to theſe ingredients, a lixivium with ſalt of tartar only, there follows a precipitation, indeed, but of no colour; and when the ſpirit of ſalt is added to this, it clears up, and the precipitation is received again into the liquor.

The very ſame effect will follow if any volatile alkaline ſpirit is made uſe of as a precipitant, or any volatile ſalt diſſolved in water; nor can the blood itſelf be ſuppoſed to communicate this change from any ſuch properties, the heat of the fire it undergoes in calcination being ſufficient to drive them off. In the calcination of the dried blood and ſalt of tartar it was obſerved, that there was a loſs of juſt one half. It is difficult to determine with certainty, what quantity of either was loſt in this operation; but it will eaſily be granted, that a much greater quantity of blood was loſt than of the ſalt: and this is confirmed by experiment; for the ſame quantity of ſalt of tartar, calcined alone in the ſame heat, has been found to loſe only one eighth part; whereas, when dried blood was calcined by itſelf, it loſt more than ſix eighths. It appears that the blood in calcination parts with its tinging quality to the ſalt, or that quality is extracted from it by the ſalt, and paſſes with it in its diſſolution with the boiling water.

To prove this, ſome dried blood was calcined alone, and a ſtrong decoction of it made in water, and afterwards filtered: this, when mixed with the former ſolutions, produced little or no alteration; and on the addition of the ſpirit of ſalt, the whole became of an amber colour, without any precipitation. When this, mixed with oleum tartari, was added to the former ſolutions, it cauſed a precipitation, but no colour; and the ſpirit of ſalt being added to the liquor, made it clear again; but of no other colour than the amber tinge it had before.

The change of colour is not effected in any of the materials, except in that of the ſolution of the vitriol; ſo that the alum ſeems only to be of uſe in fixing the colour, as it is often uſed by dyers to that purpoſe: and the ſpiritus ſalis gives it a deeper dye; for if the lixivium with blood be poured to a ſolution of alum alone, there will fall a ſediment a little inclining to the purple; which on adding ſome ſpirit of ſalt, changes to a brown. Much the ſame changes will alſo be produced if you pour the ſpiritus ſalis to the lixivium; but not the leaſt appearance of *blue*: but when the lixivium is poured to a ſolution of vitriol, there is immediately a deep *blue* produced, and this is ſtill heightened by the ſpirit of ſalt.

In all the recipes which have been given for making the *Pruſſian blue*, the liquors are ordered to be mixed together boiling hot, except the ſpirit of ſalt; and experience ſhews, that the colour is moſt readily and beautifully made that way: but in experiments made with all the liquors cold, the colours have been very well produced, only in leſs beauty; and they have required waſhing ſeveral times in freſh water, to bring them to their beauty.

If after the lixivium has precipitated the *blue* colour, on mixing with the ſolutions of alum and vitriol, a little more of the blood lixivium be added afterwards, the whole loſes its *blue*, and becomes brown; but on adding ſome more ſpirit of ſalt, the matter becomes of a fine *blue* again.

As it appears from ſome of the before mentioned experiments, that the ſolution of vitriol is the only thing which makes the colour with the blood; and as this vitriol is no other than iron diſſolved by a liquor running from the pyrites when long expoſed to the weather, it ſhould ſeem that the iron was the only ſubſtance that really produced the colour: and experiments confirm this to be the caſe. Phil. Tranſ. N°. 381. p. 20. See the article BLOOD.

PRYTANITIDES, in antiquity, a name given to thoſe widows who at Athens, and throughout all Greece, had the ſacred fire of Veſta committed to their care. The cuſtom of the Greeks, in this reſpect, differed very much from that of the Romans; who allowed none but virgins to tend this ſacred fire, whence they were called *veſtals*. See VESTALS, *Cycl.* They had the appellation of *prytanitides* from Πρυτανειον, a name common to all places ſacred to Veſta. *Hoffm.* Lex. univ. in voc.

PSALMIST, in the church of Rome, one of the leſſer eccleſiaſtical order, the ſame with what among us is called *clerk*, *precentor*, or *ſinger*. *Hoffm.* Lex. in voc.

PSEGMA, a name given by ſome of the antients to the flos æris, or flowers of braſs.

PSELAPHIA, a word uſed by the antient medical writers to expreſs friction with the hands, in caſes where the diſtempered parts required it. This was always eſteemed a part of the buſineſs of a phyſician, and was done with his own hand.

PSEN, Ψην, the name given by naturaliſts to the fig-gnat, a ſmall ſpecies of gnat bred in figs while growing on the tree, and always remaining on the leaves of the ſame tree, and feeding on its juices. See CAPRIFICATION.

PSEPHISMA, Ψηφισμα, among the Athenians, a decree of the ſenate; the ſame with *probuleuma*. See PROBULEUMA.

PSEPHOMANTIA, Ψηφομαντεια, in antiquity, a ſpecies of divination, the ſame with *cleromancy*. See CLEROMANCY, *Cycl.*

PSEPHOPHORIA, in antiquity, the art of uſing the *pſephi*, Ψηφοι, or counters. This was the firſt arithmetic taught children of every condition. Capitolinus, in his life of Pertinax, ſays, *Puer literis elementariis & calculo imbutus.* Thoſe who taught this art were called *calculones*, if ſlaves, or lately made free; but thoſe of better condition were called *calculatores* and *numerarii*. Every family, anywiſe conſiderable, had one of theſe maſters, the title of whoſe charge was *a calculis*, *a rationibus*. See the next article.

PSEPHOS, Ψηφος, in antiquity, a name given to ſeveral things, as ſmall ſtones, ſhells, and beans, uſed among the Greeks in giving their ſuffrages, and in their computations. Their origin is, by Mr. Mahudel, aſcribed to the ſons of Noah, who uſed this kind of calculation to aſſiſt their memory in numbering their flocks. Joſephus aſſures us, that the Egyptians borrowed this method of counting from Abraham; and Herodotus relates, that theſe ſmall ſtones were uſed both by the Egyptians and Greeks, only with this difference, that the latter placed them and cyphers from left to right, and the former from the right to the left. The art of uſing them in calculations was called *pſephophoria*. See PSEPHOPHORIA.

Pſephi were in uſe too among the Romans, who called them *calculi*. Whatever materials they conſiſted of, they were all of the ſame colour when uſed in calculations; whereas thoſe uſed in giving ſuffrages were partly black and partly white. Lucky days were denoted by white, and unlucky by black ones. In paſſing of laws, there were characters engraved on them, as V. R. i. e. *uti rogas*; and A. i. e. *antiquo*. Thoſe marked with V. R. approved, and thoſe with A. rejected the law in queſtion. Judges made uſe of calculi marked with the letter A. i. e. *abſolvo*, when they abſolved the accuſed perſon; but if they were for condemning him, they uſed ſuch as were marked with the letter C. i. e. *condemno*: and if the evidence for and againſt the accuſed perſon was equal, ſo that they could neither condemn nor abſolve him, they made uſe of calculi marked with N. L. i. e. *non liquet*. There was another kind of calculi uſed at public games, which were marked with figures: thus, if there were twenty athletæ ready to engage, they threw into a ſilver urn twenty calculi, every two of which were marked with the ſame figures, from 1 to 10. Then upon drawing, thoſe who got the ſame numbers were obliged to engage together; on which account they were called *calculi athletici*.

The Greeks and antient Romans made uſe of very ſimple materials for their calculi, ſuch as ſmall ſtones, ſhells, and beans; and even in the time of the firſt Roman emperors, it was thought a piece of luxury to uſe any of ivory. It is queſtioned whether the Romans ever uſed any of ſilver or gold; becauſe the

the paſſage of Petronius, which is the only one that can be alledged for their having done ſo, may be underſtood of the current coin or money, which Trimalcio, in the time of Nero, employed for calculi, *notari rem omnium delicatiſſimam, pro calculis albis aut nigris, aureos argenteoſque habebat denarios*. If this is the true meaning of the author, the firſt gold and ſilver calculi muſt have been made in France, in the fourteenth century, under Charles VIIth. whoſe name, together with the arms of France, is found inſcribed on the oldeſt ſilver counters in that king's cabinet.

PSETA, in ichthyology, a name given by Athenæus to the fiſh we call the *plaiſe*, the *paſſer lævis* and *plateſſa* of authors. See the articles PASSER and PLEURONECTES.

PSETITES, in natural hiſtory, a name given by authors to a ſtone, having in it the figure of a turbot. There are ſtones found in ſome parts of Germany having the impreſſions of ſeveral kinds of fiſh as perfect as if drawn by a pencil, and it is not to be doubted, but that they in reality owe them to the fiſh themſelves; which at ſome time, perhaps while the earth was overflowed at the univerſal deluge, were received into beds of the matter of ſtone, yet unhardened, which taking its conſiſtence while they were in it, muſt cruſh them, and retain the marks of their bodies. They are uſually found in a whitiſh flaty ſtone.

PSEUDO-ACACIA, *baſtard acacia*, in botany, the name of a genus of trees, the characters of which are theſe: the flower is of the papilionaceous kind, and from its cup there ariſes a piſtil, ſurrounded by a fimbriated membrane. This finally becomes a flat pod, which burſts into two parts, and contains kidney-ſhaped ſeeds. To this it is to be added, that the leaves are placed in ſeries over againſt one another, on a middle rib, the end of which is terminated by a pod leaf.

The ſpecies of *pſeudo-acacia*, enumerated by Mr. Tournefort, are theſe: 1. The common prickly *pſeudo-acacia*, called the *common acacia*, and by ſome the *lotus tree*. 2. The broad-leaved American *pſeudo-acacia*, with roſe-coloured flowers. And, 3. The aſh-leaved American *pſeudo-acacia*, with violet-coloured flowers. *Tourn.* Inſt. p. 649.

PSEUDO-APIOS, in botany, a name given by ſome authors to the roots of the *bulbocaſtanum*, or earth-nut.

The peaſants in Burgundy, and other parts of France, turn up theſe in great quantities with the plough, and eat them. They call them *arnottas*, and ſome of the writers of the adjacent places, not diſtinguiſhing what they truly were, have avoided the common name, by giving them this of *pſeudo-apios*, formed of the name of a root to which they have no alliance, and taking away a name by which they would have been much better known; *arnotta* being only a corruption of the Dutch name *ertnote*, or earth-nut, a name by which they are called almoſt every where.

PSEUDO-ARGYRON, in mineralogy, a word uſed by the antients in two very different ſenſes; ſome make it the name of what Virgil calls *orichalcum album*, white braſs; and others of a mineral with which the common braſs was made.

It is very evident, from the joint teſtimony of the old Greeks and Romans both, that they had in uſe a kind of white metal made of copper, and they eſteemed it greatly above the yellow, or braſs.

Ariſtotle tells us of this white metal, and gives it great encomiums; he ſays, it was very white and very bright; and that it was made by melting copper together with a certain earth: but this he does not deſcribe, ſo that we are left in the dark as to what it was.

This ſhining white metal might very naturally be called *pſeudo-argyron*, or baſtard-ſilver; but beſide this, there is another native mineral ſubſtance, called by the ſame name by Strabo and others: and this is ſaid by Strabo to be uſed in making copper into braſs. Many authors have been much perplexed in endeavouring to make out what this latter kind of *pſeudo-argyrum* was; ſome have ſuppoſed it the molybdæna, others ſome of the brighter lead-ores, and others the micæ argenteæ, or ſilvery talcs, and ſome the ſilvery mundicks: all theſe might in ſome degree anſwer to the name, as to their outward appearance, but they could none of them have the effect of turning copper into braſs.

We are to look for ſomething that will do this firſt, and then find the reſemblance in the colour to ſilver. We well know, that nothing will turn copper yellow but calamine, which is the ore of zink, or zink itſelf. Zink is a metal that comes neareſt the appearance of ſilver of any other, and is ſometimes found native, and in its proper form. If any of the mines wrought by the antients afforded this native metal, there is no doubt but it was the thing called *pſeudo-argyros*, its colour and qualities all anſwering to the name; but if not, it is probable that no more was meant by the name than the common calamine found in their ſilver mines.

Many of the ores of ſilver are found to be very like the common calamine, and in the ſame mines one might be taken for the other at firſt ſight: this reſemblance might very naturally lead people to call the calamine found there *pſeudo-argyros*, or baſtard-ſilver; and the properties of this being the ſame with thoſe of all other calamine, it cannot but anſwer in the ſame manner in making braſs.

PSEUDO-CARPASUM, in botany, a name given by ſome authors to the plant called by the generality of writers *libanotis*.

This is a plant of a very ſtrong ſmell; and the *carpaſum*, or *carpaſium* of the antients, being a poiſonous gum, and the ſmell of the libanotis approaching to the ſame odour, occaſioned its being called the *baſtard-carpaſum*.

PSEUDO-DICTAMNUS, *baſtard-dittany*, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts of one leaf, and is of the labiated kind. The upper lip is of an arched form, and uſually is bifid; and the lower is divided into three ſegments. The cup is of the ſhape of a funnel, and from it there ariſes a piſtil, which is fixed in the manner of a nail to the hinder part of the flower. The four embryos which ſurround this afterwards become four oblong ſeeds, which ripen in the funnel-faſhioned caſe, which was the cup of the flower.

The ſpecies of *pſeudodictamnus*, enumerated by Mr. Tournefort, are theſe: 1. The *pſeudodictamnus*, with cups like thoſe of Molucca. 2. The *pſeudodictamnus*, with curled and wrinkled leaves. 3. The Spaniſh *pſeudodictamnus*, with very large, hoary, and whitiſh leaves. 4. The Spaniſh *pſeudodictamnus*, with very large, hairy, and blackiſh leaves. 5. The Spaniſh *pſeudodictamnus*, with fig-wort-like leaves. 6. The ſcentleſs, verticillated *pſeudodictamnus*. 7. The ſmaller, alpine, verticillated *pſeudodictamnus*. And, 8. The ground ivy-leaved African *pſeudodictamnus*. *Tourn.* Inſt. p. 188.

PSEUDOGELSEMINUM, in botany, a name given by Rivinus to a genus of plants, the ſame with the *bignonia* of authors. *Rivin.* 1. 151.

PSEUDO-*ipecacuanha*, in botany, the name by which ſome authors have called a poiſonous kind of American apocynum, the root of which ſomething reſembles the true *ipecacuanha*, and has ſometimes been unfortunately collected and uſed in its place. *Dale*, Pharm. p. 178.

PSEUDO-*pulex arboreus*, in natural hiſtory, the name of a genus of inſects deſcribed by Mr. Reaumur, and ſomewhat approaching in their form to the *pulex aboreus*; but having their wings covered with a ſquammoſe caſe, which thoſe creatures have not, and having broader and flatter bodies.

Theſe principally live upon the fig-tree and the box; they paſs through a ſort of metamorphoſis into a hopping fly, ſuppoſed by ſome of the nature of a graſs-hopper; but erroneouſly, for that animal has a caſe for its wings, and the other not.

It has not yet been determined by obſervation, whether theſe creatures are oviparous, as moſt other of the known winged inſects, or viviparous, as the *pulex arboreus*. That ſpecies which lives upon the box throws out a ſort of glutinous matter from the anus, with which it faſtens the leaf when curled up: this curled leaf, on being opened, always diſcovers the animal, with a long train of connected globules dragging after it, and forming, as it were, a ſort of tail; but when examined more carefully, this is found only to be a train of excrements ſticking together by means of their glutinous quality, and of a ſweet taſte, like that of manna. Theſe, like the others, are at length changed into a ſort of fly, remarkable for its manner of hopping, like the flea. *Reaumur*'s Hiſt. Inſt. T. 1.

PSEUDO-*ſaliva*, in botany, a name by which ſome authors call the *phlomis*.

PSEUDO-*ſantalum*, *baſtard-ſaunders*, a name given by ſome botanical writers to the *lignum Braſilianum*, or Braſil wood. *C. Bauhin.* Pin. p. 393.

PSEUDO-*ſenna*, *baſtard-ſena*, in botany, a name uſed by ſome authors for the common *colutea veſicarica*. It is called alſo by ſome *ſena pauperum*. *Boerhaave*, p. 468.

PSEUDO *theca*, in natural hiſtory, the name of a ſpecies of two-winged fly, approaching to the nature of the common waſp, but having no ſting. It has a blackiſh head, with two ſhort antennæ, or horns; large, black, reticulated eyes; a long forked mouth, and prominent ſhoulders. The body is long and ſlender, and conſiſts of many joints. The legs are rough and hairy. It is found about dirty ditches, being bred of a water-worm that loves muddy places.

This is, according to the later diſtinctions in the hiſtory of inſects, properly called a *waſp-fly*. There are bee-flies, as much reſembling the bees as this does the waſp.

PSEUDO-*tinea*, in natural hiſtory, the name of a very remarkable ſpecies of inſect deſcribed by Mr. Reamur, approaching to the nature of the *tinea*, or cloaths-moth, while in the worm-ſtate; but not making themſelves coats of the ſubſtance of leaves, cloath, &c. tho' they form a ſort of caſes for their defence againſt a very terrible enemy.

Theſe creatures are truly of the caterpillar kind, and have, in the manner of any of theſe inſects, ſixteen legs. They feed on wax, and for food enter the bee-hives; where they boldly engage the bees, and are not to be prevented by them from feeding, tho' at the expence of their habitations and the cells of their reſervoirs of honey: ſo that it is no uncommon thing for a ſwarm of bees to be forced to change their place of habitation, and make new combs elſewhere; leaving the old ones to this contemptible victor, whom they know not how to drive out or diſpoſſeſs.

Virgil and Ariſtotle, and all the authors who have written on bees, have complained of this deſtructive animal. It never

eats the honey, but feeds only on the wax; attacking principally thoſe waxy cells where the female bee depoſits her eggs for the future progeny.

The bees, who are a match for moſt other creatures, by means of their ſtings, would eaſily deſtroy theſe weak creatures, were it not for the impervious armour they are covered with. They form themſelves a coat of armour of a double matter; the firſt, which immediately covers the body, is of a kind of ſilk of their own ſpinning; and the outer covering over this is of the bees wax: this is laid conſiderably thick, and the creature juſt thruſting out its head to feed, goes on devouring the cells undiſturbed, while a whole army of the inhabitants are in vain buzzing about him, and attempting to pierce him with their ſtings. He never forſakes his covering, but lengthens and enlarges it as he goes; and gnawing down the ſides of the cells in his march, without ſtaying to eat them one by one, the havock and deſtruction he occaſions are ſcarce to be conceived. When the time of the change of this creature approaches, it contracts its body within its double covering, and there changes into the nymph ſtate; whence, after a proper time, it comes forth in form of a moth, with granulated horns and a crooked proboſcis.

The bees have cunning enough to know their deſtructive enemy in this new form, and as this is a weak and defenceleſs ſtate, they attack and deſtroy all the moths of this ſpecies they can meet with. They ſeldom are ſo fortunate, however, as to kill the whole race as ſoon as produced; and if only one eſcapes, it is able to lay a foundation of revenge for the death of its brethren. All the flies of the moth kind lay a vaſt number of eggs, and this is behind-hand with none of them in that particular: the young ones produced from the eggs of one ſurviving female of this ſpecies, are ſufficient to deſtroy many honey-combs; nay, many hives of them. The moth produced by this caterpillar flies but little, yet is very nimble in avoiding danger by running, which it does with great ſwiftneſs.

There are a ſpecies of theſe *pſeud-tineæ*, or wax-eating caterpillars, which infeſt the ſubterranean hives of waſps, and other creatures which make wax: the manner of living, feeding, and defending themſelves from their enemies, is the ſame in all theſe ſpecies. Theſe laſt, if they are at any time diſtreſſed for food, will eat their own dung; the wax having paſſed almoſt unaltered through their bodies, and being ſtill wax, and capable of affording them more nouriſhment on a ſecond digeſtion. Theſe ſpecies, tho' they naturally live on this ſoft food, yet if by any accident they meet with harder only, they know how to live upon it; and can eat a way into the covers and leaves of books, and make themſelves caſes and coverings of the fragments of theſe ſubſtances. The accurate author of theſe obſervations deſcribes alſo a kind of *pſeudo-tineæ* which feed on wool, and another that eats leather; both making themſelves houſes alſo on the materials they feed on.

There is alſo another kind, very deſtructive of corn: theſe make themſelves a covering by faſtening together a great number of the grains, and there living and eating in ſecret. All theſe creatures, whatever be their food or habitation, finally become *phalenæ*, or moths; and may be diſtinguiſhed, even in this ſtate, from the other ſpecies, by having granulated horns of a remarkable ſtructure, and all of them a proboſcis, or trunk, more or leſs incurvated. *Reaumur*'s Hiſt. Inſ. T. 1.

PSIDIUM, in botany, the name by which Linnæus calls a genus of plants, named *guajava* by Tournefort and others. *Linnæi* Gen. Pl. p. 211. See GUAJAVA.

PSILOCITHARISTA, among the antients, one who plays on the cithara, without ſinging in concert to it. *Pitiſc.* Lex. Ant. in voc.

PSITTACUS, the *parrot*, in the Linnæan ſyſtem of zoology, makes a particular and diſtinct genus of birds, of the order of the hawks; the diſtinguiſhing characters of which are, that the feet have two toes before and two behind. *Linnæi* Syſt. Natur. p. 44.

The *parrot* is a very well-known bird, of which there are ſeveral very beautiful ſpecies.

Its head is large, and beek and ſkull extremely hard and ſtrong. It might ſeem a wonder why nature has deſtined to this, which is not naturally a bird of prey, but feeds on fruits and vegetable ſubſtances, the crooked beak allotted to the hawk and other carnivorous birds; but the reaſon ſeems to be, that the *parrot*'s being a heavy bird, and its legs not very fit for ſervice, it climbs up and down trees by the help of this ſharp and hooked bill, with which it lays hold of any thing and ſecures itſelf, before it ſtirs a foot; and beſides this, it helps itſelf forward very much, by pulling its body on with this hold.

Of all animals, the *parrot* and crocodile are the only ones which move the upper jaw; all creatures elſe moving the lower only. As ſome particular animals beſide are fond of particular foods, ſo the *parrot* loves nothing ſo much as the ſeeds of the carthamus, or baſtard-ſaffron; and eats them without any hurt, tho' they are a purge when given to other creatures.

The *parrots* are common both in the Eaſt and Weſt Indies: they are a very briſk and lively bird in the warmer countries; but with us loſe much of their vigour. They lay two or three eggs in the hollow of a tree.

In all the known *parrots* the noſtrils are round and placed very high upon the beak, and very near one another.

Parrots are divided into three kinds: 1. The larger, which are as big as a moderate fowl, called *macaos* and *cocketoons*; theſe have very long tails. 2. The middle ſized ones, commonly called *parrots*, which have ſhort tails, and are a little larger than a pigeon. And, 3. The ſmall ones, which are called *paroquets*, and have long tails, and are not larger than a lark or blackbird. *Ray*'s Ornithol. p. 72.

PSOAS *(Cycl.)*—PSOAS *major*, called alſo *lumbaris internus*, a long and thick muſcle, ſituated on the abdomen, on the *lumbar* region, adhering to the vertebræ of the loins, from the poſterior part of the os ilium to the anterior part near the thigh.

It is fixed above to the laſt vertebræ of the back, and to all thoſe of the loins; that is, to the lateral parts of the bodies of theſe vertebræ, and to the roots of their tranſverſe apophyſes. The inſertions in the bodies of the vertebræ are by a kind of digitations, and are very little tendinous: from thence the muſcle runs down laterally over the os ilium, on one ſide of the iliac muſcle; and paſſes over the ligamentum Fallopii, between the anterior inferior ſpine of the os ilium, and that eminence which, from its ſituation, may be called *iliopectinea*. Before it goes out of the abdomen it unites with the iliacus, and afterwards covers the foreſide of the head of the os femoris. It is ſometimes accompanied by a ſmall muſcle, called *pſoas parvus*. *Winſlow*'s Anatomy, p 204.

PSOAS *parvus*, a long ſlender muſcle lying upon the *pſoas major*: it is ſometimes wanting; but tho' ſome have imagined it wanting in one ſex more than the other, the conjecture ſeems without foundation. It is fixed above by a ſhort tendon, ſometimes to the laſt tranſverſe apophyſis of the back, or higher; ſometimes to the firſt of the loins, and ſometimes to both: from thence it runs down wholly fleſhy, and more or leſs complex on the great *pſoas*, in a direction a little oblique; and having reached the middle of the regio lumbaris, it forms a ſlender flat tendon, which gradually increaſing in breadth like a thin aponeuroſis, runs over the *pſoas major*, and *iliacus internus* at their union; and from thence down to the ſymphyſis of the os pubis and os ilium, and is inſerted chiefly in the criſta of the os pubis, above the inſertion of the pectinæus. *Winſlow*'s Anatomy, p. 250.

Beſide this *pſoas parvus*, there is another, ſtill ſmaller, between it and the vertebræ.

PSORA, *(Cycl.)* in botany, a name by which Aëtius and ſeveral others of the later Greek writers have called the *pſorice* of the antient Greeks, that is, the *ſcabioſa* of the Latins, and our common ſcabious. It has been ſuppoſed by ſome, that the antient Greeks were not acquainted with our ſcabious; but that is an erroneous opinion, both the deſcription and virtues of the pſorice being the ſame with thoſe of the ſcabious. See PSORICE.

PSORALIA, in botany, the name of a genus of plants of the leguminous kind, the characters of which are theſe: the perianthium is one-leaved, and is dotted with a ſort of tubercles, and is divided into five acute ſegments, the under one being twice as long as any of the others. The flower is of the papilionaceous kind, and is compoſed of five petals. The vexillum is roundiſh, emarginated, and riſes upwards. The alæ are lunulated, obtuſe and ſmall. The carina is dipetalous, lunulated, and obtuſe. The ſtamina are diadelphous filaments, and the antheræ are roundiſh. The germen of the piſtil is ſlender. The ſtile is pointed, and of the length of the ſtamina. The ſtigma is obtuſe. The fruit is a pod of the length of the cup; it is of a compreſſed figure and pointed. The ſeed is ſingle and kidney-ſhaped. It is very ſingular in this plant, that the cup is always dotted with tubercles, and the petals of the flowers are full of coloured veins. *Linnæi* Gen. Pl. p. 358. *Ray*'s Lugd. p. 372.

PSORAS, in zoology, a name by which ſome authors have called a fiſh of the turdus kind, remarkable for the variety and beauty of its ſpots, and more uſually known by the name *lepros*. *Willughby*'s Hiſt. Piſc. p. 320. See LEPROS.

PSORIASIS, a peculiar ſpecies of itch affecting the ſcrotum.

PSORICE, or PSORICE-*poa*, a name given by the botanical writers among the antient Greeks to the plant we call *ſcabioſa*, or *ſcabious*.

They have ſo well deſcribed this plant, that there is no room to doubt its being our ſcabious; and they have attributed the ſame virtues to it, and given it in the ſame diſtempers that we do. Yet ſome botaniſts of the later ages, having overlooked their deſcriptions of the *pſorice*, have ſuppoſed that our ſcabious was wholly unknown to the antients: and others have thought that the ſtæbe of thoſe writers was this plant. But this is as erroneous as the former opinion, for the ſtæbe of the antient Greeks was the name of the phleos, a kind of marſhy gnaphalium, or cudweed; and with ſome, the name of the pheos or hippopheos, called by Dioſcorides *hippophaes*, a prickly ſhrub, growing on the ſandy ſhores of the iſland of Crete, and uſed by the fullers in dreſſing their cloths.

Pelagonius recommends the herb *pſorice*, among ſeveral other known antiſcorbutics, in a compound medicine, intended for the itch, or any other virulent eruption. Aëtius preſcribes the ſame plant under the name of *pſora*, and the modern Greeks call it *campiuſa* or *ſcampiuſa*; a name which, tho'

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Fuchſius confeſſes he does not underſtand, yet is plainly no other than a barbarous term formed by theſe Grecians on the word ſcabioſa, the Latin name of the plant.

The change between ſcabioſa and ſcampiuſa is ſcarce any thing, for the common cuſtom of the Greeks of theſe times, was to change the Roman b into mp, in the words which they adopted from that language. *Pelagonius*, c. 300.

PSOROPHTHALMIA, *(Cycl.)* a name given by the antients to a ſcorbutic diſorder of the eye-lids, very troubleſome to the patient, and cured with difficulty.

PSUCHAGOGICA, a word uſed by the antients to expreſs ſuch medicines as were uſed in apoplexies and faintings, to recal life.

PSUCHROTROPHON, in the materia medica of the antients, a name given to a plant often recommended, but not perfectly underſtood as to what ſpecies it means. It is the ſame plant called *ceſtrum* by the Greeks, and has this firſt name only becauſe of its growing in moiſt places; the word being formed of the Greek Ψυχρος, moiſt, and τρεφω, to nouriſh or cauſe to grow.

Dioſcorides has opened a way to great perplexity, by ſaying that this is the plant which the Romans in his time called the *betonica*, or *ſerratula*, and ſometimes *roſmarinus*. The Romans ſeem from this to have been at that time very indeterminate in their names; but by the deſcription it appears clearly, that the roſemary which we know by that name, could not be meant; and the queſtion lying wholly between the betony and ſerratula, is decided in favour of the latter by the deſcription, which, as it ſtands in Dioſcorides, gives the plant the leaves of the oak. This may ſeem at firſt ſight not to make much in favour of the ſerratula; but the reſemblance is explained, as this author expreſly does, to conſiſt only in their being very deeply ſinuated, and finely notched, or ſerrated, all round. The ſerratula of our times ſeems plainly meant as the plant. So that this plant we are to obſerve, is the ceſtrum and *pſeuchrotrophon* of the Greeks, and the betonica, or vettonica, as well as the ſerrata of the Romans; and is ſometimes called *roſmarinus*. Apuleius ſeems to perplex the whole affair in a ſtrange manner, by ſaying, the betonica has leaves like the docks, and very large; but we are to obſerve, that he miſtakes the betonica and britannica for the ſame plant, and ſays, that the betonica, or britannica, was called *ceſtrum*, &c. by the Greeks. The reaſon of his ſaying the leaves are like thoſe of the dock, is eaſily ſeen after this; for Dioſcorides ſays ſo of the britannica, and that very juſtly; it being only the common great water-dock, or hydrolapathum. Pliny has ſomewhere run into the ſame error, of giving leaves like the dock to the betonica; but the ſource of his error is plainly the ſame. We may obſerve from this, however, that very little dependence can be had on the accounts theſe authors give us of plants.

PSYCHROLUSIA, a word uſed by medical writers to expreſs cold bathing.

PSYCTICA, a term uſed by medical writers to expreſs cooling remedies.

PSYDRACIA, a term uſed by medical writers to expreſs ſmall tubercles on the head, which reſemble puſtules, and after a little time corrode and eat through the ſkin.

PSYGMATA, a name given by phyſicians to all refrigerating medicines, external and internal.

PSYLLIUM, *fleawort*, in botany, the name of a genus of plants, the flowers and fruit of which are like thoſe of the plantain's, but the ſtalks are ramoſe and foliaceous.

The ſpecies of *pſyllium*, enumerated by authors, are theſe: 1. The *pſyllium* of Dioſcorides, or Indian *pſyllium*, with jagged leaves. 2. The great upright *pſyllium*. 3. The larger procumbent *pſyllium*. 4. The leſſer *pſyllium* of Caſpar Bauhine. *Tourn.* Inſt. Bot. p. 128.

The ſeeds of *pſyllium* are recommended by many in jaundices and dyſenteries; but the preſent practice receives it only as a mucilaginous ſeed.

PSYLON, in ichthyology, a name given by Ariſtotle, and many other of the old Greek writers, to the tench, or cyprinus niger. See CYPRINUS and TINCA.

PTARMICA, *ſneezewort*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the radiated kind, the diſk being compoſed of floſcules, and the outer circle of ſemi-floſcules; theſe are placed upon the embryo-ſeeds, and are contained in a ſquammoſe cup. The embryos afterwards become ſlender ſeeds. To this it is to be added, that the leaves are either only denticulated at the edges, or elſe divided into large broad ſegments, wholly different at firſt inſpection from the leaves of yarrow.

The ſpecies of *ptarmica*, enumerated by Mr. Tournefort, are theſe: 1. The common *ptarmica*, with long ſerrated leaves and white flowers. 2. The common *ptarmica*, with double flowers. 3. The Alpine *ptarmica*, with leaves partly whole, and partly ſerrated. 4. The low dwarf *ptarmica*, with leaves divided in the manner of thoſe of wormwood. 5. The Cretric ſhrubby *ptarmica*, with the appearance of the ſantolina. 6. The purple-flowered tawny-leaved Alpine *ptarmica*. 7. The yellow-flowered ſweet ſcented *ptarmica*. 8. The yellow ſweet *ptarmica*, with long and thick tufts of flowers. 9. The Alpine *ptarmica*, with deeply divided leaves. 10. The feverfew-leaved Alpine *ptarmica*. 11. The tall Alpine *ptarmica*, with yellowiſh white flowers. 12. The other Alpine *ptarmica*, with leſs compact flowers. 13. The elecampane-leaved Virginian *ptarmica*. *Tourn.* Inſt. p. 496.

The common *ptarmica* is frequent in our meadows, and flowers in June and July. The leaves are of an acrid taſte, and are ſometimes added to ſallad inſtead of creſſes, or the garden-tarragon. When dried and rubbed to powder, they are a good ſternutatory; they are not over ſtrong, but occaſion a continued ſneezing, which draws out a great deal of phlegm by the noſe. The root has the ſame virtue more ſtrongly.

PTELEA, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of vegetables, the characters of which are theſe: that the cup is the perianthium, divided into four ſmall ſegments. The flower is compoſed of four petals, which are of an oval figure, and pointed at the ends; theſe are flat, larger than the ſegments of the calyx, and ſpread wide open. The ſtamina are four pointed filaments. The antheræ are roundiſh. The germen of the piſtil is orbicular, but ſomewhat compreſſed. The ſtyle is ſhort. The ſtigmata are two, and are acute. The fruit is a circular membrane, placed perpendicularly, with a cavity in the middle, which contains the ſeed, which is ſingle and oblong. The fruit of this genus is extremely like that of the elm, but the ſtamina are wholly different. *Linnæi*, Gen. Pl. p. 49.

PTERIDION, in botany, a name uſed by ſome authors for a ſmall kind of fern common in damp places. *Ger.* Emac. Ind. 2.

PTERIS, in botany, the name of a genus of ferns, the characters of which, according to Linnæus, are theſe: the fructifications are diſpoſed into a line, which ſurrounds the whole margin of the under part of the leaf. In this diſpoſition the *pteris* evidently differs from all the other capillary plants.

PTEROPHŒNICUS *Indiarum*, in zoology, a name under which Nieremberg has deſcribed a bird, which he ſays is called by the Spaniards there *commendadoza*, remarkable for the redneſs of the upper part of its wings.

It is of the ſhape and ſize of the ſtarling, and not unlike it in colour, but for the ſingularity of the upper part of their wings, which in one part of their lives are of a yellowiſh or orange colour, and in the reſt red. They are kept in cages and learn to imitate the human voice: they feed on vegetables, principally Indian corn, and are common as well in the colder as in the hotter climates; flying in large flocks, and often doing great damages to the people. They build in trees and are eaten there; but are no very valuable bird. *Ray's* Ornithology, p. 302.

PTEROSPERMADENDRON, in botany, the name of a genus of plants, eſtabliſhed by Dr. Amman.

The name is derived from the Greek πτερον, a wing, σπερμα, ſeed, and δενδρον, a tree, to expreſs a tree with alated ſeeds.

The characters of the genus are theſe: the flower is of the roſaceous kind, conſiſting of ſeveral petals arranged in a circular order. From the cup of the flower there ariſes a piſtil, with an embryo fruit, which finally becomes a woody ſeed-veſſel of the ſhape of a pod, which, when ripe, opens at the end, and is ſeen to be divided into five cells, containing alated ſeeds.

Of this genus the author deſcribes two ſpecies. The firſt has leaves like the cork-tree, angulated and hoary underneath, and white flowers: the other has auriculated leaves, and a large flower and fruit. The firſt of theſe is mentioned in Petiver's muſeum, N°. 349. under the name of a tree from Champana, with a woody fruit, containing alated ſeeds: and the other ſeems to be the tree called *ſolda*, in the Hortus Malabaricus, Vol. VI. T. 58.

Beſides theſe two ſpecies, the author ſuſpects there are four others, which have not yet been ſufficiently examined in their various ſtates, to determine whether they are properly of it or not. Theſe are,

1. The poplar-leaved tree alcea, called the *green ebony* at St. Helena, and by the Engliſh *blackwood* and *ebony*, Pluk. mant. T. 333. 2. The tree alcea, with large red flowers, and with leaves like the black poplar, hoary underneath, called by the Engliſh *redwood*, *ejuſd.* 3. The quinquecapſular alcea of Florida, with bay-like leaves, lightly crenated, and with alated ſeeds. And, 4. a tree with pentangular fruit, and alated ſeeds, collected by Dr. Houſton, at La Vera Cruz. Act. Petropol. Vol. VIII. p. 218.

PTERYGIUM, *(Cycl.)* in anatomy and ſurgery, a preternatural membrane, formed externally upon the coats of the eye, and extending itſelf over the cornea and pupil, and obſtructing the ſight. Sometimes this pellicle or membrane appears red, and is then called *pannus*.

It uſually ariſes in the angles of the eyes from the temples toward the noſe, and ſometimes from above or below, extending itſelf by degrees over the pupil. Sometimes it only adheres to the cornea by a few ſlender fibres, and ſometimes it is extended over the whole eye, and is every where firmly and intimately attached to it; and in this caſe the cure is rendered very difficult.

If the patient's conſtitution, or a beginning inflammation require it, bleeding and bliſtering are proper in this caſe; and when the membrane is but thin, gentle eſcharotics may per-

form a cure, ſuch as burnt alum, vitriol, &c. mixed into a powder with ſugar; or a ſolution of half a ſcruple of white vitriol in two ounces of celandine or other water.

If theſe methods prove ineffectual, the aſſiſtance of a ſurgeon muſt be called in; who ſeating the patient before him, with his head bent backwards upon his lap, while an aſſiſtant holds open the eyelids, takes hold of the thickeſt or looſeſt part of the pellicle with a hook, and elevating it a little, paſſes a threaded needle through it; and taking hold of both ends of the thread, makes a gentle elevation of it; then ſeparates its upper and lower margin with a lancet, that he may afterwards cut off the reſt immediately in a ſtrait line near the lachrymal caruncle, with a ſtrait and fine pair of ſciſſars; then he draws back the thread and membrane towards the cornea, and if it adheres any where to the eye, frees it by degrees with the ſcalpell, or ſciſſars, not wounding the cornea, nor leaving any of the membrane behind to give riſe to a new production of it. *Heiſter*'s Surg. p. 420.

PTERYGOIDÆUS *major (Cycl.)*—This muſcle lies on the inſide of the lower jaw, almoſt in the ſame manner that the maſſeter does on the outſide, and is of the ſame figure with that muſcle, only ſmaller and narrower.

It is fixed above chiefly to the inſide of the external ala of the apophyſis *pterygoides*. This inſertion is wholly fleſhy, and from hence it runs down obliquely toward the angle of the lower jaw, and is inſerted a little tendinous in the inequalities on the inſide thereof, oppoſite to the inſertion of the maſſeter. *Winſlow*'s Anat. p. 253.

PTERYGOIDÆUS *minor*, an oblong ſmall fleſhy muſcle, ſituated almoſt horizontally between the outſide of the apophyſis *pterygoides*, and the condyloide apophyſis of the lower jaw, the ſubject being conſidered in an erect poſture.

It is fixed by one extremity to the outſide and edge of the outer ala of the *pterygoide* apophyſis, filling the foſſula which is at the baſis of this apophyſis, near the baſis of the temporal apophyſis of the ſphenoidal bone; from thence it runs backward and a little outward into the void ſpace between the two apophyſes of the lower jaw, and is inſerted anteriorly in the condyloide apophyſis, at a ſmall foſſula immediately under the angle of the inner condyle. It is alſo fixed to the capſular ligament of the joint. *Winſlow*'s Anat. p. 253.

PTOSIS, a diſtemperature of the eyelids, occaſioned by a relaxation or tumor of thoſe parts, the ſame as the phalangoſis. *Heiſter*'s Surg. p. 367. See PHALANGOSIS.

PTYALAGOGA, a word uſed by phyſicians to expreſs ſuch medicines as promote a copious diſcharge of the ſaliva, ſuch as pellitory-root and the like.

PTYSMA, a word uſed to expreſs whatever is brought up from the lungs by ſpitting.

PTYSMAGOGA, medicines which promote a copious diſcharge by ſpitting.

PUBERTY *(Cycl.)*—Dr. Kramer obſerves, that all boys at the time of *puberty*, between twelve and fourteen years of age, complain of uneaſineſs at their breaſts, which are ſwelled and itchy, the nipples and areolæ round them inflaming with pain, and ſometimes excoriation and exulceration of ſome of the lactiferous ducts. The beſt remedy for which, he ſays, is to preſs out the white ſerum then contained in them, after which they cure with a bit of plaiſter. Commerc. Norimb. 1735. Hebd. 30. ſect. 2.

By the law of Scotland, perſons under *puberty*, or under the years of diſcretion, are capable of committing the higher crimes, which being contrary to the law of nature, are obvious. But they are not chargeable with ſmaller offences ariſing from poſitive law or ſtatute.

PUBIS *(Cycl.)*—The *os pubis* is the leaſt of the three portions of the oſſa innominata; the two together form the forepart of the pelvis, and anatomiſts diſtinguiſh in each, the body, the angle, and the branch.

The body of the *os pubis* is its upper part, ſituated tranſverſely before the inferior part of the os ilium. Its poſterior extremity is very thick, and by its union with the oſſa ilium forms the oblique eminence which diſtinguiſhes theſe two portions of the oſſa innominata. It likewiſe contributes to the formation of the cotyloide cavity. Its anterior extremity ends in a ſmall eminence, or tuberoſity, called the *ſpine* of the *os pubis*, which is ſometimes double. The upper edge has on its inner part an oblique ridge, which may be called the *criſta* of the *os pubis*, and is continuous with that ridge which diſtinguiſhes the margin and the bottom of the pelvis. Before this criſta is a broad, oblong, and oblique ſlope. The lower edge is obliquely notched, and forms the upper part of the foramen ovale.

The angle of the *os pubis* is its anterior portion, and makes part of that connexion called the *ſymphyſis* of the *oſſa pubis*. This portion is flat, and not very thick; and in ſome ſubjects toward the upper part of the fore-ſide, near the angular curvature, it has an eminence, which increaſes the ſize and extent of the ſpine already mentioned. The two *oſſa pubis* connected together by this portion, form, on the foreſide, an unequal convexity; but on the backſide a pretty even concavity.

The branch of the *os pubis* is a flat thin apophyſis, which running downwards, unites with the branch of the os iſchium by a cartilaginous ſymphyſis; of which, however, there remain only ſome light marks in adults. It compleats the formation of the foramen ovale. The branches of the two *oſſa pubis* form, on the foreſide, a pointed arch; which, however, in a natural ſtate, is much more round than in a dried ſkeleton. *Winſlow*'s Anatomy, p. 71.

PUCELAGE, *(Cycl.)* in natural hiſtory, a name by which ſome authors among the French have called the porcellane-ſhells. See the article PORCELLANA.

PUCERON, the name given by naturaliſts to a ſmall inſect of a peculiar nature frequently found on the young branches of trees and plants, and that often in ſuch cluſters as wholly to cover them. See Tab. of Inſects.

The *puceron* is a ſmall animal, but very numerous in the ſeveral genera and ſpecies; inſomuch, that Reaumur has obſerved that there is ſcarce a vegetable to be found, either in the fields or gardens, that has not its peculiar ſpecies of *puceron* to feed on its juices. Mr. De la Hire, of the Paris academy, has left many curious particulars in regard to theſe animals in the memoirs of the year 1703; and Mr. Lewenhoek, and others ſince, have given figures and deſcriptions of ſeveral of the ſpecies.

Pucerons are all viviparous animals, and that after a very ſingular manner. It is to be obſerved, that the name is ſcarce more expreſſive of the creature, than ſome of the others given of late to inſects; that of the polype to a creature which has no legs or feet at all, is very improper; and that of the *puceron* hardly leſs ſo, as it would naturally lead us to imagine, that the creature thus called was able to hop like a flea, whereas, in reality, it is very ſlow in its motions, and ſeldom ſo much as walks.

Theſe creatures have ſix legs, which are extremely ſmall and ſlender; and which, when the animal is at its full growth, are loaded with a weight ſo large, that they ſeem ſcarce able to ſupport it. Some of the ſpecies arrive at a tolerable bigneſs for common obſervation; but the greater number are too ſmall to be accurately ſeen without the aſſiſtance of glaſſes. Among theſe inſects there are great numbers that in their full perfection have wings, and become a ſort of little flies: theſe are diſtinguiſhed from the others by the name of *alated pucerons*. *Reaumur*'s Hiſt. Inſ. Vol. VI. p. 9.

Thoſe ſpecies which never become winged, have nothing of the appearance of the caterpillar kind; having not long, but ſhort bodies, and much reſembling flies whoſe wings had been taken off. All the ſpecies have antennæ or horns; but theſe in the ſeveral kinds are very different from one another, ſome being very ſhort, and others as remarkably long: and of theſe laſt kinds, ſome carry them ſtrait before the head, as is the uſual cuſtom, and others carry them laid along over their backs; in ſome of theſe the horns are longer than the body. But beſide theſe antennæ, the greater number of theſe creatures have two other horns or ſpines placed in a very ſingular manner behind them, near the tail. They are placed at ſome diſtance at their origin, but they become more diſtant as they go out from the body. Theſe are much thicker and much ſhorter than the antennæ; and there are among the various kinds of them, ſome which actually want them, and others which appear to want them, tho' they have them in reality; and others have in the places of them certain round ſpots, which ſtand juſt where they ſhould, and ſeem deſtined to perform their functions.

The ſeveral kinds of *pucerons* differ greatly in colour. The greater number of them are green; but many are brown, ſome yellow, and ſome are black. In Auguſt the roſe-trees afford a vaſt number of them of a pale red, and ſome exactly of the colour of the damaſk roſe; in ſome other months of the year we find green ones on the roſe-trees. The ſycamore and ſeveral other plants afford green ones in the ſummer, and red ones in November; and there ſeems no doubt, but that theſe are the ſame individual animals which change colour, the leaves and juices of the plants being not capable of affording them the ſame ſort of nouriſhment at ſome times that they do at others. Some of them alſo are of a duſky colour, and others bright and ſhining, as if varniſhed over. Thoſe of the willow, of the poppy, and ſome other plants, are of a cloth-like appearance, and ſome reſemble velvet; others, as thoſe of the apricot, and of the catch-fly, are ſhining as if covered with the fineſt lacquer. Some appear of the colour of browſe metal, when it has its higheſt poliſh; ſuch are thoſe of the tanſy, and ſome other plants. The largeſt kind are found on the oak and other trees. The gooſeberry buſh affords a ſpecies that are of the colour of mother of pearl; and in general, the ſkin or covering of thoſe ſpecies which are thus bright and ſhining, is much harder and firmer than that of the others. The more uſual ſpecies are all over of one colour, but there are ſome others which are ſpotted; that of the common wormwood is prettily ſpeckled with black and brown; thoſe of the ſorrel are green in the middle, and black at each extremity; and there are ſeveral others, as of the willow, &c. that are variegated with theſe two colours.

It is not certain, however, that all the ſpecies are peculiar to the plants that they are found upon; for it has been obſerved, that when a plant of the common wormwood has been full of them, by ſome accident they have all left it to fix themſelves upon plants in the neighbourhood, which had juices of a leſs diſagreeable taſte. Theſe creatures always live in companies; we never find them ſingly on plants, and very ſeldom other-

wiſe than in extremely great numbers. In plants they faſten themſelves on every part; but in trees, they only ſeize upon the leaves and young ſhoots, and they uſually cover theſe entirely, leaving no part to be ſeen. *Reaumur*'s Hiſt. Inſ. Vol. VI. p. 13.

The elder is the tree on which they are of all others the moſt plentifully produced, and on which they are obſerved in their ſeveral ſtages with the greateſt accuracy and eaſe. They often cover the thick green roots of this tree for many inches together, and ſometimes for many feet; and they are always placed ſo cloſe together, that they touch in every part, and ſometimes they lie two beds, one over another. Theſe are of a greeniſh black. If they are obſerved on the branches undiſturbed, they are always found to be perfectly quiet, and ſeem to paſs their whole lives in inaction; but they are all this time doing the moſt neceſſary buſineſs of life, that is, ſucking in their nouriſhment from the juices of the tree. They do this by means of a fine ſlender trunk, which eaſily eſcapes the naked eye; but is always found by the microſcope, and it is by means of this that they pierce the bark of the tender parts of the vegetables, and get at their juices. The trunk is uſually of two thirds of the length of the body; but when they are moving on, it is always applied ſo cloſely under the belly, that it is not ſeen.

When there are two ſeries of theſe inſects placed one over another, they are always more looſly placed in the upper ſeries, and theſe are uſually the larger and the nimbler in all their motions. In this caſe they have no power of ſucking the plant; for beſide that it is cloſe covered with the other ſeries, their trunks are not long enough to reach and penetrate it from the heighth at which they ſtand above it. Theſe, therefore, are ſuch as have no farther need of nouriſhment, but are employed in propagating their ſpecies. Mr. De la Hire thought, that when theſe animals arrived at their winged ſtate, they laid eggs on the ſtalks and leaves of thoſe plants on which we find them afterwards hatched without wings. The reaſon of his ſuppoſing this, was doubtleſs the opinion of an analogy between theſe creatures, and the butterflies and flies, with the other animals of the winged claſs: but obſervation and facts agree but very ill with that analogy; for if the plants on which they abound be obſerved nicely from day to day, their numbers will be found daily to increaſe on the leaves and branches, and this without the leaſt appearance of eggs: on the other hand, as the new-produced animals are of very different ſizes, this ſpeaks their being of different ages; and from hence it appears evident, that they are not produced in the manner of other inſects, which, when perfect, have wings; but, on the contrary, that they are really produced alive from the parent. Mr. Reaumur ſaw them brought forth; and, indeed, the obſervations of Mr. Lewenhoek long before, made it evident that this was the caſe; for he ſaw, by the help of microſcopes, the young animals perfectly formed, tho' extremely minute, in the bodies of the full-grown females.

If the large and full-grown *pucerons* are watched on their native places, with moderately powerful magnifiers, there will ſoon be ſeen ſome of them that have a ſmall greeniſh body ſtanding out from near the anus. This is the moſt plainly viſible in the elder *puceron*, which is itſelf uſually blackiſh. This in its firſt appearance is an oblong body, reſembling an egg flatted a little; but as it more nearly approaches to its delivery from the body of the parent, there appear legs upon it, and it is clearly ſeen to be a perfect and very lively animal. The legs by degrees fly off from the ſides and belly, along which they were laid, and the creature then makes ſeveral motions to aſſiſt the getting out of its head from the body of the parent; for theſe inſects are always brought into the world with the hinder part foremoſt. The parent is wholly paſſive all the time of the birth, all her efforts being internal; ſo that the body ſtirs not out of its place, nor is the young one able to help itſelf till its whole body is very near out, as the legs are attached to the breaſt at a ſmall diſtance from the head: and even when the head is out, the antennæ require the repeated motion of the young one, for a minute or two, to ſeparate them.

The whole operation of the delivery of one young one uſually takes up about ſeven minutes. Mr. Reaumnr obſerved the delivery of the *pucerons* of all kinds to be in the ſame manner. He found it very eaſy to make the obſervation, as the female *pucerons* are eaſily diſtinguiſhed from the male by their being much thicker in the body, and by their ſkin ſeeming always much diſtended, and by the furrows which ſeparate the rings of the body being obliterated. They are a ſort of animal which propagates ſo quickly, that uſually there are many females on the ſame leaf or branch of a plant in labour at the ſame time; and their fœcundity is ſo great, that when they have once begun to bring forth young ones, they ſeem to continue it inceſſantly for a long time together. They will often bring forth fifteen or twenty ſucceſſively, and if their bodies be a little ſqueezed afterwards, there are forced out of it a vaſt number of others leſs mature; yet even in theſe the eyes may be diſtinguiſhed: and after theſe, there follow long chains, as it were, of leſs perfect ones, which ſeem like the beads of a necklace, and are oblong, and much reſemble eggs. Theſe young ones are of different maturity, therefore, in the bodies of the parent; and in that reſemble the eggs in hens and other birds, they always growing to a proper ſtate for excluſion in this manner, one after another: whereas, in the quadrupeds, which are viviparous, the young ones of the ſame brood, if ever ſo numerous, always grow to their ſtate of maturity for the delivery together, and are all excluded at the ſame period. The young *pucerons*, when firſt brought forth, are always paler coloured than the parent; but are of the ſame ſhape and ſtructure, except that their bodies are ſomewhat flatted.

We ſee that they are able to move their legs before they are perfectly excluded from the parent, and as ſoon as they are ſo, they walk and ſeek a place where they may fix their little trunk into the plant, for the receiving nouriſhment. This they always chooſe to do as near to ſome others of their ſpecies as they can, always loving to live in communities. The young one always places its head as near as poſſible to the hinder part of the next to it, and thus they continue enlarging their bodies at every new birth. Thoſe which live upon the leaves of trees and plants, always fix themſelves on the under ſide, being there moſt ſheltered; and as their number is always very great, they frequently much alter the plant whoſe juices they ſuck; tho' ſome ſpecies, both of trees and plants, bear this much better than others. Id. ibid. p. 15.

Theſe little inſects are extremely plentiful on many different trees, and are very eaſily obſerved in their ſeveral ſtages and progreſſions by a curious ſearcher after them; but if at any time they are not ſo eaſily found, the perſon who ſeeks after them may be conducted to them by the ants, which he will find moving in great numbers on the trees and plants where they are, and pointing out the way to them.

Mr. Lewenhoek, Hartſoeker, and others, have obſerved this, and have ſuppoſed that the ants fed on them, by their frequenting the places where they are found; but that is far from being the caſe, the ants, on the contrary, ſeem to love them as friends. Goedart judged better of the matter, and eſteemed the ants of great benefit to the nation of *pucerons*, in deſtroying many of their bloody enemies. Goedart, however, erred greatly in ſuppoſing the ants to be the mothers of the *pucerons*; yet this is an error that has place among our gardiners to this day, they all ſuppoſing that the ants leave a ſlime behind them, out of which, according to the opinion of this laſt author, they judge them to be produced. We may, however, eaſily find out the reaſon of the ants following the cluſters of *pucerons*, without doing them any injury, when we conſider that the ants love ſugar and all ſweet things, and the places about which the *pucerons* are have uſually the cavities filled with a thick ſaccharine matter, formed of the juices of the plant, extravaſated by the wounds they make in it, and dried up to this conſiſtence by the heat of the ſun.

The bladders of the leaves of the elm always contain a large quantity of a ſaccharine juice; but thoſe of the black poplar have always a much ſweeter and more delicious fluid in them; and very often on other trees, the extravaſated ſaccharine juice may be ſeen among the cluſters of theſe animals, and the ants crawling over their backs to feed upon it.

This liquor of the elm has not eſcaped the obſervation of the ſearchers after remedies from the vegetable world; but tho' great virtues have been attributed to it by many, none have yet given any true account of its origin. The moſt natural opinion would ſeem, that it was the juice of the tree ſimply extravaſated; but experience ſhews that it has another origin: it is really the excrement of theſe *pucerons*; they receive no ſolid food into their bodies, all that is conveyed into them coming through their trunk, which is an extremely fine pipe; and as none but a very thin and pure juice can be received through ſuch an organ, it is no wonder that the creature which lives wholly upon it ſhould void no ſolid excrements. If a parcel of the *pucerons* be watched, it will not be long before one or other of them will be found voiding a ſmall round drop of this liquor by the anus, and after that, ſeveral more; which all falling upon one another, form the viſible drop on which the ants feed. The creature ſeems in ſome pain on the voiding this, and very often the hinder legs may be obſerved aſſiſting in removing it from the anus.

Mr. Reaumur obſerved, that it was common to find ſeveral drops of this liquor on the leaves of ſome trees; and that, tho' they were fluid and limpid, when firſt evacuated from the animal, they became more and more thick afterwards, reſembling honey after a few days, and after that drying up ſo as not to be eaſily removed from the leaves: and Mr. Geoffroy obſerved, that the liquor of the bladder of the elm became, when dried, as hard as the gum of the cherry-tree. The drops of this liquor is not ſo frequently found on the leaves of plants as might be expected, and that becauſe many of them are immediately devoured by the ants, and many others are dried up by the ſun; but they may always be found collected in ſome quantity in the bladders of the elm, and other trees inhabited by theſe creatures, as there the liquor is defended from the heat of the ſun, and is ſafe from being devoured. *Reaumur*'s Hiſt. Inſ. Vol. VI. p. 49.

The two horns which are placed on the hinder part of the body of this inſect are as ſingular in their uſe as in their appearance; they are hollow, and they at times excrete alſo a li-

quor

quor as limpid and clear as that of the anus. This ſtands in round drops at the end of one or both of them at once, and reſembles heads upon pins. This liquor, tho' limpid in ſome ſpecies, is, however, reddiſh and thick in others; as particularly in thoſe of the willow: and as this ſeems plainly to be an excrement, the creature is very ſingular in having its different paſſages for thoſe of different kinds. The liquor voided by the aperture at the extremity of the body, which reſembles the anus in other animals, appearing to be the urine; and this by theſe two horns, the fæces of the bowels. At any time when there is not a drop to be ſeen upon either of the horns, if the body of the animal be gently ſqueezed, a drop will always be forced out either from one or both.

The *puceron*, like moſt other inſects, changes its ſkin three or four times before it arrives at its full growth. Theſe exuviæ perfectly reſemble the animal in its natural ſtate, the legs and other parts being all in their proper places; but whatever is the colour of the ſpecies of *puceron*, theſe ſkins which it caſts are whitiſh. They lie in great numbers about the leaves where the creatures are, and among them there is uſually found a cottony matter. This at firſt ſight might be miſtaken for the ſkins, reduced to a kind of powder; but on a cloſer examination, it appears to be truly filamentous, and on a nice inſpection is found to be the natural produce of many ſpecies of the animal. All thoſe kinds of *pucerons* which are not ſmooth and gloſſy, as if varniſhed, have more or leſs of this cottony matter about them: in ſome the whole roughneſs of the ſurface is made of it; and in others, it ſtands in white ſpots on ſeveral parts of the body.

Thoſe *pucerons* which inhabit the bladders or leaf-galls of the elm and other trees, and thoſe which live in the folded leaves of the black poplar, are all of the nature of thoſe which produce the largeſt ſhare of this matter: they have it hanging in long ſtrings in an odd manner from their bodies, and often are ſo compleatly covered with it, that they look as if they had been wetted, and then rolled in meal.

On examining the leaves of ſome plants and trees inhabited by theſe animals, there is ſeen a ſort of collection of this down into parcels, ſo that they reſemble the white feathers of a bird in miniature. The leaves of the beech-tree afford theſe plumes in the greateſt perfection, and frequently they cover its leaves in whole cluſters, and are an inch or more in length. Theſe plumes, or cluſters of plumes, ſeem all to grow out of the leaf, and are much thicker at their baſe than at their extremity; a great number of the plumes that compoſe them being ſhorter than the reſt, and not running to the extremity. The longer plumes divide themſelves into two cluſters near their origin, and theſe never unite again afterwards: when examined by the microſcope, each plume appears to be compoſed of ſeveral other plumes or threads, like thoſe of cotton, which are undulated, but not twiſted together. Tho' theſe cluſters of plumes ſeem to be fixed to the leaf, yet when more cloſely examined, that is found not to be at all the caſe; but that they really proceed from the body of a *puceron*. The different threads or plumes ariſe from the different parts of the body of the animal, and altogether they hide it abſolutely from ſight as it ſtands on the leaf. When the bottom of the tufts are examined, however, there are always found either the bodies of the *pucerons*, or their exuviæ; for when they quit their ſkins, they quit theſe filaments with them.

Tho' theſe long threads might ſeem a conſiderable load for ſo ſmall an animal, yet when the creature is touched it always moves very briſkly, and as it creeps along, generally leaves ſome of its plumes in the way; but in its motion, no other part of it than the head, and the foremoſt pair of legs are ſeen. *Reaumur*'s Hiſt. Inſ. Vol. VI. p. 53.

The young brood of this ſpecies are green, and only by degrees acquire this white down; which at firſt appears only in form of a farinaceous powder, and by degrees lengthens out as we ſee it. The old ones alſo, when they have newly changed their ſkins, have it not at all; and when it afterwards grows upon them, it is by theſe degrees, and in this manner. The leaves of the common bramble alſo afford this remarkable ſpecies of *puceron*; and the common meadow crowfoot is frequently covered with cluſters of them at its lower part, reſembling a white mouldineſs. The filaments that cover the bodies of this ſpecies of *puceron*, are not at all of the nature of the ſilky matter ſpun by other animals; but ſeem to be produced from every pore of the body, and to iſſue thence in form of ſmall round globules of a liquid matter, which harden with the air, and adhering to one another as they iſſue out, form this ſort of plume, a congeries of which make the tufts we ſee.

The male and female *pucerons*, as they are uſually ſuppoſed to be, differ greatly from one another in form, even in their time of growing; but much more eminently at the time of their maturity, the male having then wings, which the females never have. Lewenhoek and others, who have treated of theſe animals, have ſuppoſed that they all became at length little flies, that is, were winged; but this is a great error.

The young male *pucerons* may be diſtinguiſhed from the females by having a ſort of eminence on their ſhoulders, of a ſquare form; which is owing to the young wings. The ſeveral changes of the ſkin which theſe animals have, make no great difference in their form till the laſt, when the males appear with their wings at liberty. A little before this laſt caſting off the ſkins, the males are ſeen to have a ſort of tuberoſity alſo on each ſide, which is owing to the wings, folded up there within the ſkin; but the females, tho' much larger than theſe, have no ſuch protuberance.

The winged *pucerons*, when they have caſt off their laſt ſkin, and have their wings looſe, do not, however, ſhew them immediately; for they are folded cloſely together, and the creature then appears like what it was before, being all over green, and having only two eminences on the ſide: but in a quarter of an hour, the head and ſhoulders change from their green colour to a fine ſhining black, and the wings unfold and expand themſelves, and then cover a large part of the body, and extend themſelves to a conſiderable length beyond it.

Theſe now appear animals wholly different from what they were before, and many of the flies which we ſee in our gardens are of this kind: the animal, however, tho' it appear ſo very different from its fellow inſects, is much more like them, when cloſely examined, than could be imagined. It ſtill carries the great character of the genus, which is the having two horns growing out from the hinder part of the body, and ſtill has its trunk, and lives by ſucking the juices of plants. *Reaumur*'s Hiſt. Inſ. Vol. VI. p. 57.

Notwithſtanding, however, the general opinion, that the winged *pucerons* are all males, and the unwinged ones females, it appears that their manner of generation is yet unknown to us. This opinion was founded too haſtily by ſome from a ſuppoſed analogy of theſe and other inſects; but later obſervations prove, that this is not ſtrictly the caſe: for that the winged ones, as well as the others, bring forth young ones. Some have ſuppoſed, that theſe winged and naked *pucerons* were the offſpring of different families of ſeveral ſpecies living together; but the contrary is proved by this, that the winged ones are found to produce ſome winged and ſome naked ones; and the naked to produce both kinds in the ſame manner. Some have imagined, that they found the male *pucerons* among the others, obſerving ſome of a flatter ſhape, in whoſe bodies there were never found any young ones, as there always were in the others, even when they were very young; but theſe have been ſince found to be only ſuch females as had already brought forth their offſpring.

The young *pucerons* being themſelves filled with embryos, and that in every individual, ſo that all that have been ever examined appear mothers, has given many ſtrange ideas of the manner of their generation: many have imagined them all to be hermaphrodites; and as no copulation has ever been obſerved among them, they are by ſome ſuppoſed to be able to impregnate each itſelf. The later opinion, however, is, that when a female is once impregnated by a male, ſhe will bring forth young ones already impregnated with others, and thus to the third or fourth ſucceſſion; ſo that copulation is only neceſſary to theſe animals once in three or four generations, and the children and childrens children of an old *puceron* that has had congreſs with a male, will bring forth young ones without having ever had any ſuch congreſs. *Reaumur*'s Hiſt. Inſ. Vol. VI. p. 59. See the articles WOOD-*puceron*, OAK-*puceron*, &c.

Bladder PUCERON, a ſort of *puceron* that lives in bladders on the leaves of trees. See PUCERON, *ſupra*.

We often obſerve on the leaves of different trees, a ſort of roundiſh bladders, which only adhere to the leaf by a ſhort pedicle: theſe are a ſort of ſmall galls, and their figure varies much in the different kinds; ſome are leſs round than others, and many are very rough on the ſurface; and ſometimes they are long, terminating in a point, and being broader at the baſe than in any other part, and ſuſtained by no pedicle, but fixed immediately to the leaves.

The elm and aſh afford us more frequent inſtances of theſe than any other trees, and very often on the firſt of theſe they grow to the bigneſs of a nut, and ſometimes much larger; and when they are grown to their full ſize, they often take up the whole ſurface of the leaf. When theſe bladders are opened, they are found to contain a large number of *pucerons*.

If theſe bladders are examined at the time when they are but newly riſen, which uſually is in the beginning of June, on opening them there is uſually found in them only one *puceron*, and that always a female big with young; and in others more advanced, the parent inſect is found ſurrounded with different numbers of her young ones. Theſe bladders have all of them at firſt only one female *puceron*; but afterwards they have more, as they become larger; and the largeſt of all are uſually found filled with a prodigious number of young ones. The newly riſen bladders are always found cloſe and firm in every part, the aperture at which the female *puceron* had entered, being uſually neatly and cloſely ſtopped up. The queſtion is, how this bladder was formed?

We very well know, that winged inſects of ſeveral kinds prick holes in the leaves and branches of vegetables, and depoſit their eggs in them; and that thence ariſe all the various ſpecies of galls, the eggs hatching within thoſe tumors into worms or maggots, and theſe finally becoming winged inſects like their parents.

Malpighi has given an excellent account of the ſeveral ſpecies of

of theſe galls; but he has not mentioned any of them being produced by a viviparous inſect, for the bringing up her numerous family: he has not omitted the bladders on the leaves of trees among the numbers of galls, but he has had no true idea of their origin; nor could this, indeed, have been any way found out, but by the obſervation that the creatures contained within them were of the ſame nature and origin with thoſe on the ſurface of the ſame or other leaves.

There ſeems no doubt, but that each of the female *pucerons* found in the bladders of theſe leaves, has been herſelf the occaſion and the maker of that bladder in which ſhe is found ſo cloſe ſhut up.

It would be natural to ſuppoſe, that the creature formed herſelf this lodgment when ſhe found herſelf loaded with young, and under a neceſſity of being delivered of them: but this is not the caſe; for a female *puceron* taken in this ſtate, and placed upon a leaf, makes no attempt towards the making herſelf ſuch a lodging; and there are taken out of the new-riſen bladders many ſingle animals of this kind, which are ſo far from being about producing their young, that they are not full grown. Theſe, however, are always females.

The method of the formation of them ſeems to be this: as ſoon as the female *puceron* is produced, ſhe fixes her trunk into the leaf to ſuck its juices; the conſequence of this in all the *pucerons* is, that the ſurface of the leaf ſeparates a little from the nervous part: in the common caſes the creature takes no advantage of this, but only continues ſucking the juices; but in this kind, the female, as ſoon as ſhe has made the ſeparation between the parts of the leaf, gets into the cavity that is formed there, by enlarging the orifice firſt made by the trunk, till it will admit her body. When once in, ſhe works forward in a ſtrait line, and the hole behind her ſoon cloſes up, as there was no rupture, but only a ſtretching open of the parts of the leaf. The female thus finds herſelf in a ſecure place, and the elevation ſhe makes in the leaf is ſcarce perceivable, only appearing as an oblong ſmall ſpecies of gall. The mark of the aperture at which ſhe made her way in, is always to be ſeen at ſome diſtance behind her, tho' uſually very neatly cloſed up: thus the whole continues till the creature produces her young. But then the ſcene is quite altered; the young ones begin to ſuck as ſoon as produced, and as they uſually ſeize upon the ſides of the ſmall gall, already formed for that purpoſe, this derives more juices than otherwiſe would flow into it; and it begins to elevate itſelf much higher, and forms a tubercle of the ſhape of a nut or pear.

Its growth in this caſe is entirely analogous to that of the common galls on the branches of trees, *&c.* and all the difference in the ſhape of the ſeveral bladders, is owing to the manner of the young *pucerons* ſucking: for if they ſuck much at its baſe, that enlarges and becomes the broadeſt part, as is the caſe in the conic and pointed ones; but if they let this alone, and ſuck only the ſides and upper part, they ſwell while this does not, and conſequently this forms a ſort of pedicle to the growing bladder. *Reaumur*'s Hiſt. Inſ. Vol. VI. p. 33.

Baſtard-PUCERON. See FIG-*inſect*, and GRUB *of the box*.

Earth PUCERON. See EARTH.

Grub PUCERONS. See GRUB.

PUCERON-*eater*, or *Lion* PUCERON. See LION *puceron*.

Oak PUCERON. See OAK.

Ver PUCERON. See VER *puceron*.

Wood PUCERON. See WOOD.

PUCKAUN *beady*, in natural hiſtory, a name given by the people of the Eaſt Indies to a peculiar ſpecies of orpiment, which they uſe in medicine.

They find it on the hills and on the banks of rivers. It is prepared by ſeveral tedious proceſſes, and then is given with ſucceſs in a diabetes.

PUDDINGS, in a ſhip, are ropes nailed to the arms of the main and fore yards, near the ends, and then at three or four due diſtances inwards one from another, in order to keep the robbins from galling or wearing aſunder upon the yards, when the top-ſail ſheets are haled home.

They call alſo thoſe ropes which are wound about the rings of anchors, to ſave the clinch of the cable from being galled with the iron, by this name; ſo that when the ring is ſo ſerved, it is called the *pudding of the anchor*.

PUDDING-*ſtone*. See the article OCULATUS *lapis*.

PUDENDA *(Cycl.)*—It is remarkable, that among the fiſh-tribe all that are oviparous have no *pudenda*, properly ſpeaking; that is, they have no penis or vulva, unleſs the ovaria of the females and the vaſiculæ ſeminales of the males may be called by that name.

The viviparous fiſhes, on the other hand, as the cetaceous fiſhes in particular, and many kinds of the cartilagineous, have the penis and vulva, diſtinctly and properly ſo called. *Artedi* Ichthyolog.

PUDIANO, called alſo *pædiano*, and by others *vermelho*, *apaimixira*, and *tetimixira*, a fiſh of the ſize of a middling pearch, but not ſo broad as that fiſh.

Its head is ſmall, its noſe pointed, and the upper part of its mouth furniſhed with very ſharp teeth; its lower part with others extremely minute. Its eyes are prominent, and the rays of its back fin are rigid and prickly. Its ſcales are extremely ſmall, and ſo cloſely laid, that it ſeems ſmooth to the touch. Its whole body is of a gold-yellow; but that the upper part of its head, and its back to the end of the back-fin, are of a very beautiful purple. The rim or edge of the belly-fin is alſo purple, and the reſt of a gold-yellow. It is a wholeſome and well taſted fiſh. *Ray*'s Ichthyol. p. 339. *Marggrave*'s Hiſt. Braſil.

PUDIANO *verde*, in zoology, the name of an American fiſh of a very remarkable colour, and very well taſted and wholeſome. See Tab. of Fiſhes, N°. 60.

It is of an oblong ſhape, and its uſual ſize is about ten fingers long, and three broad in the broadeſt part; for towards the tail it is but about half that breadth. Its mouth is ſmall, and its upper jaw furniſhed with two long teeth, and a great number of ſhort ones; and its under one with four long ones, and a like number of ſmall ones. Its back-fin is very long, and is ſupported by prickly rays. It is of a yellow colour, and variegated with longitudinal ſtreaks of blue. Its tail is not forked, and is of a reddiſh brown, variegated with a bluiſh green, and has a border of green at the end. Its ſcales are broad, and are ſo diſpoſed, as to repreſent ſo many cubes. Theſe are all of a fine yellow, and each has a rim of a bright blue all round its edges; and the whole fiſh is very elegantly variegated with blue, yellow, green, and white ſtreaks. *Marggrave*'s Hiſt. Braſil. *Willughby*'s Hiſt. Piſc. p. 340.

PUFF-*ball*, the common Engliſh name for the *fungus pulverulentus*, or lycoperdon. See LYCOPERDON.

The duſt contained within this body, (which, when it is cruſhed, flies out in an inconceivably fine powder, in form of a cloud of ſmoak) when examined by the microſcope, appears to be a multitude of regulary figured, tho' extremely ſmall bodies. Theſe require the moſt powerful magnifiers to diſtinguiſh them, and are found to be little globules of an orange colour, and ſomewhat tranſparent; and ſo ſmall, that the cube of the diameter of a hair, would be equal to an hundred and twenty-five thouſand of them. In other ſpecies of this muſhroom, the globules are evidently ſeen to be ſo many *puff-balls*, being of a darker colour, and having each a little ſtalk or tail: by means of theſe ſtalks they penetrate into the ground, when ſhed from their parent plant.

The duſt of theſe muſhrooms is very hurtful to the eyes, and we have had inſtances of perſons being blinded for a long time by it, with violent pain, ſwelling, and inflammation; and this is probably owing to the ſharpneſs of theſe almoſt inconceivably minute ſtalks or tails. *Baker*'s Microſcope, p. 255.

PUFFIN, in zoology, a name by which ſome call the anas arctica Cluſii. See PUFFINUS, *infra*.

PUFFINET, in zoology, the name of a bird known among authors by that of the *columba Groenlandica*, or the Greenland or ſea turtle-dove.

It is common on the northern coaſts, and is black all over, except two ſmall ſpots on its head: but it is pretended by ſome, that in winter it turns white. *Ray*'s Ornithol. p. 245.

PUFFINUS, in zoology, the name of a water fowl, with its three fore-toes connected by a membrane; but its hinder ones looſe, and with a ſharp and crooked beak. It is called in Engliſh the *puffin*.

It is larger than the tame pigeon: its head, neck and back are black: its breaſt and belly white: its beak is two fingers breadth long, and its baſe covered by a naked membrane, and has on each ſide a furrow, running from thence to the end of it: its wings are very long, and its tail a hand-breadth long, and black: it is extremely common in the Iſle of Man, but is ſo fat, that its fleſh is accounted unwholeſome unleſs it is ſalted: it is alſo common in the Scilly iſlands. They breed only in the culf of Man, an uninhabited part of the firſt mentioned iſland, and each female lays only one egg.

They lay in rabbit holes, and as ſoon as the young are hatched, they follow their parents all day to ſea, returning only in the evening. The people take them early in the morning, about the time of their going out, and that every man may remember how many he takes, he always cuts off one of the legs, and keeps it in his pocket; hence the vulgarly obtained opinion, that *puffins* have but one leg. *Ray*'s Ornithol. p. 252.

PUGNAX *avis*, in zoology, the name of the bird called in Engliſh the *ruffe*, and the female of which is the *reeve*. It has its Latin name from its quarrelſome diſpoſition, the males being always fighting. See the article RUFFE.

PUGNITIUS, in zoology, the name of the common ſtickleback, or barnſticle, called alſo from its ſpines *aculeatus*, and by ſome authors *ſpinachia*, *turonilla*, and *centiſcus*.

It is a very well known fiſh, and is found every where in new dug ditches, *&c.* where no body can perceive how it comes. Hence the vulgar have an opinion, that it breeds there equivocally and of itſelf, without the help of parents of its own kind; and that from it all other fiſhes are bred.

Theſe are idle opinions: the ſmalleſt animalcule is not produced in putrid matter otherwiſe than by the egg of a parent animal; this origin will, therefore, hardly be believed of larger, and, as they are called, more perfect animals. Theſe ſmall fiſh are ſo far from peopling ponds with other fiſh, that they are very great devourers of the ſpawn of larger fiſh, and do infinite miſchief in ponds.

There are two ſpecies of this little fiſh, the one larger, of two inches or more in length, and conſiderably thick. This has but five prickles, three on the back and two on the belly: this laſt is fixed to a penniform bone, very hard and ſtrong; for inſtead of belly-fins, this has two triangular bony laminæ. It has no ſcales, but its ſides are defended with a bony armature, reaching from the ſpines on the back to thoſe on the belly. It can raiſe or depreſs its ſpines at pleaſure. This ſpecies is common in our ditches; and they ſometimes ſwim in immenſe ſhoals together in the ſea.

The other is the ſmaller kind: this is ſhorter and much ſlenderer than the former, ſo that it appears proportionably of a longer figure. It has ten or eleven ſpines on its back, and theſe not ſet in an even row, but alternately bending one to the right, the other to the left; and it has bony laminæ inſtead of belly-fins, and two ſpines or prickles on them; and one behind the anus. This ſpecies has not the bony armature on its ſides that the larger has. It is common in our ditches. *Ray*'s Ichthyol. p. 341. ſeq.

PUGNITIUS *longus*, in zoology, the name of a Weſt Indian ſea-fiſh, caught about Chili and in ſome other places, and approaching in many particulars to the European *pugnitii*.

It is a ſmall animal; its body is ſquare, and of a tender conſtruction; of the thickneſs of a finger, and of five, ſix, or ſeven inches long, becoming gradually ſmaller towards the tail: its ſkin is ſmooth, and its back is black; its belly yellow: its head reſembles that of the pike, but that the noſe is ſomewhat longer: it has two fins at the gills, one of a triangular ſhape on the back; and from this to the neck there are placed a row of fifteen prickles, which bend a little backward, and are not connected by a membrane. On the middle of the belly it has alſo two ſpines at the two ſides, and one behind the anus: behind this there is a fin anſwering to that on the back, and the body is terminated by a fine ſmall tail. *Schonefeldt*'s Hiſt. Piſc. *Ray*'s Ichthyol. p. 340.

PULCHER *piſcis*, in ichthyology, a name given by Gaza to the fiſh commonly known by the name of the *uranoſcope*, or ſtargazer. See URANOSCOPUS.

It is a ſpecies of the trachinus, and diſtinguiſhed by Artedi by the name of the *trachinus*, with many beards on the lower jaw. See TRACHINUS

PULEGIUM, *penny-royal*, in botany, *&c.* a name given by authors to the common water-mint. Vid. *Linnæi* Gen. Pl. p. 271. *Tourn.* Inſt. Bot. p. 189. *Rivin.* Vol. I. p. 31, 32. See alſo the article MENTHA.

Penny-royal is among the firſt plants in eſteem in the preſent practice, as well as in former ages, as an attenuant and uterine. It promotes the menſes, and forwards delivery. It is good in flatulencies and ſuppreſſions of urine, and by many is greatly recommended in dropſies, jaundices, and other chronic diſtempers. It communicates its virtues very readily to water in infuſion, and its ſimple water drawn by the alembic, has, perhaps, more virtue than any other kept in the ſhops. Its eſſential oil is ſometimes, tho' rarely, uſed in the ſame intentions with the water.

PULEX, the *flea*. It is to Signior Redi that we owe the true hiſtory of the generation of this common and troubleſome animal.

The *flea* lays its eggs, and from each egg is hatched a ſmall worm: this worm ſpins itſelf a bag of ſilk, in the ſame manner that the ſilk-worm does; and out of this bag it comes at laſt in the perfect form of a *flea*, as the other does in its winged ſtate.

The *flea* depoſits its eggs on the bodies of dogs, cats, and other animals, and on the clothes of men, or the beds, and other places where they ſleep. Theſe eggs being round and ſmooth, ſlip eaſily down till they come into ſome fold of the clothes, or ſome other place, where they are hatched. In this place each egg produces a ſmall white worm of a ſilvery appearance; theſe worms feed on the white ſcurfy matter which is found in great plenty on the ſkins of dogs and other animals; and they are alſo found among the folds of linnen in drawers and other places: they are a fortnight in arriving at the full bigneſs of the worm ſtate, and will roll themſelves cloſe up into a ball, in the manner of the wood-louſe, when touched.

They ſoon after this ſpin themſelves their web, in which they lie a fortnight, and then come out perfect *fleas*.

The *flea*, if examined a day or two before its full growth in the bag, is found to have all its parts and lineaments; but it is ſoft and white. After this it gradually becomes hard and coloured, and when it comes out of the bag, is as ſtrong and large as it ever is to be.

PULEX-*eaters*, a name given by naturaliſts to a ſort of worms frequently found on the leaves of trees, where they devour the animals called *pulices arborei*. Vid. infra.

Of theſe there are ſeveral ſpecies, which owe their origin to the eggs of different creatures; for they are none of them in their ultimate ſtate in this their time of feeding. According to the different animals whoſe eggs they are hatched from, theſe are of different form and ſtructure: ſome are hexapodes, or endued with ſix feet; theſe belong to the beetle tribe, and finally change into beetles like the parent animal from whoſe eggs they ſprung: others have no legs, and are produced from the eggs of flies of various kinds: and finally, others are genuine caterpillars, tho' ſmall; but theſe are the moſt rare of all.

The two general kinds are the hexapodes, or beetle-worms, and the apodes, or fly-worms. The fly which gives origin to the laſt of theſe is a four-winged one, and takes care always to depoſit her eggs in a place where there are plenty of the *pulices*, uſually on the ſtalk or young branches of a tree in the midſt of large families of them. The worm, as ſoon as hatched, finds itſelf in the midſt of abundance of food, preying at pleaſure on theſe animals, which are wholly defenceleſs. The ſtalk of the elder and woodbine are frequently found covered over with theſe *pulices*, and among them there may uſually be found one or more of theſe deſtroyers feeding at will, ſucking in the juices from their bodies, and then throwing away the dry ſkins. Beſides the worms of this four-winged fly, there is one of a two-winged waſp-fly, very deſtructive of theſe animals. *Reaumur*'s Hiſt. Inſ. T. 1.

PULEX-*arboreus*, in natural hiſtory, the name given by Mr. Reaumur to a very large genus of ſmall animals. They are a kind of half-winged creatures; they have granulated antennæ, and ſome of them, in their moſt perfect ſtate, have complete wings. Theſe are diſtinguiſhed from the others by the name of *muſca pulex*, or the *winged-pulex*.

The ſeveral ſpecies of theſe creatures are of different colours; ſome are brown, others yellow; but the moſt frequent are green. They all feed upon the leaves of trees, which become withered and curled up on their eroding them; and they are ſo common, that wherever a leaf of a tree is found curled up, or of a different form from the others, it is highly probable theſe animals are on it, or that it is their work. Among trees the willow and the roſe are the moſt infected by them; and among plants, the bean and the poppy. They live a ſocial life, multitudes of males and females being found together. The females are eaſily diſtinguiſhed from the males, by their being thicker in the body, and having larger bellies.

It is very wonderful, that of all the known animals of the winged kind, theſe are the only ones which are viviparous. This is eaſily ſeen beyond a poſſibility of doubt; for on examining a cluſter of them together, it is a common thing to ſee, by the help of a ſmall magnifier, a female in the act of parturition; and the author of this account frequently ſaw the young *pulex* protruded out, from a paſſage near the anus of the female, perfectly formed. He had ſuſpected this from the total want of eggs among ſo numerous a tribe of animals, and from their remarkably ſpeedy propagation, and was thus convinced of it by ocular demonſtration.

They are armed with a tender and flexile proboſcis, with which they ſeize hold of the young ſhoots of the tree: they live upon twiſting the proboſcis round it. Theſe creatures are always ſeen naked and expoſed, ſtanding on the outſide of the ſtalks and leaves, and ſucking in their juices for nouriſhment with their proboſcis. But there is another ſpecies of them, which are alike viviparous, and agree with them in all reſpects, except in their manner of living. Theſe get into the inner ſubſtance of the leaves, like the worms called *aſcarides*, and feed on the parenchyma, being defended from all injuries by living between the integuments. In this caſe, the leaves they bury themſelves in become ſcabrous and deformed, and produce a ſort of galls: ſo that Malpighi erred in ſuppoſing all the galls of trees to be produced by the animals hatched of the eggs of ichneumon flies; ſince theſe animals which are viviparous, and are of a very different kind from the worms of the ichneumon flies, equally produce them. A female of the ſpecies here treated of has been ſeen to bring forth ſeven young ones in one day; and thus, from reſiding alone in the tubercles which ſhe had formed on a leaf, ſhe in a little time becomes the mother of a numerous family; each of which raiſes its own tumor or gall on the leaf, which at firſt are ſmall and round, and of a beautiful red like kermes.

Such of theſe as are of the male ſpecies have a certain time of reſt, in which they lie buried in a ſilky matter, and afterwards become winged, flying nimbly about; whereas the females never are able to fly, but remain always half-winged. It is to be obſerved, however, that there is a different ſpecies of winged inſects frequently found flying about the female *pulices*, as well as their own males; ſo that all the ſmall-winged inſects about them are not to be thought of their own ſpecies. Theſe do not greatly differ in figure; but the one are harmleſs, and the others have ſtings, and hurt any part of the body on which they fix. *Reaumur*'s Hiſt. Inſ. T. 1. See PSEUDO-*pulex*.

Locuſta-PULEX. See CICADULA.

PULMONARIA, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is a cylindric, pentagonal, perianthium, conſiſting of one leaf divided into five ſegments at the edge, and remaining after the flower is fallen. The flower conſiſts of one petal, in form of a cylindric tube, of the length of the cup, with its edge ſlightly divided into five ſegments, and its mouth open. The ſtamina are five very ſhort filaments, ſituated in the opening of the flower. The antheræ are erect, and converge one toward another. The piſtillum has four germina. The ſtyle is ſlender and ſhorter than the cup, and the ſtigma is obtuſe and emarginated. The cup, without ſuffering any changes, ſerves in the place of a fruit, containing in its bottom four roundiſh-leaved obtuſe ſeeds. *Linnæi* Gen. Pl. p. 59.

The characters of *pulmonaria*, according to Mr. Tournefort,

are theſe: the flower conſiſts of one leaf, and is funnel-faſhioned, and divided into many ſegments at the edges. The mouth is wide, and reſembles a ſort of baſin. The cup is tubular, and uſually of a pentangular form, and divided into five ſegments. From this ariſes a piſtil, which is fixed in the manner of a nail to the lower part of the flower, and is ſurrounded by four embryos, which afterwards ripen into ſo many ſeeds, which are contained in the enlarged cup. *Tourn.* Inſt. p. 136

The ſpecies of *pulmonaria*, enumerated by Mr. Tournefort, are theſe: 1. The common ſpotted-leaved *pulmonaria*, reſembling bugloſs. 2. The common broad-leaved white-flowered *pulmonaria*. 3. The blue-flowered Alpine *pulmonaria*, with ſoft and roundiſh leaves. 4. The plain-leaved not ſpotted *pulmonaria*. 5. The echium-leaved *pulmonaria*. 6. The white-flowered *pulmonaria*, with echium leaves. 7. The red-flowered echium-leaved *pulmonaria*. 8. The blue-flowered, echium-leaved *pulmonaria*. 9. The narrow-leaved Alpine *pulmonaria*. 10. The ſoft *pulmonaria*, with the ſtrawberry ſmell. 11. The annual Cretic *pulmonaria*, with bladder cups. 12. The *pulmonaria*, with roundiſh, plain, green, not ſpotted leaves.

The figure of the flower-cup is what principally diſtinguiſhes the *pulmonaria* from the bugloſs, *&c.* and the plants of it may be uſually known when not in flower, by their long, rough, and not divided leaves, which in almoſt all the ſpecies are ſpotted, ſo as to reſemble the tabid lungs of an animal, whence it had its name. *Tourn.* Inſt. p. 137.

The common ſpotted *pulmonaria*, or, as we vulgarly call it, *ſage of Jeruſalem*, is eſteemed an excellent medicine in many of the diſorders of the lungs. It has been known to do great ſervice in ſpittings of blood, and ſtands greatly recommended, externally uſed, as a conſolidator and healer of old ulcers, as well as freſh wounds.

PULSATILLA, *paſque-flower*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the roſaceous kind, conſiſting of ſeveral leaves diſpoſed in a circular form. The piſtil ariſes from the center of the flower, and is ſurrounded by ſtamina. The piſtil becomes at length a fruit, to which there are fixed a number of ſeeds, each of which terminates in a ſlender filament. The *pulſatilla* has, like the anemone, a regular ſet of leaves growing from one part of the ſtalk under the flower; but differs from it in having its ſeed naked, and terminated by the long filament juſt mentioned.

The ſpecies of *pulſatilla*, enumerated by Mr. Tournefort, are theſe: 1. The purple *pulſatilla*, with thick leaves and a large flower. 2. The double violet-coloured *pulſatilla*, with fimbriated flowers. 3. The marſh *pulſatilla*, with more finely divided leaves and ſmaller flowers. 4. The finely divided-leaved or marſh *pulſatilla*, with paler coloured flowers. 5. The *pulſatilla* with ſmall blackiſh flowers. 6. The ſmallage-leaved ſpring *pulſatilla*, with larger flowers. 7. The ſmallage-leaved ſpring *pulſatilla*, with ſmaller flowers. 8. The ſmallage-leaved autumnal *pulſatilla*. 9. The roundiſh-leaved *pulſatilla*. 10. The *pulſatilla* with red, obtuſe-leaved flowers. 11. The white-flowered *pulſatilla*. 12. The double white Pyrenean *pulſatilla*. 13. The celeri-leaved yellow-flowered *pulſatilla*. 14. The wild parſnep-leaved yellow *pulſatilla*. 15. The yellow rough-leaved Alpine *pulſatilla*. *Tourn.* Inſt. p. 284.

PULSATOR, a name given by ſome writers to that ſpecies of beetle, commonly known among us by the name of the *death-watch*, and about which ſo many ſuperſtitious fancies prevail.

The manner of the creature's making its noiſe is this: it lifts itſelf up on its hind legs, and ſomewhat extending, or rather inclining its neck, ſtrikes down its face with great ſtrength and agility, upon any ſubſtance on which it happens to be placed. It is often found on the matted bottoms of old chairs, and ſeems to uſe the motion which makes this noiſe, in order to get its food. It is uſually found ſtanding on a part of the ſedge where the outer covering is off, and the pithy part expoſed; and it uſually works at the ſide or edge of this place, in order to the getting off more of the outer bark. Where it is found there are uſually ſeveral of theſe bald places in the ſedge, which ſeem to have been places where it was before employed in getting its food. Every ſtroke the creature gives may be ſeen to have a ſenſible effect upon the ſedge, and where it ſtrikes a ſound part, the impreſſion is ſeen to be a dent as large as a ſilver penny.

The creature is called by ſome *ſcarrabæus galeatus*, from a ſort of galea, or helmet, which it wears. It is about a quarter of an inch long, and is of a duſky brown colour. Its helmet is very broad in compariſon of its bulk, and when the creature is at reſt, it draws in its head under this covering.

PULSE (*Cycl.*)—It is certain that the climate will alter the *pulſe* of perſons, and on this is founded the obſervation of *pulſes* being naturally various in the people of different nations. The *pulſes* of Frenchmen are ſaid to be more equal and quick, and thoſe of the Britiſh, Dutch, and Germans, more irregular and uncertain; and this is to be jointly attributed to the air of the country, and to the manner of living.

In general, the higher and nearer the ſun is, the quicker is the *pulſe*; and the lower and farther off, the ſlower. In rainy ſeaſons, the *pulſe* is more free and quick, becauſe of the ſmaller preſſure of the atmoſphere. It is more impetuous in the ſpring; more equal after a quiet ſleep; weak and uncertain in men very intent upon buſineſs.

Melancholy renders the *pulſe* extremely inconſtant, probably through the great thoughtfulneſs of ſuch men: in bilious tempers it is high and ſtrong; in ſanguine, more equal and regular than in any: in the phlegmatic, equal enough; but more ſlow: in children, eſpecially infants, the *pulſe* is very ſmall; and in old men it is extremely uncertain: in glutonous people it is dull and ſlow, unleſs by drinking it is made ſtumbling and vertiginous: this ſort of *pulſe* alſo frequently foretells ſudden death By too ſparing a diet it becomes ſmall and ſlow, and always abates upon faſting. By the paſſions the *pulſe* may be alſo greatly altered; but moſt of all by fear, joy, and anger. In fevers the *pulſe* is varied according to the beginning, heighth, and declination. In ſcorbutic and hyſteric perſons it is very uncertain: in hydropical perſons it is much ſtopped and interrupted by ſtagnant humors: in the gout it is free and expedite: in the plague, as in the aſthma, it is mightily oppreſſed, unleſs freed by the hot fit. In general, any variation of the *pulſe* certainly denotes ſome alteration in the habit of the body.

The *pulſe* is unequal either in regard to time or ſtrength; that is, it either ſtrikes quicker and ſlower, or ſtronger and weaker. The firſt is common in moſt acute diſtempers, and does not threaten any immediate danger; but the latter, both in acute and chronic caſes, is always a dangerous ſymptom: very often it is the forerunner of death, which happens two or three days after this is firſt obſerved. It is ſaid to be interrupted when the ſtrokes are much ſmaller and weaker than at other times, or their intervals much greater. This firſt ſhews a great decay of ſtrength; and the latter, which is, as it were, a ceſſation for a time, denotes approaching palſies, apoplexies, and the like terrible diſtempers, and ſometimes death itſelf.

The intenſe *pulſe* is when the ſtroke is very hard, the parts being, as it were, upon the bent; or elſe this ſtrength is made up by the multiplicity and frequency of leſs mications, as in the heighth of acute fevers.

The remiſs *pulſe* has ſtrokes leſs quick and ſtrong, and in ſickneſs ſhews more danger than the other. The ſuperficial *pulſe* ſhews an exact temperament of body, as alſo a free and eaſy temper of mind.

The deep *pulſe* ſhews a diſpoſition to melancholy, aſthmas, and lethargies, and is more frequent in the aged than in young people.

The leaping *pulſe* often ſhews no great danger, but the trembling *pulſe* is uſually a fatal ſymptom, after which very few people recover.

But of all others the wandering *pulſe* is the moſt terrible and fatal; this is felt ſometimes in one part of the artery, and ſometimes in another, and ſometimes in no part at all. This is a certain fore-runner of death, and that uſually very ſpeedily following; and if great power in nature gives a ſhort reprieve after this, it is only a very ſhort relief. *Abercromb.* de variat. Pulſus.

The *pulſe* has been obſerved to beat faſter in perſons electrified. Phil. Tranſ. N°. 478. p. 59. See ELECTRICITY, *Cycl.*

PULSILOGIUM, a name given by authors to a pulſe-watch, or inſtrument to meaſure the celerity of the pulſe. Sanctorius was the firſt inventor of this machine; but ſeveral have ſince ſpoke very largely in praiſe of it, and Sir John Floyer wrote a treatiſe on this ſubject.

PULSUS *latus*. See LATUS *pulſus*.

PULVERATICUM, in Roman antiquity, the fee paid to ſurveyors for their trouble; alſo a ſum exacted from the provincial cities by their garriſons. *Pitiſc.* in voc.

PULVILLUS, in ſurgery, a term uſed to expreſs a little pledget-bolſter, or compreſs.

PULVINARIA, in Roman antiquity, cuſhions upon which the ſtatues of the gods were laid in the temples, at the time that thanks were given for ſome ſignal victory. *Danet* in voc.

PULVIS (*Cycl.*)—PULVIS *e bolo compoſitus*, a powder preſcribed in the late London pharmacopœa, and intended to be uſed in the place of the *confectio Fracaſtorii* or *diaſcordium*. It being ſuppoſed that this medicine was by its author meant as an alexipharmic, and being now principally uſed as an aſtringent, it was thought neceſſary to make this ſeparate medicine.

This powder is compoſed of bole armenic, half a pound; cinnamon, four ounces; and tormentill-root and gum arabic, of each three ounces, made together to a powder. *Pemberton's* Lond. Diſp. p. 311.

PULVIS *bezoarticus*, the name given in the late London diſpenſatory to the powder commonly called *Gaſcoign's powder*.

This is now ordered to be made only of crab's claws, one pound; prepared pearls and red coral, of each three ounces; and oriental bezoar, an ounce. The amber and hartſhorn are left out of the compoſition, as improper or inefficacious ingredients; and the whole ordered to be kept alſo without the bezoar, and called by the name of *pulvis e chelis cancrorum compoſitus*, the name the Gaſcoigne's powder uſed to be known by. *Pemberton's* Lond. Diſp. p. 313.

PULVIS *e ceruſſa*, a medicine preſcribed in the late London pharmacopœa, in the place of the white troches of Rhaſes or Razi. See TROCHE.

The late compoſitions of that medicine had been much more com-

complex than the original receipt of that author, and the college have therefore retrenched the number of ingredients in them; and as the medicine is always to be powdered for use, it is now ordered to be kept in the form of powder.

It is thus prescribed there: take cerus, five ounces; sarcocolla, an ounce; gum tragacanth, half an ounce; make the whole into a fine powder. *Pemberton*'s Lond. Disp. p. 312.

PULVIS *contrayervæ compositus*, the name given in the late London dispensatory to the composition usually called *lapis contrayervæ*.

The preparation is also there made much less complex, by leaving out the less powerful absorbent powders, and using the compound powder of crabs claws in the place of all.

This is now ordered to be made only of the compound powder of crab's claws, a pound and half; and contrayerva-root, five ounces. *Pemberton*'s Lond. Disp. p. 313.

PULVIS *e myrrha*, a form of medicine prescribed in the late London dispensatory, to supply the place of the troches of myrrh.

The composition is the same but for the omission of one or two of the ingredients, supposed not of the same virtues with the rest, or very disagreeable to the taste.

It is ordered to be made thus: take of dried leaves of rue, of dittany, of crete, of myrrh, each an ounce and half; of assafœtida, sagapenum, Russia castor, and opopanax, each an ounce, beat altogether to a fine powder. *Pemberton*'s Lond. Pharm. p. 314.

PULVIS *e scammonio*, a name given in the late London dispensatory to the purging powder commonly called the *Earl of Warwick's powder*.

It is, however, wholly altered here, the crystals of tartar and diaphoretic antimony being left out, and the medicine ordered to be made only of four ounces of scammony, and three ounces of burnt hartshorn reduced together to a fine powder. *Pemberton*'s Lond. Disp. p. 315.

PULVIS *e succino*, *amber-powder*, a form of medicine prescribed in the late London pharmacopœa, to stand in the place of the troches of amber, or *trochisci de carabe* of former dispensatories.

The composition of the powder is this: take prepared amber and gum arabic, of each ten drachms; juice of hypocistus, balaustines, and Japan earth, of each five drachms; olibanum, half an ounce; strained opium, a drachm; mix all together into a fine powder. *Pemberton*'s Lond. Disp. p. 316.

PULVIS *fœcundans*, in natural history, a name given by late writers to that fine powder which is contained in capsules upon the stamina or threads in the flowers of plants, and is called by some English writers the *maleduſt*, and in general the *farina* of flowers.

This dust was for many ages looked upon as a recrement of the plant; but it has of later times been found to consist wholly of organical bodies, which are in reality the embryo plants; and entering into the seeds in the capsules, while yet buried in the style, they fœcundate them, and put them in a state to vegetate and produce their species. On the most accurate examination, however, with microscopes, the farina, or *pulvis fœcundans* of plants, has never been found to carry any likeness to a *plantula seminalis*, or the rudiments of the plant which was to be produced by it. All that the microscope does in this case, is but increasing the apparent magnitude of the particles of the powder; but they are found, when thus viewed, to be no other than a congeries of globules, which are all alike in the same species, and composed of fibres and vasicules wrought together in such a curious manner, to the keeping whole as long as necessary, and bursting when necessary, that it appears evident they are destined for some very great uses. See Tab. of microsc. Obj Class 2.

Verdresius, in the Acta eruditorum, has given a very curious detail, and has figured and described fifty kinds of this dust, most of which are considerably different from one another; tho' some are nearly alike. He observes, that in all the number of flowers he examined, he found no farina, or *pulvis fœcundans*, that did not resemble one of these fifty; and that, therefore, whoever engages in this curious research, should first observe these, and then refer the others to one or other of them, as they next approach them, and mention their differences, if any, by way of characters, by which they might always be known. Act. Erudit Ann. 1724. p. 410.

The author of this curious treatise, from a multitude of experiments, seems to think these globules of dust rather to represent the testicles of male animals, than any other part of the organization of any known body. The numerous fibres they are composed of, which are convoluted and twisted in a most remarkable and intricate manner, and the vesicles contained in their substance among these fibres, shew a great resemblance to the testes in structure, and in their apparent uses.

The principal farinæ he describes, are those of the yellow water iris, or flag-flower, which are of an oval figure, somewhat hairy, and covered either in part or entirely with a thin membranous coat. The tulip farina, which is flat, broad, and somewhat angular at one end, tho' rounded at the other. The honey-suckle farina, which is broad and truncated at one end, and roundish, but somewhat pointed at the other. The farina of the iris-leaved yellow lilly, which is oblong, pointed at one end, and rounded at the other; and when separated perfect from its capsule, has a tail at the rounded or largest end. The farina of the hypericum, which is oblong and slender, truncated at both ends, and marked with a deep longitudinal furrow on one side, resembling the channel in the midst of the seeds of corn or oats, and serving to the same purpose, the opening of the granule. The marshmallow farina, which is like the mallow and holy oak, a very beautiful object, being round granules, surrounded with a regular circle of spines or prickles. The Indian cress has a farina, which in most lights appears of a triangular figure. The lysimachia, or willow-herb, has a farina resembling that of the hypericum, but shorter and thicker, truncated at both ends, and with a longitudinal furrow, tho' but a slight one. That of the scabious is smoother than most others, and approaches most of all to a globular figure. That of wormwood is also globular, and small, and when separated entire, has a stalk or pedicle like that of the yellow lilly. The farina of the clematitis is very singular, it being of a globular figure, but consisting of one globule enclosing another; or of a pale-coloured globule, contained in a thick browniſh husk, which opens in one determined part, and lets out the globule it contained. That of the white jessamine consists of half globules, or a sort of hemispheres, flat on one side, and regularly rounded on the other.

The farina of tobacco is oblong and slender, and pointed at both ends, sometimes very sharply, sometimes more obtusely, according to its state of ripeness. This has also an oblong furrow running from end to end on one side, which is the place where it is to open, as the hypericum and some others have. The farina of the passion flower consists of very large dusky-coloured globules, which, when separated entire, have tails or pedicles; but those very short. That of the gourd is a more elegant object than almost any other: it is round, and surrounded with a row of flat and obtuse rays, resembling the mallow farina, except that they are not pointed. The cucumber, tho' a plant nearly allied to this, yet produces a simple, small, and roundish farina. The cabbages of some kinds have farinæ composed of simple, oval bodies; in others these globules are more oblong, and resemble very perfectly the naked grains of wheat, having the same sort of furrow running longitudinally from end to end. The dust of the hyacinth is very long and slender, often crooked, and always obtuse at one end, and pointed at the other. The farina of some of the species of clary is very large, perfectly round and smooth, and has the mark of an opening in one part. It is probably like that of the clematitis, one globule contained within another, and this the opening thro' which the inner one is to pass. The author of these curious observations has given good figures of these and of the other of the fifty of his farinæ, to which we refer the reader. Act. Erudit. Ann. 1724. p. 411.

Puteolanus PULVIS, in natural history, the name of a fossile substance, found in form of powder, and famous for its consolidating under water. The accounts of it seem, however, to be a little erroneous.

The substance itself is a pale greyish powder, composed of particles so extremely minute, as to escape the distinction even of the best glasses, and appear, when viewed by the microscope, only a loose, very fine, irregular powder. It has among it a few small spangles of talc, and being shook up in a vial of water, leaves a whitish muddiness in it, which is very long in subsiding. If wetted with salt-water, it immediately dries into a firm solid mass, like a stone. It does the same also in common water; but the mass is less firm.

The antients were well acquainted with this substance and its properties. It is said, indeed, that on running down into the water, it becomes a hard stone, while it remains under it; but this is probably a mistake, arising from this, that the powder was continually running down the hills into the sea, and lodging on their sides in large quantities in many places; when these masses became wet with the waves, in storms or high tides, and afterwards deserted by them, they naturally hardened into so many masses of a sort of stone: and these were probably what authors have seen and described, for they never, probably, searched for these masses under water. The principal use of this powder among the antients, was in mixing with their cements for buildings sunk into the sea. It is at present well known in France and Italy, as an ingredient in that sort of plaister they call *pozzolane*.

The remarkable quality of its coalescing on its being mixed with water, is probably owing to its having in its composition a quantity of a certain earth known in almost all ages and countries for coalescing into a kind of plaister without previous burning. The antients knew this earth by the name of *gypsum tymphaicum*; and we, by that of *calx nativa*. It is very common on the sides of hills in many parts of Italy. *Hill*'s Hist. of Foss. p. 573.

PUMICE *(Cycl.)*—There have been many different conjectures about the nature and origin of this substance; but the very earliest writers of antiquity, and the most judicious of the later ages, agree, that it is no native fossile, nor in its original condition but a mere cinder, or remainder of some other fossile body, calcined by a violent fire.

This may have been either subterranean and unseen, or perhaps since extinguished; or that of the well-known burning

mountains, on and about which *pumices* are conſtantly found, and that in vaſt abundance. The more violent exploſions of theſe may alſo, at one time or other, have toſſed vaſt quantities of *pumices* to places ſo diſtant as to make people forget from whence they came; or into ſeas, whoſe tides and ſtorms may have carried them to other ſhores, near which no ſuch repoſitories of *pumices* are ſituated; and this might very much puzzle and miſlead people about its true nature and origin.

The great quantities of *pumices* found in this manner, far from fires by which they might have been formed, floating on the ſurface of the ſea, thus thrown on it, or perhaps raiſed by the burſting of vulcanos from its bottom; and ſomething altered from their original form and colour, by being waſhed and rounded by the motion of the waves, and by rolling againſt one another, gave riſe to an opinion in ſome, that theſe were of another kind, and were different from thoſe *pumices* found on the burning mountains, and that they were formed by the concretion of the froth of the ſea. Many have ſuppoſed, that the authors who have favoured this opinion ranked the alcyonia among the bodies they call *pumices* ſo formed; and Theophraſtus has been very unjuſtly cenſured of the ſame fault, tho' not guilty of it. *Hill*'s Theophraſtus, p. 48.

There are whole mountains in the principality of Heſſe, which conſiſt of rocks of the *pumice*-ſtone, as it is there vulgarly called. This is a ſpungy and cavernous ſtone, of a grey colour, and very much reſembles the *pumices* in external appearance; but on examination, proves to be a very different ſubſtance, and there is not the leaſt ground for ſuppoſing, that it owes its preſent appearance to the action of fire, as the common *pumices* thrown out of the burning mountains certainly do. It is very neceſſary, in order to treat accurately of the nature of the *pumice*-ſtone, to diſtinguiſh rightly between theſe ſtones and ſuch as have been burnt into their ſpungy ſtate. Yet this is generally neglected, and theſe are called *pumices* as well as the reſt, and all are ſuppoſed to be of the ſame origin.

PUMPING *at ſea*, is uſually done by ſpells, that is, by relieving the men with freſh ones, and counting how many ſtrokes they *pump* each watch. By this means they know if the ſhip be ſtanch, or how her leaks increaſe.

When all the water is drawn up, and there comes up nothing but wind and froth, they ſay the *pump ſucks*.

PUMPKIN. See the article PEPO.

PUNARU, in zoology, the name of a ſmall fiſh of the alauda kind. It has an oblong body, and a thick head, obtuſe at the ſnout. The mouth is ſmall, and in the lower jaw there are only two oblong teeth, which are ſharp and pointed like needles. The eyes ſtand high in the head, the pupil is black, and the iris yellow; and over theſe there are two ſhort red filaments. The gills are large, and have two oblong fins placed behind them. The back fin reaches from the head to the tail, and is prickly at the edge. The belly-fin reaches from the anus to the tail. The ſkin and fins are all brown.

Beſides this, there is another ſpecies, variegated on its ſides with lines of a duſky purple. Its jaws beſet with very ſmall teeth, and its fins not prickly. Both kinds are found among the rocks about Braſil, and ſometimes get into the ſhells of the larger ſhell-fiſh. *Marggrave*'s Hiſt. Braſil.

PUNAY, in natural hiſtory, a name given by the people of the Philippine iſlands to a very beautiful ſpecies of turtle, common in their woods.

It is of the ſize of a ſmall parrot, and is of a fine green colour; but the extreme feathers of its wings are tipped with white, and the lower part of its belly is of a ſaffron colour. Its beak is yellow.

PUNCH *(Cycl.)*—PUNCH, in the manege, a well ſet, well knit horſe, called in French *gouſſaut*. He ſhould be ſhort-backed, and thick ſhouldered, with a broad neck, and well lined with fleſh.

PUNCTICULARIS *febris*, a name given by ſome authors to a fever attended with ſmall eruptions.

PUNCTURE *(Cycl.)*—Among the number of the moſt ſimple wounds are reckoned thoſe which are made by *puncture*, or ſtabbing on the external parts, and not penetrating to a very great depth. In theſe wounds, after the blood has been ſtopped at the firſt dreſſing, by the application of dry lint, the common digeſtive, or *linimentum Arcæi*, is to be ſpread upon a pledget and applied once every day; or if the diſcharge is but ſmall, every other day, covering the dreſſings with a plaiſter and compreſs, and ſecuring the whole with a proper bandage. At each dreſſing, care muſt be taken to remove every thing that will give way readily; the pus or ſanies is to be gently wiped off with fine raggs; and unleſs a great diſcharge of matter make it neceſſary, too frequent dreſſings do rather harm than good. The firſt dreſſings that have been applied, eſpecially when there has been a flux of blood, ſhould by no means be removed forcibly; but be left till they will fall off of themſelves, which they will do after a ſuppuration is formed: and by this caution, much pain, and, perhaps, a freſh hæmorrhage, are avoided.

When a *puncture*, however, penetrates very deep, the cure is attended with many difficulties; eſpecially if it is made perpendicularly down, and has no depending orifice: for, in this caſe, the blood and matter are eaſily collected at the bottom, and protract the cure, and frequently form fiſtulæ. To prevent theſe conſequences, it will be proper to preſs the wound from the bottom upwards, to apply a compreſs toward the bottom of the wound externally, and to apply a bandage over all, which preſſes much tighter upon the lower than upon the upper parts. If all this precaution, however, prove of no effect, which, indeed, is too often the caſe, it is the moſt proper method to make a large opening at the bottom of the wound, before any fiſtulæ are formed there. In order to make this opening to the greater advantage, it will be proper to get a particular ſort of probe or needle, very blunt at top, and at the other end provided with a large eye, or hole, through which a linnen rag may be paſſed. This probe is to be paſſed to the bottom of the wound, and the blunt end of it preſſed outwards toward the ſkin, till you can feel it with a finger: when you can feel it, cut down upon it if you can ſafely, and make a large opening; ſpread the rag that you have run through the eye of the probe with ſome vulnerary balſam, and draw it through the wound after the manner of a ſeton, and leave it there, dreſſing up both the orifices with the ſame balſam, and covering the whole with compreſſes and the proper bandages. In every ſucceeding dreſſing, that part of the rag that is left out of the wound is to be ſpread with freſh ointment, and the lower part drawn down till this takes place in the new wound. This method is to be continued till the wound is well cleanſed, the diſcharge greatly diminiſhed, and all in a readineſs to heal: the ſeton is then to be removed, and the wound healed as uſual. *Heiſter*'s Surg. p. 35.

PUNICA, the *pomegranate*, in botany, the name of a genus of trees, the characters of which are theſe: the flower is of the roſaceous kind, being compoſed of ſeveral petals, arranged in a circular form. The cup is of the ſhape of a bell, and divided into ſeveral ſegments at the edges; this finally becomes a fruit of a roundiſh figure, coronated at the end, and divided into many cells within, which contain many kernels full of juice, affixed to a placenta, and ſeparated from one another by very fine membranes: theſe contain ſeeds of an oblong figure.

The ſpecies of *pomegranate*, enumerated by Mr. Tournefort, are theſe: 1. The common cultivated *pomegranate*. 2. The common wild *pomegranate*. 3. The cultivated *pomegranate*, with ſweet fruit. 4. The cultivated *pomegranate*, with fruit of a middle taſte between ſweet and ſour. 5. The large fruited *pomegranate*, with large, criſp, amathyſtine kernels. 6. The great double-flowered *pomegranate*, or balauſtine. 7. The *pomegranate* with a double variegated flower. 8. The *pomegranate* with ſmall double flowers. And, 9. The low dwarf American *pomegranate*. *Tourn.* Inſt. p. 636.

PUNICUS *lapis*, a name given by the writers of the middle ages to a ſtone of a ſpungy texture, the powder of which was good in diſeaſes of the eyes.

This ſeems to have been no other than the pumice, the writers of theſe times having been ſtrangely incorrect in their orthography; and all the virtues aſcribed to this ſtone, as alſo the places where it was found, which are the Æolian iſlands, *&c.* ſeeming to have been copied from Pliny's account of the pumice.

PUNK, in natural hiſtory, the inward part of the excreſcence or exuberance of an oak. It is uſed by the Indians in Virginia for medicinal burning, as the Eaſt Indians uſe moxa. Phil. Tranſ. N°. 454, ſect. 1. See MOXA.

PUPIL *(Cycl.)*—PUPIL *contracted*. The diſtemper of the eye called by ſurgeons a *contraction of the pupil*, is ſo total or cloſe a contraction of that part as will not let it tranſmit light enough to the bottom of the eye, to enable the patient to ſee objects diſtinctly. Sometimes this diſorder is from infancy, and ſometimes it ariſes from an intenſe inflammation of the eye, or other cauſes.

The cure of this is extremely difficult; but Mr. Cheſelden has invented a method by which he has often proved very ſucceſsful in his attempts to relieve it. The method is this: the eyelids being held open by a ſpeculum oculi, he takes a narrow ſingle-edged ſcalpell, or needle, almoſt like that uſed in couching for a cataract, and paſſing it through the ſclerotica, as in couching, he afterwards thruſts it forward through the uvea or iris, and in extracting it cuts through the iris.

If the diſorder is not accompanied with a cataract, it will be beſt to cut through the iris in the middle; otherwiſe, when there is a cataract, the inciſion ſhould be made a little higher in the uvea, that the cataract may not obſtruct the ingreſs of the rays of light. The cataracts that accompany this diſorder are uſually very ſmall, and ſometimes their adheſion to the iris is ſo firm, as to render it impracticable to couch or ſuppreſs them. *Heiſter*'s Surg. p. 417.

PUPPETS, in natural hiſtory, the name given by Swammerdam to the nymphæ of animals, which he diſtinguiſhes from the chryſaliſes by this ſimple name, calling theſe the *gilt puppets*, from their golden colour.

It has been a general diſtinction eſtabliſhed by writers between the nymph and chryſalis, that in the former the limbs and lineaments of the future animal might be ſeen, but in the latter not. But Swammerdam has proved, that the lineaments of every trace, and every part of the animal, is to be ſeen under the

the chryſalis as well as under the nymph ſtate, with proper attention in the examination, and that therefore the diſtinction is founded on a very vague and uncertain baſis. The far greater part of the inſect kingdom are hatched from the egg in the worm ſtate, and become, after a time, changed into theſe chryſaliſes and aureliæ; but ſome are hatched perfect, and in their own form, from the egg. Among thoſe which undergo the change into the chryſalis ſtate, the principal diſtinction is into worms that have legs, and worms that have not any. The breaſt of thoſe worms which have no feet is never changed at all, and among thoſe worms which have many feet, the ſix fore feet are never changed, but ſerve the animal as well in its flying ſtate as in its creeping one. The wings, the horns, the feet, &c. grow up under the ſkin by degrees.

In all worms, of whatever kind, theſe parts may be diſtinguiſhed more or leſs plainly under the ſkin, at the different times of their growth, in different degrees of forwardneſs. Even the frog may be thus traced, by proper care, in the tad-pole, and all its changing from the tad-pole ſtate to that of the perfect animal, is no other than as in the butterfly, the developing and unfolding its parts, as they require a proper age, conſiſtence, and maturity.

Mouffet, and other writers on inſects, call the aurelia a ſeparate and peculiar thing, and expreſly neither an egg nor an animal. Harvey alſo miſtakes the matter as groſly, in calling the aurelia an egg, and ſaying, that the bloodleſs animalcules are produced by transformation; but theſe are expreſſions much to be lamented in the works of ſuch great men, and have been the means of darkening and perplexing the knowledge of the aurelia ſtate in inſects, and muſt be overthrown before any true judgment can be formed of that ſtate.

All the change happening in the *puppets*, or nymphæ, which was ſuppoſed by Harvey to be the production of one animal from another, is in reality no more than the exſudation of a certain abundant moiſture which leaves the animal dry, and all its parts firm and capable of expanding and extending themſelves, and bearing the weather.

Goedartius has alſo propagated another groundleſs error, which, by its conſequences, tends to overthrow all the true knowledge of theſe changes. This is, that the caterpillar may change before its time, and that in this caſe it becomes a very different animal in the winged ſtate. This tends wholly to overthrow the conſtant and uniform law of nature, according to which, all the lineaments of the perfect animal are formed even in the egg, and have only to grow and enlarge in the worm and chryſalis ſtate; and can therefore be ſubject to no change in either.

What has led Geodartius into this error, was real obſervation, only not carried ſo far as it ſhould have been. In ſome of the inſects which ſuffer the chryſalis ſtate, the males are winged and the females not. In theſe the courſe and order of nature is as invariable as in the reſt, all the males being of the winged, and all the females of the reptile kind; but this author, not knowing this great difference in the ſexes, when he had been uſed to ſee a winged creature come out of the chryſalis of a worm he knew very well, and found inſtead of it a creeping animal without wings, ſuppoſed the creature, which was only of a different ſex, to be of a different ſpecies.

Some difference alſo is found in the ſize of the fly produced from the chryſalis of the ſame ſpecies of caterpillar, according to its changing ſooner or later into that ſtate. All the difference, however, is, that if the caterpillar eats its fill firſt, the fly is the larger and the fairer; and if it goes into the chryſalis earlier, then the fly is the leſs perfect: and of whatever ſize the fly is when produced out of the chryſalis, in that it remains; for it can grow no more after it has paſſed this latter change.

From the knowledge of the propagation of this ſort of animal, this author goes up to that of larger creatures, and is firm in the opinion, that there is properly no ſuch thing as generation at all; that all that our blindneſs calls ſo, is only a ſenſible production by the growing of parts at firſt very minute. All the parts of the butterfly may be ſeen, by a proper inſpection, in the caterpillar; and as to the imaginary tranſformation of the caterpillar into the chryſalis, it may be retarded and made to come on ſo eaſily, as to become the object of the ſenſes, and finally ſtopped in the progreſs, ſo as to appear half caterpillar, half chryſalis. *Swammerdam*'s Hiſt. Inſect.

PUPPIS OS, a name given by ſome authors to the os frontis. The future in this bone is alſo called by many anatomiſts the *ſutura puppis*.

PUPULÆ, a name uſed by ſome to expreſs the extremities of the fingers.

PUR *autre vie*, in our law-books, is uſed where lands are held for the life of another.

PURCHASE-*book*, among traders, is the name given to a book which is a kind of journal, containing an account of all the purchaſes made, or things bought in the day.

Purchaſe, in the ſea-language, is the ſame as *draw in*: thus when they ſay, *the capſtan purchaſes apace*, they only mean it draws in the cable apace; alſo when they cannot draw or hale in any thing with the tackle, they ſay, *the tackle will not purchaſe*.

PURETTA, a name given by ſome writers to the common ſhining black ſand, uſed to ſtrew over writing, and erroneouſly called by ſome *ſteel-duſt*.

It is a natural mineral ſubſtance, found on the ſhores near Genoa and in other places.

PURGATIVE *(Cycl.)*—We have had attempts of adjuſting the doſes of *purgative* medicines ſcientifically. Dr. Cockburn endeavoured at the ſolution of this problem; but, it is ſaid, on wrong principles. Dr. Balguy has alſo given us an eſſay on this ſubject in the Med. Eſſ. Edinb. Vol. IV. art. 5.

He aſſumes, that part of the medicine is ſpent on the firſt paſſages, where it acts as a ſtimulus; and that the other part is carried into the blood, and has its effect there by thinning and rarifying it. This being premiſed, 1ſt. If the medicine acts only in the firſt paſſages, the doſe will be as the ſize of the perſon into the conſtitution. 2d. If the whole medicine paſſes into the blood, the doſe will be as the ſize into the ſquare of the conſtitution; and therefore, 3d. You are to doſe ſo much of the medicine as is ſpent on the ſtomach and inteſtines directly, as the conſtitution; and ſo much as is carried into the blood, as the ſquare of the conſtitution, and the ſum into the perſon's ſize, is the quantity required.

The ſame rules hold in vomits. How far in either caſe the practice of phyſic may be thereby improved, we leave to the judgment of the learned. The ſolution of the problem ſuppoſes a great poſtulatum, no leſs than the art of meaſuring a perſon's conſtitution!

PURGATION, *purgatio*, in rhetoric, is uſed for that kind of defence which takes place when the accuſed perſon owns the fact, but denies that he did it with deſign, or with any bad intention. *Voſſ.* Rhet. l. 1. p. 148.

PURIFICATION, in pharmacy. See TRYING.

PURPURA, the *purple-fiſh*, in natural hiſtory, the name of a genus of ſhell-fiſh, the characters of which are theſe: it is a univalve ſhell, jagged and beſet from head to tail with ſpines, tubercles, umbos, or ſtriæ. The mouth is ſmall and roundiſh; the tail is ſhort, and uſually the baſe runs out into a long beak.

It has been uſual with moſt authors to confound together the genera of the murex and *purpura*, and to uſe the words as ſynonymous: but tho' there is ſome external reſemblance between many of the ſhells of the two genera, yet they are eaſily diſtinguiſhed by this, that the mouth of the *purpura* is leſs long, and is leſs dentated and alated than that of the murex. The body and the head of the ſhells of this genus are not ſo elevated as thoſe of the murex kind, and are not covered with points or buttons at the mouth. If a ſhell is therefore found to have a ſmall, ſmooth, and round mouth, and a body covered with undulated leaves, as it were, like thoſe of ſavory or endive, and ſometimes with long points, and its tail, whether long or ſhort, be hollowed and ſomewhat bent, this may be called a *purpura* and not a murex.

The antients diſtinguiſhed three kinds of *purpura*, one which had a long and crooked tail, made hollow like a tube or pipe; a ſecond which had either no tail at all, or at the moſt a very ſhort one; and a third which had no ſpiral head, or, as we ſhould expreſs it, no clavicle.

On examining the whole family of the *purpuræ*, we may diſtinguiſh four remarkable ſpecific differences among them. The firſt of theſe comprehends thoſe *purpuræ* which have the body of the ſhell garniſhed with a ſort of undulated foliage in clouded ridges, and have a ſhort and crooked tail. The ſecond comprehends thoſe which have the body of the ſhell covered with acute points, and have a long tail. The third comprehends thoſe which have as long a tail as the former, but have a ſmooth body, or at the utmoſt have only a few ſlight protuberances and wrinkles on it. And the fourth takes in thoſe which are ſmall, and have an elevated clavicle, a ſhort crooked tail, and the body of which is covered either with ſlender ſpines or hairs. See Tab. of Shells, N°. 14.

This ſpecies of fiſh, as well as the murex, ſerved among the antients to dye the fine purple colour they were ſo fond of, and ſome of the buccina have been of late found to have the ſame juice. The *purpura* and murex are both fiſhed up in great plenty in the gulph of Tarentum; but the ſmall quantity of the coloured juice which each fiſh contains, and the neceſſity of uſing it before the animal dies, makes it impoſſible to bring it to any regular article of traffick. The antients uſed this colour only on cotton and woollen ſtuffs, whereas our cochineal, which was unknown to the antients, ſtrikes equally well on ſilks and ſtuffs.

The *purpura* lives on other fiſh. It uſually hides itſelf at a ſmall depth in the ſand, ſometimes even in freſh-water rivers, and as it lies hid, it thruſts up a pointed tongue, which wounds and kills any thing that comes over it. We frequently find ſea-ſhells with round holes bored through them, as regularly as if made with a boring inſtrument: theſe are generally allowed to be made by the tongue of the *purpura*, in order to its feeding on the fiſh within.

The *purpura* has two horns like that of a ſnail; and Fabius Columna ſays, that they have eyes in theſe, not placed at the ends, as in the ſnail, but in the middle of each horn.

Of the ramoſe, or branched *purpuræ*, with ſhort tails, we have the following ſpecies preſerved in cabinets. 1. The rough *purpura*, with a fleſh-coloured lip, armed with three rows of branches. 2. The yellow *purpura*, with three rows of high branches. 3. The tribulus, or whitiſh *purpura*, with three rows of leſs jagged branches. 4. The fine armed *purpura*, with the branches jagged in the manner of the foot of a toad, with a diſtinct clavicle. 5. The leſs rough *purpura*, with ſix rows of branches. 6. The curled lettuce *purpura*, jagged from the head to the baſe, and having ſix rows of branches.

Of the ſpinoſe *purpuræ* with long tails, we have theſe: 1. The great ſpinoſe *purpura*, with very long ſpines. 2. The ſmall ſpinoſe *purpura*, with three rows of ſhorter ſpines. 3. The ſmall rough *purpura*.

Of the *purpuræ* covered with tubera, having a long beak and long tail, we have the following: 1. The woodcock *purpura*, with a long tail and no ſpines. 2. The leſs ſpotted woodcock *purpura*. 3. The ſmall brown woodcock *purpura*.

Of the thick coſtated, or ribbed *purpuræ*, with crooked beaks, we have the following ſpecies: 1. The marble coſtated and tuberous *purpura*, with blue faſciæ. 2. The ſpinoſe marbled *purpura*.

Of the hairy *purpuræ*, with long clavicles, we have the following ſpecies: 1. The grey *purpura*, with three rows of ſpines or hairs, with an erected clavicle and ſtrait beak. 2. The crooked beaked hairy *purpura*, with ſeveral ſetoſe fimbriæ.

Of the thin oculated *purpuræ*, with compreſſed clavicles and ſhort beaks, we have the following ſpecies: 1. The ſea-porcupine, or oculated *purpura*. 2. The porphyry *purpura*. Hiſt. Nat. Eclairc. p. 298.

The *purpura* is a ſhell-fiſh very well known, and has been known alſo in almoſt all times to afford a purple liquor; but as there has been no method diſcovered of bringing this liquor into uſe in dying, the fiſh has been neglected, and its juice never attempted to be brought into uſe.

The juice which gives this beautiful purple colour is, while it remains in the body of the animal, and while that is in health, wholly white; but no ſooner is it expoſed to the ſun, than it begins to change colour, and in leſs than five minutes goes through the ſeveral changes of pale green, yellowiſh, and a beautiful emerald green: after this it becomes of a deeper and duſkier green, then bluiſh, reddiſh, and finally a deep and very beautiful purple. Sometimes the juice is found naturally green in the animal; this is probably from the creature's being in a diſeaſed ſtate: but when it is naturally thus, it immediately becomes red, and afterwards purple, on being expoſed to the ſun, its ſeveral preceding changes ſeeming to have been made already in the body of the animal.

If a piece of linnen be rubbed over with this juice, and part of it expoſed to the ſun, part not, that only will turn red which is ſo expoſed, the other remaining green without any alteration; and it is obſerved, that the ſtronger the ſun ſhines, the quicker the change appears, and probably the colour is in proportion alſo the more beautiful and lively. And it is very remarkable, that if a needle, or any other opake body, be laid upon the linnen which is yet green, and is to become red on being expoſed to the ſun; after ſuch an expoſure the whole ſhall be changed red or purple, excepting only that ſmall ſpot which is covered by the needle, which will ſtill remain green.

A plate of glaſs, tho' it be three inches thick, will not prevent the colour from changing purple by being laid over it; but the thinneſt piece of metal will keep it wholly green. The one being opake, and the other pellucid, are evidently the only reaſons for this difference.

If the coloured linnen be ſucceſſively covered by three pieces of paper, the one blacked with ink, the other in its natural ſtate, and the third rubbed over with oil, it will change colour on being expoſed to the ſun in different degrees; and that exactly in proportion to the degree of tranſparence in each of the papers: moſt of all in that which was covered with the oiled paper, ſomething leſs than that covered by the paper in its natural ſtate, and leaſt of all in that which was covered with the blacked paper, as that is leaſt tranſparent.

The common heat of a fire, or that of a red hot iron, produce no change at all in the colour when green. The vapour of burning ſulphur produces a little; but the green which had not changed to purple by theſe experiments, immediately changed to it on being expoſed to the rays of the ſun.

Theſe experiments were all made in the months of January and February, by Mr. Du Hamel, in Provence; and the ſun having power to change the colour ſo ſpeedily there in theſe cold months, probably in a warmer climate or ſeaſon the air would have been ſufficient for the purpoſe, without the open ſun; ſince it ſeems, from experiment, that both the ſolar rays, and the light alone in a cloudy day, can act upon this colour. The light and heat of the ſun both act on this colour: light is always ſufficient to produce the effect; but the heat may eaſily be too great, or too little, and to do the whole in perfection it muſt be at a certain middle degree.

This beautiful purple, if it can ever be brought into uſe in dying, will have one very great advantage from its viſcoſity The pieces of cloth that had been ſtained by it retained their colour, in ſpite of ſeveral boilings in different liquors, which Mr. Du Hamel made them paſs through; and the colour, on examination, was found not to be ſuperficial, but penetrated the whole body of the ſtuff which was tinged by it. There are many inconveniences which muſt naturally attend the uſe of this ſubſtance as a dye, but they may, perhaps, all be got over by care and application. It is very certain, that it is of too viſcid a nature eaſily to penetrate many ſubſtances; but it is alſo certain, that this might be obviated by diſſolving it in ſome proper liquor. It appears very plainly, that the antients had a method of thus diſſolving their purple; but we neither know what was their purple, nor what was its diſſolvent; nor, which would be of much more conſequence to us at preſent, what is the proper diſſolvent for our own. Mem. Acad. Scien. Par. 1736.

Perſian PURPURA, the ſame with the Perſian-ſhell, a ſpecies of dolium. See DOLIUM.

PURPUREA *febris*, the *purple fever*, in medicine, the name given by authors to a ſpecies of *fever*, called alſo by ſome a *miliary fever*.

It is an acute, continual, and exanthematous *fever*, in which nature ſeems to be endeavouring to drive out the ſubtle morbific matter to the ſurface of the body, by increaſing her ſecretory and excretory motions. *Junker*'s Conſp. Med. p. 325.

This *fever* is divided into two kinds; of the which, one is called *purpura rubra*, or the *red purple fever*; and the other by a very odd form of expreſſion, the *purpura alba*, or *white purple fever*.

The white *purple fever* is uſually malignant; it is eaſily complicated with the petechial *fevers*, and in ſome places has of late years been found often to affect lying-in women.

The red *purpura* is much more benign and mild than this, and, indeed, often is attended with no danger.

Theſe two ſpecies of *purpura* ſeem to differ as much as the ſmall-pox and meaſles do from one another, the white *fever* of this kind being uſually as much more fatal than the red, as the ſmall-pox is more fatal than the meaſles; but as there are caſes in which the ſmall-pox is mild and benign, and the meaſles are ſometimes dangerous, ſo in theſe diſeaſes, out of the natural courſe, the white is ſometimes mild, and attended but with a ſlight *fever*, while the red is fatal, and attended with a very high one. As the ſmall-pox alſo has white puſtules, and the meaſles only protuberances on the ſkin; ſo the white *purple fever* has alſo regular white puſtules, while the red has only ſuch protuberances as thoſe of the meaſles. *Junk*'s Conſp. Med. p. 327.

Signs of theſe diſeaſes. The white kind ſeizes the patient with a general ſhivering and coldneſs, and a ſtraitneſs of the præcordia, with great anxiety of mind, and afterwards ſhews itſelf in alternate changes of heat and cold; and before the appearance of the eruptions, the patients are worſe in reſpect of their anxiety and other ſymptoms, and complain of a troubleſome itching under the ſkin. The puſtules uſually firſt appear on the fourth day, ſometimes later; and at their approach, there is firſt perceived a general redneſs of the ſkin, and after this the redneſs is collected into ſpots, in the middle of each of which there appears a white puſtule; and theſe are often ſo copiouſly ſpread over the body, that they almoſt touch one another. Theſe puſtules are pellucid, and contain only a clear water, and their eruption is uſually attended with an acute fever; when theſe puſtules have ſtood four days, they dry away, and the places appear ſcaly, and the diſeaſe terminates. Sometimes in people of humid habits, and ſuch as have no *fever*, theſe puſtules ſweat out a white water.

The red *purple fever* ſeizes the patient in nearly the ſame way with the white, that is, with ſhiverings and heat ſucceeding one another. It is alſo attended with a tenſion and pain in the back, and with a ſtraitneſs of the breaſt and a cough. The *purple* eruptions appear on the fourth, or on the ſeventh day, or later even than that, in form of ſmall protuberances, like millet-ſeeds; and are attended at the time of their eruption, with an itching within the ſkin: the *fever* is not violent, and the ſweat is copious, and of an ill ſmell. In ſome caſes this diſeaſe is attended with no *fever* at all, and people go about their buſineſs with it, only complaining of an itching all over them. Some have violent pains of the head at the time, and are ſleepy and anxious they know not why; but theſe ſymptoms uſually go off as ſoon as the eruptions appear properly: theſe remain fully out a few days, and then die away of themſelves, and the perſon finds himſelf as well as before.

The *purple fever* of both kinds ſeems to have been more frequent of late than in the times of the earlier writers on medicine. The white kind in particular, ſome years ago, was in a manner epidemic in Saxony, and carried off great numbers, and particularly ſeized the lying-in women. Wherever the petechial *fevers* are frequent, there the white *purple fever* is uſually alſo common. It often alſo mixes itſelf with the ſmall pox, and makes the caſe always greatly worſe, and all the ſymptoms more violent. The red *purple fever* is moſt frequent with young men, and ſuch as lead ſedentary lives, and are ſubject to violent paſſions; labouring people are ſcarce ever found affected with this diſeaſe Among women, thoſe of tenderer conſtitutions are moſt ſubject to it, and eſpecially ſuch

as have been before ſubject to hyſteric complaints. And the perſons moſt ſubject of all others to it, are thoſe of both ſexes who live at eaſe and within doors, and by this means always are ſending off the humours to the ſurface of the body.

Cauſes of it. Theſe are, a bad quality in the air, contagion from perſons who have the diſeaſe, the driving back of ſweats, and even the forcing them too violently by hot medicines; this too often happens to women in child-bed, and to perſons in petechial *fevers*. To theſe are to be added alſo, the curing the rheumatic and catarrhal diſorders by a too cold regimen and method, and an omiſſion of habitual bleedings, or by ſuppreſſion of the menſes, or diſcharges by the hæmorrhoidal veins.

Prognoſticks in it. The going back of the eruptions in the white *purpura* is very often fatal, and in the mildeſt circumſtances is uſually attended with aphthæ, alienations of the mind, and terrible anxieties; and, if by means of medicines, the eruptions appear again, and yet the ſymptoms occaſioned by their going in do not diſappear, there is great reaſon to ſuſpect danger. The white *purpura* attending the petechial *fever* is very dangerous when the eruptions appear on the fourth day, but is leſs ſo when they appear later. The white *purpura*, when not attended with a *fever*, is leſs dangerous than otherwiſe; but it is uſually attended with terrible anxieties of mind, and with ſpaſtic motions.

The red *purpura*, when the eruptions are ſtruck back, is not attended with ſuch ſudden danger as the white; but people uſually have ſome convulſive motions attending it, and a great languor and debility of motion, and ſometimes with inflammations of the fauces, and with dangerous quinſeys; ſometimes with a dry cough, ſometimes with a heat of urine, or with arthritic complaints, or a ſpurious pleuriſy, or a hemicrania; but all theſe ſymptoms go off as ſoon as the eruptions appear again.

Method of cure. This is to be the ſame both in the red and the white *purpura*, and is not different from that in other inflammatory *fevers*, namely, a gentle but continual perſpiration muſt be kept up, and this alone will often cure the diſeaſe. On the days before the eruption of the ſpots, powders are to be given of nitre, diaphoretic antimony, and the abſorbents, as crabs-eyes, and the like; and when the eruptions are out, which uſually happens on the fourth day, the ſame powders muſt be given interchangeably, with gentle ſudorific draughts, from all which, fumitory water, however, is to be carefully excluded. This method is to be continued, only giving the doſes leſs frequently in the decline of the diſeaſe; and when it is wholly gone off, gentle purges, with ſome mercurial admixture, are to be given, thoroughly to cleanſe the primæ viæ; and the patient is by degrees to be hardened to the air. It is to be obſerved, that all irritations of the bowels are as bad in theſe caſes as in the ſmall-pox or meaſles, and that even the uſe of the moſt gentle clyſters is ſcarce to be allowed. Great care is to be taken that no cold air be admitted to the patient during the time the eruptions are out, and he ſhould not be removed, nor have the bed made in all that time. People who are often ſubject to returns of the red or white *purpura*, would be right to uſe cupping with ſcarification frequently, by way of prevention; and when the cauſe of the diſeaſe is the ſuppreſſion of ſome habitual evacuation, great care is to be taken to ſupply the place of that by bleedings, if it cannot be recalled in the accuſtomed way. This is to be done at different times, to prevent relapſes; and in general, a method of uſing gentle exerciſe, ſo as to promote a moderate ſweat, is greatly preferable to the method uſed by ſome of cloathing too warm, which rather promotes the diſeaſe by inviting the humors to the ſurface. *Junker*'s Conſp. Med. p. 329.

PURPURINA, a name uſed by Caneparius, and ſome other authors, for the *aurum moſaicum*, or *aurum muſivum* of the ſhops, the preſent preparation of which differs from that of that author only in the proportions of the ingredients. *Pemberton*'s Lond. Diſp. p. 221. See AURUM *muſivum*.

PURPURISSUS, in the antient writers, both Greek and Roman, the name of a compound colour or fucus of a fine purpliſh red, uſed to paint womens cheeks.

It ſeems by the compoſition to have been ſomewhat like our roſe-pink, as it is called by the colourmen. It was made of the *creta argentaria*, or fine white kind of chalk, diſſolved in a ſtrong purple tincture of ſome of the roots or woods which dyed red; and when the coarſer part was ſubſided to the bottom of the veſſel, the liquor, while yet thick, was poured off into another veſſel; and what ſubſided from this, which was as fine as flour, was of a beautiful pale purple, and was the *purpuriſſus* ſaved for uſe.

PURSE *(Cycl.)*—PURSE, in the Turkiſh dominions, is a term appropriated to a certain ſum of money. When the Turks ſpeak of large ſums, they always count by *purſes*. In this, however, there is ſome difference; for the *purſe* in Egypt is twenty-five thouſand medines, and in other parts of Turky it is only twenty thouſand. *Pocock*'s Egypt. p. 175.

PURSLAIN, in botany. See PORTULACA.

PUS *(Cycl.)*—A very ſmall portion of *pus* abſorbed into the blood-veſſels, raiſes a putrid fever as certainly as yeſt does a fermentation in wort. This fever is not owing to its ſtimulating the ſolids to quicker and greater vibrations, but to its increaſing the inteſtine motion and accelerating the animal proceſs, haſtening the change of the juices to that ſubtle acrid ſtate which renders them unfit to be retained in the body, and diſpoſes them to run off in colliquative evacuations, ſuch as ſweating and purging, which conſtantly attend theſe putrid or hectic fevers, or riſing to internal ulcers. Med. Eſſ. Edinb. Vol. V. art. 77. See PUTREFACTION.

When *pus* is laudable and mild, it is one of the moſt powerful digeſters, ſuppurants, and incarners; when it ſtagnates too long, or when the liquors and veſſels are faulty, it may become an acrid, ſtimulating, eroding ſanies; when abſorbed into the blood, it affects all the liquors, ſtimulates the veſſels, and is capable of producing violent diſorders.

PUSHERS, a name given to Canary birds when new flown. See BRANCHER, CANARY, and PASSERES *Canarienſes*.

PUSILLATUM, a word uſed by ſome medical writers to expreſs a coarſe powder, or any medicinal ſubſtance, beat into ſmall pieces for infuſion, or the like purpoſes.

PUSU, in botany, the name of a famous plant growing in China, and greatly eſteemed there. This and the ginſeng theſe people a long time kept to themſelves; but at length it was diſcovered, that the one was eſteemed a certain prolonger of life, and the other a preſervative againſt all diſeaſes.

They, in their manner of ſpeaking, ſay, that the *puſu* gives immortality: we have not been ſo happy to obtain any of this famous plant for the trial, but the ginſeng having been brought over, and found not to poſſeſs thoſe great virtues they aſcribe to it, and the people in China, who are poſſeſſed of the *puſu*, dying, as well as thoſe who have it not, we find, that the virtues of both are ſo greatly exaggerated by the Eaſtern dialect, that there is not much to be expected from them. *Redi*'s Exper.

PUT, in the manege, called in French *mettre*, is uſed for the breaking or managing of a horſe: thus,

To put a horſe to corvets, or caprioles, is to teach him thoſe parts of the manege.

To put a horſe upon his haunches, called in French *aſſeoir*, is to make him bend them handſomely in galloping in the manege, or upon a ſtop. See HAUNCHES.

To put a horſe to the walk, trot, or gallop, is to make him walk, trot, or gallop.

To put a horſe upon the button. See BUTTON.

PUTEAL, among the Romans, a ſmall kind of edifice, raiſed in the place where a thunder-bolt had fallen. Mem. Acad. Inſcript. Vol. III. p. 85, ſeq. See BIDENTAL.

PUTICULI, among the Romans, ditches or holes in the earth, a little without the Eſquiline gate, in which the poorer ſort of people were buried. *Pitiſc.* in voc.

PUTORIUS, in zoology, the name by which authors call the polecat; a creature of the weaſel kind, but larger than the common weaſel, and of a blackiſh colour, and remarkable for its ſtinking ſmell.

The whole circumference of the face is white, at the extremity of the angles of the mouth there begins a broad line of a yellowiſh hue, which ſurrounds the head, and is white in ſeveral parts. Its long hairs are black, its ſhort ones yellowiſh; and the throat, the feet, and the tail, are blacker than any other part of the body. The upper jaws ſtand out a little beyond the lower. The ears are broad and ſhort, and are fringed, as it were, with white. Its ſtink is occaſioned by an extremely fetid matter, ſecreted by two glands, which it has in common with all the creatures of this kind, within the anus.

It feeds on fleſh, frequently ſtealing hens and other poultry, and ſometimes contenting itſelf with their eggs. *Ray*'s Syn. Quad. p. 199.

PUTORIUS *ſerpens*, in zoology, a name given by ſome to that ſpecies of ſerpent called by others *dryinus*. See DRYINUS.

PUTREFACTION *(Cycl.)*—In *putrefaction* there is a great inteſtine motion; when carried to a height, and when the *putrefying* ſubſtance is much compreſſed, it is accompanied with heat and ſmoke, and ſometimes flame. Air is neceſſary to it; and the viſible texture of the *putrifying* maſs is changed.

Putrefaction is the moſt ſubtle of all diſſolvents. It effectually disjoins and ſeparates all the component parts of *putrifying* bodies, except ſea-ſalt. In this powerful ſolution, the inteſtine action of the minute particles of bodies creates, collects, or is by ſome way or other the cauſe and means of heat.

The fluids of the human body are much diſpoſed to *putrefaction*, and out of the body become highly *putrid*, even in cool air, and without any ſtirring or agitation; and our blood and ſome of our juices, out of the circulation, but within the body, change to *putrid* matter.

The changes wrought in bodies by *putrefaction*, are no where more remarkable than in the *putrefaction* of vegetable ſubſtances, which by means of this change are brought nearly into the condition and nature of animal ſubſtances.

To prove this by an eaſy experiment, take a large quantity of cabbage-leaves, and preſs them hard down with weights in an open tub, with holes bored in its ſide; ſet them in a warm place, and the leaves will ſoon conceive a heat in the middle, and at length the whole, or nearly the whole, will be converted into a ſoft pappy ſubſtance. This ſubſtance diſtilled in a glaſs retort, yields the ſame kind of volatile ſalt and oil as

animal ſubſtances do: neither is it particular to this plant, but all equally do this; the acid and the alkaline, the ſweet and the bitter, the aſtringent and emolient. Hence we may learn, how it is that nature, in our bodies, converts vegetable into animal ſubſtances; and it is very remarkable, that not a grain of fixed ſalt can be procured from this *putrified* maſs. *Shaw*'s Lect. p. 134.

PUTREFACTION *of water*. It is ſaid to be the peculiar quality of the Thames water, that it will ſtink and yet be wholeſome; and after this will recover itſelf again. Many ſailors have been obliged to drink it ſtinking, ſo that they held their noſes while they poured it down their throats, yet no ſickneſs enſued from it. It generates a ſort of ſpirit alſo in this ſtinking ſtate, which will take fire at the approach of a lighted candle as if ſpirit of wine were touched by the ſame.

PUTTOCKS, or PUTTOCK-*ſhrouds*, in a ſhip, are ſmall ſhrouds which go from the ſhrouds of the main-maſt, fore-maſt, and mizen-maſt, to the top-maſt ſhrouds; and if there be any top-gallant-maſts, there are *puttocks* to go from the top-maſt ſhrouds into theſe. Theſe *puttocks* are at the bottom ſeized to a ſtaff, or to ſome rope which is ſeized to a plate of iron, or to a dead-man's eye, to which the lanniards of the fore-maſt ſhrouds do come.

PUWAKHAGA, in botany, the name by which ſome authors call the faufel-tree, of whoſe fruit the expreſſed juice called *terra Japonica*, or Japan earth, is made. *Herm.* Muſ. Zeyl. p. 51.

PYANEPSION, Πυανεψιων, in the Athenian chronology, a month of thirty days, in which the feſtival *pianepſia* was celebrated. *Potter*, Archæol. Græc. T. 1. p. 464. See the article PYANEPSIA, *Cycl.*

PYCIELT, in botany, a name given by Hernandez, and ſome other authors, to a peculiar ſpecies of tobacco, diſtinguiſhed by Mr. Tournefort by the name of *nicotiana major lato et rotundo folio*, the broad roundiſh leaved great tobacco. See the article NICOTIANA.

PYCNI, πυκνοι, in the antient muſic, was uſed for ſuch ſounds or chords of a tetrachord as might enter the ſpiſſum, or πυκνον.

Theſe were the hypatæ [a], the parypatæ [b], and the lichani [c], of the ſeveral tetrachords. The hypatæ were called *barypycni*, βαρυπυκνοι; the parypatæ *meſopycni*, μεσοπυκνοι; and the lichani *oxypycni*, ὀξυπυκνοι: becauſe the firſt were the loweſt notes; the ſecond, the middle notes; and the third, the higheſt of the ſpiſſum [d]. Such chords as could never enter the ſpiſſum were called *apycni*, απυκνοι. [a ὑπατοειδεις. b παρυπατοειδεις. c λιχανοειδεις. d *Wallis*'s Append. ad Ptolem. Harm. p. 165.]

Hence in the Greek ſcale or diagram [a], containing eighteen chords, there were five *barypycni*, as many *meſopycni*, and an equal number of *oxypycni*, together with three *apycni*. The *apycni* and *barypycni* were ſtabiles or fixed chords; but the *meſopycni* and *oxypycni* were moveable, or mobiles [b]. [a See DIAGRAM. b *Wallis* ibid. p. 165, 166.]

PYCNON, πυκνον, in the antient muſic. See SPISSUM.

PYE, in mechanics. See the article CRABB.

PYGAIA, in the materia medica, a name by which ſome authors have called the ipecacuanha, or vomiting Indian-root. *De Laët* Ind. Occid. 566. *Purchas*. Pilgr. Vol. IV. p. 1311.

PYGARGITES, in natural hiſtory, a name given by Pliny and ſome other of the old writers to the eagle-ſtone, when it was variegated with white, in the manner of the tail of the eagle called *pygargus*.

Some have called this ſtone *pygarus*, and others have applied the name to a ſtone very different from the aëtites, and only reſembling the colour of the eagle. From hence it has happened, that two very different ſtones have been confounded together; but the virtues of both being merely ideal and imaginary, the world is not greatly the worſe for the want of the neceſſary diſtinctions.

PYGARGUS, a ſpecies of eagle, called alſo by ſome authors *albicilla*, and *ilianularia*.

It is a large and fierce bird, of the ſize of a common turkey. Its beak is yellow, and covered with a yellow membrane at its baſe. It has large hazel-coloured eyes. Its feet are yellow, and its claws extremely ſtrong and ſharp. The head is white, and there are no feathers, but ſome fine hairs between the eyes and noſtrils. The upper part of the neck is of a reddiſh brown, and the rump black: all the body beſides this is of an obſcure ruſt colour, and its wings are partly black, partly grey. Its tail is long, and the upper half of it is white, and the reſt black. It is from this white part that it has its name *albicilla*.

Authors who have written on this ſubject ſeem not all agreed to call the ſame bird by this name. The *pygargus* of Aldrovand ſeems different from this, and the *pygargus prior* of Bellonius ſeems no other than the male of that kind of hawk called in Engliſh the *hen-harrier*. *Willughby*'s Ornithol. p. 31.

PYGARGUS *accipiter*, in zoology, a name by which many authors have called the ſubbuteo, a bird of the hawk kind; the male of which is called in Engliſh the *hen-harrier*, and the female the *ringtail*. *Ray*'s Ornithol. p. 40. See HENHARRIER and RINGTAIL.

PYKER, or PYCAR, in our writers, a ſmall ſhip or herring-boat. 31 Edw. III. c. 2. *Blount. Cowel.*

PYLÆA, Πυλαια, in antiquity, a name given to the aſſembly of the Amphictyons, as well when they met at Delphi as at Thermopylæ. The concourſe of people at theſe aſſemblies was ſo great, that the term *pylæa* came to be uſed for any very numerous aſſembly, or croud of people. Mem. Acad. Inſcr. Vol. IV. p. 287, 290.

PYLAGORE, Πυλαγορες, in antiquity, a name given to the Amphictyons, becauſe they aſſembled at Thermopylæ, or Pylæ. See AMPHICTYONS, *Cycl.* and *Suppl.*

PYLORUS *(Cycl.)*—Kerkring gives us an account from his own knowledge of the entire ſtoppage of this part, by a Dutch ſtiver accidentally ſwallowed, the conſequence of which was the death of the patient in a few days. On the other hand, he mentions an inſtance of another perſon's ſwallowing a copper coin, which without any other effect than violent nauſeas and ſickneſs, was, at the end of about a month, diſcharged by purges; but ſo corroded by the juices of the ſtomach, that it was ſcarce to be known, all the letters and marks being eaten down to the ſame common ſurface on both ſides. *Kerkring*'s Specileg. Anat.

PYNANG, in botany, a name by which ſome authors call the faufel, or areca tree; a kind of palm, from the expreſſed juice of which the drug commonly, but improperly, called *Japan-earth* is made. *Bont.* p. 90.

PYRACANTHA, in botany, a name given by ſome authors to the lycium, or box-thorn.

PYRALIS, the *fire-fly*, a name given by authors to a ſuppoſed inſect, which they ſay is produced in the violent fires of the glaſs and metal furnaces. Plin. l. 2. c. 36.

PYRAMIDALIS *(Cycl.)*—PYRAMIDALES *abdominis*. Theſe are called *ſuccenturiati* by Fallopius; they are ſituated on the lower part of the recti, and ſeem only a portion or appendix of it. They are partly incloſed within the vagina of the recti, running cloſe by each other along the linea alba, to which they are fixed at different diſtances by oblique tendinous indentations, the uppermoſt of which was ſometimes very long.

When theſe muſcles are wanting, the lower extremities of the recti are always thicker than uſual: often there is only one found, and ſometimes, tho' rarely, three. *Winſlow*'s Anat. p. 168.

PYRAMIDALIS *oculorum*, in anatomy, a name given by Molinet and ſome others to one of the muſcles of the face, called by Douglaſs and Cooper *aperiens palpebram*, and by Albinus *levator palpebræ ſuperioris*.

PYRÆIA, or PYRETHEA, among the Eaſtern nations of antiquity, were great incloſures uncovered, and dedicated to the ſun, in which a perpetual fire was kept up in honour of this luminary, which was worſhipped by moſt of them. *Calmet*. Dict. Bibl. See CHAMANIM.

PYRENE, in natural hiſtory, the name of a ſtone found always in the ſhape of the ſtone of an olive. It is of the lapis judaicus kind, being no other than the petrified ſpine of ſome ſpecies of echinites. See ECHINUS *marinus*.

PYRETHRUM *(Cycl.)*—PYRETHRUM, in the materia medica, a root of which the druggiſts ſell us indiſcriminately two kinds; the one the root of a corymbiferous plant, called by authors *pyrethrum flore Bellidis*, or the daiſy-flowered pellitory of Spain; the other, the *pyrethrum umbelliferum*, or umbelliferous pellitory: and it is a diſpute among the learned, which of the two is the genuine and proper kind. The deſcription left us of it by Dioſcorides, as it is differently written, ſerving as well to prove the one ſo as the other.

The roots of the daiſy-flowered pellitory are what we moſt frequently meet with. They are of three or four inches long, of the thickneſs of one's little finger, greyiſh and wrinkled without, and whitiſh within, and of an acrid and burning taſte. Thoſe of the umbelliferous pellitory are of the ſame length, but ſomewhat thinner, of a browniſh grey without, and white within, and are furniſhed with a ſort of beard at top, ſomewhat like the roots of the meum. It is of an acrid taſte, and much reſembles the other in its virtues. They are both uſed in the tooth-ach, and are preſcribed by ſome in diſeaſes of the head and nerves, and are found to be diuretic and violently ſudorific, but they are very ſeldom given.

PYRGUS, among the Romans, a dice-box of the ſhape of a modius, open above, and having a great many ſhelves or partitions within it; ſo that when the dice were thrown into it out of the frittillum, they were thereby overturned many times before they could reach the bottom, in which there was an opening for them to fall through upon the table. *Pitiſc.* in voc. See FRITTILLUM.

PYRHOPOECILOS, in the natural hiſtory of the antients, a ſtone ſo called from its having a great many ſpots of the colour of fire. *Pitiſc.* in voc.

PYRIATERION, a word uſed by the antients to expreſs a ſweating room.

PYRIATOS, a word uſed by ſome authors to expreſs a brick when heated, in order to be applied to the body wrapped up in a cloth by way of a dry fomentation.

PYRICAUSTUM, a word uſed by medical writers to expreſs a burn or ſcald.

PYRICUBIUM, in natural hiſtory, the name of a genus of foſſile bodies, uſually comprehended, with many others of very different figure and ſtructure, under the general name *pyrites*. See Tab. of Foſſils, Claſs 5.

The

The distinguishing characters of the *pyricubia* are these: they are compound, inflammable, metallic bodies, of a cubic figure, or resembling a die, being composed of six sides.

Of this genus there are only two known species: 1. The great *pyricubium*, of a foliaceous structure; and, 2. The smaller solid *pyricubium*. See Tab. of Foss. Class 5.

The first of these is a very elegant fossil, and is so regularly shaped, and so highly polished by nature, that it has been often supposed to be wrought by art. It is but moderately hard, but is very heavy, and is of a foliaceous structure. It is exactly of the figure of a die, being composed of six regular sides, placed at right angles; but tho' ever thus regular in shape, it is not at all so in size: the most common specimens of it are about a third of an inch in diameter; but it is found much larger, even to three inches, and so small as to the tenth of an inch. It is perfectly polished and smooth on all its surfaces, and is of a very beautiful whitish green, with a faint admixture of yellow. It is found in the German and Hungarian mines, and in the East Indies.

The second sort, or the small solid *pyricubium*, is a fossil of much less beauty, tho' equally regular in its shape and appearance. It is very heavy, and extremely firm and hard, and is not of a foliaceous or flaky structure; but of one regular and uniform mass, and when broken appears very bright and glossy. It is ever found in the regular form of a cube, or regular solid body, made up of six flat sides placed at right angles. Its usual size is about the eighth of an inch diameter, but it is found smaller than a pin's head, and sometimes so large as to be near an inch. It is perfectly smooth on all its surfaces, and is naturally of a pale yellowish green, and as bright on the outside as within; but very often it is found of a ferrugineous or dusky surface, owing to a sort of rusting, which is an accident to which the several species of naturally bright pyritæ are most of them also subject.

It is very common in Germany and Italy, and in some parts of America, as also in our own country. With us it is commonly found immersed in slate, such as we cover houses with; but in Germany and other places it is usually found loose among the earth of mountains. With us it is usually of a bright surface, in Germany it is more frequently dusky. *Hill*'s Hist. of Foss. p. 619.

PYRIFORMIS (*Cycl.*)—This is also called *pyramidalis*, and is a small oblong muscle, of the figure of a flat pear, or *pyramid*, whence it has its names.

It is situated almost transversely between the os sacrum and ischium, being covered and hid by the first two glutæi. It is fixed to the interior lateral part of the os sacrum by fleshy fibres, and to the neighbouring part of the anterior or concave side of that bone, by three digitations lying between the anterior holes. It is also fixed by a small insertion to the ligamentum sacro-sciaticum, and edge of the great sinus of the os ilium. From thence it runs transversely toward the joint of the hip, its fibres contracting in breadth; it terminates in a short tendon, which is inserted in the middle of the internal labium of the upper edge of the great trochanter, by two or three branches. The upper part of this tendon receives several fibres from the glutæus medius, and its lower part is united to the gemellus superior, and tendon of the obturator internus. Sometimes there are two *pyriformes*, separated only by the nervus sciaticus. *Winslow*'s Anat. 209.

PYRIPHLEGES, a word used by the old writers in medicine to express a person labouring under an extreme degree of a febrile heat.

PYRIPLACIS, in natural history, the name of a genus of pyritæ, the characters of which are these: they are compound, inflammable, metallic bodies, found in loose detached masses of a simple and uniform, not striated internal structure, and are covered with an investient coat or crust.

Of this genus of fossils there are three known species: 1. A flatted kind, with a scabrous coat. 2. A globose one, with a cracked and furrowed coat. And 3. A flatted one, with a very thick, browniish-white crust. See Tab. of Foss. Class 5.

The first of these is a dusky browniish-green mass, surrounded and every way covered by a ferrugineous coat, of the thickness of a shilling or more, which is rendered very rough and scabrous, by having received multitudes of small pebbles and particles of sand into its substance while yet moist, which are become firmly bedded in it, and make a part of its substance. This is common in the gravel-pits about London.

The second is of an orbicular figure, and is of a very coarse structure, being composed of visible granules, and is of a pale yet dusky green colour. It is covered with a browniish yellow or ferrugineous coat, of the thickness of half a crown, or sometimes much more. This is usually somewhat irregularly raised in tubercles on the surface, which are divided by a sort of fine lines: these are truly so many cracks in the superficies, all which, when the body has been some time exposed to a damp air, fly more asunder at their edges, and become deeper, opening into the body of the mass. This species is found of all the intermediate sizes between an ounce and eight or ten pounds in weight. It is very common in the chalk-pits of Kent, and in many other parts of the kingdom; and tho' most frequently found in chalk, yet is sometimes met with among gravel, or lying loose upon the surface.

The third is a very singular species, yet from its unpromising appearance has been overlooked by all the enquirers into these subjects; having never been described in the writings, nor preserved in the museums of the late collectors of fossils. It is very hard, and moderately heavy, and is usually of a flatted, orbicular, or oval figure; and its most frequent size is between two and three inches in diameter. It is of an irregular, uneven, and rough surface, full of small prominences, very harsh and rough to the touch, and looks merely like a lump of greyish hard clay. When broken, it is found, however, to consist of a nucleus of the same shape with the whole body, and every way equally surrounded with a crust of a thickness equal to its whole diameter, or nearly so.

The nucleus is of a deep and dusky browniish-green colour, and of a plain simple structure; being composed of no visible moleculæ. The crust is of a pale, greyish-brown, earthy substance, appearing like an indurated earth, and glittering in some few places with small glossy particles. This is found in great plenty in some of the clay-pits about London. *Hill*'s Hist. of Foss. p. 613.

PYRIPOLYGONIUM, in natural history, the name of a genus of fossils, the characters of which are, that they are compound metallic bodies, of a regular figure, consisting of twelve planes. See Tab. of Foss. Class 5.

There is only one known species of this genus, tho' subject to great varieties in its appearance; and this has been by authors hitherto confounded, with many other bodies of very different nature and figure, under the general name pyrites.

The *pyripolygonium*, when perfect, is an extremely elegant and beautiful fossil; but this is a state it is very rarely found in. It is moderately firm, of a compact texture, and very heavy; tho' its natural figure be a regular body, composed of twelve planes, yet it is subject to great imperfections and irregularities. It often seems to want one or more of its sides, and not unfrequently, from the accidental breaking of some of its angles, to have more than its number; and very often has a great many other smaller and less perfect bodies of its own kind, growing to its larger and less perfect specimens. It is found from the twentieth part of an inch, to four inches in diameter; but its most common size is about a third of an inch. It is naturally of a polished and shining surface, and of a pale whitish yellow; but sometimes it is browniish, or of an iron colour.

It is not unfrequent in Cornwall and Devonshire; but is much more common in Germany. *Hill*'s Hist. of Foss. p. 621.

PYRITES, *(Cycl.)* in natural history, a name used by Dr. Hill as the classical term for the less regularly figured bodies of the number of those usually called, too indeterminately, by that name. See Tab. of Foss. Class 5.

According to this distinction *pyritæ* are compound, inflammable, metallic bodies, found in detached masses, but of no determinately angular figure. Of this class there are two general orders of bodies; the first, those which are of a plain and simple internal structure; and the second, those which are regularly striated within: and of each of these there are two genera. Those of the first are:

1. The *pyriplaces*. These are *pyritæ* of a simple internal structure, and covered with an investient coat or crust.

2. The *gymnopyres*. These are *pyritæ* of a simple internal structure, and naked, or not covered by any investient coat or crust.

The genera of the second order, or the striated *pyritæ*, are,

1. The *pyritricha*. These are the *pyritæ* of a simply striated structure.

And, 2. The *pyritrichiphylla*. These are the *pyritæ* whose surfaces are covered with foliaceous flakes, made by a continuation and expansion of the ends of the striæ. *Hill*'s Hist. of Foss. p. 612.

The several species of each of these genera, see under the several generical heads, PYRITRICHUM, *&c.*

Dioscorides mentions only one kind of *pyrites*, which is the common yellow species. Avisenna and the other Arabians mention two yellow sorts, a white one, and a ferrugineous one. None of these authors made any distinction between the marcasites and *pyritæ*, but this sort of matter, whether formed into small nodules, or continued strata, was called indifferently by one or other of these names.

The four kinds of this stone mentioned by the Arabians are called from their colours, the golden, the silver, the brassy, and the ferrugineous *pyrites*. The oldest authors are of the opinion of Dioscorides, and mention only one kind, deducing them all from the same principles, and supposing their variety of colours to be only owing to accidents. Aristotle and Theophrastus thus mention the *pyrites* as one thing, under the name *mylia*, which having been translated *molaris lapis*, has been understood by some to mean some sort of mill-stone, or other coarse stone fit for such purposes; and by that means the whole sense of the authors has been perverted and misunderstood.

Pliny mentions two kinds of the *pyrites*, the gold and the silver kind: he tells us, there is a stone, with some resemblance of brass in its appearance, which is found in Cyprus, and about Acarnania; and that it is of two kinds, yellow and white. It is clear from this, that this author had consulted

ſulted ſome other of the Greeks beſides Dioſcorides and Theophraſtus, from whom he principally furniſhes himſelf with theſe accounts; but he makes no mention of the ruſt-coloured or ferrugineous *pyrites*, which is as common as any of the others, even in the country where he wrote: and thence it is evident, that he did not write from his own obſervation, tho' in ſome places we are not able to trace him up to his originals, which may be loſt. Aviſenna tells us, that cadmia was made of the *pyrites*, that is, the cadmia fornacum, or tutty. Pliny and Dioſcorides do not in all reſpects agree as to the ſeveral kinds of factitious cadmia; and tho' Pliny does not mention this particular kind of it, Dioſcorides tells us of ſuch a ſort made in ſome places by burning the ſtone called *pyrites*.

The principal contents of *pyritæ* may be in general gueſſed at from their colour. The white *pyrites* uſually contains arſenic, the yellowiſh contains ſulphur and iron, and the fully yellow ſulphur and copper. The colours, therefore, make a very eſſential mark for the diſtinction of the ſeveral kinds of this foſſil. The yellowiſh *pyrites*, that is, ſuch as contains iron and ſulphur, is found in the ſtrata of ſeveral kinds of ſtone, in clay, and in the earth lying over the mines of ſeveral metals. The white, or arſenical *pyrites*, and the fully yellow, are leſs common, but are uſually met with about mines. *Agricola* de Metall.

It is a matter of great difficulty to aſcertain the time of the formation of foſſils. Many of them ſeem to have remained in their preſent ſtate, unaltered, from the beginning of the world; but many have alſo been formed in later times, and continue to be formed to this day. Of the number of theſe laſt the ſtalactitæ, or ſtony icicles, hanging down from the roofs of grottos are known to be; and it is equally certain, that the *pyritæ* alſo are ſo formed, for many of the ſtalactitæ in the caves dug by the German miners are found to be coated over in ſeveral parts with *pyritæ* [a]; and even in our own kingdom, pieces of wood buried in clay that contains *pyrites*, ſuch as is commonly dug to make tiles, if taken up again after a number of years, is always found impregnated with this ſubſtance, forming veins in it, and ſometimes nodules on its ſurface. [[a]Act. Erudit. Ann. 1726. p. 273.]

The *pyritæ* affixed to ſtalactitæ are finer than the other kinds, and it appears very evident to ſuch as have thoroughly conſidered the proceſs of nature in them, that they are not formed of particles brought together by water, in the manner of the *pyrites*, in wood buried under clay, or in the manner of theſe ſtalactitæ themſelves; but are compoſed of infinitely minute particles, brought together by their mutual attractions on a proper baſis, and which had been before floating in the air. The antients in general ſuppoſed, that copper was contained in the *pyrites*; but they had no opinion that iron was a part of it, tho' it is certain that iron is the baſis of almoſt all of them, and copper has a part only in a very few: but this was the effect of judging from appearances, inſtead of having recourſe to experiments. Our own Liſter has the honour of being the firſt author who has treated properly of them, and found out their true and general baſis to be iron; but he carries it too far when he ſuppoſes them to be all properly iron ores: for this is not the caſe, many of them, which contain no other metal beſide iron, yet holding it in ſmall quantity, and in ſuch a combination of other principles, that it is ſcarce extricable from them, and ſome kinds contain no iron at all. *Liſter* de Font. Medic. Angliæ.

Berger, who has written on the Caroline baths, has taken up the ſubject, and improving upon Liſter's plan, has given a much more juſt account of them. He allows that iron ſeems the baſis of great numbers of the *pyritæ*, and that this is evident from the obſervation, that the remaining matter of many, of them, after burning away the ſulphur, is found to be attracted by the magnet; but he obſerves alſo, that in many copper is mixed with the iron, and that tho' iron is in general found in even thoſe kinds which give the moſt obvious proofs of copper, yet there are ſome in which there can no iron be found.

This author obſerves alſo, that beſides the metalline particles, whether iron or copper, there is alſo contained in the *pyritæ* an unmetallic earth, which is in the compoſition of this ſtone moſt equally mixed and perfectly blended with the particles of theſe metals, and with thoſe of the ſalts and ſulphurs contained alſo in the maſs. Sulphur alſo he acknowledges to make a great part of many of the *pyritæ*, particularly of all the yellowiſh and full yellow kinds. The white or ſilvery *pyrites* contains leſs ſulphur than any of the others, and the yellow or venereal *pyrites*, tho' it contain much arſenic, yet does not fail to contain ſulphur alſo in conſiderable quantity. *Berger* de Font. Carolin.

The mention of gold and ſilver in the *pyrites* is very common among authors, but the colour of theſe ſtones ſeems principally to have given ground for that opinion. In reality theſe metals are very ſeldom found naturally making parts of the *pyrites*, and when they are, it is only in a very inconſiderable quantity. But in thoſe ſpecimens found about the mines of gold and ſilver, the particles of thoſe metals aſſembled into viſible maſſes are ſometimes found unbedded in lumps of the *pyrites*; and ſuch pieces of this ſtone may then well be ſaid to contain thoſe precious metals. The occaſion of this accident, however, is no more than this, that the *pyrites* is formed in mines and other places at this day; which is plain from its being in ſome places found adhering to the ſides of ſtalactitæ, as has already been mentioned: and in like manner it might adhere to particles of gold and ſilver, and thereby give ground to the ſuppoſition of their being parts of it.

The common *pyritæ* of our clay-pits and ſea coaſts are uſed in the making of coperas or vitriol; but among theſe there is found a very great difference, ſome of them turning themſelves very eaſily to vitriol, when only expoſed to moiſt air; others doing it with more difficulty; and ſome not at all, tho' expoſed many years. Some alſo yield all their vitriol at once, on pouring warm water on them; while others muſt lie expoſed to the air at ſeveral different times, and roaſted in the mean while in order to obtain it. The ſettled obſervations on this ſubject, as collected from experiments, are theſe:

No *pyrites* which contains any copper, or any arſenic, will of itſelf turn into vitriol, but requires a previous roaſting.

The ſulphureous iron *pyrites*, void of copper or arſenic, all turn to vitriol on being only expoſed to the air; and that the ſooner or later, as they are of a more or leſs compact ſubſtance. The fibrous or radiated *tyritæ* are uſually of this kind; but this is no general rule, for there are ſome radiated ones which remain whole years unaltered in the air.

Copper and arſenic always reſiſt the ſhooting of the ſalts of the *pyrites*, or its turning to vitriol; but theſe are not the only agents that reſiſt this change, for in ſome merely ferreous and ſulphureous *pyritæ* the change is not made but with much time and difficulty. *Henkell*, Pyritol.

It is remarkable alſo, that vitriol is found in ſome *pyritæ*, if water be poured upon them immediately after the roaſting; while others will not yield any till they have been afterwards expoſed to the air. It even ſeems, that we are to look into the air for the cauſe of the appearance of vitriol in the copperas ſtones. This it may greatly aſſiſt in effecting, as it carries a quantity of moiſt vapours in it: for it is well known, that the acid of ſulphur has not the power to reſolve iron into the form of a ſalt without the addition of water; nay, oil of vitriol, or of ſulphur, being moderately concentrated, tho' it be then diluted with much more water than it is united with while yet in ſulphur, does not even diſſolve filings of iron unleſs there be four times or ſix times as much water poured to it. Water alone, however, tho' a great and neceſſary agent, cannot be ſuppoſed to effect the whole change; for tho' there are ſome of the *pyritæ* that yield their vitriol by means of it, yet there are others that do not; and ſome *pyritæ* are preſently turned into vitriol, when expoſed to the air, which had before remained for many years under water unaltered. Of this kind there are many on the ſhores of the ſea in moſt parts of Europe. In England particularly we have them in great plenty in Sheppey Iſland in Kent. Theſe *pyritæ* will long reſiſt the change into vitriol, when in the air, and yet they evidently contain no copper nor arſenic.

There is alſo a kind very common on the ſhores, which reſembles wood in texture and appearance; and has probably once been wood, but has now its pores filled with the *pyrites*: of theſe many lie buried a foot or more deep in the ſand under the ſea water; and in that ſtate they never ſhoot into vitriol, but are of a firm texture and conſiderable hardneſs, and when broken look very bright within, and have no taſte of vitriol, nor give any mark that they contain any: yet theſe, if they are taken up and expoſed to the air for a fortnight, loſe all their brightneſs and their hardneſs, and moulder-ing to pieces, become ſo rich in vitriol, that it forms itſelf into regular cryſtals on their ſurfaces. Now if moiſture alone was ſufficient to produce this effect, there is no reaſon why they ſhould not have been reſolved into vitriol under a very moiſt ſand. The great cauſe we are able to aſſign, appears to be the vague acid, ſo common in the foſſile world, and filling alſo the region of air; but an ingenious reaſoner will ſtill own, that tho' this may do much, yet there muſt be ſome other cauſe, yet undiſcovered, for the production of vitriol in theſe foſſils; ſince this, as well as the moiſture of the air, ought to act more equally than we find by experience it does on theſe ſtones, if all were owing to it. *Henkell*, Pyritol.

In the expoſing theſe copperas ſtones to the air, if it be a moiſt ſeaſon, no farther care need be taken of them than the piling them up in a heap; but moiſtening them now and then is a neceſſary circumſtance in dry ſeaſons, and in this caſe the water ſhould be ſprinkled on them in ſmall quantities at a time, and the heaps now and then turned and new made. Much depends on this management, the ſame quantity of ſtones yielding twice as much copperas, with proper care, as they would without it

When the matter of the *pyrites* is mixed with the lead ores, the method of ſeparating the metal by aſſaying is this: roaſt two centners of the ore, as in the uſual method, and keep a ſtronger fire than when the ore is pure. The *pyrites*, eſpecially when it is merely iron, hinders an ore from eaſily growing clammy, or turning into large lumps, or entirely melting. When the ore is ſufficiently waſhed, let it cool, beat it to powder, and repeat the roaſting to a third fire, till when it is red hot in the fire, there is no ſmell of ſulphur: then mix the

ore with six centners of the black flux, and two of sandiver, and finish the work in the common way, only making the fire greater, and continuing it longer, toward the end of the operation. *Cramer*'s Art of assaying, p. 292. See the article LEAD-*ore*.

PYRITICUM *liquamen*. See LIQUAMEN *pyriticum*.

PYRITRICHIPHYLLUM, in natural history, the name of a genus of fossils of the class of the pyritæ, the characters of which are these: they are compound, inflammable, metallic bodies, found in loose masses not of any regularly angular figure, and of a striated texture, with foliaceous ends to the striæ, appearing on the surface or within the mass. See Tab. of Foss. Class 5.

Of this genus there are only two known species; one having the foliaceous ends of the striæ on the outer surface of the mass, and the other having a smooth external surface, and the foliaceous ends of the striæ covering the sides of internal hollows. *Hill*'s Hist. of Foss. p. 617.

The first is a fossil of great beauty, of a very firm texture, remarkably heavy, and usually found in large masses of an orbicular or oblong figure: these masses are sometimes composed wholly of the matter of the pyrites, and in others they are only coats of that substance surrounding stones.

It is of a very closely striated texture, and the striæ are broad, but unequally so, and their extremities at the surface of the mass are beautifully formed into several series of thin foliaceous plates, which usually cover all the superficies, and stand up to several heighths and in different angles, but mostly leaning one way; they are of unequal thicknesses, being composed of different numbers of plates, and are usually notched at the ends. The whole is of a somewhat deep green, with a cast of olive or amber colour, and when it is fresh broken, is very bright and glittering.

The second is a fossil of equal beauty with the former, tho' of a very different appearance; it is very hard and very heavy, and is always found in detached masses; but those of a very singular kind, for they are always more or less hollow. These masses are of various figures and appearances, sometimes round and like pebbles, but more frequently full of odd protuberances, like the flints in our chalk pits; and sometimes the masses of it are found running over the surfaces of stones in form of crusts, which are variously protuberant in different parts, and rise into frequent beautiful tho' irregular tubercles.

The outer surface of this species is usually very bright and glossy, and perfectly smooth, as if wrought by art, even on the tubercles themselves. It is usually a sort of crust even in its most solid masses, seldom being above half an inch thick, and of a very beautifully striated texture, the striæ being remarkably fine and slender. These, tho' they unite so at their superficies as to form a very smooth surface, yet at their other ends, where they terminate at the hollows of the masses, are expanded into very elegant series of foliaceous plates, usually approaching to a square figure, and not standing erect, as in the other species, but lying horizontally and almost perfectly flat over one another: these are composed of flakes not thicker than those of many of the foliacious talcs. The whole is usually of a gold yellow, and very bright and beautiful; but the outer surface often contracts a dull brownish hue on being long exposed to the air.

The first of these is found in many of the English and German mines, the other has been yet only found in the mines on Mendip hills in Somersetshire, but there in considerable plenty. *Hill*'s Hist. of Foss. p. 618.

PYRITRICHUM, in natural history, the name of a genus of pyritæ, the characters of which are these: they are compound, inflammable, metallic fossils, always found in detached masses of no regularly angular figure, and of a simply striated internal structure. See Tab. of Foss. Class 5.

Of this genus of pyritæ there are three known species, 1. A globose one, with an irregular surface. 2. A globose one covered with angular tubercles. 3. A silver-coloured globose one, with a smooth surface.

The first is considerably hard, and very remarkably heavy, and is usually of a roundish form, tho' sometimes oblong; sometimes it is full of irregular prominences on the surface, and sometimes is a complex mass, consisting of a great number of roundish masses of smoother or rougher surfaces joined together. It is very various in size; the more common specimens of it are of six or eight ounces weight, tho' there are others of less than an ounce, and some of several pounds. The prominences on the surface are usually broad and depressed, and these are frequently marked with irregular short lines, and raised in ridges. When broken, it is found to be of a very regular striated structure; the striæ are not very broad, and usually run from the center to the circumference. It is of a pale whitish green within, and is covered with a brown or ferrugineous crust.

The second is a very firm and hard body, usually of an orbicular figure, and sometimes, tho' rarely, oblong; it is of a very remarkably rough surface, being covered with pyramidal tubercles, with very obtuse ends. These are of a quadrangular figure, and have very broad bases: they sometimes incline, or bend a little; but more usually they stand perfectly upright, and are placed so close together, that they croud and injure one another's figure at their bases. The whole is of a ferrugineous or rust colour without, and of a yellowish colour within, beautifully striated, and very bright and glittering.

The third is an extremely elegant and beautiful species, it is but moderately hard, tho' remarkably heavy, and is usually of a regularly orbicular form, tho' sometimes it varies from it like the other pyritæ. Its most frequent size is about an inch and half in diameter; but it is sometimes found as small as a nut, or a schoolboy's marble, and sometimes of more than two pounds weight. Its surface is usually smooth and even, and it is never covered with any coat or crust. It is of a very regularly striated internal structure, and of a beautiful silvery green colour: the striæ are moderately broad and run very evenly from the center to the circumference; and very often there is a small and firm central nucleus, which is much harder than the rest of the mass, and is of a plain not striated structure.

All the three species are found plentifully in different parts of the kingdom: the first in all sorts of strata, and often loose on the ground; the second, principally in the chalk pits of Kent and Sussex; and the last in Essex and Hampshire, and very frequently in the German mines. *Hill*'s Hist. of Foss. p. 617.

PYRMONT-*waters*. The country all about where these springs are, abound with materials which give virtue to the waters; and the quarries of stone, wherever they are dug, send up spirituous and martial exhalations as well as the springs that run from them, and the water among them has in general a vitriolic taste. Iron is found all about the place also, under the appearance of a yellowish earth or ochre, which contains so much of that metal, that it may be worked as an ore of it to great advantage. Ferrugineous stones are also found in great abundance in the neighbourhood of the place; these may be also worked as iron ores, and the selenites is found in the strata of earth that make up the hills thereabout, in great abundance, and in beautiful perfection.

The waters themselves, tho' they shew evident marks of an alkali, yet have also an acid principle in them, of the nature of the common acid of sulphur, except in this, that in these waters the acid carries with it a subtle mineral oil or fattiness; and mixing with the common alkali salt, which is found in all mineral waters, these together form a neutral salt: but as in the composition of this salt there is much more alkali than acid, it is necessary that the water should shew alkaline rather than acid qualities. The analysis shews also, that the waters contain a stony matter embodied in them, which is pure, insipid, colourless and tasteless, and seems to be in nothing different from common crystal. The earth about the springs contains also a great number of lumps of a clayey matter, of the size of a walnut, and of a yellowish colour; in all of which, when broken, there is found pure crystal in small shoots, sometimes in its own regular figure, and sometimes irregular and mutilated.

A water containing these principles thus combined, cannot but possess those virtues we find so eminent in this; these are, the opening obstructions, correcting the sharpness of the humors, and restoring the solids to their due state. *Seipp*, Nova Descrip. Font. Pyrm.

The history of these waters is accurately given by Hoffman in his observations on them, both in their natural state and in mixture with other bodies.

He first observes, that they contain a volatile and subtle principle, greatly more penetrating and strong, as well as in larger quantity, than any other mineral water; but that this is not to be expected in them any where but upon the spot, for those who transport them to other places are constrained to let a part of this fly off to preserve the rest. If either glass or earthen vessels be filled at the spring, and immediately corked and fastened down, the consequence is, that they will burst on the first motion or heat of the weather. They are, therefore, forced to fill them only in part at first, and let them stand a while for this subtle spirit to exhale, and then a while after the filling them up, to cork and fit them for carriage.

2. If they are drank upon the spot in a morning on an empty stomach, they affect the nose with a pungent tingling, and disturb the head for many hours afterwards.

3. If they are taken at the spring, they purge but very little; but if taken in another place, after transportation, they purge considerably more, and render the stools black. It is observable also, that if they are left in an open vessel a few days, their virtue wholly exhales, and they no longer purge nor render the stools black.

4. If tea-leaves, balaustine-flowers, or galls, are put into this water, they first change it to a blue, from that to a purple, and finally to a black. This is a ready proof, that black is only a deep purple, and purple only a deep blue: a little spirit of vitriol added to this liquor destroys all the colour, and renders it limpid as before.

5. If any acid be mixed with *Pyrmont water*, there is raised an effervescence, and bubbles of air are carried up in great quantity; and this whether the stronger acids, such as spirit of vitriol, or aqua fortis, be used; or the weaker, as vinegar, lemon-juice, or Rhenish wine.

6. If an alkaline liquor be added, whether it be volatile, as the spirit of sal armoniac; or fixed, as the oil of tartar, there

is no ebullition raiſed, but the liquor becomes turbid and milky. If ſpirit of vitriol be afterwards added to this, to ſaturate the additional alkali, the liquor becomes limpid again.

7. Cow's milk mixed in equal quantity with *Pyrmont water* does not coagulate, but, on the contrary, becomes thinner than before, and is preſerved from turning ſower ſo ſoon as it otherwiſe would in hot weather. This is a proof that there is no predominating acid in theſe waters.

8. If ſyrup of violets be added to *Pyrmont water*, it turns it to a beautiful green. This is a proof of the alkaline nature of theſe waters; and it is farther proved by adding ſpirit of vitriol, or any other acid, to this green liquor, which on that becomes limpid again.

9. Four pints of this water evaporated over a gentle fire, yield no more than two ſcruples of a dry reſiduum. Oil of vitriol being poured on this, acid efferveſcence ariſes, and with it an acrid and pungent vapour, like that produced by mixing oil of vitriol and common ſalt. If ſpirit of vitriol be uſed inſtead of the oil, the efferveſcence is in a leſs degree, and the ſalt is in part changed to a bitter ſaline maſs, the remainder ſeparated from which proves to be a calcarious earth no longer fermenting with the ſpirit of vitriol.

10. If a quantity of *Pyrmont water* be expoſed twenty four hours to the open air in a baſon, it will at the end be found to have loſt all its virtues, taſting wholly inſipid, and being turbid inſtead of the fine clearneſs it had before, and a yellow ochreous earth is precipitated to the bottom; after this the liquor will no longer ſhew any of thoſe qualities which were before its diſtinguiſhing characters, it will no longer ferment with acids, nor turn black with galls, nor green with ſyrup of violets.

It appears from the whole, that the *Pyrmont waters* poſſeſs a pure, extremely penetrating, and elaſtic mineral ſpirit, and that in a very large proportion; and to this their virtues are principally to be attributed. This mineral ſpirit, while it remains engaged in a calcarious earth, imitates the properties of an alkaline ſubſtance; and when joined with a ſubtile martial earth, it emulates the properties of vitriol, giving the ſtools a black colour, and turning a tincture of galls into ink: and while this remains in the water in theſe forms of an alkaline or vitriolic principle of ſo great ſubtilty, it cannot but give them very great virtues in ſtrengthening the tone of the viſcera, opening obſtructions, and ſtimulating in a proper manner the excretory ducts, ſo as to make them duly perform their office; but as ſoon as by the ſtanding of the water open, or by any other accident, this ſubtle element is evaporated, all the virtues of the water muſt be gone with it.

The great quantity of this powerful ſpirit contained in the waters makes them more fit for the robuſt and ſtrong conſtitutions, when depraved by illneſs, than for the weak and tender ones; but even the tendereſt people may take them, only obſerving to take but a ſmall doſe, or to dilute them with an equal quantity of common water immediately before the taking them.

Hoffman alſo recommends the *Pyrmont water* mixed with equal quantities of milk, on his own experience, in ſcorbutic and gouty caſes. *Hoffm.* Opera, T. 5. p. 143, ſeq.

Near the famous well at *Pyrmont*, is a ſtone-quarry under ground, from ſome parts of which a ſulphureous ſteam comes out, which commonly riſes to a ſmall height. Animals held in this ſteam are ſoon ſuffocated, but recover if quickly taken out. When a man ſtands in this ſteam, but with his head over it, it proves an excellent ſudorific. Dr. Seip propoſes to perform cures in ſeveral diſeaſes with it. See Phil. Tranſ. N°. 448. ſect. 4. and Miſc. Berolin. Tom. V. part. 2. ſect. 4.

Imitation of PYRMONT *water*. This medicinal water may be imitated very nicely by art in the following manner: take a quart of the pureſt and lighteſt water, add to it thirty drops of a ſtrong ſolution of iron made in ſpirit of ſalt, a drachm of oil of tartar per deliquium, and thirty drops of ſpirit of vitriol, or a little more or leſs, as is found neceſſary, not to let the alkali of the oil of tartar prevail too ſtrongly, tho' it muſt prevail a little. Shake all briſkly together, and on taſting it will be found extremely to reſemble the true *Pyrmont water*.

The baſis on which this is founded is the analyſis and trial of the true *Pyrmont water*, by which it is found to contain a ſubtle aqueous fluid, a volatile iron, and a predominant alkali, all joined together into one briſk pungent ſpirituous water. The artificial *Pyrmont* thus made, if the proportions are carefully minded, will extremely reſemble the natural, and will have the ſame effects as a medicine. *Shaw's* Lectures, p. 90.

PYROBOLUS, in natural hiſtory, a name given by many authors to the ſtone more generally called *pyrites*; others have called it *ſiderites*, *pyrobalanus*, *pyropus*, and *othonna*, and the Greeks *mylias*. Among the tranſlators and interpreters of the works of authors who have treated on theſe ſubjects, there has been great confuſion concerning this ſtone, few of them underſtanding any thing of the ſubject, and rendering its deſcriptions ſo injudiciouſly, that they may rather be thought to belong to other ſtones. See PYRITES.

PYROCTOGONIUM, in natural hiſtory, the name given by Dr. Hill to a genus of foſſils uſually comprehended by authors, with many other bodies of a different figure and ſtructure, under the general name pyrites.

The characters of the *pyroctogonium* are theſe: it is a compound, inflammable, metallic body, of a regular octohaedral figure, or compoſed of eight planes.

There is only one known ſpecies of this genus, which is a very ſingular and elegant foſſil, being compoſed of eight triangular planes; theſe being the ſides of two quadrilateral pyramids, with broad baſes, which being joined baſe to baſe, conſtitute the *pyroctogonium*. See Tab. of Foſſ. Claſs 5.

This figure is very regular and determinate in the perfect ſpecimens of this body, but there is ſcarce any foſſil which is more ſubject to imperfections and accidental variations. Its moſt perfect ſtate is when the two pyramids of which it is compoſed are placed evenly one over againſt the other; but this is but rarely the caſe, they are often placed unevenly, or ſlanting; their planes are frequently of very irregular lengths and breadths, and not unfrequently the ſpecimens are found mutilated and imperfect, and very often a number of them cohering in a cluſter one with another, and very much mutilating or injuring one another's figure. They are found of all the ſizes between that of a pin's head, and an inch in diameter; but the large ones are ſcarce, and the moſt uſual ſtandard is a third of an inch. They are naturally of a ſmooth and poliſhed ſurface, and of the colour of wrought iron; when broken they are bright and ſparkling, and of a paler colour than without. When nicely examined as to their internal ſtructure, they are found to be compoſed like the marcaſites, of a number of irregularly arranged foliaceous flakes or plates.

It is found very frequently in Cornwall, Devonſhire, and moſt other of our counties where there are mines. It is ſometimes met with looſe in the earth, ſometimes lodged in the bodies of marcaſites, or in the ſolid foſſils, and varies ſometimes from its iron colour to a duſky yellow. It is ſometimes alſo found with many ſpecimens connected into a maſs; theſe are ſeldom uniform in ſize, and cohere in various directions, often greatly injuring one another's figure. Sometimes alſo, as in the caſe of the cryſtals, they form a large maſs, of which the outer ſurface only is concreted into or covered with regular figures, the whole inner part being a confuſed ſubſtance.

Maſſes of this kind are not unfrequently found of a regularly orbicular figure, and beſet all over with regularly figured *pyroctogonia* of various ſizes. *Hill's* Hiſt. of Foſſ. p. 620.

PYROLA, *winter-green*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the roſaceous kind, conſiſting of ſeveral petals arranged in a circular form. The piſtil ariſes from the flower-cup, and ends in a ſort of proboſcis: this afterwards becomes an umbilicated and ſtriated, roundiſh, quinque capſular fruit, uſually containing a number of very ſmall ſeeds.

The ſpecies of *pyrolæ*, enumerated by Mr. Tournefort, are theſe: 1. The larger round-leaved *pyrola*. 2. The ſmaller round-leaved *pyrola*. 3. The *pyrola* with ſharp-pointed and ſerrated leaves. And 4. The ſhrubby *pyrola*, with flowers reſembling thoſe of the arbutus. *Tourn.* Inſt. p. 256.

PYROLAMPIS, the *glow-worm*, a ſmall inſect remarkable for its ſhining in the night.

The male and female differ greatly in this ſpecies of inſect. The male has wings, and is a ſmall fly; the female has no wings, but is a large crawling worm.

The body of the male is oblong, and ſomewhat flatted; the wings are ſhorter than the body; the head is broad, dun, and flat; the eyes are large and black. This has no light iſſuing from it, and is not commonly ſuppoſed to be at all of kin to the *glow-worm*. See Tab. of microſcopical Objects, Claſs 1. voc. *Cicindela volens*.

The female is what we expreſly call by this name. This is a very ſlow-paced animal, without wings, and ſomewhat reſembling a caterpillar; the head is ſmall, flat, hard, and black, and ſharp towards the mouth; it has ſhort antennæ, and ſix moderately long legs; the body is flat, and is compoſed of twelve rings, whereas the body of the male conſiſts only of five; it is of a duſky colour, with a ſtreak of white down the back. It is often ſeen in the day-time, but is not known till in the dark; at which time it is eaſily diſtinguiſhed by the glowing light, or lambent flame, that is ſeen near the tail, iſſuing from the under part of the body.

PYROMACHUS, a name given by ſome to antimony when reduced to a ſtony hardneſs; and by others to copper, when fuſed with ſulphur, and thus rendered leſs ductile.

PYRONOMIA, a term uſed by the chemical writers to expreſs the art of regulating fire, ſo as to make it ſubſervient to all their proceſſes in a determinate degree.

PYROPHAGI, *fire-eaters*, a name given by ſome to thoſe juglers and mountebanks who deceive people into a belief that they ſwallow fire.

PYROPHORUS, the name uſually given to that ſubſtance called by ſome the *black phoſphorus*. See PHOSPHORUS.

It is made in this manner: take four or five parts of alum, and one part of wheat-flour, calcine this together to a brown or blackiſh maſs; powder this and put it into a vial, ſtop it looſly with a paper, and ſet it in a ſand heat, ſo as to make it continue glowing hot for ſome time; after this, remove the

whole from the fire, ſuffer it to cool gradually, and finally ſtop the bottle very cloſe down.

A little of this powder being poured out of the bottle, and expoſed to the open air, immediately takes fire, and appears like a glowing coal; but the powder muſt be freſh made to have a good effect, for the ſun's rays, or the moiſture of the air being admitted to it, gradually take away its virtue.

Almoſt any animal or vegetable ſubſtance may be ſubſtituted inſtead of wheat-flour in this proceſs, and it will ſucceed equally well; but no other ſalt will do in the place of alum. *Shaw*'s Lectures, p. 406.

PYROPHYLACIA, a term uſed by Kircher and ſome others to expreſs thoſe magazines of fire which are placed in the cavities of mountains and other hollows of the earth, and ſerve to ſupply the ſeveral volcanos in the different parts of the world. See VOLCANO.

PYROSCOPIA, among the Greeks, a kind of divination, being the ſame with pyromancy and igniſpicium. See the article PYROMANCY, *Cycl.*

PYROSIS, a word uſed to expreſs an intenſe heat and redneſs in the face, ſuch as that of perſons who travel in extremely hot weather, and the like.

PYRRHALA, in zoology, the name of a bird well known in England by the name of the *bulfinch*, and called by ſome authors *rubicilla*.

It is a beautiful bird, and ſings very ſweetly; but does great miſchief in gardens and orchards, deſtroying the buds of the fruit-trees.

PYRRHOCORNIX, in zoology, a name given by authors to a bird of the crow-kind, deſcribed by ſome authors as a diſtinct ſpecies; but Mr. Ray, and other very judicious naturaliſts, eſteem it the ſame with the coracias, or Corniſh chough, or only differing in age or by other accidents. *Ray*'s Ornithol. p. 86. See CORACIAS.

PYRROPŒCILOS, in the natural hiſtory of the antients, the name by which they call the granite of Arabia, commonly known to this day under the name of the *oriental granite*.

The name is derived from the Greek πῦρ, fire, or fire-coloured, and ποικιλος, ſpotted; and the antients having uſed the epithet fiery to yellow, as well as red, ſome have imagined the granite muſt be a yellow ſtone; but it is evident that red is the colour meant by it here. *Hill*'s Hiſt. of Foſſ. p. 500.

PYRSEPHORUS, πυρσηφορος, in the Athenian feſtival, hephæſtia, the ſame with lampadephorus. See LAMPADEPHORUS.

PYRUS, the *pear-tree*, in botany, the name of a genus of trees, the characters of which are theſe: the flower is of the roſaceous kind, and is compoſed of ſeveral petals arranged in a circular form. The cup finally becomes a fleſhy fruit, uſually of a turbinated ſhape, umbilicated, and divided within into cells which contain oblong ſeeds. *Tourn.* Inſt. p. 629.

The ſpecies of *pear*, enumerated by Mr. Tournefort, are theſe: 1. The double-flowered *pear*. 2. The ſmall, branched, very ſweet-ſcented ſummer-*pear*. 3. The ſummer-*pear*, with very ſmall and ſweet-ſcented fruit. 4. The ſweet-flavoured ſummer-*pear*, partly of a deep red, and partly of a yellow colour. 5. The ſmall, yellowiſh, ſweet-flavoured *pear*. 6. The round, ſeſſile, ſweet-flavoured ſummer-*pear*, variegated with black ſpots. 7. The round, ſeſſile, ſweet flavoured, ſugar-taſted ſummer-*pear*, of a purpliſh green colour. 8. The oblong, iron-coloured, ſweet-flavoured ſummer-*pear*, with tender pulp. 9. The ſmall ſummer-*pear*, of a whitiſh green colour. 10. The greater whitiſh ſummer-*pear*. 11. The whitiſh, ſugar-taſted, very ſweet-flavoured, ſummer-*pear*. 12. The whitiſh ſummer-*pear*, with a long pedicle. 13. The oval ſummer-*pear*, variegated with iron-coloured ſpots. 14. The oblong, reddiſh, ſugar-taſted, ſummer-*pear*. 15. The ſmall, roundiſh, vinous, ſummer-*pear*, of a reddiſh yellow colour. 16. The ſugar-taſted turbinated ſummer-*pear*, with tender pulp. 17. The oblong, ſmall, aſh-coloured ſweet-flavoured ſummer-*pear*. 18. The globoſe, ſeſſile, ſugar-taſted, ſummer-*pear*, of a whitiſh yellow colour. 19. The ſugar-taſted, globoſe, whitiſh ſummer-*pear*. 20. The globoſe, ſeſſile, ſweet-flavoured ſummer-*pear*. 21. The turbinated, ſeſſile, red-coloured, and punctated ſummer-*pear*. 22. The turbinated, ſeſſile, ſweet-flavoured, ſummer-*pear*, partly yellow, and partly variegated with red ſpots and veins. 23. The long, red, ſummer-*pear*, of a ſomewhat acid taſte. 24. The globoſe, greeniſh purple, ſummer-*pear*. 25. The globoſe, ſugar-taſted, ſweet-flavoured, ſummer-*pear*, of a yellowiſh colour, blended with red and white. 26. The great oblong ſummer-*pear*, partly red and partly white. 27. The long ſummer-*pear*, of an extremely bitter taſte. 28. The autumnal-*pear*, with very ſweet fruit, which diſſolves in the mouth. 29. The ſeſſile, ſugar-taſted, ſweet-flavoured, autumnal-*pear*, of a greeniſh yellow colour, and diſſolving in the mouth. 30. The turbinated autumnal-*pear*, of a green colour, variegated with blood-coloured veins. 31. The roundiſh autumnal-*pear*, of a reddiſh iron colour, ſometimes ſpotted. 32. The long, green, ſweet-flavoured autumnal-*pear*, which diſſolves in the mouth. 33. The tuberous, ſeſſile, autumnal-*pear*, of a greeniſh yellow colour, variegated with black ſpots, with ſugar-taſted tender pulp. 34. The tuberous, ſeſſile, ſugar-taſted, autumnal-*pear*, with hard pulp. 35. The globoſe, iron-coloured, very ſweet-taſted autumnal-*pear*, with tender pulp. 36. The turbinated, ſeſſile, autumnal-*pear*, with yellowiſh fruit, diſſolving in the mouth. 37. The globoſe, iron-coloured, autumnal-*pear*, with viſcid pulp. 38. The Engliſh *pear*, with long fruit, variegated with iron-coloured ſpots. 39. The very ſweet-flavoured, ſugar-taſted, pale-red, oblong, autumnal-*pear*. 40. The great aſh-coloured, oblong, autumnal-*pear*. 41. The roundiſh, ſweet-flavoured, red, autumnal-*pear*. 42. The ſmall, globoſe, punctated, autumnal-*pear*, of a greeniſh red colour. 43. The ſmall, tuberous, ſeſſile, darkiſh-coloured, autumnal-*pear*. 44. The tuberous, turbinated, punctated, autumnal-*pear*, of a yellowiſh or whitiſh colour. 45. The turbinated, yellow, or ſtriated, ſubacid, autumnal *pear*. 46. The turbinated, fading yellow, and ſomewhat bitter, aromatic taſted, autumnal-*pear*. 47. The turbinated, ſeſſile, yellow, autumnal-*pear*, with a ſomewhat bitter aromatic taſte. 48. The turbinated, ſeſſile, yellow, autumnal-*pear*, with ſtriated ribs. 49. The tuberous, angular, autumnal-*pear*, of a yellowiſh, fading green colour. 50. The tuberous autumnal-*pear*, with a thin, pellucid ſkin, partly red, and partly yellow. 51. The oval, ſomewhat angular, autumnal-*pear*, with a very tender ſkin of a faint yellow. 52. The large winter-*pear*, of a reddiſh yellow colour, and ſhaped like a pyramid. 53. The pyramid like winter-*pear*, partly purple, variegated with black ſpots, and partly yellow. 54. The great oblong, turbinated, iron-coloured, Windſor-*pear*, umbilicated on both ſides. 55. The great quince like winter-*pear*, partly yellow, and partly purple. 56. The very ſweet-flavoured, yellow, winter-*pear*, with a thick pedicle. 57. The great ſeſſile, winter-*pear*, of a yellowiſh grey colour. 58. The globoſe, ſeſſile, winter-*pear*, of an aſh-colour, variegated with large dark ſpots. 59. The long yellow winter-*pear*. 60. The ſmall winter-*pear*, of a yellow colour, variegated with red ſpots, and a bitter taſte. 61. The oval, ſugar-taſted, winter-*pear*, of an iron colour, with a faint admixture of purple. 62. The citron-ſhaped, hard, and very ſweet-flavoured, winter-*pear*. 63. The globoſe, ſeſſile, ſugar-taſted, ſweet-flavoured, winter-*pear*. 64. The turbinated and unequally tumid winter-*pear*, partly purple, and partly yellow. 65. The great globoſe winter-*pear*, of a yellow colour, variegated with red ſpots. 66. The turbinated, ſeſſile, winter-*pear*, of a ſubacid taſte, a yellow colour, and covered with a multitude of ſharp points. 67. The turbinated, ſeſſile, yellow, ſugar-taſted, winter-*pear*, of a ſweet ſmell, and diſſolving in the mouth. 68. The tuberous, turbinated, greater ſugar-taſted, winter-*pear*, diſſolving in the mouth. 69. The oblong, ſugar-taſted, ſweet-flavoured, winter-*pear*, of a partly deep and partly faint iron colour. 70. The oblong, winter-*pear*, of a very pale red colour. 71. The oblong, yellowiſh green, winter-*pear*, of an auſterely ſweetiſh taſte. 72. The oblong, tuberous, ſubacid, winter-*pear*, of a punctated yellow colour. 73. The tuberous, ſugar-taſted, punctated, yellowiſh green, winter-*pear*. 74. The long, whitiſh green, winter-*pear*, diſſolving in the mouth. 75. The long, yellowiſh green, winter-*pear*, diſſolving in the mouth. 76. The ſeſſile, yellowiſh green, winter-*pear*, ſpotted, umbilicated on both ſides, and diſſolving in the mouth. 77. The globoſe, pale green, tuberous, punctated, winter-*pear*, diſſolving in the mouth. 78. The great pyramidal, whitiſh, ſugar-taſted, ſweet-ſcented, winter-*pear*, diſſolving in the mouth. 79. The ſeſſile, iron-coloured, very ſweet-ſcented, winter-*pear*, diſſolving in the mouth. 80. The globoſe, citron-ſhaped, punctated, yellow, winter-*pear*, diſſolving in the mouth, and very ſweet-ſcented. 81. The long, ſugar-taſted, yellowiſh green, winter-*pear*, diſſolving in the mouth. 82. The ſeſſile, winter-*pear*, partly purple, and partly yellow. 83. The great, double-headed, winter-*pear*. 84. The tuberous and angular winter-*pear*. 85. The oval, paler green, winter-*pear*, with a very long pedicle, and beſet with tubercles. 86. The wild *pear*. 87. The great wild *pear*. *Tourn.* Inſt. Bot. p. 628, ſeq. See the article PEAR.

PYULCUM, a word uſed by the antients to expreſs an inſtrument uſed in their times to draw out the pus from the bottom of deep ſinuſes, probably a ſort of canula.

Q.

QUACHILTO, in zoology, the name of a very beautiful Braſilian bird, of the moorhen kind, called alſo *yacacintli*, and *porphyrio Americanus*.

It is of a fine blackiſh purple colour, variegated with white. Its beak is white, while young; but becomes red as it grows older, and has a naked ſpace at its baſis, reſembling, in ſome ſort, the coot. Its legs are of a yellowiſh green. It lives about the waters, and feeds on fiſh; yet is a very well taſted fiſh. It imitates the crowing of a common cock, and makes its muſic early in the morning. *Marggrave*'s Hiſt. Braſil.

QUADRANGULARIS *piſcis*, the *ſquare-fiſh*, in zoology, the name of a fiſh, which in its moſt uſual ſize, is about fifteen inches long, four inches high in the middle, and three inches and an half over. The forehead is ſquare, a little hollow, and, by the eminency of the eyebrows, two inches and an half over. The noſe blunt, and not very ſteep, with two holes in the place of noſtrils, and the mouth very ſmall. The back is a little convex toward the tail, and on the ſides a little obtuſely angled; as is alſo the belly, which is plain and flat, and a little riſing toward the tail. It has five fins, two near the gills, two near the tail, and the tail-fin, which is conſiderably long. Part of the head and tail are covered with a ſoft ſkin, the reſt of the body with a kind of cruſt, adorned all over with little round knots, reduced for the moſt part into hexagonal figures, and ſubdivided into equilateral triangles. *Grew.* Muſ. Reg. Soc. p. 110.

QUADRANS, *(Cycl.)* a word uſed by ſome authors to expreſs a fourth part of a pound, that is, three ounces Troy weight, or four of the averdupois.

QUADRATING *of a piece*, in gunnery, is examining whether the piece be duly placed in its carriage, and that the wheels be of an equal height.

QUADRATO, or QUADRO, in the Italian muſic, is a name given to the note B, when it comes in the natural or diatonic order, and is thus marked ♮. It is a ſemitone minor higher than the B mol, or ♭, and in reſpect of that may be called *ſharp*. See FLAT and SHARP, *Cycl.* and *Suppl.*

QUADRATULUS, in ichthyology, a name given by Rondeletius to the fiſh called by other authors the *plateſſa*, and *paſſer lævis*, in Engliſh the *plaiſe*.

This is properly a ſpecies of the pleuronectes, and is diſtinguiſhed from the reſt of that genus by Artedi, by a name expreſſing that it has the eyes and ſix tubercles on the right ſide of the head, and ſmooth ſides, and a ſpine at the anus. See the article PLEURONECTES.

QUADRATURE *of the hyperbola*. See HYPERBOLA.

QUADRATUS *(Cycl.)*—QUADRATUS, in zoology, a name by which ſome authors have called the flat fiſh, called *paſſer* by moſt writers, and in Engliſh the *plaiſe*. *Rondelet.* de Piſc. p. 331.

QUADRATUS, in anatomy, a ſmall, flat, fleſhy muſcle, of the figure of an oblong ſquare, ſituated tranſverſely between the tuberoſity of the iſchium and the great trochanter. It is fixed by one extremity along that obtuſe line which runs from under the acetabulum, toward the lower part of the tuberoſity of the iſchium; from whence it runs directly towards the great trochanter, and is inſerted in almoſt all the lower half of the oblong eminence in that apophyſis, but chiefly in the ſmall riſing or tuberoſity in the middle of that eminence. *Winſlow*'s Anat. p. 211.

QUADRATUS *lumborum*, *ſive lumbaris externus*, a ſmall, oblong, flat muſcle, irregularly ſquare, narrower at its upper than at its lower part, lying along the ſides of the vertebræ lumborum, between the laſt falſe rib and the os ilium. It is fixed below to the external labium of almoſt all the poſterior half of the criſta of the os ilium, to the ligamentum ſacro-iliacum, and a little to the os ſacrum, by a fleſhy plane, the fibres whereof run obliquely backward; from thence it runs up between the ſacro-lumbaris and pſoas, by both which it is partly hid, and is inſerted in the extremities of all the tranſverſe apophyſes of the loins by oblique tendinous digitations. It is alſo fixed by a broad inſertion in the twelfth rib, on the inſide of the ligament which lies between it and the longiſſimus dorſi, by which that rib is connected to the firſt vertebra of the loins. *Winſlow*'s Anat. p. 249.

QUADRATUS *muſculus*, in anatomy, is alſo a name given by Winſlow to the muſcle of the lips called by Albinus and Cowper *depreſſor labii inferioris*.

QUADRIGÆ, among the Romans, chariots drawn by four horſes, which were harneſſed all a-breaſt, and not two and two. *Pitiſc.* in voc.

QUADRISETÆ, the *four-haired fly*, a term uſed by the writers in natural hiſtory to expreſs thoſe flies of the ſeticaude or hair-tailed kind, which have four hairs or briſtles growing from the tail, as the others have three, two, or one.

QUADRULA, in natural hiſtory, a word ſometimes uſed in the ſame ſenſe as teſſela, and ſpoken of the cubic pyrites. Sometimes it is uſed alſo as the name of thoſe little ſpangles of ſhining matter that are mixed among ſand. Theſe are generally fragments of talc, and are of various colours, white, yellow, and blackiſh.

Solinus has uſed the word *quadrula* to expreſs the fragments of yellow talc that are found in that ſand called *ammochryſos*, or golden ſand. He miſtakes theſe ſhining particles for maſſes of real gold, and makes the ſand itſelf a kind of precious ſubſtance ranked among the gems, and brought from Perſia; but in this he does not agree with the reſt of the antients.

QUADRUPEDS, *(Cycl.)* in natural hiſtory. The eſſential character of *quadrupeds* is, that they have a hairy body and four feet, and that the females are viviparous, and give ſuck to their young. *Linnæi* Syſtem. Natur. p. 33.

Alated QUADRUPEDS. Among the many fabulous things with which natural hiſtory has been loaded, ſtories of flying *quadrupeds* ſeem to claim a very high rank; the gryphon, the *quadruped* dragon, and a great many other imaginary animals, having been introduced ſo ſeriouſly among the deſcriptions of real animals, that too many have been taught to believe them. Scheuchzer, in his *Phyſica ſacra Jobi*, has done much toward diſcountenancing ſuch relations, and Hyacinthus Gemma, who has written expreſly de fabuloſis animalibus, has added much on the ſame occaſion: yet all is not done. The world have late hiſtories of lemmas and baſiliſks, which never exiſted but in the imagination of the relator, or in the ſubtle contrivances of the fabricator; as is evidently the caſe in the baſiliſks, which we find in the muſæums of the curious, and which are all made out of the wray-fiſh. And the generality of readers are ſo fond of any thing that is marvellous, that theſe things are ſure to be remembered, while perhaps all the truths in the book are forgotten.

Tho' moſt of the ſtories of *alated* or flying *quadrupeds* are falſe, yet there are evidently ſome animals which ſhew, that this property is not denied to all *quadrupeds*. We have bats in every part of this kingdom, and the Eaſt and Weſt Indies are not without them; and whoever accurately examines this creature, will find that it has nothing of a bird but that one property of flying; and that what are called its wings, and ſerve it in the office of wings, are in reality only its fore-feet extended, and webbed with a peculiar kind of membrane.

There is a ſpecies of flying lizard very common in Java, and called by many the *flying dragon*. Bellonius had led the world into a great error in regard to this animal, having miſtaken it for a two-legged creature, and deſcribed and figured it as ſuch; but Bontius, and others ſince his time, have ſet us right about it from their own obſervation, and Piſo, as well as many others, have deſcribed it truly as a *quadruped*.

Theſe creatures are properly enough called flying animals, as they can ſuſpend themſelves a long time in the air, and move about in it at pleaſure; but leſs accurate writers have added to the numbers of flying *quadrupeds* the common ſquirrel, and ſeveral other creatures which live in woods, and being very light in their bodies, and very ſtrong in their legs, can leap or throw themſelves forward to a great diſtance, and by this means paſs from one tree to another. Of this kind the moſt eminent is that ſpecies called the *flying ſquirrel*, which has a ſort of membrane which it expands on each ſide to catch the air, and ſupport it from falling in its leaps; which by this means it makes very long, and ſeems to fly, eſpecially when it throws itſelf from the top of a very high tree to a low ſhrub.

Upon the whole, the ſtandard of the flying or *alated quadrupeds* ſeems to be properly enough reducible to this: that the words flying and *alated* are not ſynonymous terms, and that there are three kinds of flying among the *quadruped* claſs. The firſt abſolute and ſwift, flying as perfect as in birds; this peculiarly belongs to the bat, which is the only *alated* or winged *quadruped*, properly ſpeaking. 2. An imperfect flying by means of certain membranes ſerving as wings, but imperfectly, and not turning quick, or enduring long flights; ſuch is the flying of the lizard, which is not properly an *alated* animal. And laſtly, the imperfect flying of the ſquirrel kind, which even in that ſpecies called, by way of eminence, the *flying ſquirrel*, is not properly flying, but only long leaping; the creature being able to turn but very little out of a right line, and only to ſuſpend itſelf during a ſhort time in a leap from a high place to a lower. Phil. Tranſ. N°. 427. p. 34.

QUADRUPLATORES, among the Romans, were informers, who had the fourth part of the confiſcated goods for their pains. *Pitiſc.* in voc.

QUÆRENS *non invenit plegium*, a return made by the ſheriff upon a writ directed to him with this clauſe, viz. *Si A. fecerit B. ſecurum de clamore ſuo proſequendo*, &c. F. N. B. 38. *Blount*, *Cowel.*

QUÆSTOR,

QUÆSTOR, among the Romans. See QUESTOR, *Cycl.* and *Suppl.*

QUAHVITLA, in botany, a name uſed by ſome authors for the tree from which the reſin commonly called *gum copal* is procured. *Hernand.* p. 46.

QUAIL, *coturnix*, in ornithology, a bird of the gallinaceous kind. See COTURNIX and GALLINACEOUS.

The *quail* is a bird of paſſage, and with us frequents the corn-fields, and ſometimes the meadows. They begin to ſing in April, and they make their neſts in the month of May, building on the ground.

Quails are to be taken by means of the call, during their whole woing time, which laſts from April to Auguſt. The proper times for uſing the call are at ſun-riſing, at nine o'clock in the morning, at three in the afternoon, and at ſun ſet; for theſe are the natural times of the *quail*'s calling. The notes of the cock and hen-*quail* are very different, and the ſportſman who expects to ſucceed in the taking them, muſt be expert in both; for when the cock calls, the anſwer is to be made in the hen's note; and when the hen calls, the anſwer is to be made in the cock's. By this means, they will come up to the perſon ſo that he may, with great eaſe, throw the net over them and take them. If a cock-*quail* be ſingle, on hearing the hen's note he will immediately come; but if he have a hen already with him, he will not forſake her. Sometimes, tho' only one *quail* anſwers to the call, there will three or four come up; and then it is beſt to have patience, and not run to take up the firſt, but ſtay till they are all entangled, as they will ſoon be.

The *quail* is a neat cleanly bird, and will not run much into dirty or wet places: in dewy mornings they will often fly inſtead of running to the call; and in this caſe, it is beſt to let them go over the net, if it ſo happens that they fly higher than its top, and the ſportſman then changing ſides, and calling again, the bird will come back, and then will probably be taken in the net.

The calls are to be made of a ſmall leather purſe, about two fingers wide, and four fingers long, and made in the ſhape of a pear; this is to be ſtuffed half full of horſe-hair, and at the end of it is to be placed a ſmall whiſtle, made of the bone of a rabbit's leg, or ſome other ſuch bone: this is to be about two inches long, and the end formed like a flageolet, with a little ſoft wax. This is to be the end faſtened into the purſe, the other is to be cloſed up with the ſame wax, only that a hole is to be opened with a pin, to make it give a diſtinct and clear ſound. To make this ſound, it is to be held full in the palm of the hand, with one of the fingers placed over the top of the wax, then the purſe is to be preſſed, and the finger is to ſhake over the middle of it, to modulate the ſound it gives into a ſort of ſhake. This is the moſt uſeful call, for it imitates the note of the hen-*quail*, and ſeldom fails to bring a cock to the net, if there be one near the place.

The call that imitates the note of the cock, and is uſed to bring the hen to him, is to be about four inches long, and above an inch thick; it is to be made of a piece of wire turned round and curled, and covered with leather; and one end of it muſt be cloſed up with a piece of flat wood, about the middle of which there muſt be a ſmall thread or ſtrap of leather, and at the other end is to be placed the ſame ſort of pipe, made of bone, as is uſed in the other call. The noiſe is made by opening and cloſing the ſpiral, and gives the ſame ſound that the cock does when he gives the hen a ſignal that he is near her.

QUALIFICATIONS *of members of parliament.* A knight, baronet, or any other under the degree of a baron, may be elected knight, citizen, or burgeſs. 4 Inſt. 46, 47.

An alien, tho' made a denizen, cannot ſit in parliament[a]; even perſons naturalized by act of parliament are uſually reſtrained from ſitting as members[b]. Perſons under the age of twenty-one years are not capable of being elected members of parliament. The election is void, and minors, tho' choſen, preſuming to ſit and vote, are under the ſame penalties as if they had ſat and voted without being choſen[c]. [[a] 4 Inſt. 47. [b] Vid. Stat. 12, 13 Will. III. 4 Ann, c. 8. and 1 Geo. I. [c] 7 and 8 Will. III. c. 25.]

None of the judges of the king's-bench, common-pleas, or barons of the exchequer, that have judicial places, can be choſen knights, citizens, or burgeſſes of parliament. 4 Inſt. 47.

None of the clergy can be elected knight, citizen, or burgeſs of parliament; becauſe they are of another body, the convocation. 4 Inſt. 47. Moor 783.

A perſon attainted of treaſon or felony is not eligible; for he ought, according to the writ, to be *idoneus, diſcretus & ſufficiens.* 4 Inſt. 48.

The king cannot grant a charter of exemption to any man, to be freed from election of knight, citizen, or burgeſs of the parliament. 4 Inſt. 49.

For the incapacities of ſheriffs, mayors of towns, and the reaſons why they may or may not be elected knights, citizens, or burgeſſes, vid. 4 Inſt. 48. *Bro.* Abr. Tit. Parliament. *Cromp.* Juriſd. 3. 16. *Ruſhw.* Collect. Vol. I. p. 684. *Townſh.* Coll. 185.

QUALITY *(Cycl.)*—QUALITY *of curvature*, in geometry, is uſed to ſignify its form, as it is more or leſs inequable, or as it is varied more or leſs in its progreſs through different parts of the curve. *Newton*'s Meth. of Flux. and Inf. Ser. p. 75. *Maclaur.* Flux. Art. 369. See CURVATURE, Appendix.

QUAMOCLIT, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the monopetalous or one-leaved kind, and is funnel-ſhaped and divided into ſeveral ſegments at the end. From the cup there ariſes a piſtil, which is fixed in the manner of a nail to the lower part of the flower; this afterwards changes into an oblong fruit, containing ſmall ſeeds, uſually of an oblong figure. See Tab. 1. of Botany, Claſs 2.

The ſpecies of *quamoclit*, enumerated by Mr. Tournefort, are theſe: 1. The finely divided pennated-leaved *quamoclit*. 2. The purple-flowered American *quamoclit*, with fingered leaves. 3. The ſix-leaved American *quamoclit*, with purple umbellated flowers. 4. The American *quamoclit*, with large heart-like leaves. 5. The purple-flowered American *quamoclit*, with large angular leaves. 6. The trifid, or ivy-leaved American *quamoclit*. 7. The pale red American *quamoclit*, with leaves like thoſe of nightſhade. *Tourn.* Inſt. p. 116.

Quamoclit differs from bindweed, or convolvulus, in the ſhape of the flower.

QUANDROS, a name given by the writers of the middle ages to a ſtone, to which they attribute great virtues, and which, they ſay, is found in the head of a vulture.

QUANTITY *(Cycl.)*—QUANTITY *of curvature* at any point of a curve is determined by the circle of curvature at that point, and is reciprocally proportional to its radius. *Newton* Meth. of Flux. and Inf. Series, p. 60. *Maclaurin*'s Fluxions, B. 1. ch. 11. See CURVATURE, Appendix.

QUANTITY *of action.* See ACTION.

QUANTITY { *impoſſible*, / *imaginary*, } See the article ROOT.

QUAPACHTOTOTL, in zoology, a name under which Nieremberg has deſcribed a bird, which, he ſays, imitates the human laugh. He ſays its body is eight inches long, and the tail as many; the beak of a bluiſh black, and bent and crooked; the breaſt grey and the belly black; the tail of a browniſh black, and the wings, neck, and head of a yellowiſh brown. *Ray*'s Ornithol. p. 298.

QUARRY *(Cycl.)*—In many parts of England we find ſea-ſhells buried in hard ſtone, and under great beds of earth.

Near Broughton, in Lincolnſhire, all the *quarries* abound with them. At the eaſt end of this town there is a *quarry* of a ſoft ſtone, which they dig through to get at a bed of clay, which is of a peculiarly glutinous quality, and hardens like mortar in drying: this is uſed for cementing other ſtones together, and in this are innumerable fragments of ſhells of cockles, ſcallops, ſea-echini, and corals; and among theſe fragments there are found ſome whole ſhells of their natural colours, and often wholly unhurt; tho' ſome of them are bruiſed and preſſed quite flat by the great weight of earth that lies upon them. On the ſouth ſide of the town there is a *quarry* of a blue ſtone, which was doubtleſs in the times before the deluge a blue clay, of the ſame nature with that juſt mentioned. This contains in its body vaſt numbers of the ſame ſorts of ſhells, and of many other kinds; but they are all ſo firmly bedded in the ſtone, that it is not eaſy to get them out whole: but there is this very remarkable, that they only lie in the ſuperficial part of the ſtone, the ſtratum being very thick, but not one ſhell found in it beyond the depth of two foot from the ſurface.

The ſurface of this ſtratum of ſtone is not even and ſmooth, but is waved and ridged irregularly, like a bed of ſnow, or like the waves of the ſea in the time of a ſmall wind. This has juſt the appearance that the ſurface of a maſs of half hardened matter muſt have, if the wind blew fiercely upon it from one quarter; and by the direction of theſe undulations, it is eaſy to ſee from what quarter the wind blew at that time. In that part of the ſtone which forms this undulated roughneſs, there are as many ſhells as any where elſe; and theſe lie partly buried and partly ſtanding out of the ſtone, juſt as we ſee the freſh water ſhell-fiſh lie half in and half out of the mud of the bottom of a pond or river that is dried up in ſummer.

It is very obſervable, that in this caſe, as much of the ſhell as is within the ſtone is perfectly well preſerved, and as hard as ſtone; whereas that part which ſtands out is either wholly decayed, or at the beſt of the nature of a rotten ſhell, which falls to pieces on being touched with the hands. The part of the ſhell within the ſtone is uſually converted into a maſs different from the ſhell in all things but figure; but that which ſtands out always preſerves the true texture of the natural ſhell, and is made up of many flakes and cruſts as the natural ſhells of the kind to which it belongs are.

Among the ſhells buried in the ſubſtance of the ſtone, ſome have their ſhell perfect on them, others have only a thin cruſt of a whitiſh ſtony matter in the place of it, and others are wholly naked, and have no ſhell nor any covering at all: theſe are properly only caſts of ſtone in the places where ſhells once were, all the matter of the ſhells themſelves having been diſſolved and waſhed away. In ſome of theſe there is a thick white ſubſtance in the place of the ſhell, between the caſt and the bed of ſtone: theſe come out the moſt eaſy and perfect of

of any, and the matter which ſupplied the place of the ſhell remains faſtened to the bed of the ſtone; others ſeparate themſelves very perfect after froſty nights.

Some of the cockles and other bivalves are found cloſed, others are found half open, as ſhell-fiſh naturally open their ſhells when deſerted by the water. In theſe the cavity is always filled with the matter of the ſtratum, and both petrified together. In ſome places they lie in heaps together in the ſtone, and there they uſually enter into and injure one another. Some are found ſhut ſo cloſely, that the matter of the ſtone-bed could not get into their cavity; and of theſe, ſome are at this time wholly empty, others are filled, or partly filled, with cryſtals and ſpars: theſe bodies muſt have been found in them only from the cryſtaline and ſparry matter riſing through the earth in vapour, and penetrating the very ſubſtance of the ſhells after their being lodged in the ſtone.

In this *quarry* there is alſo found a very remarkable ſhell, reſembling a ram's horn, bent in the ſame manner, and with the ſame lineations. This is wholly different from the common cornu ammonis claſs, and has an operculum to cloſe its mouth with, in the manner of the wilks and other ſuch ſhells. This operculum is often found entire with the ſhell, or near it, in the ſame bed of ſtone.

This ſpecies of foſſile ſhell is found in prodigious numbers together, and uſually lies near the ſurface of the bed of ſtone, a part being buried in the ſtone, and a part ſtanding out of it; many of them ſtand more than half way out, and the ſhell of theſe is ſo much more durable than that of the common kinds, that it is uſually very firm and ſtrong, even in ſuch places where the other kinds moulder all away. Theſe are uſually found entire, but in ſome places they are cruſhed flat, and otherwiſe bruiſed and injured.

From theſe and the like obſervations made on the whole ſurface of the earth, and to great depths in its bowels, where ever men have dug on any occaſion, ariſe plain proofs of the univerſality of the deluge; and from many of theſe obſervations it ſeems very plain, that in the time of the deluge the earth ſuffered great violence in many parts, that the bottoms of ſeas were in ſome places raiſed into mountains, and in others the tops of mountains ſunk into ſeas, and the beds of ſhells ſtill preſerved in the foſſile world were very often cruſhed and bruiſed by large maſſes of earth and pieces of rock thrown upon them.

Some think that it appears from the conſideration of the *quarries* and ſtrata of earth, *&c.* in the preſent world, that the antediluvian earth had ſeas and ſhores, mountains and plains, rivers and vallies, as ours has; and that waters from within the earth were let out upon its ſurface, and the whole cruſt of the then world ſubſided under theſe; that the contents of the ſeas, ſuch as ſhells, corals, and the like, were after this toſſed variouſly about over the ſurface of this drowned world, and left in different parts of it; and that this preſent earth afterwards partly aroſe out of the common flood, as iſlands are now formed in ſome ſeas, and partly was deſerted by the waters, when called off again by the ſame almighty hand that brought it on: and as the ſtrata of the earth were at that time ſoft, it is no wonder that matter then ſoft enough to let in the ſhells, *&c.* afterwards hardened, together with the ſhells it had received, into ſtone; and that in proceſs of time, the ſtony particles eternally floating in the air and waters that pervade all the ſtrata, depoſited their ſmall parts in the interſtices of theſe ſhells, and finally the whole became ſtone.

It is no wonder that all ſorts of marine productions, ſhells, parts of ſea-fiſhes, corals, and the like, are found at this time in beds and *quarries*, in hills and mountains, and alſo in the bowels of the earth; for it is certain that they were produced in the antediluvian ſea, and were either elevated with the hills and mountains in the time of the deluge, or they fell into holes, clifts, and chaſms in the earth, which muſt be formed in vaſt numbers during the time of that terrible cataſtrophe, and in theſe they remain buried to this time; while others lodged on what was then the ſurface, became afterwards covered with more ſtrata, depoſited from what was ſtill ſuſpended in the waters, and ſo were buried at great depths from the preſent ſurface; when others rolling about among the laſt ſediments of the ſame waters, while yet ſo unfixed as to be carried away with their violence, were finally left on or near the ſurface.

The *quarries* about Broughton ſeem to have been but little diſturbed; and to have been originally the mud which formed the bottom of ſome large freſh water lake; for the ſhells found in greateſt plenty of all there, are freſh water ſhells. Theſe ſeem to have remained in their original mud while turned to ſtone; and the other ſhells, natives of the ſea, which are buried there among them, ſeem to have been ſome of that immenſe number and variety that muſt have rolled along the bottom of that bed of waters; and the viſcid nature of the clay detained many of theſe among its own proper inhabitants, and preſerved them together in its ſtrong ſtate.

Beſide the parts of animals, theſe *quarries* have vegetable matters alſo in them: the leaves and branches of whortles are not uncommon, and pieces of wood turned black and reſembling charcoal are alſo found there. Theſe have been preſerved in the ſame manner with the leaves of fern on the ſlates of our coal-pits, and the plants and fiſhes found in hard ſtone in many of the German mines. Many of theſe vegetable remains are alſo found in looſe nodules of ſtone reſembling pebbles: theſe are not leſs eaſily accounted for than the reſt; for it is not ſtrange to conceive, that leaves and pieces of plants might be, in that general confuſion, received into lumps of clay, which might afterwards be rolled into roundneſs by the motion of the water, and finally received into chaſms of the earth, and there petrified. Phil. Tranſ. N°. 266, p. 685.

QUARTAN, (*Cycl.*) in medicine, the name of a ſpecies of intermitting fever, which returns upon the patient every fourth day, including the days of both the paroxyſms, with a cold fit ſucceeded by a hot one. In this nature is endeavouring to relieve herſelf from ſome noxious matter adhering to ſome of the hypocondriac viſcera, and to prevent the injury that might thence happen to the part, the *quartan* is, by authors, diſtinguiſhed into the ſimple and the continual.

The ſimple *quartan* is the moſt regular of all the ſpecies of intermitting fevers: it almoſt conſtantly ſeizes the patient about four or five in the afternoon with a cold fit; but this is not ſo violent as in the quotidian or tertian, nor does it occaſion any of the ſhaking of the limbs: it is, however very ſenſible, and uſually laſts about two hours. This is preceded and accompanied by a general languor or faintneſs; but is not ſo frequently attended with vomitings as the other intermittents in the time of their cold fit, nor is there any tendency to a diarrhœa; but, on the contrary, the bowels are uſually coſtive, not only on the day of the fit, but on the intermediate ones. The hot fit ſlowly ſucceeds the cold one, and is not ſo violent as in the tertian; but rather is troubleſome from the ſenſation of drineſs it brings on, and is ſeldom ſucceeded by any ſweating. The hot fit uſually continues about four hours, ſometimes ſix, and ſometimes much longer than that in the firſt fits. During the heat the head is vertiginous, and afflicted with a heavy pain, not a very acute one. When the fit is over, the patient returns to tolerable good health again, and remains in that ſtate for the two ſucceeding days, ſaving that he has a foreneſs in the limbs, and a wearineſs and general laſſitude. The fit afterwards returns at the very hour it firſt came on at, and rarely varies at all from this: when it is obſerved to anticipate its uſual time, there is juſt reaſon to fear its becoming continual. The perſons moſt ſubject to *quartans* are thoſe of a middle or advanced age; it rarely happens to young people unleſs epidemic, and of all other perſons, thoſe are moſt ſubject to it who live a ſedentary life, and are of a melancholy diſpoſition.

Cauſes of it. The general cauſe of a *quartan* is a morbid viſcous matter, lodged in the hypocondriac viſcera, and having communication by that means with the vena portæ. The liver, ſpleen, and glands of the meſentery are frequently the ſeats of this, rarely the primæ viæ. That theſe viſcera are affected in *quartans*, is evident from the connection theſe diſeaſes have with their other affections, ſuch as dropſies, jaundice, and the like. The occaſional cauſes are very frequently a quotidian or tertian fever improperly treated, obſtructions or omiſſions of habitual diſcharges of blood, whether by bleeding, or by the menſes, or hæmorrhoids; a heavy diet, without ſufficient drink; a ſudden chilling of the abdomen in a humid air, after the body has been violently heated. The principal time for theſe fevers is the autumn, whence they have been called by ſome *autumnal fevers*; and nothing more endangers their frequent return, than the abuſe of ſtrong liquors, or of acids, which coagulate the blood.

Prognoſtics. The tenacity of the morbific matter in theſe fevers, tho' in but a very ſmall quantiy, yet renders them very difficult of cure. They often laſt many weeks or months, in ſpite of all medicines, and in ſome ages have been accounted the greateſt ſcandal to phyſicians. When it ſeizes a perſon in the ſpring ſeaſon, it is naturally of ſhorter duration; but when it comes on in its more uſual ſeaſon, the autumn, it generally holds the patient till the ſpring. *Quartans* are very apt to return upon people at the ſame ſeaſon of the year at which they firſt ſeized them, eſpecially when they have been but injudicially treated in the cure. It is often, indeed, rather ſuppreſſed than cured, and then returns uſually at ſhorter periods, and often almoſt immediately on feeding heartily, which is commonly the caſe with thoſe who have been freed from it by the bark injudiciouſly given.

It has been already obſerved, that this diſeaſe does not naturally tend to any ſort of evacuation, and when ſuch diſcharges are unnaturally provoked by medicines, as by vomits, purges, and violent ſudorifics, it is eaſily changed into a hectic, or ſome other dangerous chronic malady. A *quartan*, when properly cured, uſually carries off with it all tendency to hypocondriac complaints, to which the patient may before have been ſubject; but, on the contrary, when improperly ſuppreſſed, it too often brings on ſchirroſities of the liver and ſpleen, and of the meſariac glands, with œdematous ſwellings, hectics, aſthmas, and other complaints.

A violent appetite after the fit of a *quartan*, or a tertian fever, is a ſign that the diſeaſe will be very difficult of cure. Eruptions on the ſkin in the time of *quartans*, uſually preſage the going off of the diſeaſe; and ſometimes hard tumors, and bad ulcers in the legs and feet, come on during the time of the ill-

illneſs; theſe generally preſage the going off of the original diſeaſe, but they have in themſelves a worſe complaint in the place of it: and it is obſerved alſo, that œdematous tumors, which have their riſe from ill-cured *quartans*, are much more obſtinate and difficult of cure than any others.

Method of cure. The uſe of the bark is now univerſal in all intermittents, and the ignorant as well as the judicious give it; but there are many authors who are greatly againſt the ſole uſe of it in *quartans*. Stahl ſays, that in this caſe the mucous matter lodged in the hypocondric viſcera, which is the cauſe of the diſeaſe, ſhould be firſt attenuated and incided by the neutral and digeſtive ſalts, as vitriolated tartar and the like; and with the gums, as ammoniacum and ſagapenum, with the roots of arum and pimpernel; and by diluents, which would alſo take off the obſtinate coſtiveneſs of the bowels. That when the matter is by this means fitted for evacuation, it ſhould be thrown off by purges and diuretics, ſuch as black hellebore, mercurius dulcis, and the tartar pills; and afterwards the cure to be compleated by reſtoring the viſcera to their due tone, by means of bitters and ſubaſtringents, as gentian, centaury, and the jeſuit's bark given in ſmall quantities. By this means cures are much more regularly and happily effected than by bark alone. *Junker*'s Conſp. Med. p. 373--376.

Bartholine, in his medical obſervations, gives us a very remarkable inſtance of a cure performed on a perſon long afflicted with a *quartan*, and who had tried all the common methods in vain. He was adviſed by ſome body to drink plentifully of very new beer; he did ſo, and going to bed, ſweat very largely upon it, and was abſolutely cured by it.

Quartans have ſometimes been cured by mercurials. Med. Eſſ. Edinb. abr. Vol. 2. p. 317.

The *quartan* ague is ſaid to be cured by a medicine compoſed of euphorbium, reſin of jalap, merc. dulc. and ſugar.

Continual QUARTANS, in medicine, the name given to a ſpecies of compound fever, which has the paroxyſms of a common *quartan*; but in which the heat never goes wholly off, but continues till the time of the ſucceeding fit. In all reſpects, except the regular returns of the paroxyſms, this diſeaſe greatly reſembles a hectic.

Signs of it. Every fourth day there is a regular paroxyſm, which begins with a coldneſs and ſhivering: this, however, does not return exactly to an hour, as the ſimple *quartan* does in its fits; but uſually the ſucceeding fit anticipates the time of the former. When the cold fit is over, there comes on a violent day-burning; the heat is much greater the firſt day than the ſucceeding ones, but continues in ſome degree till the fourth day, when the cold fit returns again, and the patient is ſeldom able to keep long together out of bed in the whole time. There is a continual thirſt and drineſs of the mouth, and the ſaliva is very little in quantity and very frothy; the appetite is bad, and the patient uſually has more inclination to ſalted and cold foods than any other; the head is diſordered rather than aking, and there is a continual deſire to ſleep, but what ſleep the patient has is troubled and unſound, and gives very little refreſhment; the urine during the whole courſe of the diſeaſe, reſembles that of hectical patients, and is reddiſh and turbid, depoſiting, after a time, a roſe-coloured ſediment.

Perſons ſubject to it. This diſeaſe is frequently brought upon perſons who have had a common *quartan*, by the injudicious treatment of that diſtemper, and particularly by the taking hot medicines in it before the approach of the fit; the too free uſe of aſtringents has alſo in many caſes changed that diſeaſe into this. People of a middle or more advanced age are more ſubject to it than youth; and of theſe, ſuch are principally ſeen to be afflicted with it as are of a melancholic habit and ſedentary life.

Prognoſtics in it. This diſeaſe, tho' in itſelf leſs dangerous than many others, yet very eaſily changes, under improper management, into a hectic, and ſometimes into a dropſy. This is the caſe not unfrequently when it is treated with large repeated doſes of aſtringents; on the other hand, when it is treated with vomits and a hot regimen, it eaſily paſſes into an acute and dangerous inflammatory fever.

Method of cure. Toward the time of the fit there ſhould be given powders compoſed of the digeſtive ſalts, ſuch as vitriolated tartar, with crabs-eyes, ſaturated with lemon juice. So long as the heat continues violent, the perſon is to be kept quiet, and to drink plentifully of warm and weak liquors; and in the following days, when the heat is obſerved to be decreaſed, gentle purges are to be given, with gentle aperitives, and reſolvents, ſuch as the decoctions of dandelion and ſuccory roots; and toward evening, a gentle doſe of ſome anodyne, as the ſtorax pill and the like. The common violent methods by vomits, bleeding, ſtimulating purges, and hot alexipharmics, have no place in the cure of this diſeaſe; but, on the contrary, violently diſturb nature, and add to the complaints. Abſorbents in large quantities are alſo to be avoided, leaſt the viſcid matter which is the cauſe of the diſeaſe ſhould be increaſed by their effects: and when the patient is happily cured, he is not immediately to abſtain from medicines, ſince relapſes are very frequent. Digeſtives and ſtomachics taken for ſome weeks after, is the way to prevent them. *Junker*'s Conſp. Med. p. 209, 401.

QUARTARIUS, a meaſure among the antients, being the fourth part of a ſextary, and nearly equal to a quarter of a pint of our wine-meaſure.

QUARTATION, (*Cycl.*) in metallurgy, is the ſeparation of ſilver from gold by means of aqua fortis; which is an operation that has ſomething ſingular in it.

If ſilver and gold are mixed together into a maſs, and the gold is not leſs than one third part of the maſs in weight, the beſt aqua fortis poured upon it is not at all capable of diſſolving the ſilver; but if you add more ſilver to this maſs, by melting it again in the fire, with ſuch a neceſſary addition of that metal alone as ſhall bring the gold in the maſs to the proportion of leſs than one third of the whole, and ſuffer it to cool, then aqua fortis poured on it will corrode the ſilver from it: this is alſo by ſo much the more ſtrongly performed, as the quantity of gold is leſs than in the proportion of one third of the whole maſs; but experience has taught us, that aqua fortis diſſolves ſilver mixed with gold quickly enough when the gold conſtitutes but one, and the ſilver three parts of a mixed maſs of them: and in this caſe, if the ſolution is not too impetuouſly performed, the gold uſually remains in ſuch a proportion, in the ſame figure that the whole maſs had before the ſeparation of the ſilver by this menſtruum; ſo that in this caſe, there is no reaſon to apprehend the gold's being torn into minute particles, and diſſipated in ſome meaſure; tho' this can hardly be prevented when the ſilver exceeds the three quarter proportion, in regard to the gold in the maſs. The artificers, therefore, always make it their ſtudy to obſerve very exactly this proportion of the gold being one fourth part of the mixture; and thence it is that the operation itſelf has been called *quartation*.

From this operation we may learn how fallacious the examination made with aqua fortis alone of the gold rubbed on the touchſtone, muſt neceſſarily prove. *Cramer*'s Art. aſſ. p. 195.

QUARTER *(Cycl.)*—QUARTER, in corn meaſure, ſeems to have ſignified originally the fourth part of a ton in weight, or capacity. See WEIGHT.

QUARTER-*chord*, in mining, is ſeven yards and a quarter, which the miner hath croſs-ways of his vein on either ſide, for liberty to lay his earth, ſtones, and rubbiſh on, and to waſh and dreſs up his ore. *Houghton*'s compl. Miner in the Explan. of the Terms.

QUARTER *of a ſhip*, is that part of the ſhip's hull which lies from the ſteerage-room to the tranſom.

Cloſe QUARTERS, in a ſhip, thoſe places where the ſeamen *quarter* themſelves, in caſe of boarding, for their own defence and clearing the decks, *&c.*

Fat QUARTER, in a ſhip. See FAT, *Cycl.*

QUARTER-*maſters*, or QUARTEERS, in a man of war, thoſe officers whoſe buſineſs is rummaging, ſtowing, and trimming the ſhip in the hold; to overlook the ſteward in his delivery of victuals to the cook; and in pumping or drawing out beer, or the like. They alſo are to keep their watch duly, in conding the ſhip, or any other duty.

QUARTER-*point* of the compaſs. See POINT, *Cycl.*

QUARTER-*wind*, at ſea, that which comes in abaft the main-maſt ſhrouds, even with the *quarter* of the ſhip.

QUARTER, in the manege. To work from *quarter* to *quarter*, is to ride a horſe three times in end upon the firſt of the four lines of a ſquare; then changing your hand to ride him three times upon the ſecond; and ſo to the third and fourth, always changing hands and obſerving the ſame order.

QUARTERS *of a ſaddle*, are the pieces of leather or ſtuff made faſt to the lower part of the ſides of a ſaddle, and hanging down below the ſaddle.

QUARTERS *of a horſe*, are the ſhoulders and fore-legs, called *fore-quarters*; and the hips and hinder legs, called *hind-quarters*.

QUARTERS *of a horſe's foot*, are the ſides of the coffin, comprehended between the toe and the heel on one ſide and t'other of the foot. The inner *quarters* are thoſe oppoſite to one another, facing from one foot to the other; and theſe are always weaker than the outſide *quarter*, which lie on the external ſides of the coffin.

QUARTER-*caſt*. A horſe is ſaid to be *quarter-caſt* when, for any diſorder of the coffin, we are obliged to cut one of the *quarters* of the hoof; and when the hoof thus cut grows anew, it is called *new quarter*.

Falſe QUARTERS, a cleft in the horn of a horſe's *quarters*, extending from the cronet to the ſhoe, which voids blood, and occaſions a great deal of pain, and makes the horſe lame.

QUARTERING *the men*, in the ſea language, the diſpoſing of the ſhip's company at the time of an engagement in ſuch a manner, that each may readily know where his ſtation is, and what he is to do: as, ſome to the maſter, for the management of the ſails; ſome to aſſiſt the gunners, to traverſe the ordnance; ſome for plying the enemy with ſmall ſhot; ſome to fill powder in the powder-room; others to carry it from thence to the gunners in cartridges, *&c.*

QUARTUM *par conſtringens*, in anatomy, a name given by Spigelius and ſome others to the muſcle called by Albinus and Riolanus *orbicularis oris*; and by Cowper and ſome others, *conſtrictor labiorum*.

QUARTUS *hyoidis muſculus*, in anatomy, a name given by

Veſalius, Fabricius, and many other anatomiſts, to a muſcle now generally called the *coracohyoidæus*.

QUARTUS *oculum movens*, in anatomy, a name given by Veſalius to one of the muſcles of the eye, called by ſome *rectus inferior*, and by others *humilis*.

It is the *depreſſor oculi* of Albinus, being one of the *quatuor recti oculi* of that author.

QUATERNA *folia*, among botaniſts. See LEAF.

QUATOTONI, in zoology, the name of an American bird of the wood-pecker kind, having a red creſt on its head, and two white lines running down the ſides of the neck to the breaſt. It is called by Nieremberg *picus imbrifœtus*.

QUATRICHROMA, in the Italian muſic, is what we call a *demi-ſemi-quaver*, thirty-two whereof make a bar in common time. See TIME, TRIPLE, and BISCHROMA.

QUAVITL, in botany, a name given by ſome authors to the cocoa-tree. *Hern.* p. 79.

QUAUHAYQHUATLI, in botany, a name by which ſome authors have called the tree whoſe fruit is the caſſia fiſtula of the ſhops. *Hern.* p. 87.

QUAUHTZONECOLIM, in zoology, the American name for a bird called by moſt a *quail*, but eſteemed by Nieremberg a ſpecies of partridge.

It is of the ſize of the European partridge, and of a browniſh colour, and ornamented with a creſt upon its head. There are alſo in America two other ſpecies of partridge much allied to this, the one with a yellow body, and black and white head; the other ſmall and brown, and without a creſt. *Ray*'s Ornithology, p. 304.

QUEEN *(Cycl.)*—QUEEN-*bee*, a term given by late writers to what uſed to be called the *king-bee*, or king of the bees; a large and long-bodied bee, of which kind there is only one found in every ſwarm, and which is always treated with the greateſt reſpect by the reſt.

This is, indeed, the parent of the ſwarm, and from the fœcundity of this one female, a whole hive is eaſily and ſoon repeopled.

It is to be obſerved, that the autumn and winter ſeaſons deſtroy a great number of the bees; ſo that a hive, which was full in the ſummer, is often found ſo thinly peopled before the end of winter, that the bees ſeem only a few inhabitants in a very large city: by midſummer again this ſame hive ſhall, however, be found ſo well filled with inhabitants, that there ſhall be a neceſſity of ſending out a colony in the name of a new ſwarm, and yet the hive will remain as full as it can well hold. This increaſe might well appear very amazing, if all the remaining bees of the hive were ſuppoſed to be females, and to join in it; but how much more ſo when it muſt be acknowledged, that it is all owing to one female, and that this *queen-bee*, or bee-mother, alone, has given origin to ſuch an immenſe progeny?

The form of this bee, and there being only one ſuch in a hive, naturally led all who ſaw it into an opinion of ſomething ſingular in its nature, and the antients determined that it muſt be the king over the reſt: they made it an abſolute monarch, and have ſuppoſed that all the buſineſs of the hive was done by its immediate orders; and that the ſeveral parties of bees allotted to work in the making the combs, in the filling their cells, in the ſtopping the crevices of the hives, and in carrying away the filth, *&c.* had all their ſeveral ſtations allotted them by this wiſe and provident monarch. This was giving great talents to the monarch-bee; but this was mere fancy, and it is plain, that if this creature rules, it is over a people who all perfectly well know their ſeveral buſineſs: but it rather appears, that there is no ſovereignty at all, but that this creature is reſpected in a very high degree by the reſt as the common parent of the whole nation.

There were not wanting among the antients, however, ſome who believed this large bee to be a female, and theſe pretend that ſhe brought forth only females like herſelf, which ſucceeded her in her reign. They had a very different opinion as to the origin of the common bees, not ſuppoſing them generated of animal parents like themſelves, but produced out of corruption, and born of the fleſh of a bull or cow. Among the later writers this opinion, notwithſtanding the ſanction of the poet Virgil, has been laughed out of the world; yet it was long before the true origin of bees, even after this, was known. The author of the female monarchy, tho' well apprized of this great bee being of the female ſex, yet ſuppoſed that ſhe only produced young ones like herſelf; and pretended that the common bees copulated together for the production of other bees like themſelves: this, however, has been ſince found to be wholly erroneous, the female, or *queen-bee*, giving birth to all, and theſe common bees being of no ſex at all.

Many of the authors who have not given into the idle opinion of the bees being bred of putrid fleſh, have yet given them an origin not leſs idle and ridiculous. They pretend that the bees are exempted from the pain of producing either eggs or young; and that their offſpring are formed of the juices of flowers, the different kinds, as the drones, females, *&c.* owing their riſe to juices of different kinds. Theſe, and a number of other falſe notions, have been propagated in regard to bees; but their true origin could not well be found till we were in a condition to ſee what paſſes at certain times within the receſſes of the hive, which is done by the uſe of that excellent invention the glaſs hive. By this, and by the help of diſſections, we may eaſily inform ourſelves perfectly of the true ſtate of the caſe.

The parts of generation are the ſubjects of our enquiry for this purpoſe, and tho' the bodies of theſe animals are ſo ſmall, theſe are uſually ſufficiently large to be diſtinguiſhed, often taking up more room in the abdomen than all the other parts together. Thus, if the large long-bodied bee be opened, the abdomen will be found to contain vaſt numbers of oblong bodies, which any one acquainted with inſects will eaſily diſtinguiſh to be eggs: vaſt numbers of theſe are large enough to be obſervable by the naked eye, but when the aſſiſtance of glaſſes is called in, there are diſcerned a vaſt number of other ſmaller eggs, which exceed all computation. It is eaſy to determine from this, that this creature, ſo long eſteemed a male, is in reality a female, and is in condition to give birth to a very numerous poſterity.

In order to diſtinguiſh this, however, a proper time muſt be choſen for the diſſection, and the moſt proper of all is when the creature is juſt ready to depoſit her eggs. This is in the months of April and May, and the moſt certain time of all is when ſhe is in a hive where a new ſwarm have been received about ten days before: if ſhe be diſſected at other times, the eggs are leſs viſible; and particularly in winter, there requires a good glaſs to ſhew the rudiments of them. This is a diſagreeable experiment, indeed, becauſe it is always the deſtruction of a future ſwarm; all the eggs we ſee in the diſſected female being what would have produced bees to labour for our benefit.

When the body of one of the drones is opened, there is found, inſtead of theſe vaſt numbers of eggs, a part ſeeming proper for a male organ of generation; and in the abdomen a number of veſſels running in ſeveral windings and contortions, and filled with a milky humour. Theſe ſeem deſtined for the important uſe of impregnating the eggs in the belly of the female, and it is very natural to determine from this that theſe are the males.

The common bees, when diſſected, at whatever time of the year, never ſhew the leaſt marks of any ſex at all. The inteſtines of theſe bees are found at times to be more or leſs diſtended with honey, and with rough wax; but there are never diſcovered any eggs, nor any of the winding ſeminal veſſels, ſo that it is plain they have no ſhare in propagating the ſpecies: and the obſervation of the ſwarms from time to time, with the aſſiſtance of glaſs hives, gives proof to what the diſſections ſeem to make ſufficiently certain without this evidence.

The female bee reſides within the center of the hive, always living in one of the ſpaces between the combs; if ſhe occaſionally comes out to the ſurface, and is ſeen walking over the edge of a comb, ſhe is to be well obſerved at thoſe times; for her only buſineſs is the laying her eggs in ſome of the empty cells of that part of the comb, which done, ſhe always retires again.

In order to ſee the female, or mother bee, employed in this operation, we are to obſerve in the morning hours, between ſeven and ten, what paſſes in a glaſs hive into which a ſwarm have been received a few days before. The ſpeed with which the common bees labour in making their combs on this occaſion is almoſt incredible, and they ſeem not only to labour to have cells to depoſit their honey in, but to know that the parent bee is at this time loaded with eggs for the production of a numerous progeny, and that ſhe has an immediate neceſſity of cells for the depoſiting them in. This neceſſity is ſo urgent, that ſhe is often forced to depoſit them in cells not yet finiſhed; tho' the bees labour ſo vigorouſly, that they often will erect a whole large comb in one day. If the hive be narrowly watched at theſe times in the morning hours, the female bee will be ſoon found employed in her work, and will be ſeen dropping her tail by turns into ſeveral cells every day. If the combs be examined a day or two after this, they will alſo be found to contain the eggs; one of theſe is placed in each cell, and appears in form of an oblong white body, fixed either to the ſolid angle of the baſe, or to one of the angles compoſed by the rhombs which form the triangular baſe of the cell, and is always attached in ſuch a manner, that it lies nearly in an horizontal poſition.

The flat glaſs hives are the moſt favourable for the making theſe obſervations, ſince in thoſe the combs are ſo narrow and ſo numerous, that the whole is taken in view at a time, from one ſide or the other; and there are always ſeveral combs to be made choice of for the operation; in the morning hours of April and May, the female mother bee will be uſually ſeen walking very ſoberly over one or other of theſe combs, attended by a guard of about twenty of the common bees, all placing themſelves in ſuch a manner, that their faces are turned toward her, and all paying her the greateſt marks of homage and adoration. As ſhe walks along in this ſtate, ſhe examines every cell as ſhe paſſes over, and ſuch as ſhe finds yet empty, and fit for her purpoſe, ſhe reſts at; and introducing the hinder part of her body at the top, plunges it ſo deep in that her tail touches the bottom. Then ſhe depoſites one egg and no more,

more, and this is at that time covered with a glutinous matter, which faſtens it to the place where it is laid: from this cell the female paſſes to ſeveral others, where ſhe depoſits her eggs in the ſame manner.

Some authors who have written of the polity of bees, have repreſented the time of the female bee's laying her eggs as a ſeaſon of feſtivity and rejoicing in the hive; but this does not at all appear to be the caſe, the few bees which attend her on this occaſion ſeem the only ones that know any thing of the matter, and their behaviour ſavours more of homage and reſpect than of joy: they are continually ſtroking and bruſhing her clean with their legs and with their trunks, and offer her from their own mouths the fineſt honey, when ſhe has occaſion for food. The reſt are all employed in their proper offices, and the work of the hive goes on as uſual; and, indeed, it is well that it does ſo, for this time of rejoicing would be of very bad conſequence to the affairs of the hive, if carried on as ſuppoſed, ſince the female bee is thus employed, more or leſs, during the whole ſummer months.

When the female bee has laid ſix or ſeven eggs, ſhe always takes a time of reſpite or repoſe; and during this time, the bees which form her levee are doubly buſy in their careſſes, ſome bruſhing her head and breaſt with their trunk, but ſeveral being always employed together to cleanſe the hinder rings of the body, which have been fouled by being thruſt into the cells. When this is done, ſhe begins again; but Mr. Reaumur obſerves, that he never could ſee a female lay more than ten or twelve eggs at one time: he ſuppoſes that his preſence diſturbed the creature, and finally drove her into the inner parts of the hive, where ſhe might continue her works in cells leſs expoſed. It is not difficult to compute the number of eggs which the female lays every day, from the ſwarm which is ready to leave the hive at the end of May: this ſwarm uſually amounts to at leaſt twelve thouſand, and as the hive out of which theſe depart is not the leſs peopled by their loſs, it is evident that they were all the produce of the eggs depoſited by the female in the preceding months of April, with a part of March, and a few of the firſt days of May. On a moderate computation on theſe principles it will appear, that the female bee cannot lay leſs than two hundred eggs every day, for a long ſpace of time together; and this, tho' ſeemingly a monſtrous increaſe, is yet much leſs than that of ſome other of the winged inſects, in one of which, a two-winged fly, that author counted no leſs than twenty thouſand living worms, all ready to be depoſited by the parent, and to become flies of the ſame kind.

It has been ſtrongly objected againſt this ſyſtem, that tho' the female bee lays eggs, ſhe is not the only one that lays; and many will not give up the opinion of the common bees alſo laying ſome eggs, tho' but a few in number; obſerving, that if each of theſe lay only four or five eggs, it would be enough to give birth to a whole ſwarm, without ſuppoſing that this prodigious fœcundity belonged to the female bee alone: but this is running into the old error of the female producing only females like herſelf; whereas if we obſerve the cells in which we ſee the female depoſit her eggs, we ſhall in the ſequel find the common bees produced from theſe eggs, and iſſuing out of theſe cells: this is a ſufficient proof to any fair reaſoner, ſince it appears very plain, that if the female produces them, they do not produce one another. It is alſo evident, that not only theſe common, or working bees, but alſo the drones, or male bees, are produced from the eggs of this ſame female; and there is this remarkable forecaſt in the female, that ſhe always depoſits the eggs which are to give origin to theſe, in peculiar cells, proper for the reception of the worms which are to be hatched from them. It is to be obſerved, in examining a hive, that there are always ſome combs, or ſome parts at leaſt of combs, the cells of which are much larger than thoſe of the other parts or combs: theſe large cells are deſtined for the reſidence of the larger worms, which are to produce the drones or male bees It has been obſerved as a miraculous ſingularity by ſome, that the female bee always knows before hand, whether the egg ſhe is going to lay will produce a male or a common bee; and that according to this knowledge, ſhe never depoſits the eggs for a male in a ſmaller cell, nor that of a common bee in a large one; but there is, in reality, leſs wonder in this than is ſuppoſed, for the eggs of which the drones are to be hatched are much larger while in the body of the female than thoſe of which the common bees are to be produced, and the whole occaſion of this choice in regard to the placing of them is, that when the creature finds a large egg coming forth, ſhe ſeeks one of the large cells to depoſit it in; and when the common ſmall eggs are coming, ſhe contents herſelf with the common cells.

It is very natural to believe, that the female bee lays a third kind of eggs; and that beſides producing many thouſand common, or working bees, and many hundreds of the males or drones, ſhe ought to lay one egg at leaſt capable of producing a female like herſelf, which is to be the mother of a future progeny, and the *queen* of the preſent race; ſince without ſuch a one for their leader, the young brood would never leave the hive in nature of a colony, and ſettle themſelves elſewhere.

What we thus perceive ought to be the caſe, is alſo found in reality to be ſo, and the female, beſides the other kinds of eggs, is found by a ſtrict obſervation to lay alſo eggs of this kind. We might perhaps only expect one female bee to be produced for each ſwarm, but as nature has ſeemed every where prodigal in the manner of the increaſe of her works, ſo it is in this caſe alſo. What millions of ſeeds are produced on a common elm-tree, for one that ſtrikes and ſucceeds ſo well as to grow up to be a tree? And of the number of young produced from the ſpawn of a carp, how few live to the ſize of a parent? Thus it alſo is in regard to the female bees; nature, tho' it has allotted only one of this kind, as abſolutely neceſſary to the new ſwarm, yet has given abundance of chances for that one to ſucceed, by the female's uſually laying at leaſt ten eggs for the production of the female offſpring, and often not leſs than twenty: there are, indeed, ſome ſeaſons when not one female is produced; but in theſe ſeaſons there is no ſwarm going out from the old hive, the creatures being informed by nature, that they have no buſineſs for combs and cells when they can have no offſpring to rear in them.

The working bees are not only very obedient to, and very careful of their *queen*, or female parent; but they are alſo very ſolicitous about her progeny. This is very evident in the ſtructure of the cells, which they prepare for the reception of thoſe eggs which are to be hatched into females. It has been before obſerved, that they prepare larger cells for the eggs which are to become drones, or male bees, than for thoſe which are to produce workers like themſelves. The large cells deſtined for the drones are, however, of the ſame ſhape and figure with the others, differing only in ſize; but this is not the caſe with thoſe deſtined for the female offſpring: theſe are not only very large, but very clumſily contrived, for the ſake of ſtrength; their ſides being much thicker than thoſe of the reſt, and their figure oval. The bees are extremely ſparing of their wax on all other occaſions, but for the conſtruction of theſe royal cells, as they may not improperly be called, they are as remarkably profuſe: one of the royal cells will weigh more than an hundred and fifty of the common kind. The bees are no more ſparing of the room than of the materials in the conſtruction of theſe royal habitations: they are often placed near the center of a comb, and a vaſt number of other cells are deſtroyed for their baſe; often alſo they hang down from the reſt of the comb, in form of ſtalactitæ from the roofs of ſubterraneous caverns.

A cell of this kind, when firſt formed, repreſents an acorn cup; but it is ſoon lengthened beyond the poſſibility of retaining that figure, and it remains thus till the creature is hatched from the chryſalis or nymph ſtate, and comes out of it; after which the bees, to loſe no room in the hive, form other common cells upon it, and the only remaining mark of the female cell, is the appearance of a knot in the place where it once ſtood.

The number of cells deſtined to receive the eggs which are to produce female bees are ſo few, and they are commonly placed in ſuch cloſe parts of the hive, that there is no great probability of the ſeeing the female employed in laying her eggs in them: there is no reaſon to doubt the fact, however, ſince when we know that ſhe lays eggs for the production of the male and the working bees, there is no wonder that ſhe ſhould alſo lay ſome for the production of females like herſelf.

It might ſeem much harder to conceive how ſo vaſt a number of bees ſhould be produced from this one, as we know are produced from her; but when one of the females is opened, the vaſt number of eggs diſcovered in each of her ovaries makes the prodigious increaſe no way wonderful.

Swammerdam obſerved, that the number of veſicles in the ovary of the female bee, was aſtoniſhingly great; he eaſily counted an hundred and fifty in each ovary, and could count about ſeventeen eggs in each veſicle large enough to be diſtinctly viſible; each ovary contains, therefore, two thouſand five hundred and fifty eggs, and both ovaries five thouſand one hundred. When we find ſo many eggs at once diſtinguiſhable by their ſize, it will be eaſy to conceive, according to the common courſe of nature in the propagation of inſects, that there may be more than as many too ſmall to be yet diſtinguiſhable; and at that rate, the number of twelve thouſand bees, which is the quantity that compoſes a moderate ſwarm, is not wonderful for the product of the eggs of one female for one ſeaſon. *Reaumur*'s Hiſt. Inſ. Vol. X. p. 111--126.

QUEI, in natural hiſtory, a name given by the Chineſe to a peculiar earth found in many parts of the Eaſt.

It is of the nature of an indurated clay, and in ſome degree approaches to the talcs, as our ſteatites and the galactites do. It is very white and abſterſive, uſed by the women of China to take off ſpots from the ſkin, and render it ſoft and ſmooth, as the Italian ladies uſe talc of Venice. They ſometimes uſe the fine powder of this ſtone dry, rubbing it on the hands and face after waſhing. Sometimes they mix it in pomatum. *Kircher*'s China Illuſtrat.

QUEM *redditum reddit*, in law, an old writ which lay where a rent-charge, or other rent, which was not rent-ſervice, was granted by fine holding of the grantor. If the tenant would not attorn, then the grantee might have had this writ. Terms of law.

QUEMI, in botany, a name uſed by ſome authors for the nigella, or geth. *Ger.* Emac. Ind. 2.

QUERCERA, in medicine. See EPIALOS.

QUERCUS, the *oak*, in botany, the name of a genus of trees, the characters of which are theſe: the flower is of the catkin kind, and is compoſed of a great number of apices affixed to an axis by ſlender capillaments, and ſtanding in thick cluſters. Theſe are male or barren flowers, and the embryo fruit grows in other parts of the ſame tree: theſe finally ripen into acorns ſurrounded with their cups, and containing a kernel which readily ſplits into two parts. To theſe characters it is to be added, that all the *oaks* have ſinuated leaves.

The ſpecies of *oak*, enumerated by Mr. Tournefort, are theſe: 1. The broad-leaved *oak*, with ſhort pedicles, called by authors the *male-oak*. 2. The broad-leaved *oak*, with longer pedicles, called by authors the *female-oak*. 3. The ever-green broad-leaved *oak*. 4. The common *oak*, with very long pedicles. 5. The ſmall *oak*, called the *phagus* and *eſculus* by the old writers. 6. The *oak*, with large acorns and echinated cups. 7. The *oak* with ſmall acorns and rough cups. 8. The Burgundy *oak*, with rough acorn cups. 9. The dwarf *oak*, which ſeldom grows to more than a foot high. 10. The woolly-leaved *oak*. 11. The ſmall gall-bearing *oak*. 12. The *oak* with prickly, not woolly leaves, producing ſmall galls. 13. The ſmaller prickly-leaved *oak*. 14. The dwarf gall-*oak*, with cluſtered galls. *Tourn.* Inſt. p. 82. See OAK.

QUERCUS *marina*, the *ſea-oak*, in botany, the name of one of the broad-leaved dichotomous ſea-fucuſes.

It is not agreed among the late botaniſts what was the *ſea-oak* of Theophraſtus; and the moſt antient botaniſts, Cluſius and Cæſalpinus ſuppoſe it to have been a ſpecies of the ſhrubby coraline; but that ſeems by no means to have been the caſe, ſince Theophraſtus ſays his *ſea-oak* had a long, thick, and fleſhy leaf, whence we may much more naturally conclude it to have been of the fucus claſs. *Park.* Herb. 294. Gen. 1378, *&c.* *Dale*, Pharmac. p. 56.

QUERFAA, in the materia medica of the Arabians, a name given by Aviſenna and others to cinnamon, when gathered with the wood of the young branches.

It was a common practice in the early times not to ſtrip the ſmall bark from medicinal trees, but to cut off the little boughs and uſe them bark and wood together. This the Greeks called *xylo-cinnamomum*, or woody cinnamon, and the Arabians *querfaa*, *querfe*, or *kerfe*.

QUERQUEDULA, in zoology, the name by which authors call the teal.

This is the ſmalleſt of all the duck kind. Its beak is black, and its head and the upper part of its neck of a reddiſh brown; but there runs on each ſide of the head a green ſtreak from behind the eyes quite to the back part, and between theſe there is a black ſpot under the eyes; there is a white line which ſeparates the reddiſh colour from the green. The lower part of the neck, the ſhoulders, and the ſides are very beautifully variegated with black and white ſtreaks. The breaſt and belly are of a duſky greyiſh white. The wings have ſome white in them, and the legs are of a pale brown. There is a black ſpot on the rump in the male, which is wanting in the female. The head alſo in that ſex is leſs beautifully coloured. *Ray*'s Ornithol. p. 290.

QUERQUEDULA *criſtata*, the *creſted teal*, a name given by Bellonius and ſome others to a ſpecies of duck, remarkable for a tuft of feathers of an inch and an half long, hanging down from the back part of its head, and thence called the *tufted duck*; but more known among authors by the name *capo negro*. *Bellonius* de Avib. See CAPO *negro*.

QUESTOR *(Cycl.)*—The *queſtorſhip* was called the firſt ſtep of honour, and the *queſtors*, who were generally employed in the provinces abroad, aſſigned to them ſeverally by lot, no ſooner returned from their provincial adminiſtration, than they took their places in the ſenate; and from that time forward, from the rank of equeſtrians, or what we commonly call knights, became ſenators for life. *Middleton* of Rom. Senate. p. 6, 7. See SENATE and SENATOR.

QUI *tam*, in law, is uſed where an information is exhibited againſt any perſon on a penal ſtatute at the ſuit of the king, and the party who is informer, when the penalty for breach of the ſtatute is to be divided between them; and the party informing proſecutes for the king and himſelf. *Finch* 340.

QUICKSILVER *(Cycl.)*—This mineral is frequently found native in the earth, in its own fluid form; ſometimes lying in large quantities together in the accidental cavities of ſtone, and running out in a ſtream as the miners break the maſſes: but this is leſs frequent; its more common appearance being in ſmall parcels, and often in ſingle globules, ſcarce large enough to be ſeen by the naked eye, lodged in great abundance in the pores of a ſoft foſſile ſtone, of a pale bluiſh colour, from which it is eaſily ſeparated by pounding and waſhing. It is alſo found in ſome places lodged in the ſame manner in ſome of the harder ſtones, and in various ſpecies of earths.

Tho' *quickſilver* be, however, often found native, yet we much more frequently find it in the form of an ore; its particles being penetrated by, and intimately mixed with ſulphur, and the concrete being by no means to be known for *quickſilver* to the naked eye, but being a red maſs of a ſtony hardneſs, called *cinnabar*: and we are very ſure that it is *quickſilver* penetrated by ſulphur that makes this ore, ſince we are not only able to ſeparate *quickſilver* eaſily from it; but by a mixture of *quickſilver* and ſulphur, we are able to make a red ſtony maſs perfectly the ſame with this.

The cinnabar is of a different form and appearance, according to the quantity of ſulphur it contains, being uſually ſtriated, and that ſometimes with broader, ſometimes with finer ſtriæ; and the quantity of *quickſilver* in this is very great, the richeſt maſſes containing ſix parts *quickſilver* to one of ſulphur; and the poorer uſually half. It is ſometimes found in large and pure maſſes, and ſometimes in ſmaller particles, lodged in different earths and ſtones. Theſe are ſometimes few in number and placed ſeparately, and ſo of little value; but in other maſſes they are placed very thick in congeries, and are then ſeparated by pounding and waſhing, and worked for *quickſilver*.

Beſide this pure ore of *quickſilver*, there is another much leſs rich; but which is worked in ſome places to conſiderable advantage: as the former is a mixture of *quickſilver* and ſulphur alone, this is a mixture of thoſe two, and of many other ſubſtances, and appears in form of a moderately hard ſtone, uſually of a duſky orange colour; but not rarely of a greeniſh brown, and ſometimes blackiſh. This has very little brightneſs, and nothing of the ſtriated texture of the cinnabar.

The manner of ſeparating *quickſilver* from its ores, is by pounding them, and waſhing off the ſuperfluous matter by repeated affuſions of water; then adding iron filings to the remainder, the whole is diſtilled in large iron retorts, and the mercury comes over pure into the receiver. In ſome places where the ore is very rich, they only powder it, and put it into long-necked earthen veſſels, which they ſtop with bundles of moſs: theſe they invert into other veſſels buried in the ground, and then making a fire about them, the *quickſilver* becomes ſeparated and drains through the maſs into the underpots. *Hill*'s Hiſt. of Foſſ. p. 627.

It is very difficult to bring *quickſilver* to the great teſt of the burning-glaſs, by which all the other imperfect metals are eaſily tried; but with proper cautions ſomething is to be learned of it by this means:

If *quickſilver* be expoſed to the focus on a piece of charcoal, on a tile, or in a coppel, the effect is the ſame, it very ſoon is wholly diſſipated in form of a thick ſmoak; but if precipitate *per ſe*, that is, mercury calcined alone by a long digeſtion on a ſlow fire, be placed in the focus, it ſeems at firſt to melt and run, but immediately after is diſſipated in a thick ſmoak, leaving a ſmall quantity of an extremely fine powder upon the tile, in form of a ſhort down. This powder, on being continued in the focus, finally runs together into a yellowiſh glaſs; in ſeveral parts of which there may be diſtinguiſhed ſmall white, ſhining, metalline particles, which ſeem to be *ſilver*.

If the precipitate *per ſe* be expoſed to the focus on a piece of charcoal, it is ſeen to melt and run into ſmall globules of pure mercury, which ſoon after begin to fume and are diſſipated entirely. It appears, therefore, upon the whole, that there is in *quickſilver* an oil, which may be ſeparated by long digeſtion over a ſlow fire; and that the matter diveſted of that, is no longer mercury, but a mere calx or a red earth, this being properly the baſis of this metal; that this calx does not vitrify in the manner of the other calxes of the metals, being too volatile for that, and eaſily flying off in the fire; and finally, that this oil of mercury is not different from the other oils, even thoſe of the vegetable kind, ſince common charcoal could ſupply its place by means of its oil, and reſtore the calx to running mercury again. As to the ſmall remainder of earth, after the diſſipation of the calx of mercury, which run into glaſs with metalline ſpecks, it is much to be queſtioned whether it be not owing to ſome impurity in the mercury. Mem. Acad. Par. 1709.

The mines of Friuli afford at preſent very large quantities of *quickſilver*, ſome native, or virgin, which they call *jung-frau*, and obtain either out of natural beds in the rocks, or by waſhing the ore in which it lies diſperſed in ſmall globules; but the far greateſt part is not viſible to the eye in the form of *quickſilver*, nor can be ſeparated from the ore without the help of fire. Kircher, in his Mundus ſubterraneous, gives a moſt frightful deſcription of this mine; but it is not more terrible than others of the ſame kind. It is remarkable, that the entrance into it is not high up in the hills, as is uſually the caſe; but upon a level ground, and in the ſtreets of the town. This ſubjects them to great inconveniences from water, but they have admirable machines for the draining it out again. The deſcent is by ladders near ninety fathoms down.

There are no damps in theſe mines, but the miſchiefs of the mercury itſelf getting into the bodies of the workmen are much greater and more general, tho' not ſo ſudden, as the effects of the damps in our lead and coal mines, and the like places.

The elaboratory belonging to theſe mines has furnaces capable of working fifty retorts at a time. There are generally ſixteen of theſe furnaces at work at once, ſo that eight hundred retorts are the general number in conſtant uſe.

The retorts ſtand in double rows on each ſide the furnace, a row of thirteen below, and a row of twelve above.

The antients all eſteemed *quickſilver* a poiſon, and it muſt be allowed to have diſmal effects; the unhappy people employed in preparing it ſeldom live more than three or four years, and then die miſerably: and ſuch as take it internally, or by way of unguents, without great care, often ſuffer for their imprudence.

Under proper regulation, however, it is a moſt powerful and noble medicine, opening obſtructions, and attenuating viſcid humors in the very remoteſt parts of the body.

The preparations of *quickſilver* now in uſe are, 1. Æthiops mineral. 2. Factitious cinnabar. 3. Corroſive ſublimate. 4. Mercurius dulcis. 5. Mercurius calcinatus, commonly called *precipitate per ſe*. 6. White precipitate. 7. Red precipitate, or red corroſive mercury. 8. Coralline mercury. 9. Turbith mineral. See MERCURY, *&c.*

Water in which *quickſilver* has lain for ſome time, tho' inſipid, is ſaid by Van Helmont to deſtroy worms; and Mr. Boyle ſeems to recommend it as an innocent and effectual coſmetic. Works abr. Vol. III. p. 345.

QUID *juris clamat*, in law, a writ that lies where I grant the reverſion of my tenant for life by fine in the king's court, and the tenant will not attorn; then the grantee ſhall have this writ to compel him. Terms of Law.

QUIJUBATUI, in zoology, the name of an American ſpecies of peroquette.

It is of the ſize of a lark, and in general of a yellow colour. Its eyes are black, and its beak grey. The edges of its wings are of a duſky green, and its tail long and yellow. It is a very beautiful bird, and very eaſily tamed. *Marggrave*'s Hiſt. Braſil.

QUIL, in zoology, the name of a ſmall animal of the ferret kind, frequent in the Weſt Indies, and famous for its combat with ſerpents. See the article QUIRPELE.

QUILAQUIL, in natural hiſtory, the name given by the people of the Phillipine iſlands to a very beautiful ſpecies of parrots, which is commonly found wild in the woods there. It is all over of a fine green colour, and is ſmaller than the common parrots, and has a broad black bill and black legs. It is a very wild bird, and will not learn any thing.

QUILLOBO, in botany, a name given by ſome to a ſpecies of ketmia, called alſo *quingombo*. See QUINGOMBO.

QUINA *folia*, among botaniſts. See LEAF.

QUINCE, *cydonia*, in botany, *&c.* See CYDONIA.

The fruit of the *quince* is aſtringent and ſtomachic, but its chief uſe in the ſhops is in the *ſyrupus cydoniarum*, or ſyrup of *quinces*, prepared from its juice with ſugar, which is a very pleaſant ſyrup.

QUINGOMBO, in botany, the name given by the people of Congo to a ſpecies of ketmia, diſtinguiſhed by Mr. Tournefort by the name of the *ketmia Braſilienſis folio ficus fructu pyramidato ſulcato*, the fig-leaved Braſilian ketmia, with a pyramidal ſulcated fruit. See KETMIA.

QUINNET, in mining, the name of a tool uſed in the cleaving rocks by means of gunpowder. This is a ſort of wedge fitted to the flat ſide of what is called the *gun*; that is, a cylindric piece of iron, only flatted in one part, to receive this, and drilled through. When a proper hole has been made in the rock by the borer, the powder is put in, and then the orifice being ſtopped by the gun, and that wedged in by this *quinnet*, the powder being fired by a train communicating with the hole drilled through the gun, exerts all its force on the rock, and ſplits it in ſeveral directions at one exploſion. Philoſ. Tranſ. N°. 167. See MINING.

QUINQUANGULAR-*leaf*, among botaniſts. See LEAF.

QUINQUEFOLIUM, *cinquefoil*, in botany. See CINQUEFOIL.

QUINQUENNES, in ſome old hiſtorians, a name given to a certain people of India, among whom the women began to bear children at five years old, and ſeldom lived to more than eight years. Pliny gives us this account, and Solinus, who repeats it from him, increaſes the miracle by telling us, that they were a nation of women who had no men among them.

QUINQUEPRIMI, among the Romans, the five principal men in the ſenate of every municipal town. *Pitiſc.* in voc.

QUINQUEREMIS, in the naval architecture of the antients, a name given to a galley which had five rows of oars. They divided their veſſels in general into monocrota and polycrota; the former had only one tire of rowers, the latter had ſeveral tires of them, from two or three, up to twenty, thirty, or even forty; for ſuch a veſſel we have an account of in the time of Philopater, which required no leſs than four thouſand men to row it.

Meibom has taken off from the imaginary improbability of there ever having been ſuch a veſſel, by reducing the enormous height ſuppoſed neceſſary for ſuch a number of rows of oars and men to work them, by finding a better way of placing the men than others had thought of. The *quinqueremes* of the antients had four hundred and twenty men in each, three hundred of which were rowers, and the reſt ſoldiers. The Roman fleet at Meſſina, conſiſted of three hundred and thirty of theſe ſhips; and the Carthaginian, at Lilybœum of three hundred and fifty of the ſame ſize. Each veſſel was an hundred and fifty foot long. Thus an hundred and thirty thouſand men were contained in the one, and an hundred and fifty thouſand in the other, with the apparatus and proviſions neceſſary for ſuch expeditions as they were intended for. This gives ſo grand an idea of the antient naval armaments, that ſome have queſtioned the truth of the hiſtory; but we find it related by Polybius, an hiſtorian too authentic to be queſtioned, and who expreſſes his wonder at it while he relates it. *Meibom* de Trirem.

QUINQUEPARTITE-*leaf*, among botaniſts. See LEAF.

QUINQUERTIONES, among the Romans, an appellation given to thoſe who had gained the victory in the *quinquertium* or *pentathlon*.

QUINQUERTIUM, among the Romans, was the ſame with the Grecian *pentathlon*, comprehending the five exerciſes of running, leaping, throwing, darting, and wreſtling. See the article PENTATHLON, *Cycl.*

QUINQUINA *(Cycl.)*—The moſt accurate account we have ever received of the tree which produces the *quinquina*, or Peruvian bark, is from Mr. de la Condamine, who in travelling through ſome parts of America, choſe the route of Loxa, where the fineſt bark is gathered, and where the greateſt number of the trees are found; and taking inſtructions from Mr. de Juſſieu, as to what enquiries were moſt neceſſary to be made, informed himſelf very much at large about it.

The fineſt bark, and the greateſt quantity, he informs us, was gathered on Cajanuma, ſituated two leagues and an half to the ſouth of Loxa; and this is the very place where the firſt bark that was ſent into Europe was gathered. He found means to remain a night on his journey on this mountain, and in his return took a branch from one of the trees which had both flowers and ripe fruit on it, as is the caſe with this tree throughout the whole year, and this branch was the ground of his figures, as the obſervations he made in the journey were of his accurate account of the tree.

The natives reckon three ſpecies of bark, the reddiſh, the yellowiſh, and the white. The laſt of theſe has very little virtue, and the other two are nearly equal in goodneſs, tho' the world gives it in favour of the red. Theſe two are the barks of trees which have no difference in their leaves, fruits, or flowers; and which even the people who are continually employed in the ſervice cannot diſtinguiſh at ſight, but pierce the bark with a knife, to ſee the difference, the yellowiſh being thus found to be tenderer and paler coloured than the other. The trees which produce theſe two ſorts grow indiſcriminately one by another, and the bark is gathered indifferently from both; and in drying the diſtinction between them becomes yet leſs viſible, ſince both acquire a browniſh colour.

The tree which produces the white *quinquina* has rounder and rougher leaves, the flower alſo is whiter, and the fruit larger, and its outer covering whitiſh. This tree uſually grows near the top of the mountain, and is not found among the other kinds; they uſually being found about the midway of the height, and principally in hollows, or in the more cloſe or ſheltered places. Some have ſuſpected, that this difference of the trees which produce white, and the other barks, was only owing to the more cold and expoſed ſituation it had on the top of the mountain; and thus much is well known as to the bark in general, that the warmer the place is where it grows, the greater are its virtues.

The *quinquina* tree never grows in the plains; it is a conſtant inhabitant of the mountains, and is eaſily known from the trees it grows among by its erect growth, and its height when of any conſiderable age, as it always carries its head above the reſt. Theſe trees are never found in clumps or cluſters together, but always ſeparate and ſingle among other kinds. They grow to a very conſiderable ſize, when ſuffered to remain long enough; ſome are as thick as a man's body, but the more uſual are about nine inches in diameter.

It is very rare, however, to find any large ones at this time on the mountain where the bark is gathered, the great demand for it having made them bark all the trees, and theſe having all periſhed by it; for the old trees never recover the barking, tho' the young ones frequently do.

They uſe no other inſtrument for barking the trees than a common knife, which the workman thruſts through the bark at as great a height as he can reach, and then bearing hard upon it, brings it down to the bottom, cutting all the way. If there be any difference, as ſome have pretended, between the bark that was at firſt imported, and that which we now receive, it muſt be wholly owing to the different ages of the trees it was then and is now procured from; that having been the bark of old trees, and there being now none but young ones: this gentleman having ſcarce ſeen any there that were thicker than a man's arm, or above twelve or fifteen feet high; and thoſe which they cut young always throw out new ſhoots from the bottom.

In the times when the bark was firſt brought into uſe, the world preferred the thickeſt pieces, now they ſet the greateſt value on the thinneſt; but the latter preference is moſt reaſonable; ſince it is not founded on fancy, but on the experiments made by the Engliſh and other nations of the different virtues, and the reſult of chemical analyſes.

There was once an opinion, that there were certain ſeaſons to be obſerved for the gathering the bark, and that it ought always to be done in the decreaſe of the moon; but expe-

rience has ſhewed theſe to be idle opinions, and it is now gathered at all times if the weather be dry. When the bark is taken off, it is laid in the ſun till perfectly dry; the omitting this circumſtance, and packing up the bark while moiſt, has occaſioned it often to become mouldy, and ſpoil, and the merchants have attributed this to the taking it off in a wrong time of the moon, when it was wholly owing to its being put into the ſkins while too moiſt.

The leaves of the *quinquina*-tree ſtand on pedicles of about half an inch long: they are very ſmooth and gloſſy, and of a beautiful green; but ſomewhat paler on the under ſide than the upper. They are perfectly ſmooth at the edges, and are of an oblong figure, pointed at the end, and rounded at that part which joins to the ſtalk. They are from two and an half to three inches in length, and from an inch and an half to two inches in breadth. The middle rib of the leaf is rounded on the upper ſide, and is uſually of a reddiſh colour, eſpecially towards the pedicle; and the whole leaf often becomes red, when perfectly mature. All the ſmall branches towards the top of the tree terminate in one or more cluſters of flowers, which, before they are open, reſemble in their ſhape and their bluiſh grey colour, thoſe of the common lavender. Mem. Acad. Scienc. Par. 1738.

When theſe open, they change their colour: each ſtalk that ſuſtains one of theſe cluſters of flowers ariſes from the ala of one of the leaves, and divides into a great number of ſmall branches, each of which is terminated by a cup divided into five parts, which ſuſtains a flower reſembling that of the hyacinth. It is compoſed of a pipe of three quarters of an inch long, which at the end is divided into five, and ſometimes into ſix ſegments. Theſe are of a beautiful deep red within, and are ſerrated round the edges in a very elegant manner. From the bottom of the tube of the flower there ariſes a white piſtil, terminated by a long green head; this ariſes above the level of the ſegments of the flower, and is ſurrounded by five ſtamina, which ſuſtain apices of a pale yellow colour: theſe remain hid within the flowers. The tube is of a dirty red, and is covered with a ſort of whitiſh down. When the flower is fallen, the cup ſwells in the middle into the form of an olive, which by degrees grows into a fruit divided into two cells, which in drying become ſhorter, and the whole fruit rounder than in its natural condition.

This fruit finally opens longitudinally into two capſules, ſeparated by a membranaceous ſeptum, and coated by a thin yelloviſh ſkin; the ſeeds are of a reddiſh colour, and in ſhape are flattiſh, and, as it were, foliaceous; they are not more than a twentieth part of an inch in diameter, and are thickeſt in the middle, becoming thinner at each ſide. The plantula ſeminalis lies in the very center of the ſeed, between two pellicles: theſe ſeeds, which reſemble in ſome degree thoſe of the aſh in miniature, are faſtened in the manner of ſo many ſcales to a placenta of an oblong figure, pointed at the two extremities, ſo as ſomewhat to reſemble a ſeed of the common oat, but that it is longer and flatter. This is joined to the ſeptum, and has on that part a longitudinal furrow; but on the other ſide is convex, and ſomewhat rough all over. Mem. Acad. Scienc. Par. 1738.

By this deſcription it appears, that they were very ignorant of the nature and characters of this tree, who, in its firſt knowledge among us, called it a ſpecies of ſebeſten.

The uſe of this febrifuge ſeems to have been very long known to the natives, and their manner of taking it was by pounding the bark, and laying it to infuſe in water, and drinking the infuſion; their hatred to the Spaniards, their conquerors, made them keep it a long time a ſecret from them; and when the thing became known among the inhabitants of Loxa, it ſtill remained a ſecret to the reſt of the world, and its great value was never generally known till the year 1633; when the lady of the viceroy of Peru, the counteſs de Chinchon, being long ill of an intermittent fever, which would give way to none of the known remedies, the corregidor of Loxa ſent to the viceroy a quantity of the *quinquina* bark, which he aſſured him would cure the lady, tho' all other means had failed. Upon this the corregidor was ſent for to Lima, and after having given the medicine to many other perſons with ſafety and ſucceſs, the lady at length took it, and was cured. She immediately on this ſent for a large quantity of the bark, had it powdered, and herſelf diſperſed it to thoſe who had occaſion for it; whence it obtained the name of the *counteſs's powder*: but this lady being ſoon tired of the office, gave it in charge to the jeſuits; and they continuing to give it to the ſick with the ſame ſucceſs, it then was called the *jeſuits powder*. Theſe reverend fathers ſoon found means to ſend a quantity of it to Cardinal Lugo, who diſperſed it with the ſame ſucceſs at Rome; and after him the apothecary to the college gave it gratis to the poor with the ſame good effects, and under the name of the *jeſuits* or the *cardinal's powder*: afterwards the better ſort were made to pay its weight in ſilver for it, to defray the expences of its importation, while the poor ſtill had it gratis. Lewis XIV. at that time dauphin of France, was cured by it of a fever which had not given way to other medicines.

In the year 1640, the count and counteſs of Chinchon being returned to Spain, their phyſician, Juan de Vega, who brought a great quantity of it over with him, ſold it at a conſiderable price; and ſoon after this, large quantities were ſent over by the galleons, but the great demands from Europe cauſing the inhabitants of Loxa to adulterate it with other barks, it had like to have loſt part of its juſt praiſe. The *quinquina*-trees are found at this time on all that chain of mountains adjoining to Cajanuma, and in many other parts of America.

QUINTAIN, (*Cycl.*) the name of an old Engliſh ſport, intended for a trial of the agility of men on horſeback. It is loſt in many parts of the kingdom, but was ſtill in uſe at Deddington, in Oxfordſhire, in the time of Dr. Plot. The method of performing it is this:

They firſt ſet up a poſt perpendicularly in the ground, and then place a ſlender piece of timber on the top of it, on a ſpindle, with a board nailed to it at one end, and a bag of ſand at the other. Againſt this board they antiently rode with ſpears, but afterwards only with ſtaves, which violently brought about the bag of ſand; ſo that if they did not make good ſpeed away, it ſtruck them on the neck or ſhoulders, and ſometimes knocked them down. The great point aimed at was always the breaking of the board, and he that did that, was accounted the greateſt maſter.

It ſeems to have had its name from the Latin *quintus*, fifth, as one of the antient ſports uſed every fifth year among the Olympian games; or becauſe it was the ſport of the fifth or laſt day of theſe games. *Plot*'s Oxford. p. 204.

QUINTESSENCE *(Cycl.)*—QUINTESSENCE *of wine*, a term uſed by Glauber to expreſs an eſſential oil of wine, which he directs to be made by a careful diſtillation, and which he is very fond of, as having a power to meliorate, improve, and even to ſpecificate the poorer wines into the nature of thoſe from which it was obtained.

This is one of the ſchemes of Glauber, generally eſteemed an impracticable one, tho' very plauſible in theory; but tho' in general there is a diſagreeable flavour in the *quinteſſence* drawn after his method, which is different from the true flavour of the wine, and ſpoils the liquor it is added to; yet by proper care there is a poſſibility of ſucceeding ſo far as to render this extraneous flavour almoſt imperceptible, and produce an oil that will mend poor wines extremely, and give a truly vinous flavour to ſuch as are in themſelves taſteleſs: but whatever may be done by this method, may alſo be done with much more certainty, and much leſs trouble, by the concentration of wines by freezing. This may be eaſily practiſed in the wine countries; and by this means Burgundy, Champaign, and other the moſt valuable wines, may be reduced into thick extracts and robs, by the means of which wines may be made in England; a very ſmall quantity of theſe concentrated wines being ſufficient to convert the whole of any of the poor taſteleſs and inſipid wines, which are of themſelves of little or no value, into the very wine from which the rob was made, and that in ſuch perfection, that the niceſt judge cannot find out the difference.

Theſe robs of wine made and preſerved upon the ſpot, would alſo be of infinite uſe in the wine countries, as they might be kept to improve the wines of bad years. *Stahl*, de Concentr. Vin. *Shaw*'s Chem. Eſſ.

QUINTUS *femoris*, in anatomy, a name given by Fallopius and many others to one of the muſcles of the thigh, now called the *pſoas magnus*. See PSOAS.

QUINTUS *oculorum*, in anatomy, a name given by Veſalius and ſome others to one of the muſcles of the eyes, more expreſſively called by others *obliquus ſuperior oculi*, and *opifex circumgyrationis oculi*.

QUINVA, in botany, a name by which ſome authors have called the amaranth, or cockſcomb. *Moriſon*, Hiſt. Vol. II. p. 602.

QUINZY, or ANGINA *(Cycl.)*—This is defined by medical writers to be an inflammatory ſtaſis of the blood about the throat, in which nature ſeems to have aimed at the diſcharging part of the load of a plethora, either by an hæmorrhage of the noſe, or by ſpitting of blood; but effecting neither, the *quinzy* is produced.

Authors have divided the *quinzy* in general into two kinds, the true and the ſpurious. The true *quinzy* is that in which the tumor is internal, and is attended with a fever. The ſpurious is that in which the tumor ſhews itſelf more outwardly, and is not attended with a fever.

The antients alſo divided the *quinzy* into four other kinds, which they called by as many names.

1. The *cynanche*. In this the tumor neither manifeſts itſelf outwardly nor inwardly, but is attended with a very violent fever.

2. The *paracynanche*. This was the name given it when the tumor appeared externally in the muſcles of the larynx, and was highly inflammatory.

3. The *ſynanche*. In this kind the tumor appears externally alſo, and there is a leſs difficulty of breathing; but a greater of ſwallowing than in the other kinds.

4. The *paraſynanche*. This name denoted an inflammation of the muſcles of the pharynx, attended with a fever.

We at this time diſtinguiſh alſo the *quinzy* into the idiopathic and ſymptomatic. The firſt, where it is itſelf the diſeaſe, and owes its origin only to a plethora. The ſecond, where it

is but the accidental ſymptom of an inflammatory fever, or ſome other diſeaſe about the time of its criſis.

Signs of a quinzy. The firſt ſymptom of this diſeaſe is a difficulty of ſwallowing, joined with a tumor in the throat, and a ſenſation of a pricking pain; to theſe ſymptoms there ſucceeds an inflammation and violent heat in the fauces: and in a few hours theſe ſymptoms increaſe to ſo great a degree, that the patient becomes unable to ſwallow; the tongue ſwells violently, and the veins appear black and tumid under it, the face becomes red and tumid, and the temporal veſſels are diſtended, and the eyes become ſwelled and ſeem as if they would ſtart out of the head; then reſpiration becomes very painful, and there is danger of abſolute ſuffocation. The hands become pale and cold to the touch; and the fleſh is at times very hot, and ſoon after very cold again; and in the progreſs of the diſeaſe the patient is uſually found to be very low ſpirited.

The idiopathic *quinzy* ſeldom happens to any except young people of a remarkably plethoric habit of body; and people are moſt ſubject to it who have been uſed to frequent bleedings at the noſe, and who live ſedentary lives, and feed high. The moſt frequent cauſes of this diſeaſe are a ſuppreſſion of hæmorrhages by the noſe, a ſudden cooling of the body after exceſſive heat, drunkenneſs, an improper uſe of ſtrong ſternutatory powders, violent and loud calling, and finally, luxations of the neck.

As to the ſymptomatic *quinzy*, the moſt common of all cauſes of it is the improper uſe of bleeding in acute fevers and other inflammatory diſeaſes.

Prognoſtics in quinzies. The more violent the attack of this diſeaſe is, the greater is the danger with which it is attended. The ſpurious *quinzy* is always more favourable than the true one, and the mildeſt of all the kinds is the paracynanche, as the cynanche is of all others the moſt fatal. Thoſe who die of this diſeaſe rather die of convulſions than of ſuffocation. When the matter cannot be diſcuſſed, there uſually happens a ſuppuration; and in this caſe the event is very dubious and uncertain.

Method of cure. Immediately on the attack of the diſeaſe, a clyſter is to be given. Warm urine or brine will ſerve the purpoſe, or, if equally ready, the pulp of colocynth, or aloes ſhould be boiled in the liquor. After this there muſt be a large quantity of blood taken from the arm, or foot, which is by ſome eſteemed much better; and if the ſymptoms do not then remit, the raninæ venæ are to be opened ſoon afterwards. In a milder attack it is not neceſſary to bleed in the time of the fit, but the common remedies for allaying the inordinate emotions of the blood take place; ſuch as powders of nitre, crabs-eyes, and cinnabar, and on occaſion a gentle anodyne or opiate may be added to theſe; as a ſmall doſe of the ſtorax pill, or the like. Theſe things are alſo to be given in the more violent caſes, and through the whole courſe of the diſtemper, provided that the difficulty of ſwallowing does not prevent it. After bleeding and theſe powders, the uſe of gargariſms is very great: of theſe there are three kinds; 1. The reſolvent or nervine and diſcutient: theſe are prepared of orrice and elecampane-root, hyſſop, chamæmile flowers, and anniſe and caroway ſeeds, and the like. 2. The lenient, or demulcent, which ſerve to allay the inflammatory heat: theſe are prepared of the mucilaginous and cooling things, as quince-ſeeds in red roſewater, with ſyrup of raſpberries, mulberries, and nitre, with jews-ears and album græcum, which two laſt are looked upon by many as ſpecifics. And, 3. The aſtringents: theſe are made of the traumatic herbs, ſuch as mouſe-ear, ſelf-heal, and the like, with biſtort and comfry-root, pomegranate rind, galls, terra Japonica, and alum.

The gentle aſtringents are to be firſt uſed, and it muſt be with great caution that we proceed from thoſe to the more powerful ones. While theſe are uſed internally, the external uſe of emolient and diſcutient plaiſters is alſo to be brought in; ſuch are melilot and diachylon with the gums: and in caſes where the heat is violent, inſtead of plaiſters, linnen-cloths wetted with ſpirit of wine and camphor, with a little ſaffron, are to be applied. If all theſe things fail, and the ſwelling riſes and breaks, the patient is always relieved by the breaking, and is to uſe afterwards, by way of gargariſm, wine ſweetened with honey of roſes. The bowels are always to be kept looſe by glyſters, or gentle purges; and finally, where the danger of ſuffocation is imminent, bronchotomy is the laſt relief. *Junker*, Conſp. Med. p. 154, ſeq.

Beſide the common occaſions of this diſeaſe, we have in the philoſophical tranſactions an account of a ſtone breeding at the root of the tongue, and cauſing one. The patient was almoſt choaked, and the tumor, which was large outwardly, tho' not tending to ſuppuration, yet was ready to break within, and ſhewed matter ready to be diſcharged. On breaking it with the finger, there iſſued out above a quarter of a pint of matter, and with it a ſmall ſtone, very hard, and of the ſame nature and ſubſtance with thoſe formed in the kidneys.

In this diſtemper, beſides high bleeding, ſome recommend a gargariſm compoſed of ſublimate mercury, half a drachm; cream of tartar, two drachms; diſſolved in a pint of ſpring water. Med. Eſſ. Edinb abr. Vol. II. p. 431.

We have the hiſtory of an uncommon *angina*, or *quinzy*, by Mr. Monro in the medical eſſays of Edinburgh abridged, Vol. II. p. 400.

QUIRICIA, a name given by ſome to the ſtone called *quiris* by the generality of writers. See QUIRIS.

QUIRINACIUM *opium*, in the materia medica, a name given by ſome to the gum we know by the name of aſſa fœtida.

It is a barbarous phraſe of the middle ages, and is founded on the name ὄπον κυρενιακον of the Greeks, which expreſſed the Cyrenean gum, that being the name they gave to the original aſſa, which was a ſweet-ſcented gum, not the ſtinking aſſa-fœtida. We call both theſe aſſa, but the Greeks diſtinguiſh the ſtinking kind by the name *ſcordolaſaron*. See the article ASA.

QUIRINUS *lapis*. See QUIRIS.

QUIRIS, a name given by the writers of the middle ages to a ſtone famous among them for its imaginary virtues, but of which they have left us no deſcription.

They call it alſo *quirinus* and *quiricia*, and pretend, that if put under any one's pillow, it will cauſe them to divulge all their ſecrets by talking in their ſleep.

QUIRPELE, in zoology, the name of a ſmall animal, called by ſome authors the *Indian ferret*, *viverra Indica*, and by others *quil*.

Garcias and ſome authors give very remarkable accounts of the enmity this creature has to ſerpents of all kinds. They tell us, that when this little creature intends an attack upon one of theſe animals, it firſt prepares againſt danger by gnawing a quantity of the root of the *lignum colubrinum*, or ſnake-wood; and when it has thoroughly impregnated its *ſaliva*, it wets with it firſt its fore-feet, and with them daubs over its head and its whole body; and that thus prepared, it boldly attacks the ſnake, and never leaves off till it has killed it. Garcias aſſures us, that many of the Portugueſe have been eye-witneſſes of theſe combats.

It is probable enough, that this creature may attack a ſnake when thoroughly hungry, knowing its fleſh to be good food; but I fear the ſtory of the antidote is to be ſuſpected. *Ray*'s Syn. Quad. p. 197.

QUITY, in botany, a Braſilian name uſed by ſome authors for the ſapindus, or ſoap-berry tree of the Weſt Indies. *Margg.* Hiſt. Braſil. p. 113.

QUOD *(Cycl.)*—QUOD *ei deforceat*, in law, a writ for tenant in tail, tenant in dower, by the courteſy, or for term of life, having loſt their lands by default againſt him that recovers, or his heir. Reg. orig. 171. Stat. Weſtm. 2. c. 4. *Cowel*, Terms of Law.

QUOD *permittat*, in law, a writ that lies where a man is diſſeiſed of his common of paſture, and the *diſſeiſor aliens*, or dies ſeiſed, and his heir enters; then if the diſſeiſee die, his heir ſhall have this writ.

QUOIL *(Cycl)*—*Weather*-QUOIL, at ſea. See WEATHER.

QUORUM *(Cycl)*—QUORUM *nomina*. In the reign of King Henry VI. the king's collectors, and other accomptants, were much perplexed, in paſſing their accounts, by new extorted fees, and forced to procure a then late invented writ of *quorum nomina*, for the allowance and ſuing out their quietus, without the allowance of the king. *Blount.*

QUOTIDIAN, *(Cycl.)* in medicine, the name of a ſpecies of fever which attacks the patient every day, at firſt with a chilneſs, and with a febrile heat ſucceeding this, by which nature commonly attempts to eaſe herſelf of the load of ſome morbific matter which uſually adheres in the primæ viæ. This differs greatly from the continual *quotidian* fever. See the article *Catarrhal* FEVER.

It is diſtinguiſhed from the double tertian by this, that the *quotidian* regularly obſerves its times of attack and of duration every day; but in the double tertian, the ſingle fits do not correſpond one with another, but only the alternate ones, that is, the paroxyſm of the third day correſponds with that of the firſt, that of the fourth with that of the ſecond, and ſo on.

Signs of it. This fever uſually attacks the patient in a morning, and moſt frequently about ſix or ſeven o'clock. The firſt ſymptom is a very violent chilneſs or coldneſs, which uſually laſts about an hour, and is attended either with a vomiting, or with a diarrhœa, or both. This cold fit is ſucceeded by a violent hot one, in which there is an intolerable thirſt and pain of the head. The whole duration of the fit is uſually ſix hours, and when the heat remits a little of its violence, then ſweats uſually come on. This returns regularly at the ſame hour the next day, and ſo on, unleſs diſturbed by any means; in which caſe, it anticipates or poſtpones the accuſtomed time.

Perſons ſubject to it. This is the leaſt frequent of all the intermittent fevers. Perſons of phlegmatic habits are more ſubject to it than thoſe of any other temperament; and it ſeizes old people oftner than young, and women much more frequently than men.

Cauſes of it. The firſt cauſe of this diſeaſe is a viſcous and mucous matter lodged in the primæ viæ. This is often attended with a ſpiſſitude of the blood in the vena portæ. The occaſional cauſes which bring on this ſpiſſitude of the blood and foulneſs of the primæ viæ, are a coarſe and thick diet, a ſedentary

dentary life, and a natural turn to melancholy. The cauſes of this, and of the tertian, ſeem to be the ſame, only that in this they are ſtronger.

Method of cure. The general cuſtom of curing intermittents by vomits and the Peruvian bark alone, is cenſured by Stahl, and many other writers, as being faulty in two extremes; the vomiting throwing off the offending matter with too much violence, and the bark locking it up in the body. Vomits, when injudiciouſly given, often give violent reachings, without bringing up any part of the matter of the diſeaſe; and the bark, and other aſtringents, bring on obſtinate coſtiveneſs, flatulencies, ſtraitneſs of the breaſt, and many other diſorders; ſuch as, the jaundice, dropſy, œdematous ſwellings, and many other the like complaints, which often ſucceed the too large or injudicious uſe of it: for this reaſon, theſe authors prefer a regular method, by inciding the tough matter in the primæ viæ, with tartarum vitriolatum, and the like, then the giving a gentle emetic; after this, gentle diaphoretics and diluents, ſuch as all warm and weak liquors; and afterwards ſtrengthening the ſtomach and bowels by bitters and ſubaſtringents, among which the bark has its place, tho' in ſmaller quantities than when truſted to alone in the uſual way. *Junker's* Conſp. Med. p. 360.

R.

RABBIT, *cuniculus*, in zoology, a well known animal of the hare kind. See the article LEPUS.

The female, or doe *rabbit* goes with young thirty days, and then ſhe kindles; and if ſhe take not buck preſently ſhe loſes her month, or at leaſt a fortnight, and often kills her young and eats them.

In England they begin to breed at a year old, but in ſome places much ſooner; and they continue breeding very faſt from the time when they begin, four, five, ſix, or ſeven times a year being common with them. They have uſually from four to ſeven in a litter, and hence it is that a ſmall number at firſt will ſoon ſtock a whole warren, if left to breed a little while undiſturbed. The does cannot ſuckle their young till they have been at buck again; this therefore is to be done preſently, elſe there is a fortnight loſt of the time for the next brood, and the preſent brood alſo probably loſt. When the buck goes to the doe, he always firſt beats and ſtamps very hard with his feet, and when he has copulated with her he falls backwards, and lies as it were in a trance; in this ſtate it is eaſy to take him, but he ſoon recovers from it.

The buck *rabbits*, like our boar cats, will kill the young ones, if they can get at them; and the does in the warrens prevent this, by covering their ſtocks, or neſts, with gravel or earth, which they cloſe ſo artificially up with the hinder part of their bodies, that it is hard to find them out. They never ſuckle the young ones at any other time than early in the morning, and late at night, and always, for eight or ten days, cloſe up the hole at the mouth of the neſt, in this careful manner, when they go out. After this they begin to leave a ſmall opening, which they encreaſe by degrees, till at length, when they are about three weeks old, the mouth of the hole is left wholly open, that they may go out; for they are at that time grown big enough to take care of themſelves, and to feed on graſs.

People who keep *rabbits* tame for profit, breed them in hutches, but theſe muſt be kept very neat and clean, elſe they will be always ſubject to diſeaſes. Care muſt be taken alſo to keep the bucks and does apart till the latter have juſt kindled, then they are to be turned to the bucks again, and to remain with them till they ſhun and run from them.

The general direction for the chuſing of tame *rabbits* is, to pick the largeſt and faireſt, but the breeder ſhould remember that the ſkins of the ſilver haired ones ſell better than any other. The food of the tame *rabbits* may be colewort and cabbage leaves, carrots, parſneps, apple rinds, green corn, and vetches, in the time of the year; alſo vine leaves, graſs, fruits, oats, and oatmeal, milk-thiſtles, ſow-thiſtles, and the like; but with theſe moiſt foods they muſt always have a proportionable quantity of the dry foods, as hay, bread, oats, bran, and the like, otherwiſe they will grow pot-bellied, and die. Bran and grains mixed together have been alſo found to be very good food. In winter they will eat hay, oats, and chaff, and theſe may be given them three times a day; but when they eat green things, it muſt be obſerved that they are not to drink at all, for it would throw them into a dropſy. At all other times a very little drink ſerves their turn, but that muſt always be freſh. When any green herbs, or graſs, are cut for their food, care muſt be taken that there is no hemlock among it, for though they will eat this greedily among other things, when offered to them, yet it is ſudden poiſon to them.

Rabbits are ſubject to two principal infirmities. Firſt, the rot, which is cauſed by the giving them too large a quantity of greens, or from the giving them freſh gathered with the dew or rain hanging in drops upon them. It is over moiſture that always cauſes this diſeaſe, the greens therefore are always to be given dry, and a ſufficient quantity of hay, or other dry food, intermixed with them, to take up the abundant moiſture of their juices. On this account the very beſt food that can be given them, is the ſhorteſt and ſweeteſt hay that can be got, of which one load will ſerve two hundred couples a year; and out of this ſtock of two hundred, two hundred may be eat in the family, two hundred ſold to the markets, and a ſufficient number kept in caſe of accidents.

The other general diſeaſe of theſe creatures is a ſort of madneſs: this may be known by their wallowing and tumbling about with their heels upwards, and hopping in an odd manner into their boxes. This diſtemper is ſuppoſed to be owing to the rankneſs of their feeding; and the general cure is the keeping them low, and giving them the prickly herb, called *tare-thiſtle*, to eat.

The general computation of males and females is, that one buck *rabbit* will ſerve for nine does; ſome allow ten to one buck; but thoſe who go beyond this always ſuffer for it in their breed.

The wild *rabbits* are to be taken either by ſmall cur dogs, or by ſpaniels bred up to the ſport; and the places of hunting thoſe who ſtraggle from their burrows, is under cloſe hedges, or buſhes, or among corn-fields and freſh paſtures. The owners uſe to courſe them with ſmall greyhounds, and though they are ſeldom kill'd this way, yet they are driven back to their burrows, and are prevented from being a prey to others. The common method is by nets, called *purſe nets*, and ferrets. The ferret is ſent into the hole to force them out, and the purſe net being ſpread over the hole, takes them as they come out. The ferrets mouths muſt be muffled, and then the *rabbit* gets no harm. For the more certain taking of them, it may not be improper to pitch up a hay net or two, at a ſmall diſtance from the burrows that are intended to be hunted: thus very few of the number that are attempted will eſcape. The method by the dog, called the *lurcher* and *tumbler*, is alſo a very good one. See FERRET and LURCHER.

Some who have not ferrets ſmoak the *rabbits* out of their holes with burning brimſtone and orpiment. This certainly brings them out into the nets, but then it is a very troubleſome and offenſive method, and is very detrimental to the place, as no *rabbit* will, of a long time, afterwards come near the burrows which have been fumed with theſe ſtinking ingredients.

The teſticle of a *rabbit* is a very good object for examining the ſtructure of this part of generation in animals. The whole ſubſtance of the teſticle in this animal is made up of veſſels, which lie in round folds in the manner of the ſmaller inteſtines, but then both ends of each roll meet at their inſertion, which ſeems to be made into the *ductus nervoſus*; and every one of theſe little rolls is curiouſly embroidered with other veſſels, which, from their red colour, appear to be arteries and veins. The ſeveral little rolls lie in ranges, diſpoſed with an uniformity which is very agreeable to the eye. Every one of theſe rolls is not a ſingle and entire tube, but each conſiſts of ſeveral tubes, beſide the veins and arteries which embroider it. This is beſt diſtinguiſhed by the cutting one of the rolls tranſverſely, and then examining the cut end with a glaſs, which will then appear to be made up of the cut and open ends of four, five, or more parallel tubes, which together form the roll, or ſingle tube, as it appears to the eye, being all wrapped up in one common and very thin membrane. Theſe are ſo tender that they cannot be explicated and viewed diſtinct, as De Graeff tells us thoſe of the teſticles of a rat, and of ſome other animals, may. Theſe however, as well as the others, are only made up of a congeries of veſſels, and the liquors, which are their contents, without any intermediate ſubſtance, or any thing of that parenchyma, which many authors have talked of. The teſticles of a bull have the greateſt appearance of a fleſhy texture of thoſe of any known animal, yet even theſe afford no particle of parenchyma, or fleſh, when examined by glaſſes in any ſort of preparation, whether boiled, raw, ſoaked in ſpirits, or in whatever other ſtate. The teſticles of various animals are very variouſly compoſed, but all in this general manner of veſſels variouſly rolled and folded together; and even the human teſticles are of the ſame ſort, being compoſed ſolely of rolls of veſſels, without any intermediate ſubſtance, be it called by whatever name, but only conſiſting of veſſels and their liquors. Philoſ. Tranſ. N° 52.

RABCHORCADO, in zoology, the name of an American bird, deſcribed by Nieremberg with many fabulous circumſtances. All that ſeems certainly known is, that its tail is very remarkably forked. *Ray*'s Ornithol. p. 305.

RABEBOIA, a name given by ſome to the roots of the flammula major.

RABICH, a name given by Leo Africanus to a tree or ſhrub growing very plentifully in many parts of Africa, the fruit of which is much eſteemed by the natives. He ſays that the tree *rabich* is prickly, and that the fruit is round and like a cherry, but ſmaller, and of the taſte of the jujube. *Leo Africanus*, lib. 3.

RABIEL, a name given by ſome authors to dragons blood. See SANGUIS *draconis*.

RABIRA, a word uſed by ſome of the chemical writers to expreſs tin. See TIN.

RABOLANE, in zoology, a name given by many to the lagopus, a bird found on the ſnowy mountains, and called by ſome the *white partridge*. *Ray*'s Ornitholog. p. 127. See the article LAGOPUS.

RABRI, a name given by ſome authors to bole armenic.

RACE, in natural hiſtory. See CIBDELOPLACIA.

RACHISAGRA, a term uſed by ſome phyſicians for the gout in the ſpine of the back.

RACING, the riding heats for a plate or other premium.

The firſt thing to be conſidered in this ſort of gaming is the chuſing a rider; for it is not only neceſſary that he ſhould be very expert and able, but he muſt alſo be very honeſt.

He muſt have a very cloſe ſeat, his knees being turned cloſe to the ſaddle ſkirts, and held firmly there, and the toes turned inwards, ſo that the ſpurs may be turned outward to the horſe's belly. His left hand governing the horſe's mouth, and his right the whip. During the whole time of the *race* he muſt take care to ſit firm in the ſaddle, without waving or ſtanding up in the ſtirrups. Some jockies fancy this is a becoming feat; but, it is certain, that all motions of this kind, do really incommode the horſe. In ſpurring the horſe, it is not to be done by ſticking the calves of the legs cloſe to the horſe's ſides, as if it were intended to preſs the wind out of his body; but, on the contrary, the toes are to be turned a little outwards; that the heels being brought in, the ſpurs may juſt be brought to touch the ſides. A ſharp touch of this kind will be of more ſervice toward the quickening a horſe's pace, and will ſooner draw blood than one of the common coarſe kicks. The expert jockey will never ſpur his horſe until there is great occaſion, and then he will avoid ſtriking him under the fore bowels between the ſhoulders and girth; this is the tendereſt part of a horſe, and a touch there is to be reſerved for the greateſt extremity.

As to whipping the horſe, it ought always to be done over the ſhoulder on the near ſide, except in very hard running, and on the point of victory; then the horſe is to be ſtruck on the flank with a ſtrong jerk; for the ſkin is moſt tender of all there, and moſt ſenſible of the laſh.

When a horſe is whipped and ſpurred, and is at the top of his ſpeed; if he claps his ears in his pole, or whiſks his tail, it is a proof that the jockey heats him hard, and then he ought to give him as much comfort as he can, by ſawing the ſnaffle backwards and forwards in his mouth; and by that means forcing him to open his mouth, which will give him wind, and be of great ſervice. If there be any high wind ſtirring in the time of riding; the artful jockey will let his adverſary lead, holding hard behind him, till he ſees an opportunity of giving a looſe; yet, in this caſe, he muſt keep ſo cloſe behind, that the other horſe may keep the wind from him; and that he ſitting low, may at once ſhelter himſelf under him, and aſſiſt the ſtrength of the horſe. If the wind happen to be in their back a juſt contrary method is to be taken with it; the expert jocky is to keep directly behind the adverſary, that he may have all the advantage of the wind to blow his horſe along, as it were, and at the ſame time intercept it in regard to his adverſary.

When running on level carpet ground, the jockey is to bear his horſe as much as the adverſary will give him leave, becauſe the horſe is naturally more inclined to ſpend himſelf on this ground: on the contrary, on deep earths, he may have more liberty, as he will there ſpare himſelf.

In riding up hill the horſe is always to be favoured, by bearing him hard, for fear of running him out of wind; but, in running down hill, if the horſe's feet and ſhoulders will bear it, and the rider dares venture his neck, he may have a full looſe. If the horſe have the heels of the reſt, the jockey muſt always ſpare him a little, that he may have a reſerve of ſtrength, to make a puſh at the laſt poſt.

A great deal depends on the jockey's knowing the nature of the horſe that is to run againſt him, for by managing accordingly, great advantages are to be obtained: thus, if the oppoſite horſe is of a hot and fiery diſpoſition, the jockey is either to run juſt behind him, or cheek by joul with him, making a noiſe with the whip, and by that means forcing him on faſter than his rider would have him, and conſequently ſpending him ſo much the ſooner: or elſe keep juſt before him, in ſuch a ſlow gallop, that he may either overreach, or by treading on the heels of the fore horſe, endanger tumbling over.

Whatever be the ground that the adverſary's horſe runs worſt on, the cunning jockey is to ride the moſt violently over; that by this means, it will often happen, that in following, he either ſtumbles or claps on the back ſinews.

The ſeveral corrections of the hand, the whip, and the ſpur, are alſo to be obſerved in the adverſary, and in what manner he makes uſe of them; and when it is perceived, by any of the ſymptoms, of holding down the ears, or whiſking the tail, or ſtretching out the noſe like a pig, that the horſe is almoſt blown; the buſineſs is to keep him on to this ſpeed, and he will be ſoon thrown out or diſtanced. If the horſe of the opponent looks dull, it is a ſign his ſtrength fails him; and if his flanks beat much, it is a ſign that his wind begins to fail him, and his ſtrength will ſoon do ſo too.

After every heat for a plate, there muſt be dry ſtraw, and dry cloths, both linnen and woollen, ready to rub him down all over, after taking off the ſweat with what is called a ſweat knife; that is, a piece of an old ſword blade, or ſome ſuch thing. Some adviſe the ſteeping the cloths in urine and ſalt-petre the day before, and letting them be dried in the ſun for this occaſion. After the horſe has been well rubbed with theſe, he ſhould be chafed all over, with cloaths wetted in common water till the time of ſtarting again. When it is certainly known that the horſe is good at the bottom, and will ſtick at the mark, he ſhould be rid every heat to the beſt of his performance; and the jockey is, as much as poſſible, to avoid riding at any particular horſe, or ſtaying for any, but to ride out the whole heat with the beſt ſpeed he can. If, on the contrary, he has a fiery horſe to ride, and one that is hard to manage, hard mouthed, and difficult to be held, he is to be ſtarted behind the reſt of the horſes with all imaginable coolneſs and gentleneſs; and when he begins to ride at ſome command, then the jockey is to put up to the other horſes; and if they ride at their eaſe, and are hard held, they are to be drawn on faſter; and if it be perceived, that their wind begins to rake hot, and they want a ſob, the buſineſs is to keep them up to that ſpeed: and when they all are come within three quarters of a mile of the poſt, then is the time to puſh for it, and uſe the utmoſt ſpeed in the creature's power.

When the race is over, the horſe is immediately to be cloathed up, and rode home, and immediately on his coming into the ſtable the following drink is to be given him. Beat up the yolks of three eggs, and put them into a pint and half of new milk made warm; let there be added to this three pennyworth of ſaffron, and three ſpoonfuls of ſallad oil, and let the whole be given with a horn. After this he is to be rubbed well down, and the ſaddle place rubbed over with warm ſack, and the places where the ſpurs have touched, with a mixture of urine and ſalt, and afterwards with a mixture of powder of jet and Venice turpentine; after this he ſhould have a feed of rye bread, then a good maſh, and at ſome time after theſe as much hay and oats as he will eat. His legs after this ſhould be bathed ſometimes with a mixture of urine and ſalt-petre.

RACK (*Cycl.*)—RACK, or *Arrack*, is properly a ſpirit procured by diſtillation, from the fermented juice of certain trees in the Eaſt Indies. See ARAC, *Cycl.*

Various and contradictory accounts have been delivered, as to the real ſubject that gives origin to this fine ſpirit. The vulgar ſuppoſe it to be rice; ſome the juice of the Eaſt Indian ſugar canes; and others a mixture of the juice of this cane and of the toddy tree; finally, ſome affirm, that it is prepared from the fleſh of animals, and other more coſtly ingredients.

The juice of the cocoa trees, and palm trees, are what afford us the fineſt *arracks*; but there are many other juices diſtilled into the ſame kind of liquors, though wanting the fine flavour of what is made from theſe. *Shaw*'s Eſſay on Diſtillery.

The manner of making the *arrack* is this. The juice of the trees is not procured in the way of tapping the trees, as we do; but the operator provides himſelf with a parcel of earthen pots, with bellies and necks, like our ordinary bird bottles; he makes faſt a parcel of theſe to his girdle, and any way elſe, that he commodiouſly can about him. Thus equipped, he ſwarms up the trunk of a cocoa tree; and when he comes to the boughs, he takes out his knife, and cutting off one of the ſmall knots, or buttons, he applies the mouth of the bottle to the wound, faſtening it to the bough with a bandage; in the ſame manner he cuts off other buttons, and faſtens on his pots, till the whole number is uſed; this is done in the evening, and deſcending from the tree, he leaves things to themſelves till the next morning, when climbing up again he takes off the bottles which are moſtly filled, and empties the juice into the proper receptacle. This is repeated every night, till there is a ſufficient quantity produced, and the whole being then put together, is left to ferment, which it ſoon does.

When the fermentation is over, and the liquor, or waſh, is grown a little tart, it is put into the ſtill, and a fire being made, the ſtill is ſuffered to work, as long as what comes over has any conſiderable taſte of ſpirit.

The liquor thus procured is the low wine of *arrack*, and this is ſo poor a liquor, that it will ſoon corrupt and ſpoil, if not diſtilled again, to ſeparate ſome of its phlegm; they therefore immediately after pour back this low wine into the ſtill, and rectify it to that very weak kind of proof ſpirit, in which ſtate we find it. The *arrack* we meet with, notwithſtanding its being of a proof teſt, according to the way of judging by the crown of bubbles; holds but a ſixth, and ſometimes but an eighth part of alcohol, or pure ſpirit; whereas our other ſpirits, when they ſhew that proof, are generally eſteemed to hold one half pure ſpirit. Ibid.

This ſhews how very uncertain a way of judging of the ſtrength of ſpirits, this by the bead or bubble proof is. And

we may from this learn, that it would be much better to have the *arrack* rectified to the pure alcohol in the Eaſt Indies, in which caſe it would be brought over in one ſixth, or one eighth part of the room, and might be lowered to its ſtandard with common water here. All that it contains beſide this ſixth or eighth part of ſpirit, being only a poor phlegm, or an acidulated water, valuable only for having been brought from Goa or Batavia. It may appear ſtrange to ſome, that this ſpirit ſhould be proof, according to the way of judging by the bead or bubble, and yet be ſo far below the ſtrength, which we uſually underſtand to be in proof ſpirit. But the truth is, that this ſtanding crown of bubbles, may be owing only to the tenacity of the oil that is held in the ſpirit. Our malt diſtillers know very well, that the more oil they work over with the ſpirit, the ſtronger proof it will hold, at a ſomewhat weaker ſtandard of ſtrength than it ought to have, and this caſe of the *arrack* ſhews the fallacy of the other. The finer and more ſubtile any oil is, the leſs it refuſes to mix with any aqueous menſtruum: thus we ſee that the eſſential oils of ſome vegetables, or at leaſt ſome portion of them, is ſo fine and ſubtile, as to mix without turning milky, even with water itſelf, which is the caſe in many of our ſimple diſtilled waters. Hence, it is no wonder, that ſo ſubtile an oil, as is contained in that thin and dilute vegetable juice of which *arrack* is made, ſhould readily mix with ſuch a mixture, as that of one part alcohol, and ſix or eight of water, which tho' weak, conſidered as a ſpirit, is much more likely to retain and embody an oil, than ſimple water alone. The oil of the cocoa is thus ſuſpended imperceptibly in the ſpirit; and that in ſuch quantity, as to give a tenacity to the whole, that diſpoſes it to form a froth or lather at the top when ſhook, and the bubbles of that froth to hang well together. Sometimes indeed there come over into England, and more frequently into Holland, *arracks* that are of the ſtrength of brandy and rum: theſe chiefly come from the Dutch ſettlements, and are a piece of frugality of the Dutch to ſave freight: it is a wonder the ſaving ſpirit had not gone a little farther, and the method of reducing *rack* to alcohol been found out on the ſame plan.

Beſide the common ſorts of Goa and Batavia *arrack*, there are two others leſs generally known; theſe are the bitter *arrack* and the black *arrack*. The bitter *arrack* is ſuppoſed to have been impregnated with ſome kind of bezoar, as that of the porcupine or monkey, which being not generated in the ſtomachs, as thoſe of other animals, but in the gall bladder, are of a very ſtrongly bitter taſte, and very readily communicate it to other things.

Some, on the contrary, are of opinion, that there is nothing added to this, but that the taſte is owing to the juice of the trees, from which the *arrack* is made; and many think that it is obtained from the juice of that tree which bears the fruit, whoſe inſpiſſated juice is what we call terra Japonica.

The black *arrack* is a very coarſe ſpirit, and is uſually drawn higher than any of the finer kinds are, being not drank like them, but employed for coarſer purpoſes. The Turkiſh *arrack*, or as it is uſually called *rackee*, ſeems to be of this kind. The finer, and better kinds of *arrack*, though ever ſo good, when put on board, are apt to grow foul, and black in the carriage; if the leager, or caſk, in which they are brought over, be decayed on the inſide, or the liquor come to touch any nails, or ruſty iron of any kind; for the ſpirit preſently diſſolves a part of the ferrugineous matter; and thence, upon account of the tincture of the oak, which it had before obtained from the wood of the caſk, it will appear inky. *Arrack*, that is thus accidentally tinged black, is not to be confounded with ſuch *arrack* as is originally black, and of the coarſe kind named before. This, which has obtained the colour by accident, is not the worſe in taſte for it, and the tinge may be taken off, and the liquor recovered by putting into the caſk a large quantity of new or ſkimmed milk; and working it well about, as the vintners do, in order to whiten their brown wines. When the bottoms are large, they are to be committed to a conical filter of flannel, through which the *arrack* runs fine. This art of purifying foul *arracks* with milk, would be very pardonable, if our dealers only impoſed that upon us: but they have a ſhameful way of lowering this ſpirit with water, and that to ſuch a degree as is ſcarce credible.

The weakneſs of ſome genuine *arracks* greatly contributes to the countenancing this cheat. This is the principal deceit uſed in regard to this commodity; for it is not eaſy to find any other ſpirit taſteleſs enough to mix with it, without diſcovering the cheat with us; and in Holland they are not only more deſtitute of clean ſpirits than here, but the price of *arrack* itſelf is ſo low there, that it is hardly worth while to do it if they had proper materials.

The extravagant price that *arrack* bears in England, has given great occaſion to the diſtillers to endeavour the counterfeiting it. All the attempts which, for cheapneſs ſake, have been made with malt ſpirit, have naturally proved unſucceſsful: but the thing is not impracticable, though theſe methods have failed. The firſt requiſite muſt be the making a perfectly taſteleſs ſpirit, and the next the treating the juices of vegetables, ſo as to obtain their flavour, to add to it, or elſe the obtaining a pulverable dry ſubſtance, which would at once mix with the ſpirit, and prevent the trouble of a ſecond proceſs of diſtillation. It is poſſible, alſo, that the Engliſh juices of trees, which will bleed freely, ſuch as the birch, maple, ſycamore, and the like, may, on proper trials, be found to afford this ſort of ſpirit in ſome degree of perfection.

RACKOON, in zoology, the name by which we commonly know an American animal, called *coati* by the Braſilians. It is ſomething ſmaller than the beaver, and is of the ſhape of the beaver in its body, and its legs are as ſhort as in that creature. Its hair is like that of a fox, very long, ſoft, and placed thick together, and black at the ends, and brown toward the body. Sometimes from this mixture of colour the back appears plainly grey; and Marggrave mentions another ſpecies, which is of a deep yellow or ochre colour. *Ray*'s Syn. Quad. p. 179.

The head is very like that of the fox in ſhape; but that the ears are ſhorter, roundiſh, and naked, and therefore has a black line drawn acroſs the eyes. The eyes are large, the noſe is black, and rounded at the extremity, like that of a dog; its tail is longer than its body, and is very like that of a cat, having annular marks of different colours. Its feet are each divided into five ſlender toes; by the help of which it climbs trees as expertly as a monkey, and uſes the fore feet as hands, to reach up its food to its mouth. It is a very cleanly animal; and if there be water any way near, it always waſhes its food, be it what it will, before it eats it. It feeds on vegetables, but is alſo very fond of eggs, and will even ſeize birds if it can catch them. It is very common in many parts of the Weſt Indies, and is a creature eaſily tamed.

RADAINUS, among the writers of the middle ages, the name of a black ſtone ſomewhat tranſparent, and ſaid to be found in the head of a cock; and, by others, in the head of a ſea fiſh. They ſay the method of finding the ſtone was to put the creature's head into an ant-hill, where theſe inſects having eaten away the fleſh, the ſtone was eaſily found among the bones.

RADIALIS (*Cycl.*)—RADIALIS *externus primus & ſecundus*, two muſcles cloſely united together; appearing, at firſt ſight, like one muſcle, lying along the external angle of the radius, between the os humeri and the carpus, being fleſhy near the former, and tendinous near the latter.

In many ſubjects we find theſe two muſcles entirely diſtinct from one end to the other; and they may, in that ſtate, be named *radialis externus primus*, and *radialis externus ſecundus*, regard being had to the inſertion of their tendons. Sometimes the two fleſhy portions adhere cloſely together, appearing to make but one body, but the tendons are always diſtinct and ſeparate. The firſt is inſerted above in the criſta of the external condyle of the os humeri, below the inſertion of the ſupinator longus. The ſecond is inſerted in the ſame condyle below the inſertion of the firſt, and in the neighbouring articular ligament. From thence the two fleſhy bodies run down very cloſe together, and having reached the middle of the outſide of the radius, each of them terminates in a long tendon.

The two tendons accompany each other to the extremity of the radius, and having paſſed under a particular annular ligament; they are divided as it were into two cornua, from whence the antients, who looked upon them as but one muſcle, called it bicornis. One of theſe tendons is inſerted anteriorly in the baſis of the firſt metacarpal bone, the other nearly in the ſame part of the ſecond bone, and the tendon of the firſt is ſometimes double, appearing like another bicornis. *Winſlow*'s Anatomy, p. 193.

RADIALIS *internus*, a long muſcle, very like in ſhape to the ulnaris externus, but ſituated more obliquely. Its fleſhy portion is fixed by a ſhort tendon to the outer and upper ſide of the inner condyle of the os humeri, from thence it paſſes obliquely toward the radius, and running along about two thirds of that bone, it forms a long tendon, which continues in the ſame courſe; and at the lower extremity of the radius, paſſes under a particular annular ligament, and under the inſertion of the muſculus thenar. This tendon is at length inſerted chiefly in the inſide of the baſis of the firſt metacarpal bone, and alſo often in the ſecond, and a little in the firſt phalanx of the thumb; having firſt paſſed through the channel of the os trapezium which ſuſtains the thumb. *Winſlow*'s Anatomy, p. 191.

RADIATED *flowers*, (*Cycl.*) in botany, a term uſed by Mr. Tournefort, and others, to expreſs flowers, like that of the great daiſy, ſun flower, *&c.*

A *radiated* flower has two parts; its middle part which is called the diſk, and which is wholly made up of floſcules; and the outer part, which is called the circle or border, which is wholly made up of ſemi-floſcules, or elſe of plain flat leaves; but that is leſs common. The floſcules and ſemi floſcules both uſually adhere to the embryos, and to the thalamus of the flower, being contained in one general cup. Theſe embryos finally ripen into ſeeds; ſometimes furniſhed with down, ſometimes with foliaceous heads, and ſometimes without either, and ſometimes marginated. Of theſe ſeeds ſome are wrapped round with a kind of caſe or capſule, others are ſeparated from

one

one another by ſmall perpendicular leaves. See Tab. I. of Botany, Claſs 1. *Tourn.* Inſt. p. 480.

RADIATED *leaf*, among botaniſts. See LEAF.

RADICAL (*Cycl.*)—RADICAL *numbers*, *numeri radicales*, in the Italian muſic, are 2, 3, 4, 5, 6, 7, 8, 9, and ſometimes 10, which are often met with in muſical compoſitions, to denote the accords of the thorough baſſes. 2 ſtands for the ſecond and its duplicates; 3 for the third; 4 for the fourth, *&c.*

RADICAL *leaf*, among botaniſts. See LEAF.

RADICATUM *folium*, among botaniſts. See LEAF.

RADII (*Cycl.*)—RADII *pinnarum*, in ichthyology, the little ſlender bones ſupporting the membrane, forming the fins in fiſhes, and called by Artedi *oſſicula radiata pinnarum*, from their running from the baſe to the ſummit in the form of rays. See FIN.

Of theſe *radii* ſome are prickly, others not. The prickly ones are always hard and rigid, the others are always ſoft and flexile, whether they terminate ſingle, or are ſplit into two or more branches at the extremity. The prickly ones are always formed of ſingle bones; the others always of two bones, each applied cloſely and evenly to one another. When the fiſh is alive, it is not always eaſy to ſeparate theſe, but when it is boiled, they are eaſily parted at the baſe, and ſometimes all the way up. The fiſh, which have the ſingle and prickly fins on their back, belly, or at the anus, are theſe: the percæ, the ſpari, the labri, the amiæ, the trachuri, the mugiles, the ſudes, the trachini, the zei, the mulli, the ligyri, the gaſteroſtei, the ſcorpœnæ, the capriſci; in theſe the *radii* are all ſingle, and are more or leſs prickly. In the mackrel, the *radii* of the firſt fin of the back, and thoſe of the belly fins, are abſolutely ſimple, but they are ſcarce obſervably prickly.

The following genera of fiſhes are thoſe which have the *radii* of the fins all double at the baſe, and ſoft and flexile: the ſyngnathi, the cobitides, the cyprini, the clupeæ, the coregoni, the oſmari, the eſoces, the pleuronecti, the gadi, and the congers. The ſofter and the more flexile theſe bones are, the more numerous, tranſverſe, and lucid internodia they have in them. The cyprini give us many inſtances of this, as alſo the clupeæ, the coregones, and the eſoces. Thoſe which have fewer of theſe internodia, or tranſverſe lines, are ſomewhat more rigid, though not aculeate, or prickly: this we ſee in the pleuronecti and gadi. Beſide theſe *radii*, there are certain other ſmall bones which are of an oblong figure, and ſerve to ſuſtain the baſes of the back fins, and the fin at the anus. The back fins, and thoſe at the anus, are not joined by their rays to ſome one large muſcle, or large bone, as the pectoral and ventral fins are; but every *radius*, or bone in theſe fins, is affixed to an oblong bone, erected perpendicularly between the apophyſes of the vertebra and the back of the fin. The rays are joined at their baſe to theſe bones by an articulation, and faſtened in by means of a cartilage; and theſe bones do not adhere to the apophyſes of the vertebra, but are placed regularly between them. Theſe bones are always ſingle, and in many kinds of fiſh, as in the pleuronecti, they are hollow at the bottom. Between theſe bones, and the firſt rays of the back fin, in mackrel, there are found certain other little bones, placed ſemicircularly and tranſverſely, but their apices are ſtriated, and turn a little upwards. This is an obſervation yet made only in a few fiſh, but it is worth while to examine whether it is found in thoſe other fiſh alſo, which have ſulci at the back fins. *Artedi*'s Ichthyolog.

RADISH, *raphanus*, in botany. See RAPHANUS.

There are ſeveral varieties of the root of the common garden *radiſh*, which is the only ſpecies cultivated by our gardners: theſe are called by them the ſmall top'd *radiſh*, the deep red, and the ſtriped *radiſh*, &c. All theſe are only varieties ariſing from the culture. The ſmall topped is the kind, the ſeed of which is moſt ſaved, and which is moſt valued about London, becauſe it does not take up much room. They are ſown at various ſeaſons, but the earlieſt is generally at the latter end of October; if theſe are not deſtroyed by froſts, they become fit to eat in March. Theſe are commonly ſowed about walls, pales, or hedges, where they may have ſome defence againſt the cold. The ſecond ſowing is commonly about Chriſtmas, if the weather be mild enough to let the ground be worked. Theſe are alſo to be ſown under a ſhelter, and, if they are not deſtroyed, will be fit to eat in April; and to have a conſtant ſupply, there ſhould be a new ſowing every fortnight, from the middle of January to the beginning of April. The later crops ſhould be ſown on a moiſt ſoil, and in an open ſituation. *Miller*'s Gard. Dict.

RADIUS (*Cycl.*)—RADIUS *of curvature*, or *Radius of the curvature of a curve*, is the *radius* of a circle that has the ſame curvature in a given point of the curve, that the curve has in that point.

RADIUS, among the Romans, a name given to the iron rod with which the boys rolled the trochus. See the article TROCHUS.

RADIUS, in anatomy. The *radius* is nearly of the ſame length with the ulna, bigger at one end than at the other, irregularly triangular, a little bent, and ſituated ſideways along the ulna, and has its name from the reſemblance it bears to the *radius*, or ſpoke of a wheel. Anatomiſts deſcribe in this bone a middle portion, and two extremities. One extremity is ſmall, and like a kind of head ſet upon a neck; the other is large, reſembling a pedeſtal, or baſis; and the bone might therefore be very properly divided into the head, body, and baſis.

The head, or ſmall extremity of the *radius*, is very ſhort or low, the top of it is concave, and the circumference cylindrical, and both the glenoide cavity, and whole circumference, are covered with the ſame ſmooth ſhining cartilaginous cruſt, and about one quarter of the circumference is broader than the reſt. The neck is ſmall, and its ſituation a little oblique; it ends by a lateral tuberoſity, which lies directly under the broad part of the head, being rough in the middle, and on one ſide, and ſmooth and ſuperficially cartilaginous on the other.

The baſis, or great extremity of the *radius*, is much broader than it is thick, and has two broad ſides, and one narrow one. One of the broad ſides is a little hollow, and pretty even; the other is unequally convex, and divided by longitudinal eminences, or bony lines, into three or four longitudinal channels; but theſe are much more diſtinct in freſh bones, than in the dried ſceleton. The narrow ſide is hollowed lengthwiſe, and between it, and the other two, are formed two angles, by which the three ſides are diſtinguiſhed; and oppoſite to it, the other two meet in a third angle. This narrow ſide ends in a ſemilunar cavity, bordered by a ſmooth cartilage, and lying almoſt in the ſame direction with the tuberoſity. The broad ſides end at their common angle by an obtuſe point, or production, which has been called the *ſtyloide apophyſis* of the *radius*, and is in reality a continuation of one of the bony lines already mentioned. The whole baſis ends in an oblong, triangular glenoide cavity, the cartilage of which is continued over the hollow edge of the narrow ſide. This is an articular cavity, reſembling an arch, and ending on one ſide at the ſtyloide apophyſis, and hollowed on the other by the cavity of the narrow ſide. It appears divided into two portions by a ſmall tranſverſe line, and in the natural ſtate, the hollowed ſide is lengthened out by a cartilaginous production, which is loſt in the dried ſceleton.

The middle, or body of the *radius*, is a little incurvated, the concavity lying between the tuberoſity in the head, and the ſemilunar cavity in the baſis. It has three ſides; one rounded, which is the convex ſide of the curvature, and two concave; three angles, two of which are obtuſe, diſtinguiſhing the two concave ſides from the convex, and the third acute, lying between the concave ſides, oppoſite to the convex ſide. In each of theſe ſides there are ſeveral muſcular impreſſions. The head and baſis of this bone are epiphyſes in children, and in ſome ſubjects remain ſuch for a long time afterwards. The *radius* is connected with the ulna, os humeri, and carpus. It is articulated with the ulna, at its two extremities, by a double lateral ginglymus, the cartilaginous ſubſtance of the head turning in the ſmall ſigmoide cavity, and the ſemilunar cavity in the baſis turning upon the ſmall head at the lower extremity of the other bone, and thus the ſmall extremity of one of theſe bones is joined to the great extremity of the other. It is articulated with the os humeri by the application of the cavity in the top of its head to the ſmall head at the lower extremity of the other bone: by this conformation it would be capable of moving in all directions; but as it is tied to the ulna at both extremities, its motions on the ſmall condyloide head, at the lower extremity of the os humeri, are confined to two kinds; that of rotation, when it turns on the ſides of the extremities of the ulna; and that of flexion and extenſion in common with the ulna; and both theſe motions may be performed at the ſame time. *Winſlow*'s Anatomy, p. 80.

Cartilages of the RADIUS. At the baſis of this bone there is a particular cartilage, or triangular production, very thin, longer than it is broad, and rather flat than concave. It is fixed by the baſis, or ſhorteſt ſide, to the lateral ſigmoide notch of the baſis of the *radius*; the other ſide touches the flat extremity of the ſmall head of the ulna, but is not affixed to it. This may properly enough be called the inter-articular cartilage of the wriſt. It is tied to the *radius* by very ſhort ligaments, and ſliding on the ſmall head of the ulna, it follows all the motions of the *radius*. It is therefore a ſort of articular production of the lower ſide of the baſis of the *radius*, and in the natural ſtate fills the void ſpace which, in the ſceleton, appears between the end of the ulna and neighbouring bone of the carpus. *Winſlow*'s Anatomy, p. 140.

Ligaments of the RADIUS. Many of the ligaments of the bones of the fore arm are common to them, and to the os humeri, and others to them, and the bones of the head: two however there are which are proper to this part of the arm, the one called the interoſſeous ligament of the fore arm, the other the coronary ligament of the *radius*; and

and to these may be added the annular ligaments, which serve only for the passage of tendons, and other ligamentary expansions, which may be called muscular ligaments. The interosseous ligament of the fore arm is like that of the leg; it is fixed by one edge along the sharp angle of the *radius*, the other along that of the ulna. It is principally made up of two very strong planes of fibres, which cross each other at oblique angles, and leave holes at different distances for the passage of blood vessels. This ligament ties the two bones closely together, and the two planes serve for the insertion of several muscles. The coronary ligament of the *radius* is a sort of ligamentary hoop, surrounding the circular circumference of the head of that bone. It is very strong, and comes near the solidity of a cartilage, and the side next the *radius* is very smooth. The capsular ligament of the joint of the elbow runs down from its insertion in the os humeri, and is fixed in the olecranum, round the edge of the great sigmoide cavity, including both the apex of the olecranum, and of the coronoide apophysis.

The true common ligaments, by which the os humeri is connected to the bones of the fore arm, called lateral ligaments, are the two fasciculi, which, after being inserted in the condyles of the os humeri, are expanded like a goose's foot; that which is fixed in the inner condyle is called the brachio-cubital, the other the brachio-radical.

Of the ligaments by which the bones of the fore arm are connected to those of the hand, one is like a roundish cord fixed in the styloide apophysis of the ulna, and from thence passes over the os cuneiforme of the carpus; and another pretty broad ligament is fixed on the point of the *radius*, and by its other extremity in the bones of the carpus. From this styloide ligament of the *radius*, along each edge of the basis of that bone, are ranks of ligamentary fibres, lying much in the same direction with the ligament itself, and continued all the way to the styloide ligament of the ulna. There are also several small annular ligaments placed at different distances on the convex side of the basis *radii*, from its styloide apex to its articulation with the extremity of the ulna; these are at least six in number, and some of them are double or triple. The first of these is fixed in the styloide apex; the second in the groove near that apex; the third in the small, narrow, or middle groove; the fourth in the groove next the former; the fifth in the corner of the notch of the basis, at its articulation with the ulna; and the sixth in the extremity of the ulna, near the styloide apophysis. These are all almost wholly covered by the great oblique ligament, and are fixed as strongly in it on one side, as they are in the bones on the other. *Winslow*'s Anatomy, p. 141. seq.

RADIUS *articulatus*, in natural history, a name given by Mellius, Gmelin, and some other authors, to a kind of figured fossils, of which there are a great many very different species, some of which have been described by authors among the belemnitæ, under the names of *alveoli belemnitarum*. Mr. Gmelin, who has taken great pains to inform himself, as well of the nature and figure of these stones, from the subjects themselves, as of their history, and the various accounts of them from other authors, observes, that the place where they are most frequent is Sweden, and that there they are no where so common as in the isle of Oeland. Volkman figures some also which he found in Silesia, and Helwing others which he collected in Prussia: he also found great numbers of them himself in Russia.

They are usually immersed in lime stone, and though at first sight they may all appear alike, yet, on a careful examination, they will be found to differ very greatly. The most obvious general distinction, established by Mr. Gmelin, is, that some of them are strait, and others crooked.

The strait ones may be divided into two genera. The first of these comprehends, according to this gentleman, two species: the first smooth, and with a converging alveolus. This consists of several patellæ of a roundish figure, and disposed in a parallel manner over one another. Each of these patellæ is convex on one side, and concave on the other; and the convex part of one is in the articulation, which joins them into one body, always received into the concave part of another, whose convex part is again received into the concave of a third, and so on throughout the whole body. The diameter of the largest of this species is about two inches, and that of the least an inch. The circumference is not perfectly circular, but in one part is cut in manner of a crescent. This hollow is made for the reception of another cylindric stone, which is not articulated, and which Mr. Gmelin calls an *alveolus*. This alveolus runs through all these crescents in a strait and continued course, and standing out beyond the patellæ, of which the body is composed, is surrounded with a series of fasciæ, more or less elate: these answer to so many of the patellæ, and from these indeed it seems to have obtained this figure; but when this alveolus has, by any accident, been disengaged from its *radius*, it is easily rendered smooth by attrition and other accidents, and is usually found smooth when loose. Acta Petropol. Vol. 3. p. 248.

These are general characters, and are observed in all the specimens of this species; but there are other accidental varieties found in the different ones. Some have the patellæ and the alveolus standing out beyond them, all covered with a thin crust of a matter plainly testaceous, and in some the shelly matter is also found between the junctures of the patellæ. Sometimes also there are seen, at every junction of the patellæ, certain little forked bodies, standing upon the outer part of the alveolus, and seeming to join the several patellæ together. Sometimes the *radii* are found without the alveolus, but then there is always a cavity, or the remains of a cavity, in form of a canal, answering to every lineament of the alveolus; and this is ever covered with a shelly crust on its inner surface. Many of these *radii* are found remarkably compressed, bent, or distorted, which is an accident accounted peculiar to the fossils formed in animal moulds, and shews, with the shelly matter, that the whole must be the remains of some sea fish. Often also, when the whole substance is not injured in its form, the alveolus alone is oddly bent and distorted, whence it appears that it was originally of a tenderer texture than the rest, and there are also evident marks of its having been once hollow.

These are the characters and varieties of this species of *radius*, and there do not seem to be any distinct species under this, unless we are to account for such, those in which the patellæ are a little thicker, or a little thinner, or where they stand closer, or farther asunder. They are found from twelve to eighteen inches in length, but never seem to have been found with the posterior extremity perfect. They all lose themselves in the stone, keeping through their whole extent, as far as they can be traced, the same cylindric figure, without tapering toward either end. It is true, that in some of the stones where they are immersed, and which are polished for various uses, they often seem to grow gradually smaller, so as to terminate in a point; but this may be owing to their being cut in a slanting, not a truly horizontal position, and the bodies themselves may be truly cylindric all the while. Possibly, however, there may be of these, as of the belemnitæ, some cylindric, and others conic; or perhaps all may be conic, but that we have not been able perfectly to trace them.

The second species of the first genus, is the strait articulated *radius* which contains an alveolus, and is of a striated texture. This is composed of patellæ, which stand close, and are firmly joined together. These are convex on one side, and concave on the other, and their several diameters sensibly decrease toward one end. These contain also an alveolus. The patellæ, of which this species is composed, are of an elliptic figure, and each is surrounded with numbers of circular striæ. Ibid. p. 256.

The second genus of the *radii* comprehends those which are strait, and which have a siphunculus running all the way through their middle. These are composed of patellæ of equal diameters, laid parallel on one another, and are convex on one side, and concave on the other; and by this shape are adapted mutually to receive, and be received by one another. The siphunculus in these may often be traced very fairly, and seen to have been once hollow, though in this fossile state it is filled up with the matter of the stone in which the body is lodged; but sometimes they are almost obliterated, either in the whole length of the *radius*, or in one part or other of it. Another species of this is sometimes found, which seems only composed of circular rings, or segments of cylinders, not patellæ: this also has a siphunculus running its whole length, and both this, and the former, have often the remains of a thin coat of a shelly matter upon them.

These are the genera, and subordinate distinction of the first class of the articulated *radii*, that is the strait ones. The second class contains those which are crooked or twisted. The bodies of this class are much more rare than those of the former. They consist of patellæ, which are nearly round, only a little inclining to an elliptic figure; they are convex on one side, and concave on the other, and are each bored through with a small aperture, through which a siphunculus passes, running through the whole length of the body. Sometimes this is placed regularly in the middle, sometimes nearer to one side. There seem to be two species of this; the one composed of very thin patellæ, and the other of considerably thick ones.

The regular and nice configuration of these bodies, shews very plainly that they cannot be of mineral origin, but the several patellæ of which each is composed, the siphunculus of communication, obvious in several, and the shelly matter yet found remaining on many, prove them to have been once shell-fish of the univalve or tubular concamerated kind; the description of which, so far as it can be gathered from these remains, must have been this. The shell must have been either cylindric or conic in figure, of a smooth surface, and divided into several chambers or cells; but this so, that the septa which form the concamerations are not continued, and whole, but in some part of the periphery are cut in, in the shape of a crescent. Through these crescents, which

ſtanding all together, make a continued canal, there has paſſed another ſhelly body of a cylindric or conic figure, alſo divided into concamerations; and that in ſuch a manner, that the ſepta which form the cells are pierced with a ſmall aperture on one ſide, which grows gradually ſmaller as the ſhell extends in length; and finally, through theſe apertures in the concamerations, there paſſes another ſhell pointed at the end, and like the reſt divided into its concamerations, and pierced along its middle with a ſiphunculus. Mem. Acad. Petrop. Vol. 3. p. 263.

This ſhell is therefore a compages of three ſhelly bodies, incloſed one within another; and it muſt be ſuppoſed, in order to carry an analogy with other ſhell-fiſh, that theſe three ſhelly bodies have communications with one another, by means of certain ſlits or perforations. The communication of theſe, one with another, ſeems alſo evident, from their being all found in their foſſile ſtate, filled with the ſame ſtony matter; this has, doubtleſs, been all received in at the ſiphunculus of the inner ſhell, and thence has been thrown into the ſecond, and from this into the third ſhell, ſo as to fill up all the concamerations of the outer, as well as of the inner parts. This muſt have been the caſe with theſe; and the ſeveral various ſpecies that are at this day found foſſile, muſt have owed their origin to as many different ſpecies of the ſhells. The crooked, and twiſted, or wreathed kinds, which have the ſiphunculus, uſually placed near the ſide, greatly approach in their ſtructure to ſome of the cornua ammonis.

RADIX (*Cycl.*)—RADIX *entrochorum*, the *root of the entrochi*, a name given by ſome authors to a foſſile ſubſtance, uſually found among the entrochi, and ſeeming to have been the baſis from which they have grown. It is plainly a part of the *ſtella marina arboreſcens* petrified, as thoſe ſtones alſo are: but people, who from a proper examination of the animal world, had miſſed the true origin of theſe ſtones, and called them rock plants, have eſteemed this part of the fiſh the bulbous root of the plant. This foſſil is rarely found whole, but the fragments of it are very common. When entire, it is about the ſize of a walnut; the top of it being flat, and in ſome degree reſembling the end of an entrochus, with a central hollow, but not having the leaſt appearance of the rays of thoſe ſtones. Theſe foſſils, though not properly judged of as to their origin, have yet been deſcribed by a great number of authors. Agricola, in particular, compares the form of them to a wheel. The body of this kind well reſembles indeed the nave of a wheel, the ſhape of it being conical toward one end, till you come to the top, and then a little flatted, with a hole in it. There is alſo a like hole in the oppoſite broad end of the ſame foſſil, ſeeming fit for an axle to paſs through; and there are five hollow ſtirts, or feet, iſſuing ſideways, at equal diſtances from the broad bottom, and equally carried on in the ſame direction, ſo as not amiſs to repreſent the ſpokes. At the end of each of theſe rays, or ſpokes, there is a hollow, of the ſame nature with thoſe in the middle of the common entrochi, but this is cut acroſs by a ſeam, or ſtreak of the ſame ſtone, which paſſes directly over its center, and covers about a third part of it; this goes no farther than the mouth of the hole, but it cuts it into two, and ſhews it in the form of two eyes. Theſe radii, or ſpokes, are very ſeldom found ſo perfect as here deſcribed. Liſter mentions them as being formed like creſcents at the end, which may very eaſily happen from the breaking off a part of the terminating part. Phil. Tranſ. N° 129.

The *radix entrochorum* is never of a ſmooth ſurface, but is wrought all over with trigonal, tetragonal, pentagonal, and hexagonal plates. The uſual ſtructure is this: the upper part of the conical end is wrought round with ſix large hexagonal plates. Theſe reach half way of the ſtone, then follow a ſecond round made up of eleven pentagonal plates; theſe are pretty large, and reach almoſt to the broad bottom, which is a little convex. The bottom itſelf and the feet contain plates of all the ſhapes, but they are uſually very ſmall. The ſubſtance of this foſſil is always a whitiſh opake ſpar, of the ſame nature with the trochites. It has outwardly a ruſty coat, and is blueiſh within, like ſmall ſhells. It is generally found in clay, and is ſo filled up with it, as to appear ſolid; but on the picking this out with a pointed inſtrument, the whole appears to be only a hollow ſhell, of about the thickneſs of a half crown piece.

The ſmall ſcales of pentangular and other figures, which make up theſe bodies, are often found looſe in the clay where the entrochi are alſo found; but they have ſo little reſemblance to any thing of the entrochus kind, that few have thought of referring them to that foſſil, till they have met with the *radix* entire. There are a vaſt variety of theſe plates, ſome are convex, others concave; ſome have edges plain and ſmooth, others ſerrated, and ſome have, on the convex parts, the figure of a ſtar, conſiſting of ſix emboſſed rays, with a ſtud between every two of them, in the manner of the wires, or appendiculæ, growing from the aſteriæ, which are a ſort of foſſils, evidently very nearly allied to the entrochus kind in all reſpects.

RADIX *alba*, a word uſed by Dioſcorides, to expreſs the root of the dracunculus.

RADULA, the *raſpatory*, a chirurgical inſtrument uſed to cleanſe foul bones.

RAERS *of a cart*. See the article CART.

RAGS. In ſome counties of England, particularly in Oxfordſhire, it is a common thing to uſe old woollen *rags* by way of manure upon land. Taylors ſhreads anſwer this purpoſe, in ſome degree; but the old *rags* of cloaths, which have been worn by men and women, are much better, which is owing to the ſalts they have imbibed from the perſpiration of the body they uſed to cover. *Plot*'s Oxfordſhire, p. 250.

RAG-*bolts*, in a ſhip, are ſuch as have jags or barbs on each ſide, to keep them from flying out of the hole wherein they are driven.

RAG-*ſtone*, a name given by our artificers to a kind of ſtone, which they uſe for ſetting an edge upon knives, chiſels, and other tools. It is a greyiſh coloured ſtone, containing a large quantity of talcky particles, and ſplits eaſily into thin flakes. It is a ſoft ſtone, and is uſed only to finiſh the ſetting an inſtrument after the edge has been prepared by grinding or rubbing the tool upon ſome other ſtone of a coarſer texture. We have this from Newcaſtle and many other parts of the north of England, where there are very large rocks of it in the hills.

RAG-*wort*, *jacobæa*, in botany. See JACOBÆA.

There are two or three ſpecies of this plant cultivated in the gardens of the curious; and one very common in moſt places, which is the maritime kind, remarkable for its white leaves. This had been long uſed to be nurſed up, with great care, in our green houſes; but of late ſome ſtraggling ſeeds of it having propagated themſelves on a wall, and there ſtood the winter's cold without hurt, we were taught that the plant did not require the care it had been uſed to be treated with.

All the kinds may be propagated by ſowing their ſeeds in March, on a bed of light earth, watering it frequently in dry weather. In May the plants may be taken up, and planted in pots, and ſet in a warm ſituation till October, when the tenderer kinds are to be taken into a green-houſe. Theſe require much pruning in ſummer to keep them in ſhape, for they grow very faſt, and in winter will die if they are not often watered. *Miller*'s Gardners Dict.

The grey, or white leaved kind, is eaſily propagated by cuttings, planting them in light earth, and frequently watering them till they have taken root, and then the plants are to be removed into a warm ſituation. This method is vaſtly better in regard to this particular plant, than the raiſing from ſeeds; becauſe, when ſo raiſed, it is very apt to degenerate, and loſe the whiteneſs of its leaves, which are its principal beauty. See JACOBÆA.

RAHAS, in ichthyology, a name given by ſome authors to the *torpedo*, or cramp fiſh. It is a ſpecies of the ray fiſh, diſtinguiſhed by Artedi, by the name of the *raia tota levis*, the wholly ſmooth ray. See TORPEDO, *Cycl.*

RAIA, in the Linnæan ſyſtem of zoology, the name of a diſtinct genus of fiſhes of the general order of the chondropterygii. The diſtinguiſhing characters of this genus are, that the body is flatted, and the apertures of the gills are five on each ſide. *Linnæi* Syſt. Natur. p. 51.

In the Artedian ſyſtem of ichthyology, the characters of this genus of fiſhes are theſe. They are of the chondropterygious kind. The apertures of the bronchia are five on each ſide, and are ſituated on the breaſt a little below the mouth. The head and the whole body are of a remarkably depreſſed or flatted figure. The ſides are terminated in broad fins, which are in the place of pectoral ones in other fiſhes. The eyes are placed in the upper ſide of the head, and the mouth generally in the lower. There is on each ſide of the head a foramen behind the eyes. And the tail is generally long and ſlender.

Of thoſe *raiæ* which have obtuſe or granulous teeth, the following are the ſpecies. 1. The oblong *ray* with one row of ſpines, along the middle of the back. This is the *rhinobatus* and *ſquatino-raia* of authors. 2. The prickly *ray*, with teeth like tubercles, and a tranſverſe cartilage in the belly. This is the *raia clavata* of authors, and our *thornback* and *maid*. 3. The ſmooth bodied *ray*, with a long ſpine ſerrated on one ſide in the tail, which has no fin. This is the *paſtinacha marina* of authors. 4. The ſmooth bodied *ray*, with generally two ſpines ſerrated behind in the tail, without a fin. This is the *altavela* of the Italians. 5. The ſmooth bodied *ray* with a ſingle long ſerrated ſpine in the tail, with a fin on it. This is the fiſh, called by authors the *aquila marina*.

Of the *rays* with ſharp teeth, the following are the known ſpecies. 1. The *ray* with the whole back armed with ſpines, with two rows of them on the tail, and a ſingle row about the eyes. This is the *ray* called the white horſe *ray*, or *raja tota aſpera* of authors. 2. The *ray* with the back and belly ſmooth, but with a row of ſpines about the eyes, and three rows of them upon the tail. This is the *raja lævis oculata* of authors. 3. The variegated *ray* with two prickly tubercles on the middle of the back. This is the *raja oxyrhincos major* of authors. It ſometimes has two fins,

ſome-

ſometimes only one on the tail. 4. The *ray* with the middle of the back ſmooth, and with only one row of ſpines on the tail. This is the *ſkate* fiſh or *flair*. It is of a greyiſh colour, variegated with blackiſh ſpots, and grows very large. 5. The wholly ſmooth *ray*. This is the famous *torpedo*, or cramp fiſh. See the article TORPEDO, *Cycl.*

Rays are generally divided by authors into the ſmooth and the prickly. The ſmooth are what we call the *ſkates* and *flairs*: the prickly we call *thornbacks*, and the young ones of both kinds *maids*. But Willughby thinks they are more regularly divided into two orders, the one containing thoſe which have teeth, the other thoſe which have none. *Willughby*'s Hiſt. Piſc. p. 68.

RAJANIA, in botany, a name given by Linnæus to a genus of plants. The different ſpecies of which are made to compoſe two genera in Plumier, under the names of *jan-raia* and *bryoniæ* ſpecies. The characters of the genus are theſe. It produces ſeparate male and female flowers; in the male flower the perianthium is divided into ſix ſegments, which are oblong, and pointed, and ſtand cloſe in the baſis, ſo as to form a ſort of bell, and expand more at their points. There are no petals, and the ſtamina are ſix briſtly filaments ſhorter than the cup, and terminated by ſimple apices. In the female flower the perianthium is one leaved, campanulated, and ſtands upon the germen, but afterwards withers away. This alſo is divided into ſix ſegments at the edge. There are no petals, and the germen of the piſtil is compreſſed, and edged, with a membrane on one ſide. The ſtyles are three in number, and are of the length of the cup. The ſtigmata are ſimple and obtuſe. The fruit is roundiſh, and has a membrane growing on one ſide, which, in fine, ſpreads almoſt round it; in this is contained a ſingle ſeed of a roundiſh colour. *Linnæi* Gen. Pl. p. 479. *Plum.* 29 and 98.

RAIL (*Cycl.*)—RAIL, or *water* RAIL, in zoology, the name of the *rollus aquaticus* of authors, a bird of the moorhen kind, but ſmaller than the common moorhen. See ROLLUS.

Fife RAILS, in a ſhip. See FIFE.

RAIN (*Cycl.*)—Vehement *rains* in many countries are found to be attended with barrenneſs and poorneſs of the lands, and miſcarriage of the crops in the ſucceeding year: and the reaſon is plain; for theſe exceſſive ſtorms waſh away the fine mould into the rivers, which carry it into the ſea, and it is a long time before the land recovers itſelf again. The remedy to the famine, which ſome countries are ſubject to from this ſort of miſchief, is the planting large orchards and groves of ſuch trees, as bear eſculent fruit; for it is an old obſervation, that in years, when grain ſucceeds worſt, theſe trees produce moſt fruit of all. It may partly be owing to the thorough moiſtening of the earth, as deep as their roots go, by theſe rains, and partly to their trunks ſtopping part of the light mould carried down by the rains, and by this means furniſhing themſelves with a coat of new earth. Phil. Tranſ. N° 90.

Preternatural RAINS. We have numerous accounts in the hiſtorians of our own, as well as other countries of *preternatural rains*, ſuch as the *raining* of ſtones, of duſt, of blood, nay, and of living animals, as young frogs, and the like. We are not to doubt the truth of what thoſe who are authors of veracity and credit relate to us of this kind, ſo far as to ſuppoſe that the falling of ſtones and duſt never happened; the whole miſtake is, the ſuppoſing them to have fallen from the clouds; but as to the blood and frogs, it is very certain that they never fell at all, but the opinion has been a mere deception of the eyes. Men are extremely fond of the marvellous in their relations; but the judicious reader is to examine ſtrictly whatever is reported of this kind, and is not to ſuffer himſelf to be deceived.

There are two natural methods by which quantities of ſtones and duſt may fall in certain places, without their having been generated in the clouds, or fallen as *rain*. The one is by means of hurricanes; the wind which we frequently ſee tearing off the tiles of houſes, and carrying them to conſiderable diſtances, being equally able to take up a quantity of ſtones, and drop them again at ſome other place. But the other, which is much the moſt powerful, and probably the moſt uſual way, is for the eruptions of volcano's, and burning mountains, to toſs up, as they frequently do, a vaſt quantity of ſtones, aſhes, and cinders, to an immenſe height in the air; and theſe being hurried away by the hurricanes and impetuous winds, which uſually accompany thoſe eruptions, and being in themſelves much lighter than common ſtones, as being half calcined, may eaſily be thus carried to vaſt diſtances, and there falling in places where the inhabitants know nothing of the occaſion, they cannot but be ſuppoſed by the vulgar to fall on them from the clouds. It is well known, that in the great eruptions of Ætna and Veſuvius, ſhowers of aſhes, duſt, and ſmall cinders, have been ſeen to obſcure the air, and overſpread the ſurface of the ſea for a great way, and cover the decks of ſhips; and this at ſuch a diſtance, as it ſhould appear ſcarce conceivable that they ſhould have been carried to; and probably, if the accounts of all the ſhowers of theſe ſubſtances mentioned by authors be collected, they will all be found to have fallen within ſuch diſtances of vulcano's; and if compared, as to the time of their falling, will be found to correſpond in that alſo with the eruptions of thoſe mountains. We have known inſtances of the aſhes from Veſuvius having been carried thirty, nay forty leagues, and peculiar accidents may have carried them yet farther. It is not to be ſuppoſed that theſe ſhowers of ſtones and duſt fall for a continuance, in the manner of ſhowers of *rain*, or that the fragments or pieces are as frequent as drops of water; it is ſufficient that a number of ſtones, or a quantity of duſt, fall at once on a place, where the inhabitants can have no knowledge of the part from whence they come, and the vulgar will not doubt their dropping from the clouds. Nay, in the canton of Berne in Swiſſerland, the inhabitants accounted it a miracle that it rained earth and ſulphur upon them, at a time that a ſmall vulcano terrified them; and even while the wind was ſo boiſterous, and hurricanes ſo frequent, that they ſaw almoſt every moment the duſt, ſand, and little ſtones torn up from the ſurface of the earth in whirlwinds, and carried to a conſiderable height in the air, they never conſidered, that both the ſulphur thrown up by the vulcano, and the duſt, *&c.* carried from their feet muſt fall ſoon after ſomewhere. It is very certain that in ſome of the terrible ſtorms of large hail, where the hail-ſtones have been of many inches round, that on breaking them there have been found what people have called ſtones in their middle; but theſe obſervers needed only to have waited the diſſolving of one of theſe hail-ſtones, to have ſeen the ſtone in its center diſunite alſo, it being only formed of particles of looſe earthy matter, which the water, exhaled by the ſun's heat, had taken up in extremely ſmall moleculæ with it; and this only having ſerved to give an opake hue to the inner part of the congelation, to which the freezing of the water alone gave the apparent hardneſs of ſtone.

The *raining* of blood has been ever accounted a more terrible ſight, and a more fatal omen than the other *preternatural rains*, already mentioned. It is very certain that nature forms blood no where but in the veſſels of animals, and therefore ſhowers of it from the clouds are by no means to be credited. Thoſe who ſuppoſe that what has been taken for blood, has been actually ſeen falling through the air, have had recourſe to flying inſects for its origin, and ſuppoſe it the eggs or dungs of certain butter-flies, diſcharged from them as they were high up in the air. But this ſeems a very wild conjecture, as we know of no butterfly whoſe excrements, or eggs, are of ſuch a colour, or whoſe abode is ſo high, or their flocks ſo numerous, as to be the occaſion of this.

It is moſt probable that theſe bloody waters were never ſeen falling, but that people ſeeing the ſtanding waters blood coloured, were aſſured, from their not knowing how it ſhould elſe happen, that it had *rained* blood into them. A very memorable inſtance of this there was at the Hague in the year 1670. Swammerdam, who relates it, tells us, that one morning the whole town was in an uproar on finding their lakes and ditches full of blood, as they thought, and having been certainly full of water the night before, they agreed it muſt have *rained* blood in the night; but a certain phyſician went down to one of the canals, and taking home a quantity of this blood coloured water, he examined it by the microſcope, and found that the water was water ſtill, and had not at all changed its colour, but that it was full of prodigious ſwarms of ſmall red animals, all alive, and very nimble in their motions, whoſe colour, and prodigious number, gave a red tinge to the whole body of the water they lived in, on a leſs accurate inſpection. The certainty that this was the caſe, did not however perſuade the Hollanders to part with the miracle; they prudently concluded, that the ſudden appearance of ſuch a number of animals was as great a prodigy, as the *raining* of blood would have been; and are aſſured to this day, that this portent foretold the ſcene of war and deſtruction which Lewis the fourteenth afterwards brought into that country, which had before enjoyed forty years uninterrupted peace.

The animals which thus colour the water of lakes and ponds, are the *pulices arboreſcentes* of Swammerdam, or the water fleas with branched horns. Theſe creatures are of a reddiſh yellow, or flame colour; they live about the ſides of ditches, under weeds, and among the mud, and are therefore the leſs viſible, except at a certain time, which is in the end of May or beginning of June; it is at this time that theſe little animals leave their receſſes to float looſe about the water, to meet for the propagation of their ſpecies, and by that means become viſible in the colour they give the water. This is viſible, more or leſs, in one part or other of almoſt all ſtanding waters at this ſeaſon; and it is always at this ſeaſon that the bloody waters have alarmed the ignorant.

The *raining* frogs is a thing not leſs wonderful in the accounts of authors who love the marvellous, than thoſe of blood or of ſtones, and this is ſuppoſed to happen ſo often, that there are multitudes who pretend to have been eye-

witneſſes

witneſſes of it. Theſe *rains* of frogs always happen after very dry ſeaſons, and are much more frequent in the hotter countries than the cold ones. In Italy they are very frequent, and it is not uncommon to ſee the ſtreets of Rome ſwarming both with young frogs and toads in an inſtant, in a ſhower of *rain*; they hopping every where between the people's legs as they walk, though there was not the leaſt appearance of them before. Nay, they have been ſeen to fall through the air down upon the pavements. This ſeems a ſtrong circumſtance in favour of their being *rained* down from the clouds, but when ſtrictly examined, it comes to nothing; for theſe frogs that are ſeen to fall, are always found dead, lamed, or bruiſed by the fall, and never hop about as the reſt; and they are never ſeen to fall, except cloſe under the walls of houſes, from the roofs and gutters of which they have accidentally ſlipped down. People, who love to add to ſtrange things yet ſtranger, affirm that people have had the young frogs fall into their hats in the midſt of an open field, but this is idle and wholly falſe.

People, who cannot agree to their falling from the clouds, have tried to ſolve the difficulty of their ſudden appearance, by ſuppoſing them hatched out of the egg, or ſpawn, by theſe rains. Nay, ſome have ſuppoſed them made immediately out of the duſt; but there are unanſwerable arguments againſt all theſe ſuppoſitions. Equivocal generation, or the ſpontaneous production of animals out of duſt, being now wholly exploded. The fall from the clouds muſt deſtroy and kill theſe tender and ſoft bodied animals; and they cannot be at this time hatched immediately out of eggs; becauſe the young frog does not make its appearance from the egg in this form, but has its hinder legs enveloped in a ſkin, and is what we call a tadpole; and the young frogs are at leaſt an hundred times larger at this time of their appearance, than the egg from which they ſhould be hatched.

It is a certainty that the frogs, which make their appearance at this time, were hatched, and in being long before, but that the dry ſeaſons had injured them, and kept them ſluggiſhly in holes, or coverts, and that all the *rain* does, is the enlivening them, giving new ſpirits, and calling them forth to ſeek new habitations, and enjoy the element they were deſtined, in great part, to live in. Theophraſtus, the greateſt of all the naturaliſts of antiquity, has affirmed the ſame thing. We find that the error of ſuppoſing theſe creatures to fall from the clouds was as early as that author's time, and alſo that the truth, in regard to their appearance, was as early known; though, in the ages ſince, authors have taken care to conceal the truth, and to hand down to us the error. We find this venerable ſage, in a fragment of his on the generation of animals which appear on a ſudden, bantering the opinion, and aſſerting that they were hatched and living long before. The world owes, however, to the accurate Seignior Redi the great proof of this truth, which Theophraſtus only has affirmed; for this gentleman diſſecting ſome of theſe new appearing frogs, found in their ſtomachs herbs, and other half digeſted food, and openly ſhewing this to his credulous countrymen, aſked them whether they thought that nature, which engendered, according to their opinion, theſe animals in the clouds, had alſo been ſo provident as to engender graſs there alſo for their food and nouriſhment.

To the *raining* of frogs we ought to add the *raining* of graſshoppers and locuſts, which have ſometimes appeared in prodigious numbers, and devoured the fruits of the earth. There has not been the leaſt pretence for the ſuppoſing that theſe animals deſcended from the clouds, but that they appeared on a ſudden in prodigious numbers. The naturaliſt, who knows the many accidents attending the eggs of theſe, and other the like animals, cannot but know that ſome ſeaſons will prove particularly favourable to the hatching them, and the prodigious number of eggs, that many inſects lay, could not but every year bring us ſuch abundance of the young, were they not liable to many accidents, and had not provident nature taken care, as in many plants, to continue the ſpecies by a very numerous ſtock of ſeeds, of which perhaps not one in five hundred need take root, in order to continue an equal number of plants. As it is thus alſo in regard to inſects, it cannot but happen, that if a favourable ſeaſon encourage the hatching of all thoſe eggs, a very ſmall number of which alone were neceſſary to continue the ſpecies, we muſt, in ſuch ſeaſons, have a proportionate abundance of them. We had lately in London ſuch a prodigious ſwarm of the little beetle, we call the *lady cow*, that the very poſts in the ſtreets were every where covered with them. But thanks to the progreſs of philoſophy among us, we had no body to aſſert that it *rained* cow ladies, but contented ourſelves with ſaying that it had been a favourable ſeaſon for their eggs. The late prodigious number of a ſort of grub which did vaſt miſchief among the corn and graſs, by eating off their roots, might alſo have been ſuppoſed to proceed from its having *rained* grubs by people fond of making every thing a prodigy; but our knowledge in natural hiſtory aſſured us, that theſe were only the hexapode worms of the common hedge beetle, called the *cock chafer*.

The *raining* of fiſhes has been a prodigy alſo much talked of in France, where the ſtreets of a town at ſome diſtance from Paris, after a terrible hurricane in the night, which tore up trees, blew down houſes, *&c.* were found in a manner covered with fiſhes of various ſizes. No body here made any doubt of theſe having fallen from the clouds; nor did the abſurdity of fiſh, of five or ſix inches long, being generated in the air, at all ſtartle the people, or ſhake their belief in the miracle, till they found, upon enquiry, that a very well ſtocked fiſh-pond, which ſtood on an eminence in the neighbourhood, had been blown dry by the hurricane, and only the great fiſh left at the bottom of it, all the ſmaller fry having been toſſed into their ſtreets.

Upon the whole, all the ſuppoſed marvellous *rains* have been owing to ſubſtances naturally produced on the earth, and either never having been in the air at all, or only carried thither by accident.

In Sileſia, after a great dearth of wheat in that country, there happened a violent ſtorm of wind and rain, and the earth was afterwards covered, in many places, with ſmall round ſeeds. The vulgar cried out that providence had ſent them food, and that it had *rained* millet; but theſe were, in reality, only the ſeeds of a ſpecies of veronica, or ſpeedwell, very common in that country, and whoſe ſeeds being juſt ripe at that time, the wind had diſlodged them from their capſules, and ſcattered them about. In our own country, we have hiſtories of *rains* of this marvellous kind, but all fabulous. It was once ſaid to *rain* wheat in Wiltſhire, and the people were all alarmed at it as a miracle; till Mr. Cole ſhewed them, that what they took for wheat was only the ſeeds, or kernels of the berries of ivy, which being then fully ripe, the wind had diſlodged from the ſides of houſes, and trunks of trees, on which the ivy which produced them crept.

And we even once had a *raining* of fiſhes near the coaſt of Kent in a terrible hurricane, with thunder and lightning. The people who ſaw ſmall ſprats ſtrewed all abouts afterwards, would have it that they had fallen from the clouds; but thoſe who knew how far the high winds have been known to carry the ſea water, did not wonder that they ſhould be able to carry ſmall fiſh with it ſo ſmall a part of the way. Philoſ. Tranſ.

RAINS, in the ſea language, that tract of the ſea to the northwards of the equator, between four and ten degrees of latitude, and lying between the meridian of Cape Verde and that of the eaſtermoſt iſlands of the ſame name. They call this tract the *rains*, becauſe there are almoſt continual calms, conſtant *rains*, and thunder and lightning to a ſtrange degree there; and the winds, when they do ever blow, are only ſmall uncertain guſts, and ſhift about all round the compaſs; ſo that ſhips are ſometimes here detained a long while, and can make but very little way.

RAIN *fowl*, an Engliſh name given by many to the common green wood-pecker, or *picus viridis*, from an obſervation that it is always moſt clamorous when *rainy* weather is coming on. The Latins have, for the ſame reaſon, called it the *pluvialis avis*. See the article PICUS.

Animalcules in RAIN-*water*. The accurate Mr. Lewenhoek has obſerved, that there are no living creatures to be diſcerned in freſh *rain-water*, but that after it has ſtood ſome days, it will be found to abound with great numbers of animalcules, ſo ſmall, that they are to a mite what a bee is to a horſe. In ſome days more animalcules much larger are diſcovered.

Another very remarkable kind is diſcovered in *rain-water*, after ſtanding ſome time; theſe have two little horns, which are in continual motion. The ſpace between the horns is flat, though the body is round, but tapering a little toward the end, where there is a tail four times as long as the body, and of the thickneſs of the thread of a ſpider's web. Theſe are ſo ſmall, that many hundred of them are not equal to a grain of ſand; and if they meet with any little filament in the water, they are uſually entangled in it, and uſe great efforts to diſengage their tails.

Another animalcule there alſo is in *rain-water*, of an oval figure, with the head at the ſmaller end. Theſe have ſeveral feet extremely minute and fine, and they can, at pleaſure, contract their bodies into a round ſhape, which they uſually do as the water dries away. A third ſort Mr. Lewenhoek obſerved alſo, twice as long as broad, and eight times ſmaller than the laſt; theſe alſo had ſmall feet, and were very nimble. But the briſkeſt of all were a yet greatly ſmaller kind; theſe were not of a thouſandth part of the ſize of a louſe's eye, and they moved round with incredible ſwiftneſs. *Baker*'s Microſcop. p. 82.

RAISE, in the manege, is uſed for working; thus to *raiſe* a horſe upon corvets, caprioles, and peſades, is to make him work at corvets, caprioles, *&c.*

RAISE is likewiſe uſed for placing a horſe's head right, and making him carry well, and hindring him to carry low, or to arm himſelf.

RAISINS (*Cycl.*)—RAISIN *brandy*, a name given by our diſtillers to a very clean and pure ſpirit, procured from *raiſins*

fermented only with water. Thus treated, they yield a ſpirit ſcarce at all diſtinguiſhable from ſome of the wine ſpirits; for there are as many kinds of wine ſpirits, as there are of grapes. The coarſer the operation of diſtilling is performed in this caſe, the nearer will be the reſemblance of the wine ſpirit; that is, there will be moſt of this flavour in the ſpirit, when as much as can be of the oil is thrown up with a galloping heat.

The diſtillers are very fond of the wine ſpirit, with which they hide and diſguiſe the taſte of their nauſeous malt, and other ſpirits; and in defect of that ſpirit, this of *raiſins*, made in this coarſe manner, will go almoſt as far. It is indeed ſurpriſing how extenſive the uſe of theſe flavouring ſpirits is, ten gallons of *raiſin* ſpirit, or ſomewhat leſs of the wine ſpirit, being often ſufficient for a whole piece of malt ſpirit, to take off its native flavour, and give it an agreeable vinoſity. It is no wonder, therefore, that the diſtillers, and ordinary rectifiers, are ſo fond of this, as it is a good cloak for their defects, and the imperfection of their proceſſes.

When *raiſin brandy* is intended for common uſe, the fire ſhould be kept ſlower and more regular in the diſtillation, and the ſpirit, though it hath leſs of the high flavour of the grape, will be more pleaſant and more pure. *Shaw*'s Eſſay on Diſtillery.

RAKE (*Cycl.*)—RAKE, in the manege. A horſe *rakes*, when being ſhoulder-ſplait, or having ſtrained his fore-quarter, he goes ſo lame, that he drags one of his fore legs in a ſemicircle; which is more apparent when he trots, than when he paces.

RAKE, in mining, is the ſame with a vein. See VEIN.

RAM, (*Cycl.*) *aries*, in zoology, the male of the ſheep kind. See the article OVIS.

RAM *head*, on board a ſhip, the name of a great block belonging to the fore and main halliards. It hath in it three ſhivers, into which the halliards are put, and at its head the tyes are reeved into an hole made there for that purpoſe.

RAMADAN (*Cycl.*)—The *ramadan* happens at different ſeaſons of the year, and when it is in the ſummer, is very hard on the labourers, who are not allowed to drink, but only to waſh their mouths. This month once in thirty-three years is in every ſeaſon of the year, the Turkiſh month being lunar, and they beginning at the day they can ſee the moon; whereas the Jews begin their account from the day the moon makes, which is a day before the Turks. *Pocock*'s Egypt, p. 184.

RAMAG, a word uſed by ſome of the chemical writers to expreſs aſhes.

RAMAGE *falcons*. See the articles BRANCHER and FALCON.

RAMAI, in natural hiſtory, a name given by many old writers to bole armenic.

RAMALIS *vena*, a name given by ſome anatomical authors to the *vena portæ*.

RAMED, a name given by ſome chemical writers to rhubarb.

RAMESAN, an oriental term for a month of faſting, very religiouſly obſerved among the Turks. See RAMADAN.

RAMEX, a word uſed by ſome as a name for a hernia, or rupture.

RAMIGRI, a word uſed by ſome writers as a name for colophony.

RAMINGUE, in the manege. A horſe gets this name that is reſty, and reſiſts or cleaves to the ſpurs; that is, defends himſelf with malice againſt the ſpurs; ſometimes doubles the reins, and frequently yerks to favour his diſobedience. See the articles TICKLISH and DOUBLE.

RAMOSE *leaf*, in botany. See LEAF.

RAMPIN, in the manege. See TOE.

RAMPION, in botany. See RAPUNCULUS.

RAMULOSE *leaf*, *ramuloſum folium*, among botaniſts. See the article LEAF.

RAMUS, (*Cycl.*) in the anatomy of plants, a name given to the firſt or lateral branches, which go off from the petrolium, or middle rib of a leaf. The ſubdiviſions of theſe are called *furculi*, and the final diviſions of theſe, into the moſt minute of all, are by ſome called *capillamenta*; but in general, both theſe kinds are comprehended under the name of *furculus*. Act. Erudit. 1722.

RAN, in our old writers, is uſed for open or public robbery, ſo manifeſt that it cannot be denied. Ran *dicitur aperta rapina quæ negari non poteſt. Lamb.* 125. Leg. Canut. c. 58. Hence it is to this day vulgarly ſaid of one, who takes the goods of another injuriouſly and violently, that he has taken or ſnatched all he could *rap* and *ran*. Terms of Law. *Blount*, *Cowel*.

RANA, the *frog*, in zoology, a very well known animal of the amphibious kind, the characters of it are; that the body is naked, and is in one part of its life furniſhed with a tail.

The feet of the *frog* are webbed, for the better ſwimming, and it has very ſtrong muſcles in the hinder part of its body to aſſiſt it in leaping. The lungs of the *frog* are different from thoſe of all other animals; they are only a ſort of membranaceous bladders, with ſeveral tubercles, by means of which they reſemble the fruit of the firs, or pines: theſe, when once inflated, do not immediately become flaccid, as in other animals, but remain in that ſtate as long as the creature pleaſes. The creature can remain a long time under water, and has been kept ſo for ſeveral days by tying it down, and received no hurt from it. It is a very long lived animal; and even if its belly be opened, and the inteſtines, and all the viſcera, taken out, it will continue its leaping, and all its other motions, as if nothing had happened to it, for a conſiderable time; but if the nerve of one of the hinder legs be cut, it loſes all power of uſing that limb on the inſtant. *Ray*'s Synop. Quad. p. 247.

The *frog* differs from all creatures in the manner of its generation. It no way reſembles any of the quadrupeds in this particular, and though in ſome ſort it approaches to the nature of fiſhes, yet it differs from them alſo in many things. The egg of the *frog* is a ſmall black ſpot, enveloped in a mucilaginous ſubſtance; in this egg is contained the embryo *frog*, which, on the breaking of the egg in hatching, comes forth in form of a tadpole. This young animal is for ſome time nouriſhed by the gelatinous matter which envelops the eggs, but it does not conſume the whole of it; for the particles of water making way by degrees into it, divide its parts, and it ſoon becomes expanded, frees itſelf from the living animals, and floats on the ſurface of the water, or at a ſmall depth in it, in form of a thin cloud: this, though it now no longer ſerves for food to the young creature, is however of ſome ſervice to it, ſerving it as an aſylum, or place of reſt and ſafety, when tired with ſwimming.

The egg of the *frog* therefore is, in ſome degree, analogous to that of an inſect of the winged kind, which is to go through a metamorphoſis before it arrives at its perfect ſtate; for it hatches into the tadpole, as the egg of a butterfly into a caterpillar, and arrives at that its ultimate ſtate, after a determinate time ſpent in the other. In this it differs from the generation of fiſhes, the eggs of whoſe ſpawn hatch into perfect fiſhes, which go through no change; and it differs from all in the gelatinous ſubſtance, which envelops the egg, and ſerves as the firſt food to the fœtus.

The eggs are indeed, when nicely examined, found to be encloſed in a double liquor, a more pellucid and thin one within the gelatinous one, which ſerves as the general covering to the whole ſeries of eggs; and it is this thin one which it principally feeds on when firſt hatched, and which ſerves to the ſame purpoſes as the white of an egg in the fowl kind.

There is alſo an opinion that the male ſperm of the *frog* is depoſited on the ſpawn of the female after it is laid. *Ray*'s Syn. Quad. p. 249.

RANA *arborea*, the *tree frog*, in zoology. See RANUNCULUS *viridis*.

RANA *piſcatrix*, the *toad fiſh*, *frog fiſh*, or, as it is called by ſome, the *ſea devil*, a very remarkable ſpecies of fiſh, of a middle nature between the cartilagineous and bony fiſhes. In ſhape and figure it reſembles a tadpole. Its head is extremely large, being equal, or more than ſo, to the reſt of the body, and of a circular figure. The opening of its mouth is ſurpriſingly great, and its lower jaw is above a finger longer than the upper. Both jaws, but particularly the under one, are armed with a great number of long and ſharp teeth, and the longer ones of the under jaw are all moveable inwards. The back is flat, and of a blueiſh green colour, mottled with a few white ſpots. The eyes are pearly in the iris, and a tranſverſe ſtreak of white is drawn acroſs the pupil. In the upper part of the head, at half a finger's breadth diſtance from the angle of the upper jaw, are placed two briſtles, the fore one is ſix fingers long, the hinder one four; and in the middle of his back, lower down, are three more, which ſerve in the place of fins. Over the upper jaw there are, on each ſide, two ſharp thorns, and there are thorny tubercles all about the eyes; and on the middle of the back, not far from the tail, there is a fin with ten rays. The tail is not forked, but the rays are branched, and all ſtand out a little beyond the fin, and are hooked. In the under part of the body, juſt under the throat, there are two fins like a mole's feet, each compoſed of five rays, or fingers. There are two others on the edge of the body, and the extremity of all theſe, as alſo of the tail, is black. It has only three bronchiæ on one ſide. It has either no noſtrils, or elſe they are hid within the head, and has a ſort of membranous rim running all round the commiſſures of its ſides and belly. Its fleſh, when boiled, taſtes like that of the *frog*. See Tab. of Fiſhes, N° 8. and *Willughby*'s Hiſt. Piſc. p. 85.

RANCE, in natural hiſtory. See CIBDELOPLACIA.

RANGIFER, the *rein deer*, an animal very common in all the northern nations, and called by ſome authors *tarandus* and *machlis*. It is of the ſhape of a ſtag, but its body is thicker, and its whole make much more robuſt and ſtrong. The breaſt is thick, covered with very long hairs. The legs very

very hairy and the hoofs moveable, for the creature expands and opens them in going; it is an extremely ſwift, as well as ſtrong animal; its horns are very long, and finely branched, and particularly run out immediately from the forehead into two fingered branches; in the middle there is a little branch, like the joints in the ſtalks of ſome plants; and thence again they are divided into broad fingered ſegments. They differ from the horns of the elk in their length, and from thoſe of the ſtag or red deer in their breadth, and from both, in the multitude of branches, and in their colour which is white. The lower branches, which fall very near the forehead, are ſaid to be uſed by the creature to break the ice, when the waters are frozen over, that he may get drink. It feeds on ſhrubs and plants, and on the moſs, which it finds on the earth and upon the barks of trees.

It is of prodigious uſe, as a beaſt of carriage to the Laplanders, and almoſt all the other nations far north. Scheffer alledges from Tornæus, that the *rein deer*, though a cloven footed animal, and plainly of the deer kind, does not chew the cud. This, however, is wholly diſbelieved by the more accurate naturaliſts. *Ray*'s Sept. Quad. p. 88.

RANINÆ *venæ*, a name given by anatomiſts to the larger veins under the tongue.

RANIO, in natural hiſtory, a name given by ſome writers to bole armenic.

RANK (*Cycl.*)—RANK *keel*, in a ſhip. See KEEL, *Cycl.*

RANUNCULUS, *crowfoot*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, conſiſting of ſeveral leaves diſpoſed in a circular order, and uſually ſtanding in a many leaved cup. The piſtil ariſes from the center of the flower, and finally becomes a fruit of a roundiſh, oval, or ſpiked ſhape, to the axis of which there grow, as to a placenta, a great number of ſeeds, which are uſually naked.

The ſpecies of *ranunculus* enumerated by Mr. Tournefort are very many, and for the ſake of order, in ſo large a number, they are divided into ſeveral ſections. 1. Thoſe which have the appearance of the anemonies. 2. Thoſe which have roundiſh leaves. 3. Thoſe uſually known by the name of the Aſiatic *ranunculuſes*. 4. The ſmooth leaved *ranunculuſes*. 5. The aconite or geranium leaved *ranunculuſes*. 6. The fine leaved *ranunculuſes*; and 7. The long leaved *ranunculuſes*. *Tourn.* Inſt. p. 285.

The ſpecies of the *anemony ranunculuſes* are theſe. 1. The yellow wood *ranunculus*. 2. The ſingle yellow flowered wood *ranunculus*, with ſmaller and more deeply divided leaves. 3. The common white wood *ranunculus*, called the white wood anemony. 4. The purple flowered wood *ranunculus*, commonly called the purple wood anemony. 5. The purpliſh red wood *ranunculus*. 6. The double purple wood *ranunculus*. 7. The double white wood *ranunculus* with a border of leaves. 8. The common double white wood *ranunculus*. 9. The trifoliate white wood *ranunculus*, commonly called the trefoil wood anemony. 10. The large leaved blue flowered wood *ranunculus* of the Apennine mountains. 11. The ſmaller leaved Apennine blue wood *ranunculus*. 12. The wood *ranunculus* with ſmall blue flowers. 13. The double violet coloured wood *ranunculus*. Ibid. p. 286.

Of the roundiſh leaved *ranunculuſes*, the ſpecies are theſe. 1. The round leaved wood *ranunculus*, commonly called Tragus's ſweet *crowfoot*. 2. The ſpring wood *crowfoot* with marſh marygold or thora leaves. 3. The Virginian wood *crowfoot* with ſoft leaves and ſmall flowers. 4. The large *crowfoot* with aſphodel roots, and ſowbread leaves. 5. The ſmaller *crowfoot* with aſphodel roots and ſowbread leaves. 6. The larger round leaved ſpring *crowfoot* called little celandine or pilewort. 7. The ſmaller round leaved ſpring *crowfoot* called the common pilewort. 8. The ſmaller round leaved ſpring *crowfoot*, or celandine, with ſpotted leaves. 9. The ſmaller round leaved ſpring *crowfoot*, or little celandine, with double flowers. 10. The ſmaller round leaved ſpring *crowfoot*, or celandine, with two rows of petals. 11. The mountain *crowfoot* with leaves like thoſe of the parnaſſia. 12. The alpine *crowfoot* with water caltrop leaves. 13. The ivy leaved water *crowfoot* with very ſmall white flowers. 14. The American water *crowfoot* with aſarabacca leaves, and flowers in umbels at the joints of the ſtalks. 15. The little ſmallage leaved rock *crowfoot* with tuberoſe reticulated roots. 16. The ground ivy leaved knotty rooted Portugal *crowfoot*. 17. The round leaved creeping *crowfoot* with echinated ſeeds. 18. The marſh *crowfoot* with echinated ſeeds. 19. The cretic echinated ſtarry *crowfoot*. 20. The broad leaved bullated aſphodel rooted *crowfoot*. 21. The ſmall flowered round leaved Portugal *crowfoot*. 22. The double flowered broad leaved autumnal *crowfoot*. 23. The trifoliate ſpring *crowfoot* with ſingle blue flowers. 24. The trifoliate ſpring *crowfoot* with violet coloured flowers. 25. The trifoliate ſpring *crowfoot* with pale purpliſh flowers. 26. The trifoliate ſpring *crowfoot* with ſingle bright red flowers. 27. The trifoliate ſpring *crowfoot* with ſingle fleſh coloured flowers. 28. The trifoliate ſpring *crowfoot* with ſingle greyiſh flowers. 29. The trifoliate ſpring *crowfoot* with ſingle large white flowers. 30. The trifoliate ſpring *crowfoot* with ſmaller ſingle white flowers. 31. The trifoliate ſpring *crowfoot* with ſingle white flowers edged with red. 32. The trifoliate ſpring *crowfoot* with double blue flowers. 33. The trifoliate ſpring *crowfoot* with double purple flowers. 34. The trifoliate ſpring *crowfoot* with double fleſh coloured flowers. 35. The trifoliate ſpring *crowfoot* with double variegated flowers. Theſe plants, properly named trifoliate *crowfoots*, are the ſpring garden flowers, commonly called *hepaticas*.

Of the third ſet of *ranunculuſes*, commonly called the Aſiatic *ranunculuſes*, the ſpecies are theſe. 1. The knobby rooted Aſiatic *ranunculus* with very ſmall ſingle ſcarlet flowers. 2. The branched knobby rooted *ranunculus*. 3. The knobby rooted *ranunculus* with yellow flowers, being variegated with red. 4. The knobby rooted *ranunculus* with white flowers. 5. The knobby rooted *ranunculus* with ſnow white flowers. 6. The knobby rooted *ranunculus* with pale yellow flowers ſtreaked with red. 7. The knobby rooted *ranunculus* with ſingle yellow flowers. 8. The knobby rooted *ranunculus* with ſingle flowers, of a deep yellow, with red bottoms and red edges. 9. The ſingle whitiſh flowered Aſiatic *ranunculus*. 10. The ſingle *ranunculus* with a red lead coloured flower with yellow edges. 11. The roſe coloured *ranunculus* with white edges, and ſtreaks of white in the flower. 12. The butterfly *ranunculus* with yellow flowers ſpotted with red. 13. The ſingle crimſon ſweet ſcented *ranunculus*. 14. The piony *ranunculus*, or the large bloody purple flowered kind. 15. The Aleppo *ranunculus* with flowers ſtreaked with yellow and red. 16. The *ranunculus* with a very wide, open, red lead coloured flowers. 17. The lemon coloured and red *ranunculus*. 18. The white proliferous *ranunculus* with crimſon ſtamina. 19. The aſphodel rooted *ranunculus* with blood coloured flowers. 20. The aſphodel rooted *ranunculus* with a reddiſh purple flower. 21. The aſphodel rooted *ranunculus* with yellow flowers with red veins. 22. The double *ranunculus*, variegated with yellow and red, called by the French the *ſeraphique*. 23. The proliferous aſphodel rooted *ranunculus* with red coloured flowers. 24. The aſphodel rooted *ranunculus* with a very large blood coloured flower. 25. The aſphodel rooted *ranunculus* with yellow flowers ſtreaked with red. 26. The aſphodel rooted *ranunculus* with double greeniſh white flowers. 27. The aſphodel rooted *ranunculus* with ſmall double white flowers ſtreaked with red. 28. The aſphodel rooted *ranunculus* with great double white roſe-like flowers. 29. The aſphodel rooted *ranunculus* with great double violet coloured flowers. 30. The great Conſtantinople *ranunculus* with ſcarlet flowers. 31. The great Conſtantinople *ranunculus* with elegantly variegated flowers. 32. The Roman giant *ranunculus* with a red lead coloured flower. 33. The giant Roman *ranunculus* with very double flowers, variegated with red and yellow. *Tourn.* Inſt. p. 288.

Of the ſet of tender leaved *crowfoots*, the ſpecies are theſe. 1. The late flowering rue leaved *ranunculus* with double gold yellow flowers. 2. The early rue leaved *ranunculus* with bright red flowers. 3. The tender leaved aſphodel rooted mountain *ranunculus*. 4. The horn like leaved *ranunculus* with foliated ſeeds, collected into ſpikes, called by many the ſmaller cow wheat. 5. The common corn *ranunculus* with echinated ſeeds. 6. The greater narrow leaved woolly *ranunculus* with aſphodel roots. 7. The leſſer narrow leaved woolly grumoſe rooted *ranunculus*. 8. The ſmallage leaved aſphodel rooted woolly *ranunculus*. 9. The fumitory leaved Alpine *ranunculus*. 10. The purple mountain *ranunculus* with hairy cups. *Tourn.* Inſt. p. 289.

Of the ſet of aconite or crane's bill leaved *crowfoots*, the ſpecies are theſe. 1. The upright acrid meadow *crowfoot*. 2. The upright acrid meadow *crowfoot* with ſpotted leaves. 3. The ſingle many flowered meadow *crowfoot*. 4. The upright *crowfoot* with pale hairy leaves. 5. The upright or ſweet or not acrid meadow *crowfoot*. 6. The great ſallad *crowfoot*. 7. The common hairy creeping field *crowfoot*. 8. The common hairy creeping meadow *crowfoot* with leaves variegated with white. 9. The round rooted meadow *crowfoot*. 10. The leſſer round rooted meadow *crowfoot*. 11. The little field *crowfoot* with trifid leaves. 12. The annual hairy field *crowfoot* with extremely ſmall flowers. 13. The double flowered erect garden *crowfoot*. 14. The great hairy creeping double flowered *crowfoot*. 15. The garden *crowfoot* with bending heads. 16. The double flowered ſweet *crowfoot*. 17. The double flowered round rooted *crowfoot*. 18. The tuberoſe rooted proliferous double *crowfoot*. 19. The grumoſe rooted *crowfoot* with leaves like thoſe of the common round rooted kind. 20. The Cretic aſphodel rooted *crowfoot*. 21. The round leaved procumbent alpine *crowfoot* with ſmall flowers. 22. The low round leaved alpine *crowfoot* with larger flowers. 23. The tall hairy white flowered mountain *crowfoot*. 24. The low hairy mountain *crowfoot* with Narciſſus flowers. 25. The purple flowered hairy mountain *crowfoot*. 26. The aconite leaved moun-

mountain *crowfoot* with large white flowers. 27. The aconite leaved mountain *crowfoot* with ſmaller white flowers. 28. The aconite leaved mountain *crowfoot* with double white flowers. 29. The aconite leaved mountain *crowfoot* with large ſingle yellow flowers. 30. The *crowfoot* with leaves like thoſe of the knotty rooted crane's bill. 31. The hairy mountain *crowfoot* with very broad leaves. 32. The crane's bill leaved downy mountain *crowfoot*. 33. The yellow flowered fine leaved mountain *crowfoot*. 34. The woolly mountain *crowfoot* with leaves like thoſe of the common meadow *crowfoot*. 35. The rock *crowfoot* with large flowers. 36. The roundiſh leaved rock *crowfoot*. 37. The very hairy Montpelier *crowfoot*. 38. The ſmallage leaved hairy marſh *crowfoot*. 39. The ſmooth ſmallage leaved marſh *crowfoot*. 40. The purple flowered ſmallage leaved marſh *crowfoot*. 41. The water *crowfoot* with ſome of the leaves roundiſh, and others capillaceous. Ibid. p. 290.

Of the capillaceous leaved *ranunculuſes*, the ſpecies are theſe. 1. The capillaceous or fine leaved water *crowfoot*. 2. The white flowered floating water *crowfoot* with peucedanum leaves. 3. The fennel leaved *crowfoot* with roots like thoſe of black hellebore, called by authors the fine leaved black hellebore. The *conſiligo*, the *hellebore* of Hippocrates, and the *buphthalmum*, or ox eye. 4. The ſmaller or lower fennel leaved *crowfoot* with very large flowers, and jointed ſtalks. 5. The camomile leaved red flowered field *crowfoot*, commonly called the adonis flower, the pheaſant's eye, or red maithes. 6. The longer leaved chamomile *crowfoot* with orange coloured flowers. 7. The chamomile *crowfoot* with ſmall yellow flowers. 8. The betony leaved mountain *crowfoot*. Ibid. p. 291.

Of the ſet of long leaved *crowfoots* the ſpecies are theſe. 1. The graſſy leaved mountain *crowfoot*. 2. The double flowered graſſy leaved mountain *crowfoot*. 3. The bulboſe rooted graſſy leaved *crowfoot*. 4. The ſingle flowered hairy graſſy leaved *crowfoot*. 5. The many flowered hairy graſſy leaved *crowfoot*. 6. The white flowered dwarf Alpine *crowfoot* with graſſy leaves. 7. The plantain leaved mountain *crowfoot*. 8. The marſh *crowfoot* with very large plantain like leaves, commonly called the water plantain. 9. The marſh *crowfoot* with narrow plantain like leaves, called the narrow leaved water plantain. 10. The low procumbent plantain leaved water *crowfoot*, called the narrow leaved procumbent water plantain. 11. The plantain leaved water *crowfoot* with very narrow leaves. 12. The American plantain leaved water *crowfoot* with white flowers and purple cups. 13. The American water *crowfoot* with arrow head leaves. 14. The *water plantain* with very large arrow headed leaves, commonly called the great water arrow head. 15. The arrow headed *water plantain* with narrower leaves. 16. The great long leaved marſh *crowfoot*. 17. The broad plantain leaved ſpearwort with hairy edges. 18. The leſſer long leaved water *crowfoot* or ſpearwort. 19. The ſpearwort, or long leaved water *crowfoot*, with ſerrated leaves. 20. The *Bayonne ſpearwort* of Parkinſon. 21. The white flowered ſmall *ſpearwort*. 22. The graſſy leaved *crowfoot* with caudated flowers, and ſeeds arranged into long and ſlender heads, commonly called mouſe tail. Ibid. p. 292.

Several of the more beautiful ſpecies of this plant have long been cultivated in the Engliſh gardens, and are moſt of them hardy plants, and will thrive very well againſt hedges, and in ſhady borders, where they require no other care than to take up their roots every other year when their leaves decay, and part them, planting out the off-ſets into other borders.

Beſide thoſe we have been long uſed to, there have been ſome of late times brought from Turkey and from Perſia, which produce ſemi-double flowers of great beauty, and annually ripening their ſeeds; there are numbers of varieties, or as the gardeners call them new flowers continually raiſed from them. Many of theſe are finely ſcented; and the roots, when ſtrong, produce eight or ten flowers on each. The double flowered *ranunculuſes* not producing ſeeds, they are only to be propagated by parting their roots, taking off the off-ſets, which they uſually produce in great plenty.

The proper ſeaſon for planting their roots is in October. The beds in which they are planted are to be of good light ſandy earth, at leaſt a foot deep. Common paſture land is the beſt for this uſe, to which if it prove too clayey, there ſhould be added a proper quantity of ſea ſand. This mixture ſhould be turned often, and the larger ſtones and clods taken out; but it muſt not be ſkreened, or ſifted very fine, for that has been the occaſion of the loſs of many roots, both of this and other plants, by cohering into a hard clod with the wet, and rotting the roots.

The beds being prepared, ſhould lie about a fortnight to ſettle, and then drawing ſtrait and tranſverſe lines over the beds, the plants muſt be planted regularly at four inches diſtance, about an inch below the ſurface and the earth, carefully drawn over them with a rake. In November the heads will appear, and then about half an inch depth of freſh earth ſhould be added, which will greatly ſtrengthen the plants. And if it ſhould be very ſevere weather, when the heads appear above this ſecond covering, they ſhould be defended with mats laid over arched hoops. In the beginning of March the flower ſtones will appear; and when the flowering is paſt, and the leaves are decayed, the roots are to be taken up, and laid by for the October following. *Miller*'s Gard. Dict. in voc.

RANUNCULUS *viridis*, in zoology, the name of an animal common in many parts of the world, and uſually known by the name of the *tree frog*, or *rana arborea*.

The creature is eaſily diſtinguiſhed from the common frog, by its being much ſmaller, and of a green colour: it uſually ſits upon the leaves of trees and ſhrubs, and makes a great noiſe in an evening, but that is rather like the ſinging of a ſmall bird than the croaking of a frog.

Theſe creatures have been kept alive many years together in glaſs veſſels, giving them flies and other ſmall inſects; and in winter, when theſe are ſcarce, they uſually become very lean and feeble; but in ſummer, when they are plentiful, they will grow fat again, as if at their liberty. This is eſteemed a poiſonous creature. *Ray*'s Syn. Quad. p. 251.

RAPA, *turnep*, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of four leaves, which are diſpoſed in form of a croſs. The piſtil ariſes from the cup, and is at length changed into a long pod, divided into two cells, by an intermediate membrane, and ending in a long fungous horn, both of which contain roundiſh ſeeds. To this, it may be added, that the root is large, fleſhy, and eſculent.

The ſpecies of *turnep*, enumerated by Mr. Tournefort, are theſe. 1. The round white rooted *turnep*. 2. The round blackiſh rooted *turnep*. 3. The round green rooted *turnep*. 4. The round red rooted *turnep*. 5. The round rooted *turnep*, yellow both on the outſide and within. 6. The long rooted manured *turnep*. *Tourn.* Inſt. p. 228. See the article TURNEP.

RAPAX, in ichthyology, a name given by Schoneveldt to the *corvus piſcis* of ſome writers, a ſpecies of chub or cyprinus, called *rappe* by the Germans, and by Geſner and others *capito fluviatilis rapax*. See the article CYPRINUS.

Broom RAPE. See OROBANCHE.

RAPHA, in anatomy, the ridge or line which runs along the under ſide of the penis, and reaching from the frænum to the anus, divides the ſcrotum and perinæum in two.

This line is not uſually cut in the grand operation of cutting for the ſtone, becauſe it is both harder than the reſt of the ſkin thereabouts, and alſo becauſe you muſt then cut upon the interſtices of the muſcles, which will make the re-union the more difficult.

RAPHANIS, in botany, the name by which the Attics, among the Greeks, called the radiſh; for the word *raphanos raphanus* with them, does not expreſs the radiſh, but the cabbage. The Greeks, of all other places, concurred in calling the radiſh *raphanos* and the cabbage *crambe*; and it is owing to this, that we have many authors who confound together theſe two plants, though ſo very unlike one another in appearance and uſe. It is generally to be underſtood, that wherever Theophraſtus mentions the word *raphanos*, he means by it the cabbage; and the ſame being obſerved, in regard to all the other Attic writers, the whole danger of confuſion and error will ceaſe.

A moderate knowledge either in the language or the ſubject might have prevented errors on this occaſion; yet Pliny, in his account of the radiſh, has been miſled by the word *raphanos* in Theophraſtus, which is that author's name for the cabbage, and has tranſlated all his account of the cabbage, and given it as part of the hiſtory of the radiſh. Theophraſtus ſays, that the Greeks diſtinguiſhed three kinds of the cabbage; the ſmooth leaved, the curled leaved, or criſp cabbage, and the wild cabbage: and Pliny has tranſlated this verbatim, and made it a part of his hiſtory of the radiſh. To this he has added ſome accounts from the Latin writers of their *raphanus*, which is the common radiſh; and putting theſe together, he has compoſed an account wholly unintelligible to all, but thoſe who ſee through the occaſion of the error. The virtues of the radiſh he has alſo intermingled with thoſe of the cabbage, interſperſing among the accounts he took from the Latin authors of the *raphanus*, the virtues and qualities of Theophraſtus's *raphanos*, that is the cabbage. The opinion of the cabbage and the vine being enemies to one another, and not growing any where together, is as old as Theophraſtus, and has a place in his account of that plant; but Pliny has perplexed the caſe, by tranſlating this quality as belonging to the radiſh, which no other author ever gave it; though ſcarce any, who have read the antients, have omitted it in the hiſtory of the cabbage.

RAPHANISTRUM, in botany, the name of a genus of plants, the characters of which are theſe. The flower is compoſed of four leaves, placed in the manner of a croſs. The piſtil ariſes from the cup, and is at length made a long pod, jointed in ſeveral places, and reſembling a faſciated column, and containing roundiſh ſeeds, one lodged in every joint of the pod. See Tab. 1. of Botany, Claſs 5.

The ſpecies of *raphaniſtrum*, enumerated by Mr. Tournefort, are theſe. 1. The common *raphaniſtrum*, with ſmooth, larger,

larger, and ſmaller jointed pods. 2. The *raphaniſtrum* with white ſtriated flowers, and ſmall articulated ſtriated pods. 3. The white flowered field *raphaniſtrum*. 4. The yellow flowered field *raphaniſtrum*; and 5. The *raphaniſtrum* with the largeſt ſtriated and articulated pods. *Tourn.* Inſt. p. 230.

RAPHANUS, *radiſh*, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of four leaves, diſpoſed in form of a croſs. The piſtil ariſes from the cup, and becomes at length a long horn-like pod, very thick and ſpungy, and filled with two rows of roundiſh ſeeds, ſeparated by a very thin intermediate membrane.

The ſpecies of *radiſh*, enumerated by Mr. Tournefort, are theſe. 1. The great orbicular or round *radiſh*. 2. The white flowered great orbicular or round *radiſh*. 3. The black *radiſh*. 4. The ſmaller or common garden *radiſh*. *Tourn.* Inſt. p. 229.

The Athenians expreſſed the cabbage by the word ραφανος, *raphanus*, but all the other Greeks called the *radiſh* by that name. Pliny not obſerving this has run into ſtrange errors. See the article RAPHANIS.

RAPISTRUM, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of four leaves, and is of the cruciform kind; and the piſtil which ariſes from the cup, finally becomes an unicapſular huſk of a ſomewhat globoſe figure, which contains a ſingle ſeed.

The ſpecies of *rapiſtrum*, enumerated by Mr. Tournefort, are theſe. 1. The ſingle ſeeded *rapiſtrum* of Caſpar Bauhine. 2. The greateſt round leaved ſingle ſeeded *rapiſtrum* of Cornutus; and 3. The field *rapiſtrum*, with pointed, auriculated leaves. *Tourn.* Inſt. p. 211.

RAPPE, in zoology, a name given by ſome to the *capito fluviatilis* rapax of Geſner, more frequently known by the name of the *corvus piſcis*. *Willughby*'s Hiſt. Piſc. p. 256. See the article CORVUS *piſcis*.

RAPUNCULUS, *rampion*, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of only one leaf, and is of the bell ſhape, but very wide open at the mouth, and ſo deeply divided into ſegments, that it appears a ſtar faſhioned one. The piſtil is divided into two horns, and the cup afterwards becomes a membranous ſeed veſſel, divided into three cells, and containing a number of very ſmall ſeeds.

The ſpecies of this plant, enumerated by Mr. Tournefort, are theſe. 1. The blue ſpiked *rampion*. 2. The deep violet coloured flowered *rampion* with ſpotted leaves. 3. The white flowered ſpotted *rampion*. 4. The yellow flowered ſpiked garden *rampion*. 5. The round headed long leaved *rampion*. 6. The Cretic pyramidal *rampion*, called by many authors *petromerula*. 7. The alpine horned *rampion*. 8. The graſs leaved *rampion*. 9. The ſcabious headed blue flowered *rampion*, called by ſome *ſheeps ſcabious*. 10. The white flowered ſcabious headed *rampion*. *Tourn.* Inſt. p. 113.

RAPUNTIUM, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, and is of a tubular form, ſulcated, and divided into ſeveral long and narrow ſegments, in the manner of fingers. The piſtil is encloſed in the cup, which afterwards becomes a dry fruit, divided into three cells, and containing numerous, and uſually very ſmall ſeeds affixed to a placenta divided into three parts.

The ſpecies of *rapuntium* enumerated by Mr. Tournefort are theſe. 1. The great ſpiked ſcarlet flowered *rapuntium*, called the red cardinal flower. 2. The great ſcarlet American *rapuntium* with white lines in the flowers. 3. The blue flowered American *rapuntium*. 4. The white flowered American *rapuntium*. 5. The golden red leaved American *rapuntium* with a ſmall blueiſh flower. 6. The talleſt American *rapuntium* with Cirſium leaves and greeniſh flowers. 7. The ſhining Cirſium leaved American *rapuntium* with double ſcarlet conglobated flowers. 8. The purple flowered American *rapuntium* with throatwort leaves. 9. The ſmall violet coloured burning *rapuntium*. 10. The purpliſh blue burning *rapuntium*. 11. The white flowered burning *rapuntium*. 12. The leſſer narrow leaved African *rapuntium* with violet coloured flowers. 13. The pinaſter leaved Æthiopian *rapuntium* with hooded, violet coloured flowers. 14. The coronopus leaved Æthiopian *rapuntium* with hooded blue flowers. 15. The blue hooded flowered Æthiopian *rapuntium* with dentated leaves. 16. The low Canada *rapuntium* with toad flax leaves. *Tourn.* Inſt. p. 163.

RARUM, *non-ſpiſſum*, in the antient muſic. See the article APYCNON, απυκνον.

RASA, a word uſed by ſome authors to expreſs reſin of any kind. See RESIN.

RASAKETI, a name given by ſome of the chemiſts to *æs uſtum*, or burnt copper.

RASCETA, a word uſed by the Arabian phyſicians to expreſs the wriſt or ankle.

RASE, *raſarium*, in our old writers, ſeems to have been a meaſure of corn now diſuſed: toll ſhall be taken by the *raſe*, and not by the heap or cantel. *Ordin. for bakers*, &c. c. 4. Pat. 12 Ed. 3. *Blount*.

RASE, in the manege. To *raſe* or glance upon the ground, called in French *razer le tapis*, is to gallop near the ground, as our Engliſh horſes do.

RASILIS *erugo*, in the materia medica of the antients, one of their kinds of verdigreaſe. It was prepared in the following manner: they ſet ſome ſharp vinegar over the fire in a ſtrong earthen veſſel, and covered it with a braſs pot inverted, well cleaned, and without any vent hole. And after ſome time the veſſels were to be ſeparated, and the verdigreaſe which was found concreted on the inſide of the braſs pot, was ſcraped off, and put up for uſe.

RASPBERRY, in botany, the Engliſh name of a ſpecies of *rubus*. See the article RUBUS.

The *raſpberry* buſh is often found wild in ſome of our northern counties, but is cultivated in gardens throughout England for the delicacy of its fruit. We have three kinds common about London. 1. The common. 2. The late red; and, 3. The white *raſpberry*.

Theſe ſhrubs ſend up great plenty of ſuckers from their roots, and are very eaſily propagated by them, they ſhould be taken up in October, and before they are replanted their fibres ſhould be ſhortened; but the buds, which are at a ſmall diſtance from the ſtem of the plant, muſt not be cut off, becauſe theſe produce new ſhoots the next ſummer. They ſhould be planted two feet aſunder, and ſet in rows, which ſhould be five feet diſtant from one another. The ſoil they thrive in beſt is in a freſh ſandy loam, which ſhould neither be too moiſt nor over dry. The time for dreſſing them is in October, when all the old wood which produced fruit the preceding ſummer ſhould be cut down to the ground, and the young ſhoots ſhortened to about two feet in length. The ſpaces between the rows ſhould then alſo be dug up, and ſome other rotten dung buried in them. In the ſummer they muſt be kept clean from weeds, and once in three or four years there ſhould be new beds made, and the old ones deſtroyed, for they ſeldom bear well after that time. *Miller*'s Gardners Dict.

RASPECON, in ichthyology, a name given by ſome to the uranoſcope or ſtargazer. It is properly a ſpecies of the trachinus; and is diſtinguiſhed by Artedi, under the name of the trachinus, with ſeveral cirri or beards growing from the lower jaw. See TRACHINUS.

RASSE *coronde*, in natural hiſtory, a name given by the Ceyloneſe to a peculiarly fine kind of cinnamon, which is the bark of a tree, growing no where but in that iſland. The name they give it ſignifies ſharp or biting cinnamon. This choice kind is exported annually, in conſiderable quantity, by the Dutch Eaſt-India company, who prohibit the mixing any other kind of cinnamon with it under a very ſevere penalty. Phil. Tranſ. N° 409.

RASTIS, a word uſed by ſome chemical writers as a name for tin. See TIN.

RASTOL, or RASOES, a name given by ſome of the chemical writers to copper.

RASTUL, a word uſed by ſome of the chemical writers to expreſs ſalt in general.

RASURA; a word uſed by the pharmaceutic writers, to expreſs the ſhaving woods, or other hard ſubſtances, to make them readily yield their virtues by decoction. Phyſicians alſo uſe it to expreſs the corroſion of acrid humours.

RAT, in zoology. See the article MUS.

RAT, in the ſea language, is uſed to expreſs a part of the ſea, where there are rapid and dangerous currents, or counter currents.

RAT-*gooſe*, in zoology, the name of a ſmall ſpecies of wild *gooſe*, common in ſome of the northern counties of England. See the article GOOSE.

Muſk RAT. See MUSK.

RAT-*tails*, or ARRESTS, in the manege, ſignify callous hard ſwellings upon the hinder legs under the hough, running along the ſinew. See the article ARRESTS.

RAT-*tailed*. A horſe is thus called that has no hair upon his tail. See HORSE.

RAT-*tailed worms*, in natural hiſtory, a ſpecies of fly-*worms*, with long tails, reſembling thoſe of *rats*, whence they have their name. They are of ſeveral ſizes, and found alſo in different places, but all change into two winged flies, having very much the reſemblance of bees, and commonly called bee flies. See Tab. of Inſects, N° 49. and *Reaumur*'s Hiſt. Inſ. Vol. 4. p. 439. See the article DRONE-*fly*.

RATIO (*Cycl.*)—When a *ratio* is given, expreſſed in large numbers, it is often very uſeful to find an approximated value of it, in ſmaller numbers. Mr. Huygens and Dr. Wallis have given methods for this purpoſe, but that of Mr. Cotes, being the moſt convenient in practice, we ſhall here inſert it. Suppoſe the *ratio* 2,718281828495 to 1, or of 1 to 0,367879441171 were propoſed to be reduced to ſmaller terms, ſo that no leſs numbers ſhall expreſs it nearer. The operation may be as follows:

Ratios greater than the true.		*Ratios* leſs than the true.	
1	0×2	0	1
2	1	2	0
3	1×2	2	1×1
8	3	6	2
11	4×1	8	3×1
76	28	11	4
87	32×1	19	7×4
106	39	87	32
193	71×6	106	39×1
1264	465	1158	426
1457	536×1	1264	465×1
21768	8008	1457	536
23225	8544×1	2721	1001×8
25946	9545	23225	8544
49171	18089×10	25946	9545×1
&c.	&c.	&c.	&c.

Divide the greater term 2.71828, &c. by the leſſer 1, or the greater 1 by the leſſer 0,367879, &c. and again the leſſer by the remainder, and this again by the laſt remainder, and ſo on: the quotients ariſing will be 2, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1, 10, 1, 1, 12, 1, 1, 14, 1, 1, 16, 1, 1, &c. Theſe being found, two rows or columns of *ratios* muſt be made, the one containing the *ratios* greater than the true, and the other ſuch as are leſs; beginning the computation from the *ratio's* 1 to 0, 0 to 1, which are moſt remote from the truth, and from thence proceeding to ſuch as approach continually nearer. Let then the terms 1 and 0 be multiplied by the firſt quotient 2, and write the products 2 and 0, under the terms 0 and 1; then adding, there will ariſe the *ratio* 2+0 to 0+1, or 2 to 1. Multiply the terms of this *ratio* by the ſecond quotient 1, and add the products 2 and 1 to the terms 1 and 0 in the firſt column, there will ariſe the *ratio* 2+1 to 1+0 or 3 to 1. The terms of this *ratio* being multiplied by the third quotient 2, and the products 6 and 2 added to the terms 2 and 1 of the ſecond column, will give the *ratio* 8 to 3. Theſe multiplied by the fourth quotient 1, and the products 8 and 3 added to the preceding terms 3 and 1 in the firſt column, will give the *ratio* 11 to 4. Whoſe terms multiplied by the fifth quotient 1, and the products 11 and 4 added to the *ratio* 8 to 3 give the *ratio* 19 to 7; whoſe terms being multiplied by the ſixth quotient 4, and the products 76 and 28 being added to 11 and 4, give the *ratio* 87 to 32. And thus we may go as far as we think fit; proceeding alternately from one column to the other. This being done, we ſhall find *ratios* greater than the true, to be 3 to 1, 11 to 4, 87 to 32, 193 to 71, 1457 to 536, 23225 to 8544, 49171 to 18089, &c. And the *ratios* leſs than the true will be, 2 to 1, 8 to 3, 19 to 7, 106 to 39, 1264 to 465, 2721 to 1001, 25946 to 9545, &c. And theſe are the principal and primary *ratios*, which continually approximate to the *ratio* propoſed.

But if the whole ſeries of *ratios* greater than the true, be required, ſo that no *ratios* greater than the true, and expreſſed in ſmaller terms, ſhall come nearer the truth; and if alſo the whole ſeries of *ratios* leſs than the true, and ſuch, as that no *ratios* leſs than the true, and expreſſed in ſmaller terms, ſhall approach nearer to the truth, be deſired, then other ſecondary *ratios* muſt be inſerted between the primary already found. And theſe take place where the quotients ſurpaſs unity. They may be found by changing the multiplication by the quotient as above directed, into a continual addition of the terms, as often as there are units in the quotient. Thus, the firſt quotient being 2, the terms 1 and 0 are to be twice added to the terms 0 and 1. The ſums will give the *ratios* 1 to 1 and 2 to 1. Theſe laſt terms 2 and 1, the ſecond quotient being 1, muſt be once added to the terms 1 and 0, and the ſum will give the *ratio* 3 to 1. Alſo the terms 3 and 1, the third quotient being 2, are to be twice added to the terms 2 and 1; and the ſums will give the *ratios* 5 to 2, 8 to 3. Theſe laſt terms 8 and 3, the fourth quotient being 1 muſt be once added to the terms 3 and 1, and the ſums will give the *ratio* 11 to 4. Theſe terms 11 and 4, the fifth quotient being 1, muſt be once added to the terms 8 and 3, and the ſums will give the *ratio* 19 to 7. Laſtly, theſe terms 19 and 7, the ſixth quotient being 4 muſt be four times added to the terms 11 and 4. The ſums will give the *ratios* 30 to 11, 49 to 18, 68 to 25, 87 to 32. And ſo we may proceed as far as we think fit. The operation being performed, we ſhall find the whole ſeries of *ratios* greater than the truth to be 1 to 0, 3 to 1, 11 to 4, 30 to 11, 49 to 18, 68 to 25, 87 to 32, &c. and in like manner, the whole ſeries of *ratios* leſs than the truth will be 0 to 1, 1 to 1, 5 to 2, 8 to 3, 19 to 7, &c.

Example of the operation.

Ratios greater than the true.		*Ratios* leſs than the true.	
1	0×2	0	1
2	1	1	0
3	1×2	1	1
8	3	1	0
11	4×	2	1×1
19	7	3	1
30	11	5	2
19	7	3	1
49	18	8	3×1
19	7	11	4
68	25	19	7×4
19	7	87	32
87	32×1	106	39×1
&c.	&c.	&c.	&c.

See *Cotes* harmonia menſurarum, p. 7, &c.

The ingenious author has not given the demonſtration of his method; but Dr. Saunderſon has ſhewn the reaſon of it, in the fifth book of his algebra, to which we refer the reader.

By means of this method, the approximated values of the *ratio* of the circumference, to the diameter of a circle, may be found in ſmall terms. Thus the proportion of the circumference of a circle to its diameter, being according to Van Ceulen's numbers, when abridged, 314159265359 to 100000000000; dividing the greater by the leſſer, &c. as before directed, we ſhall find the quotients 3, 7, 15 and 1, which will give the following *ratios*, 3 to 1, 22 to 7, 333 to 106, and 355 to 113; the ſecond is that of Archimedes, and the fourth that of Adrian Metius.

This proportion of 113 to 355 approaches very near the truth, only erring by 2 in the ſeventh decimal, when reduced to that form, for 355 : 113 :: 3, 1415129 : 1 now it ought to be 3,1415927 to 1. To remember this proportion the better, we may make uſe of the following artifice. Take the three firſt odd numbers 1, 3, 5, and write each twice, thus 113355, then will the three firſt figures of this number 113, be the diameter, and the three laſt, 355 the circumference. Theſe approximations are of uſe in many practical parts of mathematics. See inſtances thereof in Huygen's *deſcriptio automati planetarii* among his poſthumous works, tom. 2. p. 174. Edit. Amſt. 1728, where he deſcribes his method, and demonſtrates it. In muſic, it is the foundation of the different ſchemes of geometrical temperatures. See the article TEMPERAMENT.

RATIO *modularis*. See LOGARITHM.

RATIONIS *os*, a term uſed by ſome anatomical writers to expreſs the *os ſincipitis*.

RATIONARIUM, among the Romans, a book which contained the accounts of the empire. *Pitiſc.* Lex. Ant. in voc. It was otherwiſe called *breviarium*. See BREVIARY.

RATSBANE. See the article ARSENIC.

RATTLE *ſnake*, a very dreadful ſpecies of ſerpent, whoſe bite is fatal, if not timely remedied, and which is diſtinguiſhed from all other ſerpents by the *rattles* in its tail. This is compoſed of ſeveral ſcaly ſubſtances, and is ſaid to encreaſe by the creature's age; every year adding one ſcale to it. It moves over the rocks and mountains with prodigious ſwiftneſs, but is leſs nimble on even ground, than many other ſnakes.

It grows to four or five feet long, and ſometimes, though rarely, more; and one of more than four feet long, having been diſſected, and accurately deſcribed by Dr. Tyſon, the account that gentleman gives of it may not be unacceptable to the reader. The body where largeſt, which was near the middle, meaſured ſix inches and a half round. Its neck only three inches. Its head was flat, as that of the viper; and as the jaws are very broad and protuberant, and the noſe ſharp, it ſomewhat reſembles the head of an arrow. At the end of the noſe are placed the noſtrils, and between theſe and the eyes there are two other holes which may be miſtaken for ears; but they only go into a hollow of the bone of the ſkull, without any perforation into the brain. The viper has nothing of theſe holes. The eyes are round, and wholly reſemble thoſe of the viper. The whole body of the creature greatly alſo reſembles the viper, but for the ſingularity of the *rattle*; and over the eyes there are two large ſcales, looking like eye-brows.

The ſcales which cover the head are very ſmall, thence they become gradually larger as they reach toward the middle of

of the body, and from the middle to the tail they grow leſs and leſs again; and all in ſhape much reſemble the broad and flat ſeeds of the common garden parſnip. There is ſome variety in the colours of this creature, whether according to the difference of age or ſex, or from leſſer accidents. The moſt uſual colours are theſe: the ſcales are of a duſky greeniſh, like the feathers of the back of the green-finch, and are variegated with ſmall black ſpots in great number; there alſo are four large ones of the ſame colour. *Ray*'s Syn. An. p. 291. *Tyſon*'s Nat. Crotaph.

The back is of a mixt colour, of a dead yellowiſh brown, variegated with blotches of black and yellow, and with a number of ſmall dots of the ſame colours; the larger blotches being laid in great regularity, and making a very beautiful teſſelated figure; the ſcales become darker as they approach the tail, where they are almoſt black; and thoſe on the ridge of the back, all along, are raiſed into a ſort of ſharp prominence in their middle, like the ſcales of a crocodile; thoſe on the ſides are plain and flat. The belly is all along covered with oblong parallellogram ſcales, laid tranſverſely; theſe are very bright and gloſſy, and are yellow, ſpotted with black.

The head is ſmall, in proportion to the body, but the mouth is capable of opening to a prodigious width. The tongue is wholly like that of the viper, compoſed of two oblong portions, joined toward the baſes, but ſeparate as they approach the end. The teeth are of two kinds, the ſmaller ones deſigned for its eating with, the larger and longer for biting and poiſoning what it ſeizes. Theſe are only placed in the upper jaw, but all the teeth of the mouth are of the canine kind, as the creature, never chewing its prey, has no uſe for dentes molares, or grinders.

The poiſonous teeth are ſituated on the outſide of the jaw, in the anterior part of the mouth; not fixed in the ſockets of the jaws, as the others, but fixed to two bones. Theſe, in their natural ſtate, are not viſible, even when the creature's mouth is opened, unleſs it be with an intent to wound; for they lie back under a membranaceous covering, and the creature has a power of erecting, and wounding with them at pleaſure, as the lion and cat kind can retract, or thruſt out their claws. Theſe teeth are crooked, and have a hollow at their bottom, and at their point a very plain and evident ſlit, looking like the neb of a writing pen. The teeth are hollow all the way from this ſlit to their bottom, and on preſſing the gums in a dead *rattle-ſnake*, the poiſonous juice may be ſeen to aſcend by degrees up the tooth, and at length to be diſcharged out of the ſlit at the point. This makes it very plain in what manner the poiſon is conveyed into the fleſh, when the creature bites.

The *rattle* is affixed to the laſt vertebra of the tail, and is compoſed of a ſeries of ſmall bones; that next the tail is uſually of a blueiſh grey colour, the reſt of a pale brown. Theſe bones are hollow, very thin, hard, and dry, and of a brittle texture, and very ſonorous. They are all of the ſame figure, repreſenting, in ſome degree, the os ſacrum in the human ſceleton, and all are nearly of the ſame ſize. The laſt of theſe is ſeen to have a rigid extremity, in manner of a tail, and all the others have the ſame, though it is not diſtinguiſhable in them, as in the joining it runs under two others; and by means of this ſtructure they are all moveable with the ſmalleſt force, and the ſound is the more vigorous, as each of theſe tails ſtrikes on two of the hollow joints, when put in motion.

The age of the creature is known by the number of joints of this *rattle*, which are found to be from one to twenty, or more. The uſe of this ſeems not to the creature, but to other animals, that they may be alarmed at the approach of ſo terrible an enemy, and get out of its way in time. Piſo, and ſome others, affirm, that this *rattle* put up a man's fundament, is as fatal a thing as the creature's bite. The power of doing miſchief, which nature has allotted to this animal, ſeems not only by its bite, but, according to the joint accounts of almoſt all authors, it appears to have a power of deſtroying even by a look. *Ray*'s Syn. Anim. p. 322.

The charming, or faſcination of the *rattle-ſnake*, as this is uſually called, has exerciſed the wits of many naturaliſts in vain, and many have diſbelieved the fact. Sir Hans Sloan mitigates the matter, by ſuppoſing the creature firſt to ſeize or bite its prey, which it then ſuffers to eſcape, as far as the poiſon will let it, watching its death, that it may devour it without trouble; and that it is in this poiſoned ſtate that people have ſeen the ſquirrels, *&c.* dancing about before the *rattle-ſnake*, and dying convulſed; all which they have attributed to the power of charming in the eye of the *ſnake*, not conceiving that it was the effect of the creature's having before bitten them. This, though a very plauſible account, yet however wants experience to confirm it, and the general teſtimony of people, who have ſeen the facts, makes againſt it.

The ſame author gives us, however, from Colonel Beverley, the whole proceſs of the charm. The colonel acquaints us, that ſome company he was with once ſaw a hare, about half grown, ſiting quietly in an orchard, and ſtriking at her, ſhe only removed a few yards; when wondering at the cauſe, they ſaw a *rattle-ſnake*, at about ten feet diſtance, eying the hare as his deſtined prey. The poor creature was, by this time, in agonies and convulſions, often getting up on its legs, as if intending to run away, but always immediately falling down again, and growing worſe and worſe, ſoon loſt the uſe of its hinder legs, and panting vehemently, fell on its ſide. In about half an hour more the hare ſeemed to have done with all ſtruggles, and to be dead, on which the *ſnake* uncoiled itſelf, and moved gently towards it, but the poor hare ſtarting again, he ſtopt; but when all was again quiet, he moved up to it, and, raiſing his head, looked all over his prey; his colours looking at that inſtant more beautiful than before, and his eyes ſparkling. The hinder part of the hare had been toward the *ſnake* all this time, and it had periſhed without much looking at its enemy. The *ſnake* wetted the body all over with his ſlaver; and then, with great difficulty, taking firſt the head into his mouth, ſwallowed that, and afterwards the whole body, ſucking it gently down, and not getting in the ſhoulders without great difficulty.

It is certain, upon the whole, that there is much in this account to favour Sir Hans Sloan's opinion of the hare's having been firſt bitten, though that was not ſeen, ſince the convulſions, and loſs of the uſe of the hinder legs, ſeem a very natural effect of poiſon; but we are aſſured, by perſons who have been eye-witneſſes to the fact, that a bird hopping about in all this agony and terror, has, on the frightning the *rattle-ſnake* away, flown off without any difficulty; ſo that the whole ſeems yet not underſtood. *Sloan*'s Hiſt. Jamaica. *Beverley*'s Virginia.

RAUCA *avis*, in zoology, the name of a bird deſcribed by Nieremberg, as common about the lakes and rivers of America, and of the king-fiſher kind, but nearly as large as a duck, and black on the crown, and white on the breaſt and belly. Its neck is naturally very long in proportion to its body, yet it can occaſionally contract and ſhorten it in a very wonderful manner. It is a native of Mexico, and is eſteemed very good for the table. Mr. Ray has placed this among the birds, the accounts of which he is diſtruſtful of. *Ray*'s Ornitholog. p. 300.

RAUCEDO, *hoarſeneſs*, in medicine, the name of a diſeaſe which conſiſts in the conſtriction of the glandulous coat, and other glandular parts, near the top of the wind-pipe, by means of which the due quantity of lymph, deſtined to lubricate the wind-pipe, is not ſuffered to flow to its place. This diſtemper differs in degree, being milder when from external cauſes, and greatly more obſtinate and troubleſome when from internal.

Signs of it. The *hoarſeneſs* of the voice in ſpeaking ſufficiently manifeſts this complaint, but it is uſually alſo attended with a ſlight cough in the milder kind; and when of the ſeverer ſort, is not unfrequently accompanied with catarrhal and ſcorbutic effects; and not uncommonly, in its worſt ſtates, with a complication of venereal taints. The perſons moſt ſubject to *hoarſeneſſes* are young and middle-aged men, and ſometimes women, who have for ſome time been afflicted with obſtructions of the menſes.

Cauſes of it. The general cauſe of an *hoarſeneſs* is an interception of the lymph deſtined to lubricate the wind-pipe; and the occaſional cauſe of this is uſually an obſtruction of the glandular parts, toward the top of that organ, in the ſimple *raucedo*; but in the complicated kind, in which there is a ſcorbutic or venereal taint, an eroſion of the epiglottis is very often the cauſe. Beſide theſe, there are many accidental and external cauſes, which will bring on a *hoarſeneſs*; ſuch as the falling of any ſmall particle of extraneous matter, if it be only a grain of duſt, into the wind-pipe; a vehement cough will alſo bring it on, as will a frequent loud ſpeaking, and too fat foods, and acrid or bilious humors ſtagnating about theſe parts. It is eaſy to conceive, that the more complicated this diſeaſe is, the more difficult will be the cure; and accordingly *hoarſeneſſes*, which have ſcorbutic or venereal taints for their baſis, are with great difficulty removed.

Method of cure. Lubricating medicines are firſt to be given, to obtund the acrimony of the humors, and relax the ſtrictures of the glandular parts. To this purpoſe are properly taken oil of almonds, and the pectoral ſyrups, with barley water, mucilaginous broths, and decoctions of the pectoral herbs, or infuſions of them drank in the manner of tea. When there is a coryza, or cough attending it, theſe are to be treated in the uſual way, and the *hoarſeneſs* will uſually go off with them. When acrid and bilious humors are in the caſe, the abſorbents and nitrous medicines are to be given, with gentle diaphoretics; powders compoſed of crabs eyes, nitre, and diaphoretic antimony, are of great uſe in this caſe. The bowels, in all theſe caſes, are to be kept gently relaxed; and where there is a ſcorbutic, or venereal taint for the baſis, thoſe diſeaſes muſt be attacked in the common way, and then the *hoarſeneſs* will be regularly taken off. A relaxation of the wind-pipe is uſually accuſed as being the cauſe of a *hoarſeneſs*, and that not without

ſome foundation; ſince where the humors are collected, there will be ſuch a relaxation; but when we conſider all the circumſtances of the diſeaſe, and obſerve that relaxing medicines are the only cure for it, we muſt acknowledge, that though a relaxation of ſome part of the aſpera arteria may be in the caſe, yet that the origin of the complaint is from a conſtriction of ſome part of it; and it appears, that the longer this complaint remains with people, the greater the conſtriction becomes; ſo that after a courſe of years, the voice is not only *hoarſe*, but is in a manner ſuppreſſed ſo, that it can ſcarce be heard. *Junker*'s Conſp. Med. p. 505.

RAVEL *bread*, a ſort of *bread*, called alſo *blackwhytlof*, as being of a middle fineneſs betwixt white and brown.

RAVEN, *corvus*, in ornithology. See CORVUS.

It is rare to find this creature white, yet it happens ſometimes. Boyle[a] mentions one. There was alſo one ſhewn to the Royal Society not long ago.—[[a] Works Abr. Vol. 2. p. 46.]

Night RAVEN, an Engliſh name for a heron which flies in the night, and makes a very odd and hoarſe noiſe. It has been applied by ſome to the bittern, or *ardea ſtellaris*, but improperly, belonging of right to the *ardea cinerea minor*, or ſmaller grey heron, called *nyćticorax*. *Ray*'s Ornithol. See NYCTICORAX.

RAVIS, the ſame with *raucedo*. See RAUCEDO.

RAUTY *mummy*, or RAUTY *muddum*, *ſtone mummy*, a name given by the people of the Eaſt-Indies to a kind of foſſile ſubſtance, much valued for its medicinal virtues. It is of the nature of the ſelenites, and is found upon the high rocks, and ſuppoſed to be generated of the dew which falls from the heavens; but this is an idle opinion, and the formation of it is evidently the ſame with that of the European rhomboidal ſelinites. They beat it to powder, and after boiling it in milk, they give it in caſes of the venereal kind. In a common clap, they give half a ſcruple night and morning. *Woodward*'s Cat. Foſſ. Vol. 2. p. 9.

RAY, *raia*, in ichthyology. See RAIA.

RAY, in our old writers, a word appropriated to cloth never coloured, or dyed. 11 Hen. IV. c. 6. *Blount*, *Cowel.*

RAY (*Cycl.*)—RAY *of curvature*, in geometry, is uſed to ſignify the ſemi-diameter of the circle of curvature. See CURVATURE, *Appendix*.

RAYCHE, in ichthyology. See RAYTE, infra.

RAYTE, or RYCHE, in ichthyology, a name given by Joannes Cuba, Albertus, and others, to the common ſkaite, or flaire. See the article RAIA.

RAZE, in the manege. A horſe is ſaid to have *razed*, whoſe corner teeth ceaſe to be hollow; ſo that the cavity, where the black mark was, is filled up; that is, even, ſmooth, and *razed*, or ſhaven, as it were, and the mark diſappears. See the articles TEETH and MARK.

RAZOR *bill*, in zoology, the common Engliſh name of the alka, a web-footed bird with no hinder toes, common on our ſea ſhores. See ALKA.

RAZOR-*fiſh*. See the article DACTYLUS.

REAR (*Cycl.*)—REAR *half files*, in the military art. See FILE *leaders*.

REAR *up*, in the manege, called in French *cabrer*, is ſaid of a horſe that riſes upon his hinder legs, as if he would come quite over.

REARED, or *Wale*-REARED. See WALE-*reared*.

REBUS, (*Cycl.*) a word uſed by the chemical writers ſometimes to ſignify ſour milk, and ſometimes for what they call the ultimate matter, of which all bodies are compoſed.

RECEIVER (*Cycl.*)—It is to be obſerved, that a very ſmall crack in the *receiver*, uſed in pneumatical experiments, does not render them uſeleſs; for, upon evacuating the internal air, the external preſſing the glaſs on all ſides, brings the edges of the glaſs cloſer together. But in caſe of conſiderable flaws, a plaſter may be applied, made of quick lime, finely powdered, and nimbly ground, with a proper quantity of the ſcrapings of cheeſe, and water enough to bring the mixture to a ſoft paſte; which, when the ingredients are well incorporated, will have a ſtrong and fetid ſcent; and then it muſt be immediately ſpread upon a linnen cloth, and applied, leſt it begin to harden. *Boyle*'s Works Abr. Vol. 2. p. 417.

RECEIVERS, in chemiſtry, veſſels of earth, glaſs, *&c.* for receiving any diſtilled liquor. See Tab. of Chemiſtry, N° 22, 23, and 34.

RECEPTACULUM (*Cycl.*)—RECEPTACULUM *ſeminum*, in botany, the name given by authors to the baſe of the flowers and ſeeds in the ſyngeneſiæ, or compound flowered plants. This is alſo called, by ſome writers, *thalamus floſculorum*. The flowers ſtand on this in conſiderable numbers, and without any pedicles. The diſk of the *receptacle* is of various ſhapes in the various plants; in ſome it is flat, in others concave, in others convex; in ſome globular, and in many pyramidal. Its ſurface is ſometimes naked, and ſometimes paleaceous. In thoſe plants, in which the ſurface is naked, it is either abſolutely ſmooth, or furniſhed with ſmall tubercles, or with a few hairs. In thoſe in which it is paleaceous, it is all over beſet with narrow pointed paleæ, which are erect, compreſſed, and ſtand between the flowers.

RECEPTARII, a term of reproach uſed to ſuch phyſicians as write pompous receits for loads of medicines, more conſulting the good of the apothecary than the patient; as alſo for ſuch as give receits for general medicines, to be uſed at the diſcretion of people wholly unacquainted with the nature of diſeaſes.

RECESSUS, (*Cycl.*) a word uſed by ſome medical writers to expreſs an abſceſs, or apoſthumation.

RECIMUS, among the Romans, a kind of ſquare mantle, or veil worn by women on their head. Salmaſius will have it to have been a ſort of gown uſed by the Roman ladies, and tucked up before with a ſquare pin, of a purple colour. *Danet.* in voc.

RECIPROCAL, (*Cycl.*) in mathematics, is applied to quantities, which multiplied together produce unity[a]. Thus $\frac{1}{x}$ and x, y and $\frac{1}{y}$ are *reciprocal* quantities. And $\frac{1}{x}$ is ſaid to be the *reciprocal* of x, which, *vice verſa*, is the *reciprocal* of $\frac{1}{x}$.—[[a] Maclaurin de Lin. Geom. propriet. general. p. 10.] See the Appendix to his Algebra.

RECITANTE. See FAVORITO.

RECLASSE, *auricula*, in botany. See AURICULA.

The characters of a good flower of this ſort are theſe. 1. The ſtem of the flower muſt be lofty and ſtrong. 2. The foot-ſtalk of the flower muſt be ſhort, that the umbel may be regular and cloſe. 3. The pipe, or neck of each flower ſhould be ſhort, and the flowers large and regularly ſpread, being no ways inclinable to cup. 4. The colours muſt be very bright, and well mixed. 5. The eye of the flower muſt be large and round, and of a good white or yellow, and the tube or neck muſt not be too wide.

Theſe are to be raiſed from ſeeds; to procure which the beſt flowers ſhould be made choice of, and theſe muſt be expoſed to the open air, and to ſhowers, that the ſeeds may be perfect. The time of their ripening is June, and they are known to be ripe by the ſeed veſſel becoming brown and opening. This ſeed may be ſown any time between Auguſt and Chriſtmas; and the beſt ſoil for it is good freſh light ſandy mould, mixed with very rotten cow dung, or tanners bark. With this the boxes or pots muſt be filled, and the ſeeds lightly ſcattered on it, and covered an inch deep with rotten willow mould. Cover the ſurface with nets, or otherwiſe, to preſerve the ſeed from birds, and give the boxes half the day's ſun. In March the young plants will appear, and they muſt then only have the morning ſun till ten o'clock. They muſt be carefully watered after this, a little at a time, and in July they will be ready to tranſplant. They muſt be ſet in the ſame ſort of earth, at three inches diſtance, and ſhaded carefully, till they have taken root. The ſpring following theſe young plants will flower, and then the fineſt of them ſhould be marked, and each removed into a pot of the ſame earth, in which they are to be kept till the next ſpring, when it will appear what they truly are.

The fine flowers, thus obtained, may afterwards be propagated from ſlips, or off-ſets taken from the old roots in April when they are in bloom; and theſe muſt be managed juſt as the young plants from ſeed, and the ſecond year will produce perfect flowers.

Theſe are the rules for the propagating theſe plants; but in order to have them flower in perfection, the following rules muſt alſo be obſerved.

1. The plants muſt be preſerved from too much wet in winter, and muſt have free air, and not too much ſun. 2. In the beginning of February, if the weather be mild, the earth in your *auricular* pots muſt be taken off as far as may be, without diſturbing the roots, and new freſh earth laid in its place. 3. The pots muſt be covered with matting in the night, to defend them from froſts while the plants are budding. 4. When the ſtalk begins to be long, they muſt be defended from haſty rains, yet not kept too much under cover, which draws up the ſtalk too long, and makes it weak; and they muſt be watered frequently, a little at a time, and none of the wet muſt be ſuffered to fall on the plant. Laſtly, when the flowers begin to open, the pots ſhould be removed to a ſtage of ſhelves, one over another, placed under cover, open to the morning ſun, but ſheltered from the midday's ſun. Here they may remain till their flowers are paſt, and then they muſt be ſet out to have the benefit of the rains and free air, for the ripening of the ſeed, which muſt be ſaved carefully, and ſpread on papers, and laid to dry. *Miller*'s Gardners Dict.

RECLINATE *ſtalk*. See the article STALK.

RECOGNITORS, *recognitores*. The jury impanelled upon an aſſize are called *recognitors*, becauſe they acknowledge a diſſeiſin by their verdict. *Bract.* lib. 5. *Cowel.*

RECOLATION, a method of fining the decoctions of vegetables, *&c.* by repeated percolation, or ſtraining them ſeveral times ſucceſſively through a linnen or woollen bag.

RECOMPOSITION, in chemiſtry, the compounding of bodies from their ſeparated parts, or principles, ſo as to compoſe

compoſe the original whole again. This is extremely difficult to effect univerſally, but in ſome caſes it may be done, and that ſo perfectly, that the *recompoſed* body ſhall not be diſtinguiſhable by the ſenſes from that which never had been ſeparated by the fire. If the art of chemiſtry were perfect, we ſhould thus be able, at leaſt in ſome degree, to *recompoſe* all the bodies we divide; but this is far from being the caſe at preſent. We can by no means do this in vegetable and animal bodies, where there is a vaſcular ſtructure, and therefore we are carefully to diſtinguiſh between the regeneration of organized, and that of unorganized bodies. *Shaw*'s Lectures, p. 168.

RECONCILIATION *of penitents*, in church hiſtory. See PENITENTS, *Cycl.*

RECRUITS, in the military art, new men raiſed to ſupply the places of ſuch as have loſt their lives in the ſervice, or are rendered unſerviceable by age or wounds.

RECRUIT *horſes*, are the *horſes* brought up for compleating the regiments of horſe or dragoons every year.

RECTIFICATION (*Cycl.*)—That the *rectification* of ſpirits may, in all caſes, proceed with the greateſt exactneſs, a due regard to it muſt be had even from the firſt fermenting the ſubſtance from which they are to be made, and continued through all the ſtages of diſtillation, the low wines, proof ſpirit, and alcohol. The management of the fermented liquor, to this purpoſe, is principally the letting it ſtand to ſubſide after the fermentation is over, and the drawing it off clear and thin, not too rich for the ſtill. The ſtill is not to be overfilled with this. Great care muſt be taken to prevent its burning, and the faints that run laſt muſt be kept ſeparate, not mixed with the reſt of the liquor diſtilled, which is now called the low wines. In the *rectifying* theſe into proof ſpirit, great caution muſt be uſed that the fire be kept regular, not raiſed by ſudden ſpirits, which always throw up the oil in large quantities, which is to be left behind. In the ſucceeding *rectification* of the proof ſpirit into alcohol, the ſame cautious management of the fire is neceſſary; and, in both this and the laſt, the faints are not to be ſuffered to run in among the ſpirit, but to be ſaved ſeparate. They may be all mixed together at laſt, and reduced to a ſpirit fit for burning in lamps; but the keeping out of the *rectified* liquor will keep away the coarſeſt and moſt ſtinking part of the oil of the ingredients.

By theſe eaſy means, without any additional trouble or charge, we might be furniſhed with a ſpirit greatly exceeding what we commonly meet with. And in general, the art and myſtery of our ſellers of the ſeveral ſorts of Engliſh brandies, ſeem to conſiſt in this prudent management, and in the adding a little of the *oleum vini*, or oil of wine lees, to the ſpirits thus procured pure: this gives the flavour of foreign brandies, and is ſo extenſive in its uſe, that half an ounce of it is ſufficient for a hogſhead of pure ſpirits.

Malt ſpirit is that which principally requires all this care in the *rectification*, becauſe its oil is more nauſeous and offenſive than that of any other ſpirit; but all others will be greatly the better for being treated in the ſame manner, and it is indeed neceſſary that they ſhould for ſome particular uſes.

It is remarkable, that no one method of combinatory *rectification*; that is, of the *rectification* performed by means of ſalts, and other additions, is ſuited to all the ſeveral kinds of ſpirits, ſcarce indeed will any one way ſerve for any two ſpirits; but this method, by ſimple and careful diſtillation, is equally ſuited to all. Melaſſes ſpirit, cyder ſpirit, wine ſpirit, or brandy, rum, and arrack, are all improved by it, and all of them are then known to be perfectly *rectified*. When in the ſtate of alcohol, they not only prove totally inflammable in a little veſſel floating upon cold water, but when poured into the pureſt ſpring water, they have not the leaſt power of making any change in it, nor leave any marks of oilyneſs, or that unctuoſity, which, on the mixture of the leſs pure ſpirits, floats on the top, and in certain lights gives the rainbow colours. *Shaw*'s Eſſay on Diſtillery.

RECTIFYER, (*Cycl.*) in the diſtillery, the perſon whoſe employment it is to take the coarſe malt ſpirit of the malt ſtiller, and re-deſtill it to a finer and better liquor. The art of the *rectifyer* might be entirely ſet aſide, if the malt ſtiller could make his ſpirit perfect at a ſecond operation; which ſeems very practicable, if the malt ſtillers could be got to forſake their old track. The great things to be recommended for the improvement of their art, would be firſt the brewing in perfection, and ſecondly the keeping their waſh after the manner of ſtale beer, till it has entirely loſt its malt flavour, and required a pungent acid vinoſity; and then thirdly leaving out the lees, to diſtil with a well regulated fire. It is ſcarce to be thought how pure a ſpirit is to be obtained from malt this way; but the great art would be, the finding a way to make malt liquors artificially ſtale, bright, and flavourleſs, though otherwiſe vinous. *Shaw*'s Lectures, p. 223.

RECTUS (*Cycl.*)—RECTI *abdominis*. Theſe are long narrow muſcles, thicker than the oblique; they lie near each other, like two large bands from the lower part of the thorax to the os pubis, the linea alba coming between them. Their breadth diminiſhes, and their thickneſs increaſes gradually from above downward. The ſuperior extremity of each of theſe muſcles is fixed to a part of the lower extremity of the ſternum, to the three loweſt true ribs, and to the firſt falſe rib, by the ſame number of digitations, of which that which is fartheſt from the ſternum is the broadeſt.

The body of the muſcle lies in the vagina formed by the aponeuroſis of the broad muſcles of the abdomen: exteriorly it is divided into ſeveral portions, reſembling diſtinct muſcles placed end-wiſe, by tranſverſe tendons termed enervations, which commonly are all above the umbilicus, very ſeldom below it, and adhere very cloſely to the vagina. Theſe inſertions are pretty irregular: they do not always penetrate the whole thickneſs of the muſcle; and, in that caſe, they do not at all appear, or but very little, on the inner ſurface. Sometimes thoſe which are ſeen on the ſurface do not run quite croſs the whole breadth of the muſcle. The lower extremity of this muſcle ends in a thin tendon, fixed in the internal labium of the upper edge of the os pubis near the ſymphyſis, and there it touches the tendon of the other *rectus*. Above the umbilicus, theſe muſcles are at ſome diſtance from each other, according to the breadth of the linea alba, but below it they come nearer the linea alba, being there narrower, and near their lower extremity, that line is almoſt entirely hid by their thick edges. *Winſlow*'s Anatomy, p. 168.

RECTUS *anterior*, a muſcle called alſo *gracilis anterior*, as long as the os femoris, and lying directly along the foreſide of the thigh. The greateſt part of it is fleſhy, and its middle is broader than the two extremities. It has its name *rectus* from the ſtrait diameter in which it lies, and its other *gracilis* from its thinneſs and flatneſs. It terminates above by a pretty ſtrong tendon, which is divided into two branches, one ſhort and ſtrait, the other long and bent; the ſhort branch running up in a ſtrait line, is inſerted in the anterior inferior-ſpine of the os ilium. The long branch is inflected backward over the ſupercilium of the acetabulum, and runs in the direction of it from the ſpine, toward the great iſchiatic ſinus: it is ſtrong and flat, adhering very cloſely to the bone, and covered by the orbicular ligament and the glutæus minimus; and, according to the common method of diſſecting, is therefore uſually cut off, and the ſmall branch of the tendon only left obſervable. From hence the muſcle runs down wholly fleſhy, and partly penniform, ſome of its fibres meeting above and ſeparating below. It is narrow at the upper extremity, and grows gradually broader towards the middle, afterwards contracting in the ſame manner, and at the lower extremity of the os femoris, ending in a flat tendon. Through its whole courſe it lies between the two vaſti, and covers the crureus; and its inferior tendon is inſerted in the upper edge of the patella, from whence it ſends down a ſmall plane of tendinous fibres, which adhere very cloſely to the convex ſide of that bone, and having reached the great ligament ſeem to be loſt therein. *Winſlow*'s Anatomy, p. 212.

RECTUS *muſculus*, in anatomy, a name given by Fabricius, in his treatiſe of the eyes, to the muſcle, which ſerves to elevate the upper eye-lid, called by Cowper and others *aperiens palpebram*, and by Albinus *levator palpebræ ſuperioris*.

RECTUS *internus major*, in anatomy, a name given by Winſlow to one of the muſcles of the head, deſcribed by Fallopius, under the name of the *muſculus nonus capitis*; and by Winſlow, the *muſculus rectus anterior longus*.

RECTUS *capitis major*, a ſmall, flat, ſhort muſcle, broad at the upper part, and narrow at the lower, and ſituated obliquely between the occiput and ſecond vertebra of the neck. It is fixed below the branch of the bifurcated ſpine of the ſecond vertebra of the neck, at a tuberoſity, which is often found at the upper part of the branch; from thence it aſcends a little obliquely outward, and is inſerted in the poſterior part of the inferior tranſverſe line of the os occipitis, at a ſmall diſtance from the criſta, being a little covered by the obliquus ſuperior. *Winſlow*'s Anatomy, p. 236.

RECTUS *minor capitis*, this muſcle has a ſmall inſertion below in the poſterior eminence of the firſt vertebra; from thence it aſcends laterally, and is inſerted immediately under the poſterior part of the inferior tranſverſe line of the os occipitis, in a ſuperficial foſſula on one ſide of the criſta occipitalis. Ibid. p. 237.

RECTUS *capitis anticus brevis*, a ſmall flat muſcle, about the breadth of one finger, ſituated laterally on the part of the body of the firſt vertebra. It is fixed below to the baſis or root of the tranſverſe apophyſis of that vertebra, near the anterior eminence; from thence it runs obliquely upward, and inward, to a tranſverſe impreſſion in the lower ſide of the apophyſis baſilaris of the occipital bone immediately before the condyle on the ſame ſide, being covered by the anticus longus. Ibid.

RECTUS *capitis anticus longus*, a muſcle in ſome degree of a pyramidal figure, lying along the anterior and lateral parts of the vertebræ of the neck, all the way up to the baſis cranii. It is fixed to the anterior parts of the tranſverſe apophyſis,

apophyſes, of the third, fourth, fifth, and ſixth vertebræ in a digitated manner, from thence it runs up obliquely inwards, and towards the lateral parts of the bodies of the vertebræ, paſſes on the foreſide of the firſt and ſecond, without being inſerted in them, and approaching gradually toward the ſame muſcle, on the other ſide, it is inſerted near it in the fore part of the lower ſide of the apophyſis baſilaris. Id. Ibid.

RECTUS *capitis poſticus major*, in anatomy, a name given by Albinus, in his hiſtory of the muſcles, to a muſcle called *magnus rectus capitis* by Winſlow, and deſcribed by Veſalius by the name of the *tertius capitis moventium*; and by Spigelius, and others, under that of *rectus major*.

RECTUS *capitis poſticus minor*, a name given by Albinus to a muſcle of the head, called by Riolanus and others *poſticus minor*, and by Winſlow *rectus parvus*; Veſalius has deſcribed it under the name of *quartus caput moventium*.

RECTUS *exterior oculi*, in anatomy, a name given by Fabricius and others to one of the muſcles of the eye, called by Riolan and others the *ſuperbus*, and by ſome the *elevator oculi*; it is the *abductor* of Albinus, one of his *quatuor recti*.

RECTUS *inferior oculi*, in anatomy, a name given by Fabricius, and ſome others, to one of the muſcles of the eye, called by others *humilis*, and by Albinus the *depreſſor*. It is one of the *quatuor recti oculi* of that author.

RECTUS *interior oculi*, in anatomy, a name given by Fabricius to one of the muſcles of the eye, called by Molinet the *bibitorius*; and by Cowper, Albinus, and others, the *adductor oculi*. See ADDUCTOR, *Cycl.* and *Suppl.*

RECTUS *ſuperior oculi*, in anatomy, a name given by Fabricius to one of the muſcles of the eye, called the *attollens* by Albinus, and by others the *elevator oculi* and the *ſuperbus*. See the article ELEVATOR *oculi*.

RECUPERATORES, among the Romans, were commiſſioners, appointed to take cognizance of private matters in diſpute, between the ſubjects of the ſtate and foreigners, and to take care that the former had juſtice done them.

It came at laſt to be uſed for commiſſioners, to whom the prætor referred the determination of any affair between one ſubject and another. *Pitiſc.* in voc.

RECURVIROSTRA, in zoology, the name of a very remarkable bird, ſo called from the remarkable bending upwards of its beak, and named *avoſetta* by the Italians.

It is a little larger than the common lapwing, weighing uſually about ten ounces; its beak is three fingers breadth long, very ſlender, black, and flatted, and bending upwards, which is peculiar to it alone. Its head is moderately large and very round, and both that and the upper part of the neck is black, only that there is a ſmall variegation of grey juſt behind the head. Its breaſt, belly, and throat are all of a ſnowy whiteneſs, and its back is variegated with black and white; its wings are alſo variegated with black and white; its tail is all white; its legs very long and blueiſh, and feathered half way down below the knees. It is very common in Italy, and is not unfrequently ſeen about the eaſtern ſhores of England. *Ray*'s Ornithol. p. 241.

RED (*Cycl.*)—To make a deep *red* in glaſs, the following method is that moſt practiſed by the glaſs-men. Take cryſtal fritt twenty pounds, broken pieces of white glaſs one pound, calcined tin two pound, mix theſe well together, and put them into a pot to melt and purify; when theſe are melted, take ſteel calcined, ſcales of iron from the ſmith's anvil, both powdered very fine, of each an equal quantity; put leiſurely an ounce of this mixed powder to the beforementioned metal, mix all well together, and let them ſtand ſix or eight hours in fuſion, to incorporate; take out a proof after this, and if there be too little of the powder, it will appear of a duſky yellow; then more of the powder muſt be added, and then add three quarters of an ounce of calcined braſs ground to a fine powder; mix them thoroughly together, and the maſs will be of a blood *red*; continue ſtirring the whole together, and frequently taking out proofs of the colour; when it is right, work it immediately, otherwiſe it will loſe its colour and become black. The mouth of the pot muſt in this proceſs be left open, elſe the colour will be loſt. *Neri*'s Art of Glaſs, p. 100.

Blown RED, in the porcelain manufacture, a name given to a peculiarly coloured china ware of a ſpangled *red*, or to the colour alone that ſpangles it. It is an ornament eaſily introduced into uſe in our own manufactories of porcelain ware, and is done in the following manner. The colour is to be prepared of common copperas, calcined to a *red* colour in a charcoal fire, in a crucible, with another luted on the top of it inverted, and with a hole in its bottom. The ſignal of the calcination being finiſhed, is, when the black clouds ceaſe to come up through the hole, and a fine white thin vapour ariſes in their place. The veſſels are to be then ſuffered to cool, and the *red* matter in them is to be reduced to a fine powder; while the veſſels to be coloured with this are yet wet. The operator is to provide a glaſs pipe, and covering one end of it with a piece of fine gawſe; he is to dip this into the powder, and taking it carefully out, with what little is ſticking to it, he is to blow againſt the veſſel at ſome diſtance from it: thus the fineſt part of the powder only will reach the veſſel, and will be laid on in form of glittering ſpangles, very ſmall, but all diſtinct. This is a ſort of colouring much eſteemed by the Chineſe themſelves, and they have a way of uſing the common blue in the ſame manner; but few of the veſſels, thus painted, come over to us. Obſerv. de l'Aſie.

RED *game*, an Engliſh name of a bird, common in the mountainous parts of Yorkſhire, and ſome other of our northern counties. It is of the ſhape of a partridge, but much larger, and of a mixed colour of red and black, and is feathered down to the ends of the toes. See the article GOR-*cock*.

Indian RED, a name uſed by the colourmen and painters for a kind of purple ochre, brought from the iſland of Ormus in the Perſian gulf, and uſed as a red colour. It is called among the authors on theſe ſubjects *terra perſica*. *Hill*'s Hiſt. of Foſſ. p. 58.

RED *land*, in agriculture, a term much uſed by huſbandmen, to expreſs a ſandy ſoil of a reddiſh hue, interſperſed for the moſt part with pieces of ſand ſtone of the ſame colour, or ſomewhat deeper.

There are ſeveral varieties of this ſoil, one of which is almoſt entirely made up of ſand; another with an admixture of clay with the ſand, the whole making a looſe loamy earth; and a third, full of fragments, of a poor ſandy iron ore, and often containing ſhining ſpecks of ſelenitæ. *Moreton*'s Northamp. p. 40.

RED-*lead*. See the article MINIUM.

RED-*ſhank*, in zoology, the name of a water bird, called by authors *gallinula erythropus*, and *callidrys*. It is about the ſize of the common plover. The back is of a greyiſh or browniſh green, uſually ſpotted with black; its neck grey, and its throat variegated with black and white; the breaſt is white, with a few looſe ſtreaks of black. The wing feathers are variegated with black, brown, and white; the breaſt is two fingers breadth long, ſlender, and ſhaped like the beak of the woodcock; reddiſh at the baſe, and blackiſh lower down. Its legs are of a fine beautiful red, and the hinder toe is very ſhort and ſmall. *Ray*'s Ornithol. p. 221.

RED *ſtart*, in zoology, the Engliſh name of the *ruticilla*, a very beautiful bird, with a white ſpot on his head and a red tail. See the article RUTICILLA.

RED *weed*, in botany, a name given to a plant common in Bermudas, and ſome other places; and called by our firſt travellers to that part of the world the *ſummer iſland redweed*. Its berry is of a fine red colour, and affords a tincture little inferior to that of cochineal, and poſſeſſing all its virtues in medicine; the only misfortune of this, and ſome other very fine vegetable colours, is, that they fade ſoon. The juice of the fruit of the opuntia, or prickly pear, is as fine a dye as can be procured from the cochineal, but it will not ſtand; the inſect feeding on this, however, we find affords a colour of the ſame nature, that will ſtand. The fruit of the *red weed* is in the ſame manner liable to be eaten by inſects as that of the prickly pear, and it is worthy a trial, whether its colour obtained at ſecond hand from thoſe inſects, will not ſtand as well as the cochineal does, and whether the inſects may not be propagated in a ſufficient abundance to ſerve the markets in the ſame manner. Phil. Tranſ. N°40.

RED *wing*, in zoology, the name of a bird of the turdus, or thruſh kind, called alſo in ſome places the *wind thruſh*, or *ſwine pipe*, and by authors the *turdus iliacus*, or *tylas*.

It is a little ſmaller than the common thruſh, and is leſs ſpotted. Its back, neck, and head are of the ſame colour with thoſe of the common thruſh; but its ſides, under the wings, and the feathers which line the wings, are of an orange colour, or duſky red; its belly and breaſt are whitiſh, and its throat yellowiſh, with brown ſpots: the wings are of a ſort of cheſnut colour, a little variegated. It feeds on inſects, as worms, and the like; and is a bird of paſſage, coming to us at the ſame time with the fieldfare, and leaving us alſo when that bird does. It is not well known where they breed, though ſome have gueſſed it to be in the mountains of Germany and Bohemia. They have a bitteriſh taſte, and are leſs valued than the fieldfare. *Ray*'s Ornithol. p. 139.

REDDLE, (*Cycl.*) the common Engliſh name for the ſubſtance, called in Latin *rubrica*, and uſed in painting, and for marking ſheep, &c. *Hill*'s Hiſt. of Foſſ. p. 48. See the article RUBRICA.

REDIMICULUM, among the Romans, a girdle, which going about the neck, divided on the breaſt, and paſſing down each ſide, went round, and kept the robe tight to the body. See *Pitiſc.* in voc.

REDUCTION, (*Cycl.*) in metallurgy, is the bringing back metalline ſubſtances, which have been changed into *ſcoriæ* or aſhes, or otherwiſe diveſted of their metallic form, into their natural and original ſtate of metals again. *Cramer*'s Art of Aſſaying, p. 185.

All metals and ſemi-metals may be reduced by proper management, whatever have been their changes, except only zink, which having been burnt to aſhes, admits of no *reduction*. But the mixture of gold, and ſilver, was never yet

yet radically diſſolved by any experiment, whatever ſome may have imagined. Even ſome earths will turn into metals by the admixture, and intimate union of a phlogiſton, or inflammable principle; but theſe metals never need any ſuch principle to aſſiſt their *reduction*. Ibid. p. 186.

REDUNDANT (*Cycl.*)—REDUNDANT *interval*, in muſic, is uſed for an interval exceeding the truth by a comma. See INTERVAL.

Some apply *redundant* to an interval exceeding a diatonic interval by a ſemitone minor; but this is more uſually called a ſuperfluous interval. See the articles SECOND, *Cycl.* and, INTERVAL, *Suppl.*

REDUVIA, in medicine, a word uſed by ſome for a whitlow, and by others for a painful crack, or other diſorder about the nails, either of the fingers or toes.

REED, *arundo*, in botany. See ARUNDO.

REED, *calamus*, likewiſe denotes a ſort of meaſure, otherwiſe called *canna*. See CANNA.

REED *ſparrow*, the Engliſh name of a bird by many eſteemed of the picus, or wood-pecker kind, having ſhort legs, and climbing up *reeds*, &c. as the other upon trees; but it wants the great character of that genus of birds, having its toes placed only one behind, and three before, as in the generality of other birds. There are two ſpecies of this bird, a greater and a leſſer; the firſt called by authors *junco*, and *cinclus*, and the other *cannevarola*, and by ſome *paſſer arundinaceus minor*. *Ray*'s Ornitholog. p. 99. See the articles JUNCO and CANNEVAROLA.

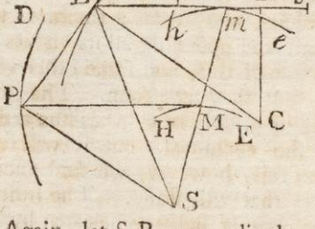
REEN *moſſa*, a name uſed by ſome for the mountain coralloides, or rein deer moſs.

REEVE (*Cycl.*)—REEVE, in zoology, the name of a bird which is the female of the *avis pugnax*; the male of which, from his long feathers round his neck, is called the *ruffe*.

REFLECTING *teleſcope* (*Cycl.*)—See TELESCOPE.

REFLEX *leaf*, among botaniſts. See LEAF.

REFLEXION (*Cycl.*)—*Cauſtic by* REFLEXION. Rays of light being ſuppoſed to iſſue from a given point, and to be *reflected* by a given curve, ſo as to make the angle of *reflexion* equal to the angle of incidence; a curve that touches all the *reflected* rays is called the *cauſtic by reflexion*.



Thus, let S be the given point from whence the rays iſſue, S L any incident ray, P L *p* the tangent at L, L C the radius of curvature at L, L *m* the *reflected* ray conſtituting the angle C L *m*, equal to C L S; then if the *reflected* rays always touch the curve *h m e*, it is the cauſtic by *reflexion*.

Again, let S P, perpendicular to the tangent L P, meet it always in P, a point of the curve D P; let H M E be the curve, by the evolution of which D P is deſcribed, and let P M touch H M E in M; join S M, and produce it to *m*, ſo that S *m* be equal to 2 S M: then will *m* be a point in the cauſtic of the curve B L, when S is the radiating point.

Hence, if perpendiculars be always drawn from the radiating point to the tangents of the *reflecting* curve, and a new curve be ſuppoſed to be the locus of the interſections of the perpendiculars and tangents, then will the evoluta of that new curve be ſimilar, and ſimilarly ſituated to the cauſtic by *reflexion* of the propoſed *reflecting* curve. See *Mac Laurin*'s Fluxions, Art. 409.

The point *m* may be thus found. Let C R be perpendicular to L R, the *reflected* ray, and let L *s* = L S; then if L R be biſected in *q*, *q m* will be a third proportional to *q s* and *q* R; that is, *q s* : *q* R :: *q* R : *q m*, or *s q* × *q m* = *q* R² = *q* L². Id. Art. 410.

Mr. de l'*Hopital*, in his Analyſe des Inf. Petits, Sect. 6. has treated of cauſtics by *reflexion*.

Point of REFLEXION, in geometry. See POINT *of reflexion*.

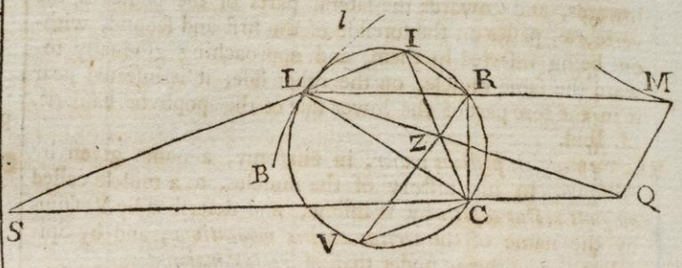
REFRACTED (*Cycl.*)—REFRACTED *angle*, in optics, the angle contained between the *refracted* ray and the perpendicular.

REFRACTION (*Cycl.*)—REFRACTION *to the perpendicular*, in optics, is when a ray falls from a leſs denſe into a more denſe medium, and ſo approaches nearer the perpendicular.

REFRACTION *from the perpendicular*, in optics, is when a ray falling inclined from a more denſe medium into one leſs denſe, in breaking departs further from the perpendicular.

Cauſtics by REFRACTION. When rays of light, iſſuing from a given point, are *refracted* at any curve, ſo that the ſine of the angle contained by the *refracted* ray, and the perpendicular to the curve, is always to the ſine of the angle contained by the incident ray, and that perpendicular, in one conſtant ratio, the curve that touches all the *refracted* rays, is called the *cauſtic by refraction*.

Let S be the radiating point, S L any incident ray on the curve B L *l*, L R the *refracted* ray, C the center of the curvature at L, C I perpendicular on the incident ray in I, C R perpendicular to the *refracted* ray in R; join S C



and I R; let R Z, perpendicular to R I, meet C I in Z; join L Z, meeting S C in Q; and let Q M, parallel to R Z, meet the *refracted* ray L R in M; then will the point M be in the cauſtic. See *Mac Laurin*'s Fluxions, Art. 413.

The point M may alſo be determined, by deſcribing a circle L I R C on the diameter L C, and by drawing V C parallel to S L; then applying R C in this circle, ſo that it may be to C I, in the given ratio of the ſine of *refraction*, to the ſine of incidence, joining V R, that meets C I perpendicular from C to the incident ray in Z, joining L Z that meets S C in Q, and drawing Q M parallel to V R. When L Z is parallel to S C, the *refracted* ray is the aſſymptot to the cauſtic. Ib. Art. 414.

The Marquis de l'Hopital has treated of *cauſtics by refraction*, in his Anal. des Inf. Pet. Sect. 7.

REFRANGIBLE, whatever is capable of being refracted. See REFRANGIBILITY, *Cycl.*

REFRIGERATORY, (*Cycl.*) a term uſed for a veſſel of cold water, through which the worm of the alembic paſſes in the common method of diſtillation, by means of which the vapours are condenſed. It is alſo uſed for the bucket head of the common ſmall alembic, containing water for the ſame purpoſe.

REFUTATION, *refutatio*, in rhetoric, that part of the anſwer made to an opponent, which diſproves what had been advanced by him. *Voſſ.* Rhet. l. 5. p. 382.

REGENERATED *tartar*. See TARTARUS *regeneratus*.

REGERENDARIUS, among the Romans, an officer who ſubſcribed and kept a regiſter of all petitions preſented to the præfect. *Pitiſc.* in voc.

REGESTOLA, in zoology, a name uſed by ſome authors for the mattageſs, or larger butcher bird, a very ſmall hawk, not exceeding the ſize of a common thruſh, but very fierce and voracious. *Aldrovand*, de Avib. See MATTAGESS and LANIUS.

REGIMEN, (*Cycl.*) in medicine, a regulation of diet, with intent to reſtore, or to preſerve health. In chemiſtry, it ſignifies the due regulation of fire.

REGINA *aurarum*, in zoology, a name given by Nieremberg to a bird called by the Mexicans *cozeacoauhtli*. It has obtained its name from its being able to fly againſt the ſtrongeſt winds. It is of the bigneſs of an eagle, and its whole body is of a blackiſh purple, variegated with a browniſh yellow, and a deep black. Its wings are variegated with black, yellow, and grey. Its legs are red. Its claws very ſtrong and ſharp; and its beak like that of the parrot. It has ſome rugoſe ſkin on the forehead, and about the beak, and its tail is black above, and grey underneath. It feeds on ſnakes, rats, and other vermin, but will alſo eat human dung. It flies very high. It is a native of Mexico, and breeds in ſpring. Its feathers are ſaid to be a remedy for many diſeaſes. But the truth of this account is much to be doubted. *Ray*'s Ornitholog. p. 302.

REGION (*Cycl.*)—REGIONS *of the ſea*. As the naturaliſts, in their deſcriptions of the ſubterranean parts of the globe, diſtinguiſh the earth into three regions of different depths, in which different temperatures are obſerved; ſo in deſcribing the ſea, they allow it two regions; the one extending from the ſurface of the water, down ſo low as the rays of the ſun can pierce, and extend their influence; and the other, from the loweſt bounds of that to the bottom. It is eaſy to ſee, that theſe regions rather regard quality than ſpace, and that their boundaries are far from being regular, or equal in all places, and at all times. The places expoſed to the hotteſt ſunſhine will have the largeſt upper *region*; thoſe where the ſun has leaſt power, will have the ſmalleſt; and the ſame part of the ſea will have its upper *region* more or leſs deep, according to the ſeaſon of the year. This upper *region* of the ſea is always more or leſs hot; the lower *region*, except in ſome few particular places, is every where cold; and the water, where the upper *region* is large, is always remarkably ſtill and quiet in the lower. *Boyle* of Coſmical Qualities.

Subterranean REGION. The earth is not only divided on its ſurface into *regions* and countries, but philoſophers, who have had occaſion to diſcourſe of its inner parts, have alſo divided them into three diſtinct *regions*, according to their different depths from the ſurface. The temperature of the ſubterranean parts of the globe is diſtinguiſhed according to the diviſion of theſe *regions*, but is not ſo regular and

preciſe

preciſe as ſome have ſuppoſed. The firſt *region* of the earth is very variable, both as to bounds and temperature. The ſecond *region* ſeems for the moſt part cold, in compariſon of the other two; but in ſeveral places, which, by reaſon of their diſtance from the ſurface of the earth, it would be natural to call the middle *region*, the temperature of the air is very different at the ſame ſeaſons of the year, which ſhews that it depends on ſomething more than bare depth from the ſurface. The third *region* of the earth is univerſally obſerved to be warm, but by no means regularly, or uniformly: the ſame depth in ſome places, giving only a moderate warmth, while in others it gives a very conſiderable heat. Borrichius tells us of a certain abbe fond of chemiſtry, and particularly curious in the matter of long digeſtions by regular heat, who found a way of making a furnace perpetually warm, by piercing the earth to a certain depth, and uſing the heat of this third *region* of it. His method, we are told, was to bore a hole with a pike twenty feet deep, and pour into it ten or twelve pounds of quickſilver; this made its way into the ſtrata, and through them in a body into the chambers of heat in this third *region*, where the heat having a vent upwards, made by this opening, never failed to aſcend in a perpetual and regular ſtream, and gave that regular digeſting heat that no artificial fire could equal. But this is an alchemical ſtory. *Boyle* of Coſmical Qualities. *Borrich.* de Ortu Chem.

REGION, in antient Rome, a part or diviſion of the city. They were only four in number till Auguſtus's time, who divided the city into fourteen *regions*, over each of which he ſettled two ſurveyors, called *curatores viarum*, who were made annually, and took their diviſions by lot. Theſe fourteen *regions* contained 424 ſtreets, 31 of which were called great or royal ſtreets, which begun at the gilt pillar that ſtood at the entry into the open place in the middle of the city.

The extent of theſe diviſions varied greatly, ſome being from 12000 or 13000 to 33000 feet and upwards in circumference. Authors, however, are not agreed as to the exact limits of each. See *Kenn.* Rom. Antiq. Not. l. 1. c. 2. p. 34. ſeq. *Pitiſc.* Lex. Antiq. in voc. *regio*. *Danet*, Dict. in voc. *Pancirol.* Deſcript. Urb. Rom. T. 3. p. 283.

REGRADATION, *regradatio*. See DEGRADATION, *Cycl.*

REGULAR *leap*, in muſic. See LEAP.

REGULUS (*Cycl.*)—The ſeparation of ſilver out of the *regulus*, made from the ſilver ore by means of lead, is to be performed in this manner. Put two coppels of the ſame bigneſs, perfectly dry, and capable of containing at leaſt one third more than the *regulus*, under a muffle in an aſſay-furnace; make a ſtrong fire, and let them be red hot for a quarter of an hour, then free the *regulus* from its ſcoriæ, by ſtriking it gently with a hammer, and put it carefully into one of the hot coppels, and into the other put, at the ſame time, the ſame quantity of granulated lead alone, as was uſed in the making the *regulus*. When the *regulus* boils and ſmoaks diminiſh the fire a little, and let the coppels be kept moderately, but not violently red hot. When it has ſtood ſo long, that the ſkin of litharge, continually produced from the lead, and covering the ſurface of the *regulus*, diſappears, and the coppel ſhews the ſcoriæ only of the lead with the pure ſilver, either in fuſion, or hard and bright in the middle, let the coppel continue only a minute or two longer on the fire; then take it out with a pair of tongs, take away the metal in grains, and if any ſcoriæ, or fragment of the coppel adhere to it, wrap it together in a paper, and ſqueeze it between the cheeks of a vice, or a pair of tongs, to break off that brittle matter without hurting the *regulus*. If this *regulus* be pure ſilver, it will now be very white, but if it contain any gold, it will ſhew it by its yellowneſs.

To determine exactly how much ſilver the quantity of ore contained, weigh it nicely in a fine balance, and take out the ſmall *reguline* lumps from the other coppel, and weighing that, deduct its weight from that of the other, becauſe ſo much ſilver that owes to the lead uſed in making it, and the remainder is the proportion of ſilver contained in the ore. *Cramer's* Art of Aſſaying, p. 211.

REGULUS *criſtatus*, the *creſted* or *golden crown wren*, the name of a very beautiful little bird, the ſmalleſt of all the European birds. Its whole weight is not more than a dram, and the crown of its head is adorned with a very beautiful ſaffron coloured, or orange red ſpot, which is called its creſt, and by ſome its crown, and from this golden crown the bird has obtained the name of the *regulus*, *tyrannus*, *baſileus*, and other appellations of royalty.

This crown the bird can at pleaſure draw together, by wrinkling its forehead, and by this means hide it from ſight. The edges of this crown are of a pale yellow, and its end circumſcribed by a black line. It is of an oblong figure, and is extended ſtrait from the origin of the beak to the back part of the head. The ſides of this little bird's neck are of an extremely gloſſy greeniſh yellow, and the ambit of its eyes white. Its neck and back are of an obſcure yellowiſh green, and its breaſt of a duſky white, ſometimes of a pale greeniſh caſt. Its wing feathers are brown, with their edges yellowiſh without, and whitiſh within; and the middle ones are ſo tinged in part with black, that when they are folded in the ſhutting of the wing, they make a black ſpot in its middle; and the tips of one ſeries of the feathers being white, they make alſo a white tranſverſe ſtreak on each wing. The tail is browniſh, the feet yellow, and the beak half an inch long, and very ſlender and black. They are common about the Peak in Derbyſhire, and in ſome other parts of England. They ſit uſually on the tops of oaks, and other high trees. They lay ſix or ſeven eggs, not larger than peas. *Ray's* Ornitholog. p. 163.

REGULUS *non criſtatus*, in zoology, the name of a bird more commonly known by the name *luteola*, and by ſome called *aſilus*. *Ray's* Ornitholog. p. 164. See LUTEOLA.

REJECTIO, a word uſed by medical authors for the caſting any thing up preternaturally by the mouth, whether it be by vomiting or by ſpitting.

REINS (*Cycl.*)—REINS, in the manege, a name given by the Duke of Newcaſtle to two ſtraps, or ropes of a caveſſon, which he ordered to be made faſt to the girths, or the pommel of the ſaddle, with intent that the rider ſhould pull them with his hand, in order to bend and ſupple the neck of the horſe.

Falſe REIN is a lath of leather paſſed ſometimes through the banquet, to bend the horſe's neck, which is diſapproved of by the Duke of Newcaſtle; by reaſon it ſlacks the curb, and makes the bit no more than a trench that has no curb.

REIS *effendi*, in the Turkiſh affairs, an officer of ſtate anſwering to our chancellor.

RELAIS, in fortification, a French term, the ſame with *berme*. See BERME, *Cycl.*

RELATION, *relatio*, in rhetoric, is ſometimes uſed to ſignify the ſame with recrimination. See RECRIMINATION, *Cycl.*

REMANCIPATION, *remancipatio*, among the Romans, a form of divorce obſerved in marriages that had been contracted by *coemption*. This was done by delivering the wife into the huſband's hands; ſo the marriage was diſſolved by the huſband's redelivering the wife into any perſon's hands, agreed upon between them. *Pitiſc.* in voc. See COEMPTION.

REMISSION (*Cycl.*)—REMISSION, *remiſſio*, ανεσις, in the antient muſic, was uſed to ſignify the paſſage of the voice from acute to grave; being oppoſite to intention. *Ariſtoxen.* p. 10—13. *Ariſtid.* Quint. p. 8, 9.

REMOLADE, or CHARGE, in the manege. See the article CHARGE, *Cycl.*

REMORA (*Cycl.*)—This is a ſmall oblong fiſh, whoſe body is of a cylindric figure, and tapers off to a thinneſs at the tail. Its mouth is triangular, and the upper part is ſhorter than its under. Its head is flat, and marked with ſtreaks, ſo as to look like the palates of ſome fiſhes: theſe run tranſverſely, and are carried on to the back, making a ſtriated ſubſtance of two fingers breadth, by which it faſtens itſelf to any other ſubſtance, as the body of a larger fiſh, the hulk of a ſhip, or the like. The eyes are ſmall and yellow, with a black pupil. It has no teeth, but in their places a multitude of ſmall prominences. It has two fins under the gills, and two more lower on the body. Beſide theſe it has two longitudinal fins, one on the back, the other on the belly, running the length of the body to the tail. The whole fiſh is of a greyiſh colour, and it is caught in the Eaſt and Weſt Indies, and in many other ſeas. See Tab. of Fiſhes, N° 14. and *Marcgrave's* Hiſt. Braſ. p. 117.

REMORA *mutiani*, in natural hiſtory, a name given by ſome to the genus of ſhells called *concha venerea*, and *porcellana*. See PORCELLANA.

REMOTION, *remotio*, in rhetoric, the ſame with what is otherwiſe called *metaſtaſis*. See METASTASIS.

REMOULIN, in the manege, is uſed to denote a ſtar upon a horſe's forehead.

REMPHAN, in antiquity, the Egyptian name for the planet Saturn. Some think that *remphan* was the moon. See the article CHIUN.

REMURIA, among the Romans, a feſtival inſtituted in honour of Remus by his brother Romulus. Mem. Acad. Inſcr. Vol. 1. p. 45.

RENALIS *lapis*, in natural hiſtory, the name given by many authors to a ſort of ſiderochitum, or cruſtated ferrugineous body of that kind, containing a nucleus of a different matter from that of the cruſts. It is found about Prague, and in ſome other places, lying near the ſurface in ſtrata of a yellow clay. Its uſual bigneſs is that of a ripe peach, and its cruſts are of a duſky ferrugineous brown colour; and its internal nucleus of a pale yellowiſh green, compoſed of a marley earth, and uſually of a kidney-like ſhape, whence its name.

RENDS, in a ſhip, are the ſame as the ſeams between her planks.

RENES (*Cycl.*)—RENES *ſuccenturiati*. Valſalva has endeavoured to prove the *renes ſuccenturiati*, or *glandulæ renales*, to be organs of generation, or aſſiſtant to them. Valſalva claimed this diſcovery. Mr. Ranby ſuſpected that the duct

which the Italian journals mentioned, as the principal part of this diſcovery, was no other than an artery ſent off from that of the capſula on each ſide, to the teſticles of men, and ovaria of women. Morgagni explained Valſalva's doctrine more fully. Valſalva gives the following reaſons for his opinion. He obſerves the ſeminary veſſels of ſeveral fowls to come out from theſe capſulæ, before they are ſent from the teſticles. In the viper and water tortoiſe, he remarks ſuch membranous connections between the *renes ſuccenturiati*, and teſticles, as make it probable that ſuch excretories are ſent through the capſulæ to the teſticles. He affirms, his having ſeen veſſels, which were neither nervous, ſanguiferous, or lymphatic, going from the human capſulæ to the teſticles. His obſervations are much the ſame as to females. To theſe he ſubjoins the conſent and ſympathy obſerved between the loins and genital parts. To confirm all, he cut away one teſticle, and extirpated the *kidney* of the oppoſite ſide, of a whelp. The wounds healed, but the creature was of a very lax habit, and ſo far from attempting coition, that he did not ſeem fond of bitches when they were proud. Acad. Bonon. Comment. p. 376. & ſeq. See alſo Phil. Tranſ. N° 387. Sect. 3. where we have an inquiry into this diſcovery, made by Valſalva, of an excretory duct from the glandula renalis to the epididymis by Mr. John Ranby. And in N° 395. Sect. 12. there are mentioned, by the ſame gentleman, two newly diſcovered arteries in women going to the ovaria; which he thinks to be probably the ſame with what Valſalva took for excretory ducts of the glandulæ renales. Valſalva's diſcovery was firſt mentioned in the *giornale di leterati* of Venice for 1719, and inſerted in the Phil. Tranſ. N° 385. Sect. 9.

RENETTE, in the manege, is an inſtrument of poliſhed ſteel, with which they ſound a prick in a horſe's foot.

RENIFORM *leaf*, among botaniſts. See LEAF.

RENTAL, a roll wherein the rents of a manor are written and ſet down, and by which the lord's bailiff collects the ſame: it diſtinguiſhes the lands and tenements, and the names of the tenants, the ſeveral *rents* ariſing, and for what time, uſually a year. Comp. Court Keep. 475.

REPART, in the manege, is to put a horſe on, or make him part a ſecond time.

REPAND *leaf*, *repandum folium*, among botaniſts. See the article LEAF.

REPHON. See the article REMPHAN.

REPOLON, in the manege, is a demivolte, the croupe in, cloſed at five times. The Italians are mighty fond of this ſort of manege. In making a demivolte, they ride their horſes ſhort, ſo as to embrace or take in leſs ground, and do not make way enough every time of the demivolte.

REPRISE, in the manege, is a leſſon repeated, or a manege recommenced. Thus we ſay to give breath to a horſe upon the four corners of the volte with only one *repriſe*, that is, all with one breath.

REPROOF, *objurgatio*, in rhetoric, is diſtinguiſhed from *invective*. See the article INVECTIVE.

REPRODUCTIVE *ſyſtem of preſervation*. See the article ANNIHILATION.

RERE *county*, a word uſed in the ſtatutes of Weſtm. 2. c. 39. And 2 Ed. 3. c. 5. And ſeems by thoſe ſtatutes to be ſome public place, which the ſheriffs appointed for the receiving of the king's money after his county court was done. *Terms of Law. Blount.*

REPUDIUM, among the Romans. See DIVORCE.

RESCUSSOR, in law, the party that commits a *reſcous*. 2 Cro. 419. *Blount.*

RESEDA, *baſe rocket*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the polypetalous anomalous kind, conſiſting of ſeveral diſſimilar petals; from the cup of which there ariſes a piſtil, which finally becomes a membranaceous capſule uſually of a trigonal form, or elſe ſquare, though ſometimes oblong and cylindric, and containing roundiſh ſeeds.

The ſpecies of *reſeda* enumerated by Mr. Tournefort are theſe. 1. The common *reſeda*. 2. The French *reſeda* with curled leaves. 3. The broad leaved *reſeda* with yellow flowers. 4. The white flowered *reſeda* with leaves like the calcitrapa. 5. The common ſmall *reſeda*, called by many authors the phyteuma. 6. The common leſſer *reſeda* with leaves not ſo deeply cut. 7. The common whole or uncut leaved ſmall *reſeda*. *Tourn.* Inſt. p. 423.

RESIANT *rolls*, are rolls wherein the *reſiants* of a tithing, &c. are ſet down. Comp. Court Keep.

RESIDUARY *legatee*, is he to whom the *reſiduum*, or what remains of an eſtate, after funeral charges, debts, and legacies are paid, is left by will.

RESIN (*Cycl.*)—According to Theophraſtus *reſin* was obtained by ſtripping off the bark from pines, and by inciſions made in the ſilver fir and the pitch pine. The inhabitants of mount Ida, he tells us, ſtripped the trunks of pines, on the ſunny ſide two or three cubits from the ground. He obſerves, that a good pine might be made to yield *reſin* every year, but the indifferent pines only every other year, and the weaker trees once in three years; and that three runnings were as much as a tree could bear. It is remarked by the ſame author, that a pine doth not at once produce fruit and *reſin*; but the former only in its youth and the latter in its old age.

RESISTANCE (*Cycl.*)—RESISTANCE *of fluids*. The greateſt part of authors have eſtabliſhed it as a certain rule, that, whilſt the ſame body moves in the ſame medium, it is always *reſiſted* in the duplicate proportion of its velocity; that is, if the *reſiſted* body move in one part of its track, with three times the velocity with which it moved in ſome other part, then its *reſiſtance* to the greater velocity will be nine times the *reſiſtance* to the leſſer. If the velocity in one place be four times the velocity in another, the *reſiſtance* to the greater velocity will be ſixteen times the *reſiſtance* to the leſſer, and ſo on. This rule, though exceſſively erroneous, when taken in a general ſenſe, is yet undoubtedly very near the truth, when confined within certain limits.

In order to conceive the *reſiſtance of fluids* to a body moving in them, it is neceſſary to diſtinguiſh between thoſe fluids which being compreſſed by ſome incumbent weight, perpetually cloſe up the ſpace deſerted by the body in motion, without permitting, for an inſtant, any vacuity to remain behind it; and thoſe fluids in which (they being not ſufficiently compreſſed) the ſpace left behind the moving body remains for ſome time empty. Theſe differences, in the reſiſting fluids, will occaſion very remarkable varieties in the laws of their *reſiſtance*, and are abſolutely neceſſary to be conſidered in the determination of the action of the air in ſhot and ſhells; for the air partakes of both theſe affections, according to the different velocities of the projected body.

If a fluid was ſo conſtituted, that all the particles compoſing it were at ſome diſtance from each other, and there was no action between them, then the *reſiſtance* of a body moving therein, would be eaſily computed, from the quantity of motion communicated to theſe particles: for inſtance, if a cylinder moved in ſuch a fluid in the direction of its axis, it would communicate to the particles it met with a velocity equal to its own, and in its own direction, ſuppoſing that neither the cylinder, nor the parts of the fluid were elaſtic; whence, if the velocity and diameter of the cylinder be known, and alſo the denſity of the fluid, there would thence be determined the quantity of motion communicated to the fluid, which (action and re-action being equal) is the ſame with the quantity loſt by the cylinder, conſequently the *reſiſtance* would be hereby aſcertained.

In this kind of diſcontinued fluid, the particles being detached from each other, every one of them can purſue its own motion in any direction, at leaſt for ſome time, independent of the neighbouring ones; wherefore, if, inſtead of a cylinder, moving in the direction of its axis, a body, with a ſurface oblique to its direction, be ſuppoſed to move in ſuch a fluid, the motion the parts of the fluid will hereby acquire, will not be in the direction of the *reſiſted* body, but perpendicular to its oblique ſurface; whence the *reſiſtance* to ſuch a body will not be eſtimated from the whole motion communicated to the particles of the fluid, but from that part of it only, which is in the direction of the *reſiſted* body. In fluids then, where the parts are thus diſcontinued from each other, the different obliquities of that ſurface, which goes foremoſt, will occaſion conſiderable changes in the *reſiſtance*; although the ſection of the ſolid, by a plain perpendicular to its direction, ſhould in all caſes be the ſame. And Sir Iſaac Newton has particularly determined, that in a fluid thus conſtituted, the *reſiſtance* of a globe is but half the *reſiſtance* of a cylinder of the ſame diameter, moving in the direction of its axis with the ſame velocity.

But though the hypotheſis of a *fluid*, thus conſtituted, be of great uſe in explaining the nature of *reſiſtances*; yet, in reality, no ſuch fluid does exiſt within our knowledge: all the *fluids* with which we are converſant are ſo formed, that their particles either lie contiguous to each other, or at leaſt act on each other in the ſame manner, as if they did; conſequently, in theſe fluids, no one particle, contiguous to the *reſiſted* body, can be moved, without moving at the ſame time a great number of others, ſome of which will be diſtant from it; and the motion thus communicated to a maſs of the *fluid* will not be in any one determined direction, but will in each particle be different, according to the different manners in which it lies in contact with thoſe, from which it receives its impulſe; whence, great numbers of the particles, being diverted into oblique directions, the *reſiſtance* of the moving body, which will depend on the quantity of motion communicated to the fluid in its own direction, will be hereby different in quantity, from what it would be in the preceding ſuppoſition, and its eſtimation becomes much more complicated and operoſe.

If the fluid be compreſſed by the incumbent weight of its upper parts (as all fluids are with us, except at their very ſurface) and if the velocity of the moving body be much leſs than that with which the parts of the fluid would ruſh into a void ſpace, in conſequence of their compreſſion; it is evident, that in this caſe the ſpace left by the moving body will be inſtantaneouſly filled up by the fluid; and the parts of the fluid, againſt which the foremoſt part of the body preſſes in its motion, will, inſtead of being impelled forwards in the

direction of the body; circulate, in ſome meaſure, towards the hinder part of the body, thereby to reſtore the equilibrium, which the conſtant influx of the *fluid* behind the body would otherwiſe deſtroy; whence the progreſſive motion of the fluid, and conſequently the *reſiſtance* of the body, which depends thereon, would be, in this inſtance, much leſs than in our firſt hypotheſis, where each particle was ſuppoſed to acquire, from the ſtroke of the *reſiſting* body, a velocity equal to that, with which the body moved, and in the ſame direction. Sir Iſaac Newton has determined, that the *reſiſtance* to a cylinder, moving in the direction of its axis, in ſuch a compreſſed fluid as we have here treated of, is but one fourth part of the *reſiſtance*, which the ſame cylinder would undergo, if it moved with the ſame velocity, in a fluid, conſtituted in the manner we have deſcribed in our firſt hypotheſis, each fluid being ſuppoſed to be of the ſame denſity.

But again, it is not only in the quantity of their *reſiſtance* that theſe fluids differ, but likewiſe in the different manner, in which they act on ſolids of different forms moving in them. We have ſhewn, that in the diſcontinued fluid, which we firſt deſcribed, the obliquity of the foremoſt ſurface of the moving body would diminiſh the *reſiſtance*; but in compreſſed fluids this holds not true, at leaſt not in any conſiderable degree; for the principal *reſiſtance* in compreſſed fluids ariſes from the greater or leſſer facility, with which the fluid, impelled by the forepart of the body, can circulate towards its hindermoſt part; and this being little, if at all, affected by the form of the moving body, whether it be cylindrical, conical, or ſpherical, it follows, that while the tranſverſe ſection of the body, and conſequently the quantity of impelled fluid is the ſame, the change of figure in the body will ſcarcely affect the quantity of its *reſiſtance*.

And this caſe, that is, the *reſiſtance* of a compreſſed fluid to a ſolid, moving in it with a velocity much leſs than what the parts of the fluid would acquire from their compreſſion; this caſe, I ſay, has been very fully conſidered by Sir Iſaac Newton, who has aſcertained the quantity of ſuch a *reſiſtance*, according to the different magnitudes of the moving body, and the denſity of the fluid. But he very expreſsly informs us, that the rules he has laid down are not generally true, but upon a ſuppoſition that the compreſſion of the fluid be increaſed in the greater velocities of the moving body: however, ſome unſkilful writers who have followed him, overlooking this caution, have applied his determinations to bodies moving with all kinds of velocities, without attending to the different compreſſions of the fluids they were *reſiſted* by; and by this means they have accounted the *reſiſtance* of the air to muſket and cannon-ſhot, to be but one third part of what it is found to be by experience.

Indeed, from all we have ſaid, it appears plain enough, that the *reſiſting* power of the medium muſt be increaſed, when the *reſiſting* body moves ſo faſt, that the fluid cannot inſtantaneouſly preſs in behind it, and fill the deſerted ſpace; for when this happens, the body will be deprived of the preſſure of the fluid behind it; which in ſome meaſure balanced its *reſiſtance*, and muſt ſupport on its forepart the whole weight of a column of the fluid, independent of the motion it gives to the parts of the fluid; and beſides, the motion in the particles driven before the body, is, in this caſe, leſs affected by the compreſſion of the fluid, and conſequently they are leſs deflected from the direction, in which they are impelled by the *reſiſted* ſurface; whence this ſpecies of *reſiſtance* approaches more and more to that deſcribed in our firſt hypotheſis, where each particle of the fluid being unconnected with the neighbouring ones, it purſued its own motion, in its own direction, without being interrupted or deflected by their contiguity; and therefore, as we before obſerved, that the *reſiſtance* of a diſcontinued fluid to a cylinder, moving in the direction of its axis, was four times greater than the *reſiſtance* of a fluid ſufficiently compreſſed of the ſame denſity, it follows, that the *reſiſtance* of a fluid, when a vacuity is left behind the moving body, may be near four times greater than that of the ſame fluid, when no ſuch vacuity is formed; for when a void ſpace is thus left, we have ſhewn the *reſiſtance* to approach, in its nature, to that of a diſcontinued fluid.

This then may probably be the caſe in a cylinder moving in the ſame compreſſed fluid, according to the different degrees of its velocity; ſo that if it ſet out with a great velocity, and moves in the fluid till that velocity be much diminiſhed, the reſiſting power of the medium may be near four times greater in the beginning of its motion than in the end. In a globe the difference will not be ſo great, becauſe, on account of its oblique ſurface, its *reſiſtance* in a diſcontinued medium, is but about twice as much as in one properly compreſſed; for its oblique ſurface diminiſhes its *reſiſtance* in one caſe, and not in the other: however, as the compreſſion of the medium, even when a vacuity is left behind the moving body, may yet confine the oblique motion of the parts of the fluid, which are driven before the body, and as in an elaſtic fluid (as is our air) there will be ſome degree of condenſation in thoſe parts; it is highly probable, that the *reſiſtance* of a globe, moving in a compreſſed fluid with a very great velocity, will be between that of a globe and of a cylinder, in a diſcontinued medium; that is, (in proportion to its velocity) we may ſuppoſe it be more than twice, and leſs than four times the *reſiſtance* of the ſame globe, moving ſlowly through the ſame medium; whence, perhaps, we ſhall not much err in ſuppoſing the globe in its ſwifteſt motions to be reſiſted near three times more, in proportion to its velocity, than when it is ſloweſt.

And as this increaſe of the *reſiſting* power of the medium will take place, when the velocity of the moving body is ſo great, that a perfect vacuity is left behind it, ſo ſome degree of augmentation will be ſenſible in velocities much ſhort of this; for even when, by the compreſſion of the fluid, the ſpace left behind the body is inſtantaneouſly filled up; yet, if the velocity, with which the parts of the fluid ruſh in behind, is not much greater than that, with which the body moves; the ſame reaſons we have urged above, in the caſe of an abſolute vacuity, will hold in a leſs degree in this inſtance; and therefore we are not to ſuppoſe, that, in the increaſed *reſiſtance*, which we have hitherto treated of, it immediately vaniſhes, when the compreſſion of the fluid is juſt ſufficient to prevent a vacuum behind the *reſiſted* body; but we muſt conſider it as diminiſhing only, according as the velocity, with which the parts of the fluid follow the body, exceeds that with which the body moves.

Hence then we conclude, that if a globe ſets out in a *reſiſting* medium, with a velocity much exceeding that with which the particles of the medium would ruſh into a void ſpace, in conſequence of their compreſſion, ſo that a vacuum is neceſſarily left behind the globe in its motion; the *reſiſtance* of this medium to the globe will be near three times greater, in proportion to its velocity, than what we are ſure, from Sir Iſaac Newton, would take place in a ſlower motion. We may further conclude, that the *reſiſting* power of the medium will gradually diminiſh, as the velocity of the globe decreaſes, till at laſt, when it moves with velocities which bear but a ſmall proportion to that, with which the particles of the medium follow it, the *reſiſtance* becomes the ſame with what is aſſigned by Sir Iſaac Newton in the caſe of a compreſſed fluid.

And from this determination we may learn how falſe that poſition is, which aſſerts the reſiſtance of any medium to be in the duplicate proportion of the velocity of the *reſiſted* body; for it plainly appears, by what we have ſaid, that this can only be conſidered as nearly true in ſmall variations of velocity, and can never be applied in the comparing together the *reſiſtances* to all velocities whatever, without the moſt enormous errors. See new Principles of Gunnery, by Mr. *Robins*, Part 2. Prop. 1.

As to the *reſiſtance* of the air, it has been thus determined from experiments. Mr. Robins, in his New Principle of Gunnery, pag. 74, 75, *&c.* having taken a muſket barrel, and charging it ſucceſſively with a leaden ball of three quarters of an inch diameter, and about half its weight of powder, and taking ſuch precaution in weighing of the powder, and placing it, as to be ſure, by many previous trials, that the velocity of the ball could not differ by 20 feet in 1′ from its medium quantity. It was fired againſt a pendulum (deſcribed under the head GUNNERY, *Append.*) placed at 25 feet, 75 feet, and at 125 feet diſtance from the mouth of the piece reſpectively. In the firſt caſe it impunged againſt the pendulum with a velocity of 1670 feet in 1′; in the ſecond caſe with a velocity of 1550 feet in 1″; and in the third caſe with a velocity of 1425 feet in 1′; ſo that in paſſing through 50 feet of air, the bullet loſt a velocity of about 120, or 125 feet in 1″; and the time of its paſſing through that ſpace being about $\frac{1}{32}$, or $\frac{1}{30}$ of 1″, the medium quantity of *reſiſtance* muſt, in theſe inſtances, have been about 120 times the weight of the ball; which, as the ball was nearly $\frac{1}{12}$ of a pound, amounts to about 10 lb. avoirdupoiſe.

Now if a computation be made, according to the method laid down for compreſſed fluids in the 38th Propoſ. of lib. 2. of Sir Iſaac Newton's Principia, ſuppoſing the weight of water to be to the weight of air, as 850 to 1, it will be found that the *reſiſtance* of a globe of three quarters of an inch diameter, moving with a velocity of about 1600 feet in 1″, will not, on thoſe principles, amount to any more than a force of $4\frac{1}{6}$ lb. avoirdupoiſe; whence we may conclude (as the rules in that propoſition for ſlow motions are very accurate) that the *reſiſting* power of the air in ſlow motions is leſs than in ſwift motions, in the ratio of $4\frac{1}{6}$ to 10, a proportion between that of 1 to 2, and 1 to 3.

Again, charging the ſame piece with equal quantities of powder, and balls of the ſame weight, and firing three times at the pendulum, placed at 25 feet diſtance from the mouth of the piece, the medium of the velocities with which the ball impinged was 1690 feet in 1″. Then removing the piece 175 feet from the pendulum, the velocity of the ball, at a medium of five ſhots, was 1300 feet in 1′. Whence the ball, in paſſing through 150 feet of air, loſt a velocity of about 390 feet in 1″; and the *reſiſtance*, computed

puted from theſe numbers, comes out ſomething more than in the preceding inſtance, amounting to between 11 and 12 pounds avoirdupoiſe: whence, according to theſe experiments, the *reſiſting* power of the air to ſwift motions is greater than in ſlow ones, in a ratio which approaches nearer to the ratio of 3 to 1, than in the preceding experiments.

Next, to examine this *reſiſtance* in ſmaller velocities, the pendulum being placed at 25 feet diſtance, was fired at five times, and the mean velocity with which the ball impinged was 1180 feet in 1″. Then removing the pendulum to the diſtance of 250 feet, the medium velocity of five ſhot at this diſtance, was 950 feet in 1″; whence the ball, in paſſing through 225 feet of air, loſt a velocity of 230 feet in 1″, and as it paſſed through that interval in about $\frac{3}{4}$ of 1″, the *reſiſtance* to the middle velocity will come out to be near $33\frac{1}{2}$ times the gravity of the ball, or 2 lb. 10 oz. avoirdupoiſe. Now the *reſiſtance* to the ſame velocity, according to the laws obſerved in ſlower motions, amounts to $\frac{7}{11}$ of the ſame quantity; whence in a velocity of 1065 feet in 1″, (the medium of 1180 and 950) the *reſiſting* power of the air is augmented in no greater proportion than of 11 to 7; whereas in greater degrees of velocity, as before, it amounted very near to the ratio of 3 to 1.

That this *reſiſting* power of the air to ſwift motions, is very ſenſibly increaſed beyond what Sir Iſaac's theory for ſlow motions makes it, ſeems hence to be evident. It being, as has been ſaid, in muſket, or cannon ſhot, with their full charge of powder, near three times the quantity aſſigned by that theory.

The *reſiſtance* of a bullet of three quarters of an inch diameter, moving in air with a velocity of 1670 feet in 1″, amounting, as we ſaid, to 10 lb. the *reſiſtance* of a cannon ball of 24 lb. fired with its full charge of powder, and thereby moving with a velocity of 1650 feet in 1″ (which ſcarce differs from the other. See GUNNERY, *Append.*) may hence be determined. For the velocity of the cannon ball being near the ſame as the muſket bullet, and its ſurface above 54 times greater, it follows, that the *reſiſtance* on the cannon ball will amount to more than 540 lb. which is near 23 times its own weight. And from hence it appears how raſh and erroneous the opinion of thoſe is, who neglect the conſideration of the *reſiſtance* of the air as of no importance in the doctrine of projectiles. See PROJECTILE.

RESPIRATION (*Cycl.*)—The alternate motion of the thorax and lungs in *reſpiration* is evident, but it is not eaſy to determine the mechaniſm by which theſe motions are performed. Dr. Martin thinks this has not been accounted for in a ſatisfactory manner, either by Swammerdam, Borelli, Ballivi, Pitcairn, or Boerhaave, and has given us an eſſay on this ſubject in the Medic. Eſſ. Edinb. Vol. 1. Art. 12.

Dr. Hoadley [a] endeavours to prove, that the external intercoſtal muſcles ſerve for *inſpiration*, while the internal intercoſtals are their antagoniſts, depreſſing their ribs in *expiration*. He thinks it proved by Dr. Hales's experiments [b], that there is air in the cavity of the thorax, between the lungs and the pleura, and endeavours to take off the force of Dr. Houſton's aſſerting that he ſaw the lungs and pleura contiguous. He grants, however, that ſometimes there may be little or no air. He accounts for *reſpiration* much in the ſame way with thoſe who aſſume the contiguity of the lungs and pleura. He joins with thoſe who think the impetus, which the internal ſurface of the lungs ſuſtains in common *reſpiration*, to be very little. The uſes of *reſpiration* are, to diſcharge from the venal blood and chyle, ſuch parts as are unfit to render them arterial blood, and to admit air into the blood. From this doctrine he accounts for the phænomena of the diſeaſes of the lungs. He ſubjoins the picture and deſcription of an ingenious inſtrument for illuſtrating the manner in which *reſpiration* is performed. —[a Lectures on Reſpiration. b Veget. Statics exp. 112, 113. and *Hæmaſtat.* p. 83.]

Organs of RESPIRATION, in fly worms. Theſe afford us not only great matter of admiration in their general ſtructure, but by their almoſt endleſs variety in the different ſpecies of theſe creatures, give ample room for the forming claſſes and genera from them.

The firſt claſs of theſe creatures is of thoſe with variable heads, whoſe organs of *reſpiration* are principally behind, the large ſenſible ſtigmata, or breathing holes, being placed there; and which have no ſcaly legs, nor any regularly formed membranaceous ones; and which have, under their belly, certain fleſhy protuberances, each ſeeming a portion of a ring, which is inflated at certain times.

Theſe are the characters common to a vaſt claſs of theſe creatures, which are transformed into two winged flies; but ſeem never to be the marks of thoſe which are produced from the eggs of the four winged claſs. *Reaumur*'s Hiſt. Inſect. Vol. 4. p. 164.

RESPONDEAS *ouſter*, in law, is to anſwer over in an action to the merits of the cauſe.

RESSELA, a term uſed by Paracelſus to ſignify, as himſelf explains it, any thing that expels heat, in oppoſition to *aſſa*, which with him ſignifies any thing that promotes it.

REST (*Cycl.*)—Monſieur de Maupertuis aſſerts, that when bodies are in equilibrio, they muſt be ſo ſituated, that if any ſmall motion be impreſſed on them, the quantity of action reſulting will be the leaſt poſſible. This he calls the law of *reſt*, and from this law he deduces the fundamental propoſition of ſtatics. See Mem. de l'Acad. de Berlin, Tom. 2. p. 294.

Monſieur de Maupertuis deduces the laws of percuſſion from the ſame principle. See *Quantity of* ACTION.

REST-*harrow*, *anonis*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the papilionaceous kind. The piſtil ariſes from the cup, and finally becomes a turgid ſeed veſſel, in ſome ſpecies longer, and in others ſhorter, and uſually containing kidney ſhaped ſeeds. The characters of the leaves are, that they uſually grow three on each ſtalk, though ſometimes they ſtand ſingly in other parts of the ſame plant.

The ſpecies of *anonis* enumerated by Mr. Tournefort are theſe. 1. The common prickly *anonis* with purple flowers. 2. The prickly *anonis* with white flowers. 3. The red flowered *anonis* without prickles. 4. The white flowered *anonis* without prickles. 5. The *anonis* with ſmooth procumbent ſtalks. 6. The leaſt red flowered *anonis* without prickles. 7. The hairy and viſcous purple flowered ſmall *anonis*. 8. The perennial red flowered *anonis* with broad, roundiſh, and deeply ſerrated leaves. 9. The early flowering purple mountain ſhrubby *anonis*. 10. The Spaniſh ſhrubby *anonis* with fleſhy tridentated leaves. 11. The low alpine *anonis* with a ſweet fleſhy root. 12. The ſmooth ſea *anonis* with flowers ſtanding in the alæ of the leaves. 13. The dwarf annual purple *anonis*. 14. The dwarf ſmooth purple flowered alpine *anonis* without prickles. 15. The Sicilian *anonis* with the appearance of the alopecuros. 16. The round leaved Spaniſh purple ſpiked *anonis* without prickles. 17. The hoary procumbent ſea *anonis*. 18. The purple flowered American ſhrubby *anonis*, called by many *crotolaria*. 19. The great yellow viſcous *anonis* without prickles. 20. The ſmooth *anonis* with yellow variegated flowers. 21. The broad leaved yellow annual viſcous *anonis* without prickles. 22. The annual broad leaved erect Portugal viſcous *anonis*. 23. The narrow leaved ſea *anonis* without prickles, with yellow variegated flowers. 24. The yellow flowered dwarf *anonis* with ſmooth narrow leaves. 25. The little yellow French *anonis* without prickles. 26. The *anonis* with ſmall yellow flowers. 27. The ſhrubby Aſiatic *anonis* with large yellow flowers. 28. The ſhrubby Spaniſh *anonis* with rounder leaves. 29. The roſe leaved ſhrubby Spaniſh *anonis*. 30. The broad and roundiſh leaved American *anonis*. 31. The creeping bituminoſe kidneybean-like *anonis*. *Tourn.* Inſt. p. 408.

RESTY, (*Cycl.*) in the manege. A malicious unruly horſe, that ſhrugs himſelf ſhort, and will only go where he pleaſes, is ſaid to be *reſty*. A *reſty* horſe is much the ſame with what the French call *ramingue*. See RAMINGUE.

RESUSCITATION (*Cycl.*)—RESUSCITATION *of plants*, in chemiſtry, the art of reproducing a plant from its aſhes. See PALINGENESIA.

Many have pretended to this art, and have ſhewn *reſuſcitated* plants in vials [c]; but all theſe ſeem only particular inſtances of artificial chemical vegetations, of which many others may be given. The external appearances of theſe reſemble plants, and the ignorant may eaſily take them for ſuch; but when cloſely conſidered, there is a great difference to be found.—[c *Boyle*'s Works Abr. Vol. 1. p. 69.] See *artificial* VEGETATION.

RETCH, or RETCHES, a name given by our farmers to an iron, or a pair of irons, which in the common plow ſerve to faſten the ſheat to the beam. The *retches* are faſtened to the ſheat with nails, and to the beam with pins.

RETENEGI, in the materia medica, a name uſed by Aviſenna, and others, to expreſs the common reſin of the pine, or fir tree, and ſometimes common black pitch. The lexicographers have given us ſtorax as the explanation of *retenegi*, but this is not warranted by any paſſage in the authors who uſe the word. It is certain, indeed, that the generality of authors have confounded the ſeveral ſorts of reſin and pitch making trees together, and among them the pine, fir, cedar, and turpentine trees, are called by the ſame name, but the ſtorax tree is never included among the number. Theſe were only confounded together, becauſe of the ſimilitude of the things they produced; but the ſtorax was too different from all theſe, and too precious a gem not be diſtinguiſhed. See ERZ.

RETENTA, a word uſed by the medical writers to expreſs things retained in the body, or which are not to be retained in a ſtate of good health.

RETENTION *of the firſt ſtools*, in infants. See INFANT.

RETIARIUS, among the Romans, a kind of gladiator, who entered the liſts armed only with a trident in his left hand, and a net in his right. He was to uſe his utmoſt addreſs to throw the net over, and thereby entangle his antagoniſt; and if he miſſed of his aim, he was to betake himſelf to flight, till he had the good luck to recover his net. *Pitiſc.* Lex. Antiq. in voc.

RETINACULUM, the name of a chirurgical inſtrument uſed in caſtration, and in the operation for a hernia, to prevent the inteſtines from falling into the ſcrotum.

RETORT (*Cycl.*)—The quantity of air riſing from ſome ſubſtances is apt to burſt glaſſes in diſtilling; Dr. Browne Langriſh has therefore given us a new contrivance of applying receivers to *retorts*, by which ſuch accidents may be prevented. To his firſt receiver he adapts a ſecond, inſerted into an opening at the top of the firſt, in order to give more room to the rarefied and new generated air. To an opening, at the bottom of each of theſe receivers, he fixes a bottle, tied on cloſe by means of a bladder, ſo that they may be removed at any time, and another inſtantly placed in their room; by which means very little of the ſteam will eſcape. He alſo ties on a bladder to an opening, or upper neck of the ſecond recipient; and this bladder being much thinner and weaker than any of the glaſſes, will always give way firſt, and prevent their burſting. And even when there is the greateſt danger of this accident, the ſmalleſt pin hole made through the top of the bladder, as ſoon as the fumes begin to riſe, will be ſufficient to let out the air as faſt as it is generated. See Philoſ. Tranſ. N° 475. Sect. 3. where we have a figure of the whole apparatus. See alſo Tab. of Chemiſtry, N° 22, and 34.

RETREAT, (*Cycl.*) or TATTOU, in the art of war, is a beat of the drum in the evening, at the firing of a piece called the *warning piece*, at which the drum-major, with all the drums of the battalion, except ſuch as are upon duty, beats round the regiment; the drums of the quarter guards, of the generals guards, and all other ſmall guards, do likewiſe beat; the trumpets at the ſame time ſounding at the head of their reſpective troops. This is to warn the ſoldiers to forbear firing, and the centries to challenge, till break of day, that the reveille is beat. The *retreat* is likewiſe called *ſetting the watch*.

RETTO *moto*, in the Italian muſic. See MOTO.

RETURNS (*Cycl.*)—RETURNS *of a mine*, in the military art, are the turnings and windings of the gallery.

RETURNUM *averiorum*, a judicial writ, the ſame with *retorno habendo*. Reg. Judic. 4.

RETUSE *leaf*, *retuſum folium*, among botaniſts. See the article LEAF.

REVE-*land*. The land which in Domeſday is ſaid to have been *thaneland*, and afterwards converted into *reveland*, ſeems to be ſuch lands as being reverted to the king after the death of his Thane, who had it for life, was not ſince granted out to any by the king, but reſted in charge upon the account of the *reve*, or bailiff of the manor. *Spelm.* Feuds, c. 24. *Blount*.

REVERSE, in the military art, ſignifies on the back, or behind. Thus we ſay, a *reverſe view*, a *reverſe commanding ground*, a *reverſe battery*, &c.

REVOLUTUM *folium*, among botaniſts. See LEAF.

REUTELE, in zoology, a name uſed by ſome for the *umbla minor*, or red charre, a fiſh common in the lakes of Germany, and of the northern parts of England and Wales. The name is originally German. *Willughby*'s Hiſt. Piſc. p. 196. See CHARRE.

REWARDS. Military *rewards*, among the Athenians, conſiſted ſometimes in crowns preſented to thoſe that had merited them; on which their names and noble actions were inſcribed. Some had leave granted them to erect pillars or ſtatues, in honour of ſome god, with inſcriptions ſetting forth their victories. This was a favour that was ſeldom granted; Cimon indeed was honoured with it, but Themiſtocles could never obtain the like. Another honour conferred at Athens on the valiant, was to have their arms placed in the citadel, and to be called *Cecropidæ*, or citizens of the true old blood. Others were preſented with a πανοπλια, or compleat ſuit of armour. Songs of triumph were honorary compliments paid to ſome. The children of thoſe who were killed in battle were maintained at the public expence, till they came to maturity; at which time they were preſented before the aſſembly of the Athenian people with a compleat ſuit of armour, one of the public miniſters proclaiming before them, "that hitherto, in remembrance of "their fathers merits, the commonwealth had educated "theſe young men, but now diſmiſſed them ſo armed, to "go forth and thank their country by imitating their fathers "examples."

Solon made a farther proviſion for the parents of thoſe that died in the wars, it being extremely reaſonable that they ſhould be maintained at the public expence, who had loſt their children, the comfort and ſupport of their declining age, in the ſervice of the public.

As for thoſe who were any wiſe diſabled, they had an allowance from the public towards their maintenance. *Potter*, Tom. 2. p. 118, ſeq.

REWEY, a term among clothiers, ſignifying cloth unevenly wrought, or full of *rewes*, 43 Eliz. c. 10. *Blount*, *Cowel*.

REX *mullorum*, in zoology, a name given by ſome authors to a ſpecies of *mullet* diſtinguiſhed from all the others by its having a prominent belly, and having no beards under the mouth. *Willughby*'s Hiſt. Piſc. p. 286. See the article MULLUS *imberbis*.

REY *graſs*. This is a hardy ſort of *graſs*, much eſteemed among the farmers for that quality. It will grow on any land, and therefore produces crops where nothing elſe will. It thrives beſt of all on ſower, clayey, and weeping grounds, and equally endures the ſevereſt droughts of ſummer, and froſts of winter, ſuffering no damage from either. It is the beſt of all winter foods for cattle, the ſhorter it is eaten the better, and it ſprings the earlieſt of any. There is no danger of overſtocking it, for if it be left to grow too much, the ſtalk becomes hard and ſticky. It is beſt for horſes and for ſheep, and very much prevents the rotting of the latter. The beſt way of ſowing it is with clover. The common quantity of ſeed is two buſhels to an acre, but three buſhels is much better; though in ſome lands, where the clover is likely to ſucceed very well, they ſow eight pounds of clover ſeed, and one buſhel of *rey* ſeed to an acre, and this makes a crop that will laſt ſeven or eight years.

Some mow it as hay, and thraſh it for the ſeed, which about London ſells from half a crown a buſhel to three ſhillings. Four or five quarters of this ſeed will be ſometimes produced from an acre of the *graſs*. If at any time a field of this *graſs* is found to grow thin, it is only neceſſary to ſtrew on a buſhel of the ſeed, and roll it with a wooden roller, and the plants riſing from this addition will make the whole crop ſufficiently thick. *Rey graſs* has this great advantage, that it kills weeds without any other ſown plant; even thiſtles cannot grow among it. When the *rey graſs* is cut for hay before perfectly ripe, the hay is the better, but the ſeed will not grow ſo well. When the ſeed is newly thraſhed, it muſt not be laid too thick, for it is very apt to heat and ferment, and the whole will be ſpoiled. *Mortimer*'s Huſbandry, p. 40.

RHABARBARUM, in botany, the name given to the plant of which *rhubarb* is the root, and which Mr. Tournefort makes to conſtitute of itſelf a peculiar genus, of which there is no other ſpecies. The characters he delivers of the genus are theſe. The flower conſiſts of one leaf, formed into the ſhape of a bell, and divided into ſeveral ſegments; from the bottom of this riſes a piſtil, which ripens into a thick fruit, containing one large triangular ſeed, which is ſo affixed to its triangular capſule as it ripens, that there is no ſeparating it from it. *Tourn.* Inſt. p. 89.

RHABDOMANTIA, ῥαβδομαντεια, among the antients, a ſpecies of divination performed with rods. *Potter*, Archæol. Græc. l. 2. c. 16. Tom. I. p. 334.

RHABDONALEPSIS, ῥαβδου ἀναλημψις, among the Greeks, the reception or elevation of the rod, a feſtival kept every year in the iſland of Cos, at which the prieſts carried a cypreſs tree. *Potter*, Archæol. Græc. l. 2. c. 20. Tom. I. p. 429.

RHABDOPHORI, ῥαβδοφοροι, among the Greeks, officers appointed to preſerve peace and good order, and to correct the unruly at their public games. *Potter*, Archæol. Græc. Tom. I. p. 448.

RHABDUS, ῥαβδος, among the antients, the iron rod with which the boy rolled the *trochus*. See TROCHUS.

RHAGADIOLUS, in botany, the name of a genus of plants, the characters of which are theſe. The flower is compoſed of a number of ſemifloſcules ſtanding on the embryo fruit, and each perforated in its bottom part by the capillament which ariſes from that embryo. Theſe are all contained in one common cup, the ſeveral leaves of which afterwards become ſo many pods, diſpoſed in the form of a ſtar, and containing long ſhaped and pointed ſeeds.

There is only one known ſpecies of this plant, which is the ſtarry headed *hawkweed* of authors, or the *hawkweed* with falcated ſeeds. *Tourn.* Inſt. p. 479.

RHAGE, a word uſed by medical writers for a fiſſure or chap in any part. The ſtones of grapes are alſo by ſome called *rhages*; and by others the ſame word is made to expreſs the extremities of the fingers or toes.

RHAMNOIDES, a name given by Tournefort, and others, to a genus of plants, called by Linnæus *hippophae*. See the article HIPPOPHAE.

RHAMNUS, *buckthorn*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is compoſed of only one leaf, and is of the ſhape of a funnel, and divided into four ſegments at the edge. From the bottom of this there ariſe a number of ſtamina ſurrounding a piſtil, which finally becomes a ſoft and juicy berry, uſually containing four callous ſeeds, gibboſe on one ſide, and flat on the other.

The ſpecies of *rhamnus*, enumerated by Mr. Tournefort, are theſe. 1. The common *buckthorn*. 2. The leſſer *buckthorn*. 3. The ſmaller *buckthorn* with oblong and narrow leaves. 4. The green flowered *buckthorn* with black berries. 5. The ſmall Spaniſh *buckthorn* with leaves like box. Theſe are called by ſome authors *lyciums*. 6. The Spaniſh *buckthorn* with larger box-like leaves. 7. The olive leaved Spaniſh *buckthorn*. 8. The Spaniſh *buckthorn* with hypericum leaves. 9. The Spaniſh *buckthorn* with the leaves and whole appearance of the *ceratia*, or *ſiliqua*. 10. The capillaceous leaved Spaniſh rock *buckthorn*. *Tourn.* Inſt. p. 593.

RHAPSODOMANTIA, Ῥαψωδομαντεια, among the antients, a ſpecies of divination performed with the works or rhapſodies of the poets, particularly Homer and Virgil, who were looked upon as divine and inſpired perſons; whence this kind of divination was called *ſortes Homericæ* and *Virgilianæ*. *Potter*, Archæol. Græc. l. 2. c. 16. Tom. I. p. 333. See SORTES, *Cycl.*

RHEEDIA, in botany, the name of a genus of plants, ſo called from Mr. Van Rheed. The characters of the genus are theſe: the flower has no cup. It conſiſts of four petals, which are of an oval figure, and are hollowed, and expanded wide open. The ſtamina are five filaments. The germen of the piſtil is globoſe. The fruit is ſmall, and of an oval figure. It is ſucculent, and conſiſts only of one cell, and contains three very large ſeeds, which are of an oval oblong figure, and marked with ſtrangely irregular lines, reſembling ſeveral characters. *Linnæi* Gener. Plant. p. 523. *Plumier*. 18.

RHEGMA, a word uſed by the antients to expreſs any breaking, or burſting of a ſoft part without a wound, but moſt frequently for abſceſſes breaking inwardly.

RHENONES, among the antient Germans, a kind of garment covering the ſhoulders and breaſt down to the middle. It was either entirely made of ſkins, or covered over with them; the long hair of which being outward, proved a good defence againſt rain. *Pitiſc.* in voc.

RHEO-STATICS, is uſed by ſome for the ſtatics, or the ſcience of the equilibrium of fluids. *Caſtel.* Math. Univ. p. 73.

RHEUMATISM (*Cycl.*)—In obſtinate *rheumatiſms* ſmall doſes of emetic wine are much recommended by Dr. Huxham.

RHEXIA, in natural hiſtory, the name of a genus of plants, the characters of which are theſe. The perianthium conſiſts of one leaf; it is of an oblong figure, tubular, inflated at the bottom, and divided into four ſegments at the mouth. It remains after the flower is fallen. The flower conſiſts of four petals; they are of a roundiſh figure; they ſtand expanded, and are affixed to the cup. The ſtamina are eight capillary filaments longer than the cup. Theſe are affixed to the cup, and are terminated by long drooping antheræ. The germen of the piſtil is roundiſh, the ſtyle is ſimple, and of the length of the ſtamina. The ſtigma is ſomewhat thick and obtuſe. The capſule is contained within the belly, or inflated part of the cup; it is roundiſh, compoſed of four valves, and containing four cells. This contains a number of roundiſh ſeeds. It is to be obſerved, that in ſome ſpecies of this genus the calyx is ſmooth, in others it has ſeveral hairs diſpoſed in a ſtellated manner. *Linnæi* Gen. Pl. p. 161. *Pluknet*, f. 173. f. 4. *Gronovius*.

RHINANTHUS, in botany, the name of a genus of plants, the characters of which are theſe. The perianthium is roundiſh, but compreſſed, ſomewhat inflated and compoſed of one leaf, divided into four ſegments at the end. This is permanent, and does not fall with the flower. The flower is of the labiated kind, and conſiſts of one petal. Its tube is of the length of the cup, its limb open but compreſſed at the baſe. The upper lip is hooded, compreſſed, marginated and narrow; the under lip is broad, flat, and obtuſe, and lightly divided into three ſegments; the middle one ſomewhat larger than the reſt. The ſtamina are four filaments, of the length of the upper lip of the flower, under which they are hid, two of them are ſomewhat ſhorter than the others. The antheræ are incumbent, and are bifid and hairy. The germen of the piſtil is oval and compreſſed. The ſtyle is capillary, and of the length of the ſtamina, or ſomewhat more than that. The ſtigma is obtuſe and bent. The fruit is an erect orbicular but compreſſed capſule, it is compoſed of two valves, and divided into two cells. The ſeeds are numerous, and of a flatted figure, and fall out by the opening of the capſule at its ſides. *Linnæi* Gen. Pl. p. 282.

RHINE (*Cycl.*)—RHINE, in ichthyology, a name given by Ariſtotle, Appian, and moſt of the Greek writers to that ſpecies of the *ſqualus*, which we uſually call the *ſquatina*; the *ſquatus* of Iſidore and Pliny. Artedi has diſtinguiſhed this from all the other ſpecies of the *ſqualus*, by the having no pinna ani, and the mouth in the extremity of the ſnout.

RHINECHITIS, a name of a chirurgical inſtrument, uſed for ſyringing the noſtrils.

RHINGAU, a name given by ſome authors to the *lavaretus*, a ſmall fiſh, caught in the German lakes, and ſent in pickle into many parts of the world. *Willughby*'s Hiſt. Piſc. p. 183. See the article LAVARETUS.

RHINOBATUS, in zoology, the name of a flat cartilaginous fiſh, of the *ſquatina*, or *monk fiſh* kind, but differing from it in this, that the body is proportionably longer, and the head is more pointed; and the mouth is a great way below the end of the ſnout, and placed under the head. It is from three to four feet long, and is common in the Mediterranean, and brought to market in ſome parts of Naples. *Fab. Column.* p. 119.

RHINOCEROS, in zoology, the name of a genus of quadrupeds, ſo called from an horn growing on their noſe.

Of this genus there are only two known ſpecies. 1. The *rhinoceros* with only one horn on its noſe; and, 2. The *rhinoceros* with two horns.

In the year 1739 we had a young *rhinoceros* ſhewn in England, of which Dr. Parſons has given a very accurate account in the Philoſophical Tranſactions.

The creature fed on rice, ſugar, and hay; his keeper uſed to mix the rice and ſugar in the following manner: ſeven pounds of rice and three pounds of ſugar made the proviſion for one day; he eat this at three meals; and beſides this he eat about a truſs of hay every week, and a large quantity of greens that were brought to him, at different times, and of which he ſeemed more fond than of dried food. He drank often, and always ſwallowed a large quantity of water at a time. See Tab. of Quadrupeds, N° 13 and 14.

He appeared very peaceable in his temper, and bore to be handled on any part of his body, with great patience, except when he was hungry; but he was then always outragious, as alſo when he was ſtruck. His moſt violent paſſions, even on the laſt occaſion, were however always immediately appeaſed by giving him victuals.

Notwithſtanding the lumpiſh aſpect, and heavy make of this creature, he would jump about very nimbly in his fits of paſſion, and often leap to a great height; and one common mark of his fury was the ſtriking his head againſt the walls, or any thing elſe that was in the way, and this he would do with terrible violence. He was very apt to fall into theſe paſſions in a morning before his rice and ſugar were given him, and from the whole he appeared quite untractable, and ſeemed able, in his paſſions, to have run ſo faſt, as that a man on foot could not have eſcaped him.

This creature was two years old, and did not exceed a young heifer in height, but was remarkably broad and thick. His head was very large; and the hinder part of it, near the ears, remarkably elevated above the reſt of the face, which was flat, and ſunk down, in a remarkable manner in the middle, riſing again toward the origin of the horn, but in a much ſmaller degree. The horn ſtands upon the noſe of the animal as upon a ſort of hill; and when the ſceleton of the head is ſeen, that part of the ſkull on which the horn is fixed, is found to riſe into a blunt cone, to anſwer to a cavity in the baſis of the horn, which is very hard and ſolid; in other reſpects, having no manner of hollow, or core, like thoſe of other quadrupeds. The horn in this young animal did not riſe above an inch high from its tough baſis, and was black and ſmooth at the top, but ragged downwards; and the determination of its growth is backward, not ſtrait up; this is very evidently ſeen in the horns of old *rhinoceroſes*, which are always curved in a conſiderable degree that way. If we conſider the proportion of this animal's ſize, to the length of its horn, and thence carry the proportion to that between the large horns we ſee in the muſeums of the curious, we muſt ſuppoſe the animal of a very ſtupendous ſize, when at its full growth. Phil. Tranſ. N° 470. p. 530.

The ſides of the under jaw, in this creature, ſtand very wide aſunder, ſlanting outward to the lower edge, and backward to the neck; the edges turn outwards from this ſtructure of the bones, and the head neceſſarily looks very large. That part of the head which reaches from the forepart of the horn to the upper lip may be called the noſe; this is very thick, and bulky, and has a kind of circular ſweep down towards the noſtrils; on all this part there are a great number of rugæ or wrinkles.

The noſtrils are ſituated very low, in the ſame direction with the opening of the mouth, and not more than an inch from it; and when viewed in a foreview, the whole noſe, from the top of the horn to the verge of the lower lip, is ſhaped like a bell. The under lip is like that of an ox, but the upper more like that of a horſe, and he uſes it as that creature does, to gather up hay from the rack, or graſs from the ground; but, with this ſuperior advantage, that this creature has a power of extending this lip to ſix or ſeven inches in length from the noſe, and there drawing it to a point; with this lip, thus extended, the creature is able to graſp a ſtick, or any ſmall ſubſtance, and hold it extremely faſt; and this power of prolonging the lips ſerves, in many purpoſes, to the ſame end as the trunk of that other unweildy animal the elephant.

The tongue of the *rhinoceros* is ſaid to be ſo rough as to be able to rub a man's fleſh off from the bones; but, in this young ſubject it was ſo ſoft, that it reſembled that of a calf. It may poſſibly grow harder with age; but the ſtory of its effects ſeems of a piece with the many other falſe marvels reported of this animal. The eyes are dull and ſleepy, much like thoſe of a hog in ſhape; he ſeldom opens them entirely; and it is to be obſerved, that they are ſituated nearer the noſe than thoſe of any other known quadruped. The ears are broad and thin toward the top, much like thoſe of a hog; but they ariſe each from a narrow round baſe, with ſome wrinkles on it, which iſſues out of a ſinus, as it were ſurrounded with a fleſhy fold. The neck is very ſhort, and has two folds, or wrinkles, wholly ſurrounding it, only that the anterior one is broken underneath; and has a flap

hanging

hanging from it ſo deep, that it would contain a man's hand; from the middle of the poſterior plica of the neck, there ariſes another, which paſſing backward, is loſt before it reaches the body. The ſhoulders are thick and heavy, and have each a fold paſſing downward. The body is very large and thick, and ſtands out at the ſides like that of a cow with calf. The legs are very thick and ſtrong, they are round, and ſomewhat ſmaller downwards than in the upper part; and when the creature ſtands upright they bend inward at the knee, ſo that they are nothing like ſtrait. In ſome quadrupeds the fetlock bends to the weight of the animal, but in this creature there is no appearance of any ſuch bending, ſo that he ſeems to ſtand upon four ſtumps, eſpecially when viewed behind. He has three hoofs upon each foot forward, but the back part is a great maſs of fleſh, rough like the reſt of the ſkin; and the ſole of the foot is very plump and callous in the ſurface, but eaſily yielding to the preſſure from the ſoftneſs of the ſubjacent fleſh. Its ſhape is like that of a heart, with a blunt apex before, and a broad baſe behind. The tail is very ſmall in proportion to the ſize of the animal, not exceeding ſeventeen or eighteen inches in length, and but thin or ſlender; it is very rough, and has a kind of twiſt or ſtricture towards the extremities, ending in a flat maſs; this gave occaſion to ſome authors to compare the whole tail to a ſpatula; on the ſides of this flat part there grew a few ſhort, but very thick and ſtrong black hairs, but theſe grow much longer in the more advanced ſtate of the creature; and are not round, like other hairs, but flat, like ſmall pieces of whalebone. The creature has no other hair about it, except a very ſmall quantity at the edge of the ears. See Tab. of Quadrupeds, N° 13 and 14.

The penis of the male *rhinoceros* is of a very remarkable ſtructure, being incloſed in two caſes. The female differs in nothing from the male except in the pudenda, which are ſhaped like thoſe of a cow.

The ſkin of the *rhinoceros* is thick, and ſeems almoſt impenetrable; it feels like a piece of board of half an inch thick. It is covered in all parts, more or leſs, with a ſort of incruſtations, reſembling ſcales. Theſe are ſmall on the neck, and largeſt of all in the ſhoulders and hips; between the folds of this thick ſkin, the cuticle, which is left bare, is ſoft, and eaſily penetrable. The ſcabby incruſtations of the ſkin have been called ſcales, by ſome writers; but this is a very wrong term, for they have nothing of the nature of ſcales, nor any thing of regularity in them.

The creature is of the retromingent, and therefore probably of the retrogenerative kind; the penis, when erect, is not more than nine, or at the utmoſt ten inches long, and is curved backward at the end. This was the deſcription of the *rhinoceros* ſhewn in England at this time, and of all the others that have been ſeen in this part of the world as to the general characters; but though theſe creatures, which we have ſeen, have but one horn, it is very certain, that there is a ſpecies of *rhinoceros* which has two. Martial has mentioned a *rhinoceros*, as ſhewn in the amphitheatre at Rome, which had two horns; but his commentators ſuppoſing the copies erroneous, have been at great pains to alter it, ſo as to make it expreſs what they had ſeen or heard of, that is a *rhinoceros* only with one horn: but it appears, from almoſt indiſputable teſtimony, that there not only is in nature ſuch a *rhinoceros* with two horns, but that ſuch were ſhewn in the public ſports at Rome, and therefore the text ſeems to have been very right, and the commentators in the wrong. The creatures we have ſeen have indeed only had one horn; and the accounts of travellers, and the great number of horns preſerved in the cabinets of the curious, which are all ſingle, ſeem to prove this; but though the *rhinoceroſes* of Aſia are all one horned, yet it is certain, that there is a kind found in Africa which has two horns, and not leſs certain, that the Romans had beaſts from this laſt part of the world as well as the other. Peter Kolbe, in his voyage to the Cape of Good Hope, deſcribes *rhinoceroſes*, which he ſaw, and which had a horn on the noſe, and another cloſe behind it. Sir Hans Sloan's muſeum affords two horns of a *rhinoceros*, ſtanding juſt as this author has deſcribed them, which are ſtill fixed to the ſame integument; and we are convinced of the Romans being acquainted with this ſpecies, from a braſs medal of Domitian, which has on it a *rhinoceros*, with two horns on the noſe placed in this manner.

Redi, who has been very ſagacious in diſcovering the falſity of many of the pretended medicines taken from animals, yet gives us, on the teſtimony of his own experience, an account of ſome very remarkable virtues in the parts of the *rhinoceros*. The blood he aſſures us is excellent in colics and in dyſenteries. The decoction of the ſkin, he aſſures us, is a grand ſtomachic antidote, and the horns are very valuable and alexipharmic. *Redi*'s Eſperience.

RHINOCEROS *avis*, the *rhinoceros bird*, a name given by authors to a ſpecies of Indian raven, called by others *corvus indicus cornutus*. The beak of which is frequently brought over into Europe.

It is a very ugly bird, and of a very rank ſmell. It much exceeds the European raven in bigneſs, and its head and neck are very thick. Its eyes are very large, and its beak of a very remarkable figure, having a large and thick horn like protuberance on its upper part. The whole beak is bent like a bow, not hooked at the end like the beaks of the hawk, *&c.* It is of a yellowiſh white below, and on the upper part toward the head is of a fine gay red, and the reſt of a yellowiſh white: the upper chap is ſerrated. The horn grows out from the head with this and runs along it, and bends up at its extremity; its upper and under part are red, its middle yellow. The bird feeds on carrion, and the guts of dead animals. *Aldrovand* de Avibus.

RHINOPTES, a word uſed by the antients to expreſs a perſon, who from an ulcer in the great canthus of the eye, laying open the paſſages to the noſe, can ſee through his noſtril.

RHIPTASMOS, a word uſed by the antients, to expreſs a reſtleſſneſs and frequent toſſing about, a very common ſymptom in fevers.

RHIZAGRA, the name of a chirurgical inſtrument uſed to extract the ſtumps of teeth.

RHIZOPHORA, in botany, the name given by Linnæus to a genus of plants, deſcribed under the name of *mangles* by Plumier, the characters of which are theſe: the perianthium is erect, and is compoſed of one leaf, divided into four oblong ſegments. The flower is erect, and is compoſed of one petal, divided into four ſegments, and is ſhorter than the cup. The ſtamina are twelve erect filaments, alternately ſhorter one than the other, and the antheræ are ſmall. The germen of the piſtil is ſubulated; there is ſcarce any ſtyle; the ſtigma is acute, and the receptacle is of an oval figure; this becomes fleſhy, and contains the baſe of the ſeed. The ſeed is ſingle, and extremely long; it is of a clavated figure, and pointed at the end. There is ſome variation in the number of the ſtamina in this plant; they are always, however, of ſome number between eight and twelve, theſe being the higheſt and loweſt extremes. *Linnæi* Gen. Pl. p. 207. *Plumier* Gen. 15. Hort. Mal. Vol. 6. p. 31, 32.

RHODIOLA, in botany, the name given by Linnæus to a genus of plants, commonly called *rhodia*. The characters of which are theſe: it produces two kinds of flowers, the one hermaphrodite, acting as male flowers; the other ſimply female. In the male flower, the cup is a concave erect perianthium, divided into four obtuſe ſegments, and not falling with the petals. The flower conſiſts of four petals, which are oblong, obtuſe, erecto-patent, and twice as long as the ſegments of the cup: theſe fall ſoon after they are open: they have four erect nectaria, ſurrounded with a thin rim, and ſomewhat ſhorter than the cup. The ſtamina are eight pointed filaments, longer than the petals of the flower. The antheræ are ſimple. The piſtil has four oblong and pointed germina. The ſtyles and ſtigmata are very imperfect. The fruit that ſhould ſucceed theſe is very abortive.

In the female flower the cup is of the ſame kind with that of the male. The flower is compoſed of four rude, erect, and obtuſe petals, of the ſame ſize with the ſegments of the cup, and remaining with it. The nectaria in this flower are the ſame with thoſe of the male. The piſtil has four oblong pointed germens, which go off into ſo many ſtrait ſimple ſtyles, crowned with obtuſe ſtigmata. The fruit conſiſts of four corniculated capſules, which are univalve, compreſſed inwards, and opening in that part. In theſe capſules are contained a number of ſeeds of a roundiſh ſhape. *Linnæi* Gen. Pl. p. 498.

RHODITES *lapis*, the *roſe ſtone*, in natural hiſtory, the name given by authors to a kind of *aſtroites*, or *ſtar-ſtone*, in which the figures more repreſent roſes than ſtars: they are in both owing to coralloide bodies immerſed in the ſtone; which, according to their various ſpecies, afford a different figure, when cut tranſverſely, in the cutting the ſtone into plates for uſe. See ASTROITES and STAR-*ſtone*.

RHODIUM *marmor*, a name given by the antients to a marble brought from Rhodes; it was of a good white, but inferior to the Parian, and was uſed by the Romans in their public buildings, and ſometimes in ſtatuary.

RHODOMELON, a name given by the antients to a confection made of roſes, quinces, and honey, uſed as a grateful aſtringent and detergent in many caſes.

RHODOPUS *gallinula*, in zoology, a name given by ſome authors to the bird more uſually known by the name *tringa*. *Geſner* de Avid. See the article TRINGA.

RHOITES, the name of a medicine among the antients, which is a ſort of rob of the juice of pomegranates. Dioſcorides deſcribes it as the ſimple juice of the fruit, evaporated over the fire to the conſiſtence of an extract; but Paulus Ægineta gives the receipt to be three parts juice of pomegranate, and one part honey, boiled to the evaporation of a third part. So that the *rhoites* of Dioſcorides was a true rob of pomegranates; the other, rather honey of pomegranates, like our honey of roſes.

RHOMB. See the article RHOMBUS, *Cycl.* and *Suppl.*

RHOMBO, the name of a peculiar fiſh of the *rhombus*, or turbot kind, called *rhombus aculeatus* by Aldrovand, Geſner, and other authors. It is a large fiſh, of an aſh coloured green on the back, and white on the belly. It has no ſcales;

but the ſkin of its back is divided by lines, ſomething in the manner of the ſkins of ſnakes. The mouth is very large, and is well furniſhed with teeth; and the palate has a number of tubercles, armed alſo with a ſort of teeth. It feeds on fiſh, and its fleſh is very delicate. It is very common in the markets at Venice, and is caught in the neighbouring ſeas, and in many other places. *Willughby*'s Hiſt. Piſc. p. 92. *Geſner*, p. 778. *Aldrov.* de Piſc. l. 2. c. 48.

RHOMBOIDÆUS *major* and *minor*, names given by Albinus to what he makes two muſcles; though Winſlow and others account it only one. What Winſlow calls the inferior portion of the rhomboidalis, Albinus calls *rhomboidæus major*, and what he calls the upper portion of that muſcle, Albinus calls *rhomboidæus minor*. See the article SCAPULA.

RHOMBOIDALIS. See the articles RHOMBOIDÆUS and SCAPULA.

RHOMBOIDES, in anatomy, a muſcle, which is a thin, broad, and oblique ſquare fleſhy plane, ſituated between the baſis of the ſcapula and the ſpina dorſi. It may be divided into two portions, one ſuperior, the other inferior, which ſometimes appear ſeparate. The ſuperior portion, which ſeems in ſome ſubjects to be made up of two, is fixed by an inſertion wholly fleſhy in the two or three loweſt ſpinal apophyſes of the neck, and partly in the poſterior cervical ligament. The inferior portion is fixed by a tendinous plane in the three or four uppermoſt ſpinal apophyſes of the back.

Theſe two portions, of which the inferior is much the broadeſt, being united, are inſerted in the edge of the baſis ſcapulæ, from the ſmall triangular ſpace to the inferior angle, the ſuperior portion covering a ſmall portion of the angularis at its inſertion. This whole muſcle is covered by the trapezius, and covers the ſerratus poſticus ſuperior, being joined to each of theſe muſcles by a filamentary or cellular ſubſtance. *Winſlow*'s Anatomy, p. 174.

RHOMBOIDIA, in natural hiſtory, the name of a genus of ſpars, given them from their being of a rhomboidal form. They owe this figure to an admixture of particles of iron, and conſiſts of ſix planes.

Of this genus there are only two known ſpecies. 1. A white thin one with very thin cruſts; and 2. A whitiſh brown thick one with thicker cruſts. Theſe are both found in the foreſt of Dean in Glouceſterſhire, and in other places where there are iron ores.

RHOMBUS (*Cycl.*)—*Solid* RHOMBUS, in geometry, two equal and right cones joined together at their baſes.

RHOMBUS, in zoology, a genus of fiſhes, which are oviparous, and have a flat, ſhort, and ſomewhat ſquared body, and ſwim on one ſide. The turbot and other fiſh of that make, are of this genus. The ſides of theſe fiſh are equal, but their angles unequal. *Willughby*'s Hiſt. Piſc. p. 93.

RHOMBUS, in conchyliology, the name given by the generality of authors to a genus of the ſhell fiſh, much more properly called by ſome *cylindrus*. See CYLINDRUS.

RHOPALOSIS, a diſtemper of the hair deſcribed by the antients, and ſeeming to be the ſame with what we call the *plica polonica*, being a ſort of matting together of the hair into long and thick treſſes.

RHOPE, a word uſed by the Greek writers, to expreſs a violent tendency of the humors to any particular part of the body.

RHOX, a word uſed by ſome authors to expreſs the tunica uvea of the eye.

RHUBARB (*Cycl.*)—The Indian *rhubarb* ſown in our gardens has this peculiar property, that it yields a fine and clear gum. This is perfectly white and pellucid, and in the months of June and July is ſo plentiful, that an ounce may ſometimes be gathered at a time from one plant of it. It exſudates of itſelf from all parts of the ſtalks and ribs of the leaves, and ſometimes from the under part of the leaves themſelves. It ſtands in ſome places in large drops, and in others the ſtalks, *&c.* ſeem only to be covered with a thin layer of it; and the under part of the leaves in ſome have it in form of twiſted wires or long icicles. The plant may always be ſeen wounded by a ſort of cauſtic in the places where the germen makes its way out, and theſe may be followed with any pointed inſtrument through the ſkin; in ſome parts of the plant this juice is found to be turned gummy within it, and looks like clear ice. As this is the only known herbaceous plant, that yields a true gum like that of trees, it would be worthy obſervation, whether or not ſome of our own plants have ſome tendency of nature, to form a juice of the ſame kind. It would be moſt proper to look for this in the plants of the ſame genus, and as nearly related to the *rhubarb* as we can. The docks ſo common about our fields are of the ſame genus; and the ſorrel ſhews, by its taſte, that it is particularly allied to the plant; for both are alike of the dock kind, and both alike ſour. It would be proper to look carefully about the leaves of ſorrel a little before it flowers, to ſee whether any thing like the ſame gum appears on it.

There is yet this farther analogy between this *rhubarb* and our common ſorrel; that the huſks of our ſorrel, boiled in water, with a little alum, turn it to a fine red colour; and the huſks of *rhubarb* do the ſame, and both the one and the other often turn red in decaying.

The juice of the roots of this *rhubarb*, extracted by bruiſing and ſteeping it in common water, when the liquor is ſtrained and evaporated, becomes only a clear uninflammable gum, and melts in the flame of a candle. This gum, as well as that of the ſtalks and leaves, is of an inſipid taſte; and it is obſervable, that though the plant naturally yields it in ſo large a quantity, yet it will not flow from wounds made by art in any part of the plant. Upon the conſideration of the inſipid taſte of this gum, and its ſolubility in water, we may find ſome probable conjecture, in regard to the different virtues of this plant in purging and binding. The woody fibres have a ſtrong taſte; and, in all probability, are alone endued with the aſtringent quality. An infuſion of *rhubarb* is known to purge, and a powder of it to bind: the reaſon is eaſily ſeen on this conſideration. The water in the infuſion takes up all this gummy juice, and its other juices, but leaves the fibroſe part behind, in conſequence of which it ought to purge without binding; but in caſe of giving the powder, the juices are in great part evaporated in the drying, and the woody part left almoſt alone; it therefore purges but little, and proves powerfully aſtringent. Phil. Tranſ. N° 224.

RHUS, *ſumach*, in botany, the name of a genus of trees, the characters of which are theſe. The flower is of the roſaceous kind, and is compoſed of ſeveral petals, diſpoſed in a circular form. The piſtil ariſes from the cup, and finally becomes a roundiſh fruit, with a depreſſion on one ſide, which gives it ſomewhat of a kidney like ſhape, and containing a ſeed of the ſame figure.

The ſpecies of *ſumach* enumerated by Mr. Tournefort are theſe. 1. The common or elm leaved *ſumach*. 2. The Virginian *ſumach*, and 3. The Canada *ſumach* with long leaves ſmooth on both ſides. *Tourn.* Inſt. p. 611.

RHUSELINUM, in botany, a name given by ſome authors to the *ranunculus*. *Ger.* Emac. Ind. 2.

RHYNE, in botany, a name uſed by ſome authors for the camphor tree. *Breyn.* Prod. VI. p. 4.

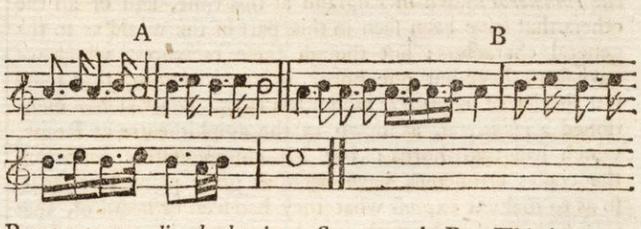
RHYTIDOSIS, the name of a diſtemper of the eye in which it waſtes and wrinkles up.

RHITHM. See the article RYTHM.

RIB. See RIBS, infra.

RIBATTUTA, in the Italian muſic, a ſtriking or ſounding the ſame note over again. Hence,

RIBATTUTA *di gola*, one of the graces in ſinging, is performed by repeated beating or ſtriking a note, from that which is immediately above it. See example A. It differs from a ſhake.



RIBATTUTA *di gola doppia*. See example B. This is pretty near what the French call *tour de goſier*, or *double cadence*. *Broſſard.* Dict. Muſ.

RIBESIA *nigra*, *black currants*, have been long famous in England for quinſies and ſore throats, ſo as to obtain the name of ſquinancy or quinſy berries. See GROSSULARIA.

RIBS (*Cycl.*)—The number of theſe varies in different ſubjects, ſometimes in one ſide only, and ſometimes in both.

Anatomiſts have divided each *rib* into the middle part or body, two extremities, the one anterior, the other poſterior; two ſides one external and convex, the other internal and concave; two edges, one ſuperior and the other inferior; and two labia in each edge, one external, the other internal. The poſterior extremity, which may be called the head of the *rib*, is articulated with the vertebræ of the back. At the anterior extremity freſh *ribs* are lengthened out by cartilaginous epiphyſes, ſtuck into their bony ends. Each of the true *ribs*, at the poſterior extremity, has two ſmall cartilaginous impreſſions, diſtinguiſhed by a kind of angle, by which they are articulated with the lateral cartilaginous impreſſions in the bodies of two vertebræ of the back; but the firſt *rib* has no more than one ſuch impreſſion, being articulated with one vertebra only. At a ſmall diſtance from the head of this extremity poſteriorly is another cartilaginous impreſſion on each ſide, a little convex, and cloſely joined to a ſmall tuberoſity. By theſe the *ribs* are articulated with the lateral cartilaginous impreſſions in the tranſverſe apophyſes of the dorſal vertebræ; and the tuberoſities ſerve for the inſertion of the ligaments; the portion which lies between the head and theſe impreſſions is contracted, and repreſents a neck. When the poſterior extremity of a *rib* is articulated with two vertebræ, the ſecond articulation is always with the tranſverſe proceſs of the loweſt two. Between the tuberoſity and middle part of the *ribs*, there is on their outſide a kind of oblique rough angle of different breadths. In the firſt *rib*, this angle is not diſtinct from the tube-

tuberoſity; in the ſecond, it reaches but to a ſmall diſtance from it; in the third *rib*, this diſtance is ſtill greater, and from thence it continues to increaſe gradually all the way to the third falſe *rib*; ſo that if we look directly at the back of a ſceleton, theſe angles repreſent the legs of a pair of compaſſes opened pretty wide. On the inſide of the *ribs*, toward the lower edge, we obſerve a groove reaching all the way from the angle to the extremity, and that chiefly in the five lower true *ribs*, and the three firſt falſe ones. The upper edge of the three firſt *ribs* is ſharp, the lower a little rounded. The upper edge of the third is more obtuſe, and the lower a little more flat. In the reſt, the upper edge is rounded, the lower, more or leſs ſharp.

In all the *ribs* the anterior extremity is lower than the poſterior; the *ribs* are much more crooked in the back than in the forepart; the appendices, epiphyſes, or cartilaginous portions of the true *ribs*, increaſe in length, as they deſcend in the ſame manner as the *ribs* themſelves; the cartilages of the firſt three or four *ribs* lie nearly in the ſame direction with the *ribs* themſelves. In the *ribs* below theſe, the cartilages make angles, at which they turn upward towards the ſternum, and this curvature increaſes in proportion as the *ribs* deſcend; and the loweſt cartilages, in changing their direction upwards, lie very cloſe to each other, and thoſe of the laſt two *ribs* have often, at their inferior edge, a ſort of apophyſis or production, by which they are connected with the cartilages immediately below them. The laſt two *ribs* extend conſiderably in breadth toward their lower ſharp edges, from the angle for a good diſtance anteriorly. Afterwards they contract in breadth and increaſe in thickneſs, forming a ſort of neck, a little longer than that at their poſterior extremity; then their breadth begins to increaſe again, by degrees, to the anterior extremity. In all the *ribs*, this extremity terminates in a cavity, in which the cartilages are graſted. The three uppermoſt falſe *ribs* increaſe in breadth from the angle forward, and the grooves are moſt conſiderable in theſe. They have alſo heads, necks, tuberoſities, and angles, almoſt the ſame as in the laſt true *ribs*. All the falſe *ribs* have cartilaginous appendages; the firſt of which is longeſt, and fixed to the cartilage of the laſt true *rib*; the two following are united together at their extremities, and the two laſt are connected only to muſcles and ligaments. They are both very ſhort, eſpecially the laſt, which is not above a quarter of an inch in length, and all theſe cartilages of the falſe *ribs* are pointed at their extremities.

The *ribs* are articulated anteriorly with the ſternum, and behind with the vertebræ of the back; the firſt *rib* is entirely united with the ſternum, by means of its cartilage, and in the ſix following the extremities of the cartilages join that bone. The three upper falſe *ribs* are joined to each other by the extremities of their cartilages; the connection of the *ribs*, with the vertebræ of the back, is for the moſt part by ginglymus. The ten upper *ribs* are confined to two motions only, upward and downward; whereas the two laſt are left more at liberty, and are therefore termed floating *ribs*. *Winſlow*'s Anatomy, p. 65.

Cartilages of the RIBS. All the *ribs* have cartilaginous portions, which differ from each other in length, breadth, incurvations, adheſions, and in their extremities. It is to be obſerved, that theſe cartilages are white, more poliſhed, broader and thicker in their natural ſtate, than in the dried ſceleton. The cartilages of the falſe *ribs* are naturally ſofter, and more pliable than thoſe of the true; the middle or inner ſubſtance of theſe acquires the conſiſtence of bones in old age, and their extremities ſometimes oſſify, and are immoveably fixed to the ſternum. Ibid. p. 149.

Ligaments of the RIBS. All the *ribs* are connected to the bodies of the vertebræ by ſtrong, ſhort, ligamentary faſciculi, fixed by one end round the foſſula in the vertebræ, and by the other round the head of each *rib*. They are alſo tied together by thin ligaments, which go from the cartilage of each *rib* obliquely to that of the next. The ten uppermoſt *ribs* on each ſide are connected to the tranſverſe apophyſes of the vertebræ of the back by ſtrong, ſhort, articular ligaments fixed to the tuberoſities of the *ribs*, and round the foſſula of the apophyſes; and this much in the ſame manner with thoſe which go between the heads of the *ribs* and bodies of the vertebræ: both theſe articulations are provided with capſular ligaments. The eleventh *rib* on each ſide having no articulation with the tranſverſe apophyſes, is connected to them by auxiliary ſtrong ſhort ligaments fixed in its neck. The laſt *rib* is only joined by its head to the body of the twelfth vertebra of the back; but it is connected, in a particular manner, to the tranſverſe apophyſis of the firſt vertebra of the loins by a broad ligament, fixed in the whole upper edge of the apophyſis, and in the lower edge of the *rib*, though about two thirds of its length. The firſt true *rib* has no ligamentary connection with the ſternum, the cartilaginous ſymphyſis being ſufficient; the reſt are cloſely joined to that bone by ſmall ligamentary portions, fixed by one end round the extremity of the cartilage, and by the other round the notches in the ſternum. The cartilage of the firſt falſe *rib* is joined to that of the laſt true *rib*, by ſeveral ſhort filaments, which go from the lower edge of the one to the upper edge of the other near its ſmall extremity. The other falſe *ribs* are connected together much in the ſame manner; except that the filaments, by which the fourth is connected to the third, are longer than thoſe above them, and thoſe between the fifth and fourth are much longer than any of the reſt; and for this reaſon theſe *ribs* are leſs ſteady than the others. The ligamentary expanſions of the vertebræ are in place of a perioſteum, but the *ribs* and ſternum have a perioſteum like other bones, only that the cartilaginous portions of the *ribs* generally give their covering the name of a pericardium.

Diſlocated RIBS. The *ribs* are ſometimes, though but ſeldom, diſlocated; for they are ſometimes diſplaced by ſome external violence, and thruſt either upwards or downwards, outwards or inwards. They cannot eaſily indeed be luxated outwards, becauſe prevented by the vertebral proceſſes, and reſiſted by very thick and ſtrong muſcles; but when they are driven into the cavity of the thorax, which oftener happens, they not only lacerate the pleura, or membrane, which lines the cavity of the thorax, but generally do great injury alſo to the contained parts: in conſequence of which ariſe moſt ſharp pains, inflammation, difficulty of breathing, coughs, ulcers, immobility, and many other dangerous ſymptoms.

When the *rib* is luxated either upwards or downwards, in order to replace it conveniently, the patient is to be laid on his belly upon a table, and the ſurgeon muſt endeavour to reduce the luxated bone to its right place with his hands; or the arm of the diſordered ſide may be ſuſpended over a gate or ladder; and while the *ribs* are thus ſtretched up from each other, the heads of ſuch as are luxated may be puſhed into their former ſeat.

Thoſe luxations, where the heads of the *ribs* are found to be thruſt inwards into the cavity of the thorax, are much the moſt difficult to be reduced, becauſe neither the hand, nor any other inſtrument can be applied internally, to aſſiſt and direct the bone in the operation. In this caſe it ſeems proper to lay the patient on his belly, over ſome gibbous or cylindric body, and move the forepart of the *rib* inwards toward the back, ſhaking it ſometimes; for thus it ſometimes happens, that the head of the luxated *rib* ſlips into its former place. But if this method of cure will not avail, we have no remedy left but inciſion, and endeavouring to replace the luxated head of the *rib* by the fingers, plyers, or little hooks. In the mean time, where the ſymptoms are not very urgent, and the heads of the *ribs* but little diſplaced, it is much more adviſeable to have recourſe to none of theſe means, becauſe there are ſeveral inſtances where the luxated *ribs* have ſafely retained their diſlocated ſtations; but above all, care muſt be taken to lay on a compreſs, dipped in warm ſpirit of wine upon the part, and retain it on by the napkin and ſcapulary bandage. *Heiſter*, Surg. p. 157.

Fractured RIBS. Sometimes the *ribs* are only fiſſured in ſuch a manner, that the external or internal part of them are only hurt, without their being removed out of their place. This is uſually attended by no bad accident, and the bone frequently grows together again of itſelf, without the accident's being diſcovered. But if the whole *rib* be fractured, and ſome part of it removed out of its place, it is a more dangerous caſe: for the coſtal muſcles, and the pleura, that lines the internal cavity of the thorax, will be much diſturbed by the fragments of the bone.

When a *rib* is fractured, it projects either externally or internally in the form of a broken arch; when it projects externally the ſymptoms are uſually much milder; but when it is drove inward the caſe is uſually much worſe, eſpecially if any vein or artery be divided by it, ſo as to let blood run into the cavity of the thorax: in conſequence of which there follow prickings, inflammation, difficult reſpiration, coughs, fevers, ſpitting of blood, ſuppuration, extravaſation of blood, and other bad ſymptoms, particularly if any of the viſcera are hurt at the ſame time.

In order to replace fractured *ribs*, it is neceſſary firſt to enquire whether they project internally or externally; when externally, the patient is to be placed upon a high table, and the ſeparated bones muſt be gently forced by the fingers into their places; the proper compreſſes, dipped in ſpirit of wine, muſt be laid on, and then covered with ſlips of paſtboard, or ſplints, and the circular bandage, or napkin and ſcapulary. But when the ſplinters are thruſt inward, while the patient retains a deep breath; both ſides of the bone muſt be compreſſed with the hands, and agitated till they are properly fixed. When they are replaced, the paſtboard muſt not be applied in this caſe, but only the bandage drawn a little leſs tight; by theſe means, fractures of this kind are uſually cured in three or four weeks. Ibid. p. 123.

RIBS *of fiſhes*. There is a very great variety in the ſhape, and other peculiarities of the *ribs of fiſhes*. They are in ſome ſmooth and flatted ſideways, as in the cyprini. In others they are rounded, as in the cotti and gadi. In the

cyprini

cyprini the ſeveral ſpecies have from thirteen to nineteen *ribs* on a ſide, and the vertebræ are from thirty-ſeven to forty nine in number, differing greatly in number in the ſeveral ſpecies of the ſame genus. The *ribs*, in many fiſh, adhere to the vertebræ, by means of cartilages, and ſeem only continued parts of them; but in others they are free, and looſe, and do not ſo much as touch the vertebræ. We find inſtances of the firſt ſort of ſtructure in the cyprini, ſalmons, *&c.* and of the other in the pearch, the gadi, and the pleuronectæ. In the ſpinoſe fiſhes, the laſt vertebra always is terminated by a pair of broad apophyſes placed perpendicularly, and touching one another, and by means of cartilages theſe are fixed to the bones of the tail. *Artedi*, ichthyolog.

RIBS, among jewellers, the lines, or ridges, which diſtinguiſh the ſeveral parts of the work, both of brilliants and roſes. *Jeffries* on Diamonds.

RICA, among the Romans, a veil with which the ladies covered their heads. *Danet*, in voc.

RICCIA, in botany, the name of a genus of plants of the lichen claſs, or, according to Linnæus, of the algæ: the characters of this genus are theſe. The male flower ſtands on the ſurface of the leaf, without a pedicle, and has neither cup nor petals, nor even ſtamina, but is a ſimple anthera or apex, of a tapering form, but truncated, and opening at the top when ripe. The female flower grows ſometimes on the ſame, ſometimes on different plants. It has ſcarce any cup, and no petals, but is loaded with a globoſe fruit, having only one cell, which contains a vaſt number of ſeeds. *Linnæi* Gen. Pl. p. 507. *Michel.* Nov. Gen. p. 57.

RICE (*Cycl.*)—The Chineſe water their *rice* fields by means of moveable mills, placed as occaſion requires, upon any part of the banks of a river. The water is raiſed in buckets to a proper height, and afterwards conveyed in channels to the deſtined places. *Boyle*'s Works abr. Vol. 1. p. 108.

RICERCATA, in the Italian muſic. See RESEARCH, *Cycl.*

RICHARDIA, in botany, the name of a genus of plants, the characters of which are theſe. The cup conſiſts of one leaf, divided into ſix parts, and is erect and pointed, and of about half the length of the flower. The flower is monopetalous, and of a cylindric funnel like ſhape, the edge is divided into ſix ſegments. The ſtamina are ſix filaments, ſo ſhort as to be ſcarce obſervable. The antheræ are roundiſh and ſmall, and ſtand in the notches of the flower. The germen of the piſtil ſtands beneath the cup. The ſtyle is capillary, of the length of the ſtamina, and divided into three parts at the top. The ſtigmata are obtuſe. The ſeeds ſtand naked, and are three in number; they are roundiſh, but angular, and are broad at the upper part and gibbous. *Linnæi* Gen. Pl. p. 150.

RICINOCARPODENDRON, in botany, the name of a genus of plants, eſtabliſhed by Dr. Ammann, the characters of which are theſe. The flower is of the roſaceous kind, conſiſting of three petals, diſpoſed in a circular order, in the center of which there ariſes a large and open tube, through which ſhoots up the piſtil, which grows at the bottom of the cup. This piſtil finally becomes a trigonal fruit, divided into three cells within, and containing each one ſeed in a rough coat.

The leaves of this tree ſomewhat reſemble thoſe of the aſh, being compoſed of three or four pairs of ſmaller leaves joined to a middle rib; theſe are not ſerrated, and terminate in a ſharp point. The flowers grow at the alæ of the leaves, they are white, and are diſpoſed in lax ſpikes. The fruit is green at firſt, afterwards it becomes of a yellowiſh red, and finally ſcarlet. It is of the bigneſs of a walnut, and in ſhape much reſembles the fruit of the ricinus. The covering of the ſeeds is black on the outſide and red within, and each ſeed is divided into two lobes. When ripe, the fruit burſts, and the ſeeds fall out. It is a native of the Eaſt Indies. Act. Petropol. Vol. 8. p. 214.

The word is compounded of *ricinus*, κάρπος, *fructus*, and δένδρον, *arbor*. See RICINUS.

RICINOIDES, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, being compoſed of ſeveral petals arranged in a circular form, and placed in a many leaved cup; theſe, however, are male, or barren flowers; for the embryo fruits appear on other parts of the plant; theſe are contained in a cup, and finally become each a fruit, which is fiſſile into three capſules, containing oblong ſeeds.

The ſpecies of *ricinoides* enumerated by Mr. Tournefort are theſe. 1. The common French *ricinoides*, from which the French turnſole is prepared, and which is called by many authors heliotropium, or turnſole. 2. The American arboreſcent *ricinoides* with divided leaves. 3. The cotton leaved American *ricinoides*. 4. The American *ricinoides* with ſtave's acre leaves. 5. The hairy poplar leaved American *ricinoides*. 6. The cheſnut leaved American *ricinoides*. 7. The ſhrubby marſh mallow leaved and American *ricinoides*. 8. The mullein leaved American *ricinoides*. 9. The æleagnus leaved American *ricinoides*, 10. The citron leaved American tree *ricinoides* with ſilvery duſt. *Tourn.* Inſt. p. 656. See HELIOTROPIUM.

RICINUS, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the apetalous kind, conſiſting only of a number of ſtamina which ariſe from a cup. Theſe flowers are barren, and the embryo-fruits grow on other parts of the plants; theſe become at length each a trigonal fruit, compoſed of three capſules, containing ſeeds covered with a hard rind.

The ſpecies of *ricinus* enumerated by Mr. Tournefort are theſe. 1. The common *ricinus* or palma chriſti. 2. The great American *ricinus* with green ſtalks. 3. The great American *ricinus* with red jointed ſtalks. 4. The ſmall American *ricinus*. 5. The *ricinus* of Ceylon with deeply divided leaves. See Tab. 1. of Botany, Claſs 15.

The ſeeds of almoſt all the ſpecies of this plant are very violent emetics and cathartics. Some have ventured to give them in ſmall doſes, in dropſies, but the practice is hardly juſtifiable.

RICKETS (*Cycl.*)—*Rickety* children have larger livers, and leſs hearts, and leſs blood, than children in health, from too full and too groſs a diet, and too little exerciſe; and they have larger livers than children in health, from the livers always increaſing in weight, when the weight of the heart and quantity of blood leſſen. See HEART and LIVER.

Dr. Hahn, in a letter on the cyrtonoſus, or *rickets*, which is commonly thought to be a modern diſeaſe; quotes Hippocrates, and ſeveral other antient writers, as treating of it. Med. Eſſ. Edin.

RIDE (*Cycl.*)—To RIDE *land-locked*, at ſea. See the article LAND-*locked*.

To RIDE *by the ſtoppers*, at ſea. See the article STOPPERS.

RIDGES (*Cycl.*)—The method of plowing land up into *ridges*, is a particular ſort of tillage. The chief uſe of it conſiſts in the alteration it makes in the degrees of heat and moiſture; theſe being two of the grand requiſites of vegetation, and very different degrees of them being requiſite to the different ſorts of plants. Thoſe plants commonly ſown in our fields require a moderate degree of both, not being able to live upon the ſides of perpendicular walls in hot countries, nor under the water in cold ones, neither are they amphibious; but they muſt have a ſurface of earth, not covered, nor much ſoaked with water, which deprives them of a proper degree of heat, and cauſes them to languiſh. In this caſe they look weak, and their leaves yellowiſh. They ceaſe growing; and, in fine, die in a weak and very bad ſtate.

The only way to cure the land of giving this diſeaſe to plants, is to lay it up in *ridges*, that the water may fall off, and run into the furrows below, from whence it may be conveyed by drains and ditches into ſome river, or otherways carried wholly off from the land.

The more any ſoil is filled with water the leſs heat it will have. The two ſorts of land moſt liable to be overglutted with water are hills, the upper ſtratum of mould in which lies on clay; and generally, all deep and ſtrong lands. Hills are made wet and ſpewy, by the wet that falls in rains, dews, and miſts; and this wet not being able to ſink through the clay, in theſe ſoils, runs down between it and the mould; but extending itſelf through the mould all the way, and making it continually waſhy. The plowing this ſort of land in *ridges*, made from the higher to the lower part of the field, is of no benefit; for the water will preſs from below upwards in theſe *ridges*, being forced by the addition of freſh ſupplies above.

There are two methods of draining a hill ground like this. The one is to dig ſeveral deep trenches croſs-wiſe, or horizontally on the ſides of the hill: let theſe be nearly filled up with ſhores, and the ſurface covered in the common method: the wet will be received into theſe in all parts, and diſcharged at the ends; and the plow will go over the ſtones, without ſtriking through the depth of earth that covers them. Thus the land will be dried for a time; but, as theſe channels fill up with earth, between the ſtones, they become of no uſe, and the expence of making new ones is very great.

The other way is to plow the land in *ridges* almoſt horizontally, and then the furrows between them are ſo many drains, carrying off the water at their lower ends; if the plow is made to ſtrike a few inches deep into the clay, and the ends of the furrows are no higher than the other parts: every furrow will be a drain to every *ridge*, and the land of the *ridges* will be kept dry. If there were no other manner of plowing the *ridges*, on the ſides of hills, than there is in the plain lands, this method of having open furrows, or drains, on declivities, would be impracticable; becauſe the plow could not turn up the furrows againſt the hill and againſt the *ridge* alſo, from the lower ſide of it. But the eaſy remedy againſt this inconvenience, is to plow ſuch *ridges* in pairs, without throwing any earth into the trenches, and then the *ridges* will be plain at top, and the rain water will run ſpeedily downward to the next trench, and thence to the head land, and ſo out of the field. Theſe trenches will be made, as well as kept always open by plowing in pairs; and this is abundantly more eaſy than the way of plowing *ridges* ſingly.

Every time of plowing the *ridges* muſt be changed as to the pairs;

pairs; ſo that the furrow, which had two *ridges*, or lands, turned towards it one time, muſt have two turned from it the next time; and this method keeps the ſurfaces of all the *ridges* or lands pretty nearly even. This, however, cannot be done on a hill, whoſe declivity is ſo great, that the plow is not able to turn a furrow againſt it; but, in this caſe, perhaps, it may be ſufficient to plow the *ridges* obliquely enough for the furrows to be turned both ways.

This plowing in an horizontal manner, on hills, is the beſt of all others; but our farmers are not to be eaſily brought into it, though they ſee thin lands of this kind ruined for want of it; their reaſons for not doing it, are, that it would prevent the ſuppoſed benefit of croſs plowing; and that they loſe more ground by having more furrows between the *ridges*, than when they lay their lands flat; where the lands are made much larger than the round *ridges* can conveniently be. But theſe are in reality very erroneous, as well as miſchievous opinions; for more miſchief than good is done by croſs-plowing in general; and inſtead of any real loſs of land by *ridges*, the true ſtate of the caſe is, that much ground is gained by it; that is, the ſurface of the earth is increaſed in quantity; for if a flat piece be plowed into *ridges*, and if in earth ſixteen feet breadth, there be an empty furrow of two feet; and yet, by the height and roundneſs of the *ridges*, they have eighteen feet of ſurface, capable of producing corn equally with eighteen feet, while the piece was flat; there is then, inſtead of any loſs, one eighth part of profitable ground, gained by the altering the piece from a level into a *ridge*.

RIDGES, in the manege, are the wrinkles, or riſings of fleſh in the roof of a horſe's mouth, which run acroſs from one ſide of the jaw to the other, like fleſhy *ridges*, with interjacent furrows, or ſinking cavities. It is upon the third or fourth *ridge* that we give the ſtroke with the horn, in order to bleed a horſe whoſe mouth is overheated. See HORN.

RIDING (*Cycl.*)—RIDING *caſt*, in huſbandry, a term uſed by the farmers for a particular method of ſowing their grounds, by making two *caſts* upon a ground at the ſame time. This is not much uſed, but it is a quicker way than the double *caſt*, which is the method now moſt uſed. *Plot*'s Oxfordſhire, p. 251.

RIDING *clerk*, one of the ſix clerks in chancery; who, in his turn, for one year, keeps the controlment books of all grants that paſs the great ſeal. *Blount*.

RIEMLING, in zoology, a name given by ſeveral to the ſmall freſh water fiſh, called by the Latins *phoxinus*, and vulgarly the *pink*. *Willughby*'s Hiſt. Piſc. p. 267.

RINÆUS *muſculus*, the name of a muſcle mentioned by Douglaſs, which he alſo calls *naſalis*: it ariſes fleſhy from the extremity of the os naſi, and adjacent parts of the os maxillare, and is inſerted into all the cartilages of the alæ. Its uſe is to open and dilate the noſtril, by pulling that part outwards.

RINAR, a word uſed by the chemiſts to expreſs filings of any thing.

RINEUS *marinus*, a name given by ſome botanical writers to the *crithmum*, or *ſamphire*, a ſea plant uſed as a pickle. *Ger. Emac.* Ind. 2.

RING, (*Cycl.*) in angling, an inſtrument intended to free the hook, when accidentally entangled among weeds. It is a circular piece of lead, of about ſix inches round, and is faſtened to a long packthread when it is to be uſed. It is ſlipped over the end of the angling rod, and let down into the water where the line conducts it to the hook; the rod and line have then no farther buſineſs; but the hook is endeavoured to be diſengaged by the pulling this ring backwards and forwards by the ſtring which is faſtened to it; the hook is generally freed from the weed by this means; but if not, and nothing but the breaking of the tackle will do, the breach is made in this manner near the hook; whereas if done without this ring, it might have happened in ſome other part of the line, or the rod itſelf might have been deſtroyed by it.

RINGS *of flies*, in natural hiſtory, the ſeveral rounds, or circular portions, of which the bodies of theſe and other inſects are compoſed.

In the *fly* kind theſe are cruſtaceous or cartilaginous, and conſequently of a matter little capable of extenſion; many actions of theſe inſects require, however, that their bodies, or a part at leaſt of their bodies, ſhould be able to inflate or diſtend, and contract their ſize occaſionally. Were every *ring* of the body one entire ſcale, or ſhelly ſubſtance, theſe changes could not be eaſily effected; nature has therefore ſo provided, that the tender bodies of theſe little creatures are ſufficiently defended, and yet all the neceſſary motions may be performed.

In many flies each *ring* is indeed one entire ſcale; but, in this caſe, it makes a circle round the body of the creature, whoſe ends do not join, but have a furrow between them, and running the whole length of the body; this furrow is placed under the belly, and is of different ſizes in the different ſpecies. It is very narrow in the great blue fly, and much broader in many ſmaller ſpecies. This furrow is filled with a matter merely membranaceous, or in other ſpecies, with a ſeries of ſmall moveable ſcales, ranged endwiſe one to another, and in number exactly equal to the *rings* of the body; and on each ſide, between theſe ſcales and the extremities of the ſeveral *rings*, there is a ſmall membranaceous ſubſtance, which is capable of extending and giving way, as the inflation or contraction of the body on different occaſions may require. *Reaumur*'s Hiſt. Inſ. Vol. 4. p. 256.

Other ſpecies of flies have to every *ring* two ſcaly arches, which differ a little in bigneſs; the one covering the back, and the other the belly of the creature; theſe arches are joined on each ſide by a muſcular membrane. When the body is in its ſtate of ſmalleſt extenſion, and is flatted, or contracted, this membrane is ſeen to make ſeveral foldings laid cloſely over one another, and making the whole take up but a very ſmall ſpace; and, in this caſe, the ſuperior ſcaly arch ſeems immediately to touch, and be joined to the inferior: but when the creature inflates, and extends its body, the membrane opens from its ſeveral foldings, and gives room for a vaſt increaſe in diameter; and the extremities of the two ranges of ſcales ſeparate to a very conſiderable diſtance from one another. The flies produced from the rat tailed water worms, give us an inſtance of this mechaniſm. In other flies there are none of theſe membranes, nor furrows, but the body is compoſed of *rings* made up each of two ſingle ſcales, one covering the back and the other the belly; but theſe, in the common ſtate of the body of the creature, are laid a great way over one another, and are not fixed to that poſition, but can ſlide aſunder as the creature diſtends itſelf; and in many ſpecies of inſects theſe ſcales continue to cover each other in part, even when the body is diſtended to a very great degree. Bees, waſps, *&c.* are thus formed; and it is extremely neceſſary that they ſhould be ſo, ſince they have frequent combats with one another: if they were not thus armed, the ſtrokes of their ſtings would eaſily find entrance through ſuch membranaceous commiſſures as are found in other flies, and would prove fatal. Ibid. p. 257.

RING *of ſaturn*, in aſtronomy, an opake, ſolid, circular arch or plane, like the horizon of a globe, which entirely encompaſſes, but no where touches the planet. See the article SATURN, *Cycl.*

RING *dove*, in zoology, the name of a bird of the pigeon kind, called by Aldrovand and other authors the *palumbus torquatus*, and by the Greeks *phaſſa*. Its beak is yellow, its feet naked and red, its legs feathered almoſt down to the feet. The upper part of its neck has a very regular and beautiful white circle, from which the bird has its name; and its whole neck, above and below this, is beautifully variegated with changes of colours, according as it is oppoſed to the light. Its head and back are of a duſky blue grey, and its throat and breaſt of a grey mixed with purple, its belly of a plain grey. The colours are all deeper, and more lively in the male than female. It ſeldom flies ſingle, but in large flocks, and builds on trees; its food is ivy berries and other vegetable matter. See Tab. of Birds, N° 27. *Ray*'s Orn. p. 185.

RING *head*, an engine uſed in ſtretching of cloth. 43 Eliz. c. 10. *Blount*, *Cowel*.

RING-*ſcalpel*. We have a deſcription and figure of a *ring-ſcalpel*, for aſſiſting the delivery of women in child-birth, by Dr. Thomas Simſon, in the Medical Eſſays of Edinburgh, Vol. 5. Art. 39.

RING-*tail*, in zoology, the Engliſh name for the female of the *ſubbuteo*; the male and female in this ſpecies, differing ſo much in colour, as to be called by two names; the male being called the *henharrier*. See the article HENHARRIER.

The *ring-tail*, or female *ſubbuteo*, is a moderately large bird. It has a ſort of *ring*, or chain of feathers, round the back part of its head, reaching to its chin on each ſide, which ſtand erect, and are brown in the middle, and of a reddiſh white at the edges, and make a ſort of crown which ſurrounds the head; and from this there hang down a naked ſkin, which covers the ears. It has a white ſpot on each ſide under the eyes; its breaſt and belly are of a tawny white, with long browniſh ſtreaks; and the middle of its throat is browniſh; its back and wings are of a duſky ferrugineous colour; its tail variegated with tranſverſe ſtreaks of black and tawny. The upper part of the beak is covered with a yellow ſkin. Its legs are yellow, and the inſide of its mouth is black. It feeds on ſmall birds, and its eggs are of a reddiſh hue, with very little clear white appearing in them *Ray*'s Ornitholog. p. 40.

RIONDO, in zoology, a name uſed by ſome for the fiſh more commonly called *aper*, a ſmall fiſh, of the ſhape of the faber or doree, caught in the Mediterranean. *Ray*'s Ichthyogr. p. 296. See the article APER.

RIPIENO, in the Italian muſic, is uſed in pieces of muſic in parts, to diſtinguiſh thoſe that play to fill up, from thoſe that play throughout the piece. There are, ſays Mr. Broſſard, two kinds of the *ripieno*: one plays the part of the little chorus exactly, and does not, therefore, increaſe the harmony or number of parts. What is to be played by all the muſicians is marked with the words *tutti* or *omnes*. This ſort of *ripieno* is found in almoſt all compoſitions. The other ſort is much better, a different part being played, whereby

whereby the number of parts is increaſed, and the harmony made fuller. Thus in pieces where in ſtrictneſs two trebles, and baſs, and thorough baſs are ſufficient, becauſe theſe parts are diſpoſed in ſuch a manner, as that their harmony is complete when played all together; yet, in order to render the piece more perfect, and to give it more grandeur, a counter tenor, tenor, and often two violins are added, whoſe parts are entirely different from the other; and the harmony then has ſeven parts inſtead of three, and is conſequently more complete and full. The parts thus added are properly called *ripieni*. *Broſſard*.

RIPIERS, *ripiarii*, in our old writers, thoſe that bring fiſh from the ſea coaſt to the inner parts of the lands. Camb. Brit. 234. *Blount*, *Cowel*.

They were thus called a *fiſcella*, *qua in devehendis piſcibus utuntur*, *anglice* a rip.

RIPOSTE, in the manege, is the vindictive motion of a horſe that anſwers the ſpur with a kick of his foot.

RIPPERS, in the wire works, are the people who attend in the mills, take the prepared ſmall rods of iron, and work at the barrels where they are drawn into wire. *Ray*'s Engliſh words, p. 133.

RISCUS, among the Romans, ſometimes ſignifies a cheſt or trunk covered with ſkins; ſometimes it is uſed for a hamper, made of twigs or ruſhes to hold lint; and ſometimes for a hollow place in the wall of a houſe, uſed likewiſe for holding lint, or the like. *Pitiſc.* in voc.

RISENTITO, in the Italian muſic, a briſk, lively, or expreſſive manner of playing.

RISIGALLUM, in the materia medica, a ſubſtance of a red colour, generally placed among the kinds of arſenic or orpiment of the antients. Some of the later writers underſtand by it the ſandarach, and others the factitious red arſenic; that it was looked upon to be poiſonous is plain from Aviſenna, who recommends it for killing rats, mice, and other vermin; and this ſeems to refer it to the factitious kind, or ſomething of that ſort, known in thoſe times; for the native ſandarach, does not ſtand in the rank of poiſons with them, nor indeed is ſuch.

Dioſcorides ſeems to diſtinguiſh the red orpiment from ſandarach, in that he ſays, it approaches to the ſandarach in colour; he would never ſay that a thing was of the like colour with itſelf; and therefore it appears, that he knew two kinds of red ſubſtances, under the names of red orpiment and ſandarach. Aviſenna mentions a red, a yellow, and a green zarnicle. We find theſe writers called the lapis armenus by the ſame name zarnicle with the orpiment; and it is probable, that this author confounding the two different ſubſtances together, means real orpiment by the red and yellow, and a poor greeniſh blue lapis armenus by the green.

RISING (*Cycl.*)—Rising *timbers*, in a ſhip, are the hooks placed on her keel; and are ſo called, becauſe as they riſe in proportion, ſo her rake and her run riſe on her flat floor by degrees.

RISORIUS *novus*, in anatomy, a name given by Santorini to a muſcle, formed of that part of the *quadratus genæ*, which ariſes from the cheek.

RISVIGLIATO, in the Italian muſic, is uſed to ſignify, that after having played or ſung a doleful and lamenting ſtrain, a gay and lively air is to follow.

RITHER, or RIDER, in mining, is a ſtone or thin clift that lies in the vein; the ore ſometimes runs on both ſides it. Sometimes the *rither* is ſo thick, it parts the vein, and makes one vein two. *Houghton*'s compl. Miner in the Explan. of the Terms.

RITUALES *libri*, among the antients. See Aruspici *libri*.

RIVERS (*Cycl.*)—It has been held by many, that all ſprings and *rivers* owe their origin to rains and dews; but there are ſome ſprings which cannot be accounted for on this principle, though others very well may. The intermitting ſprings, which flow violently in rainy ſeaſons, and are dry in ſummer, are probably owing to rains; but there are ſome ſprings, which diſcharge more water annually, than all that falls in rain and dews in the neighbouring country. The great perennial ſprings at Willowbrig in Staffordſhire is of this kind, and that of the Sorgne in France is much more eminently ſo; the *river* of that name, being, according to Gaſſendus, navigable up to the very ſprings which are its ſource.

But if ſuch ſprings, as theſe, diſcharge too great a quantity of water for the ſupply of rains and dews; how is it poſſible, that ſuch ſmall ſupplies of water as theſe, can afford the conſtant currents of the larger *rivers*? The Volga alone, according to Ricciolus, pours forth as much water in a year's time into the Caſpian Sea, as would ſuffice to drown the ſurface of the whole earth. The *river* of St. Lawrence, in the Weſt Indies, pours forth nearly as much as this. If either of theſe *rivers* alone do, as has been affirmed, from calculations, diſcharge annually as much water, as falls in the ſame time in rains and miſts upon the ſurface of the whole earth; from whence are all the reſt to be ſupplied, according to the ſyſtem of their all being made by brains; and particularly where is left the ſupply for the Rio de la Plata; which Ricciolus affirms to be larger than the Nile, the Ganges, and the Euphrates put together? its mouth being ninety miles wide, and running with that violence into the ſea, that it makes it freſh for two hundred miles together. Theſe, and the other *rivers* of the ſeveral parts of the globe, upon a very moderate calculation, diſcharge at leaſt five hundred times as much water into the ſea, as falls upon the whole ſurface of the earth, in rains, miſts, dews, ſnows, &c. in a like ſpace of time.

As it is evident, therefore, that theſe cannot be ſupplied by rains, ſo neither is it poſſible that the ſeveral hot ſprings, and the ſalt ſprings can be ſupplied that way: the origin of ſprings alſo in places where there falls little or no rain, and where the conſervatories muſt needs be too ſmall to contain a ſupply, are great proofs that rain and miſts are not the origin of ſprings, at leaſt not in all places. The iſles of Mago, Rotunda, and the Strophades, and the rock whereon the maiden tower ſtands in the Thracian Boſphorus, cannot be ſupplied with, or retain a ſufficiency of rain water to ſupply conſtant ſprings, yet ſuch are always found running there.

It cannot be otherwiſe but that there are ſubterranean communications between the ſea and the ſources of fountains, *rivers*, and the larger ſprings, by which theſe are ſupplied; and there are certainly charybdes which ſwallow the ſea for theſe purpoſes; and when theſe happen to be ſtopped, the largeſt *rivers* have been dried up, and wholly ceaſed to run for a conſiderable time: this we have accounts in hiſtory has happened to the Thames, the Trent, and Medway in England; the Elve, the Motala, and Gulſpang in Sweden, and other *rivers* in other countries. If, on the other hand, theſe charybdes happen to be too open, freſh water ſprings depending upon them will become ſalt. This we have inſtances of in hiſtory alſo; and even ſo old a writer as Pliny has ſaid, that this once happened in Caria near Neptune's Temple. *Plot.* de Origine Fontium. See Penuaria.

It is pretended, by ſome writers of voyages, that there are two *rivers* in China, the Chiemo and Jo, both in the province of Henſi, the water of both which is ſo light that the ſmalleſt ſtraw cannot ſwim in them, but ſinks to the bottom; but we have no authentic teſtimony of this wonderful thing. *Redi*'s Eſperience.

River *horſe*, in zoology. See Hippopotamus.

RIVET, in the manege, is the extremity of the nail that reſts or leans upon the horn when you ſhoe a horſe. See the articles Nail and Shoe.

RIVINIA, in the Linnæan ſyſtem of botany, a genus of plants, the characters of which are theſe. The cup is a perianthium, divided into four ſegments, of a different colour from the reſt of the plant, and remaining till the ſeed ripens. Its ſegments are oblong, oval, and obtuſe. It has no petals. The ſtamina are four filaments ſhorter than the calyx ſtanding in pairs, and remaining with the cup; the antheræ are very ſmall. The germen of the piſtillum is large and roundiſh, the ſtyle is very ſhort, and the ſtigma ſimple and obtuſe. The fruit is a round berry, ſtanding on the cup, the leaves of which are bent back; this berry contains only one cell, in which is contained one roundiſh, but flatted, rough ſeed. *Linnæus*'s Gen. Plant. p. 52.

RIVOLGIMENTO, in the Italian muſic, is the placing a treble or upper part in the place of the baſs, or any low part, or *vice verſa*. This often happens in double counterpoint, where the treble ſerves for the baſs, or the baſs for the treble; and that in ſuch a manner, that the harmony, though different, remains as correct after this change, as it was in the natural order of the parts.

RIZIUM, in botany, a name given by the antients to a peculiar kind of red root brought from Syria, and uſed by the Grecian women to paint their cheeks red.

The Latin writers, who have mentioned this, have called it *radicula*; and Pliny, who has more than once mentioned it, calls it *herba lanaria*, or *radix lanaria*. This, however, is a very great error, confounding it with the *ſtruthium* of the Greeks. It is probable, that the *rizium* was no other than the *ancuſa*, or *alkanet root*, which grows very plentifully in the countries from whence the Greeks had their *rizium*, and which will anſwer all the purpoſes for which they uſed it. See Ancusa.

ROACH, (*Cycl.*) in ichthyology, the Engliſh name of a fiſh, called by the generality of authors the *rutilus* and *rubiculus*, by ſome the *rubellio*. It is a ſpecies of the *cyprinus*, according to the new ſyſtem of Artedi. See the articles Rutilus and Cyprinus.

ROACHING *of alum*, one of the laſt proceſſes uſed in the *alum* making, and is what renders it fit for the market.

After the *alum* liquor has been left four days in the cooler, and is ſufficiently ſhot, they drain it out; and taking out the *alum*, they waſh it in a ciſtern of *alum* water ſo ſtrong, that it can ſcarce take up any more of that ſalt, but only cleanſes it of its accidental foulneſſes. After this waſhing the *alum* is put into large pans, and a quantity of water added to it. It is ſet over the fire to melt in this water and boil a little; then it is ſcooped into a great caſk, where it is ſuffered to ſtand about ten days; and it is then fit for the market under the name of *roach alum*, or *roached alum*; the

liquor let out of the cooler is boiled up again, and ſhoots more *alum*.

ROAD *gooſe*, in zoology, the name of a ſmall ſpecies of wild *gooſe*. See the article GOOSE.

ROAN, in the manege. A *roan* horſe is one of a bay, ſorrel, or black colour, with grey or white ſpots interſperſed very thick: when this party-coloured coat is accompanied with a black head and black extremities, he is called a *roan* with a black-a-moor's head. And if the ſame mixture is predominant upon a deep ſorrel, it is called claret *roan*.

ROASTING, in metallurgy, is the ſeparation of volatile bodies, from thoſe which are more fixed by the combined action of air, and fire; and is generally the firſt proceſs in the ſeparation of metals from their ores: it differs from ſublimation only in this, that in this operation the volatile parts are diſſipated, when reſolved into vapours; whereas in that they are preſerved.

Sulphur and arſenic are in this manner collected and preſerved in the *roaſting* of many ores; and ſublimation made, as it were, occaſionally in the proceſs.

The ſeparation of the volatile parts of bodies, from the more fixed is, however, in many caſes very difficult, and much nicety is required in the conducting this operation; this is the caſe, for inſtance, when the whole compound body melts in almoſt the ſame degree of fire that is neceſſary to raiſe, and diſſipate the volatile parts in the air; in ſuch caſes, care muſt be taken, firſt previouſly to pound a little the body to be *roaſted*, that its ſurface contiguous to the air may be increaſed in extent. A gentle fire is alſo neceſſary on ſuch occaſions, and a very free acceſs of the air, which is the vehicle of theſe vapours. When the body in the *roaſting* grows on theſe occaſions into large lumps or clots, the ſurface of it muſt be reſtored to the neceſſary extent, by repeated poundings, for it is neceſſary above all things, that the matter be kept extended and recent, and never collected into a heap.

Bodies the moſt refractory in the fire, are always the moſt eaſily *roaſted*; for a great fire may be conſequently kept up to ſuch, nor need the operation be repeated ſo often. Care muſt always be taken, however, that while the volatile bodies are diſſipating in the fire, they do not carry up with them ſomething from the fixed ones alſo; for this is a diſadvantageous accident, and too often happens, eſpecially when a fire too violent is uſed in the beginning of the operation; to prevent this, it is ſometimes neceſſary to add ſome fixing body to the maſs. *Cramer*'s Art of Foſſ. p. 189.

The buſineſs of *roaſting* of ores of metals, as now uſually practiſed, is ſubject to many inconveniences, which may be moſt of them eaſily remedied, and the whole buſineſs reduced to a few eaſy rules. 1. The *roaſting* of ores ſhould be always performed, without addition, when the ores are rich, or of itſelf merely of a metallic nature. But the additions of quicklime, potaſhes, iron filings, and the like, are neceſſary, when arſenical, antimonial and ſulphureous matters are found to be mixed with the ores. 2. The fire is to be ſo regulated from the firſt, that only the lighter or more volatile ſulphureous or arſenic fumes may fly off, otherwiſe the more metallic part would likewiſe go, and without ſome contrivance to catch it would be loſt. The ore muſt, however, always feel the force of an open flame, otherwiſe the ſulphur, arſenic, *&c.* will never be thoroughly diſlodged. 3. The more theſe immature ſubſtances abound in ore, the gentler the fire ſhould be at firſt; and when the greater part of the ſulphureous matter is thus exhaled, the fire is then to be quickened. 4. Where ſuch additions are uſed, as are not metalline, as lime, mud, pot-aſh, *&c.* they ought always to be ſeparated afterwards from the matter before the fuſion, by waſhing. *Shaw*'s Lectures, p. 251.

ROB, (*Cycl.*) in pharmacy, the inſpiſſated juice of any ſubſtance, uſually boiled up to the conſiſtence of honey.

It is poſſible, that great improvements might be made, by introducing the uſe of this form among the malt diſtillers. The great inconvenience attending that art being, that the malt being of a large bulk, in proportion to its ſaccharine part, and requiring a large proportion of water to extract that ſaccharine part, many large veſſels, ſuch as maſh tubs, coolers, fermenting backs, *&c.* are neceſſary; and the neceſſary labour on the ſubject is increaſed, and the commodity rendered dearer. The remedy of this ſhould ſeem the introducing a new art ſubſervient to that of the malt diſtiller, and confining itſelf to the boiling down of malt wort to a *rob*, ſo as to ſupply the malt ſtiller with his ſubject, in the ſame manner as the fine ſtillers are ſupplied with treacle by the ſugar baker. By this means the buſineſs of the malt ſtiller would be reduced to a great degree of ſimplicity, and the ſpirit produced would be alſo much finer than at preſent, becauſe the ſubject would come tolerably refined to his hands, and purged of its groſs, mealy and huſky matter, which yields a diſagreeable oil in diſtillation, and is alſo apt to burn to the ſtill, and ſpoil the ſpirit. It is poſſible that a ſpirit purer and finer than that from treacle might this way be procured from malt prudently managed. Ib. p. 219.

ROBALO, in zoology, a name by which ſome have called the *camuri* an American ſea fiſh of the *lupus marinus*, or baſſe kind. *Willughby*'s Hiſt. Piſc. p. 272. See BASSE.

ROBBINS, in a ſhip, ſmall lines which make the ſail faſt to the yards, being reeved into eylet holes in the ſail under the head-rope for that purpoſe. The word is *make faſt the Robbins:* for at ſea they don't ſay *tie*, but make faſt.

ROBERSMEN, or ROBERDSMEN, in our old writers, a ſort of great thieves, mentioned in the ſtatutes, 5 Ed. 3. c. 14. And in Rich. 2. c. 5. Sir Edward Coke ſays, that *Robin Hood* lived in the reign of Rich. 1. on the borders of England and Scotland by robbery, burning of houſes, rapine and ſpoil, &c. And that theſe *roberdſmen* took their names from him. 3. Inſt. 197. *Blount*, *Cowel*.

ROBIA HERBA, in Botany, a name given by Paulus Ægineta, and many others to a plant uſed in dying.

The near reſemblance of the name to the word *rubia*, has made many conclude that it was the *rubia*, or madder which they meant by it, but they have taken care in their writings to diſtinguiſh it from that plant, and it is plainly the *geniſtella tinctoria*, or dyers weed, that they meant by the *robia herba*. They ſay it was uſed to dye yellow, and that it was alſo a cuſtom to ſtain the hair with it.

Theſe are the properties recorded of the *cymene* and *æcomenium* of the Greeks, and *lutum* or *lutea herba* of the Latins, which were names of the *geniſtella tinctoria*. Pliny ſays, that the *lutum* had leaves like flax and flowers like broom, which is exactly the caſe with the *geniſtella tinctoria*, but by no means agrees with the glaſtum or woad.

ROBINIA, in botany, the name of a genus of plants, called *pſeudo-acacia* by Tournefort, and the generality of authors. The characters are theſe; the perianthium is ſmall and one leaved, it is divided into four ſegments at the end, the three under ſegments are very narrow, but the upper one four times as broad, tho' of the ſame length with the reſt, and is ſlightly emarginated; the flower is of the papilionaceous kind. The vexillum is large, round and obtuſe. The alæ are of an oblong oval figure, and ſtand free, having a very ſhort obtuſe appendage: the carina is nearly of a ſemiorbicular figure, it it compreſſed, obtuſe and of the ſame length with the alæ. The ſtamina are diadelphous filaments pointing upwards. The antheræ are roundiſh. The germen of the piſtill is oblong and of a cylindric figure; the ſtyle is capillary and turns upwards, and the ſtigma is hairy and placed forward at the apex of the ſtyle. The fruit is a large and long pod of a compreſſed figure and ſomewhat gibbous; it contains a few kidney ſhaped ſeeds. *Linnæi* Gen. Pl. p. 349. *Tourn.* Inſt. p. 417. *Rivin.* 4. 74.

ROCELLA, a kind of fucus or ſea wrack found in the Mediterranean and other ſeas, and in ſome places uſed by the dyers for a purple colour, and called by the botanical writers, in general, *alga tinctoria*. *Caſp. Bauhin.* Pin. p. 365.

ROCHET, the name given to a fiſh, otherwiſe called *cuculus* and *red gurnard*. See CUCULUS and GURNARD.

ROCHETTA, in the glaſs trade, another name for polverine. See the article POLVERINE.

ROCKS (*Cycl.*)—Theſe are generally ſuppoſed great enemies to vegetation, and the people of Scotland have been deterred from cultivating many of their beſt lands, from an obſervation that they had a *rocky* bottom. This is however but a vulgar error among them, for *rocks* of a proper kind and properly diſpoſed, as very many of theirs are, fertilize and are beneficial to the land, not hurtful.

In many parts of England we ſee gardens the moſt beautiful that can be imagined, both in regard to flowers and excellent plants, on a ſoil where the bottom is a hard *rock*, and the earthy covering not more than a foot or thereabout in depth. In ſome of theſe, all the diſadvantages the Scotch complain of take place, and yet the gardens are fruitful, many of them having lofty hills on the ſouth ſide; the declivity due north, and the *rock* perfectly bare next the walls on the north ſide.

The north ſides of theſe hills in this very aſpect, only with the *rock* covered with two or three foot of earth make very good hop gardens, producing a vaſt quantity of a very valuable commodity at a ſmall expence; and it is remarkable that thoſe gardens, which ſtand in this expoſure, inſtead of being ſubject to particular evils, often eſcape thoſe blaſts and other miſchiefs which affect the plantations of the ſame kind on the ſouth ſide of the hills. It might be a very valuable article of trade, if the bleak hills of Scotland, or thoſe of ſome of our northern plantations in America, could be made thus fruitful in ſo uſeful a commodity, and there ſeems only the want of a proper trial.

Another extremely valuable plant that might be raiſed on theſe barren *rocky* places, as they are generally ſuppoſed to be, is flax, in places where the deſcent is too ſteep for ploughing in the common way. It has been proved that a hand plough with a ſtem of aſh of about ſeven feet long, and a plate on each ſide near the end to turn the turf, a coulter to be let out ſhorter or longer to four or five inches deep to cut the earth up as deep as it lies upon the *rock*, and an iron wheel, may be managed with eaſe and conveniency by two people, and will prepare ground for producing large crops of the fineſt flax. The beſt ſort of flax ſeed of Flanders ſown on this ſort of ground ſucceeds ſo well, that if brought

into

into general uſe it might give the only advantage that is at preſent wanting to the Scotch holland manufactory, and make it excell that of all the world beſide. The northern American colonies might alſo furniſh us with the ſame ſort of flax raiſed at a ſmaller expence than almoſt any other vegetable commodity, and coming to a ſure market and at a very conſiderable price.

Agriculture in Scotland is too much neglected to the great impoveriſhing of the country, and the diſtreſs of a numerous poor, for whom it would find conſtant employment. It is not yet known whether many of the moſt valuable plants for medicinal and mechanic uſes will not proſper as well there, as where there are immenſe ſums made by the raiſing them; and the owners of lands would do well in this ſcheme to try the effect of liquorice, madder, woad and the like plants on their grounds. Wherever the ground is deep enough, it is pretty certain that madder and liquorice would flouriſh, and the laſt of theſe needs ſo little culture, that if once planted it may almoſt be left to it ſelf. The *rocky* bottoms of lands, not too bleak, may alſo ſucceed very well with ſaffron, which is one of the moſt profitable plants that can be cultivated. Phil. Tranſ. N° 109.

ROCK-*cryſtal*, otherwiſe called *ſprig cryſtal*, in natural hiſtory, a name given to the third order of *cryſtals* from their being affixed to a *rock*, or other ſolid body.

This kind of *cryſtal* is the moſt common of all others, and is what the generality of authors deſcribe under the name of *cryſtal of the ſhops*, being that kept for medicinal purpoſes. See the article CRYSTAL.

The cleareſt, pureſt, and moſt tranſparent that can be had, ought to be choſen; and to prove its genuineneſs, it may be tried with aqua fortis, true *cryſtal* making no effervescence with that menſtruum. *Hill*, Hiſt. Mat. Med. p. 280.

ROCK-*fiſh*, a common engliſh name for the *gobius marinus* or ſea gudgeon. *Willughby*'s Hiſt. Piſc. p. 207. See GOGET.

ROCK-*oil*, See the article PETROLEUM.

ROCK-*ſalt*, See the article *rock* SALT.

ROD (*Cycl.*)—ROD, in the manege, called in french *gaule*, is a ſwitch held by the horſeman in his right hand, partly to repreſent a ſword, and partly to conduct the horſe, and ſecond the effects of the hand and heels.

Golden-ROD, in botany. See GOLDEN *rod*.

ROGATORES, among the Romans, thoſe who in the *comitia centuriata* brought the cheſt into which the people threw the ballots containing their votes. *Pitiſc* in voc.

ROHEL, a word uſed by ſome authors as the name for dragons blood.

ROLLER (*Cycl.*)—ROLLER, in zoology, the common name of a bird of the mag-pie kind, called *garrulus argentoratenſis* by authors, and ſuſpected to be the ſame with the bird deſcribed by Geſner under the name of the *blue crow*, *cornix cærulea*, and by Aldrovand under the name of *pica marina*. Its beak is black and long, ſomewhat crooked at the end, otherwiſe like that of the common mag-pie; its eyes are of a greyiſh hazel colour, and near them are two tubercles bare of feathers. Its rump and part of its wing feathers are of a fine blue, like the ultramarine colours uſed in painting; the middle of its back is of a reddiſh brown, and the head is of a bluiſh green, and its breaſt and belly are of a whitiſh blue or dove colour. It is brought to market in Italy and ſome other places. See Tab. of Birds, N°10. *Ray*'s Orn. p. 89.

ROLLER, in gunnery, a round piece of wood of about nine inches diameter, and four foot long, which ſerves in moving mortars from one place to another when near. This is done by raiſing the fore part of the bed ſo high that a *roller* may be laid under it; then puſhing the bed forwards, and laying another in its way, and another before that and ſo on, the mortar is eaſily moved.

ROLLUS *aquaticus*, in zoology, the name given by authors to the *water rail*, a bird of the gallinula kind, called by ſome *ortygometra*, and by others *gallinula chloropus altera*, or a different ſpecies of the common green legged moorhen. It is very like the common moorhen but ſmaller; its head is ſmall; its body flatted, and its feet neither webbed nor enlarged by membranes, tho' it ſwims on the water; its beak is like that of the ruff or avis pugnax, about two fingers breadth long and flatted ſideways. It has a ſmall bald ſpot on its forehead, which is roundiſh and black; its whole upper part is of a mixed colour of black and a browniſh yellow; the middle of all the feathers being black, and the ſides of a duſky yellow. Its throat is of a greyiſh red, its breaſt is of a dead blue with a longitudinal white line in the middle; its belly is reddiſh, and the lower part of its tail white; its legs are very robuſt and ſtrong, and it runs very nimbly; it is common about the ſides of waters, and is a very well taſted bird. *Ray*'s Ornitholog. p. 234.

ROMAIN, in huſbandry, the name of a plant cultivated in the fields in many parts of the world, particulary in France, and called by our farmers *french vetches* or *french tares*; it is an annual plant but a very quick grower, and is extremely good food for cattle, particularly for horſes: they let theſe creatures feed on it all the fore part of the ſummer, and then cut it for hay in Auguſt or September. Its ſhort continuance in the ground makes it leſs valuable than ſaint foin and clover, but it has this advantage over them, that it will grow on poor ground.

ROMAN (*Cycl.*)—ROMAN *Citizen*. See CITIZEN.

ROMPION, this kind of bell flower was formerly much eſteemed in England for the ſweet taſte of the roots, and univerſally cultivated in kitchen gardens; but we at preſent diſregard it, tho' the French continue to be very fond of it. The ſeeds are to be ſown in a bed of light dry earth in March, and in May the young plants will be of a ſize to remove, or they may be left when ſowed, only houghing them up to four inches diſtance; being kept clean from weeds for the remaining part of the ſummer, they will be fit for eating in the ſucceeding winter.

RONDINE, in zoology, a name by which ſome authors have called the *milvus*, or flying fiſh. *Willughby*'s Hiſt. Piſc. p. 283. See the article MILVUS.

RONDINE-*peſce*, in zoology, a name by which ſome have called the *hirundo piſcis* or *ſwallow fiſh*, called by others *mugil alatus*. *Willughby*'s Hiſt. Piſc. p. 233. See the article HIRUNDO *piſcis*.

ROOD (*Cycl.*)—In Scotland, the *rood* contains forty ſquare falls. Tr. Pract. Geom. p. 82. See FALL.

ROOK, in zoology, a well known bird of the crow kind. See the article CORNIX.

Rooks are very deſtructive of corn, eſpecially of wheat, they ſearch out the lands when it is ſown, and watching them more carefully than the owners, they perceive when the ſeed firſt begins to ſhoot up its little blade; this is the time of their feeding on it, they will not be at the pains of ſearching for it at random in the ſown land, for that is more trouble than ſo ſmall a grain will requite them for; but as ſoon as theſe blades appear they are directed without loſs of time or pains by them to the places where the grains lie, and in three or four days time they will root up ſuch vaſt quantities of them that a good crop is often thus deſtroyed in embryo. After a few days the wheat continuing to grow, its blades appear green above ground, and then the time of danger from theſe birds is over, for then the ſeeds are ſo far robbed of their mealy matter that they are of no value to that bird, and it will no longer give itſelf the trouble to deſtroy them.

Wheat that is ſown ſo early as to ſhoot up its green blades before the harveſt is all carried in, is in no danger from theſe birds, becauſe while it is in a ſtate worth their ſearching for, the ſcattered corn in the harveſt fields is eaſier come at, and they feed wholly on this, neglecting the ſown grain; but as this cannot always be done, the farmers to drive away theſe ravenous and miſchievous birds dig holes in the ground and ſtick up the feathers of *rooks* in them, and hang up dead *rooks* on ſticks in ſeveral parts of the fields; but all this is of very little uſe, for the living *rooks* will tear up the ground about the feathers, and under the dead ones, to ſteal the ſeeds. A much better way than either is to tear ſeveral *rooks* to pieces and ſcatter the pieces over the fields, but this laſts but a little while, for the kites and other birds of prey ſoon carry off the pieces and feed upon them. A gun is a good remedy while the perſon who has it is preſent; but as ſoon as he is gone they will return with redoubled vigour to the field and tear up every thing before them.

The beſt remedy the farmer has is to watch well the time of the corn's being in the condition in which they feed upon it, and as this laſts only a few days, he ſhould keep a boy in conſtant pay to watch the field from day break till the duſk of the evening. Every time they ſettle upon the ground or fly over it the boy is to hollow, and throw up a dead *rook* into the air; this will always make them riſe, and by degrees they will be ſo tired of this conſtant diſturbance, that they will ſeek out other places of preying, and will leave the ground even before the time of the corn's being unfit for them. The reaſon of their riſing at the toſſing up of their dead fellow creature is, that they are a bird extremely apprehenſive of danger, and they are always alarmed when one of their comerades riſes. They take this for the riſing of an out-bird, and all fly off at the ſignal. *Tull*'s Horſehoing Huſbandry.

ROOM (*Cycl.*)—*Rooms* in houſes might be warmed by the ſteam of boiling water conveyed in pipes along their walls. See Philoſ. Tranſ. N°. 476. p. 370. ſeq.

The contrivance is a copper with a ſtill head, and a lead or copper pipe fixed to this head, which conveys the hot ſteam of the boiling water thro' the different *rooms* intended to be warmed.

ROOM, in a ſhip, a place diſtinguiſhed by partitions, or bulk-heads, as the gun-*room*, bread-*room*, cook-*room*, powder-*room*, &c.

ROOT (*Cycl.*—The *roots* of plants, of all kinds, have great numbers of fibres, iſſuing horizontally from them on all ſides, and running a great way; but theſe ſeldom go deeper than about ten or twelve inches, the depth to which the earth is commonly ſtirred in agriculture by the plough ſpade. Some plants have all their *roots*, even the large ones, directed horizontally and ſpreading in this manner; but of the others, even thoſe which have top roots, or ſuch as run perpendicularly

pendicularly down into the earth, the greater part have viſible fibres running horizontally from them in great numbers, and even thoſe which ſeem to have none, are not truly without them, they being only more fine and therefore leſs diſtinguiſhable by the eye.

The horizontal *roots* iſſuing from the main body of the *root* ſeem to the eye to be ſhort, and reach only a little way, but they in reality extend many times farther than they ſeem to do, often ſpreading to the diſtance of many yards, after their extream fineneſs and earthy colour makes them imperceptible to the eye.

Mr. Tull has made experiments of this kind, and found that a turnep, which is a plant whoſe root ſeems to have as few, and thoſe as ſhort fibres growing from its main ſtem as any, yet has ſuch as when the ground about it is properly moved by digging, extend to the diſtance of ſix feet every way. The diſtance to which theſe fibres of the roots of plants extend may be diſcovered by trials with ſalt; the common garden plants will not live, if their *roots* reach to a place where there is ſalt; therefore if ſeveral plants of the ſame kind be planted in different parts of the ſame bed of earth, and a trench dug round each at different diſtances, and ſalt buried in this trench, it will be ſeen by the decaying of ſome of theſe plants, and the thriving of others, according to the diſtance at which the ſalt lies, which of them has reached it with their roots, and which have not; that is, which ſalt is placed at a diſtance, to which the plants cannot extend their *roots*, and which is the fartheſt place to which they do. If a furrow be cut in the ground of the depth of nine inches, and at the diſtance of a yard from a turnep *root*, that *root* will extend its horizontal fibres to this diſtance, at the depth of ſix inches or thereabout from the ſurface; but when they are come thus far they will deſcend perpendicularly below the level of the bottom of the furrow, and when they have paſſed it, they will riſe to the level of the others on the oppoſite ſide, and extend to the diſtance of a yard beyond it. This could ſcarce be conceived of a plant which ſeems to have ſo few horizontal fibres as the turnep, but experiment has ſhewn it to be a certain fact.

This is not peculiar to the turnep; for all other plants do it on occaſion. The open mould being the natural ſoil for them to draw nouriſhment from, if they deſcend perpendicularly out of this to avoid expoſing themſelves to the open air where there is a cut or ditch, as ſoon as they have paſſed this, they always mount upwards again to enjoy the vegetable mould again at their proper depth: this is the reaſon of what ſeems ſo ſtrange a thing in the turnep fibres as their riſing after they had paſſed the furrow.

The *roots* of a common thorn hedge may be obſerved to run horizontally in their natural direction, and if they come to a ditch they will deſcend perpendicularly till lower than its bottom, and then running acroſs it, they will immediately mount again toward the ſurface, and extend themſelves horizontally at the depth of eight or ten inches to a great diſtance: on opening the earth at five feet diſtance from the ditch, the *roots* will be found tolerably large, and none of them reaching deeper than the common mould, which ſeldom is above a ſpade deep.

Mr. Tull mentions a very extraordinary inſtance of the ſpreading of the *roots* of trees in that of a witch elm; a chalk pit contiguous to a barn, the area of which was about forty perch of ground, was made clean and ſwept, ſo that it could plainly be ſeen that there was no vegetable matter about it, any more than in the floor of the barn: ſtraw was thrown from thence into the pit for cattle to lie on, and about three years after the pit was cleanſed, the dung made in it being taken up; the bottom of the pit, and the top of the chalk were at this time covered with *roots*, and theſe were found to come from a witch elm, of not more than five or ſix yards in height, which was about five yards above the area of the pit, and eleven yards from it; ſo that in three years the *roots* of this tree had extended themſelves to eight times the length of the body of the tree, beyond the extremity of the old *roots*, at eleven yards diſtance from the bottom of the trench, whence the original *roots* proceed. The annual encreaſe of the length of the *roots* in this caſe was about three times as much as the whole length of the tree.

The vegetable mould which lies uſually from the ſurface, to about a foot deep, being a proper place for the *roots* of trees, they will riſe into it, tho' the unſkilful hand of man plant them deeper. Thus in an orchard where the trees are ſet too deep, their *roots* all aſcend till they come to a proper ſcene of nouriſhment; but if the ground be moiſt there is a diſadvantage in this, for the *roots* paſſing thro' a watery place are chilled, and the circulation retarded.

The generality of the world ſuppoſe, that the horizontal *roots* of plants are much ſhorter than they really are, becauſe they ſee that they are pretty taper near the *root*, and ſeem to come to a point very ſoon: by this obſervation they conclude that they diminiſh on in the ſame proportion that they do there, and conſequently that they very ſoon come to an end. But by this means they calculate their length at leſs than one twentieth part of what it really is; for the truth is, that after the length of a few inches from the main *root*, they are not diſcernibly taper, but paſs on in the ſame bigneſs to their very ends. This may be ſeen at any time in the *roots* of plants growing in water, and with care in the tracing them it may alſo be ſeen in thoſe which grow in the earth; but the reaſon why it is not commonly ſeen in theſe, is that they generally break off in the taking up about the part where they grow taper. Many plants which ſeem to have only large naked *roots* have theſe horizontal ones, which tho' ſmall are branched out into many leſſer fibres, and convey a great deal of nouriſhment to the plant, and that from a great diſtance. If a common carrot be taken up and examined, there will be found many fine fibres, like hairs growing from its ſides: each of theſe examined with a microſcope, will be found to be a *root* not going taper, but all the way of the ſame bigneſs broken off at the end, and ſending numerous fibres from its ſides; all theſe are extended to ſome length, and then appear broken off as the other; and it is very probable from what is known to be the caſe in the turneps, that this horizontal *root* is in its natural ſtate extended four, five, or ſix feet from the carrot, all the way of the ſame length, and all the way ſending out its lateral ſhoots or fibres which run upwards and downwards the whole ſpace of the ten or twelve inches of vegetable mould. If ſo, from what a diſtance every way, and by what an immenſe number of channels does this plant receive nouriſhment?

The uſe of digging the earth to a great diſtance every way from the *roots* of ſuch plants as are deſired to thrive well, is evident from this: for theſe tender *roots* which in an open mould will run to ſo many feet diſtance, are pinched up, and deſtroyed when they come into a hard and undug earth. The advantage of having clear ſpaces between plants cultivated for uſe, is alſo plain from this, ſince they all have *roots*, tho' imperceptible to us, which occupy thoſe ſpaces, and draw nouriſhment from them.

Many plants are of a ſort of amphibious nature, and grow as well in water as on land; the perſicaria ſalicis folio, or willow leaved arſmart, called when in the water, the long leaved pond-weed, is an inſtance of this kind. This in the water and on the land makes ſo different an appearance, that the old botaniſts have taken it for two different plants. The *roots* of this, and of all other ſuch plants, are much longer when they grow on land, than when in water.

The ſecrets of vegetation as carried on by *roots*, and the uſes one part of the *root* is of to the other parts, are yet far from being underſtood to perfection. We know indeed that all *roots* imbibe moiſture from the earth, but it alſo appears, that they part with that moiſture again in the form of water, as they received it without carrying it all up into the body of the plant on certain occaſions. If a piece of flouriſhing mint in a water glaſs be ſo contrived, that while the *roots* from one joint are all immerſed in water, thoſe of an upper joint he received into a box, and laid all at one corner of it, and the box filled with ſand dryed at the fire; after a nights ſtanding, the water in the glaſs will be found ſenſibly decreaſed, and the ſand at that corner of the box where the *roots* of the mint are, will be found very wet, while all the reſt remains dry. This water which has thus wetted the ſand, muſt have been received into the lower *roots*, and from thence conveyed to the upper ones, and they muſt have again delivered it out into the ſand, inſtead of carrying it up into the body of the plant. Let a trough of earth be prepared of two feet in length, and let a ſtrong ſhoot of mint be ſet in a glaſs of water at each end of the trough, and while half the *roots* of each are placed in the water, let the other half be laid in the trough and covered with dry earth in powder; this dry earth will ſoon become moiſt, and the *roots* will ſhoot out beyond its ſurface. Theſe are to be covered with ſoft earth as they appear, till the trough will hold no more; the whole trough will thus be ſoon filled with the *roots* of theſe two ſhoots of mint, and thoſe *roots* which riſe to the ſurface, and are not covered, will be ſeen to bend down their points and enter the earth again.

Theſe mints grow greatly faſter than thoſe which are planted either in water alone, or in water with earth in it; and the earth in the trough will always be found thoroughly moiſtened, tho' no water is put to it, except what ariſes from the lower *roots*, and is carried to theſe upper ones, which are placed in the earth. The quantity of water thus ſent up by the lower *roots*, and thrown into the earth above by the upper ones, is more than a thouſand times the whole weight of the plants, and ſeems to have never mixed itſelf with the juices of the plant at all, but to have been evacuated pure water as it was received without ever going any higher than the upper *roots*.

The glaſſes in theſe experiments need very frequent ſupplies, a day or two being ſufficient to drain them; but what is remarkable is, that if they are ſuffered to be without water in the glaſſes, they will not dry up or wither, but the *roots* below, as well as the plant above, will be

kept in a flouriſhing ſtate for ſome time by the wet earth in the box. Theſe experiments ſhew us a uſe in the ſeveral parts of the *roots* of plants, which providence has wiſely allotted for the ſervice of the whole, and which we can otherwiſe have no idea of. Every part of the *roots* of the ſame plant is thus found to be capable of ſupplying all the reſt; and it is evident, that the ſeveral portions of the *roots* in the mint communicate one with another by means of veſſels which ſerve only to carry water from the one to the other, without mixing it with the juices of the plant. Such veſſels of communication there muſt have been between the two ſets of *roots* of this mint, which muſt have paſſed thro' that part of the ſtalk of the plant, which was between the two joints, tho' ſeveral inches in length, and by theſe while one root was kept moiſt, the other was moiſtened by it, whether the upper one, or the lower one was in the moiſt place, and then the nouriſhment was carried up by both to the plant.

From this we ſee the great uſe of tap *roots* to plants, and underſtand the reaſon why the lucerne, ſaint-foin, and other plants which have long tap *roots* produce ſuch numerous branches and ſucceed ſo well in dry ſeaſons, when the ſhorter *rooted* plants are nearly deſtroyed. The earth at a great depth is always moiſt, and theſe tap *roots* penetrating to that depth imbibe that moiſture, and ſend it up to the upper *roots*, which diſcharge it into the earth near the ſurface, as the upper *roots* of the mint do into the earth in the trough; and thence all the fibrillæ of the whole ſet of horizontal *roots* are ſupplied with a proper degree of moiſture in the earth, where they run and grow almoſt as well as in moiſt weather. If this was not the caſe, the *roots* which are ſpread thro' the upper ſurface of the earth could be of no ſervice to the plant in dry weather.

The ſtirring of the earth about the *roots* of plants has been a practice long uſed by our gardiners, who were well acquainted with the effects of it, tho' ignorant of its cauſe. The *roots* of plants ſend out horizontal fibres every way, and theſe ſend out fibrillæ on every ſide from them, which run thro' the whole upper ſtratum of vegetable mould: every time this mould is ſtirred, a great number of theſe fibres and fibrillæ are broken off, and the conſequence of this is, that they encreaſe in number, ſeveral new *roots* always ſhooting out in the place of one that was broken off; and as the number of *roots* is the great means of the ſupply of a plant, every time the earth is ſtirred, that number, and conſequently that ſupply is encreaſed.

There ſeems no danger of the plant's being ſurfeited by an over ſupply of nouriſhment this way; for we ſee nature has provided for a diſcharge of the abundant moiſture by the other *roots*, as we find by the water diſcharged into the earth in the trough. It remains yet to try whether the fluid thus evacuated be pure water as received, or be altered into the nature of the plant. This cannot be eaſily determined by mint; but if a ſtronger flavoured plant, ſuch as garlick, be ſet in water, and part of its *roots* placed in a bed of flower inſtead of earth, it will be ſoon ſeen whether the flower in this caſe be moiſtened as the earth in the other, and the taſting it will ſhew whether it be moiſtened with pure water, or with water altered to the taſte and nature of the plant. *Tull*'s Horſehoeing Huſbandry.

Preparation of ROOTS, there are ſeveral ways of preparing *roots* for medicinal uſe in the eaſtern nations, which ſtrongly alter them from their original form and appearance. An inſtance we have of this in the drug called *ſalep*, which is no other than the *root* of an orchis thus prepared. See the article SALEP.

Other *roots* they alſo prepare in the ſame manner, or ſomething like it; an inſtance of which we have in ſome of the oriental ginſeng, which is clear and pellucid as a reſin, and friable like one, retaining very little of the ſtructure or appearance of the *root*. Kempfer gives the method by which the people in the eaſt do this, and it may be well worth trying on ſome of our own *roots*.

The Chineſe, this author informs us, give their ginſeng its colour and tranſparence in this manner. They macerate the freſh *root* for three days in cold rice water, then expoſe it in cloſe veſſels, to the vapour of the ſame water; after which they carefully and leiſurely dry it, and it becomes hard and brittle, of a browniſh red colour, and as tranſparent as a reſin.

All the ginſeng of China is not of this ſort, and it has been ſuppoſed by ſome, that ſuch as was ſo, had aſſumed that appearance by age, as many of the more ſucculent *roots*, which have very ſmall fibres, will become much leſs opake when perfectly dry, than they were at firſt; but experience ſhews that this is not the caſe, for many perſons have kept the oriental ginſeng a great many years, but it has never been known to aſſume that appearance. There is no doubt however, but that if the Weſt Indian ginſeng were treated in this manner, it would equal the prepared ginſeng of the eaſt: for the *roots* of ſome of our umbelliferous plants, particularly the ſkirret, may be made clear and tranſparent in this manner, by only boiling it in common water, and afterwards drying it in the open air. Mem. Acad. Scien. Par. 1740.

Flower-ROOTS. See the article FLOWER.

ROOT *of oſteocolla*, a word uſed to expreſs a ſort of ſoft and rotten matter, on which the *oſteocolla* of Germany is found in ſandy grounds.

The workmen ſeek after the *oſteocolla* by the direction of certain lumps, of a white marley matter, which they find lying on the ſands; under this they always find a parcel of rotten vegetable matter, branching out from a main ſtem or trunk, at ten or twelve feet deep up to the ſurface; this rotten ſubſtance they call the *root of the oſteocolla*; and they obſerve, that where the matter they ſeek after is not found round it at the time of their digging, they need only mark the place, and dig again a year afterwards, and they will find it formed in a perfect manner. The *oſteocolla* found near Frankfort is all of this kind; and we find the holes in the center of all the pieces, through which this *root* had paſſed. It is ſo tender that it uſually moulders away on the *oſteocolla*, being expoſed to the air; but ſometimes they waſh it out. Phil. Tranſ. N° 39. See OSTEOCOLLA.

It is not eaſy to conceive what this is, unleſs the remains of foſſile branches of trees; but even then it is as difficult to account for the formation of the *oſteocolla* about them, as there is none of it found concreted where they are not. We have a ſort of *oſteocolla* found with us in what we call petrifying ſprings; but as this is done in the water, it is eaſier to conceive how it becomes ſo pure, than how a ſoft and pappy ſubſtance found in the midſt of a bed of ſand, comes not to have ſome ſand embodied in it.

ROOT, in mathematics (*Cycl.*)—The extraction of the *roots* of algebraic quantities, may be performed in a manner analogous to that uſed in arithmetic, for extracting the *roots* of numbers; and if the *root* cannot be accurately found, the proceſs may be continued indefinitely, which will give a ſeries. Thus the quantity $aa + xx$ being propoſed, its ſquare *root* thus extracted will be found to be,

$$a + \frac{x^2}{2a} - \frac{x^4}{8a^3} + \frac{x^6}{16a^5} - \frac{5x^8}{128a^7} + \frac{7x^{10}}{256a^9} -, \&c.$$

See Newton's *Meth. of Fluxions & inf. ſeries*, p. 4. of Mr. Colſon's Edit.

But the extraction of *roots* may be abbreviated by that great author's *binomial theorem*, which he thus expreſſes in his letter to Oldenburgh.

$$\overline{P+PQ}^{\frac{m}{n}} = P^{\frac{m}{n}} + \frac{m}{n}AQ + \frac{m-n}{2n}BQ + \frac{m-2n}{3n}CQ + \frac{m-3n}{4n}DQ +, \&c.$$

Where $P + PQ$ ſignifies the quantity whoſe *root*, or dimenſion, or *root* of any dimenſion, is to be inveſtigated. P, is the firſt term of the quantity; Q, the reſt of the terms divided by the firſt. And $\frac{m}{n}$ is the index of the dimenſion or power of $P + PQ$, whether that denomination be a whole number, a fraction, affirmative or negative. Laſtly, A, B, C, D, &c. repreſent the terms of the *root* as they are found; that is, A ſtands for the firſt term $P^{\frac{m}{n}}$, B for the ſecond $\frac{m}{n}AQ$, &c. The uſe of the rule will appear by a few examples.

1. To find the ſquare root of $cc + xx$; that is, $\sqrt{cc+xx}$, or $\overline{cc+xx}^{\frac{1}{2}}$. Subſtituting cc for P, $\frac{xx}{cc}$ for Q, 1 for m, 2 for n, $cc^{\frac{1}{2}} = c = P^{\frac{m}{n}} = A$, &c. we ſhall have $\overline{cc+xx}^{\frac{1}{2}} = c + \frac{xx}{2c} - \frac{x^4}{8c^3} + \frac{x^6}{16c^5} -, \&c.$

2. In like manner $\frac{N}{\sqrt[3]{y^2 - a^2y}}$ or $N \times \overline{y^3 - a^2y}^{-\frac{1}{3}}$ will be found equal to $N \times \frac{1}{y} + \frac{a^2}{3y^3} + \frac{2a^4}{9y^5} + \frac{14a^6}{81y^7} +$ &c.

For $P = y^3$, $Q = \frac{-aa}{yy}$, $m = -1$, $n = 3$, $A = P^{\frac{m}{n}} = y^{3 \times -\frac{1}{3}} = y^{-1} = \frac{1}{y}$, $B = \frac{m}{n}AQ = -\frac{1}{3} \times \frac{1}{y} \times \frac{-aa}{yy} = \frac{aa}{3y^3}$, &c.

3. Simple powers may be found in the ſame way. Thus, if $\overline{d+e}^5$, or $\overline{d+e}^{\frac{5}{1}}$ were required. Then by the rule $P = d$, $Q = \frac{e}{d}$, $m = 5$, and $n = 1$. Hence, $A = P^{\frac{m}{n}} = d^5$, $B = \frac{m}{n}AQ = 5d^4e$, &c. $C = 10d^3e^2$, $D = 10d^2e^3$, $E = 5de^4$, $F = e^5$; and laſtly, $G = \frac{m-5n}{6n}FQ = 0$.

Here the ſeries terminates, and therefore $\overline{d+e}^5 = d^5 + 5d^4e + 10d^3e^2 + 10d^2e^3 + 5de^4 + e^5$.

4. Di-

4. Diviſion may be performed by the ſame rule. Thus, if it were required to divide 1 by $d+e$. Then $\frac{1}{d+e} = \overline{d+e}^{-1} = \overline{d+e}^{-\frac{1}{1}}$. Hence by the rule, $P=d$, $Q=\frac{e}{d}$, $m=-1$, $n=1$, $A=P^{\frac{m}{n}}=d^{-\frac{1}{1}}=d^{-1}=\frac{1}{d}$, $B=\frac{m}{n}AQ=-1\times\frac{1}{d}\times\frac{e}{d}=\frac{e}{d^2}$, and $C=\frac{ee}{d^3}$, $D=-\frac{e^3}{d^4}$, &c. That is, $\frac{1}{d+e}=\frac{1}{d}-\frac{e}{d^2}+\frac{e^2}{d^3}-\frac{e^3}{d^4}+$ &c.

See *Newt. Epiſt. ad Oldenburgh.* Tom. 3. Oper. Wallis. *Analyſ. per quant. Series*, &c. Lond. 1711. p. 23. ſeq.

The method of extracting the *roots* of numbers, mentioned in the Cyclopædia under the head EXTRACTION, is the ſame as that given long ago by Vieta, and is to be met with in almoſt all books of arithmetic and algebra. Monſ. de Lagni and Dr. Halley have given us much more expeditious methods. Dr. Halley's rules for the ſquare and cube are inſerted in the Cyclopædia, under APPROXIMATION; only one of the formulæ for the cube is erroneouſly printed. We ſhall here inſert the doctor's rules which extend to the ſeventh power, and may eaſily be continued at pleaſure, the law of the continuation being obvious.

$\sqrt{aa\pm b}=\sqrt{aa\pm b}$, or $a\pm\frac{ab}{2aa\pm\frac{1}{2}b}$.

$\sqrt[3]{a^3\pm b}=\frac{1}{2}a+\sqrt{\frac{1}{4}aa\pm\frac{b}{3a}}$, or, $a\pm\frac{ab}{3a^3\pm b}$

$\sqrt[4]{a^4\pm b}=\frac{2}{3}a+\sqrt{\frac{1}{9}aa\pm\frac{b}{6aa}}$, or, $a\pm\frac{ab}{4a^4\pm\frac{3}{2}b}$

$\sqrt[5]{a^5\pm b}=\frac{3}{4}a+\sqrt{\frac{1}{16}aa\pm\frac{b}{10a^3}}$, or, $\pm\frac{ab}{5a^5\pm 2b}$

$\sqrt[6]{a^6\pm b}=\frac{4}{5}a+\sqrt{\frac{1}{25}aa\pm\frac{b}{15a^4}}$, or, $a\pm\frac{ab}{6a^6\pm\frac{5}{2}b}$

$\sqrt[7]{a^7\pm b}=\frac{5}{6}a+\sqrt{\frac{1}{36}aa\pm\frac{b}{21a^5}}$, or $a\pm\frac{ab}{7a^7\pm 3b}$

For the application of theſe formulæ or rules, obſerve, that a denotes the neareſt *root* to that of the propoſed number, whether greater or leſs than the true; and that b is the difference between this *root*, involved to the proper power, and the propoſed number. Thus, if it were propoſed, to extract the cube *root* of 231, the neareſt cube to it is 216, the *root* of which is $6=a$, and the difference between 231 and 16 is $15=b$. The *root* required will therefore be $=\frac{1}{2}a+\sqrt{\frac{1}{4}aa+\frac{b}{3a}}=3+\sqrt{9+\frac{5}{6}}=3+\sqrt{9.8333}=6.1358$. But this is only a firſt approximation. For a ſecond ſuppoſe $6.1358=a$; then its cube will be $=231.000853894712$, which is greater than the truth, and the difference $0.000853894712=b$. Therefore the *root* $=\frac{1}{2}a+\sqrt{\frac{1}{4}aa-\frac{b}{3a}}=3.0679+\sqrt{9.41201041-\frac{0.000853894712}{18.4074}}=6.13579243$-966195897 true to the eighteenth figure, which Dr. Halley aſſures us he computed within an hour.

By this example the method of working may be ſufficiently clear, and the uſe of the double ſign $\pm$ is obvious. When a is leſs than the truth, then a^3+b repreſents the given number; but when a is greater than the truth, the propoſed number will be repreſented by a^3-b. In the firſt caſe, the *root* is $\frac{1}{2}a+\sqrt{\frac{1}{4}aa\pm\frac{b}{3a}}$ or $a+\frac{ab}{3a^3\pm b}$, and in the ſecond caſe it is $\frac{1}{2}a+\sqrt{\frac{1}{4}a^2-\frac{b}{3a}}$ or $a-\frac{ab}{3a^3-b}$.

Dr. Halley juſtly obſerves, that the irrational formulæ, $\frac{1}{2}a+\sqrt{\frac{1}{4}aa\pm\frac{b}{3a}}$ is preferable to the rational, $a\pm\frac{b}{3a^3\pm b}$; becauſe the extraction of the ſquare *root* is much eaſier than a diviſion by ſo great a diviſor, as $3a^3\pm b$.

Theſe rules are at leaſt triple the figures of the *root* at every new operation. Thus, in the foregoing example, by the firſt operation, we had five figures, *viz.* 6.1358 for the *root*; and at the ſecond, we had the *root* true to eighteen places.

Monſ. de Lagni publiſhed a rule for the ſurſolid *root*, or fifth power, which quintuplicates the figures of the *roots*, at leaſt. The rule is this,

$\sqrt[5]{a^5\pm b}\quad\sqrt{\frac{1}{2}a+\sqrt{\frac{1}{4}a^4\pm\frac{b}{5a}}-\frac{1}{4}aa}$

See Phil. Tranſ. N° 210, or Lowthorp's Abridgment, Vol. 1. c. 1. Sect. xx. p. 81. Mac Laurin's Algebra, p. 242. Simſon's Algebra, p. 155. Where various general theorems for approximation to the *roots* of pure powers are given. See alſo EQUATION.

For common uſe, theſe extractions may be moſt commodiouſly performed by logarithms: dividing the logarithm of the power by the index of the required *root*, that is two for the ſquare, three for the cube, &c. the quotient is the logarithm of the *root*; which may therefore be found by the tables.

In ſome books we have tables of ſquare and cube numbers, by which the neareſt ſquare or cube to any propoſed number within the limits of the table, may be found by inſpexion. *Preſtet* has given a table of this kind in his *Elemens des Mathematiques.*

For the *roots* of adfected equations. See EQUATION.

Seminal ROOT. See the article SEMINAL.

Cube ROOT, in geometry. Obſerve, that the *cube root* of any quantity A^3 may be A, or $\frac{-1+\sqrt{-3}}{2}\times A$, or $\frac{-1-\sqrt{-3}}{2}\times A$.

This follows from what was ſhewn under the head UNITY, that the *cube roots* of unity or 1 are 1, $\frac{-1+\sqrt{-3}}{2}$, $\frac{-1-\sqrt{-3}}{2}$. Hence the *cube roots* of A^3 or of $1\times A^3$ will be as above mentioned. *Mac Laurin's* Algebr. p. 226. where he ſhews the uſe of ſuch expreſſions.

In general, every power has as many *roots*, real and imaginary, as there are units in the exponent of the power. *Mac Laurin* Ibid. p. 128.

Impoſſible ROOT is not only the ſquare *root* of a negative quantity, but any other *root* denominated by any even number. Thus $\sqrt[4]{-1}$, $\sqrt[6]{-1}$, $\sqrt[8]{-1}$, or in general $\sqrt[2m]{-1}$ or $\sqrt[2m]{-x}$ are all impoſſible roots, or quantities.

Some call them *imaginary roots* or quantities.

ROPALON, in botany, a name given by ſome authors to the *nymphæa*, or *water lilly*, and alſo to the *faba ægyptia* of the river Nile.

ROPE (*Cycl.*)—*Standing* ROPES, in a ſhip, the ſhrowds and ſtays are ſo called, becauſe they are not removed, unleſs to be eaſed or ſet taught.

ROQUET, in zoology, the name of a ſpecies of American lizard, of ſmall ſize, and of a reddiſh brown colour, variegated with black and yellow ſpots. Its fore legs are remarkably long for a creature of this kind; its eyes are particularly vivid and ſparkling, and its head is carried continually erect; and the creature is almoſt eternally in motion, hopping about like a bird, and it uſually carries its tail bent into a ſemi-circle over the back. It is far from being ſhy or timorous, and is delighted at the ſight of men; when tired with play or with running, it will open its mouth and pant, and loll out its tongue as the dogs do. *Rochefort*, Hiſt. Antill.

ROS (*Cycl.*—ROS *mayalis*, *maydew*, the *dews* that fall in the beginning of ſummer, particularly in this month, have great virtues attributed to them by many authors, when newly gathered and clean filtered. It is not of a watery appearance, or colourleſs, but is yellowiſh, and much reſembles the urine of a healthful perſon. The common methods of putrifying water alſo have no effect on *dew*. Several quantities of it have been placed in digeſtion with different degrees of heat, from that of dung to that of a ſand ſurface, but no putrefaction brought on it, though continued two months together; the heat, in whatever degree, ſerving to purify it, not to hurt it. The ſummer ſun, for all the hot months together, has no more effect on it. It only ſends out a green vegetable matter of the conferva kind which floats on the ſurface, and adheres to the ſides of the veſſel, and the whole quantity of the liquor remains as pure as before. Phil. Tranſ. N° 3.

Though theſe common methods of putrefaction do not take place in this fluid, a much more ſimple proceſs will. If a quantity of it be put into an open wooden veſſel, and ſet in a cool ſhady place, with a canvas ſtretched over it to keep out duſt and inſects, it will in three or four weeks putrefy and ſtink, and depoſite a large quantity of a black and thick mud. The manner of the formation of this ſediment is this: a ſmall quantity of a foul matter firſt ſeparates itſelf from the liquor, and floats at the top in form of a ſkin or film; this ſoon after precipitates itſelf to the bottom, and another ſucceeds in its place at the top, which is ſoon after precipitated in the ſame manner. Thus the mud is a congeries of theſe films one on another. If a quantity of *dew* be put into a long and narrow glaſs veſſel, theſe films, inſtead of ſinking, as ſoon as formed, will combine one with another at the top, and form a thick ſcum, which may be taken off with a ſpoon, and is very different from the black mud, ſeparated to the bottom in the former experiment, being

being a white and thick ſlime: if a quantity of this be put into a drinking glaſs, or other ſuch veſſel, and the water drained from it, it will ſomewhat ſhrink in twelve hours ſtanding, and will become ſo ſolid as to take the form of the glaſs, and may be ſhook out; it then reſembles a lump of boiled white ſtarch, but is ſomewhat more tranſparent.

We have, in the Philoſophical Tranſactions, a very remarkable account of a vegetable production from this jelly. A perſon having put a quantity of it into a double veſſel, in order to putrify it, obſerved, that after ſome days, the moiſture was in great part evaporated, through a fault in the luting of the junctures, and that a large muſhroom was growing up out of the almoſt dry reſiduum. It was, he ſays, of a ſpungy and watery nature, and of the ſame nature with ſome which he had ſeen growing out of rotten wood. The warmth employed in this digeſtion was that of a *balneum mariæ*. The probable account of this is, that the ſeeds of this muſhroom, which are very light, and eaſily wafted about every where by the winds, had fallen into the jelly, in the time of its being expoſed; and finding it a proper nidus, had, by means of the additional warmth, which is alſo greatly beneficial to all the muſhroom claſs, been ſet a growing, and arrived at their perfection in the form of the parent plant they fell from. There are in the ſame paper other odd accounts of productions of the animal kingdom, in the ſame *dew*, which might puzzle any one not verſed in experiments of this kind with other fluids. In one of the veſſels of this *dew* he found millepides, differing from the common kind in ſome particulars. Theſe were the common water millepides; and in another he found a quantity of green matter, probably a conferva, with numerous eulæ of inſects inhabiting it; for in a few days there were produced from this a vaſt number of flies. Another parcel of the *dew*, ſet in an open glaſs, was found after ſome days filled with the eulæ of the common gnat, and the flies were hatched from theſe. Phil. Tranſ. N° 3.

It is eaſy for a bad philoſopher to infer from theſe accounts the equivocal generation of theſe creatures in the water; but the inſight we have had into the wonders of nature in the inſect world are ſuch, that at preſent we know their generation to be in many ſpecies, particularly in the gnat and fly kinds, from the eggs of their parents depoſited in water, or any watery fluids, and that common ditch water will at any time do what the *dew* does in this experiment.

Ros *ſolis*, *ſundew*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, compoſed of ſeveral leaves, arranged in a circular form. The cup is tubular, and the piſtil which ariſes from it is at length converted into an oval pointed fruit, which opening at the extremity, diſcovers a number of oblong, or roundiſh ſeeds. To theſe marks, it is to be added, that the leaves are covered with long hairs, from which there ſeem to be ſeparated large drops of water.

The ſpecies of *ſundew* enumerated by Mr. Tournefort are theſe. 1. The common round leaved *ſundew*. 2. The common long leaved *ſundew*. 3. The perennial round leaved *ſundew*. 4. The perennial long leaved *ſundew*. 5. The largeſt, long leaved *ſundew*; and 6. The Portugal *ſundew*, with leaves like thoſe of the ſmaller aſphodel. *Tourn.* Inſt. p. 244.

ROSA, the roſe. See the article ROSE.

ROSA *crucis*, in church hiſtory. See ROSYCRUCIANS, *Cycl.*

ROSA *fatuina*, in botany, a name given by ſome authors to the piony.

ROSA *junonis*, in botany, a name given by ſome authors to the lilly.

ROSACEOUS *flower*, *roſaceus flos*, in botany, a term uſed to expreſs ſuch flowers, as are compoſed of ſeveral petals or leaves, diſpoſed in a ſort of circular form, like thoſe of the roſe: ſuch are the flowers of the piony, crowfoot, cinquefoil, *&c.* In this ſort of flowers the diſpoſition only of the leaves is regarded, their number being of no conſequence. It is very ſeldom that the number is two or four, except in the circæa and onagra. The moſt frequent number of leaves in theſe flowers is five, and ſuch as have four differ from the cruciform flowers, not only in their diſpoſition, but in this, that the number is in the ſame ſpecies indeterminately four, five, or ſix, as is the caſe in the clematitis, the capers, and the ſpecies of rue, whereas in the cruciform ones it is ever conſtant. See Tab. 1. of Botany, Claſs 1. *Tourn.* Inſt. p. 234.

ROSACLORUM, or according to ſome authors *roſi-chiero*, a fine red uſed to enamel on gold with. It is prepared in this manner: take ten pound of cryſtal glaſs, put it into a pot, and when it is well melted, add to it, at twice, a pound of the beſt red lead, ſtir the maſs well together, and afterwards caſt it into water. Repeat this proceſs three times, then when the matter is again in fuſion, mix with it five ounces of calcined braſs, and the ſame quantity of the deepeſt cinnabar; ſtir the whole well together, and let it ſettle three hours; then add of glaſs of tin three ounces, mix the whole, and it will be of a fine roſe colour. *Merret*'s Notes on Neri, p. 350.

ROSALIA, a name uſed by authors for the meaſles, or a diſeaſe very like the meaſles, conſiſting in a number of aſperities and protuberances of the ſkin, which ſoon die away.

ROSARBA, in botany, the name of an imaginary plant, which has given great trouble to the commentators on the works of the antients.

The Arabian writers, Aviſenna, Serapion, and others, have mentioned two kinds of carob or ceration; the one eſculent, and endued with the virtue of a gentle purgative, the other an aſtringent.

This laſt they have diſtinguiſhed from the other by the name of the nabathæan pod or aljembut. They ſay, in their deſcriptions, that the aljembut is like the *roſarba*, ſo run the old tranſlations, but the true meaning of the original is *roſa vineæ*. This was a name given to the common wild acacia tree, and the tree which produced the nabathæan pod, might be very well likened to this; it being, in reality, only a ſpecies of the acacia, and the ſuccus acaciæ, or inſpiſſated acacia juice of the ſhops; being, according to Iſidore, made oftentimes from the unripe fruit of this very ſpecies.

ROSARIA, among the Romans, a kind of perfumes, ſo called, either from their being chiefly made of roſes, or becauſe they had a moſt exquiſite odour.

ROSARY (*Cycl.*) is a word frequently met with in the antient hiſtories of Ireland, and uſed to expreſs a peculiar ſort of baſe money coined abroad, in the form of the penny, current in that kingdom; but of ſo much baſer an alloy, that it was not worth quite half the real value of the penny. This and many other ſuch coins were decried, and it was made death to import any of them by Edward the firſt in 1300.

ROSBOTH, a word uſed by ſome authors to expreſs a ſoft excreſcence from any part.

ROSCOLÆ, a name given by ſome medical writers to the meaſles.

ROSE, ROSA, in botany, the name of a genus of trees, the characters of which are theſe. The flower is compoſed of ſeveral petals arranged in a circular form. The cup is compoſed of ſeveral leaves, and finally becomes a roundiſh or oblong fleſhy fruit, which is unicapſular, and contains a number of angular hairy ſeeds.

The ſpecies of *roſe* enumerated by Mr. Tournefort are theſe. 1. The ſingle red *roſe*. 2. The double red *roſe*. 3. The double reddiſh black *roſe*. 4. The red *roſe* which does not open. 5. The ſingle pale red *roſe*. 6. The double pale red *roſe*. 7. The deep or blackiſh red *roſe*. 8. The purple *roſe*. 9. The ſingle purple *roſe*. 10. The changeable coloured *roſe*. 11. The Engliſh changeable *roſe*. 12. The red and white variegated *roſe*. 13. The Ciphian *roſe*, or ſmall pimpernel leaved Scotch *roſe*, with elegantly variegated flowers. 14. The greateſt double *roſe*. 15. The middle ſized double *roſe*. 16. The great ſingle white *roſe*. 17. The great double white *roſe*. 18. The ſmall white *roſe*. 19. The large muſk *roſe*. 20. The ſingle flowered muſk *roſe*. 21. The double flowered muſk *roſe*. 22. The evergreen muſk *roſe*. 23. The large flowered *roſe* without prickles. 24. The ſmall flowered *roſe* without prickles. 25. The curled leaved *roſe* with bright red flowers. 26. The common wild *roſe* with a pale ſweet ſcented flower. 27. The wild *roſe* with a large deep red flower. 28. The double flowered dog *roſe* or wild briar. 29. The *eglantine*, or *ſweet briar*, with double flowers. 30. The common ſingle flowered *ſweet briar*. 31. The wild *roſe* with red very ſweet ſcented flowers. 32. The wild *roſe*, with a white very ſweet flower. 33. The ſingle cinnamon *roſe*. 34. The double flowered cinnamon *roſe*. 35. The ſmall red *roſe*, commonly called the May *roſe*. 36. The ſingle yellow *roſe*. 37. The double yellow *roſe*. 38. The very thorny field *roſe* with a white ſweet ſcented flower. 39. The dwarf very thorny *roſe* with red flowers. 40. The dwarf alpine *roſe*, with ſmall roundiſh pimpernel leaves, and very little flowers, of a livid red. 41. The wild dwarf red *roſe*. 42. The great wild apple *roſe*. 43. The white field *roſe*. 44. The creeping white field *roſe*. 45. The ſmalleſt *roſe*. 46. The two flowered field *roſe* without prickles. 47. The pale red mouth *roſe*. 48. The white mouth *roſe*. 49. The double pale red mouth *roſe*. 50. The ſingle purple mouth *roſe*. 51. The crimſon *roſe*. 52. The Frankfort *roſe* with a thick cup, which does not open its flowers; and 53. The wild *roſe* or briar with large hairy fruit. *Tourn.* Inſt. p. 637.

We have a vaſt variety of theſe beautiful flowers preſerved in our gardens; ſome few of which are natives of our own country, but the far greater number are of foreign origin. They are all propagated either by ſuckers, by layers, or by binding them on the other ſorts of *roſes*; the laſt method is but ſeldom practiſed, but is neceſſary for the finer ſorts, which do not naturally ſhoot vigorouſly, and which produce few or no ſuckers. The beſt ſort of *roſe* for ſtocks is the Frankfort kind; the ſeaſon for doing it is in June, and there muſt be great care afterwards, that the ſtock produce no ſuckers at the bottom, for theſe would ſoon ſtarve the bud. *Miller*'s Gardner's Dict.

When *roſes* are to be propagated from ſuckers, they are to be taken off annually, and planted into nurſery beds, or into the places where they are to remain. They always take

take root well the firſt year, but if ſuffered to remain on the ſtock longer, they grow woody, and often fail.

But the beſt method of obtaining vigorous plants, is, by laying down the ſhoots; this is to be done in autumn, and by the autumn following they will have taken root ſo well, that they may be taken off from the old plant, and removed to the places where they are to remain. Theſe may be tranſplanted any time from October to April, but the earlier the better.

Roſes, in general, delight in a rich moiſt ſoil, and an open ſituation, in which they will produce great quantity of flowers, and thoſe much more beautiful than when they are on a dry ſoil and ſhady ſituation.

All the pruning they require is to have their dead wood cut, and their ſuckers taken away every autumn; and if there are any very luxuriant branches they may be ſhortened, and the doing this will ſupply the other parts of the tree with freſh wood. *Miller*'s Gardners Dict.

Eſſence of ROSES. There is ſcarce a more valuable perfume in the world than the eſſence of damaſk *roſes*, and ſcarce any thing is obtained from its ſubject with more difficulty and in leſs quantity. All eſſences or eſſential oils are, while in the plant, contained in certain veſicles, lodged in different parts, and of different ſtructure; theſe veſicles are in the *roſe* particularly ſmall and tender, and are placed very ſuperficially; the conſequence of this is, that there is originally but a very little of this eſſence in the flower, and this is the very ſubject that will be diſſipated and loſt when the flowers are gathered and thrown in a heap together, as they are ſucculent, and very quickly heat in lying together. To avoid all diſſipation and waſte of this choice eſſence, the *roſes* ſhould be thrown into the ſtill as ſoon as gathered, and diſtilled with very little water, and that in a balneum mariæ; then the fire is to be continued ſo long as the flowers float ſeparate about in the water; but as ſoon as ever they form themſelves into a cake, and ſtick to the bottom, the diſtillation ſhould be finiſhed, as they then yield no more eſſence. With all theſe precautions, however, it is with great difficultly we can procure any eſſence of *roſes*. What we obtain by this diſtillation being chiefly a very odoriferous and fragrant water. In the warmer countries the ſame caution affords a larger quantity of oil, which may be ſeparated and preſerved under the name of the eſſence. In Italy they make ſome quantity of it, but there it is very dear; a vaſt quantity of the flowers yielding only a very little eſſence, and that being thick and troubleſome in the procuring, as it every where ſticks to the veſſels.

It is to be obſerved, that the ſeaſon of the year, as to wet or dry, makes a very great difference in the eſſential oils of all plants; they are always much finer in dry and hot ſeaſons than in cold and moiſt: we find our *roſe* water in England much finer, and more fragrant, though diſtilled in the ſame proportion in hot and dry ſummers than in colder and rainy ones; and Mr. Geoffroy gives an account that he ſucceeded, one very hot and dry year, in the making eſſence of *roſes* in France, in the following manner.

As the *roſes* were brought to him freſh gathered, he turned them immediately into the ſtill; and drawing over the water into a glaſs matraſs, when it had ſtood by ſome time, and was perfectly cold, he diſcovered ſome of the eſſence fixed to the ſides of the matraſs, and the ſurface of the water covered with a thin reticular pellicle. All the contents of the matraſs were put to filter through a paper, ſupported by a fine linnen cloth; and the filtrated water was added to new *roſes* for many ſucceeding diſtillations, the produce of which was all filtered through the ſame paper. After a long courſe of diſtillations, with freſh flowers every time, but ſtill with the ſame veſſels and the ſame water, there was found in the paper of the filtre a quantity of thick eſſence; this being carefully waſhed out of the paper with a ſmall quantity of the moſt fragrant of the water, and afterwards ſeparated pure from its ſurface was very white, and extremely fragrant, and as thick as fine butter. This is not the only eſſential oil which naturally concretes into this firm ſtate; oil of anniſeed, though fluid, when diſtilled, always concretes in the ſame manner on the firſt approach of cold; and another oil of this kind is that of the laurel, which is uſed in ſome places, though very improperly, to give the ſcent and taſte of bitter almonds, or apricot kernels, to foods of different kinds.

Monſieur Homberg has taught us how to gain a larger quantity of the eſſential *oil of roſes* than is uſual in diſtillation, by the previous addition of mineral acids, as the ſpirit of ſalt, vitriol, &c. thereto; which increaſe the fermentation, and joining with the *oil* render it more liquid, and eaſier to be raiſed by heat. He adviſed a perfumer, who before ſcarce obtained an ounce of *oil* from an hundred weight of *roſes*, to ſteep his flowers for fifteen days in water made ſharp with ſpirit of vitriol, by which means the perfumer, upon diſtillation, found his quantity of *oil* increaſed almoſt a third.

The perfumers keep the ſtructure of the veſſel they employ in this diſtillation in great ſecret. Mr. Homberg tells us, it is a large convenient ſtill, that opens in a tube at the top to receive the water which muſt often be poured upon the *roſes* to bring over the *oil* with it; this it does but very ſlowly, and ſo requires that its quantity be large; the ſtill alſo opens below, that the flowers, when they will yield no more *oil*, may be eaſily taken out; but the principal contrivance is the figure of the veſſel which receives the *oil*; this is made like an ordinary matraſs, from the lower part of the belly whereof comes a tube, as from an old faſhioned cruet, and riſing to the bottom of the neck of the receiver, it bends outwards; ſo that though the veſſel uſually contains but two or three French pints, it conveniently receives and lets paſs many hundred pints of the *roſe* water, without any neceſſity of being changed; for a change would loſe the ſmall quantity of the *oil* obtained. The water diſtilled runs through a pipe into a ſecond receiver: the *oil* being lighter than the water, floats upon its ſurface, and adheres to the neck of the veſſel as high as the aperture of the little pipe, while the water runs from the bottom of the firſt receiver into the ſecond. See Mem. de l'Acad. des Sciences, 1700.

Mr. Homberg obſerves that this ſtill may be uſeful to draw off any kind of precious eſſential *oils*.

ROSE *fly*, in natural hiſtory, the name given by authors to a peculiar ſpecies of *fly* found very frequently on *roſe* buſhes, and produced out of a baſtard caterpillar, which feeds on the leaves of that tree.

The male of this *fly* has a long body, the female a ſhort and thick one; ſhe depoſits her eggs in ſmall holes, which ſhe makes in the bark of the young branches, and for this purpoſe is furniſhed with a very remarkable inſtrument placed at the hinder part of the body, which is a kind of ſaw. This is a four winged *fly*, and is ſo common on *roſe* buſhes, that it is ſcarce poſſible to miſs it in any of the ſummer months; and the parts of the branches where it has depoſited its eggs, are ſo vitiated by it, that they alſo are eaſily known. They are uſually ſwelled to a greater bigneſs, than either the part above or below them, and are uſually ſomewhat bent; they are often black on the underſide, and among this blackneſs the holes made for the eggs, and often the eggs in them may be ſeen. The head and breaſt of this *fly* are black. Its wings alſo are edged with black, its body is yellow, and its legs yellow, with a few black ſpots.

If theſe *flies* be obſerved in a ſummer morning, as they are crawling upon the branches of the *roſe* tree, they will ſoon be found at work for the depoſiting of their eggs. Theſe creatures give us a very good opportunity of obſerving the manner in which they perform this, as they are of a very ſluggiſh diſpoſition, and will ſtand ſtill even to be taken between the fingers; ſo that when one of them is in a proper ſituation, it may be examined, by bringing the eye near it, and by uſing the common magnifying glaſſes, without quitting its place or its work; and if there be leaves of the tree, or ſmall branches of it in the way, they may be removed without diſturbing the creature. *Reaumur*'s Hiſt. Inſ. Vol. 9. p. 145.

As ſoon as the *fly* has found a proper place for her eggs, ſhe directs the hinder part of her body downwards, and opening a pair of ſcaly ſubſtances placed near her tail, ſhe thruſts out from between them an inſtrument exactly repreſenting two common ſaws, with ſharp teeth and ſmooth backs; when ſhe has ſo placed theſe, that their points touch the bark, ſhe preſſes down her body in order to force the points to enter, and afterwards continues this preſſure till the whole length of both ſaws is immerſed in the wood. If the whole be nearly examined, however, it will be found that a ſimple preſſure is not all the means employed to force them in; but that as ſoon as ever the points are entered the bark, the two ſaws begin to work by means of tendons and muſcles made for that purpoſe, and are moved about exactly as the common ſaw in the hand of a carpenter; only that as there are two of them, they always move the contrary way, one being forced in while the other is drawn out; by this means they become a ſupport to one another.

As theſe inſtruments are extremely ſmall, they would not naturally cut an opening large enough for the receiving and covering the egg which is to be depoſited there. The creature therefore uſes great art and addreſs in the working with them. She opens the branch, not by making a bare puncture, but in the ſame manner in which a ſurgeon opens a vein, by plunging the point of his lancet perpendicularly in, and then raiſing it out obliquely; and, in order to enlarge the width of the wound, ſhe makes the teeth of each of the ſaws work forcibly againſt the ſides of it at every return. When the aperture is thus made of a proper ſize, the creature immediately draws out the ſaw, and preſſing her body down upon the bark, depoſits an egg in the hole; immediately after which, ſhe covers the orifice with a viſcous fluid, which bubbles up in the manner of ſoap ſuds, and ſerves at once to preſerve the egg, and to prevent the wounded fibres of the tree from decaying too ſoon. Ib. p. 150.

When the laying of one egg is thus finiſhed, the creature moves a little way forward or backward on the branch, and then begins the like operation for another egg, and goes on in this manner till ſhe has laid her whole ſtore. If the branch be all the way proper to receive them, ſhe lays them

them in a train, twenty or more, at ſmall diſtances, in a ſtrait line before one another; but if ſhe finds the branch become leſs proper for her purpoſe after ſhe has laid three or four, ſhe leaves it and ſeeks out another, where ſhe finiſhes what ſhe had there begun. There is not any apparent difference in the ſeveral young branches of the ſame *roſe* tree, that can ſhew us why one is, and another is not proper for this purpoſe; but the creature herſelf is very curious in her choice, and uſually examines a great number before ſhe fixes upon a proper one. The operation might ſeem very difficult to ſo ſmall an animal; but though the creature be of a very ſluggiſh diſpoſition, in all reſpects, it ſeems to find no trouble in this, and will uſually finiſh the laying ſix eggs in this manner in half an hour. The apertures are ſo ſmall, that there are uſually about fifteen of them in the ſpace of an inch, and yet there is always a ſmall ſpace between each, and thoſe above and below it. On ſtripping the bark from one of theſe branches, the wounds are ſeen to enter into the wood, and reſemble ſo many openings of a vein, by a ſurgeon in blood letting. In each of theſe there is depoſited one egg, which is conſiderably large, of a yellow colour, and pointed at one end. If the branch of a *roſe* tree, in which the eggs of this inſect are thus depoſited, be examined from time to time afterwards, the part where they are placed will be found to change colour, the bark will turn brown and then black, and the wounded parts will elevate themſelves above the reſt of the ſurface, and reſemble a ſtring of beads, or a long chain of olives. This elevation of the wounded parts is not to be attributed to the growth of them; but they are, on the contrary, ſo far deſtroyed, as to be rendered incapable of increaſe that way. This ſwelling is owing to another very ſingular cauſe, which perhaps nature does not give us another inſtance of in the whole animal world. The egg daily increaſes in ſize after it is laid, and this is very evidently ſeen on opening the ſeveral lodgments, formed at different times; thoſe which have been made two or three days, always containing eggs more than twice as large as thoſe made within a few hours. It is to be obſerved, in favour of this ſtrange occurrence, that the egg of this creature is not covered with a hard ſhell in the manner of a bird's egg; but only with a thin, and eaſily diſtenſible membrane; but then all other eggs of inſects are in the ſame manner covered with a diſtenſible membrane, not a hard ſhell, and yet none of them are ever known to increaſe in ſize after their being laid. The egg, in thus increaſing in ſize, raiſes up the wood and the bark which cover it; and in conſequence of this, the train of eggs make a ſtring of regular elevations of the part, as the egg increaſes, and the tumor grows larger; the aperture at the ſurface grows alſo wider in proportion, ſo that the worm, when hatched out of it, finds no difficulty in getting out, but immediately crawls to the leaves and begins eating.

There is, beſide this ſpecies, another *fly* of the ſame genus, produced from a baſtard caterpillar of the *roſe* tree, and of the ſame ſhape and ſtructure of parts with this, but differing in colour: the head and breaſt of this *fly* are of a deep violet colour, the body is yellow, and the legs and wings are of a ſomewhat paler violet tinge. This creature alſo depoſites its eggs in holes, made in the branches of the *roſe* tree, by means of a double ſaw placed at the hinder part of the body; but, as the former ſpecies lays them in a ſingle ſtrait line, this diſpoſes them in a very beautiful and very regular manner in two rows. Two eggs are firſt laid by the creature, at ſome ſmall diſtance, ſideways, one from another, but at the ſame height of the branch. The bottoms of theſe meet almoſt one with the other; but their tops are expanded a little, ſo that they make an acute angle, or expreſs the ſhape of the letter V; behind theſe there are placed two others, making a ſomewhat wider angle, and ſo behind theſe two others. Thus the creature frequently depoſits ten, twelve, or fourteen pair of eggs, which are all placed at ſome ſmall diſtance from one another, and are ſeparated into two diſtinct rows by an intermediate line. Theſe are not ſo well defended from injuries as the eggs of the former ſpecies, and are entirely buried in the wood; and lodged in ſuch large holes, that they appear naked even when firſt laid. Mr. Valliſnieri, who has elegantly deſcribed this inſect, obſerves, that as the ſaws of the former ſpecies are toothed only on one ſide, having a flat back in the manner of our common ſaws, thoſe of this ſpecies are toothed both ways: he obſerves alſo, that the two pieces which make a caſe for theſe ſaws, and which are opened to give them paſſage when they are to be uſed, are each of them hollow, and are of the greateſt uſe to the creature; the one ſerving as the paſſage for the eggs, the other for that of the glutinous liquor with which the creature covers the wound in the wood, after depoſiting her egg in it. But Mr. Reaumur, in comparing the ſize of the egg, when new laid, with the aperture, which this author ſuppoſes it to be depoſited through, is of opinion that it is much too large to have gone through ſuch a paſſage; he alſo obſerves, that the eggs may always be forced out of the body by preſſing it between the fingers; but that, in this caſe, they are always ſeen iſſuing out at the anus.

The *roſe* tree ſeems the peculiar favourite of theſe ſorts o flies, for beſide the two ſpecies already deſcribed, there is another very ſmall one which is found on this tree in great abundance in the months of April and May. This is every way ſhaped like the large kinds, but it is all over black except ſome white ſpots on the legs; the ſaw of this ſmall inſect is not of a ſufficient ſtrength to penetrate the branches of this ſhrub, it therefore always is ſeen upon the leaves, and depoſits its little eggs in a row of holes made in the middle rib of a leaf. It is to be obſerved that all the falſe or baſtard caterpillars produce theſe ſerrated flies; yet it is very ſingular that they do not all make the ſame apparent uſe of their ſaws that theſe do. The fly produced by the falſe caterpillar of the gooſeberry, always depoſits its eggs in ſingle rows along the middle ribs of the leaves; but the eggs are not let into them by holes made for that purpoſe, but are merely laid along upon the ſurface. It may be however, that the creature makes a wound where every egg is to be depoſited, which though not large enough to receive it, may yet ſuffice to afford a neceſſary moiſture to it. Mr. Reaumur was at the pains to keep ſome of the falſe caterpillars produced from the eggs of this fly the whole ſeaſon, and obſerve them through all their changes. When they had eaten ſufficiently in the caterpillar ſtate, they crept into the earth which he had put into the bottom of his boxes, and then changed into chryſaliſes in a double covering of a ſilky matter of their own ſpinning; they remained all the winter in this ſtate, and in the ſucceeding ſpring came forth out of the earth in form of flies. This author obſerves, that on putting a male and female together into another box, in which there were ſome branches of gooſeberry buſhes, the female immediately ſearched out the proper places for depoſiting her eggs, and laid ſeveral before his face in ſingle rows on the moſt prominent part of the ribs of the leaves: the creature ſeemed to give herſelf all the motions that the other ſpecies do in piercing the branches of the *roſe* tree, before the depoſiting of every egg; but that on examining the places afterwards, he never could find any mark of a wound in them, the eggs all lay upon the ſurface, but they were ſo firmly fixed on the place, that there was no removing them without breaking them, and a piece of the ſkin was always left behind, which ſtuck faſt on the place and covered the hole if there was any. There are alſo ſome other ſpecies of theſe *flies*, which make no apparent uſe of the curious ſaws they have behind: yet they all are poſſeſſed of them. *Reaumur*'s Hiſt. Inſ. Vol. 9. p. 160. See the article SERRATE *Flies*.

ROSE *galls*, in natural hiſtory, a name given by authors to certain unnatural productions of the *roſa ſylveſtris*, or dog *roſe*, occaſioned by the bites of inſects: there are two kinds of theſe, the one very common, the other more rare.

The ſcarcer kind is uſually found on the young ſhoots, and on the heps or fruit, and is of a woody ſubſtance; the other is hairy and ſpungy and is found on the old branches. The woody kind uſually appears in the months of June and July, and is always found in cluſters. Theſe are compoſed of ten, twelve, or more *galls* of different ſizes and figures, ſome round, others oblong, ſome of the ſize of an olive, and others not larger than a pea. They are of the common ſubſtance of the white wood or blea of trees, and when ſituated on the fruit they prevent its ripening and make a very ſingular figure. They are of a reddiſh colour and are uſually ſmooth and gloſſy, but ſometimes they are beſet with ſhort and fine prickles.

The hairy *roſe gall* is too common, and too ſingular a figure to have eſcaped the obſervation of perſons in all ages; it has been introduced into medicine in many parts of the world, and is at this time preſcribed in Germany, when reduced to powder, in diarrhœas, dyſenteries and other diſorders of the bowels, and to promote urine and break the ſtone. Theſe *roſe galls*, though they appear at firſt ſight compoſed of tufts of hair, are however in reality made up of ſeveral ſmall *galls* growing from a bud on the branch and forming a cluſter on the part. They are of an oblong figure and reſemble the ſhape of a plum-ſtone. Each of them is the habitation of a ſingle worm, each having one cell in the center. This is perfectly ſmooth and even on the inſide, but from the outer ſurface of each of theſe ſeparate *galls* there go off a vaſt number of filaments which uniting and intermingling with one another form one complex maſs, and give the whole cluſter the figure of one *gall* of the bigneſs of an Indian or horſe cheſnut. Theſe filaments are of a reddiſh or greeniſh colour, and are often nearly an inch in length. They are called by ſome hairs, but very improperly, having no true character of a hair, but being of a rough ſurface, flatted, and branched with ſeveral ſhorter filaments growing from their ſides. The tubercles within, from which theſe grow, are of a hardneſs greater than that of moſt ſpecies of wood. Though theſe *galls* are uſually found on the branches of the ſhrub, and ariſing from the buds or eyes of young ſhoots, and are therefore ſuppoſed by authors to be the vitiated matter of a whole branch.

branch with its leaves divided into theſe filaments, yet they are ſometimes found growing to the middle rib of a ſingle leaf, where yet they do not want all their filaments, though there have been no vitiated leaves to form them. *Reaumur*'s Hiſt. Inſ. Vol. 6. p. 251.

Though theſe *galls* and the ſmooth ones before deſcribed are extreamly different in external appearance, yet on a cloſe examination they appear to be more nearly allied than might be ſuſpected. They are doubtleſs both the work of the ſame inſect, and their principal difference is, that the one is ſmooth, and the other covered with theſe filaments. It is to be obſerved however, that the ſmooth ones have ſometimes a ſort of ſhort and ſoft ſpines upon them, and theſe ſeem the rudiments of theſe hairs; and there ſeem to be *galls* found ſometimes more, ſometimes leſs hairy, and indeed of all the middle degrees between the two ſorts.

The naked *galls* are uſually larger and of a more ſpungy texture than the hairy ones; which is owing to all the matter, which ſhould have formed the filaments, being united and wrought up into the body of the *galls*. There is alſo another variety of the ſmooth kind, which might appear an abſolutely diſtinct ſpecies. This is a ſingle and large *gall* of a ſmooth ſurface and ſpungy but woody texture. When cut open, it is found to contain ſeveral cells, each inhabited by one worm; and when nearly examined is found to be a congeries of as many ſmaller *galls* as there are cells, which have grown firmly together.

All theſe *galls* of the *roſe* tree afford the ſame ſpecies of worms, and the ſame ſpecies of flies. The proper inhabitants, however, are hardly to be diſtinguiſhed by the moſt curious obſerver from the great variety of ſpecies which are found in them, all produced of the eggs of other flies, whoſe worms are of the carnivorous kind, and are lodged in the *gall*, not to feed on the juices of the tree, but on the fleſh of the proper inhabitant. When the parent fly who gives origin to the *galls* has depoſited her eggs, and the tumor in conſequence begins to be formed, an enemy of this kind pierces the covering, and ſends in her offſpring to feed on the inhabitant. Theſe are flies of the ichneumon kind, and ſeveral ſpecies of them are of great beauty. All the flies deſcribed by authors as iſſuing out of this *gall* ſeem to have been of this kind: the proper inhabitant being a ſmall black fly of no great beauty is diſregarded, while the others have been particularly deſcribed. Mentzelius has given an elegant account of a ſpecies whoſe back is of a fine blue and its belly purple, and others have figured and deſcribed greeniſh and gold coloured ones, but theſe are all ichneumons, all bred of devouring enemies which have fed on the proper inhabitants of the *galls*, and lived and transformed themſelves in their cells. *Reaumur*'s Hiſt. Inſ. Vol. 6. p. 254.

Oil of ROSES. See *eſſence of* ROSES, *ſupra*.

ROSEA, a name given by ſome authors to the eriſipelas or St. Anthony's fire.

ROSLAND, in our old writers, heathy land, or ground full of ling; alſo watry and mooriſh land. 1. Inſt. 5. *Blount*.

ROSMADIAN, a name uſed by the alchemiſts for what they call mercury of the philoſophers.

ROSEMARY, *roſmarinus*, in the linnæan ſyſtem of botany, a diſtinct genus of plants, the characters of which are, that the cup is a perianthium compoſed of one leaf, tubulated, and flatted in its upper part; its rim is erect and labiated, the upper lip whole, and the lower indented in three places. The flower is a ſingle petal in form of a tube, and longer than the cup. It is labiated at the extremity; the upper lip is ſhort, erect, divided into two ſegments, acute, and has bent edges; the lower lip is bent back, and is trifid, the middle ſegment large and hollow with a narrow baſe, the lateral ones are narrow, the ſtamina are two pointed filaments bent toward the upper lip and longer than it, the antheræ are ſingle. The piſtil has a quadrifid germen, the ſtyle is of the length, figure, and ſituation of the ſtamina, and the ſtigma ſingle and acute. The cup holds in its bottom four oval ſeeds. *Linnæi* Gen. Pl. p. 6.

The characters of *roſemary*, according to Tournefort, are theſe. The flower conſiſts of one leaf, and is of the labiated kind; the upper lip is bifid, and turned backwards and upwards, and adorned with crooked ſtamina; the under one is divided into three ſegments, the middle one being larger than the reſt, and hollowed in the manner of a ſpoon. The cup is divided into two or three ſegments, and is furniſhed with a piſtil, which is fixed in manner of a nail to the hinder part of the flower; this is ſurrounded with four embryos which afterwards become four roundiſh ſeeds ripening in the cup of the flower.

The ſpecies of *roſemary* enumerated by Mr. Tournefort are theſe. 1. The common narrow leaved garden *roſemary*. 2. The ſilver leaved garden *roſemary*. 3. The broad leaved wild *roſemary*. 4. The variegated leaved *roſemary*. 5. The large ſpiked purple flowered *roſemary*. The ſeveral ſpecies of *roſemary* when neither in flower or ſeed may be known by their having hard woody ſtalks, narrow leaves, and a ſmell much approaching to that of camphor. *Tourn.* Inſt. p. 198.

We have five or ſix different ſpecies or varieties of this ſhrub in our gardens; they grow wild in the ſouth of France, and in Spain and Italy, on rocks near the ſea where they multiply prodigiouſly. With us they grow the moſt vigorouſly on a moiſt rich ſoil, but they are much ſweeter ſcented when on a poor ſoil, and on ſuch they bear the ſeverity of our ſeaſons much better, than where they grow more freely.

They are all propagated by planting ſlips or cuttings of them, in the ſpring of the year, on a bed of light freſh earth, and when they are rooted, they are to be removed into the places where they are to remain. The beſt ſeaſon for doing this is in Auguſt, if they are planted later than this, they ſeldom live through the winter; therefore ſuch as are not tranſplanted at this time ſhould be left till the following ſpring, when March is a very good time for removing them; and if this be done in ſhowery weather they take root almoſt immediately. The plants are ſometimes killed in cold winters in our gardens, but when by accident they have rooted themſelves in an old wall, as is often the caſe, they ſtand all weathers unhurt, which is owing to their being ſtunted and their roots dry.

The flowers of *roſemary* are uſed on many occaſions in medicine; they are cephalic, good in all nervous and hyſteric caſes, and are ingredients in many compoſitions of the ſhops; they are eſteemed of great ſervice in apoplexies, palſies, vertigoes and epilepſies. They ſtrengthen the ſight, are good againſt a ſtinking breath; they are alſo preſcribed in obſtructions of the liver and ſpleen: the conſerve of the flowers is an excellent thing to bring other medicines in theſe intentions into form, when they are intended to be given in boluſes and electuaries.

The hungary water ſo long famous in England and elſewhere, is made of the flowers of *roſemary* diſtilled with rectified ſpirit of wine.

ROSMARUS, in zoology, the name of an animal called alſo by ſome the ſea horſe, and more uſually known by the name *morſe*. See MORSE.

ROSOMACHA, in zoology, a name given to a ſpecies of hiæna. They are, ſays Olaus, taken by hunters chiefly on account of their ſkins, which are much eſteemed by people of fortune for robes, as being variegated with very bright colours reſembling flowers. *Hoffm.* lex univ. in voc. See the article HIÆNA.

ROSPUS, a name uſed by ſome authors for the ſtrange fiſh called the *rana piſcatrix*, or frog fiſh. *Willughby*'s Hiſt. Piſc. p. 86. See RANA.

ROSSE, in ichthyology, the name given by Bellonius to that kind of the cyprinus of Artedi which we call the roach. See the article CYPRINUS.

ROST, in metallurgy, a term uſed by the miners at Chemnitz to expreſs the ore of gold after it has been waſhed and powdered, and melted firſt with lime ſtone, and afterwards burnt with charcoal alone. See LECH.

ROSTEN, in the materia medica of earlier ages, a name given to crab eyes.

ROSTRUM (*Cycl.*)—The *roſtrum* or ſnout in fiſhes varies very much in figure, and ſerves as a conſiderable article of diſtinction. It is 1. in ſome plagioplateous or depreſſed, as in the pike, *&c.* 2. In ſome it is conic in ſhape as in the oxyrynchus, *&c.* 3. In ſome it is extended into a long and ſharp point, as in the common ones; and 4. In others it is triangular, or nearly ſo, as in the rays.

ROSTRUM is alſo uſed to ſignify an inſtrument wherewith paper is ruled for muſical compoſitions.

ROT, in ſheep (*Cycl.*)—This is the greateſt of all the inconveniencies that attend the keeping theſe uſeful animals.

It is a very hard thing to prevent the *rot* if the year prove very wet, eſpecially in May or June. Salt marſhes and lands, where broom grows, are the beſt places of preſervation for them. Sheep are ſometimes all cleared of the *rot* when not too far gone with it, only by removing them into broom fields. Scurvy-graſs, muſtard, parſley, and thyme, are alſo good for the prevention of it.

Some propoſe the giving ſheep half a handful of bay ſalt every month or oftener; and there is great probability that this may be of ſervice; but the rational way of attacking all diſorders in cattle, is by conſidering what are the cauſes of them. It will appear, upon enquiry, that wet ſeaſons are the general occaſions of the *rot* in ſheep, and therefore it would be adviſeable for the owners, when ſuch ſeaſons come on, to remove the animals into the drieſt paſtures they can, and then to feed them principally with dry ſweet hay, oats, bran, and the like, this would prevent the occaſion; and if they were already a little infected, ſome ſalt given with their dry food, would be a happy means of curing them. *Mortimer*'s Huſbandry, p. 244.

ROTATED, *rotatus*, in botany, the name of a ſort of flowers, ſo called from their ſhape, ſomewhat reſembling a wheel. Theſe are of the monopetalous kind, and are only a ſub-diſtinction of the infundibuliform flowers. *Tourn.* Inſt. p. 116. Tab. 1. of Botany, Claſs 1. See the article INFUNDIBULIFORMIS.

ROTA-

ROTATION (*Cycl.*)—Mr. Winſlow has given an account of this, as well as of pronation, and other circulatory animal motions. See Mem. de l'Acad. des Sciences, 1729.

ROTCHET, an Engliſh name for the fiſh, called by authors *cuculus*, and more frequently by us the *red gurnard*. *Willughby*'s Hiſt. Piſc. p. 282. See the article CUCULUS.

ROTELE, in zoology, a name by which ſome call the *rutilus latior*, or *rubellio fluviatilis*, more frequently known by the name of the *rud* or *finſcale*, a river fiſh with red belly-fins and tail. *Ray*'s Ichthyogr. p. 252. See RUBELLIO.

ROTHALS, in zoology, a name given by Geſner, and ſome others to the *pochard*, or *red headed wigeon*; a bird diſtinguiſhed from all others of the duck kind, by having no variegation in its wings. See POCHARD.

ROTKNUSSEL, in zoology, a name by which the Germans call the *gallinula melampus* of Geſner. It is a bird ſomewhat approaching to the ſnipe kind; its back is brown, with a ſlight admixture of reddiſh, and ſome ſpots of a duſky colour; its wings are variegated with black and white, and its beak and legs are black. It is common in many parts of Germany.

ROTOLO, an Egyptian weight of twelve ounces, each ounce conſiſting of twelve drachms, and each drachm of ſixteen carrats. *Pocock*'s Egypt. p. 175.

ROTSCHWENTZEL, in zoology, the name of a bird, deſcribed by Geſner and ſome other authors, and ſeeming to be the ſame with our *ruticilla*, or *red-ſtart*. See the article RUTICILLA.

ROTSIMPA, in ichthyology, a name given by the Swedes to a ſpecies of *cottus*, called by Jonſton and Schonveldt *ſcorpius marinus*. It is different from the *ſcorpæna* of the generality of writers, and is of the *cottus* kind. It is diſtinguiſhed by Artedi by the name of the ſmooth *cottus*, with many thorns upon the head, and with the upper jaw ſomewhat longer than the under one. See the article COTTUS.

ROTULA (*Cycl.*)—ROTULA, in natural hiſtory, the name of a genus of the *echini marini*, of the general claſs of the placentæ. The characters of the *rotulæ* are, that they are flat ſhells in form of a cake, compoſed of various flat pieces, and formed into a round, ſomething like that of a wheel; but wanting one or more parts of its outer ring, and radiated or dentated. Their mouth is ſituated in the middle of the baſe, and the aperture of the anus in the third region of the axis, and marked with a cinquefoil flower at the ſummit. The great and obvious character is however the dentated edge. Of this genus there are two known ſpecies. 1. A kind with three very deep ſinuſes, and four pervious foramina at the top, or ſometimes only with two, and with a finely crenated pentagonal vertex; and 2. The ſolar echinus, which has uſually nine rays free from the outer ring. The vertex, in this ſpecies, is round and denticulated, and variegated with very elegant lines. See Tab. of Teſtaceous Animals, N° 10. *Klein*'s Echin. p. 32.

ROTULA, in ichthyology, is alſo a name given by ſome to the *faber* or *doree*. See the article FABER.

ROTUNDUS *major*, (*Cycl.*) in anatomy, a name given by Riolan, and ſome others, to a muſcle, called by Veſalius and others the *tertius humeri*, and *tertius brachium moventium*. Albinus, Cowper, and others, call it *teres major*.

ROUGET, in ichthyology, a name given by the French to the fiſh called the *lyra* and *capo* by authors. It is a ſpecies of the *trigla*, and is diſtinguiſhed by Artedi by the name of the *trigla* with the long bifid ſnout and tubulous noſtrils.

ROUGH (*Cycl.*)—ROUGH-*ſea*, in the ſea language. See the article OVER-GROWN-*ſea*.

ROUND (*Cycl.*)—ROUND *in*, or ROUND-*aft*, at ſea, a term belonging to the main and fore ſail. When the wind largeth, they ſay, *Let riſe the main tacks*, or *the fore-tacks! Hale aft the fore-ſheet to the cat head*; *and the main ſheet to the cubbridge-head!* And when theſe ſheets are thus haled down they keep them from flying up with the *paſſarado rope*. This work is called *rounding in* or *rounding aft* the ſail.

ROUND-*ſeam*, in the ſea language. See SEAM.

ROUND-*ſplice*, in the ſea language. See SPLICE.

ROUND-*top*, in the ſea language. See TOP.

ROUSSIN, in the manege, is a ſtrong well knit, well ſtowed horſe, ſuch as are commonly brought into France from Germany and Holland.

ROWELS *of a ſpur*, in the manege. See SPUR, *Cycl.*

ROWLE, in a ſhip, is a round piece of wood or iron, wherein the whip goes, being made to turn about, that it may carry over the whip the eaſier from ſide to ſide.

ROYENA, in botany, the name of a genus of plants, the characters of which are theſe. The perianthium conſiſts of one leaf, which is inflated and permanent, and is lightly divided into five obtuſe ſegments at the edge. The flower is monopetalous, and conſiſts of a tube of the length of the cup, and an expanded mouth, which is divided into five oval and reflex ſegments. The ſtamina are ten very ſhort filaments growing to the flower. The antheræ are oblong, acute, and double, and they ſtand erect, and are of the length of the tube of the flower. The germen of the piſtil is of an oval figure and hairy, and is divided into two ſtyles, which are a little longer than the ſtamina. The ſtigmata are ſimple; the fruit is an oval capſule, compoſed of four valves, and furrowed with four deep lines, and contains only one cell, in which are four oblong and triangular nuts covered with a calyptra. This has been deſcribed in Paradiſus Batavus, and ſome other books, under the name of a ſpecies of the bladder nut, *ſtaphylodendri ſpecies*. *Linnæi* Gen. Pl. p. 193. *Hort. Amſtel.* Vol. 1. p. 187. *Herm.* P. B. p. 232.

RUBECULA, in zoology, the name of a bird, commonly known in England, under the name of the *red breaſt*, and called by ſome *erithacus*. This is a ſolitary bird, and naturally ſhy, but in winter will even come into peoples houſes in ſearch of food. It is very careful in building its neſt. It builds in the thickeſt buſhes and hedges, where there are multitudes of fallen oak leaves, or the like large light matter. It covers its neſt very artfully with large quantities of theſe leaves, and makes only one way to get into it, which is by a narrow paſſage, and which it always covers with leaves when it goes abroad for food. *Ray*'s Ornitholog. p. 160.

RUBELLIO, in ichthyology, a name given by ſome authors to a ſmall ſea fiſh of a red colour caught in the Mediterranean, and more uſually called by writers on theſe ſubjects the *erythrynus*. *Aldrovand.* de Piſc. p. 154. See the article ERYTHRYNUS.

RUBELLIO *fluviatilis*, the name of a freſh water fiſh of the leather mouthed kind, called in Engliſh a *rudd* or *roud*, and in ſome places a *finſcale*. It is a common fiſh in many of the rivers of England and Germany, and eſteemed a well taſted fiſh. They are in ſeaſon all the year, except in the month of April, which is their ſpawning time, and the males at that time are ſubject to a great number of white ſpots upon their heads, and are more rough than at any other ſeaſon. It is a fiſh broader than the carp, but thicker than the bream. It is of a browniſh yellow colour, and has very large ſcales; the tail and belly fins are red, and the gills are commonly marked with a red ſpot. *Willughby*'s Hiſt. Piſc. p. 252.

RUBELLUS, in zoology, a name given by ſome authors to the common roach, and by others to the rudd or finſcale. *Geſner*, de Aquat. p. 965. See the articles RUTILUS and RUBELLIO.

RUBEOLA, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, faſhioned like a funnel, and either lightly dentated, or divided into four ſegments at the edge. Theſe have ſometimes a ſingle, ſometimes a double cup, and that of the two which was the lower, or the ſingle one, if there were no other, is finally converted into a fruit compoſed of two ſeeds.

The ſpecies of *rubeola* enumerated by Mr. Tournefort are theſe. 1. The broad leaved *rubeola*. 2. The narrow leaved *rubeola*. 3. The procumbent *rubeola* with a very long ſpike. 4. The common ſmooth purple flowered ſmall *rubeola*, called by many *rubia ſquinanchica* and ſquinancy wort. 5. The white flowered ſmooth four leaved *rubeola* or ſquinancy wort. 6. The rough Portugal *rubeola* with purple flowers. 7. The ſea *rubeola*. *Tourn.* Inſt. p. 130.

Theſe plants are called by Mr. Tournefort *rubeola* as a diminutive of *rubia*, or madder; moſt other authors have called them *rubia ſpicata*, or ſpiked madder. They differ principally from the galliums in the funnel ſhape of the flower.

RUBETA, the *toad*, in zoology, a creature ſufficiently known. It is larger than the frog, its body is thick, its back broad, and its belly ſwelled, and looking as if inflated, whence it is too heavy and unweildy to hop about as the frog does; its ſkin is conſiderably thick, and full of tubercles, of a duſky and blackiſh colour on the back, and ſpotted on the belly; and is naturally a loathſome and diſagreeable object.

It feeds on the ſame things that the frog does, worms, ſnails, flies, and other inſects; it ſeems alſo, that they are able to live on much lighter food, ſince there have been many inſtances of toads being found in the ſolid bodies of trees in holes, juſt big enough for them to turn about in; and where there could be no nouriſhment conveyed to them, except what they found in the juices of the tree. There are not wanting alſo inſtances of their having been found in the ſame manner in blocks of ſolid ſtone, if we can credit the generality of authors. *Ray*'s Syn. Quad. p. 252.

RUBETRA, in zoology, a name by which Geſner and ſome others have called that ſpecies of the *œnanthe*, commonly known by the name of the *ſtone-chatter*, *ſtone-ſmick*, or *moor-titling*. *Geſner* de Avib. See the article STONE-CHATTER.

RUBIA (*Cycl.*)—RUBIA, *madder*, in the Linnæan ſyſtem of botany, a diſtinct genus of plants, the characters of which are, that the calyx is an extremely ſmall perianthium, ſituated on the germen, and divided by four notches at its extremity. The flower is compoſed of one ſingle petal which is flat, divided into four ſegments, hollow at the baſe, but forming no tube. The ſtamina are four pointed filaments ſhorter than the flower. The antheræ are ſimple. The germen of the piſtil is double, and ſituated below the receptacle. The ſtyle is ſlender, and bifid at top, the ſtig-

mata are headed. The fruit is compoſed of two round bodies, ſmooth, and firmly joined together. The ſeeds are ſingle, roundiſh, and umbilicated. *Linnæi* Gen. Plant. p. 24.

The characters of this genus, according to Mr. Tournefort, are theſe. The flower conſiſts of one leaf, ſhaped like a bell, and very open at the mouth, and divided into ſeveral ſegments, and uſually perforated. The cup changes into a fruit compoſed of two ſucculent berries, which contain uſually an umbilicated ſeed. The leaves are all ſet in rundles about the ſtalk, ſeveral being placed at a joint in form of a radiated ſtar.

The ſpecies of *rubia* enumerated by Mr. Tournefort are theſe. 1. The common cultivated *madder*. 2. The great wild *madder* of Montpelier; and 3. The exotic four leaved ſhining *madder*. The diſpoſition of the leaves, about the ſtalks of theſe plants, ſerve to diſtinguiſh them from other claſſes, when they are not in flower; and this genus is abundantly diſtinguiſhed from all the others which have their leaves diſpoſed in this manner, by its having a berry, or juicy fruit, inſtead of the dry fruits of the others. *Tourn.* Inſt. p. 15. See MADDER, *Cycl.* and *Suppl.*

The root of the common *madder* cultivated for the uſe of the dyers, is an excellent aperient and diuretic. It is preſcribed with great ſucceſs in obſtructions of the liver and ſpleen, in ſuppreſſions of the menſes and urine, and in dropſies, jaundices, and cachexies. It is alſo recommended as a vulnerary, and ſaid to be peculiarly excellent in the diſſolving coagulated blood. The dyers prepare a red colour with it, and uſe it alſo as a firſt tint for ſeveral others.

RUBIA *icterita*, a term uſed by Paracelſus and his followers for the eriſipelas.

RUBICAN, in the manege. A horſe is ſaid to be of a *rubican* colour, that is a bay, ſorrel, or black, with a light grey or white upon the flanks; but ſo that this grey or white is not predominant there.

RUBICILLA *americana*, in zoology, a name given by Mr. Ray to the *guiratirica*, a Braſilian bird, of the bull-finch kind, very beautifully variegated with red, black and grey. See the article GUIRATIRICA.

RUBICULUS, in ichthyology, a name given by Figulus and ſome others to that ſpecies of fiſh which we call the *roach*. It is of the cyprinus kind, and is diſtinguiſhed by Artedi under the name of the red-eyed cyprinus, with the tail and belly fins red. See the article CYPRINUS.

RUBIGO, (*Cycl.*) in huſbandry, is the name by which the antients expreſſed what we call the *blight* in corn, *&c.* they gave it this name from the reſemblance of the colour of the blighted ſtalks to ruſty iron.

They generally thought that it came from heaven, being ignorant of its true cauſe, which is want of nouriſhment in the earth. Virgil gives this up as an incurable diſtemper, and tells the farmer, that if his corn is blighted he muſt live upon acorns, not ſuppoſing that any remedy could be deviſed for ſuch a diſtemper.

Palladius gives many receipts to cure the *blight*, and other diſtemperatures of corn that come from above, as they imagined at that time. The chief efficacy of theſe ſeems to conſiſt in certain ſecret ſympathies and antipathies, to fright the clouds away with. The world will eaſily judge how likely ſuch means as theſe were to have ſucceſs.

The antient farmers generally uſed prayers, ſupplications, and ſacrifices to their gods on this occaſion; and if theſe did not ſucceed, they proceeded to blaſphemy and threatenings, and brandiſhed bloody axes againſt the ſky, as a token to their gods to deſiſt from plaguing them, or elſe to expect no quarter. They uſed to hang up in their fields and gardens, on theſe occaſions, pieces of red cloth, and the feathers and heart of an owl, as a way to fright the clouds from coming over thoſe places. Theſe people in general having no true knowledge of the theory of huſbandry, had recourſe to magic, and uſed what they thought ſpells and enchantments on all occaſions. Cato, Varro, and even Columella, are full of theſe ridiculous devices. A better knowledge in the real nature of huſbandry, has taught us to underſtand this matter in a very different manner, and to apply more efficacious remedies to it. *Tull*'s Horſehoing Huſbandry, p. 68. See BLIGHT.

RUBINUS, the *ruby*, in natural hiſtory. See RUBY.

RUBRICA, in natural hiſtory, a red earth uſed for marking, and in painting. There are two kinds of it, a harder and a ſofter.

The firſt, or harder kind, is but little in uſe, except among the turners in wood, as it does not mark ſo eaſily, requiring to be firſt wetted, and then preſſed hard upon the ſubſtance to be marked. This is dug in Lincolnſhire, Hampſhire, and Suſſex; and is a hard and dry earth, of a ſomewhat pale red, like the common pale red bricks, and is of a very regular and cloſe texture, and always compoſed of a number of thin lamina, lying cloſely and evenly on one another. It is of a rough uneven ſurface, adheres firmly to the tongue, is not eaſily broken between the fingers, and ſtains the hands a little; it is of a very aſtringent taſte, and melts pretty readily in the mouth. It is very readily diffuſible in water, mouldering to powder, ſoon after being thrown into it, and makes no efferveſcence with acids.

The ſecond or ſofter kind is very common, and put to a number of different uſes. It makes ſimply a very good pale red for the painters, and is very ſerviceable to them in their mixed colours. It is in conſtant uſe in many parts of the kingdom for the marking of ſheep; and when waſhed and ſeparated from its ſandy particles, is, by ſome of our modern druggiſts, ſold under the name of bole armenic.

It is found in many parts of the world; the beſt in England is that from ſeveral parts of Derbyſhire, from whence the colour-ſhops and druggiſts of London are ſupplied; many of the latter thinking this a ſhorter method than the common one of our bole armenic makers, of preparing it from a mixture of tobacco pipe clay, and the red ochre called Spaniſh brown. See BOLE and BOLUS.

This ſoft, or common *ruddle*, is a looſe ponderous earth, of a lax texture, and very friable; and of a pale, but tolerably bright red, of a ſomewhat ſmooth and gloſſy ſurface, ſoft to the touch, adhering firmly to the tongue, eaſily broken between the fingers, and ſtaining the hands. It is of a rough auſtere taſte, very readily breaks, and falls to powder in water, and makes no efferveſcence with aqua fortis. *Hill*'s Hiſt. of Foſſ. p. 48.

RUBUS, the *blackberry buſh*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, being compoſed of ſeveral petals, arranged in a circular form on a cup, from the middle of which there ariſes a piſtil, ſurrounded with a great number of ſtamina; this finally becomes a fruit of a globular form; compoſed, as it were, of a number of ſmall berries full of juice; theſe are affixed to a placenta, and contain oblong ſeeds. See Tab. 1. of Botany, Claſs 21.

The ſpecies of *rubus* enumerated by Mr. Tournefort are theſe. 1. The common *blackberry buſh* with black fruit. 2. The French white flowered *blackberry buſh*. 3. The *rubus* with double white flowers. 4. The Poliſh *rubus* without prickles, and with a large black fruit. 5. The common *rubus* without prickles. 6. The prickly *rubus* with the leaves and flower both elegantly divided. 7. The prickly *raſpberry buſh*. 8. The ſmooth *raſpberry buſh*. 9. The ſweet ſcented *rubus*. 10. The white *raſpberry*. 11. The creeping *rubus* with bluiſh fruit. 12. The dwarf alpine *rubus*. 13. The dwarf marſh *rubus*. 14. The creeping trifoliate *rubus*, with ſoft hoary leaves and large blue fruit. 15. The ſmall, erect, hoary, white flowered alpine *rubus*. 16. The trifoliate dwarf upright elegant *rubus*, with prickles like the roſe-buſh, and a fruit of the colour and taſte of the ſtrawberry. *Tourn.* Inſt. p. 614.

RUBUS, in ichthyology, a name given by Joannes Cuba, Albertus, and ſome other writers, to the ſpecies of *ray*, uſually called the *ſkaite* or *flaire*. See RAJA.

RUBY, *rubinus*, (*Cycl.*) in natural hiſtory, a gem, the diſtinguiſhing character of which is, that it is of a red colour with an admixture of purple.

The *ruby*, in its moſt perfect ſtate, is a gem of very great beauty, and of equal value. It is often found perfectly pure, and free from all ſpots or blemiſhes; but it is much more frequently debaſed by them, and greatly brought down in its value, eſpecially in the larger ſpecimens. It is of very great hardneſs equal to that of the ſapphire, and ſecond only to the diamond. It is various in ſize, but is leſs ſubject to variations in its ſhape than moſt of the other gems. It is moſt frequently found very ſmall; its common ſize being that of the heads of the larger ſorts of pins; and when of this ſize it is very cheap; but it is alſo found of four, ſix, and ten carrats; and ſometimes, though but very rarely, up to twenty, thirty, or forty; nay, we have accounts of ſome of more than an hundred. It is never found of an angular or cryſtalliform ſhape, but always of a pebble like figure, often roundiſh, ſometimes oblong, and much larger at one end than the other, and in ſome ſort reſembling a pear, and is uſually more or leſs flatted on one ſide.

It is commonly ſo naturally bright and pure on the ſurface as to need no poliſhing; and is worn in rings, and in the crowns of princes, in its rough or native ſtate. Its colour is red in very different degrees, from the deepeſt garnet colour to that of the paleſt red diamond, but it ever has with the red more or leſs of a purpliſh tinge: this is very plainly diſtinguiſhed in the deeper coloured ſpecimens, but in the pale ones is gradually leſs and leſs to be diſtinguiſhed in proportion to their degree of colour. Theſe are the diſtinguiſhing characters of the *ruby*, and by theſe it is eaſily known from the garnet, carbuncle, and other red gems.

Our jewellers are very nice, though not perfectly determinate in their diſtinctions; knowing this gem, in its different degrees of colour, under three names; the firſt is ſimply the *ruby:* this is the name they give it in its moſt perfect and ſtrongeſt coloured ſtate.

The ſecond is the *ſpinal ruby*. Under this name they know thoſe *rubies*, which are of a ſomewhat leſs deep and greatly leſs vivid colour, than what they call the true *ruby*, or ſimply the *ruby*.

The third is the *balaſs ruby*, a name derived from Balakeia,

the name of a country where the paler *rubies* are principally found. Under this name they expreſs a pale, yet very bright *ruby*, with a ſmaller admixture of the purple tinge than in the deeper coloured one, and ſomething reſembling the colour of the damaſk roſe. This is of conſiderable value, but leſs than the deeper, or as they call it the true *ruby*.

Beſide theſe, they know alſo two other ſtones, under the general name *rubies*, calling them the *rock ruby* and the *rubacelle*. But theſe are not truly of the *ruby* kind; the firſt being a very beautiful ſpecies of garnet, and having a tinge of blue with its red; and the other a hyacinth, having a manifeſt caſt of yellow.

We have the true *rubies* only from the Eaſt Indies. In Europe there are not unfrequently found cryſtals tinged to the true colour of the *ruby*, but theſe ever want its luſtre and hardneſs. In the Eaſt Indies, the true *rubies* are often found almoſt colourleſs, and not unfrequently variegated with ſpots or ſtains of a pure blue, evidently the ſame with that of the ſapphire. Doubtleſs alſo the *ruby* is ſometimes found like the other gems, wholly deſtitute of colour; but in this caſe, as the hardneſs of the ſtone is the only thing that proves it to be of the gem claſs; both this, and all the other colourleſs ſpecimens of the gems, are confounded under the name of the colourleſs ſapphire; or, as our jewellers chuſe to ſpeak it, the white ſapphire. *Hill*'s Hiſt. of Foſſ. p. 590. ſeq.

Arſenical RUBY, *rubinus arſenicalis*, in chemiſtry, a name given to a ſublimation of a mixture of arſenic and common ſulphur. Theſe two bodies mixed together in different proportions afford very different appearances. If arſenic, mixed with one tenth part of its weight of ſulphur, be thrown into a crucible red hot upon the fire, and covered immediately with a tile, and finally poured out after two minutes fuſion, it becomes a ſolid brittle maſs of a very pale yellow. If arſenic be melted in the ſame manner, with a fifth part of ſulphur, the maſs when cold will be of a red colour: and finally, if arſenic and ſulphur be melted or ſublimed together, in equal quantities, the product is a beautiful red tranſparent maſs, called *rubinus arſenicalis*.

Counterfeit RUBY. The way to give the true fine red of the *ruby*, with a fair tranſparence, to glaſſes, is as follows. Calcine, in earthen veſſels, gold diſſolved in aqua regis till it become a red powder. The operation will require many days in a hot furnace; when the powder is of a proper colour, take it out; and when it is to be uſed, melt the fineſt cryſtal glaſs, and purify it by often caſting it into water; finally add, by ſmall quantities, enough of this red powder, to give it the true colour of a *ruby*, with an elegant and perfect tranſparence. *Neri*'s Art of Glaſs, p. 192.

RUDD, in ichthyology, a name given by the Engliſh to a fiſh of the cyprinus kind; it is called *orfus* and *rutilus latus*, or the *broad roach* by authors, and in ſome parts of England the *finſcale*. See ORFUS, RUTILUS and CYPRINUS.

RUDDER (*Cycl.*)—RUDDER-*irons*, in a ſhip, are the cheeks of that iron, whereof the pintle is part, which is faſtened and nailed down about the rake of the *rudder*.

RUDDER-*rope*, in a ſhip. See ROPE, *Cycl.*

RUDDLE, *rubrica*, in natural hiſtory. See RUBRICA.

RUDDOCK, in zoology, an Engliſh name for the *rubecula*, more commonly known by the name of the *red breaſt*, or *robin red breaſt*. *Ray*'s Ornitholog. p. 160. See the article RUBECULA.

RUDMAS *day*, in our old writers, the feaſt of the *holy croſs*. There are two of thoſe feaſts, one on the third of May, being the invention of the *croſs*; and the other the fourteenth of September, called *holy rood-day*, and is the exaltation of the croſs. *Blount*.

The word is compounded of the Saxon *rode*, i. e. *crux*, and *maſs-day*, i. e. feaſt-day.

RUE, *ruta*, in botany, &c. See the article RUTA.

We have ſeveral ſorts of *rue* in the gardens of the curious, but the common kind only is propagated for medicinal uſe. All the kinds may be propagated, either by cuttings in the manner of roſemary, or elſe by ſeeds. Theſe ſhould be ſown in the ſpring on a bed of light earth; and when the young plants come up, they ſhould be removed at about two inches high to the places where they are to remain. *Miller*'s Gardners Dict.

Goats RUE, in medicine. See GALEGA.

Wild RUE. See the article HARMALA.

RUELLIA, in botany, the name of a genus of plants, deſcribed by Linnæus, Plumier, and others, the characters of which are theſe. The cup is compoſed of one leaf, and is divided into five erect narrow ſegments. The flower conſiſts of one petal, the tube is of the length of the cup; the neck broad and inclined, and the verge divided into five open ſegments. Theſe are all obtuſe at the points, and the two upper ones are longer than the reſt, and are turned a little backwards. The ſtamina are four filaments placed in the wide part of the tube in pairs. The germen of the piſtil is roundiſh, the ſtyle is ſlender, and of the length of the ſtamina; and the ſtigma is bifid and acute, and the lower ſegment of it is rolled back. The fruit is a cylindric capſule rounded at each end; it is of the length of the cup, compoſed of two valves and ſemibilocular: this contains ſome roundiſh but compreſſed ſeeds. *Linnæi* Gen. Pl. p. 298. *Plumier* Gen. 2. *Dillen.* Hort. Elth. 248, 249.

RUFFE, in zoology, the Engliſh name of the *cernua* or ſmall gilded pearch, a fiſh common in our rivers, and much reſembling the pearch in figure. *Ray*'s Ichthyol. p. 334. See the article CERNUA.

The *ruffe* is called by the generality of authors *cernua fluviatilis*; and by ſome *chærus acerina* and *aſpredo*. It is called by Johnſon and Charleton alſo *ſcrollus*. Willughby, as well as theſe authors, has mentioned the *ſcrollus* as another ſpecies of fiſh; but it is proved, by obſervation, that they are evidently the ſame ſpecies. Artedi makes this fiſh a pearch, or *perca*; and accurately diſtinguiſhes it from the other fiſh of that genus by the name of the pearch, with only one fin on the back, and with a cavernous head. See the articles CERNUA and PERCA.

This fiſh may be preſerved alive in glaſs jars with freſh water, and be made very tame. It muſt be fed, for it cannot ſubſiſt on the animalcula of river water as ſmall dace can. See DACE and Phil. Tranſ. N° 478. p. 25.

No fiſh ſhews the circulation of the blood in a finer manner than *ruffs*, whoſe fins are exceeding tranſparent. Beſides, it is a creature vaſtly tenacious of life, and will live twenty or thirty minutes out of water, without receiving much damage. Phil. Tranſ. l. c. p. 26.

RUFFE, in ornithology, the name of a male ſpecies of bird, the female of which is called *reeve*, and the Latin name for which is *aves pugnax*, or the fighting bird.

It is about five ounces in weight; its head is of a greyiſh brown with blackiſh ſpots, its neck is grey, and its back and ſhoulders variegated with black, white, and brown. Its breaſt and belly are white, and its throat of a greyiſh white, and ſomething mottled. Its wings are black and white. The females are ſomewhat ſmaller than the males, and they ſeldom fight. The males have a very remarkable circle of long feathers, ſurrounding their necks in the form of a *ruff*, worn antiently by ladies, and from this the bird has its name; the feathers of this are ſometimes white, but more uſually black, yellow, grey, or of a very ſhining blackiſh blue; nor is the diverſity of colour peculiar to the feathers of the *ruff* alone; but the whole body of the bird is ſo variable, in this reſpect, that at ſome ſeaſons it is ſcarce poſſible to find any two of the males which are exactly of the ſame colour; but about Midſummer, when they have newly moulted, they are all of the ſame colours, and continue ſo till toward the ſucceeding ſpring. The beak is ridged and triangular, and is blackiſh, and the feet of a yellowiſh red. They come over to us in vaſt numbers in ſpring, and remain the ſummer, building in ſome parts of Lincolnſhire, particularly in the fenny country about Crowland. When they firſt come over there are many more males than females among them; but theſe are ſo continually fighting, that their number ſoon decreaſes below an equality. They are fed up after they are taken with bread and milk, and become very fat, and a very delicate bird; but they are obliged to be kept in the dark, for as ſoon as the leaſt light is admitted they begin to fight. They are uſually taken with nets, while vaſt numbers of them are fighting together. *Ray*'s Ornitholog. p. 224, 225.

RUFFE is alſo the name of a particular ſpecies of pigeon, called by Moore the *columba cucullata rudis*.

It is in ſhape very like that ſpecies of pigeon called the *jacobine*, but is larger, and has a longer beak. The iris of the eye is ſometimes red, ſometimes pearl coloured. The feathers of the hood and chain are much longer than the *jacobine*, though they do not come down ſo low to the ſhoulders of the wings, nor are they ſo compact and cloſe, but are apt to blow about with every little blaſt of wind, and fall more backward off the head, and lie in a rough confuſed manner.

It is a common thing to match the *jacobine* pigeon with this ſpecies, with intent to improve its chain by the length of the *ruff*'s feathers; but the event is, that the pigeon is always worſe inſtead of better, being longer beaked, and looſer in its head and chain without any real advantage. *Moore*'s Columb. p. 48.

RUGGIOLA, a ſort of Spaniſh ſlate, ſerving in many places in the room of tiles and bricks. It is a flaky ſtone, of the nature of ſome of our grey ſlates, and is cut out of a mountain near Cordova; a plate of this being well heated on both ſides, will retain its warmth for twenty-four hours.

The people of Cornwal and ſome parts of Yorkſhire uſe a ſtone, which is of a talcky nature, to warm themſelves when in bed, applying it at the feet of the bed. This they call the warming ſtone from its uſe, and it will retain a ſenſible heat ſix or eight hours, after once moderately warming. *Plot*'s Oxfordſhire, p. 258.

RUGOSE *leaf*, among botaniſts. See LEAF.

RUININE *oil*, a name given by ſome authors to the oil of the *palma chriſti*, which is very common in the Weſt-Indies, and is uſed by the common people in lamps. It is a delicate ſweet and tranſparent oil, and has no peculiar operation in phyſic. They often give it in glyſters from one ſpoonful to three at a time, and it has only the effect of common oil:

but

but the leaves of the plant are one of the grand medicines of the negroes, bruiſed and applied to the head; they are thought to be an almoſt infallible remedy for the head-ach, of whatever kind, or from whatever cauſe.

RUKKAIA, in zoology, a name given by ſome to a peculiar kind of ſquirrel, found in the iſland of Ceylon. See the article SCIURUS.

RUM (*Cycl.*)—*Rum* differs from what we ſimply call ſugar ſpirit, in that it contains more of the natural flavour or eſſential oil of the ſugar cane; a great deal of raw juice and parts of the cane itſelf being often fermented in the liquor, or ſolution of which the *rum* is prepared.

The unctuous or oily flavour of *rum* is often ſuppoſed to proceed from the large quantity of fat uſed in boiling the ſugar; which fat, indeed, if coarſe, will uſually give a ſtinking flavour to the ſpirit, in our diſtillations of the ſugar liquor, or waſh, from our refining ſugar houſes; but this is nothing of kin to the flavour of the *rum*, which is really the effect of the natural flavour of the cane. The method of making *rum* is this:

When a ſufficient ſtock of the materials is got together, they add water to them, and ferment them in the common method, though the fermentation is always carried on very ſlowly at firſt; becauſe, at the beginning of the ſeaſon for making *rum* in the iſlands, they want yeaſt, or ſome other ferment to make it work; but by degrees, after this, they procure a ſufficient quantity of the ferment, which riſes up as a head to the liquor in the operation, and thus they are able afterwards to ferment and make their *rum* with a great deal of expedition, and in large quantities.

When the waſh is fully fermented, or to a due degree of acidity, the diſtillation is carried on in the common way, and the ſpirit is made up proof: though ſometimes it is reduced to a much greater ſtrength, nearly approaching to that of alcohol or ſpirit of wine, and it is then called double diſtilled *rum*. It might be eaſy to rectify the ſpirit, and bring it to much greater purity than we uſually find it to be of; for it brings over in the diſtillation a very large quantity of the oil; and this is often ſo diſagreeable, that the *rum* muſt be ſuffered to lie by a long time to mellow before it can be uſed; whereas, if well rectified, it would grow mellow much ſooner, and would have a much leſs potent flavour.

The beſt ſtate to keep *rum* in both for exportation, and other uſes, is doubtleſs that of alcohol, or rectified ſpirit. In this manner it would be tranſported in one half the bulk it uſually is, and might be let down to the common proof ſtrength with water when neceſſary: for the common uſe of making punch, it would likewiſe ſerve much better in the ſtate of alcohol; as the taſte would be cleaner, and the ſtrength might always be regulated to a much greater exactneſs than in the ordinary way.

The only uſe to which it would not ſo well ſerve in this ſtate, would be the common practice of adulteration among our diſtillers; for when they want to mix a large portion of cheaper ſpirit with the *rum*, their buſineſs is to have it of the proof ſtrength, and as full of the flavouring oil as they can, that it may drown the flavour of the ſpirits they mix with it and extend its own. If the buſineſs of rectifying *rum* was more nicely managed, it ſeems a very practicable ſcheme to throw out ſo much of the oil, as to have it in the fine light ſtate of a clear ſpirit, but lightly impregnated with it; in this caſe it would very nearly reſemble arrac, as is proved by the mixing a very ſmall quantity of it with a taſteleſs ſpirit, in which caſe the whole bears a very near reſemblance to arrac in flavour.

Rum is uſually very much adulterated in England, ſome are ſo barefaced as to do it with malt ſpirit; but when it is done with molaſſes ſpirit, the taſtes of both are ſo nearly allied that it is not eaſily diſcovered. The beſt method of judging of it is, by ſetting fire to a little of it; and when it has burnt away all the inflammable part, examining the phlegm both by the taſte and ſmell. *Shaw*'s Eſſay on Diſtillery.

RUMI, in the materia medica, a name given by Aviſenna and Serapio to maſtic of the finer kind. They diſtinguiſhed this drug into two ſorts; the one called by this name *rumi*, which was white and pure; the other called *cupti*, which was foul and blackiſh; the former came from the iſland of Chios, the latter from ſome part of Ægypt.

RUMOUR, in law. Spreading falſe *rumours* is criminal and puniſhable at common law. 1 *Hawk.* P. C. 234.

RUMPHIA, in the Linnæan ſyſtem of botany, the name of a plant which makes a diſtinct genus. The characters of which are, that the cup is a one leaved perianthium, divided by three notches at the extremity, and is placed erect, and is plain. The flower is compoſed of three petals, which are all oblong, obtuſe, and equal in ſize. The ſtamina are three pointed filaments of the length of the flower. The antheræ are very ſmall. The piſtil has a roundiſh germen. The ſtyle is pointed, and of the ſame length with the ſtamina, and the ſtigma is three cornered. The fruit is a ſkinny drupe of a turbinated form, and furrowed in three places. The ſeed is a whole nut of an oval figure, containing three cells, the nuts in each of theſe are three cornered in ſhape. *Linnæi* Gen. Pl. p. 9.

RUN (*Cycl.*)—RUN, in the manege. To *run* a horſe is to put him to his utmoſt ſpeed. Some uſe the word *running* for any kind of gallop.

RUNCARIA, in our old writers, ſignifies land full of brambles and briars. 1 Inſt. 5. The word comes from the Latin *runca*, a weed. *Blount.*

RUNCATION, a term uſed in the antient huſbandry, to expreſs the clearing away the weeds from among the corn and other ſown plants.

They uſed when the corn or other plants were an inch or two high, to draw a ſort of rake or harrow over the ground indiſcriminately over the corn and weeds, and when this was done a perſon followed over all the field, and picked up all the weeds with the hand; the treading down the young corn, however, by this perſon's feet, and the injury done to it by the rake, were ſo great, that the crop always ſuffered greatly by it; and many of the Romans choſe to omit the uſe of the rake or harrow, as a thing that did as much injury to the corn as to the weeds, and contented themſelves with the ſending a perſon to pick up the weeds without it.

This was a ſort of firſt hint to the horſehoing huſbandry of the moderns, though ſo injudiciouſly managed, that it was of very little, if any, uſe in this its infancy. But had theſe farmers been inſtructed to ſow their corn in rows, and then to uſe the rake or harrow as we do the hoe, only between thoſe rows, they would then have had all the advantage of deſtroying weeds by it, and of ſtirring the earth, and no injury would be done to the crop. *Tull*'s Huſbandry. See the article HUSBANDRY.

RUNGS, in a ſhip, the ſame with the floor or ground timbers, being the timbers which conſtitute her floor, and are bolted to the keel, whoſe ends are *rung-heads*.

RUNG-*heads*, in a ſhip, are made a little bending to direct the ſwip or mold of the *futtocks* and naval timbers: for here the lines, which make the compaſs and bearing of a ſhip, do begin.

RUNIC (*Cycl.*)—In ſeveral parts of Sweden, ſtones may be met with which were formerly ſet up as obeliſks in memory of the dead; and theſe monuments are marked with the antient northern letters called *runor*, or the *runic* characters. In ſome places, the characters vary from the *runic*, particularly in free ſtones found in Helſignland, of which Mr. Celſius has given us a deſcription, with an explanation. See Phil. Tranſ. N° 445. Sect. 3.

From theſe Helſingland inſcriptions an alphabet of ſixteen letters may be derived, which is very ſingular. In other alphabets different ſounds are generally denoted by different figures; but here the ſame character, according to the diverſity of its place and altitude between two parallels, denotes different ſounds.

But theſe characters, however different they may appear at the firſt ſight from the *runic*, may eaſily be derived from them; or *vice verſa*, the *runic* may be derived from the *helſingic*, if theſe be ſuppoſed the moſt antient. The ſubtraction of a perpendicular line in the firſt caſe, or its addition in the latter, brings the two characters to a near reſemblance.

The inſcription, which Mr. Celſius conſiders, was publiſhed in Monſ. de la Motraye's travels, but erroneouſly. See Phil. Tranſ. loc. cit.

RUNNING, in antiquity, made one of the exerciſes performed in the pentathlon or quinquertium. See the article PENTATHLON, *Cycl.*

This exerciſe was in ſo great eſteem among the antient Greeks; that ſuch as prepared themſelves for it, thought it worth their while to burn, or parch their ſpleen, becauſe it was believed to be an hindrance to them.

Indeed, all thoſe exerciſes, that conduced to fit men for war, were more eſpecially valued; and that ſwiftneſs was eſteemed ſuch in an eminent degree, appears from Homer's giving his hero the epithet of ποδας ωκυς Αχιλλευς. *Pott.* Arch. Græc. l. 2. c. 21.

RUNNING *of the eyes*, in infants. See INFANT.

RUNNING-*fights*, at ſea. See FIGHTS.

RUNNING-*ropes*, in a ſhip, are thoſe which run on blocks and ſhivers.

RUNOR. See the article RUNIC.

RUNT, the name uſed with the diſtinction of places for ſeveral ſpecies of pigeons. Theſe are the Leghorn, the Spaniſh, and the Frieſland *runt*, &c. The *columba domeſtica Piſarum, Hiſpaniæ & Friſiæ* of Moore.

The Leghorn *runt* is a ſtately large pigeon, ſeven inches or better in the legs, cloſe feathered and faſt fleſhed, extremely broad breaſted, and very ſhort in the back. He carries his tail, when he walks, ſomewhat turned up like a duck's; his neck is longer than any other pigeons, and he carries it bending like a gooſe or ſwan. He is gooſe headed, and his eye lies hollow in his head, with a thin ſkin round it, like that of the Dutch tumbler. His beak is very ſhort for ſo large a bird, and has a ſmall wattle on it, and the upper chap falls a little over. It is a very valuable pigeon, but is tender, and requires care.

The

The Spaniſh *runt* is the longeſt bodied of all the pigeons; it is ſhort legged, and looſe feathered, and does not walk ſo upright as the Leghorn *runt*. Theſe are of a great variety of colours, but are apt to have accidents in ſitting, from their ſitting too heavy, and often breaking their eggs.

The Frieſland *runt* is a large pigeon, and has all its feathers reverted, or looking as if placed the wrong way.

The Roman *runt* is a pigeon of the ſame general make with the common kind, but ſo large and heavy that it can hardly fly.

The Smyrna *runt* is middle ſized, and is feather footed, and that to ſuch a degree ſometimes, as to look as if there were wings upon the feet; the feathers of theſe are ſometimes four or five inches long, and often pull the eggs and young out of the neſts. The common *runt* is the common blue pigeon kept for the table, and known to every body. *Moore*'s Columb. p. 42.

RUNT is alſo a name given to Canary birds when three years old. See CANARY and PASSERES *Canarienſes*.

RUPELLENSIS *ſal*, in chemiſtry, a name given to a peculiar kind of ſalt, invented by Mr. Seignette at Paris, and extolled as a very valuable medicine.

The preparation of it was kept a great ſecret, till diſcovered by ſome members of the Paris academy. It was found to be a ſpecies of *ſal polycreſtum*, and was properly a ſoluble tartar compoſed of cream of tartar, and the fixed ſalt of common pot-aſhes well depurated. This ſalt is of a very ſingular nature; for though it be a true alcaline ſalt, it yet is capable of cryſtalization, and it does not eaſily diſſolve in the open air as other fixed ſalts do; but, on the contrary, it calcines therein like vitriol and the Glauber's ſalts. Phil. Tranſ. N° 436.

Another peculiar property of it is, that if it be ſatiated with vitriolic acids, and the liquor be evaporated, there is obtained a ſalt which has the figure of Glauber's ſalt, and all the properties requiſite to make Mr. Seignette's ſalt. In order to which, take ſalt of kali or pot-aſhes of Alicant well purified one pound; diſſolve it in water, and add to it cream of tartar half a pound: this is about the quantity uſually neceſſary; but the true proportion, in this caſe, can no more be determined than in the making the common ſoluble tartar, otherwiſe than by trial every time; either from the ſalt of kali's having retained more or leſs humidity, or from the tartar's having more or leſs foulneſs. Boil the whole together in order to diſſolve the tartar; and if the quantity of tartar have been too great after the fermentation is over, filtre the liquor, and as it cools the ſuperfluous tartar will fall to the bottom: after the ſeparation of the tartar, evaporate the lixivium over a gentle fire to a proper ſtandard, and then ſet it in a cool place, and there will ſhoot fine cryſtals. If the liquor be a little too far evaporated, there will be no cryſtals formed, but the whole liquor will congeal into a hard ſubſtance tranſparent like ice; but upon diſſolving this in more water, it will ſhoot as fair as it would have done if properly evaporated at firſt.

The virtues of this ſalt conſiſt in its being an excellent purge, its doſe is from one to two ounces; and it is to be diſſolved in a large quantity of water.

RUPERT's drops, a ſort of glaſs drops with long and ſlender tails, which burſt to pieces, on the breaking off thoſe tails in any parts, ſaid to have been invented by Prince Rupert, and therefore called after his name.

This ſurpriſing phænomenon is ſuppoſed to ariſe from hence; that while the glaſs is in fuſion, or in a melted ſtate, the particles of it are in a ſtate of repulſion; but being dropped into cold water, it ſo condenſes the particles in the external parts of their ſuperficies, that they are thereby reduced within the power of each other's attraction, and by that means they form a ſort of hard caſe, which keeps confined the before-mentioned particles in their repulſive ſtate; but when this outer caſe is broke by the breaking off the tail of the drop, the ſaid confined particles have then liberty to exert their force, which they do by burſting the body of the drop, and reducing it to a very peculiar form of powder.

This theory ſeems to be corroborated by making the drops red hot, and letting them cool again by gentle degrees in the open air, for then there is no ſuch effect. Yet it muſt be allowed, that there is another experiment which ſeems to impugn this hypotheſis; and that is by grinding away any part of the drop upon a grindſtone, when the remaining part continues entire; though there appears no reaſon why it ſhould not break, and burſt into duſt, if the internal parts be the cauſe of it; ſince by this means they muſt needs be ſet at liberty, in the moſt ample manner poſſible, unleſs it be that in grinding, the vacuities between the internal particles are filled up with the matter worn off from the ſtone; and by this means fixing the parts of the glaſs next the ſtone, they deſtroy their repulſive force; conſtituting as it were another ſort of hard external caſe, which confines the internal particles no leſs than the other did.

The hiſtory of theſe drops is this; they were firſt brought into England by prince Rupert out of Germany, and ſhewn to king Charles II. who communicated them to the Royal Society at Greſham College; and a committe appointed on this occaſion by the Society, gave the following account of them. They muſt be made of green glaſs well refined, for till the metal, as the glaſs men call it, is perfectly refined they never ſucceed if made of it; but always crack and break ſoon after they are dropped into the water. The beſt way of making them is to take up ſome of the metal out of the pot upon the end of an iron rod, and immediately let it drop into cold water, and there lie till it is cold. If the metal be too hot when it is dropped into the water, the buſineſs does not ſucceed, but the drop froſts and cracks all over, and falls to pieces in the water, and every one that does not crack in the water, but lies in it whole till it is quite cool, is ſure to be good: there is great nicety in the hitting a due degree of heat in the metal, and the workmen who beſt know their buſineſs cannot promiſe beforehand which ſhall ſucceed, but often two fail for one that hits right. Some of them froſt over the ſurface without falling to pieces, and others break into pieces before the red heat is quite over, and that with a ſmall noiſe; others break ſoon after the red heat is over and make a great noiſe, and ſome neither break nor crack till they ſeem to be quite cold; and others hold together while they are in the water, but fly to pieces with a ſmart noiſe when they are taken out of it; ſome do this on the inſtant, others an hour or two after, and others will keep ſeveral days, nay weeks, and at laſt fall to pieces without being touched. *Neri*'s art of glaſs by Merrett. p. 356.

If one of them be taken out of the water while it is hot, the ſmall part of the neck and ſo much of the thread or ſtring it hangs by, as has been in the water, will upon breaking fall into ſmall parts, but not the body, though it have as large cavities in it, as thoſe which burſt in pieces.

If one of theſe drops be cooled in the open air hanging on a thread, or on the ground, it becomes like common glaſs in hardneſs, ſolidity, and all other its qualities, and has nothing of the nature of the drops cooled in water.

When a glaſs drop falls into the water, it makes a hiſſing noiſe, the body of it continues red a pretty while, and there proceed from it many eruptions like ſparkles that crack, and make it leap up and move, and ſeveral bubbles ariſe from it till it cools; but if the water be ten or twelve inches deep theſe bubbles diminiſh ſo in the aſcending, that they vaniſh before they attain the ſuperficies of the water, where nothing is to be obſerved but a little thin ſteam.

The outſide of the glaſs drop is cloſe and ſmooth like other glaſs, but within it is full of ſpungy cavities and blebs. The figure is a ſort of oval or pear like ſhape, ſuch as pearls are painted in, the bottom of which is rounded, and the top terminates in a long neck which is uſually variouſly bent and crooked. Almoſt all thoſe that are made in water have a little protuberance or knob, a little above the largeſt part of the body, and moſt commonly placed on the ſide toward which the neck ends, but ſometimes it is upon that ſide that lies uppermoſt in the veſſel where it is made.

If the water be hot into which the glaſs drop is thrown, it always cracks and breaks in the water, either before the red heat is over or very ſoon after. If dropped into oil they do not miſcarry ſo often as when dropped into water: they produce alſo a greater number of large bubbles, and continue longer bubbling than when dropped into water: thoſe made in oil have alſo fewer blebs, and ſmaller than thoſe which are made in water; and frequently they are ſmooth all over, not having thoſe knobs which the others have. Some part of the neck of theſe alſo, and part of the ſmall thread that is quenched in it, cooled, breaks like common glaſs; but if the neck be broken off near the body, and the body held all the while cloſe in ones hand, it will crack and break all over; but even then it flies not into ſo ſmall parts, nor with ſo ſmart a force and noiſe as thoſe do which are made in water, and the pieces will hold together till they are parted, and there then appear long ſtreaks or rays upon them, pointing toward the center of the body, and thwarting the little blebs in it.

If the drops are dropped into vinegar, they froſt and crack, ſo that they are ſure to fall to pieces before they are cold, and the noiſe of their falling in is more loud and hiſſing than in water, but the bubbles are not ſo remarkable.

In milk they make no noiſe nor any bubbles that can be perceived, and never miſs to froſt and crack all over, and fall to pieces before they are cold. In ſpirit of wine they bubble more than in any other of the liquors, and while they remain entire, they tumble to and fro, and are more agitated than in other liquors, and they never fail to crack and fall to pieces; and by that time five or ſix of them have been dropped into this ſpirit it will be ſet on a flame, but it receives no particular taſte from them.

In water wherein nitre or ſal armoniac have been diſſolved they ſucceed no better than in vinegar. In oil of turpentine, the firſt broke as in the ſpirit of wine, and the ſecond ſet it on fire, ſo that it could not be uſed again. In quickſilver, being forced to ſink by a ſtick, it grew flat and rough on the upperſide; but the experiment could not be perfected, becauſe it could not be kept under till it cooled. In an experiment made in a cylindric glaſs like a beaker, filled with cold

cold water, out of ſeven that were tried one only ſucceeded, the reſt all cracking and breaking to pieces; and it was obſerved, in this experiment, that at the firſt falling of the drop into the water, and for ſome time after, while the red heat laſted, red ſparks were ſhot forth from the drops into the water; and that at the inſtant of the eruption of thoſe particles, and of the bubbles which manifeſtly break out of it into the water, it not only cracks, and that ſometimes with a conſiderable noiſe, but the body moves and leaps about, and that as well in thoſe which ſucceed as thoſe that break in the water.

A blow with a ſmall hammer, or other hard body, will not break one of theſe glaſs drops if ſtruck upon the body; but if the tip only of the neck be broke off, it flies to ſmall particles, which eaſily crumble into duſt; and if it be broken, when the particles have liberty to diſperſe themſelves, they will fly every way in an orb, in the manner of a granado.

If they are ground down ever ſo low into the body with water and emery they do not fly; but rubbed on a dry tile, they uſually fly to pieces as ſoon as the bottom is a little flatted, though ſometimes they bear rubbing away deeper; and ſome, when rubbed half down, have been laid by without burſting, and have flown to pieces a little while after without being touched.

If one of them be broken in the hand under water, it ſtrikes it more ſmartly than if in the open air; and if it be broken near the ſurface of the water, the particles it flies into do not diſperſe themſelves into an orb as in the air, but all fall regularly and evenly to the bottom; and they burſt in the ſame manner in the exhauſted receiver of the air pump as in the open air. One of theſe drops being faſtened into a cement, all but a part of the neck, and then the tip of it broken off, it made a pretty ſmart noiſe, but not ſo great as if broken in the hand; and though, on examining, it appeared to be all ſhivered to pieces within, and its colour turned greyiſh; yet the outſide remained ſmooth, though cracked, and being taken in pieces, the parts of it roſe like thoſe of the flaky bodies, talc, or the like; the flakes were many of them conical in ſhape, and were alſo cracked, that they eaſily fell into duſt.

Another drop faſtened into a ball of cement of half an inch in thickneſs upon the breaking off the tip of it, burſt the ball in pieces like a granado. And when attempted to be bored by a lapidary as they bore pearls, they fly to pieces as ſoon as the tool enters them, in the ſame manner as they do when the tip is broken off.

Theſe were the ſeveral experiments tried on them by the gentlemen of the royal ſociety, and theſe all tend to prove the before-mentioned account of their burſting to be true; and indeed none more than the dry and wet grinding of them; the wet emery, in the latter caſe, making a coat in the place of that it wore away; and the dry powder of tile in the former, ſcarce anſwering the ſame purpoſe, and at beſt but very imperfectly, and preſerving the body together only for a ſmall time. *Neri*'s Art of Glaſs, p. 362.

RUPICAPRA, in natural hiſtory, the name of a creature of the goat kind, from whoſe ſkin the chamois leather is made, the creature itſelf being called alſo the *chamois* by the French, and by the Germans the *gemp*. See Tab. of Quadrupeds, N° 8.

It is very common in the mountains of Helvetia, and in many other places. In the figure of its body it ſeems to approach very much to the ſtag kind; its belly, forehead, inner part of its ears and throat are white; it has a yellow ſtreak on each ſide near the eyes, and the reſt of the body is perfectly black; its tail alſo is black, and that equally on all ſides, not white on that part next the body as is the caſe in the deer. *Ray*'s Syn. Quad. p. 78.

The male and female both have horns, which are a hand's breadth and an half long, rough toward the bottom, and ſomewhat knotty; a new knot growing every year; they are nearly ſtrait, but at the top bent into the ſhape of a hook, black, and not ſmooth, but longitudinally ſtriated with ſlender ſtreaks, and their inner cavity is filled up with a ſolid bone proceeding from the ſkull.

This creature has two remarkable holes always open behind its ears: theſe ſome have imagined ſerved for reſpiration; and Appian, who had the *poetica licentia* for whatever he choſe to ſay, ſeems to have led them into this; but there is no ſort of probability of truth in it, ſince the ſkull is ſeen immediately under theſe holes, and there is no perforation through it, nor any duct diſcoverable from them. The vulgar have alſo ſome remarkable opinions founded on the ſtructure of the horns of this creature; the one, that in depreſſing them to rub his back, he often gets them ſo far within the ſkin that he cannot get them out again; and the other, that he hangs by his horns to the rocks.

RUPITANI, a name given to the Donatiſts. See CAMPITÆ.

RUPPIA, in botany, the name given by Linnæus to a genus of plants, called by Micheli *bucca ferrea*. The characters are theſe. The cup is compoſed of a ſubulated ſpadix, ſtrait, and of a very ſimple ſtructure, which becomes a little bent when the fruit is ripe, and is doubly beſet with fructifications. There are no petals, nor any ſtamina, but a number of kidney ſhaped antheræ placed on each ſide. The piſtils are ſeveral ſlender capillary ſtyles, each bearing an

an oval germen with a ſimple ſtigma. The fruit is an oval, pointed, thin capſule or cortex placed on the ſtyle, which becomes elongated. There are as many of theſe as there were piſtils on the plant, and each contains one roundiſh ſeed. *Linnæi* Gen. Pl. 442. *Micheli* 35.

RUSCUS, in botany, the name of a genus of plants, called in Engliſh *butchers broom*. The characters of the genus are theſe. The flower conſiſts of only one leaf, and is of the globoſe campaniform kind or hollow, with the belly or body larger than the rim. This is incloſed in a cup, divided into many ſegments, and from the baſe of it riſes a piſtil, which ripens into roundiſh ſoft fruit, containing one or two ſeeds which are uſually very hard.

There are four ſpecies of this plant. 1. The common myrtle leaved kind. 2. The broad leaved one with the flowers and fruit growing to the leaves called the Alexandrian bay. 3. The narrow leaved one with the fruit growing to the leaves, called *hippogloſſum* by authors; and 4. The narrow leaved kind with the fruit growing on the tops of the branches.

Authors have not been accurate in referring the plants of this genus to their proper name *ruſcus*, but the three latter have been called by different writers *hippogloſſum*, *bonifacia*, *laurus alexandrina*, *chamædaphne*, *laurotaxa*, and *radix idæa*; and many of them have, in their deſcriptions, miſtaken the calyx of ſome ſpecies for the flower. *Tourn.* Inſt. p. 79.

The root of *butchers broom* is one of the five aperient ones, and is celebrated by authors as a very powerful attenuant and reſolvent. It is good in all chronic caſes, and is frequently preſcribed in diet drinks, intended to open obſtructions of the viſcera, or to promote urine.

RUSH, in botany. See the article JUNCUS.

Petrified RUSHES. What is uſually called by this name is a kind of foſſile coral. But we have in England alſo another not uncommon ſubſtance, frequently called by the ſame name; this is an incruſtation of ſparry matter, in form of a ſtony cruſt on the outſides of real *ruſhes*; though, in this caſe, it is no real petrifaction, but only a covering of this ſtone-like matter. Incruſtations and petrifactions are uſually confounded together, and the generality of people do not attend to the diſtinction, which is, that in a real petrifaction, the ſtony matter penetrates the very ſubſtance of the body, as is the caſe in the petrified wood of Ireland and other places; whereas in theſe incruſtations the ſubſtance itſelf remains unaltered within, and its outer part alone is covered with the ſtony ſubſtance: this is the caſe with what is called petrified moſs at Scarborough and in other parts of England, and this is the caſe in regard to what we call ſometimes petrified *ruſhes*. Theſe being water plants, and growing by the ſides of ſprings, loaded with ſpar, often fall in, and become covered over with it. We have near Kettering in Northamptonſhire a ſpring which does this very quickly: a gentleman who tried the experiment, by putting in ſome *ruſhes*, at about thirty yards from the ſource, found them in one day covered with a thin ſkin of ſpar; but after lying ſome months there, it formed itſelf into a cruſt of half an inch thick round them; and was ſo hard, that it would not break by being thrown violently on the ground; but all this while the *ruſhes* were not petrified, but only incruſted. *Woodw.* Cat. Foſſ. Vol. 2. p. 78.

RUSH *graſs*. See the article JUNCAGO.

RUSMA, in natural hiſtory, the name given by the eaſtern nations to the ſubſtance, called by the antient Greeks *ſory*. It is properly an ore of vitriol, and is uſed as a depilatory, being mixed with lime. *Hill*'s Hiſt. of Foſſ. p. 6. See the article SORY.

Mr. Boyle tells us, he made a fine powder of equal parts of *ruſma* and quick-lime, and letting them ſoak a little time in water they became a ſoft paſte, which he ſpread on the part he would free from hair; and after letting this paſte lie on about three minutes he wiped it off with a wet cloth, and found the hair taken away by the roots, without any inconvenience to the part. *Boyle*'s Works Abr. Vol. 1. p. 137.

Orpiment and quick-lime is uſed in Europe for a depilatory. See the article HAIR, *Cycl.*

RUSSGANGENUM, in natural hiſtory, a name given by the people of the Eaſt-Indies to a yellow and braſs like foſſile ſubſtance, found in many places there; it reſembles the marcaſites, only that on trial it is found to contain very little ſulphur: it is probably an ore of zink.

RUST *of corn*, or BLIGHT, in huſbandry, the name given by our farmers to a diſeaſe in corn and other vegetables, in which their ſtalks and leaves ſeem burnt up, and appear of a ſort of *ruſt* colour.

Wheat is blighted at two ſeaſons, firſt in the bloſſom, and then its generation is prevented, many of the huſks being empty in the ear, and the rudiments of the grains not impregnated: ſecondly, wheat is blighted when the grains are brought to maturity; and in this caſe they become light, and are of little value for making of bread, having ſcarce any flour in them.

The firſt of theſe cannot happen in England from froſts, becauſe our wheat is not in flower till the month of June;

but it is long and continual rains that chill the bloſſoms, and in this manner prevent their fertility: this, however, does not often happen to us; theſe rains are not common at this ſeaſon of the year; and if they were, this country lying much of it open, the winds diſlodge theſe drops of water from the ears, and prevent the miſchief they would do there.

Lammas wheat does not retain theſe drops ſo long as the bearded or cone wheat; and, in conſequence of this, in the terrible blight in England in the year 1725, the bearded wheat received infinitely greater miſchief than the lammas wheat.

The ſecond kind of *blight* from light ears, is, that which is more frequent, and more general with us; this brings the greateſt ſcarcity of wheat, and the cauſe of this is plainly want of nouriſhment of the grain, by whatever means that want is occaſioned. Several accidents kill the plants, or injure their health, and in that caſe the grains are not filled: lightning does great miſchief to the farmer in this kind, as is plain by the ſeveral black ſpots and patches in fields of corn, in years, when there has been more lightning than uſual. This is a diſaſter that muſt be quietly ſuffered, ſince it can be neither prevented nor remedied; but the other cauſes of *blights*, which are moſt general, and do the moſt damage, may be prevented in ſome meaſure at leaſt.

One great and common cauſe of the *blight* is, the lodging or falling of corn; in this caſe the ſtalks are broken near the ear, and the veſſels are hurt which ſhould carry up the nouriſhment to the ear. In this caſe, there can juſt juices enough paſs for the keeping the plant alive, and bringing it to its full height, but it is languid all the time, and the grains can never be filled with flour. The earlier in the ſeaſon this lodging of the ſtalks happens, the thinner and poorer the ears will be: hence it happens, that when dung and tillage have brought a wheat land into ſo good a ſtate, that in April and May it ſeems to promiſe the farmer five or ſix quarters of wheat, it ſhall be all deſtroyed by falling in June, and ſcarce yield him five buſhels, and this ſo thin and lank, that the expences of reaping and thraſhing are more than its value. The wind is generally accuſed of the throwing down theſe ſtalks, but this does not ſeem to be truly the caſe; the wind may preſs upon the plants; but the cauſe of their giving way to it is a weakneſs in their ſtalks, and this ſeems owing either to the want of nouriſhment, or the want of air, or of the ſun's rays, and perhaps to the want of all three together.

A rich acre will maintain a crop of five quarters ſtanding, while a poor acre will not be able to ſupport ſuch a crop, as would have yielded only about three quarters had it ſtood. This is a proof of want of due nouriſhment being one great cauſe of the falling. Air is neceſſary to the nouriſhment of all plants, wheat in particular requires a very free air. It ſucceeds beſt in open hilly places where the wind comes freely to it, and ſhakes off the drops of water from the leaves, as well as their own recrements; and it is plain, that a great quantity of the ſun's rays is neceſſary to keep wheat ſtrong; becauſe in the hotter countries it is not ſubject to fall as it is with us, and in other northern countries.

There is another cauſe of the *blight*, which is the wheat's coming too late into bloſſom. It ſhould bloſſom in the beginning of June, becauſe there is not otherwiſe time during the hot weather for it to paſs through the different ſtages to the perfection of the grain.

The cauſes of the *blight* being thus known, the cure or prevention may be attempted by the farmer, on much more rational grounds than it was among the antients. It is advantageous to haſten as much as poſſible the time of bloſſoming of the corn, and to protract as long as we can the ripening of the grain, that it may have ſufficient time to fill and ſwell. The earlieſt ſown wheat is generally obſerved to eſcape the *blight* beſt, and this is owing to its coming ſooneſt into bloſſom. The antients uſed to let their ſheep feed upon the corn while young in the blade, by way of preventing it from lodging or falling afterwards: ſome of our own farmers uſe this method alſo; and, it is true, that the corn is prevented from falling by this; but the remedy is as bad as the diſeaſe, for the ſtalks are not made very ſtrong by this practice, but the ears lighter. They therefore do not weigh down and lodge the ſtalks indeed, but they are in ſome ſort blighted by this means, and the diſeaſe is cauſed by the means uſed to prevent it. This feeding the wheat with ſheep retards the time of its bloſſoming, and the only advantage of early ſowing is thus taken away by it: what grows after the eating of the ſheep is a ſort of latter crop, and is always weaker and later than the firſt. The longer the corn remains on the ground the more nouriſhment it requires from it; and in this unnatural remaining on the land, there is no proper ſupply provided.

The general remedy for all the caſes of the *blight* is the modern method of horſehoing huſbandry. In this the hoe ſtirs up the ground as often as the farmer pleaſes, and every ſuch ſtirring gives new life and nouriſhment to the plant: this way a ſupply of food for the ear may be given, whenever it is neceſſary, and the wide intervals left for the hoe in the drilling the wheat; for this ſort of huſbandry gives a free paſſage for the ſun and air to all the plants.

The moſt general *blight* of all that happen in theſe cold countries is cauſed by inſects, which ſome think are brought in the air by an eaſt wind, accompanied by moiſture, a little before the grain is filling with that milky juice which hardens into flour. Theſe inſects depoſite their eggs within the outer ſkin or rind of the ſtalks; and when the young ones are hatched they feed on the parenchyma, and eat off many of the veſſels which ſhould convey this juice; then the ear is deprived of it, and muſt in conſequence be thin and poor, in proportion to the number of the veſſels eaten, and as the inſects happen to come earlier or later; for ſometimes they come ſo late, that the grains are ſufficiently filled with this milky juice before they have any power to hurt the veſſels.

In this caſe, though the ſtraw, when examined by the microſcope, appears to have its veſſels eaten and torn, and to be full of black ſpecks, which are cauſed by the ſame inſects, yet the grain is plump and full. This is one of the many caſes in which the early ſown wheat eſcapes the *blight*. It has been ſeen, that of the crop of wheat, in the ſame field, ſome of which has been ſown earlier and ſome later, though there has been no other difference in the whole, yet the early ſown wheat has been full eared, and the late ſown has been light eared; and both have had their ſtalks equally eaten and ſpotted by the inſects.

A proof that theſe miſchievous inſects are brought by the eaſt wind, is, that the corn on the eaſt ſide of hedges is often found *blighted*, and deſtroyed by them, while that on the weſt ſide of the ſame hedge is unhurt. Some ſuppoſe they are bred in the earth, and crawl up the ſtalks, becauſe ſome whole fields are ſubject to them, and others eſcape them wholly; but this is more probably owing to the difference of the ſituation of theſe fields, as they are more or leſs expoſed to the eaſt. Some wheat is more liable to be hurt by this inſect-*blight* than another, and the beſt remedy in this evil is to plant fields which are moſt expoſed to theſe *blights*, with ſuch wheat as is leaſt ſubject to be injured by them. The white cone, or bearded wheat, which has its ſtalk or ſtraw like a ruſh, not hollow, but full of pith, except near the lower part, where it is very thick and ſtrong, is very proper on this occaſion; it is probable, that this plant has ſap veſſels, that lie deeper, and ſo are not to be deſtroyed like thoſe of common wheat; the ſtalks of this are often found ſpotted with black, which ſhews that the inſects have been there, and yet the ears are found full, and the grains plump in them.

There is another kind of *blight*, called by the farmers *moor loor*, this is occaſioned by the earth's falling away from the roots of the wheat, and is cured by throwing up ſmall furrows againſt the rows in the drilling method. The horſehoing huſbandry is beſt of all others calculated to prevent *blights*, and to cure them when they happen; but as there are ſome years when all wheat is *blighted*, even at theſe times, the horſehoing huſbandry has an advantage; for when the ſtalks fall they never lie abſolutely on the ground in this caſe, but the air has room to play between them; but the common ſown wheat has not this advantage. The ears in the *blighted* wheat of the drilled kind are not ſo light nor poor as in others, but make the farmer ſome amends in the corn, though greatly leſs than in the common produce. *Tull*'s Horſehoing Huſbandry.

Corn is always more ſubject to *blights* after a wet ſummer than at any other ſeaſon; the reaſon ſeems, that the roots being continually drenched with water, the plant runs up to ſtalk, and has very little ear, and the corn in the ear is never large or full.

It is obſerved, that when the mildews riſe or *blights* fall, they generally infeſt only one kind of grain, ſometimes wheat, ſometimes oats, and ſometimes barley only; and the ſame ſort of obſervation holds good in regard to fruit, ſometimes only apples are *blighted*, ſometimes only pears, ſometimes cherries, and ſo on. *Mortimer*'s Huſbandry. T. 1. p. 305. See the article BLIGHT.

RUSTICULA, in zoology, a name by which Aldrovand and ſome other authors have called the *godwit*, more commonly known by the name *ægocephalus*. *Aldrovand.* de Avib. See the article ÆGOCEPHALUS.

RUSTICULA *braſilienſis*, in zoology, the name given by Mr. Ray, and ſome others, to the *guarauna*, a water bird of the Braſils, of the ſize of our ſnipe. See GUARAUNA.

RUT (*Cycl.*)—RUT *of the ſea*, is where it daſhes againſt any thing.

RUTA, *rue*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, uſually conſiſting of four hollowed petals, diſpoſed in a circular form. From the cup of the flower there ariſes a piſtil, which afterwards becomes a roundiſh fruit, approaching to a ſquare form, and compoſed of four capſules affixed to an axis, and uſually containing angular or kidney ſhaped ſeeds.

The ſpecies of *rue* enumerated by Mr. Tournefort are theſe. 1. The common broad leaved garden *rue*. 2. The more ſhrubby broad leaved garden *rue*. 3. The narrower or ſmaller leaved garden *rue*. 4. The larger wild *rue*. 5. The

ſmaller wild *rue*. 6. The broad leaved *rue* with hairy flowers. 7. The narrower leaved *rue* with hairy flowers. 8. The white-flowered coriander-leaved prickly mountain *rue*. 9. The Spaniſh flax-leaved wild *rue*.

The *rues* would ſeem to belong properly to the plants, with cruciform not roſaceous flowers; but that the number of the petals in each flower is in the cruciform flowers, always determinately four; but in this genus, as in the other roſaceous ones, it is ſometimes four, ſometimes five. *Tourn.* Inſt. p. 257.

Rue has always been held in great eſteem as a cephalic and alexipharmic. It is good in all nervous diſeaſes, fevers, ſmall-pox, meaſles; and greatly ſo in hyſteric caſes. It is given by many to ſtrengthen the ſtomach, and to prevent the return of habitual colics. It has alſo been given in pleuriſies and peripneumonies, and againſt the bites of venomous animals. There uſed to be a conſerve and a ſimple water of *rue*, but both are now rejected.

RUTA *muraria*, *wall-rue*, in botany, the name of a genus of plants, the characters of which are theſe. The leaves are of a ſhape nearly reſembling thoſe of garden *rue*. The flower is not diſcovered, but the fruit are a number of roundiſh membranaceous capſules ſurrounded by an elaſtic ring, on the contraction of which they burſt and throw out a great number of minute ſeeds.

The ſpecies of *wall-rue* enumerated by Mr. Tournefort are theſe. 1. The common *wall-rue*. 2. The broad leaved alpine *wall-rue*. 3. The taller German *wall-rue*; and 4. The tall climbing *wall-rue* with various leaves. See Tab. 1. of Botany, Claſs 16. *Tourn.* Inſt. p. 541.

RUTICILLA, in zoology, the name of a ſmall bird, called by the Greeks *phœnicurus*, and in Engliſh the *red-ſtart*. Its breaſt and rump are of a reddiſh brown, the lower part of its belly is white; its head, neck and back of a gloſſy lead colour; the head is marked before with a very fine white ſpot, which is ſeparated from the eyes and beak by a black line. Its throat is black, with an admixture of grey at the tops of the feathers. Its long wing feathers are all brown; its tail is compoſed of twelve feathers, the five outer ones of each ſide red, the two middle ones blackiſh. Its legs and beak are black, and its mouth yellow within. It feeds on flies, beetles, ſpiders, *&c.* *Ray*'s Ornithol. p. 159.

RUTILUS, in zoology, a very well known river fiſh, called in Engliſh the *roach*, remarkable for its livelineſs and vivacity.

In ſome parts of the world this fiſh will only live in ſtanding waters; with us it equally thrives in ponds and rivers, and is remarkable for its numerous progeny; a pond being much ſooner ſtocked with this than with any other fiſh. *Ray*'s Ichthyog. p. 262.

RUTILUS *latior*, in zoology, a name given by many authors to the fiſh called in Engliſh *rudd* or *finſcale*, and more uſually in Latin *rubellio fluviatilis*. Id. Ibid. p. 252.

RUTTEE, a weight uſed in the Eaſt Indies, one hundred of which make eighty-eight caracts. See CARACT.

RUTULUS, in Roman antiquity, the barrier of the cavea, or place where the wild beaſts uſed in amphitheatrical ſports were ſhut up. It was made of iron bars, which turned upon hinges, and all at once flew open with great ſwiftneſs. See *Pitiſc.* Lex. Ant. in voc. *rutulus* and *cavea*.

RUTY-PUNDOC, in natural hiſtory, a name given by the people of the Eaſt Indies to a peculiar ſpecies of yellow orpiment, which they find on the tops of the mountains there; and after ſeveral calcinations give internally in coughs and colds. The antient Greeks uſed this orpiment in the ſame manner; we have of late run into an opinion of its being a fatal poiſon. But Dr. Boerhaave, in his chemiſtry, affirms, on his own trials, that it is innocent and harmleſs. Theſe people, who have not the uſe of chemiſtry, give us a hint of the virtues of great numbers of our own foſſils, which are common alſo to their country. The ſelenitæ, fibroſe talcs, ſpars, and many other foſſils, which we wholly neglect, are in common uſe with them, and great cures are often performed by them. *Woodw.* Cat. Foſſ. Vol. 2. p. 13.

RYE, *ſecale*, in botany. See the article SECALE.

This ſort of grain ſucceeds very well on any ſort of dry land, even on the moſt barren gravel or ſand. The farmers ſow it about the beginning of September, after a ſummer's fallow, in the drieſt time they can. Two buſhels of ſeed is the quantity generally allowed to an acre of land; but if it be ground newly broken up, or if it be ſubject to worms, they then allow a peck more to the acre. A little ſprinkling of dung, or mud, upon *rye* land, will greatly advance the crop, though it is laid but half the thickneſs that it is for other corn; its produce is commonly about twenty buſhels upon an acre.

The farmer knows it is ripe when the ſtraw is yellow, the ear bends, and the grain feels hard. It is not apt to ſhed the ſeeds; and therefore, if there are many weeds among the crop, it may be left lying upon the ground, or gravel, as they call it, eight or nine days after it is cut, before it is bound up, if the weeds are not dry ſooner: for otherwiſe, they will grow moiſt in the barn, and cauſe the whole to give, and not to thraſh well, and ſometimes they will make it muſty.

As it is a grain that will grow in the ear ſooner than any other if it be wet, care muſt be taken if rain falls after it is cut, to turn it as it lies on the ground every other day; and at the ſame time to keep the ears as far from the earth, and as much above the ſtubble as may be; this will prevent the miſchief. If it be pretty clear of weeds it may be houſed as ſoon as it is cut. If either this grain or wheat lodge upon the ground, it is beſt to cut them, even though they are not ripe; for the ſtalk being broken will yield no more nouriſhment to the ear.

There is another very eſſential uſe to the farmer made of *rye*. April is the ſeaſon of the year when food is of all others the ſcarceſt for cattle, eſpecially for ſheep and lambs: on this occaſion ſome ſplit the ridges of the wheat ſtubble and ſow them with *rye*; they harrow this in, allowing about a buſhel to an acre: they feed the ſheep with this in April, and in May they plow it up for fallow. *Mortimer*'s Huſbandry, p. 136.

In many parts of France there have been certain years, in which this grain, from no apparent cauſe, has proved noxious, and ſometimes even poiſonous. Mr. Perrault travelling through Sologne, was informed that the *rye* of that province was ſometimes ſo corrupted, that thoſe who eat of the bread that had much of the corrupted grain in it, were ſeized with gangrenes in different parts of the body, which was not preceded by any fever, inflammation, or any conſiderable pain; and that the gangrened parts uſually fell off after a time of themſelves, without the aſſiſtance of chirurgical inſtruments.

The grains of *rye* thus degenerated are black on the outſide, and tolerably white within; and when they are dry, they are harder and cloſer than the natural good grain: they have no ill taſte, but ſometimes they have a viſcous metallic like honey hanging to one end of them. They grow longer than the other grains in the ſame ear, and are found from one or two, to ſeven or eight in the ſame ear. Some have ſuppoſed that theſe were not the proper ſeeds of the plant, but ſome other extraneous bodies that got in among them; but it is evident, from a cloſe inſpection, that they are really the genuine ſeeds only altered by ſome accident; the coats, and the furrow, and even the germen for the young plant, being entirely the ſame as in the natural ſeeds.

The places where the *rye* is found to degenerate in this manner, are all a dry and ſandy ſoil. In theſe places there is ſcarce any ſoil in which more or leſs of theſe large ſeeds are not found among the others, but where there are but few of them the ill effects are not perceived. The ſeaſons when the degeneracy is greateſt, and the effects the worſt of all, is, when there have been exceſſive rains in the ſpring, and there come on exceſſive heats in the ſucceeding ſummer.

The bread which is made of the *rye* that holds ever ſo much of this bad corn, is not diſtinguiſhable from other *rye* bread by the taſte, and ſeldom produces its ill effect, till ſome conſiderable time after it is taken. Beſide the gangrenes already mentioned, it not unfrequently brings on other bad conſequences, ſuch as drying up the milk of women who give ſuck, and occaſioning ſometimes malignant fevers, accompanied with drowſineſs, ravings, and other dangerous ſymptoms. The part uſually ſeized by the gangrene is the legs, and this often in a very frightful manner. The arms are the part moſt ſubject next, but all the other parts of the body are ſubject to it.

The firſt ſymptom of this approaching gangrene is a ſtupefaction and deadneſs in the part; after this there comes on ſome pain, though not violent, and the ſkin becomes livid; ſometimes the ſkin ſhews no mark of it, but the pain and ſwelling increaſe; and it is neceſſary to make an inciſion into the fleſh to find the gangrened part. In the more deſperate caſes, the only remedy is the taking off the part; and if this is neglected, the fleſh is all waſted, and the ſkin becomes black, and clings round the bones, and the gangrene appears again in the ſhoulders.

The poorer people are only ſubject to this diſeaſe; and, as they principally eat the *rye* bread; and as thoſe years when there is moſt of this bad grain among the ears of *rye* produce moſt of theſe diſorders, it has been judged certain that the *rye* is the occaſion of it. It may deſerve enquiry, however, whether that grain may not be innocent of the miſchief, and its degeneracy and the diſtemperature attributed to it may not both be the effect of the ſame bad conſtitution of the air. If it proves, on enquiry, that only thoſe who eat of the *rye* are ſubject to the diſeaſe, it will ſeem a proof of its being really owing to it; and in this caſe the miſchief may be prevented by the ſifting the grain before it is ground, the degenerated grains being ſo long that they will all remain in the ſieve that lets the others through. The experiment has been made on the ſpot, by giving the flower of the corrupted grains alone to animals, and it is ſaid they have been killed by it. Phil. Tranſ. N° 130.

RYSAGON, in the materia medica, a name by which ſome authors have called the *caſſumunar root*.

S.

S, in the Italian muſic, ſtands for *ſolo*; it is uſed in pieces of muſic of ſeveral parts, to intimate, that in ſuch places a voice, or inſtrument, is to perform alone. See the article SOLO.

SABAZIA, Σαβαζια, among the Greeks, nocturnal myſteries in honour of Jupiter *Sabazius*, into which all that were initiated had a golden ſerpent put in at their breaſts, and taken out at the lower part of their garments, in memory of Jupiter's raviſhing Proſerpina in form of a ſerpent. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 429.

SABINA, *ſavin*, in medicine. See SAVIN.

SABINITES *lapis*, in natural hiſtory, a name given to a ſtone in which are preſerved the leaves of the common ſavin. See the article *foſſile* PLANTS.

SABLE (*Cycl.*)—SABLE, in zoology, the name of the animal whoſe fur is ſo much valued, and ſold under the ſame name. It is a creature of the weaſel kind, and called by authors *muſtella zibellina*. See the article ZIBELLINA.

SABLE *mouſe*, in natural hiſtory, the name of an animal found in Lapland, and in other cold countries; many extraordinary things are related of the manner of living of theſe creatures.

They are of the bigneſs of a ſquirrel, and their ſkin is ſtreaked with brown and black; there are alſo ſome ſpots beſide the ſtreaks; the black is a very fine deep colour, the brown is pale; they have two very ſharp teeth above, and two below of the ſame kind; their feet are like a ſquirrel's, and they have no tail; they are uſually very fat and fleſhy, and are ſo quarrelſome and fierce an animal, that if a ſtick be held out to them they will bite at it, and will hold it ſo faſt, that they may be toſſed and ſwung about in the air by it without letting it go. In their march they uſually keep a direct line from north eaſt to ſouth weſt, and always travel in thouſands in the ſame troop. The whole number forms a ſquare body, and they march only from the time of the twilight to the morning, lying ſtill all the day.

They march in lines, which are ſome ells diſtant, but always exactly parallel to each other, ſo that the places they have gone over look like the furrows of a ploughed field. If they meet with any thing in their way that might deter another animal, it never ſtops them; but, though it be fire, a deep well, a pond, a torrent, or a bog, they without heſitation venture through, and by that many thouſands of them are deſtroyed, and are found dead in the morning, in the waters, or otherwiſe.

If they be met ſwimming over lakes, and attacked by men in boats with the oars, boat hooks, or other inſtruments; they neither retreat nor offer to run up the oars, but hold on their courſe; and if they be put out of it they preſently return into it again. When they are met in the woods or fields, they ſet themſelves up on their hinder feet, and make a ſort of ſqueaking noiſe, ſomewhat like the barking of a dog; they will leap up at a man, and riſe as high as his head, and in this manner they will defend their line a long time; but if they find themſelves overpowered, they will diſperſe and run into holes, or any other places of ſecrecy, making a noiſe, which ſounds ſomething like the word *biob*, *biob*.

They never come into a houſe, nor meddle with any thing that we eat; if they chance to come to a houſe in their way, there they ſtop till they die; but if they come to a ſtack of hay, or corn, they eat their way through.

When they march over a meadow they do it great damage, by eating the roots of the graſs; but if they encamp there, they wholly deſtroy the produce; the land looks like a place where there had been a fire, and the whole ſurface looks as if ſtrewed with aſhes.

They are ſaid to be very fruitful, bringing forth eight or nine at a time; but it is certain, at leaſt, that they bring forth more than one, for in their marches it is not unuſual to ſee a female with a young one in her mouth and another on her back. They ſeem no great delicacy to creatures of prey. If dogs or cats kill them they eat only the head, and when a bird of prey ſeizes them it only feeds on the entrails; it is ſaid only on the heart: the poor Laplanders, however, in want of other food eat the whole body, and ſay it is as well taſted as a ſquirrel. In the ſeverity of winter theſe creatures lie under the ſnow, and have their breathing holes as the hares, and other inhabitants of theſe places uſe to have. The Laplanders are always glad to ſee theſe creatures on their march, for it always foretels plenty of more valuable creatures among them: the ſame cold that ſends theſe out, ſending alſo a number of fowl, ſquirrels, foxes, and other animals the ſame way. Wormius has written a complete treatiſe on this animal, calling it *mus norwegius*, this is reprinted at large in his Muſeum. Phil. Tranſ. N° 251. p. 112.

SABURRÆ, in natural hiſtory, the name of a genus of foſſils found in form of powder, and uſually confounded among the ſands, and called by the ſame name. Theſe are not compoſed like the genuine ſands of pure natural concretions, but are irregular particles, ſeeming to have been the fragments of other large bodies. They are not to be diſſolved or diſunited by water, but retain their figure in it, and do not cohere by means of it into a maſs. They are often very opake, and in many of the ſpecies will ferment with acids, and are often fouled with heterogene particles, taking in the coarſer, ſtony, mineral, and metalline particles, and are according to their colour divided into ſeveral kinds.

White SABURRÆ. Of theſe conſiſting of pure ſpar we have three kinds. 1. A fine ſnow white one; and 2. A dull coarſe white one found in different places on Mendip Hills; and 3. A fine cream coloured one found only in the iſlands of the Archipelago. Of theſe containing heterogene particles we have nine ſpecies. 1. A bright coarſe white one compoſed of cryſtal and ſpar found in Leiceſterſhire. 2. A white coarſe one with micæ common in Wales. 3. A dull white fine one found in Northamptonſhire. 4. A dull greyiſh white coarſe one common in Yorkſhire. 5. A fine dull browniſh white one common in Leiceſterſhire. 6. A fine glittering greyiſh white one found in Yorkſhire. 7. A fine greeniſh white ſpangled one found in Dorſetſhire. 8. A dull coarſe greeniſh grey one common in Yorkſhire; and 9. The *pulvis puteolanus*, a fine dull looking grey one found in Italy. See PUTEOLANUS.

Red SABURRÆ. Of thoſe which are pure we have five ſpecies. 1. A fine pale red one found in Briſtol. 2. A coarſe ſhining pale red one found on the coaſt of Fife. 3. A coarſe ſhining greyiſh red one found on the ſhores of the iſland of Minorca. 4. A coarſe greeniſh red dull one found on the ſhores of ſome parts of the Mediterranean. 5. A fine ſhining ferrugineous one found about Liſbon. Of thoſe variegated with talcy ſpangles we have nine ſpecies. 1. A fine red one with micæ found about Minorca. 2. A coarſe red variegated one with micæ. 3. A large bright fleſh coloured one with micæ. 4. A fine browniſh red variegated one with micæ. 5. A fine fleſh coloured micaceous one, all from the coaſts of Scotland. 6. A fine whitiſh red one with micæ, and variegations, found on the ſhores of the northern iſlands. 7. A browniſh red coarſe one found on the ſhores of the Red Sea. 8. A large coarſe blackiſh red one found on the ſhores of Sicily; and 9. A coarſe ſhining greeniſh red one found on the ſhores of the Mediterranean.

Green SABURRÆ. Of theſe we have only two known ſpecies. 1. A coarſe beautifully green dull one, which was the chryſocolla of the antients, ſee CHRYSOCOLLA. And 2. A fine ſhining green one found on the ſhores of the Red Sea.

Yellow SABURRÆ. We yet know only one ſpecies of this kind, which is the ſhining gold coloured micaceous one, which has deceived the world very often into an opinion of its containing gold. It is very common in Virginia and elſewhere.

Black SABURRÆ. Of this we have one pure ſpecies, a fine black one variegated with white, common in France. Of thoſe containing talcy particles we have two known ſpecies. 1. A fine variegated black and white one, with micæ found on the ſhores of the Mediterranean; and 2. A coarſe variegated black and grey one, frequent on the ſhores of Wales; and beſides theſe there are three of this colour which are full of metalline particles. 1. A ferrugineous black glittering one found on the ſhores of Italy. This is the ſhining black ſand, as it is called, uſed to throw over writing. 2. A coarſe glittering browniſh black one, common on the ſhores of Wales, and uſed there on the ſame occaſion; and 3. A fine bluiſh black glittering one, common alſo on the ſhores of Wales. All theſe are principally made up of lead ore. *Hill's* Hiſt of Foſſ. p. 569.

SACABURGH, SACABERE, or SAKEBERE, in our old writers, one that is robbed, or by theft deprived, of his money or goods, and puts in ſurety to proſecute the thief with freſh ſuit; according to Selden, in his titles of honour, and Briton. c. 15 & 29. with whom agrees Bracton (lib. 3. tract. 2. c. 32. n. 2.) *Furtum vero manifeſtum eſt, ubi latro deprehenſus ſit ſeiſitus de aliquo latrocinio*, ſcil. Honhabend

& Backberond & *insecutus fuerit per aliquem cujus res illa fuerit, qui dicitur* sacaburh, &c.

The word may come from the Saxon *sac* or *saca*, i. e. *lis, causa, prosecutio*, and *burh, pignus, hoc est furti symbolum. Spelm.* Gloss. in voc.

But Sir Edward Coke says, *sacabere*, or *sakebere*, is derived from *sac* and *bere*, that is, he that did bear the bag. 8 Inst. fol. 69. *Blount.* Law Dict. in voc.

SACCARII, among the Romans, were a company or fraternity of porters, who had the sole privilege to carry all goods from the harbour to the warehouses, none being allowed to employ their own slaves, and much less those of others, for that purpose. *Pitisc.* in voc.

SACCER. See the article SAKER, *Cycl.*

SACCHARUM (*Cycl.*)—SACCHARUM, in the Linnæan system of botany, is the name of the plant which produces sugar, and which makes a distinct genus by itself. The characters of this are, that there is no calyx or flower cup, but a downy substance longer than the flower, and including only one single flower, which is composed of two oblong and pointed valves, both equal in size, placed erect, hollowed and naked, or not bearded. The stamina are three capillary filaments of the length of the flower; the antheræ are somewhat oblong, the germen of the pistil is pointed. The styles are two and are hairy, the stigmata are simple. The flower encloses the seed which is single, oblong, narrow, and pointed. *Linnæi* Gen. Pl. p. 18.

SACCHARUM *saturni*, in medicine, is recommended by some internally for dysenteries, and hæmorrhages of all kinds; but the generality of the world condemn it, as containing all the poisonous qualities of the metal it is made from in their highest degree.

Externally it has been long famous for its virtues in the erysipelas, in inflammations of all kinds, and in embrocations. It is used also in small quantities in collyriums for the eyes; it deterges, dries, and cicatrises ulcers; and in gonorrhœas is mixed in injections with great success.

It is well known that this salt made with the common vegetable or mineral acids, when distilled, will not give back the acid again, but only yields a water without any sharp taste and an inflammable oil; but if it be made into the animal acid of pismires, whether procured by distilling those insects fresh, or by throwing large quantities of them into water till it is sufficiently impregnated, it will on distillation yield back the same proportion of acid of the same strength. Phil. Trans. N° 68. See TINCTURA *antiphthysica.*

SACCHARUM *lactis.* See the article MILK.

SACCINI, in our old writers, Monks so called, because they wore a garment of goat's hair next to their skins. *Saccus* is applied to coarse cloth made of such hair. *Blount.*

SACCO *beneditto.* See the article SANBENITO, *Cycl.*

SACCUS *cum brochia*, in our old writers, a service or tenure of finding a *jack* and a *broach* to the king, for the use of his army. Bract. lib. 2. c. 16. *Blount, Cowel.*

SACCUS *lacteus*, a name given by some anatomists to the *receptaculum chyli.*

SACER (*Cycl.*)—SACER, in ichthyology, a name given by Gaza and some others to that species of the *labrus*, distinguished by Artedi by the name of the red forked tailed *labrus*, and called by the generality of other authors the *anthias piscis.* See the article ANTHIAS.

SACHETTUS, in zoology, the name of a sea fish, much resembling the common river pearch in shape and colour, and having the same black obliquely transverse lines on its sides, and seeming the same with the *channadella* of Bellonius, Rondeletius, and other authors. It has only one long back fin, the foremost rays of which are prickly, the others smooth behind these prickly rays; it has a large black spot, which alone distinguishes this from all the other fish of its kind. Its mouth is large, and its lower jaw something longer than its upper. The belly fins are black, and the tail is forked; the scales are large; and as in the other fish of this kind, cover not only the body but the gills, and part of the head of the fish. It is common in the Mediterranean, and is brought to market at Rome, Venice, and elsewhere, and accounted a very delicate and well tasted fish. *Ray*'s Ichthyolog. p. 326.

SACRA (*Cycl.*)—SACRA *fistula*, a name given by some to the cavity, in which the spinal marrow is lodged, and by others to the spinal marrow itself.

SACRA *gentilitia*, among the Romans. Beside the public festivals observed by the whole Roman people, and beside the holy-days kept on birth-days, marriages, or any other personal account, there were likewise family feasts celebrated annually by the descendants only of particular families.

They thought themselves obliged to keep these with the utmost exactness and regularity, on pain of divine vengeance. Livy tells us that a young man of the Fabian family, when the capitol was besieged by the Gauls, made his way through the enemy's army, in order to celebrate the yearly festival of his family, to the no small astonishment both of the besiegers and besieged. Mem. Acad. Inscript. Vol. 8. p. 310.

SACRANUS *color*, a name given by some authors to purple, or very deep red.

SACRARIUM, among the Romans, a chapel in a private family. It differed from *lararium*, as being dedicated to some particular deity, and the *lararium* to the household gods in general. *Pitisc.* in voc.

SACRE, in zoology, the name of a species of falcon, called by authors *falco sacer*, and differently described by different authors, but by all agreed to be an extremely bold and active bird. The description Mr. Ray has selected of it is this. It is a larger bird than the common falcon. Its head is flat and of a greyish colour; its eyes large, and its beak bluish. Its back and wings are brown; its breast white, and variegated with brown spots. Its thighs are white within, and its tail is variegated with spots of the shape of a kidney. Its wings are very long, and its legs and feet of a bluish colour. The yearling birds of this species are called *sori*, and differ considerably in their plumage from those of a more advanced age, having their legs paler, and their breasts less spotted. It will seize upon the largest birds, and on young goats, &c. for food. *Ray*'s Ornithol. p. 43.

SACRIFICE (*Cycl.*)—SACRIFICES, among the Greeks, were of four kinds, *viz.* 1. Free-will offerings, or such as were paid in consequence of a vow, χαριστηια and Ευκλαια, for a victory obtained, the first fruits offered by husbandmen for a plentiful harvest, and the like. 2. Propitiatory offerings, ιλαστικα, to avert the anger of some offended deity, and such were all *sacrifices* used in expiation. 3. Petitionary sacrifices, Αιτητικα, for success in any enterprize. 4. *Sacrifices* expressly commanded by some oracle or prophet, τα απο μαντειας.

For the materials and rites of *sacrifices* see *Potter*, Archæol. Græc. T. 1. p. 209. seqq. and SACRIFICE, *Cycl.*

SACRIMA, among the Romans, the new wine which was offered to Bacchus as an acknowledgment of his protecting and preserving every thing that belonged to wine. *Pitisc.*

SACRO-COCCYGÆUS, in anatomy, a name given by Winslow to a muscle now generally called simply the *coccygæus*, he calls it also *coccygæus posterior.*

SACRO-LUMBARIS, a long complex muscle, narrow and thin at the upper part, and broad and thick at the lower, representing a kind of flat pyramid. It lies between the spine and posterior part of all the ribs, and along the back part of the regio lumbaris, all the way to the os sacrum. Through all this space it is closely accompanied by the longissimus dorsi, which lies between it and the spinal apophyses of the vertebræ, a narrow fatty or cellular line running between them; it is fixed below by a broad thin tendinous aponeurosis to the os sacrum, and part of the crista of the os ilium. From thence it runs upward, and a little laterally over all the regio lumbaris; afterwards it runs up obliquely over all the ribs, sometimes as high as the two or three lowest vertebræ of the neck. The side next the longissimus dorsi is all this way very even; but that next the ribs is divided into several digitations, resembling the branch of a palm tree. These are fixed in the transverse apophyses of the neck, in the tuberosity of the first rib, in the lower part of the angular impressions, in the following ribs, and near the extremity of the last. *Winslow*'s Anatomy, p. 245.

SACRO-LUMBARIS *pars superior*, in anatomy, a name given by Cowper and some others, to a muscle, called by Winslow *transversalis collateralis colli*, and by Albinus the *cervicalis descendens.* See the article TRANSVERSALIS.

SACRO-SCIATIC *ligaments.* These are two in number, the one broad and external, the other small, narrow, and internal. The broad, or external *sciatic* ligament, is slightly fastened to the inside of the tuberosity of the crista of the os ilium. It covers exteriorly the two posterior spines of that bone, and continues to be inserted along the anterior and exterior edges of the false transverse apophyses of the sacrum. From thence this ligament diminishing in breadth, descends obliquely toward the tuberosity of the os ischium, and is inserted immediately below the sinus, which lies between that tuberosity and the *sciatic* spine. This insertion is afterwards continued over the whole internal labium of the inferior portion of the os ischium, and of the ramus of that bone, and the inferior portion of the ramus of the neighbouring os pubis. Through all this latter course of its insertion, that is after its arrival at the tuberosity of the ischium, it produces a kind of ligamentary falx, one edge of which is fixed to the bones, the other lies loose; and by this situation of the falx, it seems, together with the bones, a kind of deep channel or groove. The small *sacro-sciatic*, or internal *sciatic* ligament, adheres closely to the inside of the posterior portion of the former. It is fixed interiorly also to the edge of the inferior part of the fourth false transverse apophysis of the os sacrum, and from thence all the way to the upper part of the os coccygis. From this insertion it runs up a little obliquely to the spine of the ischium, in the sharp point and upper part of which it is fixed. During this course it crosses the broad ligament, being closely united to the inside thereof, and loses but very little of its breadth. By these two ligaments two distinct openings are formed; a large one which is the superior *sciatic* sinus, and a small one with the inferior *sciatic* notch. *Winslow*'s Anatomy, p. 123.

SACRUM *os.* See the article Os *sacrum.*

SACTIM, a word uſed by ſome of the chemical writers to expreſs vitriol.

SADAF, in the materia medica, a name given by the Arabian writers, ſometimes to the purpura or purple fiſh, and ſometimes to the purple fucus, with which the antient Greek women uſed to ſtain their cheeks. This was the original of all painting, and the plant was the common purple ſea wracks. After this every thing was called fucus that was uſed by the women to paint their faces; and they had a fucus metallica made of white lead or ceruſs, and the purple root of alcanet, *&c.* were called fuci.

SADAR, or ALSADOR, the Arabian name of the medicinal *lotos*, deſcribed by Dioſcorides, and many others of the antients. This ſhrub was called by ſome of the antients *acanthus*, from its being full of thorns, and hence many have confounded it with the common *acanthus*, or *bear's breech*, and many with the *acanthus* of Theophraſtus, which is the acacia or gum arabic tree. The fruit of this tree, called by Virgil the berries of the *acanthus*, is the *nabac* of the Arabian writers, though ſome would have it to be a kind of fig. Serapion evidently declares the *ſadar* and *acanthus* of Virgil, that is the *lotus cyreniaca* of Herodotus, and the *lotus* of Dioſcorides to be one and the ſame plant. Bellonius has alſo deſcribed it under the name of *napeca*, a name probably derived from *nabac*, the appellation uſually given its fruit: he ſays it is an ever-green ſhrub, and was called by ſome of the Greek writers *œnoplia*. Proſper Alpinus, in his account of the Ægyptian plants, alſo deſcribes the *nabeca* as a thorny ſhrub; though authors have obſerved that there are two ſpecies of it, the one thorny and the other not. Leo Africanus, in his third book, mentions alſo the ſame tree; but he miſtakes the name, writing it *rabech* inſtead of *nabech*; he ſays it is a prickly tree, producing a fruit reſembling a cherry, but ſmaller, and of the taſte of the zizyphus. Theſe are the berries of the *acanthus* mentioned by Virgil. *Proſper Alpin.* de Plant. Ægypt.

SADDLE (*Cycl.*)—A hunting *ſaddle* is compoſed of two bows, two bands, fore-bolſters, pannels, and *ſaddle*-ſtraps: and the great *ſaddle* has beſide theſe parts, corks, hind-bolſters, and a trouſſequin. The pommel is common to both. See BOW, BAND, BOLSTER, *&c.*

A horſeman that would ſit a horſe well, ought always to ſit on his twiſt, and never on his buttocks, which ought never to touch the *ſaddle*; and whatever diſorder the horſe commits, he ought never to move above the *ſaddle*. *Guill.* Gent. Dict. P. 1. in voc.

SADDLE-*backed*, among horſemen, a name given to a horſe, that is hard to fit with a *ſaddle*, his reins being low, and his head and neck raiſed, ſo as to require a *ſaddle* to be made on purpoſe for him. *Guill.* loc. cit.

SADDLE *caſe*. See the article HOUSING, *Cycl.*

SADDLE *roll*. See the article TROUSSEQUIN, *Cycl.*

Cart-SADDLE. See the article CART.

SADDLE *ſtraps*, are ſmall leathern ſtraps, nailed to the bows of the *ſaddle*, which are uſed to hold the girths faſt to the *ſaddle*. See the article BOWS.

SADIR, a word uſed by ſome chemiſts to expreſs the ſcoria of any metal in fuſion.

SADRE, a title given by the Perſians to the chief of the Mahometan religion. See the article CALIPH.

SÆPÆ, a name given by ſome medical writers to ſharp corroding puſtules.

SAFFRON, *crocus*, (*Cycl.*) in botany. See CROCUS.

There is no accident attending the culture of this valuable and uſeful plant, which the farmers ſo much dread, as what they call the *rot* with us, and in French *la mort*. This is more common in the *ſaffron* fields of the Gatinois than in ours. Mr. du Hamel, who undertook to give the Paris academy ſome account of this malady of the plant, obſerves, that no author has given any account of it; and that the people employed in the culture of the *ſaffron*, know the terrible effects of it, without at all gueſſing at what may be its cauſe. It ſeems a ſort of contagion among the plants, ſpreading far and wide, and extending from one root as from a center all over a whole field, if not ſtopped; the ſeaſon of its moſt fatal ſpreading is the ſpring, and the miſchief is found to be ſtopped from farther progreſs, by digging deep trenches at that time of the year between the ſound and the tainted parts of the field.

Mr. du Hamel, in enquiring into the ſtate of the roots or bulbs of the *ſaffron* in many fields where this diſorder reigned, found that the roots in the center where the diſtemperature moſt raged, and thoſe at a middle diſtance from this part and the border of the field, and thoſe at the border, were all in three different ſtates, according to the degree of ſpreading of the infection. Thoſe in the middle where the infection began, were utterly deſtroyed, their ſeveral coats all ſhrivelled up and withered, their inner part reſembling only a dirty and rotten earth, and their ſuperficies being covered with ſeveral browniſh red glandulous bodies of the bigneſs of beans. Thoſe of the middle diſtance were found in a condition nearly allied to theſe; their integuments were flaccid, but not wholly withered; and there were ſome remains of the fleſhy bulb within; but this matter was a ſort of pulp, looking as if it had been boiled. It was eaſy to ſee from this, that theſe roots were ſpeedily approaching to the perfect ſtate of decay of the others; they were covered in the ſame manner on their outſides with glandulous ſubſtances, like thoſe of the middle roots, only that they ſeemed on theſe more plump, and well fed. At ſome diſtance from theſe he alſo obſerved a number of violet coloured threads, forming a ſort of network in the ground.

The roots at the edges of the field were found in a yet much ſounder ſtate than any of the others; their bulbs ſeemed unhurt, and the membranes ſound and freſh, but they were in many places covered with reticular violet coloured filaments, and from ſome parts of theſe there iſſued ſmall glandules, which ſeemed ready to grow into the ſame ſhape and ſize with thoſe on the decayed roots; though they, at this time, appeared only as ſo many purple ſpots lodged on the ſurface of the root or between its membranes. The earth all about theſe roots was alſo found to be full of theſe reticular violet coloured threads.

Theſe violet threads and their glandules being always found in the places where the rot was among the *ſaffron* roots, and never in any other place, it became very natural to ſuppoſe they had ſome conſiderable ſhare in the contagion; to examine, therefore, what they truly were, Mr. du Hamel picked ſeveral of them out of the earth, and having waſhed them clean, he found that they were very like the truffle in appearance; and in all their qualities they were ſeldom larger than a hazel nut, and were covered with a ſort of ſoft down or velvety coat, and they had a muſhroom like taſte, but with an earthy flavour. There were found ſome of them adhering to the bulbs of the *ſaffron*, and others two or three inches diſtant from them; the violet threads are of the thickneſs of a coarſe thread, and are covered with a velvety coat, in the ſame manner with the glandulous bodies; ſome of theſe extend themſelves from one to another between theſe glandules, while others ſpread themſelves over the ſurface of the bulb of the *ſaffron*, and pierced it in many directions quite to the center: they make numerous anaſtomoſes and inoſculations in the body of the root, and have faſtened to them in ſeveral places little knots or ganglions, which ſeem only ſmall tufts of the cottony or velvety matter which covers them.

From the whole it ſeems very clear, that this is a paraſitical plant, which grows very quick in its glandules; and by means of theſe threads, or filaments, ſucks its nutritious juices from the roots of the *ſaffron*, which it by that means deſtroys. It ſeems to grow in the ſame manner with the truffle, that is, it never appears above the ſurface of the earth, but is produced under ground, and there grows and propagates its ſpecies. It ſpreads very faſt, and ſoon occupies a large compaſs of ground, continually furniſhing new glandules at the end of the filamentous roots, in the manner of the potatoe and ſome other roots. Thus the diſeaſe of the *ſaffron*, wherever it begins, ſpreads itſelf every way in a circular direction; and there is nothing to be ſeen on the ſurface of the earth, which can give any opportunity of gueſſing at its cauſe.

It remained now to enquire whether this plant was peculiar to fields of *ſaffron*; and whether it was brought thither with the *ſaffron*, or was there before: and another material queſtion was, whether it could draw its nouriſhment from any other plants, or muſt have it from *ſaffron* only. To try this, Mr. du Hamel put ſome of the bulbs of the new plant into a pot of freſh earth, where he alſo planted ſome roots of *ſaffron*, of narciſſus, and of the common lilly. Six months afterwards, examining the whole, he found the glandules had greatly increaſed in number, and had fed upon the lilly roots as well as on the *ſaffron*; hence it appeared, that this was a real plant capable of increaſing itſelf, and not deſtined ſingly to that food; after this digging up the earth in ſeveral places where *ſaffron* had never been planted, he found in ſome places the ſame paraſitical plant, faſtening itſelf to the roots of the anonis, and ſome other plants, and letting alone ſeveral others, ſuch as the ſenecio, *&c.* The roots of muſcari were alſo ſometimes found affected by it; and a certain diſtemperature, which the floriſts complain of in their tulip roots, ſeems to be owing to the ſame cauſe.

This miſchievous plant, however fatal it prove to the *ſaffron* fields; may, on the contrary, prove a real benefit in corn fields, by deſtroying many of the pernicious herbs which hurt the corn, as it preys only on thoſe which ſend their roots deep into the earth, never hurting thoſe which are ſuperficially fixed, as corn, and the like are. The floriſt, however, is probably often as much injured by it, as the *ſaffron* cultivator; and doubtleſs, whole beds of plants are often deſtroyed without the proprietor's knowing what to attribute the miſchief to. One misfortune attending this deſtroying plant, is, that the common culture of land which deſtroys other weeds, ſerves rather to promote its increaſe, ſince it delights in light dry earth, not in wet, or undug lands: it is poſſible, however, to ſtop its progreſs, by digging pretty deep between the ſound and the infected roots; of the laſt, thoſe which are eaten to the heart can never recover again, but of thoſe which are only wounded ſuperficially there is ſome hope; ſince it is common for them to be

be cured by taking them up, peeling off their outer huſks, and drying them in the ſun. This ſeparates the worſt part of the deſtructive plant, and the reſt becomes ſoon dried and withered, and incapable of farther vegetation, while the root itſelf is uninjured, and when put into the ground will ſhoot again. Mem. Acad. Par. 1728.

The yellow tinge, which this medicine is able to give to the fluids, is carried ſo far, that no juice eſcapes it. Amatus Luſitanus gives an account of a fœtus in a mother's womb, tinged yellow, by her taking very frequently medicines with *ſaffron* in them. This had been diſputed and diſbelieved by many. But an experiment made at Leipſick on a bitch big with puppies, reſtored the credit of Amatus. For on giving this creature *ſaffron* frequently among her food, the puppies had their fleſh and the whites of their eyes, when opened, dyed yellow with it; though the chyle, in the lacteals, was not yellow but whitiſh. However, it does not ſeem improper to verify the experiment farther.

Tree SAFFRON, in natural hiſtory, the name of an Eaſt-Indian ſhrub, which grows to about two feet high, having ſquare branches, which are beſet with leaves in pairs. The pedicles of the flowers come from the alæ of the leaves, and are branched, each pedicle ſupporting about five flowers; theſe are of the ſhape of the jaſmine flowers, and are white above, and of the fine reddiſh yellow colour of *ſaffron* below. The flowers never open but in the night, and then do not perfectly expand themſelves, but all the petals remain in ſuch a poſition, that they can cloſe inſtantaneouſly on occaſion of the leaſt heat; they are placed each in a green cup, to which they are ſo ſlightly faſtened, that the leaſt motion makes them fall. They ſeldom ſtand more than four days, often not ſo long; the flowers have no ſmell, but are of a cordial virtue, approaching to that of *ſaffron*. Mem. Acad. Paris, 1699.

Meadow SAFFRON, *colchicum*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the liliaceous kind, but conſiſts only of one leaf which ariſes immediately from the root, in form of a fine ſlender tube, and by degrees expands and enlarges, and becomes divided into ſix ſegments. The piſtil ariſes from the bottom of the flower, and terminates in ſeveral very ſlender filaments; this finally becomes a fruit of an oblong trigonal form, which is divided into three cells, and contains roundiſh ſeeds. To this it is to be added, that the root is doubly tuberoſe, one part being fleſhy, and the other tuberoſe, and both are covered with a common membrane.

The ſpecies of *colchicum* enumerated by Mr. Tournefort are theſe. 1. The common *colchicum*. 2. The white *colchicum* with purple lines. 3. The common *colchicum* with a leaf veined with white. 4. The common *colchicum* with a leaf painted with yellow. 5. The common French *colchicum* with ſingle blackiſh purple flowers. 6. The *colchicum* which flowers both in ſpring and autumn. 7. The Engliſh narrow leaved white flowered *colchicum*. 8. The *colchicum* with flowers mottled with white and red. 9. The many flowering *colchicum*. 10. The white *colchicum* with red ſtreaks. 11. The many flowered variegated *colchicum*. 12. The broad leaved variegated *colchicum*. 13. The *colchicum* variegated with a deep purple and ſnow white. 14. The *colchicum* variegated with a paler purple and a greyiſh white. 15. The *colchicum* with flowers, teſſelated like the fritillaries. 16. The Coan purple *colchicum*, with large, broad, and curled deep green leaves. 17. The double Portugal *colchicum* with fleſh coloured and purple flowers. 18. The *colchicum* with narrow variegated ſegments of the flower. 19. The double flowered variegated *colchicum*. 20. The many flowered, broad leaved, variegated *colchicum*. 21. The white many flowered *colchicum*. 22. The broad leaved many flowered *colchicum* with white hellebore leaves. 23. The double autumnal many flowered *colchicum*. 24. The vernal many flowered *colchicum* with broad convoluted leaves. 25. The double flowered common *colchicum*. 26. The many flowered double white *colchicum*. 27. The double many flowered *colchicum* with teſſelated flowers. 28. The vernal Spaniſh *colchicum*; and 29. The narrow leaved mountain *colchicum*. *Tourn.* Inſt. p. 349.

Syrup of SAFFRON. This medicine is thus made: take fine *ſaffron* an ounce, cut it ſmall, and put it to infuſe in a pint of mountain wine; let it ſtand three days without heat, then ſtrain off the wine; to which, after filtration, add twenty-five ounces of double refined ſugar: melt the ſugar over a gentle heat, and then ſet it by for uſe.

Tincture of SAFFRON, a preparation made as follows: take *ſaffron* an ounce, cut it ſmall, and pour on it in a matraſs a pint of proof ſpirit; let them ſtand together three days without heat, often ſhaking the veſſel, then filter off the tincture for uſe. Its doſe is from thirty drops to a drachm or more. It is good in all caſes where the *ſaffron* in ſubſtance is.

If the ſame quantity of wine be uſed inſtead of ſpirit, it is called *vinum crocatum*, *ſaffron* wine.

SAGADENON, a name given by the antients to what they ſay was the very fineſt kind of opobalſamum, produced in Paleſtine and the country thereabout.

SAGDA, or PSAGDA, in natural hiſtory, the name of a ſtone deſcribed by Aldrovand, which he ſays is of a green colour, and has the property of attracting wood.

Pliny and the antients give this name to a gem of a greeniſh colour, very much eſteemed at that time; and about the origin of which the antients had many fabulous reports. Solinus tells us, that it is produced at the bottom of the ſea, and thence riſes up of itſelf as ſhips paſs over the place where it is, and fixes itſelf to their bottoms, and that it cannot be got off again without cutting away a part of the wood. This author has generally taken his accounts of things from Pliny; though he has been at the pains to diſguiſe them, in ſuch a manner, that they are often unintelligible. All that Pliny ſays on this occaſion, is, that the *ſagda* was of a green colour, and was found by the Chaldæans at the bottoms of their ſhips; even this, however, is not very intelligible, unleſs they meant that the ſhips which traded to the Red Sea, and lay long in the harbours, and were ſometimes aground, picked up at their bottoms the ſtones which make up the ſhores, and ſome of theſe are of the jaſper kind, and uſually green; at this rate it could not be a ſtone of any great value, nor do we indeed find any where that it was, except in Solinus.

It is to be obſerved, that the antients called a certain ointment by the name *ſagda* as well as this ſtone; this ointment was green, and probably the ſtone had its name from the reſembling it in colour. This was a cuſtom common among the writers of early times; and they have the names of *libanotis*, *myrrhites*, *ſtactachates*, and *aromatites*, from the reſemblance which certain agates and jaſpers had to the drugs, *&c.* in common uſe among them.

SAGE, *ſalvia*, in botany. See SALVIA.

The ſeveral ſorts of *ſage* propagated either for the kitchen, or for medicine in our gardens, are to be produced by cuttings planted in any of the ſummer months, watering and ſhading them till they have taken root, and after that they ſhould be removed to a dry ſoil, where they may have the benefit of the ſun. *Miller's* Gardners Dict.

Sage has always been eſteemed a cephalic and ſudorific. An infuſion of it made in the manner of tea, has been long famous as the common drink of people in fevers. It is attenuant and diuretic, promotes the menſes, and is good in vertigoes, tremors, palſies, and catarrhs. There uſed to be a ſyrup, conſerve, and ſimple water of *ſage* kept in the ſhops; which are all diſuſed, and the dried herb only retained.

SAGE *apples*, a name given by naturaliſts to a ſort of ſoft gall, or protuberance, found frequently on the leaves and ſtalks of *ſage* in the eaſtern parts of the world, and much reſembling the ſoft gall of the oak leaf, called the *oak apple*.

Theſe are both owing to the ſame cauſe, the puncture of an inſect of the fly kind, which depoſits its eggs in the wound, and the worms or maggots hatched from thoſe eggs feed on the inſide of the gall, and occaſion a preternatural derivation of juices to the part, whence it ſwells and aſſumes this form. The leaves of many other plants are alſo liable to the ſame accident, particularly thoſe of ground-ivy, on which there grow eatable galls of this kind. The *ſage apples* are ſo frequent in the eaſt, that they are brought to market at Conſtantinople, and eaten as delicacies. See GALLS.

SAGENE, a Ruſſian meaſure equivalent to ſeven Engliſh feet. Five hundred *ſagenes* make a werſt. Phil. Tranſ. N° 445. Sect. 7. See WERST.

SAGIMEN *vitri*, a name given by ſome of the chemiſts to any alkaline ſalt.

SAGINA, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe. The cup is a four leaved perianthium remaining after the flower is fallen; the leaves being of an oval figure, hollow, and ſpread very open. The flower is compoſed of four oval obtuſe petals, ſhorter than the leaves of the cup, and ſpread wide open. The ſtamina are four capillary filaments, the antheræ are roundiſh. The germen of the piſtil is of a globoſe figure; the ſtyles are four in number, tapering in ſhape, and bent back; theſe are downy, and the ſtigmata are ſimple. The fruit is a capſule, of an oval figure, containing four cells, with four valves. The ſeeds are numerous and very ſmall, and are fixed to the receptacle. *Linnæi* Gen. Pl. p. 55.

SAGITTARIUM *alexipharmacum*, in the materia medica, the name of a root cultivated with great care in Jamaica, and ſuppoſed a remedy for the wounds of poiſonous arrows. The plant of which it is the root is the *canna indica radice alba*. *Sloan's* Hiſt. 1. p. 253. but its virtues have not yet brought it into uſe on this ſide the water. *Dale*, Pharm. p. 250.

SAGITTATED *leaf*, among botaniſts. See LEAF.

SAGOCHLAMYS, among the Romans, a ſort of garment that partly reſembled the *ſagum* and partly the *chlamys*. See SAGUM and CHLAMYS, *Cyc. Pitiſc.* in voc.

SAGOUIN, in zoology, the name of a very beautiful ſmall ſpecies of monkey, deſcribed by Cluſius, and ſeeming the ſame with *cogui minor* of Marggrave. See COGUI.

Cluſius ſays it is of the ſize of a ſquirrel, and has the look

of a lion about the head, and that it is a very tender and delicate little animal, and impatient of the ſlighteſt injury. *Ray*'s Syn. Quad. p. 154.

SAGULUM, among the Romans, a little, or ſhort *ſagum*. See the article SAGUM, *Cycl.*

SAHIRA, in the materia medica, a name given by Aviſenna to the *miſy* of Dioſcorides and the Greeks. Aviſenna has placed it among the zagi or atramenta, but deſcribes it in the very phraſe of Dioſcorides, ſaying that it is of a gold yellow colour, hard and ſparkling when broken. The Greek chemical writers call this *chalcanthum chloron*, or yellowiſh vitriol. There ſeems, however, ſome reaſon to ſuſpect that Aviſenna has, in this place, confounded two ſubſtances, and given to the melanteria the name of *ſchira*, and the deſcription of miſy; for the miſy has nothing in it to entitle it to the name of atramentum or ink; but the melanteria of the Greeks very well deſerves that name, as it immediately turns black on being wetted, though it be in itſelf naturally of a yellow colour reſembling ſulphur. The properties of theſe two ſubſtances are ſtrangely confounded by Aviſenna; his interpreters are generally cenſured, as being faulty; but the blame, in reality, lies upon the author himſelf, who did not clearly underſtand the things he was to deſcribe to others. See the articles MELANTERIA and MISY.

SAIC, one of the many names given by the antients to quickſilver. See MERCURY, *Cycl.* and *Suppl.*

SAIL (*Cycl.*)—*After*-SAILS, in a ſhip, are thoſe that belong to the main maſt and miſſen. They keep the ſhip to windward. On which account ſhips ſailing on a quarter wind require a *head-ſail* and an *after-ſail*; one to countermand the other.

Netting-SAIL, in a ſhip, is only a *ſail* laid over the *Nettings*.

SAINT CUTHBERT's BEADS, an Engliſh name for the *trochitæ* and *entrochi*, found in great abundance in the clay of Yorkſhire and ſome other counties with us. They are truly the remains of parts of the arms of the *ſtella arboreſcens*, or branching *ſtar-fiſh*; but have been ſo far miſtaken, by authors, as to be ſuppoſed a ſort of rock plants, or the parts of ſome unknown vegetable petrified.

Agricola judged very well of the nature of the matter they conſiſt of, ſaying they were of the ſame ſubſtance with the *lapis judaicus*, which is a ſpar, as they are, but theſe are uſually of a duſkier colour, ſometimes bluiſh, ſometimes whitiſh or reddiſh, though theſe latter colours are more rare. The ſame author obſerves alſo, that they make an effervescence with vinegar, and ſome of them move out of their places with it, becoming a ſort of creeping ſtones. This is no great mark of diſtinction, however, for all ſpars, or all foſſils, which vinegar will corode, will be acted upon, in the ſame manner by it, provided that they are broke into ſmall pieces, and that the bottom of the veſſel in which the vinegar is put, be not too rough or too ſlanting to a point. The ſingle joints are uſually thin, and regularly round; they have always a hole through the middle; though it is ſometimes filled up with earthy or ſtony matter; this has given them the name of *beads*, as by means of this they may be eaſily ſtrung together. The hole is uſually ſmall, and ſometimes oval, though commonly round.

The outermoſt round or circle is generally ſmooth, but the flat ſides are all thick drawn with rays or lines from the circumference to the central hole. Aldrovandus from theſe ſtriæ reſembling antimony, and the whole maſs in the compound pieces, or *entrochi*, reſembling the trunks of ſmall trees, with the hollow for the pith, and the ſeeming rudiments of branches growing from them, calls them *ſtelechitæ ſtibii facie*. Though in other parts of his book he diſcourſes of them after Geſner and Agricola, under the names of *trochitæ* and *entrochi*. In the compoſition of the compound ſtones or *entrochi*, the ſingle joints are applied cloſely to one another ſide by ſide, and they are fitted ſo nicely together by the rays of one meeting the cavities between the rays of another, that the whole maſs, when ſtruck violently, will not ſeparate into them, but breaks tranſverſely in an oblique direction, as all the other ſpars do; particularly the *lapides judaici* or ſpines of *echini* petrified. Phil. Tranſ. N° 100.

SAINT FOIN, *ſanum*, or *ſanctum fœnum*, the name given by the French, and continued by us to a ſpecies of plant, frequently uſed for the food of cattle, either freſh or dried; it is called *holy hay* or *wholeſome hay*, from its excellent nutritive quality. The ſtalks of the plant are commonly about two feet long, but they grow ſometimes to five or ſix feet, and it has tufts of red flowers of three, four, or five inches in length.

This plant will make a forty times greater increaſe in poor ground than the common turf; and this is owing to its having a long perpendicular root, of that kind, called tap roots, which ſinks to a great depth to attract its nouriſhment. The length of this root is ſcarce to be credited by any but thoſe who have ſeen it; it is frequently drawn out of the ground to the length of twelve or fourteen feet, but it is ſaid to be often thirty feet or more in length.

The farmers have a general opinion, that this plant never ſucceeds well in any land, where there is not an under ſtratum of ſtone, chalk, or ſome other hard matter, to ſtop its running; but that otherwiſe it ſpends itſelf in root, and comes to nothing above ground. This is an error too groſs to need much refutation. It is certain, that the roots being to plants, what the ſtomach and guts are to animals, the more and larger roots any plant has, the more nouriſhment it receives, and the better it thrives.

Saint foin always ſucceeds where its roots run deep, and the beſt crops of all are produced upon lands where there is no hard under ſoil to obſtruct their paſſage. An under ſoil of clay may kill the plants, by retaining the water, and chilling and rotting their roots.

The long root of *ſaint foin* has, near the ſurface, many horizontal roots iſſuing from it, which extend themſelves every way; there are of the ſame kind all the way down, as the roots go, but they grow ſhorter and ſhorter all the way. Any dry land may be made to produce this valuable and uſeful plant, though it be ever ſo poor; but the richeſt and beſt land will produce the fineſt crops of it. The beſt way of ſowing it is by drilling, but the earth muſt be very well prepared, and the ſeed well ordered, or elſe very little of it will grow. The heads of theſe ſeeds are ſo large, and their necks ſo weak, that if they be much more than half an inch deep, they are not able to riſe through the incumbent mould; and if they are not covered they will be malted, as the farmers expreſs it; that is, it will ſend out its root while it lies above ground, and be killed by the air; and whether the farmer plants bad ſeed that will not grow, or good ſeed that is buried or malted, the event will be the ſame. The ground will be underſtocked with plants. A buſhel of ſeed to an acre of land is full twenty ſeeds to each ſquare foot of land; but as there is ſome difference in the largeneſs of the ſeeds, there is no abſolute certainty as to this calculation. The worſt ſeaſons for planting it are the beginning of winter, and the drought of ſummer; the beſt is the beginning of the ſpring; and it is always ſtrongeſt when planted alone, and is not ſown together with corn, as is the practice of ſome farmers. If barley, oats, or any other corn, ſown with the *ſaint foin*, happen to be lodged afterwards, it kills the young *ſaint foin*. If it be planted with any other corn, it is beſt done by drilling in the horſehoing way; in this caſe it is not much liable to be killed by the lodging of the corn, as the drilled corn ſeldom falls at all, and when it does, never falls ſo low as the ſown corn.

The quantity of ſeed to be drilled upon an acre of land will depend wholly upon the goodneſs of it; for there is ſome ſeed of which not one in ten will ſtrike, whereas in good ſeed not one in twenty will fail. The method of knowing the goodneſs, is, by ſowing a certain number of the ſeeds, and ſeeing how many plants are produced by them. The external ſigns of the ſeed being good, are, that the huſk is of a bright colour, and the kernel plump, of a light grey or blue colour, and ſometimes of a ſhining black. The ſeed may be good though the huſk be black, as that is ſometimes owing to the letting it receive the wet in the field, not to its being half rotted in the heap.

If the kernel be cut acroſs, and appear greeniſh and freſh, it is a certain ſign that it is good. If it be of a yellowiſh colour, and friable, and look thin and pitted, they are bad ſigns.

The quantity of ſeeds allowed to the acre in the drill way, is much leſs than that by ſowing, and is to be computed according to the number of plants that are to be allowed in that ſpace, allowing for the common caſualties. It is not neceſſary to be exact in this calculation, or to ſay whether two, three, or four hundred plants are to be allowed to a ſquare perch; neither is it poſſible to know before-hand the preciſe number of plants that may live out of thoſe that come up; for ſometimes the grub takes them when they have only the two firſt leaves, and the crop is greatly diminiſhed by this means. Four gallons of good ſeed to an acre of land will cover the land with plants when judiciouſly managed.

Single plants of *ſaint foin* make the greateſt crops; but the farmers, in general, plant them ſo cloſe, that they ſtarve one another. The ſingle plants always run the deepeſt, and thoſe which do ſo will always draw moſt nouriſhment. The plants which ſtand crowded ſtarve one another, and often die after a few years; but the ſingle ones grow to a vaſt bigneſs, and are every year better and better.

The beſt way to calculate how many plants are to be allowed to a perch, is to compute how much hay each ſingle large plant will produce; for if kept ſingle, and well cultivated, they will all be large ones. Without culture theſe plants never arrive at a fourth part of the ſize that they do with it. The hay of a large ſingle cultivated plant will weigh more than half a pound, and a hundred and twelve plants upon a ſquare perch, weighing but a quarter of a pound a piece, one with another, amount to two tun to an acre. If *ſaint foin* be planted on ſome ſorts of land early in the ſpring and hoed, it will ſometimes produce a crop the following ſummer; in a garden the ſeeds ſown in February will yield plants of two feet high that will flower in the

month

month of June following; and though March be frosty the young plants seldom suffer by it. This shews, that this plant is naturally a quick grower; but the farmers usually plant it on poor or cold land, and give it too little culture, which makes it backward, and slow of growth with them. The poor land usually allotted to this plant also makes it generally yield but one crop a year, but on a rich land it will yield two very good crops annually, with a moderate share of culture and management.

The farmer who expects to make a profit of this plant must not expect a good crop the first year. Nothing is so injurious to *saint foin* as its standing too thick; if it be sown so thick as to cover the ground the first summer, the plants will starve one another for ever after; but if the owner will be content to place them so thinly as to have but a small crop the first year, they will increase prodigiously, and every succeeding crop will be better and better. When *saint foin* is well hoed, it will grow as much in a fortnight as it would otherwise do in six weeks; and this quick growing is of advantage to it every way, not only making the plants larger, but of better nourishment to the cattle, whether they are eaten green or made into hay.

The proper distance to drill this plant for the horsehoing husbandry is at double rows, with eight inch partitions between them, and thirty inch intervals between every two and two. These intervals need only be hoed alternately, leaving every other interval for making the hay on. This method of hoing is of vast advantage, and poor land by means of it will always produce two crops in a year. The land is always to be perfectly cleared of grass before the sowing the *saint foin*, and the lumps of earth carefully broken. But no harrowing is to be allowed after it is drilled, for that would bury it; and it is not proper to roll it at all, unless for the sake of barley, when they are sown together; and when that is done, it should be with a light roller and in dry weather. This should be done lengthwise of the rows, and as soon as it is drilled; if it be not done at this time, it is best to stay three weeks before it is done, that the necks of the young *saint foin* may not be broken.

No cattle are to be suffered to come in the first winter upon the *saint foin*, after the corn is cut, among which it was sown. Their feet would injure it by treading the ground hard, as much as their mouths, by cropping it, and it would never come to good. Sheep should not be suffered to come at it even the following summer and winter. One acre of drilled *saint foin*, considering the difference of the quantity and goodness of the crop, is worth two acres of sown *saint foin* on the same land, though the expence of drilling be twenty times less than that of sowing. The first winter is the time to lay on manure after the corn is reaped off. Pot-ashes, or the like, are very proper, and a small quantity of them will do, as there are at this time no other plants to partake of the benefit, but the young crop has it all; and the young plants being thus made strong at first, will continue so, and be long the better for it.

It is observed, however, that in the drilling and horsehoing way there is no necessity for any manure at all. Some farmers sow eight or ten bushels of the seed of *saint foin* to an acre along with their corn, with intent that it should kill all the other weeds; but the consequence is, that the plants stand close, and starve one another, and are no bigger than where the plant grows wild on the hills in Calabria, where it is so small and seemingly despicable a plant, that it seems a wonder that any body could be tempted to think of cultivating it: yet, when rightly managed, it seems capable of being as useful a plant as any in the world. Where these plants stand so thick they draw out all the nourishment from the ground, in a few first years, and soon die, though manured ever so carefully. Six or seven years seems their greatest duration; whereas, when the seed is drilled in, and the plants are horsehoed, they will be as strong and vigorous as ever, at thirty years standing.

Some people who have turned their thoughts to husbandry, have been of opinion, that the cytisus would succeed better with us than the *saint foin*; it is probable enough that it would grow well; but the labour of sheering it, would with us, where the pay of servants is so dear, run away with the greatest part of the profits of the crop.

Lucerne is another thing which many have thought of introducing among us in the place of *saint foin*, but it requires so much care to suit it with a proper soil, that whatever are the profits of it, it never can be so general as *saint foin*. *Tull*'s Horsehoing Husbandry, p. 76. seq.

Saint foin succeeds best also in high grounds, which is a great advantage in the article of making it into hay, as it has greatly more advantage of the sun, and less to fear of mischief from wet than grass which grows in low grounds. On the high grounds the wind will dry more in an hour than it will in meadows that lie low in a whole day; and often the crops of *saint foin* make very good hay in the same seasons in which all the grass hay is utterly spoiled. The sun, on the high grounds, has also a more benign influence, and sends off the dew there two hours earlier in the morning, and holds it up as much longer in the evening; by these advantages the *saint foin* has more time to dry, and is made with half the expence of common hay.

All kinds of hay differ greatly in their goodness, according to the manner in which they are made, but the hay of *saint foin* differs more than all.

There are properly four kinds of the *saint foin* hay, differing according to the times of cutting them. These are first, the virgin hay; secondly, the blossomed hay; thirdly, the full grown hay; and fourthly, the thrashed hay. The first of these, or virgin hay of *saint foin*, is the best of all, and excepting lucerne has not its equal in the world. The *saint foin* for this hay must be cut before it begins to blossom; for when it stands till full blown, the most volatile spirituous and nutritive parts of its juices are spent on the generation; and this being done at once, the sap is greatly depauperated, and the plant can never afterwards recover the strength, vigour, and nutritive qualities it had at that time. The exact time of cutting this is, when a few of the blossoms, which are forwarder than the rest, are beginning to look red. *Saint foin* cut in this state, even though the weather prove bad, may be made up in small ricks, and a chaff basket drawn in the middle of each; this easy care will prevent it from firing; and though the colour be a little altered, it will be as good and nourishing, as if made at the most favourable season. Working stone-horses have been kept fat the whole winter on this hay alone without corn, and they are so fond of it that they will refuse beans and oats mixed with chaff in the common way for it.

Sheep will also be fatted in pens in winter with only this hay and water better than with pease, oats, and the like; and if the hay be weighed to them, and the whole expence and profit computed, the clear profit will be found to amount to four pounds a tun. These creatures make no waste in this way of feeding, but eat up every morsel of the stalks, though ever so thick, for they are always brittle, and are as well tasted as the rest.

The blossom hay is very beautiful to the eye, and of a very sweet smell, but it does not fatten the sheep as the virgin hay does, nor can working horses be kept fat upon this without an admixture of some corn.

The land ought to be well tilled for the virgin hay; for if it stand on a poor land, without much culture, it will not be above four or five inches long before it flowers, and will therefore yield but a poor quantity, and will spring up again, but very slowly, for another crop; but when on good land and well tilled, it will yield at this time two or three tun to an acre, and will spring up immediately very strong for a second crop.

This virgin hay is seldom sold, it being worth a much greater price than the common, and being usually kept by the farmer for his own use. Id. Ibid.

Beside the advantage the farmer makes of this plant, as well for hay as for the feeding his cattle, there is a considerable profit to be made by selling the seed of it when properly managed.

The owner of a land of *saint foin* has three chances for the making his hay; since this may be done either when it is in the leaf, or in the bloom, or when full grown. If the weather should prove unfavourable all this time, he may still reserve the crop for seed, and for thrashed hay, to his no small advantage. The ordinary crop of seed from one acre is sufficient to plant a hundred acres in the way of horsehoing husbandry; but as this is not yet universally practised, there is a sufficient demand for what seed a few who practise it can spare.

But beside the use of *saint foin* seed in sowing for new crops, it is also an excellent provender for horses; and those, in general, who have tried it, affirm, that one bushel of it will go as far as a bushel and a quarter of oats. When this seed is well cured, it is extremely sweet, and all sorts of cattle are fond of it: hogs will eat it and be fattened very well by it. But the goodness of the seed, and of the remaining hay, from out of which it is thrashed, depends very much upon the manner of the managing of them. When the thrashed hay has been kept dry, it is found to be better food for horses than common grass hay; and when cut small with an engine it is found as good as chaff for any cattle. It requires some skill to know the time at which the *saint foin* should be cut for seed. The seeds never ripen all at once. The flowers grow in spikes, and begin opening at the bottom, from thence gradually opening to the top. It is several days before the whole succession of flowers are blown, and the seed ripens in the same manner, so that the lower part of the ear has ripe seed many days before the top; and, in consequence, if the farmer stays till the top seeds are quite ripe, the lower ones will be all shed and lost.

The propereſt time to cut it is when the greatest part of the seed is ripe, the top part beginning to be full and the bottom full ripe. The kernel or seed is bluish, and the husk brownish when ripe. The seeds and husks are green for some time after the flowers are fallen, and it is better to cut the plant while it is thus, than to let it stand too long; for the

the ſeeds will ripen and become bluiſh after cutting, which will be much better than the letting them be loſt by waiting till they ripen upon the ſtalks in bad weather.

The *ſaint foin* for ſeed muſt never be cut in the heat of the day, for then it will dry too faſt as it falls, and much of the ſeed will be loſt. It is beſt for the mowers to begin at day-break, and to leave off as ſoon as the ſun has any power, going to work again in the cool of the evening. If the plant be dry at the time of cutting, it may be immediately made up into little cocks; but if not, it muſt be made hay of, only obſerving never to turn it while the ſun is hot upon it: unleſs there happen rain it is ſcarce neceſſary to turn the ſwarths at all; and when this is done, it muſt be done very carefully, that the ears be not ſhaken.

There are two ways of thraſhing this plant; the one on the field, the other in the barn. The firſt can only be done in very fine weather, and while the ſun ſhines warmly upon the field. The middle of the day is the only time for this, and the method is to ſpread a large ſheet, and peg it down at the corners, and in this thraſh the plants from the cocks by ſmall parcels at a time. The ſtraw is to be ſeparated from the ſeed, and made up into ricks; and this is good food for horſes and other cattle, and the ſeed, *&c.* is to be collected, and afterwards winnowed, to ſeparate the chaff.

If the ſeed have been wetted in the time of thraſhing or lying in the ear, it may be put up immediately; but if it have been thraſhed and winnowed dry, it will ferment and ſpoil if laid together too ſoon. The common way of managing it is by ſpreading it in a malt-houſe, or on a barn floor, but in ſpite of this it will often heat and ſpoil; the beſt way of all is to ſpread a layer of ſtraw, and on this ſprinkle a layer of the ſeeds, then cover theſe with another layer of ſtraw, and this with more ſeeds, and ſo on, till the heap is raiſed ſix or ſeven feet high. The ſeed will thus be kept cool, and in ſpring it may be eaſily ſeparated from the ſtraw, and will be as freſh as if juſt thraſhed; if this be ſown, not one ſeed in twenty will fail of coming up. When the weather is not fine enough to give opportunity to the thraſhing the *ſaint foin* in the field, it muſt be very carefully carried into the barn with ſheets at the bottom of the carts, otherwiſe a great quantity of the ſeed will be loſt in the way. *Tull*'s Huſbandry, p. 90.

SAKER, in the manege, the ſame with *dock*. See DOCK.

SAL, *ſalt* (*Cycl.*)—See the article SALT.

SAL, in the hiſtory of the gems, a term uſed by Pliny and the antients, to ſignify a defect or flaw, which took off very much from the value of the gem. Martial having occaſion to mention this ſort of blemiſh, in cryſtal, calls it *nitrum* inſtead of *ſal*. *Et turbata levi queſtus cryſtallina nitro.*

The critics have ſometimes changed this word *nitro*, to *vitro*, and others have made the confuſion yet greater, by ſuppoſing that the poet did not mean rock cryſtal but cryſtalline glaſs: but theſe are all errors. It is plain, by what Pliny and others have ſaid on the ſame ſubject, that the author means here the ſame that others do by the word *ſal*. This was a duſky and duſty foulneſs, ſeemingly compoſed of a quantity of ſaline particles, ſhooting into their forms within the body of the cryſtal. The gems in general were ſubject to this blemiſh; and we find, in particular, that the emerald was frequently debaſed by it.

It is found at this time, indeed, that cryſtal is much more ſubject to it than any of the gems; but, as the Romans called all the green cryſtals found in the copper mines of Cyprus by the name of emeralds, it is eaſy to conceive, that the emerald, as they underſtood the word, muſt be frequently ſubject to it. The poets uſing the word *nitrum* inſtead of *ſal* is not wonderful, for the Greeks called common ſalt *halonitrum*, ſo that the words ſeem almoſt ſynonymous.

SAL *Ægypti*, in natural hiſtory, a name given by Hippocrates, and many other of the old writers, to the *natrum* of the antients, called alſo *nitrum* by ſome, though very different from our nitre. It had the name *natrum* from *natrium*, or *nitrium*, the name of a city of Ægypt; and therefore this, as well as the name uſed by Hippocrates, ſtood for Egyptian ſalt.

SAL *ammoniac*, or *armoniac*. See ARMONIAC, *Cycl.*

The ſubſtance known by the antients, under this denomination, was very different from the *ſalt* we now call by this name. It was indeed no other than a particular appearance of the *muria*, or common alimentary *ſalt*, in a ſtriated form. We have common *ſalt* of this very form now in ſome parts of the world, but though with us it is ſcarce, with them it was very frequent, and was in common uſe, and eſteemed the very beſt kind of *ſalt* for the uſe of the table. Dioſcorides is extremely accurate and expreſs in his account of it, and when he has reckoned up the various properties and uſes of common *ſalt*, he deſcribes the ſeveral ſorts of it, and particularly this ſtriated one among them, which, he ſays, was the very beſt of all the kinds; yet it ſeems owing to the deſcription of this author, that the common errors about this *ſalt* have ariſen; for he ſays that it was foſſile, and compoſed of ſtrait regular fibres. And after writers finding no *ſalt* of the common alimentary kind, anſwering to theſe characters, and perceiving that the compound maſs, we call *ſal armoniac*, was of this ſtructure and appearance, made no heſitation to determine this to be the *ſalt* called *ſal ammoniacum* by the antients, not conſidering the incongruity of the characters of that *ſalt* to their accounts, or the impoſſibility of its ever being uſed at table as common *ſalt*. *Hill*'s Hiſt. of Foſſ. p. 384.

The *ſal ammoniac* of the moderns may be eaſily prepared in the following manner: take four ounces of common volatile *ſalt* of ox bone, ſaturate it with ſtrong ſpirit of ſea *ſalt*, and evaporate the ſuperfluous moiſture, upon which there will be found a cake of true *ſal armoniac* left behind.

This is an experiment which regards both philoſophical and technical chemiſtry, as it ſhews that odours may depend upon the mechanical ſtructure and texture of bodies; and leads to a cheap way of making *ſal armoniac* in other countries, as well as in the Levant. The volatile *ſalt* here employed has a very quick and pungent odour; ſo likewiſe, though in a leſs degree, has the ſpirit of *ſalt*; but theſe two, upon mixing, deſtroy each other's odour, ſo as to leave the cake of *ſal armoniac* ſcentleſs; but if a little of this *ſal armoniac* be rubbed in a mortar with ſalt of tartar, or any other fixed alkali, this lays hold of the acid of the ſea *ſalt*, and leaves the volatile ſalt to ſtrike the noſe as pungently as before. *Shaw*'s Lectures, p. 422.

Our own volcanos, or ſubterraneous fires, which we have in the coal countries, afford us *ſal ammoniac*. It is found ſticking to the ſides of the openings of theſe volcanos, in conſiderable thick cruſts, under other cruſts of ſublimed ſulphur. There is no foſſile *ſalt* in theſe places, nor any thing elſe, that can form *ſal armoniac* in the common way we ſuppoſe it to be found in; but it appears truly, that it proceeds only from the coal that feeds theſe fires. It is certain, that *ſal armoniac* is ſometimes found on brick kilns, where nothing but coals and common brick clay are burnt; and as no one would ſuſpect it of being contained in the brick clay, there is here only the coal to afford it. The common coal ſlate of thoſe counties alſo contains alum, ſulphur, and *ſal armoniac*; for alum may be drawn from it by the common operations; and when it is burnt, as it frequently is there for hardening the coal ways, both brimſtone and *ſal armoniac* are found in the heaps in ſeveral places.

The *ſal armoniac* found in the openings of the burning mountains, particularly mount Ætna, is evidently the ſame in all reſpects with ours; and even this alſo may, for ought we know, be formed of coals, of which the inacceſſible bowels of that mountain may contain great ſtores; though none have been found riſing near enough to the ſurface to be dug for uſe. Other bitumens alſo may poſſibly afford this *ſalt* on burning as well as coal, and it is not to be doubted but many ſuch are to be found in the earth thereabouts. The *ſalt* on the ſides of the mouths of mount Ætna is found in large and thick cakes, and in dry weather may be collected in vaſt quantities, and poſſibly a great part of what the Venetians ſell into other parts of Europe may be from theſe places. Either this *ſalt*, or that of our own volcanos, may be uſed in all the proceſſes of chemiſtry, with the ſame ſucceſs as other *ſal armoniac*. It is of itſelf grey and coarſe, but on mixing it with lime, and wetting them, a volatile ſpirit is raiſed; and on ſubliming a mixture of it with pot-aſh, a dry and white volatile *ſalt* is obtained. If ſome ſpirit of wine be added to the mixture of *ſal armoniac* and pot-aſh, more of the volatile *ſalt* will be produced than any other way. Phil. Tranſ. N° 130.

We are well aſſured that this *ſalt* is a concrete, the acid of which is that of ſea *ſalt*, and its alkali, a volatile urinous one; both of which are found in dung burnt and raiſed into ſoot.

If there is occaſion to ſeparate the acid of ſea *ſalt* from *ſal ammoniac*, there need only be uſed the common vitriolic acid, which being well known to be ſtronger than that of ſea *ſalt*, it diveſts that acid of its alkali by its ſuperior power, and it becomes the baſis of a new concrete *ſalt* with this acid, while the acid of ſea *ſalt* now freed and ſeparated may be drawn off pure by diſtillation.

If on the other hand it were required to draw from *ſal ammoniac* its volatile alkali, the ſubſtances to be employed to this purpoſe are ſuch alkalies as act upon the acid of the ſea *ſalt*, abſorbing and retaining it; the volatile alkali becomes freed, and riſes with a very ſmall heat. This alkali thus raiſed appears in two different forms, the one a liquid, which is called ſpirit of *ſal ammoniac*, the other a dry one, which is called the ſublimed *ſalt* of *ſal ammoniac*; and though theſe are ſometimes obtained ſeparate, yet in ſome operations they are in part of the one and in part of the other kind. This is well explained by Mr. du Hamel in his courſe of experiments on this ſubſtance. Mem. Acad. Scien. Par. 1735.

As the adding an alkali is the way to ſeparate this natural volatile alkali from *ſal ammoniac*, the more powerful that added alkali is, the better may it be expected to perform its effect. Chalk, lime, *ſalt* of tartar, and pot-aſhes, have all been in common uſe to this purpoſe, and all except the lime give the volatile alkali in a dry form, which is no wonder, ſince theſe are all naturally dry bodies before the operation; but there is one circumſtance in theſe operations very worthy regard,

regard, which is, that the mixtures ſometimes afford more volatile alkali than the weight of the whole quantity of *ſal ammoniac* from which this volatile alkali is drawn; beſide that, there muſt be ſuppoſed to remain all the acid matter at the bottom of the veſſel; but the whole account of this muſt be, that this volatile urinous *ſalt* is ſo extremely powerful, that it raiſes and carries up with it a part of its other matter.

It remains, however, yet to enquire why lime alone being joined with *ſal ammoniac* in diſtillation, yields this volatile alkali in a liquid form, or in the ſtate of ſpirit of *ſal ammoniac*. There ſeldom riſes any thing in a dry form in this proceſs; when there does it is but very little; and when there ariſes no liquid, as is ſometimes the caſe, there ariſes often nothing at all; whereas, with the other alkalies, there ariſes, as has been ſeen, more than the weight of the whole quantity of *ſal ammoniac*. We very well know that this liquid ſubſtance, which we call ſpirit, is no other than the ſame volatile *ſalt* diſſolved in water, or in ſome other humidity, furniſhed by the matter, added to the ſalt in the diſtillation, and that this *ſalt* in riſing has brought up its diſſolvent with it. The lime, though deprived in a great degree of its humidity, by the operation which made it lime, yet retains enough for the purpoſe of melting the *ſalt* into what we call this ſpirit; and when the operation with lime does not ſucceed it is owing to this, that the calcination of the lime has been ſo perfect, as to deprive it of all its humidity; and the truth of this is evident, ſince the adding a little water will always enſure the riſing of a ſufficient quantity of ſpirit, and that with leſs fire than it can be obtained with when no water is added. We are yet at a loſs, however, to account for lime's acting differently from all the other additions to this *ſalt*, and making nothing ariſe in a dry form.

Mr. du Hamel obſerves, that by its formation, lime is diveſted of all acids, and of all humidity; but that by means of its fatty particles, whether they are from ſhells embodied in the ſtones from which it was made, or from the natural bitumen of ſtones, it is always endeavouring to recover what it has been diveſted of by fire; that it abounds with a vaſt number of fiery particles; and that by means of theſe, it is enabled to act upon the urinous, and therefore fatty matter of the *ſal ammoniac*; whether it be, that it unites itſelf intimately with it, ſo as never to be ſeparated from it, or whether it decompounds, and as it were burns it. And what confirms this conjecture, is, that Mr. du Hamel having diſtilled four drachms of ſpirit of *ſal ammoniac* with one drachm of freſh lime, he obtained a ſmall quantity of volatile *ſalt* in a dry form; the lime in ſo ſmall a proportion not being able to prevent the *ſalt* from this ſpirit from appearing in a dry form. And it is eaſy to conclude hence, that a volatile *ſalt* might be obtained from *ſal ammoniac* with lime, in a dry form, provided that the *ſal ammoniac* be mixed in an over proportion up to a certain quantity. Mem. Acad. Scien. Par. 1735.

The ſpirit and *ſalt* of *ſal ammoniac* being the ſame matter in a dry and a liquid form; it is evident, that the liquid muſt of the two be moſt ſtriking to the noſe, becauſe the particles of the *ſalt* are more eaſily diſunited from this latter union: and the *ſalt*, in a dry form, is ſo very volatile, that it entirely evaporates when laid on a hot iron, however fixed the matter may have been, which it originally carried up with it. It appears very plain from this, that the union between this volatile body and the particles of more fixed ones, which it carries up with it in ſublimation, and which are proper to give it the form of a dry concrete, is ſo intimate, that it will bear very ſevere trials and remain unaltered, and indeed, that it is ſcarce poſſible at all to decompoſe it.

It is no indifferent matter what the additions are with which *ſal ammoniac* is diſtilled; they muſt, by no means, be either ſuch as contain a nitrous, or a vitriolic acid; the former of theſe meeting with the fatty and ſulphurous part of the *ſal ammoniac*, may cauſe a detonation and burſt the veſſels; and the other, which is yet much more dangerous, might diſengage a portion of the ſea *ſalt*, which would again mix with the volatile part with which it has now no buſineſs to be allied, and with the fatty matter it might form a very diſagreeably ſcented ſulphur. Bole contains a vitriolic acid, and is therefore to be rejected. Gypſum mixed with it gives a ſmoaking liquor, whoſe odour is inſupportable, and chalk and common pot-aſhes are the beſt of all additions.

The firſt who gave *ſal ammoniac* internally was Platerus; but its uſe in fevers was not then known; he only uſing it in aſthmas. In ſucceeding times it became known as a febrifuge. It is frequently uſed in this intention, in Germany and Holland, and with great ſucceſs. The common doſe to a grown perſon is one drachm. The largeſt doſe, in caſes of the moſt robuſt conſtitutions, is two drachms. A perſon of eleven or twelve years old may take two ſcruples, and an infant of a year old may take fourteen grains. Its chief virtue is in intermittent fevers, in which it may be thus given. Let the doſe of *ſal ammoniac*, proportioned to the age and ſtrength of the patient, be diſſolved in an ounce of common water, or of any diſtilled water; and let the patient take it half an hour before the time that the fit is to come on. This is to be repeated in the ſame manner, before every fit, till the diſtemper is removed.

Though the great uſe of this medicine be in intermitting fevers; it is not, however, adapted only to thoſe, but may be of uſe in fevers of other kinds. The ſame doſe may be taken every five or ſix hours, drinking a baſon of ſage tea after it. It very frequently ſucceeds ſo well, that one doſe of it carries off the diſeaſe, ſo that it never returns again; but if the firſt doſe does not ſucceed in this manner a few others will. Two, three, or four doſes almoſt always prove ſufficient. This medicine has no viſible effect upon the body, more than the ſudden removal of the ſickneſs; for it neither operates by vomit, nor by ſtool, nor by ſweat: its effect ſeems to be owing to the correcting and altering of the matter of the diſeaſe, not the evacuating it out of the body.

The bark is ſuperior to this *ſalt* in the cures of quartan agues, and indeed in other caſes it is more certain in the ſtopping a ſecond fit; but there is another advantage in this, which the bark greatly wants, this is the preventing relapſes. Theſe are very frequent after cures in the common way, but are ſcarce ever found to follow in caſes when this *ſalt* has been uſed.

Another advantage of this medicine is the ſmall quantity of the doſe, and the few doſes that are neceſſary to be taken for a cure; whereas every one knows how many large doſes of the bark are neceſſary, and that often at ſuch ſmall diſtances of time, in caſes, that it is often difficult to perſuade the patient to be cured at the expence of ſo nauſeous a load of medicines. Act. Erudit. 1717.

SAL *aquarum*, in natural hiſtory, a name given by many of the antient writers to the nitre of the antients or *natrum*.

They had this *ſalt* principally from Ægypt, and called it in their works the produce of the evaporated waters of the Nile; for this reaſon Hippocrates ſometimes calls it *ſal ægypti*, and ſometimes *ſal in aquis creſcens*, a *ſalt* growing in the waters.

SAL *circulatum*, in chemiſtry, a term uſed by Paracelſius for a preparation of ſea *ſalt*, of which he diſtinguiſhes two kinds, under the name of the *circulatum minus* and *circulatum majus*. Theſe ſeem to have a great affinity with the famous alkaheſt or univerſal ſolvent, ſo much talked of in the works of this author, and his ſucceſſor Van Helmont.

The *circulatum minus* was a liquor procured by a tedious proceſs from ſea *ſalt*; this *ſalt*, he ſays, is that body in which nature has placed the greateſt perfection; and from this he, by incredible induſtry, procured a liquor which he calls a perpetual oil, and to which he alſo gives the name of the ens primum of *ſalts*. He calls it the higheſt and moſt ſucceſsful of all *ſalts*, and declares that all poiſons are ſubdued by it; and that being brought to the utmoſt degree of purity and ſubtilty, it pervades all bodies, and readily diſſolves them, itſelf remaining unaltered in the action. Theſe are all properties expreſsly attributed by Helmont to the famous alkaheſt. See ALKAHEST.

The *circulatum majus*, however, we are told, by the ſame author, was much more powerful and much more difficult to be obtained than the former. This he calls the matter of mercurial *ſalt*, and the living fire: he acknowledges that the higheſt fire and celeſtial life lie hid in common mercury, and ſays the quinteſſence of mercury is celeſtial fire: by this and a great many other enigmatic expreſſions in this writer, there is room to believe, that the alkaheſt, deſcribed by Helmont, is a preparation of mercury and ſea *ſalts*. *Boerh.* Chem. p. 573.

SAL *diureticus*, a form of medicine, of the nature of the *terra foliata tartari*, introduced into practice by the late college diſpenſatory. The method of preparing it is this: take of any alkaline fixed *ſalt* a pound, boil it in four or five pints of diſtilled vinegar in a gentle heat. When the fermentation is over, pour on more diſtilled vinegar; and when the fermentation ariſing from this addition is over, pour on ſtill more, and proceed thus till the moiſture being nearly all evaporated, freſh vinegar being added will excite no more fermentation: this generally happens when about ten quarts have been uſed; then evaporate to a dryneſs; the *ſalt* will be impure, and muſt be melted for a ſmall time, with a gentle heat, afterwards diſſolved in water, and filtered; if the melting has been rightly performed, the ſtrained liquor will be pellucid as water; then evaporate this in a gentle heat to a dryneſs, and you will have a very white *ſalt*, ſoluble either in water or ſpirit of wine. *Pemberton*'s Lond. Diſp. p. 187.

Jamblici SAL. See the article JAMBLICI *ſal*.

SAL *lucidum*, in natural hiſtory, a name given by ſome to nitre. Others uſe the phraſe to expreſs the nitre of the antients, that is the natrum.

SAL *marinus*, in ichthyography, the name of a truttaceous fiſh of the umbla kind, and very much approaching to that ſpecies called the *reutele*. See REUTELE. And by ſome ſuſpected not to be eſſentially different from that ſpecies. It is a very ſcarce fiſh, and is extremely valued for the table, but is never caught in any plenty, never keeping in ſhoals as many other fiſhes, but living ſingly. It loves clear ſtony rivers of a ſharp current, and feeds on ſmall fiſh. Its moſt frequent ſize is of about a pound weight, and it very rarely

exceeds

exceeds twice that. Its tail and fins are very red; its ſides and belly reddiſh, and its back of a ſort of orange colour or reddiſh yellow, having ſome yellow ſpots. Its ſcales are moderately large, and do not eaſily fall off on rubbing.

The *ſal marinus* is diſtinguiſhed by Artedi by the name of the forked tailed ſalmon, with a yellowiſh back, and with yellow ſpots. See SALMO.

SAL *marinum regeneratum*, in chemiſtry, the name given to a ſea *ſalt*, produced by adding an alkali to its acid ſpirit of *ſalt* drawn by diſtillation. The proceſs is thus, dilute four ounces of oil of tartar, with three times its weight of fair water; put this mixture into a tall glaſs body, and heat it, and drop into it any of the kinds of ſpirit of ſea *ſalt*, whether Glauber's, or that prepared with bole; ſhake the veſſel now and then, and continue to drop in the acid till the alkaline liquor is ſated, and there riſes no more effervеſcence; filter the liquor, and evaporate to a pellicle, and ſet it by to cryſtallize, and there will be procured cryſtals of perfect ſea *ſalt*, in all things agreeing with common *ſalt*. *Boerh.* Chem. Part II. p. 253.

SAL *martis*, *ſalt of iron*, a chemical preparation, which is made as follows: mix together a quart of water and eight ounces of oil of vitriol; pour the oil of vitriol in by a little at a time; and having put this mixture into a glaſs veſſel, add to it filings of iron, four ounces. When the ebullition is over, evaporate the liquor to a pellicle, and ſet it to ſhoot; there will be found a green vitriol or *ſalt* in fair cryſtals, which dry for uſe.

This *ſalt* is one of the moſt powerful preparations of iron; it opens obſtructions of all kinds, and ſtrengthens the viſcera; it is an excellent medicine in cachexies, obſtructions of the ſpleen and liver, and in ſuppreſſions of the menſes; it is alſo found good againſt worms.

The beſt manner of giving it is in ſolution, half an ounce in a quart of water, four ounces of which is a doſe; and if drank in the manner of the natural chalybeate waters, it will be found to exceed moſt of them in its good effects.

SAL *mirabile*. *Glauber's ſalts*. Though this be a well known preparation, and the reſult of a mixture of a vitriolic acid with marine *ſalt*, and the world has ſuppoſed it could be no other way found than by ſuch an union made by art; yet Mr. Heliot has communicated to the academy of ſciences of Paris, an account of its being found in vitriol alone, without the addition of any foreign matter.

The common green vitriol or copperas is well known to be made in England, by an union of the ſulphureous acid of the common pyrites, and iron. Old iron is thrown into large quantities of a ſolution of the pyrites, that it may be diſſolved, and the union produces a concrete in the form of a regular *ſalt*. This *ſalt* we well know contains a ſulphureous matter; whether that be obtained from the pyrites, or from the iron that enters its compoſition; ſince, in the diſtillation of its oil, there ever eſcapes a very ſtrong and penetrating ſcent of ſulphur through the junctures of the veſſels.

There are alſo ſome vitriols, particularly the common Swediſh kind, which may very probably be aluminous; ſince the yellow ſhining gold like marcaſite from which it is made, yields in its native ſtate true ſulphur in diſtillation, and afterwards affords vitriol in the lixivium, after the remainder has been long expoſed to the air, and finally it yields alſo alum by the addition of urine and pot-aſhes, to what they call the mother water of vitriol.

Mr. Lemery has ſhewn, that after a moderate diſtillation of green vitriol, a *ſalt* of the nature of alum may be drawn by a lixivium from the colcothar; and beſide this, Mr. Heliot has found in that colcothar a vitrifiable earth, and a genuine *Glauber's ſalt*. Thoſe who are at all acquainted with chemiſtry, know that *Glauber's ſalt* is a concrete compoſed of the vitriolic acid and ſea *ſalt*, and it is generally received as a certainty that any other acid joined to ſea *ſalt* cannot afford this concrete; therefore if *Glauber's ſalt* is to be produced from ſea ſalt alone, and yet is proved to be found in pure vitriol; it muſt follow, that pure vitriol does contain ſea ſalt, or at leaſt that ſubſtance which is the baſis of ſea ſalt: and this will prove a leſs ſingular obſervation, if it can be evinced, according to Becher, that all the known *ſalts* owe their origin to marine *ſalt*.

Mr. Lemery, in order to procure his aluminous *ſalt* from vitriol, does not puſh his diſtillation too far, that the acid may remain engaged and entangled in that earth, by the union with which it is to form this *ſalt*, which is afterwards to be ſeparated by lixiviation; but Mr. Heliot puſhes the diſtillation to the utmoſt degree with a violent fire of three or four days and nights, ſuch as Kunkel preſcribes, for the diveſting vitriol of all its acid, that the remainder in the retort may contain little or no *ſalt* at all. He took eighteen pounds of Engliſh vitriol, which he calcined to a redneſs, and by that means reduced it to ſix pounds. This quantity, though put in a covered earthen veſſel, acquired nine ounces in weight from the humidity of the air in two days; and in this ſtate it was put into a german retort, and urged to that degree by the violence of fire, for ſo long a continuance, that the remaining black maſs, though treated with all the care imaginable, and waſhed by repeated lixiviation, yielded only two ounces and a half of *ſalt*, and that of a very earthy kind. About nine ounces of phlegm had been ſeparated at the beginning of the diſtillation, but when the white vapours began to appear, the veſſels were all cloſed, and ſo kept to the end of the operation; the produce of which was an icy oil of vitriol, which was found in a black cryſtalline form.

The ſucceſs of the operation, as to the procuring this icy oil of vitriol, depends on the nice luting the junctures of the veſſels, ſo as to prevent all communication with the external air; for otherwiſe the vapours attract a moiſture from the air, which renders them fluid in the receiver. The receiver muſt alſo be placed at a conſiderable diſtance from the retort, that it may be cool enough to condenſe the vapours, and large enough to prevent their exploding, for want of room; for though the preceding calcination has carried off the more volatile parts, yet there remains matter enough for great exploſion, and for the formation of a ſubſtance not leſs inflammable, than crude ſulphur, were the acid in a leſs proportion.

The beſt method is to fit to the neck of the retort a receiver with two necks; the one of which receives that of the retort, and the other is received into a capacious ſingle receiver of the common kind.

The icy oil is not eaſily got out of the receiver, for it exhales ſo ſtrong a ſulphureous vapour, that if it be placed lower than the operator's head, it would ſuffocate him in a moment.

This icy oil is black, becauſe it carries over with it a quantity of that oily matter, which no vitriol is ever entirely free from, and which is always found in the mother water, as it is called, of vitriol, after the repeated cryſtalliſations of the *ſalt* from it; and it is well known, that any inflammable ſubſtance, in ever ſo ſmall a quantity, will turn the pureſt oil of vitriol black; nor is this all, for the acid ſpirits alſo, when urged by a violent fire, carry over with them iron, or at leaſt ſuch particles, as are capable of becoming iron. This is eaſily demonſtrated in either the common or the blackiſh cryſtals of the icy oil of vitriol; for if theſe be diſſolved in a large quantity of pure diſtilled water, and allowed to ſtand ſeven or eight days, there always precipitates to the bottom of the veſſel a ſediment, which, after it has been calcined, has many particles, which readily anſwer to the magnet.

Beſides this oily matter, and theſe particles of iron, the oil of vitriol carries with it alſo a white, heavy, and cryſtalline ſubſtance, of the nature of earth, which may be ſeparated, by means of ſpirit of wine, from oil of vitriol, ever ſo well rectified. The ſame ſort of earth is alſo found in the *ſalt*, which is extracted from the *caput mortuum*, left after the diſtillation of the icy oil. The lixivium made by this author from the remaining maſs, left after the diſtillation of the icy oil of vitriol, was expoſed to the air, in a glaſs cucurbit, for the ſpace of ſix months; and the ſaline liquor, concentrated by evaporation in a ſand-heat, became green, and would by no means cryſtallize. The firſt ſaline pellicles had a ſaline, but earthy taſte: theſe precipitated by degrees of themſelves, and were finally ſucceeded by others, which taſted acid, but not greatly ſo. This liquor being evaporated to a dryneſs, an ounce of the remainder was put into a retort, and four ounces of oil of vitriol was put on it, with one ounce of water, to forward the diſſolution; this was kept in digeſtion twenty days, at the end of which time the liquor acquired a green colour, which ſhewed that there were yet in the maſs metallic parts for it to diſſolve: this was finally diſtilled with a gentle heat, to ſeparate the phlegm, and afterwards the fire was encreaſed, to drive over the acid; the oil of vitriol came over as ſtrong, as it was when put on, but much more ſulphureous. The diſtilled oil being returned upon the *ſalt*, with the freſh addition of a ſmall quantity of water, became ſo hot, that the veſſel could not be held in the hand; which had not been the caſe in the firſt mixture, at leaſt not in any ſenſible degree. Several more cohobations made it yet more and more acid, and at length it became ſo cauſtic, as to leave an eſchar on being juſt touched upon the tongue.

The green colour, which the acid firſt received, became at length changed into a blue one, which gave ſuſpicion that there was copper, as well as iron in the vitriol. This might appear ſtrange, as it was Engliſh vitriol that was uſed; but Kunkel has proved by experiments, that there is ſome copper in all vitriol, even in the Engliſh; nay he advances, that in the vitriol of iron, made with oil of vitriol and filings of that metal, there may always be diſcovered ſome ſmall portion of copper; and, in fine, that there is no iron but contains ſome portion of copper, and no copper but contains ſome portion of iron.

After the ſixth cohobation of this blue liquor, there remained a granulated and filamentous ſaline ſediment, on the ſurface of which there was a ſmall quantity of a yellow ſublimation, reſembling flower of ſulphur; warm water being poured upon this matter, became of a greeniſh colour; and this being digeſted in a ſand-heat, became afterwards

reddiſh, and precipitated to the bottom a white and very heavy powder; which, on a ſeries of examinations, proved to be of the nature of that opake white ſtone, uſually found among the ores of metals, and called by the Germans *quartz*.

The ſaline liquor, from which this was ſeparated, became yet redder by long digeſtion, but when cold, it turned to a fine green.

This liquor being concentrated, by evaporation, to the quantity of two or three ounces, was put into a glaſs veſſel, with its pellicle, which ſoon precipitated itſelf to the bottom, in form of a thin cruſt, covering the ſurface of the glaſs in the manner of a wet paper. In five or ſix weeks time, there became formed in this veſſel, both at the bottom and ſides, a number of large cryſtals, of a beautiful green colour, and as the liquor dried away, theſe mouldered into a browniſh red powder.

In fine, there appeared, in the remainder of this liquor, another ſort of cryſtals; theſe were white and tranſparent, and were formed in ſquare columns, with their extremities cut in the manner of thoſe of the pyramids of the columns of *Glauber's ſalt*; they had alſo a bitter taſte, and left a remarkable ſenſe of coldneſs on the tongue. Theſe appeared indiſputably, by theſe and all other trials, to be true *Glauber's ſalt*. Mem. de l'Acad. Scien. Par. 1738.

Glauber's *ſal mirabile* was long thought to be the produce of art only; but of late years, a natural *ſalt*, perfectly ſimilar to Glauber's, has been found in many places. We have a full account, by Mr. Boulduc, of a ſubſtance of this kind, which had been found near Grenoble in Dauphine. The ſame gentleman alſo found a *ſal mirabile* in the waters of Paſſy. The true Epſom *ſalt*, deſcribed by Dr. Grew in 1696, is alſo either the ſame as Glauber's, or at leaſt Glauber's is the principal part of it. Stahl afterwards found a true *Glauber's ſalt* in the acidulæ, or ferrugineous waters, and did not ſcruple placing this among the natural mineral *ſalts*. Hoffman alſo found a ſpring of very bitter and purgative mineral water, a pound of which contained two drachms of this *ſalt*. The cathartic *ſalt*, found near Madrid, is alſo of the ſame nature. See Hiſt. de l'Acad. Par. 1727. p. 29, 30. and the Memoires of the ſame year, p. 375, ſeq. 4to.

It is to be obſerved, that though Glauber made his *ſalt* known about the middle of the preceding century, yet Kunckel, in his Laborat. Chymic. aſſures us, it was known in the electoral houſe of Saxony an hundred years before. However this be, we owe the knowledge of it to Glauber, who called it *admirable*; and it ſoon acquired, and has ever ſince maintained, the reputation of an excellent internal medicine in many caſes.

Glauber's ſalt may be obtained from borax, by mixing oil of vitriol with it. Mix four ounces of borax with one ounce and one drachm of oil of vitriol; upon ſublimation, this gives the *ſal ſedativum* of Homberg, and the reſiduum, expoſed to a ſtrong fire, affords *Glauber's ſalt*. This operation may be ſhortened very much, for inſtead of ſublimation, the *ſalt* may be obtained by cryſtallization, in light foliated laminæ. This *ſalt*, whether prepared by ſublimation, or by cryſtallization, has the property of diſſolving in ſpirit of wine; and if this ſpirit of wine be ſet on fire, the flame is green. Spirit of wine has no effect on borax, and the oil of vitriol digeſted with it, does not make its flame green. Therefore it is neceſſary, in order to give this greenneſs to the flame, that borax ſhould be united to an acid. Philoſ. Tranſ. N° 436. p. 39.

SAL *nitrium*. See NITRIUM *ſal*.

SAL *polychreſt of Seignette*, a ſoluble tartar made with *ſal kali*, inſtead of *ſalt* of tartar. Mr. Boulduc deſcribes this *ſalt* in the Mem. Acad. Scienc. 1731. See POLYCHREST, *Cycl.*

SAL *ſedativum of Homberg*, This uſed to be made by diſſolving borax in water, into which oil of vitriol was poured, and then diſtilling this mixture, quieting *ſalt* was obtained. Mr. Geoffroy has lately taught us an eaſier way of preparing it: he evaporates the liquor to the proper conſiſtence, and then allows it to cryſtallize. Mem. de l'Acad. Par. 1732. See SEDATIVUM *ſal*.

SALACSAE, in natural hiſtory, a name given by the inhabitants of the Philippine iſlands to a kind of bird, by whoſe flight they pretend to divine the event of things. All the account we have of the bird is, that it is of a ſmall ſize, and is variouſly coloured, and has a long and large beak.

SALAMANDRA, the *ſalamander*, in zoology, a name given by authors to ſeveral ſpecies of the lizard kind, but the principal are two, the *ſalamandra aquatica*, and *ſalamandra terreſtris*.

The *ſalamandra aquatica*, or water *ſalamander*, is our common water newt, or eft, which is very common in fiſh-ponds, and other ſtanding waters, and is diſtinguiſhed from the reſt by the flatneſs of its tail.

The manner of propagation in theſe animals is very ſingular, and ſerves to illuſtrate the analogy between animal and vegetable nature.

The *ſalamandra terreſtris*, or land *ſalamander*, is a ſpecies of lizard very like the green kind, except that its head, and its belly, are thicker. Its tail is ſhort, and its colour a fine black, marked with red ſpots, and of a bright, ſhining, and gloſſy appearance. It is very common in many mountainous places.

The difference between this and the water kind is not only in colour, but in the ſhape alſo of the tail; which in this is round, not flat as in that; yet there are ſome who affirm, there is no ſpecific difference between the two, but that the water kind, when it deſerts that element, and comes to live on ſhoar, alters in colour, and becomes round at the tail.

The opinion of this creature's being able to remain unhurt in the fire for a long ſpace of time, is wholly falſe and fabulous.

The *ſalamander* is evidently a viviparous animal, yet it is ſuppoſed that the young are hatched from perfect eggs, while in the body of the parent animal. *Ray*'s Synop. Quad. p. 274.

SALAMANDRINO, in ichthyology, a name given by the Italians to that ſpecies of ſalmon, which Salvian calls *ſalmarinus*. It is diſtinguiſhed from all the other ſpecies of this fiſh, by its having a yellowiſh back, with yellow ſpots, and a forked tail. The fleſh of this ſpecies is very delicate. It loves cold and clear rivers. *Willughby*'s Hiſt. Piſc. p. 199.

SALAMGA, in natural hiſtory, the name given by the people of the Philippine iſlands to a ſpecies of ſea ſwallow. This is the bird, whoſe neſts are ſo famous as an ingredient in ſoops.

SALANDRA. See the article CHELANDIUM.

SALANDRIA. See the article CHELANDIUM.

SALAR, in ichthyology, a name given by ſome authors to the trout. See TRUTTA.

Others apply the name to a young ſalmon while very ſmall. See SALMO.

SALAYASIR, in natural hiſtory, the name by which the people of the Philippine iſlands call that ſmall ſpecies of duck, which is ſo common thereabouts. This is an inhabitant of their lakes and marſhes, and is a perfect duck, and very beautifully coloured, but does not exceed the bigneſs of a man's fiſt.

SALEFUR, a name given by ſome of the chemiſts to garden ſaffron. See SAFFRON.

SALEP, in the materia medica, the root of a ſpecies of *orchis*. See the article ORCHIS.

Salep ſhould be choſen clean, firm, and hard; it is very little liable either to decay, or ſophiſtication.

The people of the Eaſt are extremely fond of *ſalep*; they look upon it as one of the greateſt reſtoratives, and provocatives to venery in the whole vegetable world.

That *ſalep* is the root of an *orchis*, no way differing from our common *orchis's* in virtue, but owing its appearance to the manner of preparing it, and conſequently, that *ſalep* may be prepared from the roots of *orchis* of our own growth, Mr. Geoffroy has proved in the following manner. He conſidered, that the method of curing one root in the eaſtern parts of the world was probably the ſame with that uſed in all; and obſerving that Kæmpfer had deſcribed the manner in which the Chineſe prepare their ginſeng, to make it pellucid, which was by firſt ſteeping, or macerating it in water, and afterwards carefully drying it; he determined to attempt the curing the roots of the common *orchis*, in a method not unlike that uſed to the ginſeng, in order to make *ſalep* of it. The *ſalep*, which we receive from Turkey, is a root of a white or reddiſh colour, according to its different age; and as we receive it, is always tranſparent. As to our own *orchis*, if we attempt to dry the roots in the common way, they never will appear at all like the *ſalep*, but will become ſhrivelled up and brown, and will always retain, or be ready to imbibe from a humid air, a great quantity of moiſture. To prepare theſe, in imitation of the *ſalep*, Mr. Geoffroy choſe the largeſt, plumpeſt, and faireſt roots he could find; theſe he nicely ſkinned, taking off the whole outer rind, then throwing them into cold water, he ſuffered them to macerate there ſome time; after this he lightly boiled them; and after this taking them out of the water, and draining them, he had them ſtrung upon threads, to be dried in a warm and dry air. When the roots were thoroughly dried, they were very tranſparent, and reſembled pieces of gum tragacanth, and continued dry and hard. The roots thus prepared, may be kept ever ſo long in a dry place, and will never attract humidity, or become mouldy and rotten; as they will always do in wet weather, if dried in the common way with their ſkins on.

The *orchis* roots thus prepared may be reduced to powder, this powder will diſſolve away in boiling water, and a ſcruple of it will make a baſon full of jelly, in the manner of the Turkiſh *ſalep*. This jelly is an admirable medicine in all the caſes, in which *ſalep* is preſcribed, and may be rendered agreeable by the addition of wine, ſugar, ſpice, &c. and the powder may be given with great ſucceſs in aſſes milk, for diſeaſes of the breaſt.

If the water, in which the roots have been boiled, be evaporated over a gentle fire in an earthen veſſel, there will remain an extract of a viſcous texture, and a very agreeable ſmell, reſembling that of a meadow of flowers when the wind blows over it. Mem. de l'Acad. Scienc. Par. 1740.

SALIÆ, in antiquity, Roman virgins, dreſſed after the manner of the ſalii, who aſſiſted the pontif in ſacrificing. *Pitiſc.* in voc. See the article SALII, *Cycl.*

SALIAN *dance*, in antiquity. See DANCE and SALII, *Cycl.*

SALICARIA, *willow herb*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, conſiſting of ſeveral petals, diſpoſed in a circular form, and growing out of the ſegments of a tubular cup; from the bottom of this cup there ariſes alſo a petal, which finally becomes an oval bicapſular fruit, containing a number of ſmall ſeeds, affixed to a placenta, and uſually ſurrounded and covered by the cup.

The ſpecies of *ſalicaria*, enumerated by Mr. Tournefort, are theſe. 1. The common long leaved *ſalicaria* with purple flowers. 2. The trifoliate purple flowered *ſalicaria* with hexangular ſtalks. 3. The roundiſh leaved purple flowered *ſalicaria*. 4. The narrow leaved Portugal *ſalicaria*. 5. The broad hyſſop leaved *ſalicaria*. 6. The narrower hyſſop leaved *ſalicaria*. 7. The white flowered hyſſop leaved *ſalicaria*. 8. The Spaniſh hyſſop leaved *ſalicaria* with long deep blue flowers. 9. The ſmalleſt narrow leaved *ſalicaria*. 10. The ſmalleſt Portugal *ſalicaria* with leaves like moneywort. *Tourn.* Inſt. p. 253.

SALICARIA, in zoology, a name by which Geſner, and ſome others, have called a ſmall bird, very much reſembling the muſcicapa, or fly-catcher, if not the ſame ſpecies.

It lives among the willows in wet places, and feeds on ſpiders, flies, and other inſects. *Geſner.* de Avib. See the article MUSCICAPA.

SALICASTRUM, a name by which Pliny, and ſome other botanical authors, have called the *ſolanum lignoſum*, the woody nightſhade, or bitter ſweet. *Ger.* Emac. Ind. 2.

SALICHA, in the materia medica, a name given by ſome of the old writers to cinnamon. Aviſenna and Serapion uſe it for the bark we call *caſſia lignea*, and the Greeks *hylocaſia*, when ſtripped clean from the wood.

The antients had two ways of collecting the barks of trees and plants for medicinal uſes; the one was the ſtripping them from the branches of trees, as we do at this time; the other was the cutting off the branches, bark and all, and drying them together. The *ſalicha* ſignifies, however, the *caſſia*, or cinnamon, thus ſtripped from the wood, not cut with it. The word *ſelach*, in the Arabic, from which it is derived, ſignifying *exuviæ*, or the caſting off the outer part of any thing. The *ſelach alhaie* is the *exuviæ ſerpentis*, or caſt ſkin of a ſerpent, and ſo of the reſt. The determinate ſenſe of the word *ſalicha* is, therefore, the bark of *caſſia* ſtripped from its wood, and is what the antients called *caſſia fiſtula*, from its being rolled up in the form of a pipe. But we have perverted their meaning in this term, and applied it to the fruit of the pudding pipe tree, that being our *caſſia fiſtula*. Damocrates, in his iambics, and alſo in his antidote, mentions this bark under the name of *caſſia fiſtula*; and Scribonius Largus, among the reſt, expreſsly informs us, that it was the bark, not the fruit of a tree, that was at his time known by this name. Aviſenna, and the more correct writers, keep this word for the name of *caſſia*, never expreſſing cinnamon by it, though others do. They call cinnamon *darſini*.

SALICINEA, in the materia medica, a name uſed by Geſner, and ſome other authors, for the *nardus Celtica*, or Celtic ſpikenard. *Ger.* Emac. Ind. 2.

SALINE, a name given to a preparation of ſea *ſalt*, procured from the froth of the ſea, hardened by the ſun in hot countries. It is called by ſome authors *pilatro de Levante*, and is uſed in glaſs-making; and in the making the fine purple colour from cochineal, by boiling it in a ſmall quantity, with the bran and fœnugreek, of which the magiſtery is made for that purpoſe. *Neri*'s Art of Glaſs, p. 173.

SALINE is alſo the name given by authors to ſprings of *ſalt* water, called by us *ſalt wells*, *ſalt ſprings*, and *brine pits*. Moſt parts of the world are found to have theſe, but thoſe of Franché Compté, in France, ſeem to be the moſt remarkable. The ſprings are ſituated in deep caves, and theſe in the greater work are about four hundred feet in length, and fifty feet in breadth: into this work they deſcend by a ſtone ſtaircaſe of forty ſteps, and thence by a wooden one of twenty; at the bottom of theſe ſtairs is a cave with an arched roof. This firſt cave, or vault, is forty feet long, and thirty two feet and a half broad, and in it are ſix ſprings of *ſalt* water, and two ſprings of freſh water; all which iſſue out of the ſame rock, in the ſpace of fourteen feet in length. From this cave they go into others, which are ſupported in the middle, each by a row of thick pillars, from which are carried double rows of arches. They then paſs through two gates into a ſpacious vault, thirty five feet high, and ſupported, nigh the entrance, by four ſtrong pillars, placed in form of a ſquare. In the middle ſpace, between theſe pillars, is a baſon of a very conſiderable ſize, into which the *ſalt* water from ſeveral ſprings is collected: and in the ſame vault, beyond theſe pillars, are four others placed in a row, ſupporting different arches, of ſixty feet in length, and forty eight feet in breadth; beyond which there is an irregular ſpace, ſixty three feet long, in which are ſix or ſeven ſprings of *ſalt* water, and ten or twelve of freſh. The *ſalt* waters of theſe ſprings, and of the ſix ſprings before-mentioned, are kept ſeparate from the freſh water, and are all conveyed through gutters to the baſon before-mentioned. From this baſon, they are drawn out by a wheel and buckets into four large ſtone baſons or reſervoirs, one of which holds fifteen thouſand hogſheads, and the other three together twenty-five thouſand hogſheads. From theſe reſervoirs they are to be drawn off, as occaſion requires, into ſmall ciſterns placed near the boiling houſes; and the waters contained in the ſeveral baſons, as they are drawn from the ſprings, at different times, and are of different ſtrength, are mixed together before the boiling, in ſuch proportion, that each pound of the water yields about three ounces of *ſalt*.

The water of the freſh ſprings is alſo collected in the caves into a freſh water baſon prepared to receive it, and is raiſed by means of a crane to the level of a little brook, through which it runs away by a ſubterranean conduit. *Brownrig* of Salt, p. 94.

SALINE *principle*, a term uſed by the chemical writers, to expreſs a conſtituent part of ſeveral mixt bodies, on which their exiſtence in that form depends; and which, though always exiſtent in them, and always ſeparable by art, is yet not perceivable in many of them in the complex.

The *ſaline principle* of vitriol is of the number of thoſe made by ſome a neceſſary principle of the exiſtence of that body, and by others ſuppoſed not to exiſt at all, otherwiſe than in the general form of that compound *ſalt*. But the exiſtence of it, in a ſeparate ſtate, is proved by this experiment: take four or five gallons of the ſtrong vitriolate water at the water works, as it runs from the beds of pyrites to the great ciſtern; this is to be choſen, becauſe having yet undergone no operation but that of the air and water, it muſt needs be in the moſt ſimple and natural ſtate; diſtil from this about two thirds of the inſipid water, let the glaſſes cool, and the water will then let fall a vitriol of a lovely pale green colour, together with a large quantity of ochre or yellow earth. Evaporate away a third part of the remaining liquor, and more vitriol ſtill will be produced of a paler colour than the former, and ſome yellow earth will alſo be thrown down, though leſs in quantity than before; after this has been repeated five times, inſtead of vitriol, a yellow *ſalt* will be obtained; and after that, on more evaporations, a white *ſalt* will be every time obtained, which will be extremely different from vitriol both in colour and taſte, being fiery and pungent, and partaking ſcarce at all of that acrid and nauſeous aſtringent taſte, which is ſo peculiar to vitriol. It is unctuous like *ſalt* of tartar, and cleanſing like ſoap, rendering the hands waſhed with it ſoft and ſupple; whereas the common vitriol makes them very harſh and rough; finally, this laſt *ſalt* diſſolved in water appears fatty and mucilaginous.

From five pounds and a half of the laſt lixivium four pounds of this ſalt will be obtained, and half a pound of the liquamen will never congeal. It is remarkable, that this *ſaline* matter is the moſt ſoluble of all the ſorts, as the greateſt quantity of it may be kept fluid in the ſmalleſt quantity of water we know of in any experiment of this nature.

The liquamen remains thin, and is of an acrid and fiery taſte, ſcarce ſupportable on the tongue. See the article LIQUAMEN *pyriticum*.

The white ſalt, which is called the *ſaline principle* of vitriol, being put into a retort, and diſtilled in a ſand furnace; the far greater part of it comes over in form of a highly acid ſpirit, eſpecially that coming laſt in ſmall drops. This liquor being rectified in a tall glaſs body, a volatile ſulphureous liquor ariſes immediately on the application of the heat. The ſmell of this is ſo ſubtile, and penetrating, that it is almoſt inſupportable, and yet it is clear as water and inſipid to the taſte. This may be preſerved in its full perfection many years, only by keeping it cloſe ſtopped, not letting fall any ſediment. The remaining liquor is the common acid liquor of vitriol, and by diſtillation may be ſeparated into ſpirit of vitriol, and that heavy and corroſive liquor, commonly called oil of vitriol.

In alum, vitriol, and mineral ſulphur, the *ſaline principle*, which in each of them is by far the chief part, both in quantity and energy, has much the ſame nature and properties. In the laſt indeed it is clogged with ſulphur; for the true nature of common ſulphur is, that it is a vitriolic ſalt, the very ſame with that of common vitriol; and the ſulphureous parts, which give it that form and exiſtence which we expreſs by the word ſulphur, are leſs copious than could be imagined, compared with the *ſaline*, which are genuine vitriol, differing in nothing from the common vitriol, but that it contains a ſmaller admixture of terreſtrial and metalline parts. Phil. Tranſ. N° 103.

SALINE *earths*. The chemiſts under this, as a general head, reckon all thoſe *ſaline* and *earthy* ſubſtances, which are calcined or burnt in the fire; as all the kinds of lime, potaſhes, ſoot, and the like; theſe being ſo many mixtures of ſalt and *earth*; and all ſalts appearing to them, indeed, on a rigorous examination, to be only *earths* of different natures, which when reduced to a certain degree of ſubtility or fineneſs of parts, ſo as permanently to diſſolve in water, are then emphatically denominated ſalts. *Shaw*'s Lectures, p. 67.

SALIVAL (*Cycl.*)—SALIVAL *ducts*. Dr. Trew endeavours to ſhew, that the veſſels called *ſalival ducts*, by Coſchwitzius, are not truly *ſalival ducts*, but veins. Phil. Tranſ. N° 457. Sect. 7. p. 441.

SALIVARIS, in botany, a name given by ſome authors to the pellitory of Spain, or pyrethrum of the ſhops, from its quality of draining a large quantity of the ſaliva into the mouth by its great heat and acrimony. *Ger.* Emac. Ind. 2.

SALIX, the *willow*, in botany, the name of a genus of trees, the characters of which are theſe. The flower is of the amentaceous kind, being compoſed of a great number of ſtamina arranged in form of a ſpike. Theſe are the male flowers, and are barren; the embryo fruits appear on other trees of the ſame ſpecies, which produce no male flowers. Theſe are diſpoſed like the ſtamina into the form of a ſpike, and finally become conic capſules, which when ripe open into two parts, and diſcharge a ſeed winged with down.

The ſpecies of *willow* enumerated by Mr. Tournefort are theſe. 1. The common white tree *willow*. 2. The common black *willow* with leaves not ſerrated. 3. The common red *willow*. 4. The yellow *willow* with crenated leaves. 5. The almond *willow* with auriculated leaves, green on both ſides. 6. The *willow* with almond like leaves auriculated on each ſide, which caſts its bark. 7. The *willow* with long and very narrow leaves white on both ſides. 8. The long narrow leaved *willow*. 9. The long hoary and pointed leaved *willow*. 10. The brittle or crack *willow*. 11. The dwarf *willow* with ſcaly heads. 12. The great bay leaved mountain *willow*. 13. The round ſilvery leaved *willow*. 14. The dwarf broad leaved erect *willow*. 15. The broad leaved creeping *willow*. 16. The round leaved creeping dwarf alpine *willow* with leaves greyiſh underneath. 17. The round leaved dwarf *willow*. 18. The creeping round or alder leaved alpine *willow*. 19. The mountain creeping *willow* with leaves woolly on each ſide. 20. The dwarf *willow* with leaves ſmooth on both ſides. 21. The dwarf hoary flax leaved *willow*. 22. The dwarf *willow* with ſhort narrow and woolly leaves. 23. The Pyrenean mountain *willow*. 24. The ſmooth narrow leaved creeping *willow*. 25. The Alpine *willow* with ſhining leaves like ſerpyllum. 26. The ſallow or *willow* with broad roundiſh leaves. 27. The ſallow with pointed roundiſh leaves. 28. The broad leaved white *willow*. 29. The Portugal *willow* with auriculated ſage like leaves. *Tourn.* Inſt. p. 591. See Tab. 1. of Botany, Claſs 19.

SALIX *amerina*, in botany, is uſed for *agnus caſtus*. *Lemeri* Tr. des drog. p. 18. See AGNUS *caſtus*.

SALLIUS *lapis*, a name by which Ludovicus Dulcis, and ſome other writers of his time, have miſcalled the *lapis ſamius* of the antients. That author deſcribes it as being heavy, white, and brittle, and gives it the ſame virtues with the *lapis ſamius* of Pliny.

SALLY (*Cycl.*)—SALLY-*port*, in a fire ſhip, is a great opening in her ſide, made on purpoſe for the men to eſcape by, when they have grappled an enemy, and fired their train.

SALMO, the *ſalmon*, a well known fiſh. It is diſtinguiſhed from other fiſh of the truttaceous kind by theſe characters. It is of an oblong body covered with very ſmall ſcales, a ſmall head, a ſharp noſe, and a forked tail. Its back is bluiſh; the reſt of its body whitiſh, or reddiſh, and uſually ſpotted. Its under jaw is bent upwards, and that ſometimes ſo much as to make itſelf a ſinus in the upper, by conſtant motion, and ſometimes to perforate it. The *ſalmon* is firſt produced from its parent's ſpawn in freſh rivers, thence it goes into the ſea to acquire its growth and feed. And at the time of its full growth, and in the ſeaſon for ſpawning it removes into the freſh waters again.

The *ſalmon* in the different ſtages of its life and growth has different names. The Latins called it when young *ſalar*, when of a middle growth *ſario* or *fario*, and only when full grown *ſalmo*. In England the fiſhermen have names for it in every year of its growth. In the firſt it is called a *ſmelt*, in the ſecond a *ſprod*, in the third a *mort*, in the fourth a *fork-tail*, and in the fifth a *half fiſh*; finally, in the ſixth it is called a *ſalmon*. This is the common agreement of our fiſhermen, though there are ſome who ſay the *ſalmon* comes much ſooner to its full growth. *Willughby*'s Hiſt. Piſc. p. 139.

In the Artedian ſyſtem of ichthyology, the characters of this genus of fiſhes are theſe: the branchioſtege membrane on each ſide contains eleven, twelve, or nineteen bones. The body of the fiſh is generally variegated with ſpots. The back fins are placed nearer the head than thoſe of the belly, and the teeth are large, and are placed in the jaws, and palate, and on the tongue.

The ſpecies of this genus enumerated by Artedi are theſe. 1. The *ſalmon* with the ſnout often reaching beyond the lower jaw. This is the common *ſalmon*. The ſpots are black, and the back convex, the belly flat and plain. 2. The *ſalmon* with grey ſpots, and with the end of the tail equal. This is that ſort of *ſalmon* which we call the grey; its body is broader and thicker than the common *ſalmon* in proportion to its length. 3. The broad *ſalmon* with black and red ſpots, and with an even tail. This is the kind we call the *ſcurff*, or the *bull trout*. 4. The forked tailed *ſalmon* with only black ſpots, and with a longitudinal furrow on the belly. This is the *trutta lacuſtris* of authors. Its fleſh is red. Its weight about twenty pound, when full grown; it will ſometimes weigh much more. The upper jaw in the ſpawning time is crooked, the head and back are of a bluiſh green colour. 5. The *ſalmon* with the lower jaws ſomewhat longer than the upper, and with red ſpots. This is the common river trout. The tail of this fiſh is ſcarce at all divided; the pinna ani has ten rays; the ſpots below the lineæ laterales are red, thoſe on the head and back are blackiſh. 6. The oblong *ſalmon* with two rows of teeth in the palate, and with only black ſpots. This is that ſort of trout, called by the Germans *huch*; the ſides and the fins are red, and the body is ſlenderer than in the common river trout. There are ſome ſpots on the lower jaw, but none on any other part of the head. 7. The twelve inch *ſalmon* with five rows of teeth in the palate. This is the fiſh called by authors the *carpio lacus benaci*, and by us the *gilt charre*. The body is much broader than that of the common trout. The fleſh when boiled becomes red. It has eight ſpots on each ſide in the lower jaw, and black ſpots in the back. The ſides and belly are ſilver coloured, and the ſnout is bluiſh. 8. The twelve inch *ſalmon* with red belly fins, and the lower jaw ſomewhat the longer. This is the *ſalmo lapponicus* of Linnæus. The *torgoch* of the Welch, and probably the *red charre* of ſome parts of England. The body is more ſlender than that of the river trout. The belly is generally reddiſh. The fleſh of this ſpecies ſcarce becomes at all red in boiling; the ſpots are broad, but of a faint and obſcure colour. 9. The forked tail *ſalmon* with the lineæ laterales turning upwards, this is the umbla of authors; it has three or four foramina under the eyes, and has no middle line of teeth in the palate. The belly and the ſides below the lineæ laterales are yellow. The head is bluiſh, and there are ſome whitiſh ſpots above the lateral lines. 10. The twelve inch *ſalmon* with the upper jaw longer than the under. This is the fiſh called the *pavelin* by the Germans, and the *umbla altera* of authors: it has yellow ſpots on the ſides, and the belly and its fins are alſo yellowiſh. The lateral line is ſtrait. The middle row of teeth in the palate is ſcarce perceivable; but there is a double row of them in the upper jaw, with a ſkin reſembling a lip between them. The fleſh boils red. *Artedi*'s Gen. Piſc. p. 9.

The *ſalmon* is a very peculiar kind of fiſh. It is bred in rivers, but goes every year from thence into the ſea; and at a certain ſeaſon of the ſame year it always returns up into the freſh water again; and what is remarkable, is, that ſo far as obſervation has been able to trace them at any time, the ſame ſhoals of *ſalmon* always return into the ſame river out of which they ſwam, not into any other; ſo that the people who live on the *ſalmon* fiſhery are not afraid for their rivers being cleared, by all the fiſh in them going down into the ſea, for they know that they will all return up to them again at a proper time. When the *ſalmon* has once entered a freſh river, he always ſwims up againſt the ſtream, and often will go an hundred leagues up a river in the large and long rivers; and the people at this vaſt diſtance from the mouth have the pleaſure of taking a fiſh, that is properly in part of the ſea kind. It is alſo remarkable, that the rivers which moſt abound with *ſalmon* do not make the ſeas about their mouths any more abound with them than others, particularly the harbour of Breſt affords no *ſalmon*; though the river Chateaulin, which diſcharges itſelf into it, is the richeſt *ſalmon* river in France.

Another ſingularity, in regard to the *ſalmon*, is their ſwimming up the rivers together in ſuch vaſt numbers. It is to be allowed, indeed, that herrings, mackrel, and many other fiſh, do in the ſame manner appear on the coaſts at certain ſeaſons in prodigious numbers; but the reaſons for their coming together in theſe quantities, are much more eaſily explained than that of the *ſalmons* doing ſo. The herrings, when they come in ſuch prodigious ſhoals to the coaſts of Normandy, have been found to be allured thither in theſe numbers by a prodigious quantity of a particular ſort of ſea worms which are their favourite food, and which are found to cover the whole ſurface of the ſea at that time. Rondeletius has deſcribed theſe inſects under the names of ſea caterpillars; they always appear in the months of June, July, and Auguſt, which are the herring ſeaſons at that part of the world; and probably the ſame cauſe will be found to bring them to other places, if ſufficiently enquired into, as theſe and ſome other fiſh come to certain places in ſhoals to get food. The *ſalmons* do it in order to propagate their ſpecies. The ſpawn of the *ſalmon* is never depoſited but in rivers, and at the time that theſe fiſh are found up the rivers, it is only with this intent; the females go firſt, and the males follow as far as the others pleaſe to lead them, which is uſually to ſome convenient place in ſhallow water, where the ſpawn when depoſited is not buried under too great a quantity of water, but has the advantage of a continual warmth from the ſun's heat.

Salmon do not equally frequent all rivers, though they may ſeem to us equally proper for their reception. There are

two

two rivers which open themſelves into the harbour of Breſt very near one another; the one of theſe is famous for the quantity of *ſalmon* in it, and the great advantage of the fiſhery, the other never has any of theſe fiſh in it. It moſt probably is owing to their finding plenty of food, and proper places for the depoſiting their ſpawn in the one of theſe rivers, and not in the other, that makes this regular choice. *Des Landes* Trait. Phyſ.

SALMON *pipe*, in our old writers, an engine to catch *ſalmon*, or ſuch like fiſh. 25 H. 8. c. 7. *Blount*, *Cowel*.

SALMON *trout*, in zoology, the Engliſh name of the fiſh called *trutta lacuſtris*, by Geſner and other authors. It is caught in lakes, in mountainous countries, and grows to a very conſiderable ſize, ſometimes to thirty, forty, or fifty pounds weight. It reſembles the *trout* in figure, but its belly is very flat, and has, as it were, a long furrow or cavity running the length of the belly. Its back and head are of a very beautiful bluiſh green colour; and the whole fiſh, eſpecially its back and the upper parts of its ſides, are marked with numerous black ſpots. Its back fin is alſo ſpotted with black, and its ſcales are ſmall and ſilver coloured. *Geſner* de Piſc. p. 1210.

SALMULUS, in zoology, the name of a ſmall fiſh of the truttaceous kind, called in Engliſh a *ſamlet*.

It ſeldom grows to more than ſeven inches in length. It is very like the common trout, but differs in theſe particulars. 1. It is broader in proportion to its length. 2. It has fewer ſpots, and thoſe of a deader colour. 3. It is white in its general colour. 4. The tail is more forked. 5. The lines on the ſides are ſmaller and paler. 6. The ſides under the lines are yellowiſh; and 7thly, It has ſeveral bluiſh ſtreaks near the ſide lines. It is caught about Hereford, and in ſome other places. *Willughby*'s Hiſt. Piſc. p. 189.

SALPA, in zoology, the name of a fiſh caught in great plenty in the Mediterranean, and common in the markets of Italy and elſewhere. Its uſual ſize is about a foot in length, and it has a ſomewhat flatted, yet conſiderably thick body, and a ſtrait back. Its ſides are variegated with a number of fine gold coloured lines running longitudinally; the intermediate ſpaces between theſe toward the back are of a bluiſh green, toward the belly they are white; there are uſually eleven of theſe lines on each ſide. The mouth is extremely ſmall, and each jaw has only one row of teeth, which are thick and broad below, and terminate in a double point. It has only one back fin, the anterior rays of which are prickly, the hinder ones ſoft. It generally keeps about the ſhores, and ſwims in large ſhoals. Though it be a very beautiful fiſh it is no very delicate taſted one, nor much regarded, the poorer ſort of people uſually buying it up. *Rondelet* de Piſc. l. 5. c. 23. p. 154. *Aldrovand* de Piſc. l. 2. c. 21. See Tab. of Fiſhes, N° 55.

SALPUGA, in natural hiſtory, a name given by ſome of the Latin writers to the *ſolipuga*, a ſmall kind of ſpider, that buries itſelf in the ſands in hot countries, and bites men who come in its way in a very venomous manner. It is common in Africa, and in ſome parts of Europe; Sardinia in particular, according to Solinus, abounds with it. See the article SOLIPUGA.

SALSIRORA, in botany, a name uſed by ſome authors for the *ros ſolis*, or ſundew. *Ger.* Emac. Ind. 2.

SALT (*Cycl.*)—*Salts* are defined to be ſolid foſſile bodies, friable, pellucid, not inflammable, but fuſible by fire, and congealing again in the cold; ſoluble in water, ſo as to diſappear in it, naturally concreting into regularly figured cryſtals, and impreſſing a ſenſation of acrimony on the tongue.

Theſe are the characters and qualities common to all *ſalts*, and to no other bodies: and theſe they always manifeſt when pure and freed from heterogeneous ſubſtances; but in the ſtate in which they are naturally found in the earth, though they have that in their taſte alone which may ſufficiently diſtinguiſh them, yet they do not exhibit all their genuine characters: ſome of them being found ſolid and pure, either within the earth or on its ſurface, but commonly without their proper form; others embodied in earths and ſtones, as the particles of metals in their ores; and others in a fluid ſtate ſuſpended in waters.

Of the foſſils of this claſs, nature therefore affords us three diſtinct orders, and under thoſe they are diſtinguiſhable into five genera. The *ſalts* of the firſt order are thoſe found native and pure, either in the earth or without its ſurface, and exhibiting all other natural characters, though often without their proper form. Of the ſecond, are thoſe found not native, but in form of ores, never pure, but diſtinguiſhable by their taſte, and immerſed in and blended with the conſtituent matter of earths and ſtones in extremely ſmall particles. And of the third are thoſe naturally found ſuſpended in waters, and in a fluid form, but ready to aſſume their proper figures on the evaporation of a part of that water.

Of the firſt of theſe orders are the common *alimentary ſalt* or *muria*, and the *natrum* or *nitre* of the antients. Of the ſecond are *alum* and *nitrum*, and of the third are *borax*, and *halcryptium*, an alkaline *ſalt* hid in the chalybeate waters. *Hill*'s Hiſt. of Foſſ. p. 380. See the articles NATRUM, ALUM, NITRUM, BORAX, and HALCRYPTIUM.

The *muria* or *alimentary ſalt* is a body which appears to us under an almoſt infinite variety of forms, but is always immediately diſtinguiſhed by applying it to the tongue, and always aſſumes the ſame figures after a regular cryſtallization. Sea water, and that of *ſalt* ſprings, ſuſtain it in a liquid form; and beſide this ſtate, it is found in vaſt maſſes in the earth, either of a fine pellucid ſtructure, called *ſal gem*, or elſe variouſly debaſed and coloured, or in form of a ſtriated body, reſembling the fibrariæ, or fibroſe talcs, as they are called. This is the true *ſal ammoniac* of the antients. See SAL *ammoniac*. But in which ever of theſe forms this *ſalt* is found, it affords the ſame cryſtals on evaporation: theſe, according to the degree of heat uſed in the evaporation, are either pyramidal, cubic, or parallellopiped. All theſe *ſalts* are ſoluble in water, but they require different quantities of it to diſſolve them, and this makes one of their criterions. This *ſalt* requires three times and one ſeventh its own quantity of water, to make a perfect ſolution. The ſea water, in different parts of the world, is very differently ſated with it, ſome parts containing twice as much as others. *Hill*'s Hiſt. of Foſſ. p. 380.

Alimentary ſalt, according to the various ways of preparing it, may be diſtinguiſhed into ſeveral kinds. 1. *Bay ſalt*, prepared by evaporation by the heat of the ſun. 2. *Marine ſalt* boiled, which is extracted from ſea water by coction. 3. *Brine ſalt*, or fountain *ſalt*, prepared by boiling from natural brine, whether of ponds and fountains, or of lakes and rivers. 4. *White ſalt*, prepared from ſea water, or any other kind of *ſalt* water, firſt heightened into a ſtrong brine by the heat of the ſun, and operation of the air. 5. *White ſalt*, prepared from a ſtrong brine, or lixivium, drawn from earths, ſtones, or ſands, ſtrongly impregnated with common *ſalt*. 6. Refined *rock ſalt*, which is boiled from a ſolution of foſſile *ſalt* in *ſalt* water, or in freſh. And 7. *ſalt upon ſalt*, which is made from bay *ſalt* diſſolved in ſea water, or other water, and boiled to a white *ſalt*. *Brownrig*, on Salt, p. 50.

Bay SALT. This *ſalt* is of two kinds: the firſt drawn from ſea water, as is practiſed in France, Spain, and Portugal, and many other hot countries; the other from the water of *ſalt* ſprings, or lakes, as in the Cape Verd iſlands, in the iſland of Tortuga, Turks iſland, and many other parts of America.

The firſt kind is, in times of peace, imported into Great-Britain in very large quantities, and our colonies and fiſheries in America commonly ſupply themſelves with the latter.

There are ſeveral methods practiſed, in the different parts of the world, of making this uſeful *ſalt*; of which ſome are more ſimple and eaſy, others more complex. It is ſometimes prepared by a total exhalation of the water in which it was diſſolved; but the moſt ſimple and eaſy method of making it, is, when the water of ponds and lakes, impregnated with *ſalt*, is totally exhaled by the force of the ſun and air, and the *ſalt* is left concreted into a hard cruſt at the bottom of the lake. We have many inſtances of *ſalt* thus prepared, in the different parts of the world. In the Podolian deſerts, near the Boryſthenes, is a *ſalt* lake, whoſe water, by the heat of the ſun, is exhaled, and all its *ſalt* left in form of ice, in ſo hard cakes, that it is to be cut away in large pieces with tools; and in Ruſſia, on the borders of Crim Tartary, there are vaſt deſert plains, which in ſummer produce neither tree nor plant, but are covered with *ſalt*. In the Weſt-Indies we are told of a *ſalina* of this kind, called *garci mendoza*, forty leagues long, and ſixteen broad. And in the kingdom of Algiers there are many *ſalines*, which in winter are ſo many *ſalt* water lakes, and dry plains in ſummer, covered with a cruſt of *ſalt*, which is dug out, and ſold in very large quantities; and there are more of them in ſeveral parts of the world.

Large quantities of *ſalt* of this kind, however, are prepared by the art and labour of man. The Engliſh in the Cape Verd iſlands have long been uſed to prepare great quantities of it. The iſlands, which principally afford this *ſalt*, are chiefly Mayo, Bonaviſta, and Sall. The ſubjects of Great-Britain have long enjoyed a liberty of preparing *ſalt* in the two firſt of theſe, free of all taxes, except a late one impoſed on the captains for every aſs which they hire of the inhabitants, to carry the *ſalt* to their boats. *Brownrig* of Salt, p. 1 to 19.

The time of making this *ſalt* is in the dry ſeaſon, which in thoſe iſlands is uſually from November to July: thoſe ſhips, therefore, which are to load with *ſalt*, are to be there in the months of December or January. On the weſt ſide of Mayo, or May iſland, they find themſelves, as ſoon as on ſhoar, upon a bank of dry looſe ſand, fifty or ſixty yards broad; and when they have paſſed this, they enter upon the *ſalina*, or *ſalt* marſh. This is a plain of half a mile broad, and a mile long, the greater part of which is hollowed out into pits, which, at a proper ſeaſon of the year, are filled to the depth of eight inches with ſtrong brine, or pickle. See SALT-*marſh*, infra.

Some authors, who have given accounts of theſe works, ſay, that this brine is only ſea water, let in through holes in the bank at ſpring tides. But this is an error, the brine of theſe pits being much more ſtrongly impregnated with *ſalt*,

ſalt, than the ſea water, and being the real produce of *ſalt* ſprings, with which the whole iſland abounds at a certain depth. In moderate ſeaſons, the ſailors find theſe pits ready filled with brines, but in times of great drought, they are obliged to dig little wells to come at the water, and with this they fill the pits to the proper depth. The bottom of theſe pits is a kind of cloſe earth, which retains the water, and the ſailors, who firſt arrive at the place, clean out as many of theſe as they have occaſion for, and others, who follow them, do the like. After the pits are properly filled, the heat of the ſun exhales the water very freſh, and leaves all the *ſalt*, which forming itſelf into cryſtals, ſinks to the bottom from time to time. As this is done very quick in this ſeaſon, they twice a week draw out all the *ſalt* that is ready formed with rakes, and lay it in little heaps to drain; after this they add it to their general cargo in one large heap, where it ſoon dries entirely, and becomes fit to be put on board their ſhips.

If the weather be favourable, a large ſhip may be, in this manner, loaded with *ſalt* in a fortnight, and it is often done much ſooner, the ſailors finding the pits, at their arrival, ready filled with concreted *ſalt*.

Though a ſhip be thus very eaſily loaded with *ſalt* in good ſeaſons, yet bad weather, and delays upon the voyage, often are the occaſion of ſhips returning without their loading; for the wet deſtroys all the *ſalt* they had prepared, and the tornados toſs up the ſand, and mix it with the *ſalt*, and at the ſame time make it impoſſible to load it. This trade might therefore be carried on with much greater advantage, if there was a Britiſh factory eſtabliſhed at the place, whoſe buſineſs it ſhould be to make *ſalt* in the dry ſeaſon, and ſell it afterwards to the ſailors, and this might be done at a cheaper rate, than what the ſeamen can make it for, it uſually ſtanding them in about ſixpence a buſhel.

The *ſalt* is made at Bonaviſta in the ſame manner as in the iſland of May; but the brine is weaker, and the *ſalt* does not kern, as the ſailors call it; that is, it does not granulate, or cryſtallize, ſo ſoon as in the other place; but the ſhips are often forced to be contented with this, when either the iſle of May is too crouded, or when the rainy ſeaſon ſets in there, while they are at work; for though theſe iſlands are but eighteen leagues diſtant from one another, the rains are ſometimes ſeveral weeks later in one than in the other. The weather is not exceſſively hot in either of theſe iſlands, the ſailors finding it tempered continually by breezes from the ſea. *Brownrig* of Salt, p. 26.

The Britiſh colonies in America have alſo, for near a century paſt, been uſed to ſupply themſelves with *ſalt* of this kind from Tortuga, one of the Leeward iſlands, uninhabited, and ſituated near the coaſt of Caraccas, on the Spaniſh main, and the Turk's iſland, which lies not far from Hiſpaniola; and many veſſels, freighted from North-America to Barbadoes, and others of the Caribbee iſlands, were accuſtomed to go from thence to theſe *ſalt* iſlands, and carry back a loading of *ſalt*, for which they always found a market in Newfoundland, New-England, and other places in North-America. The Spaniards, who had been uſed to ſuffer this without moleſtation, at length ſeized ſuch ſhips as they found loaded with this *ſalt*, and the traders in this way were compelled to go in a ſort of fleet from Barbadoes, and the neighbouring places, and they kept together till out of danger. The method of making the *bay ſalt* in theſe places, is much the ſame with that already deſcribed; only in the American iſles they do not collect it out of ſmall pits, but out of large ponds and lakes; and the ſailors often find vaſt quantities of clean and good *ſalt* ready prepared, lying at the bottom of theſe lakes.

It has been reported, as a very extraordinary thing, that in theſe American iſlands the *ſalt* never kerns, or forms into grains, except during the hot ſeaſon of the year; but this is a ſtory much improved in the telling, and the whole truth ſeems to be this. During the conſtant rains, the ponds overflow, and great quantities of *ſalt* are waſhed away; and when theſe are over, the ponds and lakes remain full of a very weak brine, ſo that no *ſalt* can cryſtallize in them till moſt of the water is exhaled, and this does not happen, till toward the time of the rainy ſeaſon's ſetting in again; but as this ſeaſon begins only in ſhowers once in two or three days, and thoſe not great, the *ſalt* is eaſily prepared from the brine of the pits, which is then very rich, notwithſtanding this ſlight interruption. Theſe firſt ſhowers of the rainy ſeaſon are always a ſort of tornados, and waſh off a great quantity of *ſalt* from the ſurface of the earth into the ponds; and, in general, while they are ſo moderate, that there falls no more water in them, than is daily evaporated by the ſun, they are an advantage in keeping the ponds ſupplied, which otherwiſe, after the continuance of heat that has been at that time, would be dry, and in no condition for working.

Bay ſalts, prepared in France and other parts of Europe, are of the ſame kind, in the general meaning of the proceſſes, with thoſe of the African and American iſlands. As the *ſalt* is there prepared from the water of *ſalt* ſprings, it is in Europe made from ſea water. *Bay ſalt* is not extracted from ſea water, in the colder parts of Europe, as on the coaſts of Germany, Denmark, and Sweden, but in places ſituated in a more ſouthern climate, as on the coaſts of France, Spain, and Italy. Some marine *bay ſalt* has alſo, of late years, been made in England at Limington, and in ſome other parts of Hampſhire, and in the Iſle of Wight: but in theſe places it is only made in drier ſummers, and then rather by accident than deſign, it being collected from ponds, which were originally made for heightening of ſea water, or reducing it into a ſtrong brine by the heat of the ſun, in order to leſſen the expence of fuel, in boiling it into white *ſalts*. *Brownrig* of Salt, p. 35.

The ponds, in which this *ſalt* is made, nearly reſemble a rude kind of *ſalt* marſh, deſcribed by Agricola, in which the ſea water is received into a pool, and thence, by a trench, is conveyed into ſeveral pits dug in the earth; and when it has ſtood ſome time in theſe pits, it is ſuffered to run out into others, and ſo on, till the brine is ſtrong enough to cryſtallize.

This is the caſe in our Engliſh *ſalt* works; but the French marſhes, in which a vaſt quantity of *bay ſalt* is annually prepared, are made in a much more artful manner. A full account of which is given in the Philoſophical Tranſactions, N° 51. See SALT-*marſh*, infra.

When rainy weather happens, in the time that the French are making this *ſalt*, they keep it out of the pits as much as poſſible; but unleſs it rain much, the damage is not very great, the heat of the ſun ſufficiently exhaling it. If it rain very violently for a whole day, all the care in the world cannot ſo well keep it out, as to render it practicable to make *ſalt* for the three or four next days. But when it has rained ſucceſſively for five or ſix days, they are forced to empty all the water out of the beds, and take in freſh, before any *ſalt* can be made. This is an accident, however, that rarely happens to them. The hotteſt years always afford the moſt *ſalt*. In the very hot weather, there is *ſalt* made even in the night; and it is always obſerved, that there is more *ſalt* made in ſtormy weather than in calm. The weſt, and north-weſt winds, are always found to be moſt uſeful to the *ſalt* makers; and in good ſeaſons, the French *ſalt* workers draw out the *ſalt* from their pits every other day, and draw more than an hundred weight from every pit. This they do with inſtruments that will retain the *ſalt*, and are pierced full of ſmall holes, which let the water run off.

Thoſe pits which are made in a reddiſh earth, are always found to make the *ſalt* more grey; and thoſe in a bluiſh earth, more white; and it is always obſerved, that if more than the proper quantity of water be let in, the *ſalt* is the whiter, but there is the leſs of it in proportion. All the marſhes ſhould have a clayey viſcid earth, neither ſpungy nor ſandy. There is a great deal of caution to be uſed in drawing out the *ſalt*, that the earth, or other impurities of the pit, do not mix with it; for two workmen, who are differently ſkilled in their buſineſs, will procure from the ſame pit a very brown and foul, and a very clean and white *ſalt*; and they always ſeparate a pure and white *ſalt*, which riſes to the top of the water, before the other granulates, and falls to the bottom. This pure *ſalt* is not only of a better colour than the other, but is in ſmaller grains, and this is what the politer people uſe at their tables. Theſe marſhes are overflowed once a year, at the end of the ſeaſon, about a foot high, and this preſerves them from year to year. *Brownrig* of Salt, p. 44.

The French have ſo many works of this kind, that in favorable ſeaſons as much *bay ſalt* is made in a fortnight, as ſerves for the whole year, not only for the home conſumption, but for that of other nations, who purchaſe it of them, and who uſe much more of it than the French themſelves. But, on the contrary, when a rainy ſeaſon comes, there is often a ſcarcity for a whole year afterwards. It is wonderful, that though the method in which the French work has been long known among us, we have never attempted it ourſelves, either here, or in our American colonies, which would ſeem a very eaſy matter, the principal care being in the firſt erecting the works, or *ſalt* marſhes. See SALT *marſh*, infra.

The ſeveral kinds of *bay ſalt*, made in the different parts of the world, are found to differ greatly from one another in ſeveral particulars; as 1. in the ſize of the cryſtals, which is owing to the heat of the ſun, and the time it lies in the pits. The French cream of *ſalt*, and the blown *ſalt* of the iſle of May, are fine and ſmall grained. The Portugal *ſalt* is larger grained than that of France; and that of Tortuga is larger than either. 2. In purity. As all *bay ſalt* has ſome mud, ſlime, or the like, in the making, and ſome kinds are mixed with the bittern *ſalt*, or what is called Epſom *ſalt*, they are all more white while dry, and more pellucid when moiſt, and they differ in colour, according to the earth which makes the bottoms of the pits. Thus ſome of the French *bay ſalt* is grey, ſome reddiſh, and ſome white, according as a blue clay has lined the pits, or a red, or white one. 4. Some kinds of *bay ſalt* are more apt to contract a moiſture from the air than others: this is ſometimes owing

to the ſmallneſs of the grain, and ſometimes to a mixture of a calcarious, or alkaline *ſalt* with it. And 5. ſome kinds have an agreeable ſmell in large heaps; ſuch are the Portugal, and the Hampſhire *bay ſalts*; and this ſeems owing to the ſea water, they were made from, having a bituminous matter in it. 6. It differs greatly in taſte, according to the various foreign mixtures it contains; and it will often alter in taſte, and other qualities, by long keeping. Thus the *ſalt* of Peccais is ſo bitter, when new made, as not to be eatable, but after keeping a while, it becomes very pleaſant. This is owing to its containing at firſt a large portion of the bittern *ſalt*, or Epſom *ſalt*, which liquifies in keeping, and running off in form of a fluid, leaves the reſt of a good taſte. In general, *bay ſalt* is much fitter for uſe, after it has been kept ſome time in a dry place, than when it is firſt made.

From the accounts already given of the *bay ſalt* of other countries, and the manner of preparing it, it ſeems evident, that our being obliged to purchaſe it of other nations is the effect of our want of application to the making it ourſelves; ſince it is evident that it may be very well made, both in England, and in many of our American colonies. *Brownrig* of Salt, p. 202.

In England, a very advantageous ſort of works might be ſet on foot in the following manner. A number of *ſalt* pits ſhould be made in a row in the marſh, and their bottoms lined with plaiſter, or ſome ſtrong cement that will not eaſily break up; and by this caution, the *ſalt* may be drawn white and pure like the Portugal kind, not grey like the French. Over each pit covers ſhould be made of thin boards, or rather of canvas painted white, and ſtretched on frames of wood, and theſe ſhould be fixed to ſtrong poſts, erected on the north ſide of the pits, and contrived to be eaſily drawn back to them, in the manner of draw-bridges. Theſe covers, thus fixed, may be let down over the pits, in manner of a ſhed or penthouſe, in rainy weather, to keep the brine from being diluted with freſh water; and in dry weather they may be raiſed almoſt to a perpendicular, but inclining a little toward the ſouth, ſo as to form a wall with a ſouth aſpect; and thus they would ſerve for a double uſe, being a covering to the pits in rainy weather, and reflectors of the ſun's heat in fair. The reflexion of ſo large a body of the ſun's rays, in the courſe of a bright day, would greatly promote the evaporation of the brine; and the hinges, on which the reflectors turn, being placed at ten inches from the ground, when the reflectors ſtand upright, there will be a ſpace under them, through which the air will continually flow in a briſk current, and this will greatly promote the evaporation of the water.

The paſſages of communication between the pits muſt be narrow and winding, and muſt be wholly ſtopped up in wet weather, that no freſh water run into the brine. This channel ſhould be covered alſo with boards, and at the entrance of the pits there muſt not be a pond, as is the cuſtom in France, but only a narrow covered trench, running parallel with the ſide of the pits which is oppoſite to the reflectors; and the pond, which forms the entrance of the pits in the French *ſalt* marſhes, muſt in theſe be detached from them, and inſtead of it, there muſt be formed a fourth brine pond, communicating with the third by a long and narrow channel.

If theſe contrivances ſhould be reduced to practice in England, the *ſalt* will probably cryſtallize much faſter there than in the French marſhes, and the brine may be kept as deep, and even deeper than in the French pits; and a ſhower of rain will only retard the work for the ſmall time in which it is falling: whereas, in the French works, it throws them back three or four days, as no *ſalt* can be formed till all the water it brought be evaporated.

Four ciſterns may be dug adjoining to the brine pits, to admit the brine in the *ſalt* ponds, when the weather is very rainy; and as to the *ſalt* water in the reſervoir, if it ſhould be found neceſſary to preſerve it from rain in ciſterns, when ſo much rain falls, as to make it freſher than ſea water, it may be let out, and ſea water admitted in its place. And in order to promote the evaporation, and to make the *ſalt* water in the reſervoir fitter to ſupply the firſt brine pond with brine of a due ſtrength, it may be proper, by means of a ſmall fire engine, continually to force up the *ſalt* water in the reſervoir, as often as occaſion requires, and by means of a diverger, fitted to the engine, to make it deſcend again into the reſervoir like a ſhower of rain; by which means, the evaporation of the watery vapours will be greatly promoted, after much the ſame manner as is practiſed at ſeveral of the *ſalt* works in Germany, where the brine is very weak. *Brownrig* of Salt, p. 209.

Thus by augmenting the force of the ſun's heat, and of the air, by promoting the evaporation of the watery vapours, and preventing the brine from being diluted with rain, it is very probable that, during the ſummer ſeaſon, double the quantity of *ſalt* might be prepared at an Engliſh work with theſe contrivances, that is now uſually prepared at a French *ſalt* marſh of equal magnitude.

Beſide theſe methods of managing ſea water, it is certain that very large quantities of *bay ſalt* might be prepared in England with great eaſe, from the natural brine of *ſalt* ſprings, and from the common foſſile, or rock *ſalt* of Cheſhire, diſſolved in weak brine, or in ſea water. Upon the whole, *bay ſalt* might thus be made here at a moderate price, and in ſufficient quantities to ſupply both the nation itſelf, and all our colonies.

Brine SALT, a name given to that ſort of common *ſalt* which is not made from ſea water, but from the water of *ſalt* wells and ſprings. Great quantities of this *ſalt* are made in moſt of the inland countries, as in Germany, Switzerland, Hungary, and in ſome parts of France and England.

In Somerſetſhire, Cumberland, Weſtmoreland, Durham, and Yorkſhire, there are many *ſalt* ſprings, but they are either too weakly impregnated, or ſituated where fuel is ſcarce, and for thoſe, and other reaſons, are not worked; but in other parts of England there are many rich and valuable *ſalt* ſprings, which are worked to great advantage: of theſe ſome are ſituated in Staffordſhire, a great many in Lancaſhire, but the chief are thoſe at Droitwich in Worceſterſhire, and Nortwich in Cheſhire; about which laſt place there are many rich mines of foſſile *ſalt*, above and beneath the beds of which the *ſalt* ſprings are uſually found. At Nantwich, in the laſt county, there are alſo ſome *ſalt* wells, which have been of very long ſtanding, being ſuppoſed by many to have been worked in the time of the Romans. The *brine* of theſe ſprings is found to differ very greatly in its ſtrength and qualities; ſome yielding greatly more *ſalt* than others, and the *ſalt* extracted from ſome of them being found improper for many uſes, for which that of others ſerves very well.

The *brine* of Barton and Nortwich is almoſt fully ſaturated with *ſalt*, a pound of it yielding ſix ounces of *ſalt*; that of Droitwich, Upwich, and Middlewich, contains about one fourth *ſalt*; ſome of the ſprings at Nantwich yield a ſixth part *ſalt*, and thoſe of Weſton, in Staffordſhire, afford only one ninth part. In England, we ſeldom boil weaker brine than the laſt; but in Germany, and ſome other places, where *ſalt* is ſcarce, they work ſprings, whoſe water is not higher impregnated than the common ſea water, containing about $\frac{4}{3}\frac{1}{6}$ *ſalt*. *Brownrig* on Salt, p. 98.

Beſide common *ſalt*, the brine of moſt ſprings is impregnated with ſeveral other ingredients, the nature and properties of which ought to be known to every perſon who works the ſprings, in order to his managing his affairs with judgement. The brine of almoſt all *ſalt* wells has ſomewhat of a ſulphureous principle mixed in it, as may be obſerved from its fetid ſmell, but this ſoon goes off in the boiling. Dr. Liſter obſerves, that the brine of the pits at Droitwich ſtinks like rotten eggs, and will make any thing ſtink in twelve hours that is *ſalted* with it, whether it be fleſh of young, or of grown animals; and yet the *ſalt*, prepared from this brine, is accounted the beſt of any inland *ſalt* in England, and ſeems indeed as good as any in the world. Nay, this very brine, after it has been boiled a little and clarified, proves an excellent pickle for beef, or any other meat, and for other domeſtic uſes. Philoſ. Tranſ. Abr. Vol. 2. p. 362.

In the *ſalt* mines at Bevieux, in the Pais de Vaux, there are always found large veins of virgin ſulphur, and the people who dig in them are often killed with damps and exploſions. *Scheuchzer* of the Salt Works at Bevieux.

The brine of many of the Engliſh ſprings turns black as ink on being mixed with galls, and has in it a ferrugineous ochre, which ſubſides from it when it is expoſed to the air in an open veſſel, and falls to the bottom of the *ſalt* pan, as ſoon as the liquor begins to boil.

Brine of our *ſalt* ſprings has alſo uſually mixed with it a very large proportion of what is called *ſcratch*. This is a ſparry ſubſtance, analogous to that which forms the cruſts in our teakettles, and the incruſtations of moſs, &c. in our petrifying ſprings. The Droitwich brine is very free from this, but the other brines of England, as well as thoſe of Germany, and other places, all abound with it. At the bottom of ſome of our *ſalt* wells there is alſo found a black mud, which, when ſtirred up, blackens and infects the whole ſpring, like ink; and beſide theſe ingredients, the brine of moſt ſprings is impregnated with ſeveral other *ſalts*, as well as the marine one. In all the German *ſalt* ſprings the liquor leaves a bitter ponderous fluid, reſembling our bittern, produced in the working of ſea *ſalt*, but ſeeming to partake more of the muriatic, or calcarious *ſalt*, than the bitter purging one of ſea water, as may be concluded from the numerous experiments made on it by Hoffman. This is alſo obſerved by Leigh, in his Natural Hiſtory of Lancaſhire and Cheſhire, who obſerves, that beſide the marine *ſalt*, the waters of the *ſalt* wells in thoſe counties always contain a quantity of a calcarious nitre; and both the obſervations of Hoffman on the German brine pits, and the experiments made on the waters of ſeveral of our own ſprings, ſeem to confirm, that the waters of this kind in general contain among them other *ſalts*, or mineral alkalies. *Hoffman*, Obſ. Med. Chym. Lib. 2. Obſ. 18. *Leigh's* Nat. Hiſt. Lancaſhire, p. 44.

The antient methods of boiling brine into *ſalt*, in Cheſhire and Worceſterſhire, are accurately deſcribed in the tranſactions of the Royal Society; and the method, formerly uſed in Staffordſhire, is delivered in Dr. Plot's hiſtory of that county; but the method, now generally uſed in England, is this.

The brine being received from the well into a large ciſtern, is thence received, as occaſion requires, into the *ſalt* pan. Theſe pans are of the ſame form with thoſe uſed in the boiling of ſea *ſalt*, and uſually hold about eight hundred gallons: in ſome places theſe are made of iron, and in others of lead. When the brine is put into the pan, a little blood is mixed with it, in order to clarify it, and leaden pans are placed at the corners, to receive the ſcratch, or calcarious earth, that ſeparates from them in the boiling. An ounce of blood is ſufficient for eight hundred gallons of brine. As ſoon as it is boiled, it is carefully ſkimmed, and afterwards it is ſuffered to boil very briſkly for ſome time, till the *ſalt* is granulated; after this the ſcratch is ſeparated, and the fire ſlackened, till the whole *ſalt* is formed.

When they have ſeparated the ſcratch, and the *ſalt* is ready to cryſtallize, they put into the pan ſeveral ſorts of ſeaſonings, as they call them, ſuch as ale, butter, and the like, which they ſuppoſe correct the bad qualities of the brine, and make the *ſalt* of a ſmaller grain. After this they boil it very gently, and when as much *ſalt* is formed, as will fill two or three of their wicker baſkets, they rake it up to the ſides of the pan, and fill it into the baſkets, placing them over the leach trough, that the brine may drain into it from the *ſalt*. The *ſalt* taken out, they call a draught of *ſalt*, and the operation, a clearing of the pan. *Brownrig* of Salt, p. 104.

In this manner they draw the *ſalt*, and clear the pan five or ſix times during each proceſs, leaving at laſt only a few quarts of brine at the bottom of the pan. The baſkets, into which they put the *ſalt* out of the pan, are called alſo *barrows:* they uſually contain about a buſhel of *ſalt*, and are of a conic figure, open at the baſe. The whole proceſs of working a pan of brine uſually laſts about twenty four hours. After the *ſalt* has drained an hour or two in the baſkets, it is removed into the hot-houſe over the furnace, where it remains four or five hours to be thoroughly dried, and is then taken out of the baſkets, and laid up for ſale. In all the Engliſh *ſalt* works, the leach brine, which is what remains in the pan after the *ſalt* is cryſtallized, and what drains from the *ſalt* in the baſkets, is not thrown away, as it is in Germany, but is added to the pan next to be boiled. And beſide the *ſalt* made in this manner, they have, at moſt of the Engliſh *ſalt* works, a different kind, which they call *ſhivery ſalt*. See the article SHIVERY *ſalt*.

They have alſo another kind of *ſalt*, made up in form of ſugar loaves in ſmall wicker baſkets, which is thence called *loaf ſalt*, or *baſket ſalt*. This is the whiteſt, drieſt, and fineſt grained of any *ſalt*, and is therefore greatly eſteemed at table. In preparing this *ſalt* they uſe ſome reſin, and other additions, to break the grain, and render it very ſmall; others alſo, to this purpoſe, boil it the more briſkly, and ſtir it briſkly all the while. But in Cheſhire, where the beſt baſket *ſalt* is made, they uſe no particular proceſs about it, but only take the third draughts of every pan, which always are the pureſt *ſalt*; and they do not ſuffer theſe to lie ſo long in the pan, as when they make *ſalt* of a larger grain, but take it out before it can form large cryſtals: by this means they have it of a fine ſmall grain, and they then preſs it hard down into the wicker baſkets, and when dried in the ſtove, they let it remain in the baſkets for ſale. *Brownrig* of Salt, p. 107.

Not long ſince Mr. Lowndes publiſhed a method of greatly improving the Engliſh *brine ſalt*, ſo as to make it at leaſt equal to the French *bay ſalt*.

The method is this. Let a brine pan, containing about eight hundred gallons of liquor, be filled with brine to within an inch of the top; then make and light the fire, and when the brine is juſt lukewarm, put in either an ounce of blood from the butchers, or the whites of two eggs. Let the pan boil with all poſſible violence, and as the ſcum riſes take it off. When the freſh, or watery part is pretty well decreaſed, throw into the pan the third part of a pint of new ale, or the ſame quantity of the grounds of any malt liquor. When the brine begins to grain, add to it the quantity of a ſmall nut of freſh butter, and when the liquor has ſtood half an hour longer, draw out the *ſalt*. By this time the fire will be greatly abated, and ſo will the heat of the liquor; let no more fuel be thrown on the fire, but let the brine gently cool, till a perſon can juſt bear to put his hand into it; keep it in that degree of heat as nearly as poſſible, and when it has worked for ſome time, and is beginning to grain, throw in the quantity of a ſmall nutmeg of freſh butter, and about two minutes after that ſcatter throughout the pan, as equal as may be, an ounce and three quarters of common alum, pulveriſed very fine; then inſtantly, with the common iron ſcrape-pan, ſtir the brine very briſkly in every part of the pan for about a minute; then let the pan ſettle, and conſtantly feed the fire, ſo that the brine may never be quite ſcalding hot, yet always a great deal more than lukewarm; let the pan ſtand working thus for about three days and nights, and then draw it, or take out the *ſalt*. The brine remaining, will, by this time, be ſo cold, that it will not work at all, therefore freſh coals muſt be thrown upon the fire, and the brine muſt boil for about half an hour, but not near ſo violently as before the firſt drawing; then with the uſual inſtrument take out ſuch *ſalt* as is beginning to fall, and put it apart; then let the pan ſettle and cool. When the brine becomes no hotter than one can juſt put one's hand into it proceed as before, and let the quantity of alum not exceed an ounce and a quarter, and about eight and forty hours after draw the pan, and take out all the *ſalt*. *Lowndes*'s Brine Salt improved.

This is Mr. Lowndes's proceſs only; he afterwards directs cinders to be chiefly uſed in preparing the fires, the better to preſerve an equal heat, and by that means alſo he propoſes ſaving a conſiderable expence, aſſerting, that at preſent cinders are ſo little valued in Cheſhire, as to be thrown out into the highways. Mr. Lowndes adds, that in a pan of the ſize before-mentioned, there may be prepared, at each proceſs, ſixteen hundred pounds weight of *ſalt* from the beſt brine in Cheſhire, and one thouſand and ſixty-ſix pounds from the ordinary brine of that county. This, as the proceſs continues five days, is a little more than five buſhels and a half of *ſalt* a day, from the beſt brine, and a little more than four buſhels a day from the ordinary kind. *Brownrig* of Salt, p. 106.

Marine SALT, the name given by writers on this ſubject, expreſsly to that kind of common, or white *ſalt*, which is boiled from ſea water, without any previous preparation.

This *ſalt* is only made in countries where great quantity of fuel can be had at a very low price, or where the ſun has not force enough; and is therefore made in few counties of England, except on thoſe parts of the Britiſh coaſt which moſt abound in pit-coal. This has thence got the name of *Newcaſtle ſalt*, and is exported to Denmark and Norway, and ſome other countries, as well as ſent to London and other parts of England.

The moſt convenient works for the making this *ſalt* are conſtructed in the following manner. The ſaltern is erected at ſome convenient place near the ſhore; it is a long and low building, conſiſting of two parts, one called the fore-houſe, and the other the pan houſe or boiling-houſe. The fore-houſe ſerves to receive the fuel, and cover the workmen; and in the boiling houſe are placed the furnace, and the pan in which the *ſalt* is made. And in ſome places they have two pans, one at each end of the building, and the fuel and place for the workmen is in the middle. The furnace opens into the fore-houſe by two mouths, and from theſe is carried up a wall to prevent the aſhes from flying to the *ſalt* pans, and in this is a door of communication between the two houſes. The body of the furnace conſiſts of two chambers, divided from one another by a brickwork called the mid feather, which from a broad baſe terminates in a high edge nigh the top of the furnace, and by means of ſhort pillars of caſt iron fixed upon it, ſupports the *ſalt* pan. The pans are oblong and ſhallow, the common meaſure being fifteen feet in length, twelve feet in breadth, and ſixteen inches in depth; they are commonly made of plates of iron joined together with nails, and the joints filled with a ſtrong cement; and the bottom of the pan is prevented from bending down, or changing its figure, by hooks faſtened to ſtrong iron bars which are placed acroſs it.

Between the ſides of the pan and the walls of the boiling-houſe there runs a walk five or ſix feet broad, where the workmen ſtand to draw out the *ſalt*. The roofs are wood, and are faſtened with pegs of wood, nails mouldering away into ruſt in a few months.

Not far diſtant from the ſaltern on the ſea ſhore, between full ſea and low water mark, they make a little pond in the rocks, or with ſtones in the ſand; this they call a *lump*, and from this pond they lay a pipe; through which, when the ſea is in, the water runs into a well adjoining to the ſaltern, and by this well they pump it into troughs, by which it is conveyed into their ſhip or ciſtern, in which it is ſtored up till they have occaſion to uſe it.

The ciſtern is built cloſe to the ſaltern, and may be placed moſt conveniently between the boiling-houſes on the back-ſide of the fore-houſe. It is made either of wood, brick, or clay, and ſhould be covered with a ſhed, that the *ſalt* water in it may not be weakened by rains, and ſhould be placed ſo high that the water may conveniently run out of it into the pans. When the ſea water has ſtood in the ciſtern till the mud and ſand are ſettled from it, it is drawn off into the *ſalt* pan; and at the four corners of the *ſalt* pan, where it is ſupported by the brick work, and conſequently the flame does not touch its bottom, there are placed four ſmaller leaden pans and ſcratch pans, which for a *ſalt* pan of fifteen feet, are uſually about a foot and half long and a foot broad, and three inches deep. Theſe have a bow or circular handle of iron, by which they may be drawn out with a hook when the liquor in the pan is boiling.

The *ſalt* pan being filled with ſea water, a ſtrong fire of pit-

pit-coal is lighted in the furnace, and then, for a pan which contains about fourteen hundred gallons, the *ſalt* boiler takes the whites of three eggs, and incorporates them all with two or three gallons of ſea water, which he pours into the *ſalt* pan, while the water contained therein is only luke-warm, and mixes this with the reſt by ſtirring it about with a rake. In many places they uſe inſtead of eggs the blood of ſheep or oxen to clarify the ſea water; and in Scotland they do not give themſelves the trouble of clarifying it at all. As the water heats, there ariſes a black frothy ſcum upon it, which is to be taken off with wooden ſkimmers. After this the water appears perfectly clear, and by boiling it briſkly about four hours, a pan loaded in the common way, that is about fifteen inches deep, will begin to form cryſtals upon its ſurface. The pan is then filled up a ſecond time with freſh ſea water; and about the time when it is half filled, the ſcratch pans are taken out and emptied of a white powder, ſeeming a kind of calcarious earth, which ſeparates itſelf from the ſea water, during its boiling before the *ſalt* begins to ſhoot. When theſe have been emptied, they are again put into their places, where they are afterwards filled again. This powder being violently agitated by the boiling liquor, does not ſubſide till it comes to the corners of the pan where the motion of the maſs is ſmaller, and it there falls into theſe pans placed on purpoſe to receive it.

The ſecond filling of the pan is boiled down after clarifying in the ſame manner as the firſt, and ſo a third and a fourth; but in the evaporation of the fourth, when the cryſtals begin to form themſelves, they ſlacken the fire, and only keep the liquor ſimmering. In this heat they keep it all the while that the *ſalt* is granulating, which is nine or ten hours. The granules or cryſtals all fall to the bottom of the pan; and when the water is almoſt all evaporated, and the *ſalt* lies nearly dry at the bottom, they rake it all together into a long heap on one ſide of the pan, where it lies a while to drain from the brine, and then is put into barrows and carried to the ſtore-houſe, and delivered into the cuſtody of his majeſty's officers. In this manner the whole proceſs is uſually performed in twenty-four hours, the *ſalt* being commonly drawn out every morning. This is the method in moſt of our *ſalt* works, but in ſome they fill the pan ſeven times before they boil up the *ſalt*, and ſo take it out but once in two days, or five times in a fortnight. In the common way of four boilings, a pan of the uſual ſize, containing one thouſand three hundred gallons, they draw from fifteen to twenty buſhels of *ſalt* every day, each buſhel weighing fifty-ſix pounds.

When the *ſalt* is carried into the ſtore-houſe it is put into *drabs*, which are partitions, like ſtalls for horſes, lined at three ſides, and the bottom with boards, and having a ſliding board on the foreſide to draw up on occaſion. The bottoms are made ſhelving, being higheſt at the back, and gradually inclining forward; by this means the brine remaining among the *ſalt*, eaſily ſeparates and runs from it, and the *ſalt* in three or four days becomes ſufficiently dry; in ſome places they uſe cribs and barrows, which are long and conic wicker baſkets for this purpoſe, and in ſome places wooden troughs with holes in the bottom. The ſaline liquor which remains from the making of *ſalt* is what is called bittern. See the article BITTERN.

The ſides of the pans in which the *ſalt* is made, are ſoon cruſted over with the ſame ſort of matter formed into cakes or cruſts, that falls in powder into the ſcratch pans; this the workmen call ſtone ſcratch; they are obliged to cleanſe the pans of it once in a week or ten days, otherwiſe they will be burnt: in England they do this with iron picks, but at Hall in Saxony they have a much better method; for they then take out the pans, and turning them bottom upwards, burn ſtraw under them, by which means the matter of the cruſt looſens itſelf, and after this it falls off on being ſtruck with a mallet or hammer. *Brownrig* of Salt, p. 62.

In Lancaſhire, and ſome other parts of England, ſea *ſalt* is made in this manner: they pare off, in dry weather, in ſummer, the ſurface of the flats, which are covered at full ſea, and bare when the tide is out. When they have procured heaps of this they put it into troughs, and pour freſh water on it; this waſhes off the *ſalt* that hung about the ſand, and is received ſo impregnated into veſſels ſet underneath the troughs. So long as this liquor is ſtrong enough to bear an egg they put on more water; when an egg ſinks in it they throw the ſand out of the troughs, and put in freſh from the heaps. The water thus impregnated with *ſalt* they boil in leaden pans, and evaporate to a dryneſs, the *ſalt* remaining behind. *Ray*'s Engliſh word, p. 179.

Rock SALT, a name given by the common people of England to the foſſile *ſalt*, or *ſal* gem, found in ſeveral parts of the world.

It was in the year 1670 that we firſt diſcovered the mines of *rock ſalt* in Cheſhire, where it was accidentally found on the lands of Mr. Marbury, of Marbury, in that county, in boring for coal. It lay there thirty-three or thirty-four yards from the ſurface, and there iſſued from it a vigorous ſharp brine ſtronger than any of the Cheſhire *ſalt* ſprings before known afforded. Since that many other mines of it have been found in the ſame county, and a great many are now worked by a company of proprietors, and yield vaſt quantities of *ſalt*; but this is eſteemed unfit for domeſtic uſes in its natural ſtate, and for that reaſon the proprietors uſe the method practiſed in Poland, Hungary, and many other places on the coarſer *rock ſalt*, that is, the refining it, by diſſolving it in weak brine, and then boiling it into *ſalt* again; this is done with great quantities on the ſpot; and beſide this great quantities are carried in the rough ſtate to Liverpool, and there refined with the water of the river Merſey at full ſea, or elſe ſhipped at Liverpool, and thence tranſported to other parts of England and Ireland, where it is wrought into *ſalt* with ſea water.

The *rock ſalt* refined upon the ſpot is alſo exported to Ireland; and in times of war, to our American colonies, when they cannot have bay *ſalt*. The works where they refine the *rock ſalt* are called refineries, and the *rock ſalt* is broken ſmall and put into leaden ciſterns, where it is diſſolved cold in ſea water. When the ſolution has ſtood a day and night to ſettle, it is drawn off from the ſediment into the *ſalt* pan, and refined into *ſalt* in the ſame manner that common brine is boiled up. The ſame additions are uſed in the clarifying it, and the ſcratch or calcarious matter falling from it, forms a cruſt as in the other works. The brine left in the pans after the *ſalt* is taken out is not thrown away, but is added to the next quantity put into the pan, and ſo on to the end of the works. *Brownrig* on Salt, p. 139.

In Hungary, near the city of Eperes, they have a very remarkable mine of this *ſalt* which ſupplies the whole country thereabout. The mine is near two hundred fathoms deep, and in the greateſt part is ſunk through earth, not through rock. The veins of *ſalt* are ſo large, that there are many blocks of it weighing two thouſand pounds, ſome of ten or more. The *ſalt* is uſually hewn out into long ſquare pieces of about two feet, and is afterwards ground between two grindſtones, to reduce it to a powder fit for uſe. Though the mines of *ſalt* are uſually cold and damp, yet the *ſalt* itſelf being very ſolid, and in the rock or maſs, is ſeldom much affected by the dampneſs. The *ſalt* in many of the mines is not of a fine white, but ſuch as is of a duſky grey in the maſs, often becomes very white when powdered, and made fit for uſe.

Salt upon SALT, a name given to a kind of common *ſalt* prepared by the Dutch, of great uſe in preſerving herrings and other fiſh, and to which they principally owe their advantages in the herring trade. The Dutch prepare two kinds of refined *ſalt*, one of a ſmall grain, intended for the uſe of the table, and called butter *ſalt*. They export large quantities of this to the countries upon the Rhine, and into other parts of Germany. The other kind is a very ſtrong and pure *ſalt*, and is of the largeſt grain of any boiled *ſalt*, now made: this laſt they call the St. Ubes or Liſbon *ſalt*, from its reſemblance to the pure bay *ſalt* made in thoſe places.

The *ſalt*, which they refine, is altogether marine bay *ſalt*, and they chiefly have it from France and Spain; but they find, by experience, that any one kind of bay *ſalt* does not anſwer their purpoſes, ſo well as two or more kinds; they therefore frequently mix three parts of Cadiz *ſalt* with one part of that of Souſton, which is of great ſtrength, but very dirty, and of a green colour, and does not coſt above half the price of the Spaniſh *ſalt*; for diſſolving the bay *ſalt*, they uſe ſea water, which they bring in lighters to Dort and Rotterdam from below the Brill or Helvoet; out of theſe lighters it is craned into cellars, and is thus impregnated with bay *ſalt* to a certain degree of ſtrength, which they determine by hydrometers made for that purpoſe. After the heavy droſs of the *ſalt* is ſubſided to the bottom of the cellar, the clear brine is pumpted up into the *ſalt* pan through a mat, which retains the light ſcum, ſtraws, or other impurities, which floated on the ſurface of it. Theſe *ſalt* pans are of iron, of a round figure, and commonly forty feet in diameter, and eighteen inches deep. Theſe pans are placed over a hearth furnace, and the only fuel they uſe in the boiling the *ſalt* is dry turf. The fire is kept up ſo high, that the liquor boils briſkly all the time, and if any ſcum ariſes, they carefully take it off, but they uſe no clarifying mixtures. A little before the *ſalt* begins to granulate, they add to the pan a lump of butter, of the bigneſs of a walnut, and half a pint of ſour whey, which has ſtood at leaſt half a year. When theſe things are perfectly mixed in by a good ſtirring, they ſhut the doors and windows of the houſe, that no air can blow in cold, and the houſe is kept thus hot all the time that the *ſalt* is forming. This method is not new, or peculiar to the Dutch works, for Agricola deſcribes an apparatus of boards, to keep the cold air out of the *ſalt* pan all the time that the *ſalt* is forming; and the Germans uſe it in many places at this time.

It is out of this ſame brine, and by the ſame proceſs, that they make the table *ſalt* and the ſtrong *ſalt*; only toward the end of the proceſs they make this difference, if the pan is to be wrought into table *ſalt*, the brine is kept gently ſimmering during the whole operation, and all is finiſhed in twenty

twenty four hours; but if it be to be made into the ſtrong *ſalt*, they ſlacken the fire to ſuch a degree, that the operation takes up three days. In both caſes they let the *ſalt* remain in the pan till the whole is finiſhed; they then rake it out with wooden rakes, and after it has drained a while in wooden drabs, it is fit for uſe. The mother brine, of which there always remains a large quantity in the pan after the ſtrong *ſalt* is made, as alſo the drainings of the drabs where the *ſalt* is put, is reſerved to be boiled up into table *ſalt*; but the mother brine of the table *ſalt* becomes more ſharp and bitter after every proceſs, and is finally thrown away. *Brownrig* of Salt, p. 142.

Sea SALT. The common *ſea ſalt* is deſtructive to almoſt all plants, except thoſe which naturally grow in the ſea water, or on the ſhores. Mr. Tull has invented a method of determining how far the horizontal roots of plants run, by burying *ſalt* at a diſtance from them. See the article ROOT. It has been thought by ſome that this was an uncertain trial, becauſe, though the roots reaching the *ſalt* were deſtroyed by it, yet the plant would continue to be ſupplied by others, and would not periſh; but this is erroneous, for the roots of plants coming where *ſalt* is, are not killed by it, but they draw juices from the earth where it is buried, and carry it with thoſe juices to the plant, and by this means they fail not to kill it. One root, thus coming in the way of *ſalt*, is able to kill the whole plant, though it have ten thouſand roots, taking good nouriſhment from other places.

This is finally exemplified in the growing of mint in water. If a ſtrong and vigorous ſhoot of mint, growing in ſimple water, be placed near a glaſs of *ſalt* water, and one fibre of its roots be raiſed out of the glaſs in which it ſtands, and plunged into the *ſalt* water, the whole plant will be killed in a few days by this *ſalt*, taken in by this ſingle fibre, though all the reſt are taking in proper nouriſhment from the freſh water all the time. The ſame thing happens, if one of theſe roots be taken up and tied in a bag, containing a ſpoonful of dry *ſalt*; the *ſalt* will ſoon grow moiſt, and the plant will be killed. On taſting of the leaves of the plants thus killed, they are found to have imbibed a larger quantity of *ſalt* than could be conceived from ſuch a ſmall and ſingle root, the whole ſtalk, leaves, and every other part of the plant, taſting ſtrong of *ſea ſalt*. *Tull*'s Horſe-hoeing Huſbandry. See *Marine* SALT, ſupr.

Egra SALT. See the article EGRANUM *ſal*.

Eſſential SALTS. See *Salts of* PLANTS.

Fixt SALTS. Mr. Homberg has given, in the Memoirs of the Paris Academy, a very curious paper of the ſubject of volatilizing the *fixt ſalts* of plants. He obſerves, that the *fixt ſalt* of any plant is a *ſaline* matter, which has already loſt in the fire all, or the greater part at leaſt, of the volatile matter contained in the plant it is obtained from, as its phlegm, acid ſpirit, urinous ſpirit, its eſſential oil and urinous *ſalt*; and that its figure is in ſome degree that of a ſponge, the pores of which being always open, are ever ready to receive again ſuch ſorts of volatile ſubſtances, as the fire has before driven off from them; and that art may in ſuch a manner add theſe its deprived parts to it again, that the concrete ſhall loſe its fixity, and become volatile, as the whole was in a great meaſure before. The whole of this operation conſiſts in the adding to the lixivial *ſalt* one or more of thoſe volatile ſubſtances, the loſs of which gave it its preſent form. Theſe are to be introduced into the *ſalt* by repeated cohobations, which are to be continued till ſo much volatile matter is added to the fixt, that the whole becomes volatile together; the naturally volatile particles being mixed in ſuch proportion, as to be able to carry up the fixed in vapour with them. The ſeveral volatile ſubſtances of plants are of different kinds, and conſequently require different operations, to make them mix with the *ſalt*. Tartar may very well ſerve as a general inſtance in this caſe, and the manner of introducing into its *fixt ſalt* thoſe principles, of which the fire before diveſted it, and by this means rendring it volatile, may ſerve as a ſpecimen of the manner of doing it in all the reſt: but as *ſalt* of tartar, and all other fixt vegetable alkaline *ſalts*, however well purified, always contain a great deal of earth, the ſeveral volatiles employed act differently on this, according to their ſeveral natures; ſome carrying it all up in vapour, others carrying only a part of it, and leaving at the bottom of the veſſel more or leſs of an earthy matter, inſipid to the taſte, and wholly diveſted of its alkaline *ſalt*; every particle of which, even in this caſe, has been volatilized, and raiſed by the fire.

The alkaline *ſalt*, thus volatilized, appears alſo, according to the different ſubſtances employed, in very different forms; ſometimes in that of a *ſaline* liquor, ſometimes in an acid, and ſometimes in an urinous ſpirit: ſometimes alſo it becomes changed into a volatile *ſal ſalſus*, ſometimes into an acrid and fœtid *ſalt*, and finally, ſometimes into a volatile aromatic one. The firſt matter which fire drives out of tartar, or any other vegetable ſubſtance, is its phlegm: this being mere water, one would think at firſt ſhould be little able to change ſo fixed a ſubſtance as *ſalt* of tartar into a volatile one; but when we farther conſider the great power of water, when put in action by the fire, and that this agent is the cauſe of ſome of the greateſt changes that happen in animal and vegetable bodies, and perhaps of every thing of this kind that paſſes in our earth, we ſhall not wonder that it may be made, by the help of fire, one of the agents capable of raiſing, or volatilizing a part at leaſt of *ſalt* of tartar; but as phlegm is the leaſt active of all the principles which chemiſtry ſeparates from bodies, or at leaſt acts upon the others the moſt ſlowly, and with the leaſt violence, the method of volatilizing part of *ſalt* of tartar by means of this, muſt naturally be more tedious than by any of the other principles; yet it is to be done with time by this, as well as by the other.

The thing that put Mr. Homberg upon this courſe of experiments was, as he candidly acknowledges, an accident. He was diſpleaſed with the Venice ſoap, with which he ſhaved himſelf; and endeavouring to mend it, he cut it into thin ſlices, and after drying it three months in the ſhade, he powdered it in a mortar, and wetted it into a paſte again with oil of lavender and ſpirit of wine; and in continuing his trials to this purpoſe, he at length found part of the *ſalt* of the ſoap become volatile.

It is very well known that ſoap is made of the *ſalt* of kali, or pot aſhes and oil. On the event of this experiment, Mr. Homberg proceeded to judge, according to the known rules of chemiſtry, that oil, of which the volatile *ſalts* are generally ſuppoſed to borrow their volatility, being intimately mixed with the fixed alkaline *ſalts*, as here with that of the kali, might render them all volatile, as in this inſtance; for that in this ſtate they were no longer alkalis, their pores being now not open, but filled to the utmoſt with the particles of oil. All oils contain alſo an acid, and that acid being mixed with the alkali *ſalt*, the whole on this muſt ceaſe to be an alkali, and become a middle, or neutral *ſalt*, ſuch as common ſea *ſalt*; but then as the acid is not, in this caſe, joined to the alkali, but by the means of oil, and accompanied with oil, this new found neutral *ſalt* muſt neceſſarily be of an oily, or a ſulphureous nature.

In carrying on this idea, and trying by chemical experiments all the objects it offered, Mr. Homberg, in fine, found, that in order to volatilize the *fixt ſalts* of vegetables, it was neceſſary to begin, by converting them into ſoap; then to wait for the ſhooting of certain cryſtals, or bright points, which would appear upon the ſurface, and that theſe cryſtals were a neutral *ſalt*, volatilized of itſelf by the mere operation of nature: after this the matter is to be moiſtened with a new liquor, and then ſet upon the fire, and that thus there would be a new appearance of volatilized *fixed ſalt*; and the repeating this proceſs ſeveral times, affords always, at length, a very large proportion of the *fixed ſalt*, no longer ſuch, but truly volatilized. The choice of a proper liquor, for the wetting the matter, is a thing of no ſmall conſequence. Water is, of all others, the leaſt proper, and oil appears the moſt ſo; and of the different oils, thoſe drawn by diſtillation are much more effectual than the common expreſſed ones. The great reaſon of this is, that the liquor ought not only to be the moſt volatile that may be, but it muſt be alſo ſuch, as will moſt intimately unite with *ſalt*. Spirit of wine is very excellent for the purpoſe, but would be much more ſo, did it not want this laſt quality.

Mr. Homberg, by various trials, carried at length this attempt to ſo great a height, that he was able to volatilize nearly one half of *ſalt* of tartar, or of any other volatile *ſalt*. The new *ſalt* often appears in a dry form, the oil, which is employed in the making it, preſerving it from the effect of humid vapours, which would otherwiſe have reſolved it into a liquor. Mem. de l'Acad. Par. 1714.

Foſſile SALT. The iſland of Tſongming, in the Eaſt-Indies, affords the moſt remarkable kind of foſſile, or native dry *ſalt* in the world. The country is there, in general, very fruitful, but in certain parts of the iſland there are ſpots of ground, of ſeveral acres, which appear wholly barren, yielding not the leaſt appearance of any thing vegetable upon them.

Theſe ſpots of ground taſte very *ſalt*, and abound in *ſalt* in ſuch a manner, that they ſupply not only the whole iſland, but a great part of the neighbouring continent. When the people ſee the earth become dry, and covered with white ſpangles, which are pieces of *ſalt*, they dig it up about a foot deep, and carry it away to the work places, where they put it into large wooden veſſels of four or five inches deep, and many feet broad, ſet a little ſlanting. They pour water upon it in theſe. When it has ſtood a proper time they let it out, and add more, till all the *ſalt* is diſſolved; then they boil this water in the common way, and extract the *ſalt* from it. It is very remarkable, that the ſame pieces of land, which produce vegetables one year, will produce this *ſalt* another; and, on the contrary, the *ſalt* parts will ſome ſeaſons produce vegetables. The *ſalt* work there is a thing of great advantage to the inhabitants, and all the poor are, in the ſeaſon, employed in it; the men in collecting and wetting the earth, and the women in boiling up the water, which they attend as carefully as the men. Obſerv. ſur les Cout. de l'Aſie.

Glauber's SALT. See SAL *mirabile*, supr.

SALTS *of Count Lagarais*, a name by which the French and ſome other nations call a preparation of vegetable bodies, invented by the gentleman whoſe name it bears, but very improperly called by him a *ſalt*.

The hiſtory of theſe preparations is this: in the year 1731, the Count de Lagarais ſhewed the French king ſome powders, which he proved to be very uſeful in medicine, and which he called the *eſſential ſalts of certain plants*. The method of making theſe was long kept a ſecret, but at length the diſcoverer publiſhing it to the world, it appeared that they were made by means of water only, agitated in a violent and continued manner in a cloſe veſſel with an inſtrument reſembling a chocolate mill. Mr. Langelot had before attempted a reſolution of this kind of vegetable, and other ſubſtances, by means of water and motion, but his was done by grinding them with a very ſmall quantity of water at a time; whereas this of the Count's is by powdering the ingredients, mixing them with a large quantity of water, and breaking them to pieces by a continued motion of this ſort of mill made with four vanes, or flaps of thin wood, which was kept for ſix or eight hours in a continual motion by means of a larger wheel, ſuch as the lapidaries poliſh ſtones with.

There is no doubt but that the inſtrument, uſed by the Count, is of very great uſe, and that the reſult of the operation is a very valuable form of medicine; but it is not a *ſalt*, but an extremely fine extract, containing the gummy, reſinous, and *ſaline* parts of the body, and is a form capable of being reduced to powder, and eaſily adminiſtered, as it contains the virtues of the plant it is made from in an extremely ſmall compaſs, and is capable of ready ſolution in aqueous fluids. It is certainly a form of medicine worthy to be brought into practice, and muſt be a very proper way of adminiſtring the more bulky medicines to children, and perſons of tender conſtitutions.

To give a proper view of the nature of theſe preparations, and their difference from the extracts made in the common manner, it may be proper to enter, in ſome degree, into the manner of preparing the two forms. The common extracts of the ſhops are made either from the juices of ſucculent plants, as houſeleek, purſlain, or the like; or from a ſtrong decoction of the other drier plants in common water, which when ſeparated from the coarſer parts by ſubſidence, filtration, or the like means, are evaporated over a balneum mariæ to the conſiſtence of a thick honey.

There will, in proceſs of time, an eſſential *ſalt* ſeparate itſelf from theſe extracts, and many plants have, in the decoctions, a large quantity of a fine ſubſtance, which will never be made to paſs the filter: and the extracts, made by this means, contain the oil, the gummy and reſinous parts of the plants, and their eſſential *ſalts*, though this is but in a very inconſiderable quantity. Theſe are the common extracts of plants.

The method of making thoſe extracts, called *Count Lagarais's ſalts*, is this. They chooſe a glaſs veſſel, capable of holding ſix or ſeven pints, and having a wide mouth; into this they put an ounce of bark, ſena, guaiacum, or whatever other vegetable they are to make the extract of, firſt reduced to a coarſe powder. They pour on this two pints and an half of rain water, or diſtilled water, and then taking the veſſel to the place where the mill is fixed, they raiſe it ſo high, that the body of the mill is in the middle of the liquor; they then cover the top of the veſſel with a wet bladder, that the froth may not be thrown over, and then turning the large wheel, they make the mill move round very ſwiftly in the liquor for ſix or ſeven hours together; after this they let the liquor ſettle for an hour or two, till only the finer parts of the body remain ſuſpended in it, and then pour it off into a number of flat China, or ſtone ware diſhes, putting only a ſmall quantity into each diſh, and theſe they ſet in the ſun, or over a balneum mariæ prepared on purpoſe; for ſhould they attempt the evaporation in a ſand-heat, the ſmall quantity of extract in each diſh would be burned. When the whole is evaporated to a dryneſs, there remains on the whole inner ſurface of the diſhes a thin cruſt of an extract, which is to be ſeparated by ſcraping it off with a piece of ſtiff paper, and reſerved for uſe. This always breaks up in ſmall ſcales, which have a very ſhining ſurface on that part where they adhered to the diſhes, and it ſeems that this has given occaſion to ſome to believe, that they were particles of real *ſalt*.

There is no doubt, but this method of procuring a powerful extract might be of great uſe, in regard to all thoſe ſubſtances which water can have power to penetrate; but it is not eaſy to give credit to its being able to make the like valuable medicines from the metals, though that has been pretended. Gold and ſilver are pretended to be operated on in a powerful manner by it, but there ſeems a fallacy in this, ſince even iron itſelf, which is much more penetrable by water than thoſe metals, yields but little virtue to it, two ounces of the filings of this metal yielding, with the utmoſt care and accuracy, only about four grains of a white earthy matter, which is alſo much more likely to be a part of the water than of the metal.

The *ſalts of the metals*, as the Count called them, which were prepared by this means, were always ſuſpected to hold ſome *ſaline* quality, which they owed to the menſtruum, which, whatever was pretended, was not ſimple water, and a ſtrict examination of them always diſcovered a marine *ſalt* among them. It is true indeed, that according to Langelot's method of grinding, ſome leaves of gold were reduced, by the addition of a very ſmall quantity of water, into a liquor, from which, on diſtillation, a few red drops were ſeparated; but it is to be obſerved, that as Langelot's method is the grinding the ſubſtance with great vehemence, and for a long time, in an iron mortar, with a peſtil of the ſame metal, there is reaſon to ſuſpect, that what was found to come forth in red drops was a ſolution of iron, not of gold, as was pretended by thoſe who firſt prepared them. It is not to be doubted, but the method of evaporation of Count Lagarais's medicines is of great uſe, ſince no other can ſo well retain the finer parts of the medicines. Mr. Geoffroy tried it on roſes, violets, and ſome other flowers, and found great reaſon to wiſh that all the medicinal extracts could be prepared in the ſame manner; but the method is impracticable, when medicines are to be prepared for general uſe; for though the mills might be made to be moved in great numbers at once, by a current of water, and ſo this part of the work performed with tolerable eaſe, yet the evaporations, in ſuch quantities, could by no means be made in any tolerable room, or time, and they muſt be evaporated as ſoon as made, ſince they very quickly turn ſour, and loſe all their virtues. Mem. de l'Acad. Scienc. Par. 1739. See EXTRACT.

Lixivial SALTS. It may appear very natural, from conſidering the common method of making the *lixivial ſalts*, that they ſhould be all of them one and the ſame ſubſtance; and as the greater part of them agree perfectly, not only in taſte, ſmell, and colour, but even in their effects, in the niceſt chemical operations, in which it appears wholly the ſame thing, whether one or another of them be employed; many, even of the moſt celebrated chemiſts, have poſitively declared that they are all the ſame, and Kunkell has poſitively aſſerted this on many repeated experiments, allowing them no other difference, than that ſome contain more, ſome leſs earth; and this he affirms not to be owing to the different ſpecies of the plant, but from certain accidents in the burning.

This account, however ſpecious, is not true; for though there are many of the *lixivial ſalts* procured from different plants, which, on many trials, appear alike, yet there are ſome that greatly differ from the common kinds; as that of tamariſk, which wants the greateſt of all their characters, in that it is no alkali, but a true *ſal ſalſus*; and beſide this, there are probably many other as remarkable differences in others, which happen not yet to have been obſerved. Mr. Bourdelin, of the Paris Academy, having obſerved, that among the *lixivial ſalts* ſome were greatly more, ſome greatly leſs alkaline, and this laſt mentioned kind not at all, determined to ſearch minutely into their differences in this reſpect. In this attempt he tried the produce of a great number of different fruits and flowers of plants, many of which gave *lixivial ſalts*, conſiderably different from one another; but nothing more ſtrengthened his opinion of the eſſential differences of ſome of them, than the *ſalt* of guaiacum, which proved to be little more an alkali than the *ſalt* of tamariſk, and which he is of opinion may be prepared in ſuch a manner, as not to prove at all alkaline. Mem. de l'Acad. Par. 1728. See LIXIVIOUS, *Cycl.*

The opinion of the fixed *ſalts*, drawn by elixiviation from all plants, being the ſame, having greatly prevailed, Mr. Gmelin, of the Peterſburg Academy, went through a multitude of experiments with the *ſalts*, made carefully from a great number of different plants, on a number of different liquors; ſome mineral acids, others ſolutions and impregnations of different ſubſtances; and by theſe he found that they had very different qualities, beſide their differing greatly in the degree of their alkaline power, which had been looked upon as their eſſential character.

He obſerves, that theſe *ſalts* are not to be obtained pure by any means, except a violent and repeated calcination; and that this is not the method uſed with the ſeveral *ſalts* made for medicinal uſe, and conſequently that they are all impure. The additional matter, which makes theſe *ſalts* impure, is either an earthy, an oily, an acid, or a volatile alkaline ſubſtance, according as the plant, while recent, abounded with one or the other of thoſe principles, or as their mutual connexions with one another were more or leſs ſtrong in each. As therefore the ſeveral ſpecies of plants are well known to abound with different principles, it muſt neceſſarily follow that the *lixivial ſalts*, obtained from them in the common way, muſt differ in their nature and properties, as the acid abounds in one, the volatile alkali in another, and the earth or oil in a third.

This difference unqueſtionably owes its origin to the nature of

of the different plants; but beſides this it muſt be allowed, that there are ſeveral accidents by which the *ſalt* may alſo be rendered of a different nature, or at leaſt its natural diverſity from others may be encreaſed, and ſet in a ſtronger light. The different manner of burning the plant will occaſion a great change in the *ſalt* it yields; and two different *ſalts* will be obtained, if one half of the ſame quantity of aſhes be lixiviated with hot water, and the other half with cold. This has been fully proved by Stahl in his *Fundamenta Chemica*.

Theſe are only accidental differences in the ſame *ſalt*; what Mr. Gmelin takes upon him to prove by experiment, is, that there are more real differences between the *ſalts* of various plants, and thoſe wholly dependent on the nature of thoſe plants, than had been before ſuſpected.

That the *ſalts* of plants may be fairly compared together, it is neceſſary that they ſhould all be made in the ſame manner; the fire ſhould, in all the proceſſes, be raiſed to the ſame degree, and the time of the plants remaining in it ſhould be alſo aſcertained, and the lixivium from each be prepared in the ſame uniform manner: thus the volatile parts of one plant will be no farther evaporated than of another, and the lixivia will contain an equal ſhare of the principles of the ſeveral plants, proportioned to their ſeveral natures; for it is a certain fact, that if the lixivium of the ſame aſhes be made in part with hot water, and in part with cold, the *ſalt*, obtained from that made with the hot water, will contain more of the earthy and oily parts of the plant, than that made with the cold.

The method of making a fixt *lixivial ſalt* of a plant, ſo as to retain as much as may be of the virtues of the plant, is this. Let the plant continue on fire without breaking out into flame, and let the fire be continued till it fall into aſhes, but no longer, leſt ſome of the volatile parts be driven off, which might have been preſerved. Cold water, and not hot, ſhould be uſed to make the lixivium, that the *ſalt* may appear in its proper form; and as the water of wells, rivers, and other places, differ greatly from one another, the water uſed for this purpoſe ſhould be ſuch, as has been previouſly diſtilled two or three times over, and ſo rendered perfectly pure, and kept in glaſs veſſels, not in earthen, leaden, or wooden ones, leſt it contract ſome adventitious particles. Now if the lixiviums of plants, made with all theſe cautions, are found to differ from one another, there is no room to doubt, but that the *ſalts* of thoſe plants are really different one from another.

This evidently appeared from the labours of a Swediſh chemiſt, whoſe papers fell into Mr. Gmelin's hands, and who had with all this care and caution prepared the *ſalts* of a number of plants; a copious table of the different effects of which, in different mixtures, is added to Mr. Gmelin's account: but not only the *ſalts*, but the very aſhes of different plants, prepared in the ſame exact manner, are found to differ obviouſly to the ſenſes. The aſhes of mugwort, ſmall centaury, chervill, and dill, are of a browniſh grey; goats beard and lingwort afford white aſhes; thoſe of ſanicle are whitiſh; thoſe of Roman wormwood of a greeniſh grey; thoſe of rue, agrimony, and ſaxifrage, brown; thoſe of tanſy of a duſky green; thoſe of dodder of a fine green; eyebright, ſouthernwood, common wormwood, and ſcabious, afford them grey; ſcurvygraſs of a whitiſh grey; hyſſop, yarrow, and ſowbane, of a duſky grey; melilot and oak leaves, as alſo plantain, colts foot, pine tops, and fumitory, of a duſky brown; pennyroyal of a pale brown, with ſome ſpots of white; elder flowers, ſage, and mother of thyme, afford yellow aſhes; thoſe of ſtrawberry leaves are of a pale brimſtone colour; thoſe of catmint of a duſky red; of prunella brick coloured; of honeyſuckle blue; of ſern blackiſh; and thoſe of St. John's wort, feverfew, origanum, and pimpernel, are all of a deep black.

The quantity of aſhes, produced from an equal weight of different plants, is very different, ſome yielding a ſeventh part of their weight, others but a twelfth or thirteenth, and ſome particular plants much leſs than this; St. John's wort in particular yields but a twenty eighth part, and fern but a twenty fourth.

The lixiviums made from theſe different aſhes were ſome colourleſs from the beginning, others at firſt were bluiſh, greeniſh, or of other colours, but theſe tinges all went off after a few days, and the liquor became limpid.

The lixiviums of the ſeveral plants are very differently acrid to the taſte, though made exactly in the ſame manner and proportion, and thoſe of ſome plants are not acrid at all; that of ſtrawberry leaves has ſcarce any taſte; that of the barba capræ, inſtead of an acrid taſte, has a ſweet one; and the lixivium of mother of thyme has no taſte, by which it can be diſtinguiſhed from fair water: the lixiviums of pimpernel, dill, and ſtrawberry leaves, have a ſulphureous ſmell; thoſe of moſt other plants are wholly ſcentleſs. Act. Petropol. Vol. 4. p. 289.

SALTS *of metals*. See the article METAL.

SALT *of milk*. See MILK.

Mineral SALT. It has been for many ages a conſtant opinion among the chemiſts, that minerals contain no volatile *ſalt*. Mr. Homberg, however, found the means of preparing an acid mineral *ſalt*, in a dry form and volatile. This would diſſolve in ſpirit of wine, and that ſolution being thrown on marble, fermented, and diſſolved it in the manner of aqua fortis.

All the world knows that many mineral ſubſtances contain an acid, and that this is eaſily raiſed in diſtillation, and therefore is very volatile; but as this could never before be ſeparated, otherwiſe than in a liquid form, they eſteemed it ſomething of a peculiar nature, and called it an acid mineral ſpirit, baniſhing the word *ſalt* from its name. But Mr. Homberg found, that if the acid ſpirit of any mineral was ſo embarraſſed in the particles of ſome metal, as that it ceaſed to be fluid, that metal was always conſiderably increaſed in weight by it; and that if afterwards all the acid which had been added to it were again ſeparated from it, there would remain a volatile *ſalt* in a dry form, and that this *ſalt* if diſſolved in ſpirit of wine, or in common water, made an acid liquor, which would diſſolve all alkalies with an ebullition: from this, he ſays, it is plain, that the minerals have a volatile *ſalt*, as well as the animals or plants; which laſt were alſo long ſuppoſed to want it, and the volatile *ſalt* ſuppoſed peculiar to the animal kingdom: from this alſo it very plainly appears, that the acid ſpirits of minerals, as they are called, are in reality no other than theſe volatile *ſalts* diſſolved in their own phlegm.

The method of procuring this *ſalt* may be ſeen in the following inſtance. Take two ounces of fine ſilver, diſſolve it in five ounces of ſpirit of nitre; pour this ſolution, while hot, into a pint of river-water, in which there has been before diſſolved as much ſea *ſalt* as it can contain, the ſilver will precipitate itſelf in form of white ſcales. Waſh this precipitate till it is inſipid to the taſte, and then dry it; it will, when perfectly dried, weigh two ounces and an half.

After this calcine in an iron veſſel over a ſtrong fire two or three pounds of fine tin, in which there is no mixture of any other metal. Take of this calx of tin well dried an ounce and half, mix this carefully with the two ounces and half of the calx of ſilver, perfectly dry alſo: put the mixture into a matraſs, of which two thirds ſhall remain empty; expoſe this matraſs to the naked fire, with its neck turned downwards, there will run into the neck of the matraſs a black matter, which will immediately fix itſelf into a hard ſtone of a brown colour, this will weigh about an ounce and half; this ſtone is the calx of tin diſſolved by the acids, which remain in the calx of ſilver; and the caput mortuum, at the bottom of the matraſs, will be found to be the ſilver now diveſted of thoſe *ſalts*, which it had carried with it from its diſſolvent in the precipitation. This may be run into a maſs by the copel, and no part of it will be loſt.

Beat this brown ſtone to powder, let the powder be perfectly dry; then put it into a double veſſel, ſublime it according to art, and the reſult of the operation will be half an ounce of a volatile *ſalt*; this is to be rectified by re-ſubliming it two or three times over a very gentle fire, and it will then be a volatile and mineral *ſalt*, perfectly dry, of a fine white colour and tranſparent. The caput mortuum of this ſublimation is the calx of tin. Mem. Acad. Par. 1692.

SALT *of mineral waters*. See the article HALCRYPTIUM.

Pine SALT. See the article PINE.

SALTS *of plants*. See the article PLANT.

Sedative SALT, a name given by the modern chemiſts to a *ſalt*, of the virtues of which they boaſt much. Thoſe who firſt deſcribed it gave the proceſs for making it in a very enigmatical manner; and their ſucceſſors invented many different ways of preparing it. The truth is, that all mixtures of borax with the vitriolic acids furniſh us with a *ſedative ſalt*, as do alſo the mixtures of borax with ſpirit of nitre, or of ſea *ſalt*.

Becher firſt gave the enigmatic account of it, which Homberg traced to its origin, and found the way of making it with the vitriolic, as Lemery did with the other acids. This *ſalt* is formed by ſublimation, and is a congeries of ſaline flowers, not a little approaching to flowers of benjamin. Theſe flowers are ſo light and fine, that they ſwim upon water, and will not diſſolve in it unleſs it be made warm.

The *ſedative ſalt* is a perfect *ſal ſalſus*; it makes no alteration in the colour of the juice of violets, and has no ſenſible effect on the ſolution of corroſive ſublimate, or on a ſolution of mercury in ſpirit of nitre for a long time; but it finally precipitates a yellow powder from it as the borax does; there is this difference, however, between this precipitate, and that formed by crude borax, that the powder precipitated by the *ſedative ſalt*, does not as the other become white on waſhing with large quantities of water. Theſe experiments ſhew this *ſalt* to be wholly analogous to tartarum vitriolatum, or to the Glauber's *ſalts* in its effects.

When the compoſition of which this *ſalt* is to be made is placed on the fire, there ariſe different liquors before the *ſalt* appears; the firſt is a phlegm of a fattiſh complexion, and with the ſmell of ſoap; this is ſucceeded by a turbid white liquor, along with which there ariſe ſome of the firſt flowers.

ers. This makes a ſolution of mercury in ſpirit of nitre muddy after ſome time, and finally precipitates from it a ſmall quantity of a white powder. After this all the *ſalt* or flowers aſcend; theſe flowers, diſſolved in warm water, recryſtallize themſelves in it when cold, aſſuming the ſame form with that they had in the flowers, except that the combinations of particles are more denſe and heavy.

The uſual method of making this *ſalt* has been this. Take a glaſs retort, with a large neck, put into it four ounces of borax in fine powder, and pour on this half an ounce of common water to wet it into a ſort of ſoft paſte; then add to this an ounce and two drachms of concentrated oil of vitriol; place the retort in a reverberatory furnace, and give at firſt a ſmall fire, which raiſe by degrees till the retort is red hot: there will paſs over into the receiver about an ounce of aqueous matter; and after this the flowers, or *ſedative ſalt*, will riſe with a little more humidity; hence ſome part of the flowers will be diſſolved in the liquor, and run over into the recipient, but the greater quantity will remain in form of a dry ſublimation in the neck of the retort; they will finally ſtop up the whole orifice of the neck, and what ariſes after this uſually forms a circle of a ſort of gloſſy *ſalt*, about their baſes, out of which the flowers ſeem to ſhoot.

They are compoſed of multitudes of fine thin blades, or flakes, and are eaſily bruſhed out of the neck of the retort with a feather; the gloſſy circle at the bottom of them may be diſſolved in water, and recryſtallized, and by this means all the *ſalt* will be procured.

Mr. Geoffroy the younger has given, in the memoirs of the Paris academy in 1732, an account of a way of making this *ſalt* by ſolution and cryſtallization alone, without the trouble of diſtilling; he has alſo ſummed up the ſeveral other ways of making it with blue and white vitriol, but the method here mentioned is that by which the chemiſts now make it. Mem. Acad. Par. 1732.

Shivery SALT. See the article SHIVERY.

Vitreous SALT, in chemiſtry, a term uſed by ſome modern chemiſts for a kind of *ſalt*, which till of late has wanted a name, and which is found in and ſeparable from the fixed alkaline *ſalts* of vegetables.

It is bitter, hard, fixed, and not alkaline, and of a cryſtalline or gloſſy appearance.

The method preſcribed by Boerhaave for the procuring it with moſt eaſe, is this: put ſix pounds of the beſt pot-aſhes into a clean glaſs, add thereto twenty pints of cold rain water; ſtir them together with a ſtick, and ſuffer the whole to reſt. When the aſhes are thoroughly diſſolved, gently decant the clear lixivium; and there will be found at the bottom, mixed with the fæces, a number of ſmall greyiſh granules, of a bitter taſte, and of an almoſt glaſſy brittleneſs and hardneſs; theſe are the *ſalt* required, and contain no alkaline quality; but to obtain it in greater purity, diſſolve ſix pounds of pot-aſhes in fourteen times their weight of water; filter the lixivium while hot, and make it perfectly clear; then put it into a glaſs veſſel ready heated, and moiſtened, and ſuffer it to ſtand; a duſky cruſt will ſoon begin to ſhoot to the bottom and ſides of the glaſs, and will gradually become thicker and thicker; at length when no more appears to ſhoot, pour off the liquor, and there will remain behind a *ſalt* like the former, but purer, and in larger quantity: if the remaining lixivium be boiled a little, and ſet to cryſtallize again, it will afford a ſmall quantity more of this *ſalt*; but after this it will yield no more; whence there ſeems to be only a certain and determinate quantity of this *ſalt* contained in the alkali. If this *ſalt* be put into a veſſel of rain water and ſhook about, it does not diſſolve, only the alkali waſhes off, and the *ſalt* remains purer than before; after this it is to be gently dried and kept. *Boerh.* Chem. P. 2. p. 42.

It is well known among the chemiſts, that genuine fixed alkaline *ſalts* can hardly be cryſtallized; and though ſome have produced this *ſalt* as a cryſtallized alkali, the fallacy of the pretext is evident, ſince this appears on trial to be no alkali at all; and it remains not leſs difficult than before to cryſtallize pure alkali, though a *ſalt* different in its nature from it, may be cryſtallized in a certain quantity from among it.

This *vitreous ſalt* never runs ſpontaneouſly in the air, nor does it eaſily diſſolve in cold water; when boiled it requires a large proportion of water to diſſolve it, and as ſoon as cold it eaſily ſeparates itſelf from it again: it is laſtingly bitter to the taſte, and crackles very much when thrown into the fire: it is neither acid nor alkaline, nor approaches in its nature to any other *ſalt* hitherto known; but ſeems neareſt of all others to reſemble ſandiver. This may ſuggeſt a query, whether the fire in producing the fixed alkali, does not at the ſame time produce this *ſalt* from vegetables; and whether by combining the ſand and alkali together in glaſs-making, the fire does not again ſeparate and throw up this *ſalt* in ſandiver. Something of this kind ſeems to be the caſe, and a cloſe inquiry on theſe principles may ſhew us why tartar, in the ſtate of an alkali, does not afford this *ſalt*; for tartar proceeds from a ſubtile liquor, intimately fermented in all its parts. There yet remains the trying this *ſalt* on various bodies, by means of fire, to give a true knowledge of its nature, which is at preſent too little known. This is to be obſerved, however, that it differs ſo much from the alkali, in which it is contained, that the careful chemiſt, before he makes uſe of that alkali in any nice proceſs, or experiment, ought carefully to ſeparate this neutral *ſalt* from it. *Boerhaave's* Chem. P. 2. p. 100.

Fuſible SALT *of urine*. This *ſalt*, otherwiſe called by ſome *ſal microcoſmi*, and *native ſalt of urine*, is extracted from *urine* in a particular manner.

It is beſt prepared from putrified human *urine*; but it may be prepared from freſh. A quantity of the *urine* of ſound beer drinking men being putrified in a moderate heat, and then ſlowly boiled in glazed earthen veſſels to the conſiſtence of a ſyrup; if this liquor be placed in a cellar or cool place, in about four weeks time, or ſooner in winter, cryſtals of a peculiar figure will be formed. But theſe being impure, muſt again be diſſolved in a ſufficient quantity of water, and filtered as hot as poſſible through grey paper, and the ſolution again put in a cool place, where in a few days cryſtals will again be formed much cleaner than the former. Theſe being ſeparated from the liquor and dried, the operations of ſolution, filtration, and cryſtallization, muſt be reiterated twice or thrice, till the *ſalt* becomes perfectly white and without ſmell.

Mr. Marggraff ſays, that 100, or 120 meaſures of *urine* give about three or four ounces of this *ſalt*, which always cryſtallizes firſt, and is eaſily diſtinguiſhed from that which appears afterwards in cryſtals of a long and cubical form.

This *ſalt* is ammoniacal, but of a peculiar nature. It is a ſaline acid body. By diſtillation an urinous volatile ſpirit firſt riſes. The reſiduum may be reduced by a violent fire into a pellucid white tranſparent maſs like glaſs, of a very fixed nature, and from which neither acid nor any thing elſe can be ſeparated, without the addition of ſome other matter.

This vitreous ſubſtance may be entirely diſſolved in two or three parts of diſtilled water, and is thereby changed into a tranſparent liquor, ſomewhat thick, not unlike the concentrated oil of vitriol, and having the properties of all acids, ſuch as fermenting with volatile and fixed alcalies, forming neutral *ſalts* with them, precipitating bodies diſſolved in alcaline menſtruums, and diſſolving alcaline earths. It does not diſſolve gold nor ſilver; and copper, tin, and lead little; but iron very ſtrongly. It extracts a red colour from *cobaltum pro cæruleo*, in German, *blau farben-kobalde*, the mineral by which glaſs is tinged blue.

But this *ſalt*, in its dry ſtate attracts metals with much more vigour, and with them produces ſeveral remarkable and ſingular phænomena; for all which, as alſo for the relation their *ſalt* bears to acid, alcaline and neutral *ſalts*, we refer to the learned author, who has alſo examined its effects on ſeveral ſolutions of terreſtrial bodies. One moſt eminent property is, that mixed with the inflammable part of ſoot, and diſſolved in a cloſe veſſel, it produces a phoſphorus. An ounce of this *ſalt* of urine thus ſeparated from its urinous part, and exactly mixed with half an ounce of ſoot, affords in this way a drachm of the beſt phoſphorus. The reſiduum did not produce any when tried.

The learned author does not pretend to determine exactly the true origin of this *ſalt*, he thinks its acid may come into the human body from vegetable aliments. He has obſerved elſewhere that creſſes, muſtard, rocket, and even corn expoſed to a very violent fire, produce a phoſphorus. Hence he thinks this acid muſt be mixed with thoſe ſubſtances; and the like may happen in other vegetables. He thinks this conjecture ſtrengthened, becauſe urine in ſummer, when people eat moſt vegetables, always produces this *ſalt* in the greateſt quantity. *Marggraff*, in Mem. de l'Acad. de Berlin 1746. See alſo Miſcel. Berol. Tom. VII. p. 341.

Spirit of SALT. This menſtruum diſſolves iron into a yelloviſh green liquor, and copper into one of a very deep yellow colour: tin diſſolves in it with great violence and noiſe, and in great quantity; the ſolution becomes a thick but pellucid fluid: lead alſo diſſolves in it; but after this ſolution has ſtood for ſome time, there always ſubſides to the bottom a white powder. Silver, if it is perfectly pure, does not diſſolve in *ſpirit of ſalt*, but if it contain ever ſo little copper, as it is very ſeldom met with perfectly pure from that metal, its ſurface is then always corroded, and its colour ſullied. *Spirit of ſalt* diſſolves mercury into a limpid liquor; if diluted with water it does not diſſolve the regulus of antimony; and if this regulus is diſſolved by the moſt concentrated *ſpirit of ſalt*, if a little water be added, or it be only expoſed to a moiſt air, it is reduced to a fine powder. Zink diſſolves eaſily and perfectly in this menſtruum. *Cramer's* Art of Aſſaying, p. 38.

SALT-*marſh*, *ſalina*, a place where *ſalt* is made, of which there are many natural ones in the hotter countries, where the ſea exhaling the water of *ſalt* lakes, leaves the *ſalt* dry and ready for uſe at the bottom, without any art or labour of man to make it: thus in Muſcovy and ſome other places there are whole fields of *ſalt*. See *bay* SALT, ſupr.

The countries, however, where this is not naturally performed, may effect it by art, and make *ſalines* or *ſalt marſhes*, where they may uſe the ſun's heat to great advantage. This is annually done to great advantage in France, and there is no reaſon why we may not do the ſame, either at home or in our American colonies, though it has not yet been attempted.

In order to make a *ſaline* or *ſalt marſh*, a low plat of ground muſt be choſen, adjoining to the ſea, and diſtant from the mouths of large rivers, and this muſt be near ſome convenient harbour for veſſels. The ground muſt be free from freſh water ſprings, and out of the reach of land floods, and if poſſible ſhould have a clayey bottom; and finally, it muſt be well defended from the ſea, either by natural or artificial banks of earth of a proper ſtrength and thickneſs.

The ground thus choſen muſt be hollowed out to three ponds or receptacles. The firſt into which the ſea water is uſually admitted may be called the reſervoir. The ſecond receptacle, which is to be divided into three diſtinct ponds, communicating with each other by narrow paſſages, and containing brine of different degrees of ſtrength, may be called the brine ponds; and the third receptacle is to be furniſhed with an entrance, between which and the brine ponds there is to run a long narrow and winding channel; the reſt of it is to be divided into ſmall and ſhallow pits, containing a very ſtrongly ſaturated brine, which in them is to be converted into *ſalt*, and they may therefore very properly be called the *ſalt* pits.

The firſt receptacle or reſervoir muſt have a communication with the ſea by a ditch, defended on each ſide by walls of brick or ſtone, and made of ſuch a depth, that by it all the water of the reſervoir and other parts of the *ſalt marſhes* may be able to run out at low water, and by it alſo the ſea may be admitted into it at high tide. So that at neap tides the marſh may be filled with ſea water to the depth of ten inches in the reſervoir; and conſequently, at higher tides, to the depth of two feet, when there is occaſion to overflow the marſh, as is always to be done in the winter ſeaſon, when there is no *ſalt* to be made; for, by this means, the wood work is kept from decay, and the clay bottom from injuries by froſt. The ditch between the reſervoir and the ſea muſt have a flood-gate, by which the ſea water may be admitted, retained or let out as occaſion may require. *Brownrig* of Salts, p. 37. Phil. Tranſ. N° 51.

The ſeveral ponds or receptacles muſt not have all their bottoms upon the ſame level, but muſt be made of unequal depths, ſo that the firſt receptacle or reſervoir may be eight inches and a half deeper than the *ſalt* pits in the third receptacle. The three brine ponds alſo ſituated between the reſervoir and the *ſalt* pits muſt be of unequal depths. The next adjoining to the reſervoir muſt be the deepeſt, and that which is nigheſt the *ſalt* pits the ſhalloweſt, but all of them muſt be ſhallower than the reſervoir; and the three receptacles being thus conſtructed, the water ſtanding at the ſame height in them all, and forming with its ſurface one continued plain, will be ten inches deep in the reſervoir, when only an inch and half in the *ſalt* pits.

The length and breadth of the brine ponds and reſervoirs are to be at diſcretion; but it is beſt to err in making them too large, and in general they ought to be ſo large as to furniſh the *ſalt* pits with a conſtant ſupply of brine, fully ſaturated with *ſalt*; and, for this purpoſe, it is neceſſary to have them of different dimenſions, in different countries, according to the degree of heat.

The bottoms of the reſervoir and brine ponds are to be lined with any kind of lean and tough clay, or earth, that will hold water; and the French uſe a red, or blue clay, to be had in the neighbouring grounds. With them the blue always ſucceeds better than the red, which colours the *ſalt* much more; but in order to have a perfectly pure *ſalt* from this kind of manufacture, the bottom ſhould be lined with ſome clean cement, which will hold water perfectly, and will not be eaſily broken up. Id. Ibid.

The *ſaline* or marſh being thus conſtructed; the ſaltmen, at the proper ſeaſon of the year, open the flood-gate when the tide is out, and drain off all the ſtagnating water; when this is done, they repair the bottom of the marſh in ſeveral places, where it is found neceſſary, and cleanſe the ſeveral receptacles from mud and dirt: after this they admit the ſea water, at the next high tide, till it floats the whole marſh, and ſtands at about ten inches high in the reſervoir. In a day or two moſt of the water in the *ſalt* pits is exhaled, and what remains is a very ſtrong brine, they then let in more ſea water at the two or three following tides; and ſo take care to admit as much water freſh into the marſh as has been waſted in vapour by the heat, conſtantly raiſing it to the height of ten inches in the reſervoir, and conſequently to an inch and half in the *ſalt* pits; and when the weather is extremely hot, or there are ſharp drying winds, they fill them ſomething higher than this.

All the parts of the marſh are thus ſupplied with water out of the reſervoir, but the ſea water which is let into the reſervoir, is not confuſedly let into the other water or brine of the ponds and *ſalt* pits; for, as the ſeveral parts of the work communicate only by narrow channels: it is provided, that the *ſalt* water flowing out of the reſervoir never returns to it again, but gently flows along till it arrives at the ſecond brine pond, and from that to the third, being forced forward by the ſea water received from time to time into the reſervoir: during this flow courſe, the watery fluid alway flies off in great quantity by exhalations, and the brine is continually preparing for cryſtallization as it flows along gently, growing all the way ſtronger and ſtronger, as it approaches the *ſalt* pits; ſo that when it at length enters theſe pits, it is fully ſaturated with *ſalt*; and particular care is taken to guard the entrance of the *ſalt* pits by a long and narrow channel, by which means the ſtrong brine contained in theſe pits is prevented from returning back, and mixing with the weaker brine in the brine ponds; care is alſo taken, that the ſtrong brine in the *ſalt* pits is ſpread out very thin, and expoſed to the ſun and air with a large ſurface, by which means the water more quickly exhales from it, and the *ſalt* is left concreted into cryſtals. Theſe cryſtals, or *ſalt*, the workmen in France draw out every day, and diſpoſe them at length together in a pyramidal heap, which they cover over at the top with thatch or ſtraw, and ſo preſerve them from the injuries of weather. Thus at a ſmall expence and trouble a *ſalt* is prepared, which is found very fit for all domeſtic uſes; and France is furniſhed with a very profitable article for exportation into other countries. *Brownrig* of Salt, p. 43. See *Bay* SALT, ſupra.

SALT-*petre*. There are ſome lands in Jamaica and our other American plantations, which are ſaid to contain *ſalt-petre*; though there have been no works ſet up for the refining and preparing it. The earth containing it has been found to have very different effects on vegetables from thoſe of common earth.

The ſugar canes that grow on theſe ſpots ſhoot up much faſter, and grow larger than in other grounds; but they rot very ſoon if not ground, and they do not boil ſo well into ſugar as the others. Potatoes planted in theſe grounds are always found to be two months forwarder than others, but they muſt be uſed ſoon, otherwiſe they decay, the *ſalt-petre* eating away the ſkin, which is thinner on thoſe roots which grow in this ſort of ground than elſewhere; and the fleſhy part of this beginning to rot and moulder away. The tobacco planted, on the ſame grounds, is greatly altered in its nature alſo. It grows up very quickly, and becomes robuſt and ſtrong, but it will not be cured to ſo good a colour as that which grows on common earth, nor will it keep ſo well; many cargoes of this tobacco have wholly periſhed at ſea, by the leaves mouldering away to duſt. And it is reported, as a certainty, that this tobacco, when ſmoaked, flaſhes in the pipe with large flames. Phil. Tranſ. N° 33.

SALT *ſprings*. There is a copious *ſalt ſpring* in the neighbourhood of Durham, loſt to the country, by its riſing in the bed of the river Weare. It does not iſſue out of any one particular ſpot, but bubbles up from the mud and rocks for the ſpace of forty yards in length, and about ten yards in breadth. It is beſt examined in dry ſeaſons, in the middle of ſummer; for at this time the water of the river is all carried into another part of the channel, and this place left dry. The greateſt quantity at this time is found to iſſue out of a hard rock. It is as *ſalt* as any of the Cheſhire brines; and though but very ſmall in quantity, in proportion to the ſize of the river, yet it gives a manifeſt ſaltneſs to the water a hundred yards below. The brine has been collected in ſummer by ſome curious people, and evaporated, and is found to yield a very uſeful *ſalt*, not like that of the common inland *ſalt ſprings*, which is our white baſket *ſalt*, but rather like the bay *ſalt*, of a duſky colour, and not very pleaſant taſte, but as fit for all the uſes of life as any other *ſalt*. The water of this ſpring, as it runs among the ſtones in ſummer tinges them all of a reddiſh colour, which is a property not common to other brine. Phil. Tranſ. N° 163.

In Cheſhire, and many other counties, they make a great uſe of the water of theſe ſprings, as a manure for their lands. They let out the water of theſe ſprings for a certain time upon the lands, after there has been rain, and by this means the quantity of *ſalt* they contain is ſo blended with the rain water, that it is too weak to hurt the corn or graſs, and yet is ſtrong enough to kill worms, and other vermin.

The vegetables of all kinds are improved alſo by this, for there are no lands that fatten cattle ſooner, than the paſture grounds which are thus, at times, overflowed by the *ſalt* water.

We have inſtances of a like effect of ſea *ſalt* in ſmall quantity, and but occaſionally laid on, doing great good to paſture in thoſe high paſtures about Erith, which are only overflowed ſometimes in ſpring tides. Theſe fatten cattle of all kinds in a very ſurpriſing manner. It is a wonder that no body has yet attempted a regular manuring of land with *ſalt* upon this plan, for bay *ſalt* might be had at a very ſmall price in time of peace, and a buſhel or two allowed to an acre, would probably have all the advantages that theſe

overflowings of the high tides, and natural *ſalt* ſprings, are found to have. Some farmers have tried the ſcattering *ſalt* over their corn fields, as ſoon as ſown, in the quantity of two buſhels to an acre, and it is ſaid with good ſucceſs. *Mortimer*'s Huſbandry.

SALTS *microſcopically examined.* Mr. Lewenhoek has opened a very extenſive field for microſcopic obſervations, in the evaporation of certain fluids, in which *ſalts* of various plants, and other ſubſtances of a like kind, had been diſſolved.

The fixed *ſalts*, in general, are ſaid by chemiſts to admit of no cryſtallizations at all; but this curious obſerver found, that on being evaporated in ſmall quantities before the microſcope, they each would ſhoot into extremely minute, but regular cryſtals, and thoſe often of various forms in the ſame *ſalt*; but that theſe varieties were only of a certain number, and that no other *ſalt*, but that to which they belonged, had them all in the ſame regular manner.

The ſophiſtications of *ſalts*, too common among our chemiſts, may be diſcovered by this means, and many other advantages may be obtained from it, as well as great amuſement, in the obſervation of the variety and beauty of the figures.

The moſt agreeable way of examining theſe *ſalts* is by the ſolar microſcope; but the moſt accurate, and fitteſt for making deductions from, is that by the common double microſcope. The way is to diſſolve a ſmall quantity of *ſalt*, of any kind, in water, and add to this about one fourth part of ſpirit of wine; this renders the whole a much leſs fit menſtruum for keeping the *ſalt* in ſolution, and conſequently it much more readily concretes from among it. A large drop of this liquor is to be laid on the ſurface of a thin and clear piece of glaſs, ſuch as may conveniently be laid upon the ſtand for receiving objects in this microſcope; then this glaſs is to be held till gently heated over a clear fire, and when it begins to evaporate, the glaſs is to be placed under the microſcope, and about a third magnifier uſed to examine it. The *ſalts* will ſoon be ſeen beginning to ſhoot, and will form themſelves under the eye into very beautiful figures; ſome reſembling branches of trees, others ruins and fortifications, and the like; but what are moſt to be depended upon, as eſſential to the *ſalt*, are certain little ſingle ſhoots, reſembling cryſtals; theſe are determinate in their figure, the others more vague and uncertain. Theſe will always be produced the ſame from the ſame *ſalt*, the others ſcarce twice from even the different drops of the ſame ſolution, alike in all reſpects. Philoſ. Tranſ. N° 172. p. 1075.

Carduus Benedictus affords three different kinds of *ſalts*, or cryſtals, ſingle and perfect in their kinds; the one is a thin ſquare, another an oblong, and thicker body, terminated by a point at each end, and reſembling in miniature the perfect double pointed ſhoots of rock cryſtal; and the third a quadrilateral pyramid, of the ſhape of the cryſtals of common *ſalt*. The oblong double pointed ſhoots are the moſt numerous in this *ſalt*, and ſeem to be the perfect figure of the genuine and purer *ſalt* of the plant. They are ſo numerous and minute, that Lewenhoek ſays he ſaw as many of them in the quantity of a ſingle grain of water, as the eye can count ſtars in a clear night.

Theſe, as alſo the cryſtals of many other *ſalts*, continue regular while the water is about them, but as that evaporates they join together, and become confuſed.

Wormwood affords a great variety of figures in its *ſalt*. When this begins to ſhoot by the evaporation of the water, there are diſcovered a number of very ſmall double pointed ſhoots, reſembling the ſhape of a weaver's ſhuttle; after theſe there are found ſome ſquare ones, then ſome which have ſix angles, yet are flat and thin; ſome others reſemble triangles with the corners cut off, and ſome are large and oblong; others large and ſquare, and bordered round with the reſemblance of the cut edges of a looking glaſs.

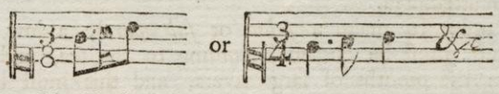
Blue vitriol, beſide its own rhomboidal cryſtals which ſhoot firſt, affords afterwards many oblong ones. The firſt rhomboidal ones have no ſenſible thickneſs, but they grow larger and thicker every inſtant, while the eye looks at them. They are pellucid and colourleſs at firſt, but afterwards they by degrees become blue, as they encreaſe in thickneſs.

Oil of tartar, made by diſſolving the *ſalt* into a liquor by the humidity of the air, firſt ſhoots into oblong and cylindric, but very thin bodies, reſembling ſmall cuttings of hairs; after theſe there appear certain flat bodies, having either two oblique ends, or one end ſtrait, and the other oblique.

Ruſſia pot-aſh firſt concretes into figures like a weaver's ſhuttle, but theſe ſoon after enlarge, and loſe their form: after this there appear hexangular figures with broad baſes, reſembling ſome of the native diamonds and cryſtals; among theſe there are others oblong and flat, but truncated at each end, and ſome roundiſh; others approaching to that figure, but with ſeveral angles, irregular both in number and ſize.

Camphor forms regular cryſtallizations, approaching to a rhomboidal figure, having ſix perfect ſides, though generally irregular in bigneſs, and their thickneſs is generally equal to their breadth. Among theſe are many irregular ones; ſome ſhaped like the flint of a gun, and ſome broad at the baſe, and running to a taper and fine point. Philoſ. Tranſact. N° 173. p. 1089. See Tab. of microſcopical Objects, Claſs 3.

SALTARELLA, or SALTARELLO, in the Italian muſic, is applied to triple time, the firſt note of which is pointed thus:



Airs in this kind of movement are ſaid to be in *ſaltarello*. Such are the Venetian forlanos, ſicilianas, ſome jigs and other gay dances.

SALTATIO *mimicorum*, in antiquity. See DANCE, *Cycl.*

SALTO, in the Italian muſic. See LEAP.

SALVIA, *ſage*, in the Linnæan ſyſtem of botany, makes a diſtinct genus of plants, comprehending the *horminum*, and *ſclarea* of Tournefort and other authors, as plants of the ſame characters, and properly of the ſame genus: the characters of which are, that the calyx is a one leaved perianthium hollow, ſtriated, larger and compreſſed above, with an erect bilabiated edge; the upper lip being divided into three ſegments, the lower into two. The flower is a ſingle petal in form of a tube, large, and compreſſed above, and labiated at the mouth; the upper lip is concave, compreſſed, bent, and rimmed round its edge; the lower is broad and trifid; the middle ſegment being large, roundiſh, and rimmed round the edge. The ſtamina are two filaments bifid from their middle; the two branches remote, and having an obtuſe ſinus, one branch being the longer, and hid under the upper lip of the flower, and on this the anthera is placed; the other is terminated by an obtuſe body, probably a nectarium. The piſtil has a quadrifid germen, a thread-like, and very long ſtyle, placed in the ſame direction with the ſtamina, and a bifid ſtigma. There is properly no fruit, the calyx or cup of the flower cloſing ſlightly, and containing in its bottom four roundiſh ſeeds. *Linnæi* Gen. Plant. p. 6. See Tab. 1. of Botany, Claſs 4.

The characters of this genus, according to Tournefort, are theſe. The flower conſiſts of one leaf, and is of the labiated kind; the upper lip is ſometimes only arched, ſometimes very much hooked, the lower is divided into three ſegments; the middle one being protuberant, not hollowed like a ſpoon, as in the claries. The piſtil ariſes from the cup, and is fixed in the manner of a nail into the hinder part of the flower, and is ſurrounded with four embryos, which afterwards become as many ſeeds of a roundiſh figure, which ripen in a tubular caſe, that was originally the cup of the flower. To theſe marks it may be added, that the ſtamina reſemble the os hyoides in animals. *Tourn.* Inſt. p. 180.

The ſpecies of *ſage* enumerated by Mr. Tournefort are theſe. 1. The greateſt yellow flowered mountain *ſage* with clary leaves. 2. The large broad leaved *ſage*. 3. The greater *ſage* with purple flower cups. 4. The greater *ſage* with changeable coloured leaves. 5. The great *ſage* with leaves variegated with green and yellow. 6. The three coloured ſilvery *ſage*. 7. The leſſer *ſage* with ſinuated leaves edged with yellow. 8. The roundiſh leaved *ſage*. 9. The broad leaved ſerrated *ſage*. 10. The wormwood *ſage*. 11. The berry-bearing *ſage*, or apple *ſage* of Candy. 12. The Candy *ſage* without apples. 13. The white flowered Candy *ſage* without apples. 14. The narrow leaved ſerrated *ſage*. 15. The leſſer auriculated, and not auriculated *ſage*. 16. The ſmall white flowered not auriculated *ſage*. 17. The leſſer *ſage* with variegated leaves. 18. The thin leaved Spaniſh *ſage*. 19. The lavender leaved Spaniſh *ſage*.

The common broad leaved *ſage*; or, as we uſually call it, from the colour of ſome of the leaves, red *ſage*, is a ſudorific and diuretic; it promotes the menſes, and is good in palſies, vertigoes, tremors and catarrhs; and mixed with honey, it is ſaid to be one of the beſt known cures for the aphthæ and eroſions of the mouths of children.

The ſmaller leaved *ſage* generally ſold among us under the name of *ſage* of virtue, has the ſame qualities in a greater degree.

SALUSANDRIA, in botany, a name given by ſome authors to the nigella, called in Engliſh *gith*, or fennel flower. *Ger.* Emac. Ind. 2.

SALUTATION, *ſalutatio*, among the Romans, was a daily homage paid by clients and inferiors to their ſuperiors.

Among the great the atrium was the place appointed for this purpoſe, but among people of middling condition the veſtibulum only. See the articles ATRIUM and VESTIBULUM.

This practice of *ſalutation* was not confined to the city, but took place in the army likewiſe, it being uſual for the private ſoldiers to go very early in the morning to *ſalute* their centurion, who at their head proceeded to *ſalute* the tribune, and then the tribune, with the reſt, went and *ſaluted* the imperator, or commander in chief.

The women too had their crowds of *ſaluters* attending them every morning. *Pitiſc.* in voc. *ſalutatio*.

The manner of receiving thoſe who came to pay their reſpects,

ſpects, was to receive thoſe of the better ſort with a kiſs, and the poorer ſort had a ſmall entertainment given them, and were even feaſted by ſuch as wanted to be thought more liberal than ordinary.

SALUTATORIUM, in nunneries, a place where the nuns receive the ſalutation of thoſe that come to ſee them. *Hofm.* Lex. univ. in voc.

Salutatorium is alſo uſed for the veſtry, or place where the biſhop was dreſſed, and received the ſalutation of viſitants before divine ſervice. Id. ibid.

SALUTIGERULI, among the Romans, were ſervants chiefly employed by the women in carrying ſalutations to one another. *Pitiſc.* in voc.

SAMALUM, in botany, a name by which Pliny and ſome other authors have called the *pulſatilla*, or paſque flower. *Ger.* Emac. Ind. 2.

SAMARRA, a garment worn by thoſe condemned by the Romiſh inquiſition to be burnt; ſuch are impenitents, and thoſe who confeſs themſelves guilty of hereſy, but repent, and renounce their errors before the execution.

It is a black kind of frock, made of ſackcloth, and painted with flames pointing downwards; ſometimes the unhappy ſufferer's picture is drawn to the life on it, and ſometimes devils are painted on it dragging, as it were, the perſon along with them to hell. It is otherwiſe called *ſambenito*, and *ſamaretta*. *Hofm.* Lex. univ. in voc.

SAMBAK, or ZAMBAK, in botany, a name uſed by ſome authors for the jaſmine, or common white jeſſamy. *Chabræus*, p. 112.

SAMBENITO, a kind of frock worn by thoſe who are condemned by the Romiſh inquiſition to be burnt. See the article SAMARRA.

SAMBUCA, among the antients, a triangular muſical inſtrument. *Pitiſc.* in voc.

SAMBUCUS, the *elder*, in botany, the name of a genus of trees, the characters of which are theſe. The flower conſiſts only of one leaf, and is of the rotated kind, and divided into many ſegments at the edges. The middle of the flower is perforated by the pointal of the cup, in the manner of a nail, and the cup finally becomes a berry, containing ſeveral oblong ſeeds.

The ſpecies of *elder*, enumerated by Mr. Tournefort, are theſe, 1. The common *elder* with black berries. 2. The common *elder* with white berries. 3. The racemoſe mountain *elder* with red berries. 4. The jagged leaved *elder*. 5. The dwarf *elder*, called *ebulus*, or danewort. 6. The dwarf ſhrubby *elder* with beautifully variegated leaves. 7. The jagged leaved *ebulus*, or danewort. *Tourn.* Inſt. p. 606.

SAMEL-*bricks*. See the article BRICK.

SAMIA *terra*, in the materia medica, an earth of the marl kind, found in the iſland of Samos, and much uſed both in medicine and in the pottery of the antients.

It is of two kinds, a white dull looking one, called the *collyrium ſamium*, and a browniſh and glittering one, called the *aſter ſamius*. *Hill*'s Hiſt. of Foſſ. p. 38.

The *collyrium ſamium* is ſtill to be found in the place from whence they had it, and from whence it has its name; and is a very fine and pure earth, of a cloſe, equal, and regular texture, and yet remarkably light. It is of a fine bright white colour, and of a ſmooth, even, and gloſſy ſurface. It is ſoft to the touch, adheres firmly to the tongue, is eaſily broken between the fingers, and does not at all ſtain the hands, but drawn along a rough ſurface, leaves a fine clean white line. It melts ſlowly in the mouth, and does not ferment with acids. Theſe are the characters by which it is to be diſtinguiſhed from the white earths: to which may be added its manner of lying in the earth; which is not, as that of moſt of the other earths, in a continued ſtratum, or bed, but in the perpendicular fiſſures, and horizontal cavities in the ſtrata of ſtone, in the manner of the European earths, called the *medullæ ſaxorum*, but in ſubſtance very different from them all.

The antients prepared them by burning, waſhing, and then uſed them with ſucceſs internally in hæmorrhages, and fluxes of all kinds, and externally in inflammations. They alſo uſed them, probably, both mixed together, and blended with ſome other viſcous earth, or clay, for the fineſt of their earthen ware. *Hill*'s Hiſt. of Foſſ. p. 38.

The other kind of *Samian* earth, called *aſter ſamius*, is ſtill found in the place from whence they had it, and lies in the ſame manner in which they have deſcribed it, in an horizontal cavity between two rocks.

It is a looſe, lax, and crumbly earth, of a mixed colour, between a duſky white and a pale brown, and all over ſpangled with ſmall glittering particles. It is of a looſe and incoherent ſtructure, but uſually breaks away into flat pieces, and ſeems ſomewhat of an obſcurely laminated make. It is of a dry duſty ſurface, falls to pieces very readily between the fingers, and though it duſts the hands, does not at all ſtain them. It melts very readily in the mouth, and when thrown into water parts immediately, with a hiſſing noiſe, into a number of flaky pieces, and from thence moulders into a looſe powder. It makes no efferveſcence with acid menſtrua, and when its glittering particles are ſeparated, and ſtrictly examined, they are found to be ſo many thin flakes of that ſpecies of foſſils, called *ſelenites*.

This, as well as the other ſpecies, or *collyrium*, was prepared by calcination and waſhing, and uſed by the antient phyſicians internally in fluxes and hæmorrhages, and externally in inflammations. It was alſo one of the moſt valued earths in the Roman pottery. *Hill*'s Hiſt. of Foſſ. p. 39.

SAMIARII, among the Romans, were a kind of furbiſhers, who with Samian earth poliſhed the arms of the prætorian ſoldiers and emperor's life guards. *Pitiſc.* in voc.

SAMIR, a kind of worm, which, according to the fabulous ſtories of the Jews, was made uſe of by Moſes in fitting and poliſhing the precious ſtones in the ephod, and the two tables of the law. *Hofm.* Lex. univ. in voc.

SAMLET, an Engliſh name for a fiſh of the truttaceous kind, caught in Herefordſhire, and ſome other parts of England, and called by Willughby *ſalmulus*. *Willughby*'s Hiſt. Piſc. p. 193. See SALMULUS.

SAMOLUS, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, is rotated, aad divided into ſegments at the edge. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the lower part of the flower, and finally joining with the cup, it forms a ſhell, or capſule, which opens at the ſummit, and contains a great number of ſmall ſeeds.

The ſingle ſpecies of *ſamolus*, according to Mr. Tournefort, is the *ſamolus valerandi*, called *anagallis aquatica rotundifolia*, or the round leaved water brook lime, by authors. *Tourn.* Inſt. p. 143.

SAMP, in our American colonies, a name given to a ſort of bread made of the maiz, or Indian corn.

They firſt water the corn for about half an hour, and then beat it in a mortar, or grind it in a hand mill; they then ſift out the flour, and winnow the huſks from it; they then mix this into a thin paſte with water, and bake it in flat loaves, which they call *ſamp* loaves, or *ſamp* bread.

Beſide this they have another diſh prepared of this corn, which they eſteem a great delicacy, and call by the name of *ſamp*, without the addition of loaf or bread. To make this, they only bruiſe or grind the corn to the ſize of rice, and then winnowing away the huſks, they boil it gently till it is thoroughly tender, and then add to it milk and butter, and ſugar: this is not only a very wholſome, but a very pleaſant diſh. It was the firſt diet of our planters when newly ſettled there, and is ſtill in uſe, as an innocent food in ſickneſs as well as health.

The Indians, who feed on this ſort of food, are found never to be ſubject to the ſtone, and to eſcape ſeveral other painful diſeaſes.

The Engliſh have found a way of making a very good ſort of beer of the grain of this Indian corn: they do this either by uſing the bread made of it, or elſe by malting it as we do our own corn. When they make the beer of the maiz bread, they break or cut it into lumps as big as a man's fiſt; they maſh theſe in the ſame manner that we do malt, and boil up the wort in the ſame manner, either with or without hops. Phil. Tranſ. N° 142.

SAMPHORÆ, among the antients, were horſes marked with the letter Σ on their legs. *Pitiſc.* in voc.

SAMPSUCHUS, a word generally uſed as a name of the common ſweet marjoram. This is as old a cuſtom as Dioſcorides; for that author expreſsly ſays, that the plant *ſampſuchus* was called *amaracus* by the Cyzenians, and ſome others whom he names, and ſeems to make them proper ſynonyms of the ſame plant; yet afterwards mentioning the oils, called *oleum ſampſuchinum* and *oleum amaracinum*, he declares them to be different medicines.

This might ſeem to imply a falſe text, either by the error of the tranſcribers or printers, in one of the places, but thoſe who are verſed in the writings of Dioſcorides, will not infer ſo much; for there are too many inſtances of this ſort of contradiction in his works. It appears, however, from the moſt antient writers of all, that the *amaracus* and *ſampſuchus* were originally the names of different plants.

Meleager in his poem, where he compares the ſeveral poets of his own and former times to the flowers of various garden plants, compares one to the *amaracus*, and another to the *ſampſuchus*. Galen and Paulus Ægineta alſo make them different plants, and allot different chapters to the treating of them. This would never have been the caſe, had the general opinion of the world at that time made them one plant; and the teſtimony of Dioſcorides, that they were ſo, will weigh very little with thoſe who know how often that author, though excellent in his way, is guilty of inaccuracies of this kind.

Diocles, in Athenæus, indeed mentions *amaracus*, which ſome call *ſampſuchus*: but even allowing that ſome people did call the *amaracus* by this name, it does not follow but that this might be improperly done, and that the *ſampſuchus* might ſtill be the name of a different plant.

SAMYDA, in botany, the name of a genus of plants firſt deſcribed by Plumier, and called by him *guldonia*; the characters are theſe. The cup is a very large one-leaved peri-

anthium

anthium, divided into five ſegments, which ſtand wide expanded, and remain when the flower is fallen, and are of an oval figure. The flower is of the ſhape of a truncated cone; it is of the length of the cup, and is dentated at the edge, and ſulcated. There are no ſtamina, but the apices ſtand each at the ſummit of one of the jags of the flower, and are of a roundiſh figure. The germen of the piſtil is of an oval figure; the ſtyle is of the length of the flower, and is of a pointed form; and the ſtigma is headed. The fruit is an oval berry with four deep furrows, divided into four cells, and containing a number of kidney-ſhaped ſeeds in an oval receptacle. Linnæus thinks this nearly related to the *melia*. *Plumier*, 24. *Linnæi* Gen. Plant. p. 520.

SANALIA, a name given by ſome authors to thoſe tumors, commonly called *meliceres*.

SANAMUNDA, in botany, a name uſed by ſome authors for the ſea heath ſpurge, or empetrum of the ſhops; a plant of the thymelæa kind.

In the materia medica, however, according to moſt catalogues, the *ſanamunda* is appropriated to be the name of the heath ſpurge, another plant of the thymelæa kind, different from the ſea ſort. *Park.* Theatr. p. 203. *Dale*'s Pharmac. p. 314.

SANATES, among the Romans, an appellation given to thoſe people in the neighbourhood of Rome, who having revolted, ſoon ſubmitted themſelves again; on which account they had equal privileges with the other citizens, there being a law in the twelve tables ordaining *ut idem juris* ſanatibus *quod foretibus ſit*. *Pitiſc.* in voc.

SANATODOS, in natural hiſtory, a name given by the people of Sicily to the ſpungy excreſcence found on the ſtalk of the dog roſe, and more uſually called the *bedeguar*.

This they greatly eſteem in all venomous bites, and uſe it in fine powder, both internally and externally, in many parts of that country. They uſe no other remedy for the bite of a viper: the wound is ſcarified, and ſome of the powder is ſprinkled on, and large doſes of it are alſo given internally in ſtrong wine.

In the bite of a mad dog they apply it to the wound, ſoftened into a ſort of pultice with oil, or with ſtrong wine; and they give it in repeated doſes internally in broths, and other weak fluids. They give it alſo in continual fevers, and in many other caſes, particularly in the colic. It is ſaid, that a ſingle doſe of a dram of it, in red wine, takes off all the pain of the colic in an hour.

There ſeems a very old opinion on the ſide of this medicine, in the cure of a bite from a mad dog; for Pliny tells us, that the root of the wild roſe, from the ſtalks of which this ſubſtance grows, was revealed in a dream for the curing this terrible diſeaſe. People, who have found out ſome one virtue in a plant, are generally ready to attribute a great many more to it; but though too much may be ſaid in praiſe of the virtues of this ſubſtance, by the people of that part of the world, it is well worth trying whether it does not contain ſome of them, as it is a thing very common among us, and eaſily had in any quantities. *Boccone*'s Muſeo de Piante.

SANCTORIAN *tables*, is uſed to ſignify ſuch regiſters as exhibit the quantities of perſpiration, its proportion to ſtool or urine, *&c.* We have ſuch tables from the obſervations of Dr. Lining at Charles-Town, South-Carolina. See Philoſ. Tranſ. N° 470, and 475.

SANCTUARIUM, in eccleſiaſtical writers, the ſame with *brandeum*. See BRANDEUM.

SANDS, *arenæ*, in natural hiſtory, a genus of foſſils, the characters of which are; that they are found in minute concretions forming together a kind of powder, the genuine particles of which are all of a tendency to one determinate ſhape, and appear regular, though more or leſs compleat concretions; not to be diſſolved or diſunited by water, or formed into a coherent maſs by means of it, but retaining their figure in it; tranſparent, vitrifiable by extreme heat, and not diſſoluble in, nor efferveſcing with acids. *Hill*'s Hiſt. of Foſſ. p. 544.

Theſe are ſubject to be variouſly blended and intermixed either with homogene, or heterogene particles, particularly with flakes of talc; and according to theſe, and their different colours, are to be ſubdivided into ſeveral kinds.

White SANDS. Of ſuch of theſe as are pure and free from heterogene particles, we have only ſix known ſpecies. 1. A fine ſhining kind, commonly uſed for ſtrewing over writing, and common in many parts of the kingdom. 2. A large ſhining white *ſand*, found in great plenty about Maidſtone, and ſent up to London for the making our common white flint glaſs. 3. A very fine white glittering *ſand*, found on the ſhores of ſome rivers in Italy, and uſed there for the fineſt glaſs. 4. A browniſh white fine, but dull looking *ſand*, very common in France, and uſed there in glaſs-making for the green glaſs; but though common enough with us alſo, is ſo much inferior to the other kinds we have, that it is never uſed or regarded. 5. A yellowiſh white fine dull *ſand*, common in the deſerts of Africa, and not leſs ſo in Italy, America, and England, but made no uſe of. And 6. a reddiſh white one, common in Suſſex, and in many other places.

Of the white *ſands*, mixed with *ſandy* particles of other colours, we have three ſpecies. 1. A large browniſh white ſhining *ſand*, found, ſo far as is yet known, only in one place, which is in the loam pits in Hedgerley near Windſor; and this is the very *ſand*, of which with clay that loam is compoſed, and to which probably it owes its value. 2. A large yellowiſh white ſhining *ſand*, which nearly reſembles the former kind, and which might be of uſe to make an artificial loam, in the place of the natural one beforementioned, as alſo in the glaſs trade: this is found about Deptford, Highgate, Hampſtead, *&c.* 3. A large coarſe variegated *ſand*, made up of white, black, reddiſh, and brown: this is very common in our gravel pits, and on the ſhores of the ſea and rivers.

Of the white *ſands*, containing heterogene particles, there are alſo three kinds. 1. A fine dull browniſh white *ſand*, with micæ, or ſmall ſpangles of talc: this is common near the ſurface in moſt parts of England. 2. A fine dull greeniſh white *ſand*, with micæ, common about Deptford, Woolwich, *&c.* And 3. a fine glittering greyiſh white *ſand*, with micæ, found in great plenty on the ſhores of the iſlands of Scilly.

Red, or *reddiſh* SANDS. Of thoſe which are pure there are five ſpecies. 1. A large ſhining red *ſand*, found on the ſhores of the iſland of Santorini. 2. A large ſhining fleſh coloured *ſand*, common about Naples. 3. A coarſe ſhining browniſh red *ſand*, common on the heaths of Suſſex. 4. A fine browniſh red ſhining *ſand*, found near the ſurface on Hampſtead heath. 5. A fine pale browniſh red ſhining *ſand*, frequent near the ſurface on the heaths of Suſſex. *Hill*'s Hiſt. of Foſſils.

Of the impure reddiſh *ſand* we know only one ſpecies, a pale red very fine one, with micæ: this is common in the deſerts of Arabia, and not in any other place, ſo far as is yet known.

Yellow SANDS. Theſe are a very numerous ſort. Of thoſe which are wholly pure we have thirteen known ſpecies. 1. A fine pale browniſh yellow one, common on Hampſtead heath. 2. A fine ſhining pale reddiſh yellow one, common about Highgate. 3. A very fine ſhining pale yellow one, common in the deſerts of Arabia, and alſo found with us in Kent and Suſſex. 4. A fine ſhining gold coloured *ſand*, common on Hampſtead heath. 5. A very coarſe ſhining pale yellow one, frequent every where to the north of London. 6. A coarſe dull whitiſh yellow one, common in Hyde-Park. 7. A large ſhining yellow one, found alſo in Hyde-Park. 8. A coarſe very bright yellow one, found in Northamptonſhire, and in ſome other counties. 9. A large dull yellow one, common on the ſhores of our rivers. 10. A fine dull deep yellow one, common in America, and in England. 11. A duſky yellow ſhining coarſe one, found on Hampſtead heath. 12. A coarſe ſhining browniſh yellow one, common among gravel about London.

Of thoſe mixt with arenaceous particles of other colours, we have ſix known ſpecies. 1. A fine greeniſh yellow pale and dull one, found on Hampſtead heath. 2. A fine greeniſh and reddiſh yellow pale dull one, found in Suſſex. 3. A coarſe blackiſh yellow ſhining one, common about Tyburn and elſewhere. 4. A fine blackiſh yellow ſhining one, common about London. 5. A large ſhining blackiſh and pale yellow one, found about Hampſtead. 6. A fine deep yellowiſh brown ſhining one, found in Glouceſterſhire, and ſome other counties.

Of the yellow *ſands* which contain heterogene particles, not arenaceous, we have nine ſpecies. 1. A browniſh yellow fine one, with micæ, found about Hampſtead. 2. A fine pale reddiſh yellow one, with ſmall ſpangles, common in America, and found with us in Suſſex and elſewhere. 3. A coarſe ſtraw coloured *ſand*, with micæ, found in Suſſex, and about London. 4. A coarſe ſulphur coloured *ſand*, with micæ. This is a more ſcarce ſpecies. 5. A large ſhining yellow *ſand*, with micæ, found on Hampſtead heath. 6. A fine dull deep yellow one, with micæ, common in moſt parts of the kingdom. 7. A large deep yellow *ſand*, with micæ, found in Northamptonſhire, and ſome other counties. 8. A coarſe ſaffron coloured *ſand*, with micæ, common in Germany, and found alſo in Suſſex. 9. A deep browniſh yellow fine *ſand*, with micæ, found about Highgate.

Brown SANDS. Of thoſe of this colour which are pure, we have only three known ſpecies. 1. A fine brown *ſand*, frequent about Woolwich. 2. A coarſe ſhining pale brown one, found on the ſhores of the Thames. And 3. a coarſe purpliſh brown ſhining one, common about Briſtol.

Of thoſe containing heterogene particles, we have only two ſpecies. 1. A dull brown coarſe *ſand*; this has among it ſome fragments of ſpar. It is found on the ſhores of rivers. 2. A coarſe ſhining pale brown one, common among gravel on the beds of rivers.

Black SANDS. Of theſe we have only two ſpecies. 1. A fine ſhining greyiſh black one, found in Italy, but not with us. 2. A fine ſhining reddiſh black one, which ſeems peculiar to America.

Green SANDS. Of theſe we yet know only one ſpecies, which is a coarſe variegated duſky green one, common in Virgi-

nia, but not known elſewhere. *Hill*'s Hiſt. of Foſſ. p. 568.

It is remarkable that *ſand*, though it appear a very hard, denſe, and indiſſoluble body, yet is contained inviſibly in the brine, or ſalt water of our ſalt ſprings; and even on the ſhooting of the ſalt, after evaporation, there ſtill remain the particles of it in the clear pellucid ſalt; and this, though wholly ſoluble in water, yet when a brine, made by ſuch a ſolution, is boiled, depoſits as much of the *ſand* as the common brine of the pits, or ſea water.

Dr. Plot, who was very curious to know the true hiſtory of this ſingular effect, procured experiments to be made in the following manner. Eight folds of fine Holland, and as many of much finer cambrick, were put together, and a quantity of the brine of the Staffordſhire ſalt pits being ſtrained through this, there was nothing ſeparated from it but a ſmall quantity of black duſt, which ſeemed to have fallen in by accident, and which was not at all like *ſand*; yet on evaporating this brine, it was found to contain no leſs than one fourth part as much *ſand* as ſalt. The quantity of brine yielding a buſhel of ſalt, yielding alſo a peck of *ſand*.

Some have ſuppoſed from theſe, and the like obſervations, that the *ſand* was generated during the time of the boiling of the liquor, but the more careful examiners think otherwiſe; it appearing to them, that the particles of this *ſand* may be ſeen in the brine, by the help of a microſcope, before the boiling, in form of rectangular oblong plates, ſome nearly ſquare; theſe were ſo ſmall, as readily to paſs the ſtrainer with the water; and appearing as numerous in it after, as before the ſtraining, ſhew that they are no more to be kept, but by ſuch means, than the ſalt.

The pores of the fineſt ſtrainers, examined by the microſcope, appear twenty times bigger than theſe plates, or particles of the *ſand*, and therefore it is not to be wondered at, that they let them through. There requires, therefore, no more to the formation of the *ſand*, than the coaleſcing of ſeveral of theſe particles into one larger granule, and ſo on; and this is very likely to be done by means of the evaporation of a part of the fluid which kept them ſeparate, and of the motion given to them in boiling, which naturally and neceſſarily brought them into the ſpheres of their own mutual attractions, at a time when their attraction with the fluid they ſwam in, was alſo much diminiſhed with its quantity. This attraction ſeems even evidently to increaſe between the particles, as the water becomes evaporated, and when finally the ſalt is drawn from it, and it is examined as it drops from the baſkets, in which the ſalt is put to drain; it is ſeen to contain more numerous particles of this ſandy matter than before; and theſe are found to coaleſce into yet larger concretions, by degrees, as the remainder of the fluid evaporates from them on the glaſs.

The particles of this ſtony matter, when once thus united, are no more to be ſeparated by water, nor is the matter any longer ſoluble in that fluid. The common ſpar found in form of ſtalactites and incruſtations on the roofs, walls, and floors of old caverns, ſhews that it was once diſſolved in water, and by that means brought to thoſe places, and made into thoſe forms; and it ſhould ſeem, that this *ſand*, as it is called, was only this ſort of ſpar, which is contained more or leſs in all water; and which, on the evaporating of that water and ſeparation of the ſalt, which might help in making the water a menſtruum proper for the retaining it, ſhoots out into its own natural concretions; for the figure of theſe thin plates is the true and natural thin parallellopiped or rhomboidal figure of the ſmaller concretions of that matter, and even of thoſe pieces into which it falls on breaking. Phil. Tranſ. N° 145.

Sand ſeems to have been the firſt ſubſtance added to proper ſalts for the making of glaſs. Joſephus, Tacitus, Strabo, Pliny, Agricola, *&c.* all mention this, and tell us of the ſtores, from which the *ſand* for this uſe was brought, being inexhauſtible.

Later ages have found that ſtones which have cryſtal for their baſis make a finer glaſs than *ſand*, of this kind are flints, *&c.* but theſe all are ſo expenſive in their preparation, that *ſand* is ſtill uſed in much greater abundance than any other ingredient. All the preparation it requires, is, that it be well waſhed before it is uſed; which much of what is uſed is found ready to their hands, being brought from the ſhores and beds of rivers.

Our glaſs-houſes, in London, uſe for their white glaſs the common white *ſand* uſed in writing, and have it from Maidſtone in Kent in vaſt quantities. For their green glaſs they uſe a common coarſe and greeniſh looking *ſand*, of which there are vaſt ſtrata at Woolwich. *Merret*'s Notes on Neri, p. 260.

Common *ſand* is a very good addition by way of manure to all ſorts of clay lands, it warms them, and makes them more open and looſe. The beſt *ſand* for the farmers uſe is that which is waſhed by rains from roads, or hills, or that which is taken from the beds of rivers; the common *ſand* that is dug in pits never anſwers nearly ſo well. *Sand* mixed with dung is much better than laid on alone: and a very fine manure is made by covering the bottom of ſheep folds with ſeveral loads of *ſand* every week, which are to be taken away, and laid on cold ſtiff lands, impregnated as they are with the dung and the urine of the ſheep.

Beſide clay land there is another ſort of ground very improveable by *ſand*; this is that ſort of black foggy land on which buſhes and ſedge grow naturally, and which they cut into turff, in ſome places. Six hundred load of *ſand* being laid upon an acre of this land, according to the Cheſhire meaſure, which is near double the ſtatute acre, meliorate it ſo much, that without plowing, it will yield good crops of oats or tares, though before it would have produced ſcarce any thing. If after this crop is taken off, the land be well dunged, and laid down for graſs, it will yield a large crop of ſweet hay.

Once ſanding this land will improve it for a vaſt number of years, and it will yield two crops of hay in the year, if there be weather to make it in. Some land in Cheſhire has been, by this means, rendered of twelve times its former value to the owner. The bogs of Ireland, when drained, have been rendered very fruitful land, by mixing *ſand* in this manner among the earth, of which they conſiſt. Add to this, that in all theſe boggy lands, the burning them, or firing their own turff upon them, is alſo a great advantage. The common peat, or turff aſhes, mixed with the *ſand* for theſe purpoſes, add greatly to its virtue.

Sea *ſand*, which is thrown up in creeks and other places, is by much the richeſt of all *ſand* for manuring the earth, partly its ſaltneſs, and partly the fat and unctuous filth that is mixed among it give it this great virtue. In the weſtern parts of England, that lie upon the ſea coaſts, they make very great advantages of it. The fragments of ſea ſhells alſo, which are always in great abundance in this *ſand*, add to its virtues; and it is always the more eſteemed by the farmers, the more of theſe fragments there are among it.

The ſea *ſand* uſed as manure in different parts of the kingdom is of three kinds: that about Plymouth, and on other of the ſouthern coaſts, is of a blue grey colour like aſhes, which is probably owing to the ſhells of muſcles, and other fiſh of that or the like colour, being broken and mixed among it in great quantity. Weſtward, near the land's end, the ſea *ſand* is very white, and about the iſles of Scilly it is very gliſtering, with ſmall particles of talc; on the coaſts of the north ſea the *ſand* is yellowiſh, brown, or reddiſh, and contains ſo great a quantity of fragments of cockle ſhells, that it ſeems to be chiefly compoſed of them. That ſea *ſand* is accounted beſt, which is of a reddiſh colour: the next in value to this is the bluiſh, and the white is the worſt of all.

Sea *ſand* is beſt when taken up from under the water, or from *ſand* banks, which are covered by every tide.

The ſmall grained *ſand* is moſt ſudden in its operation, and is therefore beſt for the tenant who is only to take three or four crops; but the coarſe or large grained *ſand* is much better for the landlord, as the good it does laſts many years.

Where the *ſand* is dredged out of the ſea, it is uſually twice as dear as where it is taken from the *ſand* banks.

When the land has been well manured with the large *ſand*, they take four crops of corn from it, and then lay it down for paſture for ſix or ſeven years before they plow it again. The graſs is ſo good, that they commonly mow it for hay the firſt year; it always abounds very much with the white flowered clover. If the graſs grows but ſhort, it is the farmer's intereſt to feed his cattle upon it, and it will turn to as good account this way, being very ſweet and rich, and making the cattle fat, and the cows yield a very large quantity of milk. *Mortimer*'s Huſbandry.

Indian SAND. The ſubſtance, commonly called *Indian ſand*, is famous for anſwering to the magnet. It is brought into ſeveral parts of Europe, and is ſaid to be gathered on the ſea ſhore in Perſia. After it is gathered, it is boiled in water to waſh away the ſea ſalt and other impurities it may contain. After this operation, it is dried and ſent abroad in form of a black powder, conſiſting of grains of different ſizes. Some of theſe grains are very rough in every part of their ſurface, and others have one ſide only rough, the others perfectly ſmooth and gloſſy. Their figure is very irregular, and reſembles that of the grains of common *ſand* only; the grains of this *Indian ſand* are uſually ſmaller than thoſe of our common *ſands*.

Theſe little lumps have neither taſte nor ſmell, and are ſo friable, that they are eaſily reduced to an impalpable powder by rubbing. Some of the particles are ſtrongly attracted by the loadſtone, and others are ſo inactive as to be ſcarce at all affected by it. Thoſe particles, which are of the deepeſt duſky black, are moſt of all affected by the loadſtone; thoſe which are not affected by it, ſeem rather of the colour of lead, of a bluiſh black and ſhining; theſe are in the greateſt quantity, and the others are ſelected from among theſe by the loadſtone. Phil. Tranſ. N° 432. p. 298.

Muſchenbroek conſidering that ſome of the particles of this *ſand* had ſo ſtrong a magnetic virtue, and others ſcarce any at all, was tempted to try whether it might not be poſſible to increaſe the like virtue in theſe laſt, and after ſome trials he found a way to ſucceed in this attempt; ſuſpecting, that there

there might be too great a quantity of ſulphur adhering to the *ſand*, to ſuffer it to be turned into any metalline regulus by a long continuance in an open fire; he mixed it with half its quantity of pot-aſh, and toaſted it in an open crucible about two hours: after this the ſalt being waſhed away with common water the *ſand* was found to be much blacker than before, and about one fourth of it was now endued with a very powerful magnetic force.

The ſalt has a great ſhare in making this *ſand* magnetic after burning; for a burning of it, without that admixture, is found to give it, indeed, ſome power of this kind, but it is very little.

There is another matter, however, which being mixed with this ſand, contributes yet greatly more to its virtue, this is black ſoap. This *ſand* being mixed with an equal quantity of black ſoap is to be put into a crucible, and placed in a gentle fire, where the ſoap will ſwell and bubble up; as ſoon as this is over, and the moiſture all evaporated, the fire is to be increaſed, and the matter kept red hot, about half an hour, or a little longer than that; then the crucible being taken out, and cooled, the remainder is to be waſhed, and this will be then a black powder; every grain of which is magnetical, and that very beautifully. If the operation be ever ſo many times repeated on the ſame *ſand*, the power remains the ſame in it, neither being increaſed nor leſſened by all the work.

A mixture of one third of this *ſand*, one third of black ſoap, and one third of ſalt of tartar, treated in the ſame manner as the former, ſeems to increaſe the virtue of magnetiſm yet farther in the *ſand*, than when treated with the ſoap alone; beef ſuet mixed with the *ſand* gives it much of the magnetic virtue, after melting and burning it away on the fire; and common pitch treated in the ſame manner with it, yet greatly increaſes it. If it be too long kept over the fire, with any of theſe mixtures, the virtue decreaſes, and if not long enough, it does not ariſe to its utmoſt height; ſo that experiments only can ſettle the true degree of heat, neceſſary to its greateſt perfection.

The greateſt power that can be given to this *ſand*, in this quality of magnetiſm, is, however, to be given in the following manner. Mix together equal parts of the *ſand*, and of roſin, pitch, frankincenſe, and rape oil, put this into a crucible, and lute it well in all parts, then place it for an hour in a reverberatory furnace: when this is cooled, there will be found black grains of the *ſand*, between black coals of the oily matter, which, when ſeparated, will leap up to the magnet, when held at ſome diſtance over them; and ſhew, in all reſpects, the ſtrongeſt magnetic virtue, that we know communicable to this ſubſtance.

It might appear, from this experiment, that the *ſand* grew more ſenſible of the magnet, as its particles more approached to the nature of ſteel; but on making the trial by calcining the *ſand* with the ingredients uſed to turn iron into ſteel, ſuch as chimney ſoot, ſea ſalt, powdered charcoal and aſhes, it acquired ſome magnetic virtue indeed, but not nearly ſo great as that given it by the laſt proceſs, or by the ſimply mixing it with bluiſh ſoap before the calcination.

After theſe experiments, the queſtion naturally occurs, of what can this *ſand* be. It has been ſuppoſed by ſome, to be the granulæ or fragments of load-ſtones, or the ſeparated particles, which when concreted into a maſs, afford the common magnet; but this can by no means be the caſe, ſince common load-ſtones loſe of their force, by being calcined with the very ingredients which render this magnetic; and indeed the phænomena it affords on experiments are ſo very ſingular, that it is not eaſy to determine any thing about it.

There are ſeveral parts of the world which afford this *ſand*, but with ſome difference in the figure of its grains, and their magnetic virtue. Beſide Perſia it is found on the ſhores of Virginia; another ſort of it is found about Italy, and very common at Leghorn; this is very magnetic. There are two ſorts of it found in the river Eber in Haſſia, of which one is like the Italian, but the other conſiſts of large grains, almoſt as big as hempſeed, but having very little virtue. A very ſtrong ſort is found in Dalmatia, near old Raguſa; and probably future enquiries will ſhew, that there are yet many more kinds of it differing in ſtrength and ſize. Phil. Tranſ. N° 432. p. 301.

SAND *bags*, in the military art, are bags of earth or *ſand*, containing about a cubical foot; they are uſed for raiſing parapets in haſte, or to repair what is beaten down.

They are alſo of uſe when the ground is rocky, and affords no earth to carry on their approaches, becauſe they can eaſily be brought from far off, and removed at will.

The ſmaller *ſand-bags* hold about half a cubical foot of earth, and ſerve to be placed upon the ſuperior talus of the parapet, to cover thoſe that are behind, who fire through the embraſſures, or intervals, which are left betwixt them.

SAND *flood*, a term uſed by the people of Suffolk, and ſome other parts of England, to expreſs a miſchief to which they are ſubject, by having their lands covered with vaſt quantities of *ſand*, rolling in upon them like a deluge of water.

Mr. Wright, a ſufferer by one of theſe deluges, gives a very good account of them in the Philoſophical Tranſactions. In the neighbourhood of the plains, ſubject to this miſchief, there are always hills which are made up of *ſand*, and only covered with a thin turf. The plains themſelves, which are inevitably ruined by the deluge of this dry ſort, are alſo ſandy; having only the ſame ſort of thin turf on them, though capable of producing very good crops, and ſtanding all common accidents.

Violent winds break through the turf that covers theſe hills, and then the *ſand* lying looſe and naked, is ſoon carried down upon the plains, where it covers and buries the graſs, and in a very little time eats through the light turf, and mixing itſelf with the *ſand* underneath, becomes one bed of this dry matter never to be covered with a turf again. A large body of *ſand* being thus got together, nothing ſtops its progreſs; but it at every ſtorm rolls over more and more ground, ſo that in a few years it extends itſelf a vaſt way; eſpecially where the ground, over which it paſſes, is of the ſame ſandy nature, and only covered with a thin turf.

In ſome parts of Suffolk the ground encourages this change ſo greatly, that a bed of *ſand* broke looſe from a neighbouring hill, and covering only a few acres, perhaps eight or ten, will, before it has travelled four miles forward, which it does in a ſmall courſe of years, deluge a thouſand acres. It travels down hill faſter than any way elſe, but will not be ſtopped by aſcent, but will move up the ſteepeſt hill, only that it requires more time. The making of fences, in the common way, to keep it out is vain. It runs through the hedges, and flies over the tops of the banks; and when it reaches a village, in its courſe, will bury the cottages, unleſs preſerved at more charge than they are worth. It will in a very little time beat up to the eaves of a houſe, of the low kind, that are uſually built in country villages, and has often weight enough to break down walls in its paſſage.

The beſt way of ſtopping its progreſs is by hedges of furze, planted one over another as they become levelled; theſe, if well kept up, will, by degrees, ſtop or divert the progreſs; and ſome who have tried this, with reſolution, after they have had the *ſand* raiſed twenty feet high, have found it ſtop its increaſe; and then having manured this adventitious ſoil with dung, found it as good ground as that which made the ſurface before.

About Thetford the villages were wholly deſtroyed by this about ninety years ago; and the branch of the river Ouſe, called then Thetford river, ſo blocked up by it, that very ſmall veſſels only could go up it, where very large ones uſed before. The river has been of great ſervice in ſtopping its progreſs into Norfolk, where otherwiſe its courſe would have carried it, and its vaſt ſpreading ſideways in proportion of its going forward, would have made it bury vaſt quantities of land in a very few years.

The moſt probable conjecture, as to the cauſe of this ſtrange ſort of deluge in theſe parts of England, is, that this portion of the county of Suffolk lies eaſt north eaſt of a part of the great level of the fens, and is by this expoſed to very impetuous winds, which acquire more than ordinary force, by their paſſing through ſo large a tract of country uninterrupted; the ſtorms ſeem to be one great cauſe of the miſchief, and the ſandy nature of the ſoil the other. There are old ſtories in the country, of ſuits at law commenced among the farmers, for grounds blown out of the owner's poſſeſſion; but the people who gain this ſort of wandering land are the greateſt ſufferers. A little *ſand* ſprinkled by the winds over a tract of land, where there is a bed of *ſand* under the turf, ſoon eats through that obſtacle; and what was at firſt only a thin coat of *ſand*, becomes then a deep plain of it, capable of being blown away to the depth of eight, ten, twenty, or more feet, and is carried over every thing in its progreſs before the winds, when once taken up by them. Phil. Tranſ. N° 37.

SAND-*gavel*, a payment due to the lord of the manor of Rodley, in the county of Glouceſter, for liberty granted to the tenant to dig *ſand*, for their common uſe. *Blount.*

SAND-*lands*, a term uſed by our farmers to expreſs ſuch grounds, as conſiſt wholly of a pure ſheer *ſand*.

This is of different colours, as white, blackiſh, reddiſh, or yellowiſh, and is very different in its nature, and in the ſize of its particles, ſome being harſher and ſome milder, and ſome very light, ſeeming only to be mere duſt. The grey, black, and aſh-coloured *ſand*-lands are the worſt of all, and generally are found on heaths and commons. Gravelly lands approach much to the nature of theſe, and thoſe which conſiſt of largeſt ſtones, and are mixed with the harſheſt *ſands*, are of all the moſt barren.

The propereſt plants for arable land, of this kind, are white oats, rye, black wheat, and turneps. The natural produce, in weeds, is quick graſs, ſorrel, broom, furze, fern, and heath.

The beſt manure for them is either marl, or ſuch clay as will break with the froſts. Cow dung is alſo a good manure for theſe lands, and many uſe with ſucceſs chalk, mud, and the half rotten ſtraw from dunghils.

When

When the farmer has a mind to raiſe corn on theſe lands, he muſt order them, as the clays; (ſee CLAY-*lands*) but where they are over-run with broom, furzes, and ſuch ſort of weeds, marl is to be laid on in great quantities. This is the practice in Staffordſhire, and by it they rid themſelves of theſe troubleſome weeds, and procure good crops of corn, though at ſome expence.

The firſt ſowing of this land is with black wheat, and for this they make three fallowings in winter, and ſtir them in the May following; at this time they ſow them, allowing one buſhel of ſeed to an acre, which generally yields them ſixty again. Then once plowing theſe lands, after this crop is off, they are fit to ſow rye on.

In Oxfordſhire they ſeldom give theſe lands more than two fallowings for wheat, except they are very much over-run with weeds; and they eſteem the white and lammas wheat the moſt agreeable for this ſort of land, and then after a fallow rathripe barley. They afterwards generally fallow them every other year, and reckon them unfit for beans and peas, though they ſometimes ſow them with winter vetches. If they ſow peas on them, they eſteem the rathripe kinds the beſt.

In Herefordſhire they are much ſubject to moſs growing upon their *ſandy lands*, and they make a great improvement by burning it on the ground, and mixing the aſhes with lime, which they then plow in.

They generally ſow them with rye after this manure, and that yields a very great increaſe upon them, and brings on a very good kind of graſs, if they are laid down after a crop or two. *Mortimer*'s Huſbandry, p. 70.

SANDAL-*bricks*. See the article BRICK.

SANDALIGERULI, among the antients, ſervants whoſe buſineſs it was to carry their maſter's or miſtreſs's *ſandals*. *Pitiſc.* in voc. See SANDAL, *Cycl.*

SANDAPELONES, among the Romans, a kind of porters who were employed in carrying the bier called *ſandapila*. *Pitiſc.* in voc. See SANDAPILA.

SANDAPILA, among the Romans, a ſort of bier uſed for carrying out the bodies of people of low circumſtances.

It was not a bed, but a kind of wooden cheſt, made of a few boards nailed together, and was uſually burnt along with the body. *Pitiſc.* in voc.

SANDARACH, (*Cycl.*) in the works of ſome of the antients, a name by which the yellow matter collected on the legs of bees is called; others of them called it *erithace* and ſome *ambroſia*.

We uſually eſteem this to be wax; but the experiments of Reaumur, and others, evidently prove, that it is not real wax; though it contains the matter of which wax is to be made: it is only the farina of flowers, collected into lumps, and probably ſerves the bees as food; and after it has afforded them nouriſhment, ſuffers ſome change in their bowels, by which it is converted into the ſubſtance we call wax. *Reaumur*'s Hiſt. Inſ. V. 10. p. 510. See PAIN *d'abeile*.

Gum SANDARACH is eſteemed good in diarrhœas and hæmorrhages, its doſe being from ten grains to half a drachm. It is alſo ſometimes preſcribed in gonorrhœas and the fluor albus. See SANDARUS, infra.

SANDARESUS, in natural hiſtory, a gem, the chief property of which, according to Pliny, is its being pellucid, and containing in its ſubſtance a kind of gold coloured globules; which are likewiſe tranſparent, when ſeen betwixt one and the fire. *Hofm.* Lex. univ. in voc.

SANDARUS, in the materia medica, the original name of the gum, which later ages have, by corruption of the name, called *ſandarax* or *ſandaracha*. The latter name is peculiarly improper, as it confounds this innocent gum with a poiſonous mineral of the arſenic or orpiment kind.

The Arabians are not eaſily to be underſtood in what they ſay of this gum. Some deſcribe it as a diſtinct gum from all others, and ſay that it reſembled amber in its colour and properties; this ſeems to expreſs properly what we at this time call *ſandaracha*, which has much of the appearance of yellow reſin, and therefore cannot be wholly unlike amber; but, as this gum was uſed in varniſh, and ſeveral other gums were alſo uſed for the ſame purpoſe, theſe writers, according to their uſual cuſtom of attributing the ſame name to different things, which had the ſame properties, have ſometimes called the *cancamum* by this name, and ſometimes amber. Gum lacca has often been called alſo by this name by theſe authors; and the context only can clear up what is meant, when either the word *ſandarus* or *cancamum*, or vernix is uſed.

SANDASTER, in natural hiſtory, a kind of gem mentioned by Pliny, with gold coloured globules in it that ſhone like ſtars, and were in number and diſpoſition not unlike the ſeven ſtars. *Hofm.* Lex. in voc.

SANDIVER (*Cycl.*)—It is reported, by many authors of great credit, that this ſalt, in its genuine form, and no way differing from ſuch as is ſeparated from glaſs, is thrown out in great abundance in the eruptions of the burning mountains, and lies about in lumps of a ſpungy texture and great ſize, or in ſmaller ſolid ones among the ſciarri and aſhes thrown out at thoſe times. The more firm and ſolid pieces are the moſt pure, and are generally of a fine white; the others not unfrequently are tinged bluiſh or yellow, and have ſometimes ſome of the melted matter of the ſciarri blended among the maſs, and filling up ſome of the cavities. In the catalogue of the ſpecimens of ſubſtances thrown out of Mount Ætna in one of its eruptions, and ſent as a preſent to the Royal Society, we find mention of ſeveral pieces of *ſandiver*, but without any particular deſcription. Phil. Tranſ. N° 53.

SANDYX (*Cycl.*)—Though the generality of authors have taken this to be only a name for the fine red colour, ſome have plainly uſed it for a bluiſh green.

Strabo tells us, that the colours uſed by painters, in his time, and called *armenium pictorium*, was of a bluiſh green colour, and that it was called *ſandycis metallum* by ſome. Thus the word *zarnich* was made to expreſs the ſame two things with the addition of the yellow orpiment; and Aviſenna deſcribes them all together, telling us, that *zarnich* is yellow, red, or green. The two firſt of theſe colours are natural to zarnich, as the name of orpiment; and there is, indeed, a greeniſh zarnich now alſo known in the world, but that was unknown in his times; and, we find, that he meant the *lapis armenus* by the *green zarnich*.

SANE *memory*, i. e. Perfect and ſound memory to do any lawful act.

SANGUINALIS *lapis*, in natural hiſtory, the name of a ſtone, deſcribed by Monardes, and other authors, and celebrated for its great virtues againſt hæmorrhages.

It is of the Jaſper kind, and is properly to be called an accidental heliotrope, being of a duſky green, ſpotted and veined with red; and differing in nothing from our common heliotropes, which are brought from the Eaſt-Indies, but in that it is leſs tranſparent and coarſer. See the article HELIOTROPE.

SANGUINARIA, *bloodwort*, a name given by many botanical authors to the *lapathum ſanguineum*, or bloody dock, from the red veins in its leaves; and by ſome to the *cornu cervinum*, or buckſhorn plantain, from its ſuppoſed virtues. *Ger.* Emac. Ind. 2.

SANGUINARIA, in botany, the name of a genus of plants, the characters of which are theſe. The ſpatha is compoſed of two leaves, and is oval and concave, and ſhorter than the flower. The flower conſiſts of eight oblong and obtuſe petals; they ſtand very wide expanded, and the inner ones are narrower than the outer. The ſtamina are numerous ſimple filaments, ſhorter than the flower. The antheræ are ſimple. The germen of the piſtil is oblong and compreſſed. There is no ſtyle. The ſtigma is thick furrowed, with ſtriæ all along, and equals the ſtamina in height. The fruit is an oblong capſule, compoſed of two valves, and containing many round ſeeds. *Linnæi* Gen. Plant. p. 227. *Dillen*, Hort. Eltham, p. 252.

SANGUINEA, a name given by ſome of the chemiſts to nitre. See NITRE.

SANGUINEOUS *fevers*, a term uſed by the medical writers to expreſs a kind of fever, in which there is always a plethora, or fullneſs of blood, which nature is attempting to leſſen by means of this accelerated motion of it, either by forming ſome hæmorrhage, or by throwing a part of it off in form of ſweat. It is very obvious to reaſon, therefore, that bleeding is the firſt thing neceſſary in theſe fevers. The continent fevers, ſuch as the ephemera and ſynocha, are of this kind. *Junker*'s Conſp. Med. p. 252.

SANGUINEROLA, in ichthyology, a name given by the Italians to the *phoxinus*, or minow. Artedi makes this a ſpecies of cyprinus.

It has the Italian name from the blood red colour which diſplays itſelf under its belly. *Willughby*, Hiſt. Piſc. p. 268. See PHOXINUS.

SANGUINUS, in botany, a name given by ſome of the antients to the birch tree, from the deep reddiſh black colour of its twigs. Pliny calls it *ſanguineus frutex*, and not underſtanding that it was the ſame with the birch, mentions the name of that tree immediately after it, as if different from it. The Italians ſtill call the birch *ſanguino*; and ſome authors, from the redneſs of the twigs of ſome ſpecies of the alaternus, have called that ſhrub the *ſanguinus albus*. Some have ſuppoſed that this name was uſed to expreſs the birch tree alſo, but erroneouſly; for though the bark of the body of that tree is ſometimes white, there was no reaſon for adding that epithet to the word *ſanguinus*, which not being uſed for any other tree, could need no diſtinction. The Romans, and many other nations, uſed this tree as we do, for the puniſhment of children's faults; and it is poſſible that the name *ſanguinus* might be given it on this occaſion. *Pliny*, lib. 16. cap. 36.

SANGUIPURGIUM, a name given by ſome authors to a ſlight ſpecies of fever which was judged ſalutary, and only ſerving to purge and cleanſe the blood.

SANGUIS *draconis herba*, in botany, a name by which ſome authors call the *lapathum ſanguineum*, or bloody dock. *J. Bauhin*, Vol. 2. p. 988.

SANGUISORBA, in the Linnæan ſyſtem of botany, the name

of a diſtinct genus of plants, the characters of which are theſe. The cup is a perianthium, compoſed of two very ſhort leaves, placed oppoſite one to another, and falling with the flower. The flower is a ſingle petal, divided into four oval obtuſely pointed ſegments, which cohere only at their lower extremities. The ſtamina are four filaments, broad in the upper part, and of the ſame length with the flower. The antheræ are ſmall and roundiſh. The germen of the piſtil is ſquare, and ſituated between the cup and the flower. The ſtyle is ſlender, and extremely ſhort; and the ſtigma obtuſe. The fruit is a capſule containing two cells, filled with very ſmall ſeeds. *Linnæi* Gen. Plant. p. 46.

SANGUISUGA, in zoology, a name by which ſome authors expreſs the *hirudo*, or leech. *Charlt.* Inſ. p. 62. See the article HIRUDO.

SANGUISUGUM, a name given by ſome barbarous authors to a diſorder of the heart, ſuppoſed to ariſe from its retaining an abundant quantity of blood.

SANICULA, *ſanicle*, in botany, the name of a genus of the umbelliferous plants, the characters of which are theſe. The flower is compoſed of ſeveral petals, which are diſpoſed in a circular form, and have their points bending inwards. Theſe ſtand upon a cup, which finally becomes a fruit compoſed of two echinated ſeeds, which are gibboſe on one ſide, and flat on the other. Many of the flowers of the plants of this genus are barren.

The ſpecies of *ſanicle*, enumerated by Mr. Tournefort, are theſe. 1. The common wood *ſanicle*; and 2. the Canada *ſanicle*, with very large and jagged leaves. *Tourn.* Inſt. p. 326.

The medical writers all agree in celebrating this plant, as one of the greateſt vulneraries we have of our own growth. They recommend it for the healing freſh wounds and eroſions; and many go ſo far, as to talk of fiſtulas having been cured, by injecting a decoction of it: but the modern practice of ſurgery has fallen upon very different methods of practice, in theſe caſes, from their predeceſſors, and in conſequence of that, the whole tribe of vulnerary herbs are diſregarded.

SANIDIUM, in natural hiſtory, the name of a genus of foſſils, of the claſs of the ſelenitæ, but neither of the rhomboidal nor columnar kinds, nor any other way diſtinguiſhable by its external figure, being made up of ſeveral plain flat plates.

The word is derived from the Greek, Σανιδιον, tabella, a flat thin plate or table, and expreſſes a body made up only of ſuch plates. And the ſelenitæ of this genus are of no determinate form, nor conſiſt of any regular number of planes or angles, but are merely flat, broad, and thin plates or tables, compoſed of other yet thinner plates, like the talcs, but diſtinguiſhed from thoſe bodies by this, that theſe plates are made up of arangements of ſlender fibres, diſpoſed obliquely, but in uninterrupted lines acroſs the body.

The ſelenitæ having been always eſteemed (when meant of this claſs of bodies, for ſome have applied the word to certain ſpars and other ſubſtances) regularly figured foſſils, this genus has been overlooked by authors, and the ſpecimens of it which occurred, looked on as bodies of a different claſs, as ſpars or talcs. Their not fermenting with acids, however, determines them not to be ſpars; and their obliquely ſtriated ſtructure, their want of elaſticity, and their readily calcining in the fire, diſtinguiſh them from the talcs, and ſhew them to be true and genuine ſelenitæ. *Hill*'s Hiſt. of Foſſ. p. 122.

Of this genus there are only two known ſpecies, the one colourleſs and pellucid, the other whitiſh and opake. The firſt is found pretty frequently about Oxford, as alſo in Northamptonſhire, Yorkſhire, and other counties; the other is very common in all parts of Germany, and is found alſo in Leiceſterſhire, and ſome other parts of England, but with us it is not common. *Hill*'s Hiſt. of Foſſ. p. 144, 145.

SANIS, Σανις, among the Greeks, a kind of puniſhment, inflicted by binding the malefactor faſt to a piece of wood. *Potter*, Archæol. Græc. Tom. I. p. 131.

SANKIRA, in botany, a name given by ſome authors to the plant, of which the China root, uſed in medicine, is the root. *Kæmp.* Amœn. Exot. p. 781.

SANS *pareille*, in conchyliology, the name of a peculiar ſpecies of buccinum, which has its mouth opening a contrary way to that of all other buccina. This is a ſingle ſpecies among the recent buccina, but we find more than one kind with this peculiarity among the foſſile ſhells, and that in great abundance in many places in England.

SANTALUM, (*Cycl.*) in botany, the name of a genus of plants, the characters of which are theſe. The perianthium is a narrow rim, ſtanding on the germen of the piſtil, and rightly indented into four ſegments. The flower is monopetalous, and of the campanulated kind; its edge is divided into five acute ſegments. The ſtamina are eight filaments; they ſtand on the upper part of the tube of the flower, and are alternately one ſhorter than another. The antheræ are ſimple. The germen of the piſtil is turbinated. The ſtyle is of the length of the ſtamina; and the ſtigma is ſimple. The fruit is a berry. *Linnæi* Gen. Pl. p. 164.

SANTEO, in botany, a name given by the people of Guinea to an herb, which they eſteem remarkably good in all diſeaſes of the eyes, the herb being boiled in water, and the eyes waſhed with it. The leaves of this grow in pairs, oppoſite one to another, and have no footſtalks. The joints, or ſettings on of the leaves, are blackiſh, and they are of the ſize and ſhape of thoſe of the laurel. Philoſoph. Tranſact. N° 202.

SANTOLINA, *female ſouthernwood*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the floſculous kind, and is of a globoſe ſhape. The ſeveral ſmall floſcules, it is compoſed of, are divided each into ſeveral ſegments at the end, and are placed upon the embryos, with imbricated leaves between them, and the whole contained in a ſcaly cup of a ſemiorbicular figure. The embryos ripen into ſeeds, which have no down, and the flowers are larger than thoſe of the wormwood, or abrotanum.

The ſpecies of *ſantolina*, enumerated by Mr. Tournefort, are theſe. 1. The common *ſantolina* with cylindric vermiculated leaves. 2. The *ſantolina* with hairy woolly leaves, and with large flowers. 3. The *ſantolina* with heath, or ſavin-like leaves. 4. The cypreſs leaved *ſantolina*. 5. The creeping hoary *ſantolina*. 6. The *ſantolina* with leſs hoary leaves. 7. The *ſantolina* with duſky green leaves, and ſulphur coloured flowers. 8. The *ſantolina* with duſky green leaves, and gold yellow flowers. 9. The great roſemary leaved *ſantolina*. 10. The leſſer roſemary leaved *ſantolina*. 11. The corymbiferous African *ſantolina* with a large coronopus leaf. 12. The corymbiferous African *ſantolina* with a ſmaller coronopus leaf. 13. The Spaniſh camomile leaved *ſantolina*. And 14. the Cretic *ſantolina* with vermiculated leaves. *Tourn.* Inſt. p. 460.

Santolina has the ſame virtues aſcribed to it with the *male ſouthernwood*. See SOUTHERNWOOD.

It is alſo particularly recommended in uterine complaints. It is uſed to deſtroy worms; and the powder of the dried leaves, half a drachm for the doſe, and to be continued for a conſiderable time, is eſteemed good in the fluor albus; alſo in pleuriſies and peripneumonies.

SANTONICUM *ſemen*, in the materia medica. See the article CHOUAN.

SANTSI, in botany, a name given by the Chineſe to a plant, famous among them for its medicinal virtues.

It is deſcribed by the writers, who have been on the ſpot, in ſo remarkable a manner, that it cannot eaſily be miſtaken, provided their deſcriptions are juſt. They tell us that it grows wild on the mountains in ſome of the provinces of China, and that each root of it uſually ſends up eight ſtalks, the middle one greatly higher than the reſt.

They have no branches, and have each only three leaves at the top, and the middle ſtalk bears cluſters of flowers. The root they ſay is four inches thick, and puſhes out ſeveral ſide branches, of the thickneſs of a finger. The bark of theſe roots is rough and brown, and their internal part ſoft and yellow.

The ſmall roots only are uſed in medicine, the great ones being ſeldom found. The plant flowers in the month of July, and the ſpring ſeaſon is accounted the beſt for taking up the roots.

The way of multiplying the plant is to cut the great root into ſlices tranſverſely, and plant theſe an inch deep in a good ſoil; they will ſoon ſhoot up the natural number of branches, and in three years the plant will grow to its utmoſt perfection.

The great uſe of the plant is in hæmorrhages, in which caſe it is ſaid to be almoſt infallible. Obſerv. ſur les Cout. de l'Aſie.

SAP *Cycl.—Courſe of the* SAP, a term uſed by gardners and nurſery men to expreſs the current of the *ſap* in trees.

This has been generally ſuppoſed to run in an equable and even manner; but Mr. Fairchild has ſhewn, that it has an irregular, and even contrary motion to its firſt courſe.

This is a diſcovery of more real uſe in gardening, than might at firſt thought be imagined; ſince this accurate experimenter obſerves, that by means of it he could render barren trees fruitful, and decaying trees healthful, and render the ſyſtem of gardening much better in itſelf, and more uſeful to the public.

The laureola grafted on the mezereon, and the evergreen oak of Virginia upon the common Engliſh oak; both theſe hold their leaves all the winter, and are in good ſtate and flouriſhing, though grafted on trees which drop their leaves in winter. This plainly ſhews that the juices riſe upwards in winter, even in thoſe trees which drop their leaves, otherwiſe theſe grafted ever-greens muſt have ſtarved at that ſeaſon.

If all the variety of foreign oaks were to be grafted on the Engliſh oak, it would make the timber more firm and laſting than it is, when raiſed from foreign acorns; for as the crab ſtock makes the wood of the apple more firm and laſting, than that of the apple ſtock, and the peaches and almonds, budded on plums, are more laſting than thoſe on peach ſtalks: ſo, by the contrary rule, all firm timber, graft-

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ed on ſpungy ſtocks, would be made worſe than it would be on its own bottom; as if the Engliſh elm were grafted upon the Dutch elm, it would partake ſo much of the nature of the ſtock, as to be a ſpungy wood, and not fit for the uſes it is uſually put to.

In grafting the New-England cedar, or juniper, upon the Virginia cedar, this experimenter found that the branch which was grafted, being left ſeveral inches below the grafting, that part continued growing, as well as the upper part above the grafting. The viburnum was another ſubject of his experiments. On bending down the top of this tree, and burying its upper branches in the earth, theſe became roots, and the proper roots were by degrees removed out of the ground as theſe took place. All the roots became branches, and finally the tree became inverted, and grew as well as in its natural ſtate.

A pear tree being inarched upon two pear ſtocks, continued in a flouriſhing ſtate, even when the root was raiſed out of the ground, and it received no nouriſhment, but from the two inarched branches. This tree, after it had ſtood ſome years in this condition, puſhed out new ſuckers from the root; which proves, that the branches are as uſeful to ſupply the root with nouriſhment, as that is to ſupply the branches; and hence it is no wonder that ſo many trees miſcarry in planting, when there are no branches left on the head. Philoſ. Tranſ. N° 384. p. 127.

SAPA, among the Romans, new wine boiled to the third part of its firſt quantity. *Pitiſc.* in voc.

SAPINDUS, the *ſoapberry tree*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, being compoſed of ſeveral petals, arranged in a circular form; theſe are uſually four in number, and the cup is alſo compoſed of four leaves. The piſtil ariſes from the cup, and finally becomes a round fruit, which encloſes a ſtone of the ſame ſhape, with a roundiſh kernel in it.

There is only one known ſpecies of this genus, which is the *ſoapberry tree* with leaves growing to an alated rib. *Tourn.* Inſt. p. 659.

The berries of this tree are uſed as ſoap; they are of the ſize of a muſket-bullet, and are uſed in waſhing without any admixture of ſalt or oil. They perform the office of ſoap very well, as to the cleanſing the linnen, but they rot it in time.

The negroes in general uſe them for their coarſe apparel, which bears them much better than the finer linnen worn by the Europeans. Philoſ. Tranſ. N° 96.

SAPINUS, in botany, a name given by ſome of the modern botanical writers to the fir tree. This does not ſeem, however, to have been the tree ſo called by the antients. Some of thoſe writers have plainly deſcribed the pine tree under this name, and Pliny makes it the denomination of the pitch tree, ſuch as was manured in his time.

Matthiolus contends that no peculiar tree was ever called by this name, but that what the antients meant by this word, was, that part of the fir, or any other tree of that kind, which was above the ground, and below the branches. This is uſually a ſmooth part of the tree, free from knots; and the other part, where the branches grow, was called *fruſterna*. Matthiolus grounds this on the authority of Pliny, but that author errs in this; for that part of the tree was not called *ſapinus*, but expreſſed by the adjective *ſappinea*.

This is abundantly proved by Vitruvius; and on comparing the text of theſe two authors, it appears that Pliny took from Vitruvius what he ſays on this ſubject, though he did this erroneouſly; for Vitruvius ſays, that this part of the fir was called *ſappinea*, becauſe very ſmooth, and free from knots, like the *ſappinus*, or pine.

Pliny, in another place, diſtinguiſhes between the *ſapinus* and *ſappinus*. The *ſappinus* he ſeems to make the ſame with the common pitch tree, and the *ſapinus* with the pine, or with ſome other tree of the coniferous kind: he places this great diſtinction between them, that the *ſappinus*, when cut down, would never grow up again, but that the *ſapinus* would.

Some of the old gloſſaries diſtinguiſh alſo between the *ſapinus* and *ſappinus* in this manner, the one being always tranſlated the pine, πίτυς; and the *ſappinus* the fir, πεύκη. The obſervation of Pliny, of the one of theſe trees growing again from the root when cut down, and the other not, is contrary, however, to the ſentiments of the reſt of the antients.

Theophraſtus ſays of both the pine and fir, that when once cut down they never ſhoot up again; and Herodotus mentions the ſame thing, as a ſingularity among trees.

The word *ſapinus* ſeems to be only a contraction of *ſapapinus*, a name given by the Latins to the domeſtic or cultivated pine, from the vaſt quantity of juice or ſap it contained. They had a way of expreſſing this juice by the word *ſapa*; and Theophraſtus has, for the ſame reaſon, called the domeſtic pine by the name *orrus*, ὄρρος, a word ſignifying juice or ſap. This was the pine tree which bore the pine nuts uſed in medicine and in foods; and Pliny, who calls it the *manured pitch tree*, plainly errs, becauſe that tree cannot bear eſculent nuts, or anſwer to the reſt of the deſcription.

SAPO *amygdalinus*, *almond ſoap*, a new form of medicine got much into uſe of late in nephritic caſes, and made to ſupply the place of the common hard *ſoap* for internal uſes, in a more determinate manner for the phyſician, and a more cleanly one for the patient.

It is thus made. Take any quantity of freſh oil of almonds, and thrice its quantity of *ſoap* lees; digeſt them together in ſuch a heat as will make them but juſt boil, within a few hours the oil and lees will be united, and the liquor will ſoon after become ropy, and ſomething tranſparent, and will cool into the conſiſtence of a jelly; then throw in ſea ſalt till the boiling liquor has loſt its ropineſs; continue the boiling till drops of the liquor being received upon a tile, the water is ſeen to ſeparate freely from the coagulated *ſoap*; then take away the fire, and the *ſoap* will riſe to the top of the water, and is to be taken off for uſe. *Pemberton's* College Diſpenſ. p. 184.

SAPONACEA *terra*, in natural hiſtory, a term uſed by ſome to expreſs a kind of native alkali *ſalt*, of the nature of the nitre, or natron of the antients, which is found on the ſurface of the earth, mixed with dirt, &c. in the neighbourhood of Smyrna, and thence called by ſome *Smyrna earth*.

It is found principally in two places near Duraclea, a large open village, about ſix leagues to the eaſtward of Smyrna; and in a very flat plain, about a league weſtward from the river Hermus. It is at firſt gathering, a fine whitiſh *ſalt*, which of itſelf boils up, as it were, out of the ground. It is always gathered before ſun-riſe, and only in mornings in which there falls no dew; ſo that a ſtock ſufficient for the whole year muſt be laid in during the ſummer months. It comes up in ſome places an inch or two above the ſurface of the ground, but when the ſun riſes upon it, it dries and falls down again. The earth producing it lies low in both places, and in winter is waſhy. It is thinly covered with graſs.

It may be ſuſpected, at firſt ſight, that the neighbouring ſea impregnates this earth about Hermus, but the ground which produces it, and lies about Duraclea, is ſo far from the ſea, that it overthrows this ſpeculation; though every morning in ſummer the earth be ſwept clean of this *ſalt*, the next morning always produces a new crop.

Dr. Smyth, who made experiments upon this *ſalt*, informs us, that three hundred drachms of it being put into a retort, and this ſet in a ſand-heat with a very ſtrong fire for twelve hours, yielded between five and ſix ounces of an inſipid phlegm, of no other ſmell but ſuch as, in all ſuch operations, ariſes from the fire. It appeared from this, that the matter contained no volatile *ſalt*. After this the quantity of two hundred drachms, calcined in a German crucible, were diſſolved in water. This compoſition of earth and water, boiled into a lixivium, made five hundred drachms, after it had boiled three hours, and the foul ſcum had been continually taken off during that time, and been filtrated; the cloſe liquor being then evaporated to a dryneſs, there remained a pure white fixed alkaline *ſalt*, of the nature of pot-aſh.

The people of the place make ſoap with this earth in the following manner. They mix three fourths of this earth with one fourth of lime, and then pour boiling water upon the mixture: they ſtir this with a ſtick, and there ariſes to the top a thick browniſh ſubſtance, which they ſcum off; they ſave this in veſſels by itſelf. They uſe both this and the clear liquor in making ſoap, but this is much ſtronger than the liquor. They put fifty kintals of oil into a large copper boiling veſſel, and kindling a large fire under it, they let the oil boil a little, and then throw in by little and little firſt the ſcum of the lye, and afterwards the liquor itſelf; though ſometimes they uſe only the one, or only the other. They continue adding more and more of theſe, till the oil acquires the conſiſtence of ſoap, which is often ſeveral days. The fire muſt be all this time kept up very ſtrong. The ſcum of the lye, and the ſtronger part of the lye itſelf, mix with the oil in the boiling, and the weaker part unmixing itſelf, ſinks to the bottom, and is let out by a cock prepared for that purpoſe. This is not thrown away, but is let run upon freſh lime and earth, to make a lye for future uſe; and when the ſoap is perfectly made, it is ladled out, and put upon a brick or lime floor to harden.

The common proportion in the making the ſoap is two loads of earth, of five kintals each, to fifty kintals of oil, and the produce is between ſeventy and eighty kintals of ſoap. The earth is bought at a dollar a load, and the ſoap at 6½ a kintal. There is employed annually, in making ſoap at Smyrna, at leaſt ten thouſand kintals of oil. The bringing the ſoap earth to Smyrna employs a thouſand camels, or fifteen hundred, for eight months of the year, the four ſummer months being too hot for camels to travel in. A common ſoap houſe produces, at a medium, a thouſand dollars a year clear profit. Philoſ. Tranſ. N° 220. p. 230.

SAPONARIA, in the materia medica, a name given at different times to ſeveral plants, which had in ſome ſort the properties of ſoap.

The *ſtruthium* of the Greek, and *herba lanaria* of the Romans, having ſomewhat of this property, and being uſed in the cleaning of wool, ſeveral authors have explained it by the word *ſaponaria*; but this is leaving us as much in the dark, as to the plant, as we were before, not at all aſcertaining which, if any of the plants at one time or other ſo called, was to be underſtood as being the ſame with the *ſtruthium*.

The Greeks have many times called hyſſop by the name *ſaponaria*; others have given the ſame name to the anagallis, or pimpernel; and others to ſeveral different plants, which they ſuppoſed to have the effects of ſoap, or of nitre, in cleanſing of things.

None of the plants, however, that we have under the name *ſaponaria*, will at all agree with the *ſtruthium*, or *herba lanaria*, which was a thiſtle; and the very Arabians ſeem not to have known it, but have erroneouſly ſuppoſed their candiſi to be it.

SAPONARIA *terra*, in mineralogy, a name given by ſome authors to the common fullers earth. *Dale*'s Pharm. p. 19. See FULLERS *earth*, *Cycl.* and *Suppl.*

SAPONARIA *terra alba*, in natural hiſtory, a name given by ſome authors to the common tobaccopipe clay.

They call the common fullers earth alſo *ſaponaria terra*, and diſtinguiſh it from this by the epithet *purpuraſcens*; though it has no ſuch colour as purple about it. *Kentman*'s Nomenclator, foſſ. p. 1. See the article CIMOLIA.

SAPONARIUM *lixivium*. See LIXIVIUM *ſaponarium*.

SAPONEA, a name given by authors to a pectoral medicine made of oil of ſweet almonds and ſugar, mixed with the diſtilled water of violets.

SAPOTA, in botany, the name by which Plumier calls a genus of plants, ſince deſcribed by Linnæus under the name of *achras*. See the article ACHRAS.

SAPPAN, in the materia medica, a name uſed by ſome authors for the wood of the *arbor Campechiana*, or logwood uſed in dying. *Breyn.* Prodr. Vol. 2. p. 37.

SAPPHIRE, (*Cycl.*) the name given by the moderns to a beautiful pellucid gem of a blue colour: this is however extremely different from the ſtone the antients knew under the name of the *ſapphire*; for that was no pellucid gem, but an opake ſtone of a very deep blue, veined with white, and ſpotted with ſmall gold coloured ſpangles, in form of ſtars, and was only a more beautiful kind of their *cyanus*, which was the ſtone we call *lapis lazuli*.

The deſcriptions of all the authors of antiquity of the ſtone they called the *ſapphire*, plainly evince this; and hence authors of a later date have too haſtily concluded, that our *ſapphire* was wholly unknown to them: but this ſeems a very improbable conjecture, and a ſtrict enquiry into their writings will ſhew that they have very well deſcribed our *ſapphire*, under the name of *the ſky blue beryl*, or *beryllus aëroides*; and as it had among them no peculiar generical name, it could not have been better named than thus; as the beryl is plainly that of all the gems to which the *ſapphire* moſt approaches, and its colour is in the fineſt ſpecimens a pure ſky blue.

It is in its moſt perfect ſtate a very elegant and valuable gem, and is ſecond only to the diamond in luſtre, hardneſs, and price. It is met with of various ſizes, but ſeldom ſo very ſmall as many of the other gems, and has been ſometimes found up to three quarters of an inch in diameter. Its more uſual ſtandard is between a ſeventh and a ſixth of an inch. It is various in figure, being ſometimes found in the pebble, and ſometimes in the cryſtal form. Its moſt uſual appearance is in ſmall irregularly rounded, or oblong flattiſh ſtones, covered with no cruſt, and looking of a bright blue, but without the luſtre and fine poliſh of the native ruby. It is ſometimes alſo found in beautiful hexangular cryſtals, terminated by hexangular pyramids of a fine blue throughout, and naturally of a high poliſh. Sometimes alſo theſe ſprigs are only coloured at their points, and ſometimes they are wholly colourleſs.

The proper and only colour of the gem is blue; in ſome ſpecimens this is a fine deep colour, like that of the cleareſt ſky; and in others it varies into paleneſs in ſhades of all degrees, between that and the pure brightneſs and water of cryſtal, without the leaſt tinge of colour, but with a ſuperior brightneſs, that eaſily diſtinguiſhes it at ſight from cryſtal, it more than any ſtone approaching to the nature of the diamond; and in ſome it has a duſky whiteneſs, like that of milk: this laſt colour might be ſuppoſed owing to a mixture of a fine white earthy matter, but that it has been found that different mixtures of pellucid liquors, ſolutions of copper, and of different ſalts, are capable of producing the ſame colour.

It ſeems very clear, from a multitude of experiments, that this gem, in its pureſt and fineſt ſtate, owes its beautiful blue to copper; and the ſame metal being found capable of giving this milky look with a caſt of blue, the general opinion of this laſt mentioned milky looking ſtone being a true *ſapphire*, ſeems perfectly right.

The pebble *ſapphires* are always finer than the cryſtalliform ones, and moſt of the fine colourleſs *ſapphires*, which our jewellers commonly, but very improperly, call white *ſapphires*, as they have not the leaſt tinge of whiteneſs in them, but are abſolutely colourleſs, as the pureſt waters are of the pebble, not of the ſprig kind.

The *ſapphire* is of very different degrees of hardneſs and brightneſs in different parts of the world, and conſequently of very different value.

The antients uſed to diſtinguiſh the *ſapphire*, as they did all the other precious ſtones, into the male and female kind, according to the deeper or paler colour; and our jewellers, according to their cuſtom of dividing the gems into ſeveral kinds, according to their different accidents of purity, beauty, &c. make four kinds of *ſapphire*.

1. The firſt is the fine blue oriental *ſapphire*. This is the name they give the *ſapphire* when in its greateſt degree of purity and perfection, as hard as the ruby, and of a fine ſky blue.

2. The white *ſapphire*. This is the name they give the *ſapphire* when wholly colourleſs, and reſembling the diamond; and that whether it have been naturally found ſo, or reduced to that ſtate by art: for as all *ſapphires* loſe their colour on being put into the fire, it is a common practice with ſome jewellers, when they have *ſapphires* of a bad colour, to diveſt them wholly of it by fire, and bring them to what they call white *ſapphires*; but this, as before obſerved, is a very improper name, as the gem in this ſtate has not the leaſt tinge of white, but is wholly colourleſs, and as there is another white *ſapphire*, which is truly ſo, and which they call the milk *ſapphire*.

3. The third kind of *ſapphire* is what they call the water *ſapphire*. This alſo is a very improper name, not at all expreſſing what they mean by it; for they call by this name all the ſoft pale blue *ſapphires* which are found in Europe.

4. The laſt is the milk *ſapphire*. This is the name they give the *ſapphire* when of a white milky caſt, with a faint tinge of blue.

The fineſt *ſapphires* in the world are thoſe brought from the kingdom of Pegu in the Eaſt-Indies, where ſome are found perfectly colourleſs as cryſtal, and others of all ſhades of blue, up to the violet colour, but never with the leaſt tinge of purple, or any other colour but true blue: theſe are all found in the pebble form. We have other very fine *ſapphires*, both of the pebble and cryſtalliform kind, from Biſnagar, Conanor, Calicut, and the iſland of Ceylon: theſe are of all the ſhades of colour, and in Ceylon there are ſometimes found a ſort of baſtard gems, part red and part blue, ſeeming of a mixt nature between the *ſapphire* and the ruby.

The occidental *ſapphires* are from Sileſia, Bohemia, and many other parts of Europe, and are often very beautiful ſtones; but are greatly inferior, both in luſtre and hardneſs, to the oriental. *Hill*'s Hiſt. of Foſſ. p. 594.

SAPPHIRE-*colour*. To give this elegant and beautiful blue to glaſs, the workers in the glaſs-houſes uſe the following method. Take an hundred weight of rochetta fritt, and add to it a pound of prepared zaffer, and to this one ounce of manganeſe; mix all well together, and put them into the furnace to melt and purify, and when it is become perfectly pure and fine, work it into veſſels, &c. This ſmall quantity of manganeſe, with the zaffer, gives a moſt beautiful violet blue. *Neri*'s Art of Glaſs, p. 93.

SAPPHIRE-*paſte*. The method of making the counterfeit *ſapphires* in paſte is this. Take of cryſtal prepared two ounces, minium, or common red lead, ſix ounces, zaffer prepared five grains, manganeſe prepared ſeven grains; mix all the powders perfectly together, and put them into a crucible, cover it with a ſtrong lute, and put the whole into a potter's kiln, to ſtand in the hotteſt place for twenty four hours; it will be of a moſt beautiful deep *ſapphire*-colour. Blue paſtes of two other degrees of blue are alſo made in the following manner. For a ſky blue take cryſtal prepared two ounces, red lead ſix ounces, prepared zaffer twenty one grains; mix all well together, and bake them as before. For a deep violet blue take cryſtal two ounces, red lead four ounces, and four grains of painters blue ſmalt; mix all, and bake together in the kiln.

Theſe both make good blues, but much inferior to the firſt proceſs. *Neri*'s Art of Glaſs, p. 132.

SAPPHIRINA *aqua*, the *blue eye water*, is thus made. Pour a pint of ſtrong and freſh lime water into a copper veſſel; add to it a drachm of crude ſal armoniac, and throw in ſome filings, or ſmall pieces of copper, it ſoon acquires a beautiful blue colour, and is not only uſed as an eye water, but alſo to deterge old ulcers; and ſometimes is mixed with other things in injections for gonorrhœas.

SAPPHIRO-RUBINUS, in natural hiſtory, a name given by ſome modern writers on gems to a ſtone, partly a ſapphire, and partly a ruby, or, more properly ſpeaking, a ſapphire tinged in ſome part with the ruby colour, while the reſt

remains

remains blue. The Indians call this *nilacundi*. *Boet.* de Boot. See NILACUNDI.

SARABARA, among the antients, a Mediſh or Babyloniſh garment, which reached only to the knees. *Pitiſc.* in voc.

SARACHINUS, in ichthyology, a name given by Charleton and others to the fiſh, called by the generality of authors the *thriſſa*, by us the *ſhad*, or mother of the herrings.

Authors have given names to the herring kinds, according to their different growth and ſize, and multiplied the ſpecies much beyond what they ought to be. Artedi obſerves that the *agonus* and *ſarachinus* are only herrings of different growth, and that the *alauſa minor* of authors is the ſame with the *agonus*. See the article CLUPEA.

SARACUS, in zoology, a name given by ſome authors to a ſpecies of ſea fiſh of the herring kind, more uſually called *agonus*, and by many ſuſpected to have no eſſential difference from the *alauſa* or ſhad, but to be the ſame fiſh in another ſtate. *Ray*'s Ichthogr. p. 226.

SARAX, in botany, a name given by ſome authors to the whole claſs of the ferns. *Ger.* Emac. Ind. 2.

SARCITES, the *fleſh ſtone*, a name given by ſome authors to the cornelian, from its being of the colour of fleſh; as it is very exactly in ſome pieces.

SARCITES, or SAURITES, is alſo a ſtone ſuppoſed to be found in the belly of a lizard; it ſeems to have been a ſpecies of pale cornelian. Pliny mentions it, but gives no deſcription of it.

SARCITES, the *fleſh ſtone*, in natural hiſtory, is alſo a name given by ſome authors to a ſpecies of ſtone, whoſe fibres were ſuppoſed to repreſent thoſe of beef. It was of a black colour and firm texture.

SARCLIN-*time*, is the time or ſeaſon when huſbandmen weed their corn.

SARCOCOLLA (*Cycl.*)—It has been the opinion of many writers of the middle ages, that this was the gum of the beach tree. That fruit tree being very common in moſt parts of the world, and nothing at all like the *ſarcocolla* being found to come from it, people have been led to wonder how this abſurd opinion firſt got footing in the world; but this is eaſily explained by tracing up the authors who ſet it on foot to their origin.

Dioſcorides is the great fountain, from whom all theſe little ſtreams of knowledge have been ſupplied; and this author treating of *ſarcocolla*, ſays, that it is the gum of a Perſian tree. The words *perſian tree* and *peach tree* are the ſame both in Greek and Latin; and hence, what he ſaid of a tree growing in Perſia, has been attributed to the peach tree; and this gum, ſo very different from the gum of that tree, has been ſuppoſed to flow from it.

But this is not the only confuſion made in regard to this word. The later Greeks have given the name *ſarcocolla* to a plant, in nothing reſembling the *ſarcocolla* tree. The old Greeks called both the gum and the tree, which produced it by the ſame name of *ſarcocolla*, as they did in regard to the ſtyrax and galbanum, and many other of the medicinal gums, and the trees and plants which produced them. But among the later Greek writers, the little plant *argemone*, an herb of the poppy kind, was called *ſarcocolla*. Apuleius tells us, in his account of this plant, that the Greeks of later Ages called it *arſella* and *ſarcocolla*; and Strabo confirms this, giving the ſame name to the ſame plant, only that he miſtakes the Latin name, and writes *agrimonia* for *argemone*.

Marcellus Empiricus has the ſame obſervation; he ſays, in expreſs words, the plants which the Greeks called *ſarcocolla*, the Latins call *argemone*; and Neophytus, who deſcribes the plant, and ſpeaks largely of its virtues in bruiſes, and the like, ſays, that ſome of the Greeks call it *argemone*, ſome *artemone*, and others *arſella* and *ſarcocolla*.

The near alliance of the ſounds *argemone* and *agrimonia* ſeems to have deceived this author, and ſome others, and they ſometimes give us the plant agrimony, ſometimes argemone, as the *ſarcocolla* of the Greeks: Neophytus is of this number, for he calls it *argemone altera*, as a plant very different from the common argemone, and his deſcription ſuits with the agrimony. *Apuleii* Herb. c. 31. *Strabo* Hortul.

SARCO-EPIPLOCELE, a term uſed by the old medical writers, to expreſs a compound rupture, conſiſting of a deſcent of the *epiploon* and a *ſarcocele*; or a rupture of the indurated *epiploon*, whether umbilical or ſcrotal.

SARCOMA (*Cycl.*)—The *ſarcoma narium*, by ſome called alſo *hyperſarcoma narium*, is the ſame with what is commonly called the *polypus narium*, a caruncle of various ſize and conſiſtence in the noſtril. Theſe caruncles are uſually ſoft, extenſive, and capable of elongation, but ſometimes they are hard and rigid. They are ſometimes pale, ſometimes red, and are generally ſmall in their beginnings, and advance but gradually; though ſome of them grow ſo faſt, as to hang down out of the noſe in three or four days time. They are uſually not attended with pain; but ſome of them are hard, livid, very painful, and have a tendency to become cancerous. Some are wholly concealed in the noſe, others hang down to the lips, and others, though contained in the noſe, yet diſtend it greatly. Some are of an even ſurface, and others like a cluſter, ſome deſcend backward through the apertures by which we draw breath through the noſe into the fauces; and grow ſo big there as to be viſible behind the uvula, and occaſion difficulty of ſpeaking and ſwallowing, and ſometimes almoſt ſtrangle the patient.

They have uſually but one root, though ſometimes ſeveral, and are uſually formed in and from the pituitary membrane, and the diſorder ſeems to be really no other than a morbid diſpoſition of the ſpungy production and glands of this membrane. The *ſarcoma* and *polypus*, though diſorders of the ſame kind, may however be properly enough made two ſpecies; the *polypus* being ſoft, and hanging by a ſlender root, like the ſtalk of a fig; and the *ſarcoma* of a more fleſhy conſiſtence, and adhering by a large, firm, and immoveable baſis.

Theſe diſorders come ſometimes from internal cauſes, ſometimes from external injuries, and too often prove cancerous, or are attended with a ſpina ventoſa, or caries of the bones of the noſe. They may be ſometimes removed by cauſtics, but the extirpating them with the knife is the ſhorteſt, ſafeſt, and moſt eligible method. *Heiſter*'s Surgery, p. 437.

SACROMA *of the eyes*, a fleſhy excreſcence or tubercle formed on the inner ſurface of the eye-lids. Theſe tubercles, in their beginnings, are uſually ſmall; but they, by degrees, advance often to a very conſiderable bulk. Some of theſe are of ſmooth ſurfaces, others rough and unequal, like a raſberry or mulberry.

They are always to be cured by extirpation, getting them out by a hook, a pair of plyers, or a needle and thread, and then cutting them out to the roots with ſciſſars; the wound ſhould be ſuffered to bleed a while, and afterwards waſhed with a collyrium made of aloes, tutty, and ſugar of lead mixed in roſe water, till it is perfectly healed. Some uſe the cauſtic to theſe tumors, but the ſciſſars are more ſafe and leſs painful. *Heiſter*'s Surgery, p. 374.

SARCOTHLASMA, a term uſed by the old phyſicians to expreſs a bruiſe on the fleſh.

SARCULATION, a term uſed in the antient huſbandry, to expreſs a ſort of hoing, which they uſed among their peaſe and beans, and ſometimes among their corn.

The *ſarculum* was a ſort of narrow and long hoe, with which they rooted up the weeds among plants growing irregularly. We have the ſame kind of inſtrument in uſe at this time in ſome places for hoing between the plants of flax; but one way of ſowing, in rows, at preſent, has prevented the neceſſity of having recourſe to ſo inconvenient and troubleſome an inſtrument in other caſes.

SARCULATURA, in our old writers, weeding of corn; whence *una ſarculatura* was the tenant's ſervice of one day's weeding for the lord.—*Tenet in bondagio & debet unam* ſarculaturam, *&c.* *Kenn.* Paroch. Antiq. p. 403.

SARDA, the *cornelian*, in natural hiſtory, the name of a genus of the ſemi-pellucid gems: the characters of which are, that they are ſemi-pellucid ſtones, compoſed of cryſtal with a ſmall admixture of earth, of a plain uniform ſtructure, not tubulated nor cruſtated, and uſually of one ſimple colour.

Of this genus there are three ſpecies. 1. The *red cornelian*, which is a very common ſtone among our jewellers, and is of all the degrees of red from a deep blood colour, to that of the water in which raw fleſh has been ſoaked; and this laſt, if any can be called ſo, is its proper colour. It is uſually found in a roundiſh, or pebble like form, and its moſt frequent ſize is between half an inch and two inches in diameter, and is found in the Eaſt and Weſt Indies, and in many parts of Europe: our jewellers value none but the oriental, but there are very fine ones found in Sileſia and Bohemia, and on the ſhores of the Rhine. The antients, according to the degree of colour, divided theſe ſtones into male and female, the deeper coloured ones being called the male; and our jewellers call one ſort of it the beryll: this is the male *cornelian* of the antients, and is an oriental ſtone of a clear deep red; they have had this from the Italian lapidaries, who call every ſtone which is ſofter than the gems, and of a good colour, and capable of a fine poliſh, beryll, with the addition of its proper name, calling this therefore the beryll *cornelian*; and the brown cryſtal, the beryll cryſtal; but our dealers reject the proper name of the ſtone, and keep only the word, ſignifying its excellence; and both the one and the other of theſe ſubſtances are by them called ſimply the beryll. *Hill*'s Hiſt. of Foſſ. p. 460.

The ſecond ſpecies is the *yellow cornelian*. This is a ſtone, in the opinion of many, of greater value than the former, when in its moſt pure and perfect ſtate. It is found ſometimes in broad flat pieces, but more uſually in the ſhape of our common pebbles, and is of all degrees of yellow from the deepeſt that can be imagined to that of a lemon peel. It is of a greater degree of tranſparence than the red, and in its moſt common ſtate appears, when cut, like a piece of fine yellow amber. We have it principally from the Eaſt Indies; there are ſome ſpecimens of it found in Germany, but they are neither very good nor very frequent, and in England we ſometimes meet with large maſſes of it, but they are never thoroughly coloured.

The third ſpecies is the *white cornelian*. This, though leſs

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beautiful than either of the others, is however a very beautiful ſtone; it is often found in the rugged ſhape of our common flints, though not unfrequently flattiſh or roundiſh like the reſt. It is the largeſt of all the *cornelians*, being found from two to ſix inches, and often more in diameter, and is of a very beautiful colour, not a clear white, but with an admixture of blue, bringing it to a ſort of pearl colour, and is leſs tranſparent than either the yellow or the red kind. It is found in the Eaſt Indies and in many parts of Europe; France has afforded very fine pieces of it, and Germany produces it in great abundance; but the beſt next the Oriental is that of New Spain. Ibid. p. 461.

Mr. du Fay, of the academy of ſciences of Paris, accidentally hit upon a very fine way of turning any part of a red *cornelian* white, ſo as to form veins or clouds of that colour at pleaſure in it. He had obſerved, that there was a way of making figures in white upon garnets, which was done by engraving the intended figure in the ſtone, and then filling up the engraving with the common white enamel, which, when poliſhed down to the level of the ſtone, ſeemed to make one body with it, and the figure to be naturally formed in white in it. Deſirous of trying this experiment on the *cornelian*, he had one engraved, and filled up the lines with white enamel in powder, then putting it over the fire to melt the enamel, he drew it back ſeveral times, to ſee how the proceſs ſucceeded, and at length found that this ſtone would not bear the neceſſary degree of fire for the operation, but would itſelf be calcined and ſpoiled before the enamel would run: on this he ſhook out the powder, but was ſurprized to find the bottom of the engraving had all been tinged white by it, though it had not melted. To continue this trial, he laid ſome of the powder enamel on a *cornelian* that was not engraved, but only the powder was laid on in a certain figure. A ſmall degree of heat having been given to this under a muffle in a wind furnace, the parts of the ſtone which had been covered with the powder were found to be white, and the others as red as before the ſtone was put into the fire.

It appeared hence, that this coating over a part of the ſtone was ſufficient to give it a whiteneſs by the help of fire; but the curious author of this invention did not ſtop here, he ſoon found that the matter of the enamel was not neceſſary to this change, but that any other denſe ſubſtance would produce the ſame effect. The common Spaniſh white, and ſeveral other colours, were found to ſucceed very well; but the beſt of all other ſubſtances, he obſerves, is a colcothar of vitriol carefully prepared; the finer part of which being ſeparated by waſhing, and afterwards mixed up with gum water, may be uſed to draw traces ever ſo beautiful, and theſe will be all ſhewn in white upon the ſtone after it has paſſed the fire. The different parts of a figure thus delineated will be more or leſs white, as the coat of colour has been laid more or leſs thick upon the ſtone, ſo that there only requires a nice hand to draw figures ever ſo beautifully diverſified, with the ſhades of a thicker or a clearer white. The counterpart of this experiment gives alſo very beautiful figures, that is, the covering the whole ſurface of the ſtone with a coat of the colour, and then drawing the intended figure or lines cut through this coat; this being done, and the whole ſet by to dry, when it has afterwards been in the fire, all the ſurface will be found white, except where the lines were cut in, and theſe will all be beautifully red, the colour of the ſtone having ſuffered no hurt in them. Thus the figure will be expreſſed in red upon a white ground, and even the minuteſt traces drawn by the point of a fine needle will not be loſt. Mem. Acad. Par. 1732.

All *cornelians* are not equally proper for this purpoſe. Thoſe of a fine deep red, which are all of one ſimple colour, and are commonly called by our jewellers *cornelians* of the old rock, always ſucceed perfectly well, and their natural deep red ſhews the white with much beauty. The common pale *cornelians* always loſe a part of their own colour in the fire; and the *cornelians*, which have veins of different colours, or ſhades of colour, never ſucceed well, becauſe every different vein receives the tinge in a different manner. The meaner ſort of *cornelians* are ſubject alſo to crack and fly, with the degree of heat neceſſary to this operation; whereas the finer ſtones of the old rock always bear it without hurt.

It would ſeem a natural conſequence from theſe experiments, that the black agate, the coloured jaſpers, and many other of that ſort of ſtones might ſucceed as well in the delineating figures on them; but Mr. du Fay, after repeated experience, found that the *cornelian* alone would do.

SARDA, in zoology, a name by which ſome call the fiſh, more uſually known by the name of *pelamys* or *pelamys ſarda*; a fiſh reſembling a young tunny, but having larger and longer teeth and no ſcales. *Geſner* de Piſc. p. 1151. See the article PELAMYS.

SARDACHATES, in the natural hiſtory of the antients, the name of a ſpecies of agate, found frequently at this time on the ſhores of rivers in the Eaſt-Indies; and ſeeming to contain an admixture of the matter of the common red cornelian, is very excellently characterized by the name the antients gave it.

It is a very elegant and beautiful ſpecies, and is often found of a conſiderable ſize. It is of a pale whitiſh ground, and has no veins or other variegations, except a multitude of minute ſpots, of a pale red, and of the matter of the red cornelian; theſe are ſcattered very ſparingly in ſome parts of the maſs, but in others they are ſo cluſtered together, as to make ſmall clouds of an elegant red. It is very hard, and is capable of an elegant poliſh. Our lapidaries do not much eſteem it, but in ſome other places it is wrought into toys which are much eſteemed. *Hill*'s Hiſt. of Foſſ. p. 483.

SARDANUS, in zoology, the name of a fiſh of the harengiform kind, caught in the Mediterranean, and common in the markets of Rome and Venice. Its body is broader than that of the pilchard, and its back green; and the line which runs along the belly is much leſs rough than in that fiſh. It is indeed eaſy to diſtinguiſh it from the pilchard, but not ſo eaſy to ſhew in what it differs from the common herring more than in ſize. It ſeems very probable, that it is no diſtinct ſpecies of fiſh; but, that the herring, like the pilchard, is always ſmaller in the Mediterranean than in the Ocean. *Willughby*'s Hiſt. Piſc. p. 225.

SARDAR, in the Turkiſh military orders, the title of an officer choſen from among the caias of the Janizaries on ſome particular occaſion, ſuch as to head a detachment ſent to war, or on any other occaſion.

The word is of Perſian origin, and is derived from *ſar*, which in the language ſignifies a head or chief.

This officer is a colonel of a detached body; he is attended in his expedition by his deputy, and two ſecretaries, and his office expires at his return from the buſineſs he was diſpatched on. *Pocock*'s Ægypt. p. 169.

SARDELLA, in zoology, a name by which ſome have called the pilchard of the Mediterranean ſea, ſuppoſing it different in ſpecies from that of the ocean, but it ſeems in reality to be no other than the common pilchard, only not growing ſo large there as in the Ocean. *Willughby*'s Hiſt. Piſc. p. 224. See the article PILCHARDUS.

SARDINA, in zoology, a name by which many have diſtinguiſhed a fiſh of the harengiform kind, which is in reality, however, no other than a ſmall pilchard, the pilchard growing to a larger ſize in the Ocean than in the Mediterranean. *Willughby*'s Hiſt. Piſc. p. 224. See PILCHARDUS.

SARDOA, or SARDOUM, in botany, a name given by the antients to the water crowfoot, with jagged leaves, called alſo *apiaſtrum* and *ranunculus apii folio*, from its leaves reſembling in ſome degree thoſe of the ſmallage. This has been in all ages characterized as a poiſon; but Pliny has found means to confound this with baum, under the name of apiaſtrum, which he ſays is fed on by the bees in Italy, but is very well known to be a dangerous poiſon in Sardinia.

SARDONIA *herba*, in botany, a name given by many of the antients to the poiſonous water *ranunculus*, which others call *apiaſtrum*, from its having leaves ſomewhat reſembling ſmallage; and our modern botaniſts call it the *ranunculus paluſtris apii folio*, or water crowfoot with ſmallage leaves.

It had the name *ſardonia* from its growing very plentifully in Sardinia. The old Greeks have generally written the name of that iſland *Sardonia*, not Sardinia; and hence they have called the plant alſo by the ſame name.

It is branded by all authors, both antient and modern, with the name of a poiſon, and we ſee that even the cattle will not touch it, though a very ſucculent and well looking herb.

SARDONYX, (*Cycl.*) in natural hiſtory, the name of a genus of the ſemi-pellucid gems, which are conſiderably tranſparent, of the true onyx ſtructure, either zoned or tabulated, and are compoſed of the true matter of the onyx, variegated with zones of that of the red or yellow cornelian.

Of this genus there are four known ſpecies. 1. The thin zoned red *ſardonyx*, or whitiſh onyx, with thin, ſnow white, and red zones; this is one of the moſt beautiful of the ſemi-pellucid gems. The ground of this is a cryſtalline matter, ſomewhat whitiſh, otherwiſe very little differing from pure cryſtal, either in colour or tranſparence; and the zones are always extremely fine and ſlender, and laid with a beautiful regularity over one another; they are of the true matter of the cornelian, and ſome are of the plain red cornelian, others of the white, and others often of a pale fleſh colour, made by an admixture of the former two. It is only found in the Eaſt Indies, and is greatly valued among our lapidaries. *Hill*'s Hiſt. of Foſſ. p. 493.

The ſecond ſpecies is the broad veined red *ſardonyx*, or horny onyx, with red punctated zones. This is a beautiful ſtone, though greatly inferior to the former kind. Its ground is of a true horn colour, and much reſembles that of many of the agates of the Eaſt Indies, and its zones are of the true matter of the red cornelian, but they are broad and coarſe to the naked eye; and when viewed with a microſcope, or even only attentively examined by the naked eye againſt a good light, they are found to be each compoſed of a number of thin ones, ſeparated from each other by narrow zones of the common matter of the ſtone, and each compoſed of ſeveral cloſe arrangements of ſmall red ſpots. This is found in New Spain and in ſome parts of Europe, and is ſometimes wrought into ſnuff-boxes, counters for cards, or other toys; but is very little eſteemed.

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The third ſpecies is the yellow leaved *ſardonyx*, which, as its veins are as truly of the matter of the yellow cornelian, as thoſe of the former ſpecies are of the red, is certainly entitled as much as they to the name of *ſardonyx*. This is a very beautiful ſtone, and was well known among the antients by the name of the *onyx in qua chryſolithi color*, or the chryſolite onyx. The chryſolite of the antients was the gem we now call the topaz, and the zones of this ſtone are truly of that colour, though of leſs tranſparence and brightneſs. It is found in pretty large maſſes, but always flat, and full of numerous cracks and flaws, ſo that few pieces of it can be obtained of any ſize. Its zones are ſo many flat and regular plates or tables, laid evenly on one another, but divided by other zones of the matter of the ſtone: this is of a clear and beautiful pale brown, and the zones being of an extremely bright yellow, the whole is very beautiful. It is found in many parts of the world, but is no where common, it being rare to meet with two ſpecimens of it together. Arabia, Armenia, Perſia, China, and New-Spain, have all been known, at times, to produce it. In Italy it is very much valued, but with us it is hardly known.

The fourth ſpecies is the orange coloured *ſardonyx*, or the bluiſh white onyx with orange coloured and whitiſh zones. This is a very ſingular ſpecies, and is not without its beauty, though greatly inferior to the former. Its ground, or baſis, is a bluiſh white, and its zones are made of the matter of the deeper yellow and the white cornelian laid alternately, and often intermixed with other zones, made of the common matter of the ſtone. It is found in Ægypt, Arabia, and the Eaſt-Indies, and not unfrequently in Germany, but the European is greatly inferior to the Oriental.

Theſe are all the genuine *ſardonyxes*; but the ſtone called *ſardonyx*, in Pliny's time, being properly a camæa, not a *ſardonyx*, is to be ſeen under that head. *Hill*'s Hiſt. of Foſſ. p. 497.

SARFAR, a name given by ſome of the chemiſts to iron.

SARGAZO, or SARGASO, in botany, a name for the plant commonly called *ſea lentils*; a ſmall ſea plant found among the rocks, and ſometimes at open ſea, and ſuppoſed to be a good diuretic. *Mont.* Exot. p. 7. *Piſo*, p. 18.

SARGO, the name uſed by Aguſtino Scilla, in his book of petrifactions, for the name of one of thoſe kinds of ſea fiſh, in the hinder part of whoſe jaws are found thoſe round *dentes molares*, or grinder teeth, which, when found in a petrified ſtate, are called *bufonitæ*, or toadſtones.

It is very certain, that by *ſargo* Scilla means no other fiſh than the *ſargus*; yet Mr. Willughby ſays that the *ſargus* has none of theſe round grinders, or *tubercula oſſea*, as he calls them, and makes this one of the characters by which the *ſargus* is to be diſtinguiſhed from the ſparus and ſcarus, and other fiſhes of that tribe.

It is probable that Scilla, who wrote more expreſsly on theſe ſubjects, diſſected his *ſargus* with too much accuracy, to be miſtaken in this material part of it; and it is poſſible that Mr. Willughby, though a very accurate writer, might overlook theſe teeth in the hinder part of the jaw of a fiſh which he was only deſcribing in the common way, and had no peculiar reaſon for examining in ſo nice a manner juſt in this part. Philoſ. Tranſ. N° 219. p. 195.

SARGUS, in zoology, the name of a fiſh well known, and much eſteemed among the antients, and not uncommon at this time in the markets of Rome, Venice, *&c.* being caught in the Mediterranean and Adriatic in conſiderable quantities. See Tab. of Fiſhes, N° 54.

It ſomething reſembles the ſparus in figure, but its noſe is longer and more pointed, and turns up a little, and its foreteeth are ſhaped like two human teeth, which ſtand in the ſame part of the mouth. It has no tubercles in the hinder part of the jaws, as the ſparus has; and its whole body is variegated with brown tranſverſe rings, reſembling the variegations of the perch, and has only one fin on the back, the anterior rays of which are prickly, the hinder ones not at all ſo. *Willughby*, Hiſt. Piſc. p. 309. *Geſner*, de Piſc. p. 993.

SARGUS, in zoology, is alſo the name of a river fiſh, called by others *gardon*, *ſardus*, and *cephalus*, and by many ſuppoſed to be no way eſſentially different from our common roach.

It is a river fiſh, very much reſembling the chub in its general figure, and the ſize of its ſcales, but it has a ſmaller head, and a ſomewhat broader body than that fiſh. Its back is bluiſh, its neck greeniſh, and its belly white. It has no teeth. Its eyes are yellow, and it is uſually leſs fat than the chub.

It is a very briſk and lively fiſh, and is a ſort of emblem of health among the French, and uſed proverbially as ſuch in the ſame manner as the roach among us. We ſay of a healthy man, he is as ſound as a roach, they, he is as ſound as a *gardon*. It is common in the rivers of France, Italy, and Germany, and is eſteemed but a moderately fine fiſh for the table. *Willughby*'s Hiſt. Piſc. p. 260.

SARIGOY, in zoology, a name by which ſome call the creature we know by the name of the *opoſſum*. See the article OPOSSUM.

SARIO, in zoology, a term uſed by ſome authors for the ſalmon when in the middle ſtage of its growth, when it is paſt its younger ſtate, in which it is called a *ſalar*, and is not yet arrived at what is properly called a *ſalmon*. *Willughby*'s Hiſt. Piſc. p. 189. See the article SALMO.

SARISSA, in antiquity, a very long ſpear uſed by the Macedonians. Ælian ſays, that by the antient uſage they ought to be ſixteen cubits in length; but that in fact they were but fourteen, two cubits being allowed for the handle, and the other twelve to cover their bodies. *Pitiſc.* in voc.

SARMATICA *lues*, a name given by ſome authors to the *plica polonica*.

SARMENIUS *lapis*, a name given by the writers of the middle ages to a ſtone ſaid to be uſed in the poliſhing of gold, and to have virtues in medicine alſo; ſuch as preventing abortion, and the like.

It ſeems to have been only a corrupt way of ſpelling *famius lapis*, a ſtone to which Pliny has attributed the ſame virtues.

SARMENTOUS *ſtalk*. See the article STALK.

SARONIA, Σαρωνια, among the Greeks, a feſtival kept in honour of Diana, ſurnamed *Saronia*, from Saro the third king of Træzene, by whom a temple was erected, and this feſtival inſtituted to her. *Potter*, Archæol. Græc. Tom. I. p. 439.

SAROS, Σαρος, in chronology, a period of 223 lunar months. *Suidas* in voc. Σαρος Mem. Acad. Inſcr. Tom. 8. p. 283.

The etymology of the word is ſaid to be Chaldean, ſignifying reſtitution, or return of eclipſes; that is, conjunctions of the ſun and moon in nearly the ſame place of the ecliptic.

The *ſaros* was a cycle like to that of *meto*. See the article METONIC, *Cycl.*

SAROSEL, in the glaſs trade, the name of the room into which the mouth of the Leer opens, and in which the glaſs veſſels are placed, when taken out of the Leer.

The men who attend to do this are called the *ſarole* men. *Neri*'s Art of Glaſs, p. 244.

SARPA, in zoology, the name by which the *ſalpa*, a very beautiful fiſh of the Mediterranean, is known in the Italian markets. *Geſner* de Piſc. p. 979. See SALPA.

SARPICULA, among the Romans, a term uſed by the old Roman writers to ſignify a pruning hook. *Pitiſc.* in voc.

SARPLAR *of wool*, a quantity of wool otherwiſe called a pocket, or half ſack; a ſack containing eighty tod, a tod two ſtone, and a ſtone fourteen pounds. See the article SACK, *Cycl.*

In Scotland it is termed *ſarpliath*, and contains eighty ſtone. Vid. Dict. Ruſt. in voc.

SARPOE, a name given to the fiſh called by authors *ſalpa*. See SALPA.

SARRACENA, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, and is compoſed of ſeveral leaves, arranged in a circular form, and placed on a one leaved cup, divided into many ſegments at the edges, or ſometimes of a number of diſtinct leaves; from the center of the cup there ariſes a piſtil, which carries on its top a ſort of membranaceous ſhield, which finally becomes a roundiſh fruit, uſually divided into five cells, and containing oblong ſeeds.

There is only one known ſpecies of *ſarracena*, which is the *ſarracena* with hollow and auriculated leaves, commonly called *the hollow leaved ſea lavender*, the *limonio congener* of Cluſius. *Tourn.* Inſt. p. 657.

SARRITION, *ſarritio*, in Roman authors, the term uſed to expreſs what we call hoeing in huſbandry, or ſomething analogous to it, that is a way of ſtirring up the earth about young plants, and deſtroying the weeds that would grow among them. When the plants had been ſome time come up, they ſtirred the land with wooden rakes or harrows, and then went over the fields, and pulled up the weeds by hand.

Columella ſays, that they ſowed the medica by ſcattering the ſeeds on the ſurface of the ground, and then raking them in with iron rakes, and that at different times. After this they went over the ground again with the ſame inſtruments, to root up the weeds which would have choaked the young plant. They both harrowed and hoed *raſtris* with rakes; ſo that their *occatio* and *ſarritio* were performed with much the ſame ſort of inſtrument, and differed only in the time or ſeaſon at which they were performed: the firſt was at ſeed time, to cover the grain and level the ground, and the other was to move the ground after the plants were up.

They uſed two kinds of *ſarrition*; the one was intended only to move the ground, the other was to cover up the young plants, that they might grow the more ſtrong and vigorouſly. The antients all ſowed their corn under furrow; that is, they firſt levelled the ground by harrowing, then ſcattered the ſeed upon it, and afterwards plowed it in. This method left the ground very uneven, and the corn came up moſtly in the loweſt places betwixt the furrows, which always lay higher. This we ſee is always the caſe at preſent, where the ſame method is followed; and the underſtanding this explains a paſſage in Virgil, which many have been perplexed about, *cum ſulcos æquant fata*, when the corn is as high as the furrows, which it is plain it could not

be in this method of husbandry, till it was of some growth. When they only hoed to stir the surface of the ground, or used what they called plain *sarrition*, they harrowed or hoed lengthways of the furrows, which being somewhat hardened, there could be little earth thrown down thence upon the corn.

The other kind of *sarrition* was performed by stirring the earth crosways of the furrows, by which a great deal of it must needs be thrown down among the young corn. The husbandmen of these times supposed, that the falling down of this earth upon the stalk, burying it to some depth, was the occasion of its growing strongly and vigorously: but though this could not be the case, it is certain that the corn did grow better for the operation, because the ground was thoroughly stirred by it, and had an advantage for the plants, like that obtained by the modern practice of horse-hoeing.

The antients in many other cases, as well as this, seem to have mistaken the intent and meaning of their general practices in husbandry. Columella says that beans, pease, and other the like herbs, should all be well hoed when they are about four fingers high, excepting only the lupine, but that hoeing was injurious to this plant, which having only one root, when that was cut the whole plant perished.

He adds, that hoeing was not necessary to this plant, because it was of itself so strong a grower, that it kills all weeds, starving them out by drawing all the nourishment to itself.

If the husbandmen of these times had sowed their lupines in rows, and harrowed only between those rows, they would have been in no danger of cutting the roots of the plant; and had they been better acquainted with hoeing, they would have known that the killing the weeds is the least part of the advantage arising from it, the principal being the opening and dividing the earth, and giving it a kind of new tillage.

The *sarrition* used by the antients scratched only so slight a part of the surface of the ground, that it is to be doubted whether it was of much advantage; and this was done so indistinctly among the corn and weeds, without favouring one any more than another, that it is a dispute whether the good it did, in facilitating the runcation, or hand-weeding afterwards, was greater than the damage it did by tearing the corn; so that many of the husbandmen of those times chose to omit it, and only to employ the hand-weeders: but with us hoeing, when carefully practised, is of infinite advantage, no way injurious to the corn, though wholly destructive of the weeds.

It is an error therefore in the translators of the antients, to render the word *sarritio* by *hoeing*, without giving any farther explication of it; for the antients truly hoed their vineyards in an exact sense of the word, but not their corn; neither did they plant their corn in rows, without which they could not give it their vineyard hoeing. This sarculation was used only among small quantities of sown corn, and is yet in use for flax; for the sarculum, which is a sort of very narrow hoe, is still used among the plants of flax growing irregularly, but this is too tedious and expensive ever to have place in whole fields of corn.

If the antients hoed their crops of corn standing irregularly, as sown at random, they must have made very mad work of it, since they were at no pains to sow in rows, and hoe between them with their bidens, which was an instrument with which they tilled many of their vineyards, and which entered the ground as deep as the plow, and was a much better instrument than the English hoe, which is very ill calculated for the office its principal business lies in, which is stirring the ground. *Tull*'s Horse-hoeing Husbandry.

SARTORIUS (*Cycl.*)—This is the longest muscle of the human body; it is flat, and about two fingers in breadth, situated obliquely along the inside of the thigh. It is fixed above by a very short tendon, in the lower part of the anterior superior spine of the os ilium, before the musculus fasciæ latæ. The beginning of its body lies in the notch, between the two anterior spines of that bone. From thence it runs down obliquely over the vastus internus, and other muscles that lie near it, all the way to the inside of the knee, where it terminates in a small tendon, which grows broader near its extremity, and is inserted obliquely, and a little transversely, in the forepart of the inside of the head of the tibia, near the spine or tuberosity of that bone, immediately above the insertion of the gracilis interior.

The fleshy body of this muscle is enclosed in a vagina made by the fascia lata; its fibres in general are longitudinal, and when its lower tendon turns obliquely over toward the head of the tibia, it seems to be braced down, and secured in its place by a tendinous frænum or vagina. *Winslow*'s Anatomy, p. 214.

SASSAFRAS (*Cycl.*) The culture of this tree is a hard task, it being a very difficult tree to keep long alive, though it will do very well for some time. It will not live in greenhouses, and hard winters kill it in the open air.

The best way to manage it is to remove it in April into a warm and well defended place, where it will be safe from the cold winds, and from too much open sun. It must not, however, be under the droppings of other trees. In winter some mulch must be laid on the ground round the stem, and in the summer season all the weeds must be cleared away about it.

It is brought from Virginia and Carolina, in both which places it is common.

Ximenes, an author of considerable credit in the world, has ventured to tell us, that the chips of the *sassafras* tree put into sea water will, in a few days, render it fresh and potable. He was probably imposed on by some person, in whom he placed too much confidence in this article, for experiments shew it to be false; ever so large a quantity of this wood, kept for ever so long a time in sea water, having no such effect. *Redi*'s Esperienze.

The oil of *sassafras* forms into chrystals like the oil of thyme, observed by Mr. Neuman, and which he supposed like to camphor. Philos. Trans. N° 389, 390, and 450. See CAMPHOR and OIL *of sassafras*.

SASSAROLLO, in zoology, the name of a peculiar species of pigeon, called by some *columba rupicola*, or the rock pigeon.

It is of the shape of the common pigeon, but smaller, and has red legs, and a grey variegated back. It seems the same with the *livia* of other authors. *Aldrovand* de Avib. See the article LIVIA.

SATISFACTION, in law, is used for the giving of recompence for an injury done; or the payment of money due on bond, judgment, *&c.* In which last it must be entered on record. 2 *Lill.* Abr. 495. Terms of Law.

SATURATION, in chemistry, is the impregnation of an acid with an alkali, or of an alkali with an acid, till either will receive no more, and the mixture becomes neutral.

SATUREIA, in botany, the name of a genus of plants, the characters of which are these. The flower consists of one leaf, and is of the labiated kind. It differs from thyme, in that the flowers grow scatteredly in the alæ of the leaves; from calamint, in that they do not stand on ramose pedicles; and from the thymbræ, in that they are not verticillate.

The only species, properly of this genus, is the common garden *savory*.

SATURN (*Cycl.*)—The ring of *saturn* sometimes disappears, concerning which we have a paper in the Philosophical Transactions, N° 471. sect. 9. by Mr. Heinsius of Petersburg.

This phænomenon is rare. It ought to happen every fifteen years; but from the situation of the earth, with respect to the sun and to *saturn*, it happens not above once in 30 or 45 years. See Philos. Trans. loc. cit.

SATURNIAN, *saturnius*, in antient poetry, a kind of iambic verse used in satirical writings: it consisted of six feet, and a syllable over, and thence called *trimeter hypercatalectus*. *Pitisc.* in voc. See IAMBIC, *Cycl.*

SATURNINE, (*Cycl.*)—SATURNINE *tincture*, *tinctura saturnina*. See the article TINCTURE.

SAUEL, in ichthyology, a name given by the Portuguese to a kind of fish, very frequent on the coasts of China, which by the natives is called *xiyu*. In the months of April and May vast numbers of them are taken in the river Kiang, near Nanking: during which time one of the most honourable of the emperor's eunuchs takes care to have several ships filled with these fish; which being put into the ships alive, are buried, as it were, in ice provided for that purpose, and in this manner preserved for the summer's provision of the emperor. The ships made use of to carry these fish to the emperor's court at Pekin, are of the neatest kind, and richly adorned; and all other vessels are obliged to make way for them. *Hofm.* Lex. univ. in voc.

SAVELIN, in zoology, the name of a truttaceous fish of the umbla, or umbra kind, caught in the Danube, and in some other large rivers. Its back is black; its sides spotted with yellow spots; and its belly and the belly fins are yellow. The scales are very small, and on the head there is a very remarkable series of spotted lines running into a singular figure, and surrounding the eyes, and running afterwards to the angle of the gills. The upper jaw is much longer than the lower. Its most frequent size is about a foot in length, but it sometimes comes up to six or eight pound weight. It is a very fine tasted fish. *Willughby*, Hist. Pisc. p. 195.

SAVIN, *sabina*, in medicine, is a famous hysteric and attenuant; it promotes the discharges by urine; but its great effect is the promoting the menses, which it will do more forcibly than safely, if not under very careful management.

It is kept in the shops as an ingredient in many compositions, but is very rarely used in extemporaneous prescription. *Savin* is a species of *juniper*. See the article JUNIPER.

SAVORY, in botany. See SATUREIA.

SAURITES, a stone mentioned by Pliny, and supposed by the antients to be found in the belly of a lizard. It seems to have been a kind of cornelian of a pale flesh colour.

SAURURUS, in botany, the name of a genus of plants, the characters of which are these. The perianthium is oblong, coloured,

coloured, and permanent; it is compoſed of one leaf, and ſtands ſideways on the amentum. There are no petals, but the cup being coloured, has been by ſome taken for a flower. The ſtamina are ſix long capillary filaments, three ſtanding on each ſide. The antheræ are oblong and erect. The germen of the piſtil is oval, and divided into three lobes. There is no ſtyle. The ſtigmata are three, and are obtuſe and permanent. The fruit is an oval berry, having only one cell, and containing only one oval ſeed. *Linnæi* Gen. Pl. p. 155.

SAURUS, in ichthyography, a name given by ſome authors to the *lacertus*, or longer gar fiſh, called *aguglia imperiale* by the Italians, and the *girrock* by the Engliſh fiſhermen. *Willughby*, Hiſt. Piſc. p. 232.

SAURUS, the *lizard fiſh*, is alſo a name given by Salvian, and ſome other writers, to a fiſh of the cuculus kind, reſembling the mackrel in figure and taſte, and more uſually called *trachurus*. *Salvian*, de Aquat. p. 15. See the article TRACHURUS.

SAUSTRA *beady*, in natural hiſtory, a name given by the people of the Eaſt-Indies to a kind of foſſil, to which they attribute great virtues in medicine.

Before it is given internally, it undergoes an hundred calcinations, and ſeveral preparations with the juices of herbs. When the operation is over, they ſay it will cure a thouſand diſeaſes. It has its name from thence, the word *ſauſtra* ſignifying with them a thouſand.

It is a talcy ſtone, and in its native ſtate is of a reddiſh colour. *Woodw.* Cat. Foſſ. Vol. 2.

SAUVAGEA, in botany, the name of a genus of plants, the characters of which are theſe. The perianthium is compoſed of five acute and lanceolated leaves, and remains after the flower is fallen. The flower conſiſts of five plane, erect, obtuſe, emarginated petals, which are longer than the leaves of the cup. The ſtamina are numerous capillary filaments, about half the length of the flower. The antheræ are ſimple. The germen of the piſtil is buried in the cup. The ſtyle is ſimple and ſhort. The ſtigmata are ſix; they are of an oblong figure, and of the length of the ſtyle. The fruit is a covered oval capſule, conſiſting of one cell. The ſpatha and capſule open horizontally along the middle. The ſeeds are ſmall and numerous. *Linnæi* Gen. Pl. p. 240.

SAW *fiſh*, in ichthyology, the Engliſh name for the fiſh called by authors the *priſtes*, and *ſerra piſcis*. It has theſe names from the form of its ſnout, which reſembles a large toothed *ſaw*.

According to the new ſyſtem of Artedi, this is a ſpecies of ſqualus, and is diſtinguiſhed from the other ſpecies of the ſame genus, by the name of the ſqualus with a long pointed and flatted ſnout, dentated on each ſide. See Tab. of Fiſhes, N° 5. and SERRA *piſcis* and SQUALUS.

SAWING *aſunder*, a puniſhment very common among the antient oriental nations. See *Pitiſc.* in voc. *ſerra*.

SAXIFRAGE, *ſaxifraga*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, conſiſting of ſeveral petals diſpoſed in a circular form; from the cup of which there ariſes a two horned piſtil, which finally becomes, together with the cup, a roundiſh, but two horned bicapſular ſeed veſſel, which uſually contains a number of very ſmall ſeeds.

The ſpecies of *ſaxifrage*, enumerated by Mr. Tournefort, are theſe. 1. The common round leaved *ſaxifrage*. 2. The *ſaxifrage* with bulbs at the leaves. 3. The ſmall annual ſpring *ſaxifrage*, called rue-leaved whitlow graſs. 4. The moſſy *ſaxifrage* with trifid leaves. 5. The trifid leaved alpine *ſaxifrage* with pale yellow flowers. 6. The ſmall hairy trifid leaved alpine *ſaxifrage*. 7. The white flowered trifid leaved rock *ſaxifrage*. 8. The many flowered houſeleek leaved white *ſaxifrage*. 9. The Pyrenean houſeleek leaved *ſaxifrage* with crenated leaves. 10. The narrower houſeleek *ſaxifrage* with ſerrated leaves. 11. The *ſaxifrage* with rounded ſerrated leaves. 12. The alpine houſeleek *ſaxifrage* with rough leaves. 13. The purple flowered heath-like alpine *ſaxifrage*. 14. The blue flowered heath-like alpine *ſaxifrage*. 15. The long leaved pyramidal mountain *ſaxifrage*. 16. The ſmalleſt yellow flowered Pyrenean *ſaxifrage* with leaves like houſeleek, very cloſely put together. 17. The ſmalleſt white flowered Pyrenean *ſaxifrage* with leaves very cloſely ſet together. 18. The ſmalleſt alpine *ſaxifrage* with bluiſh green leaves bending downwards. 19. The yellow alpine houſeleek leaved *ſaxifrage*. 20. The broad leaved Pyrenean trifid *ſaxifrage*. 21. The broad leaved rigid *ſaxifrage* with trifid leaves. 22. The ſmalleſt trifid leaved Pyrenean *ſaxifrage* with pale yellow flowers. 23. The Pyrenean *ſaxifrage* with leaves partly whole, and partly trifid. And 24. the ſmalleſt yellow flowered moſs-like Pyrenean *ſaxifrage*. *Tourn.* Inſt. p. 252.

In the materia medica we have two very different plants deſcribed under the name of *ſaxifrage*; ſo that the writers on theſe ſubjects ſeem often ſtrangely to contradict one another in their deſcriptions, when they are really deſcribing two perfectly different plants.

The one is the *ſaxifraga antiquorum*. This is a low plant, ſomewhat reſembling thyme, and its ſeed is of an agreeable ſmell, and warm and acrid taſte. The other is the common white meadow *ſaxifrage*, a plant of ſix or eight inches high, with roundiſh leaves and large white flowers. The root of this ſpecies is granuloſe, or made up of a number of ſmall knobs, and theſe are in moſt places uſed in the ſhops under the name of *ſaxifrage* ſeeds.

The ſeeds of *ſaxifrage* were once in great eſteem, as a diuretic and remedy for the ſtone, but they have of late loſt their credit. It may be obſerved, however, that we are not proper judges of what might have been the virtues of an acrid ſeed, while we uſe in its ſtead an inſipid root. *Lemery*'s Hiſt. of Drugs.

Golden SAXIFRAGE. See CHRYSOPLENIUM.

Red SAXIFRAGE, *ſaxifraga rubra*, a name given by ſome botanic authors to the *filipendula* or dropwort. *Ger.* Emac. Ind. 2. See FILIPENDULA.

Yellow SAXIFRAGE, *ſaxifraga lutea*, a name given by Fuchſius, and ſome other authors, to the common melilot. *Ger.* Emac. Ind. 2.

SAYACU, in zoology, the name of a Braſilian bird, of the ſize of our chaffinch, and all over of a greyiſh green colour, and very beautifully bright and ſhining in the back and wings. Its beak is black, as are alſo its eyes. *Marggrave*'s Hiſt. of Braſil.

SAYAN, in natural hiſtory, a name given by ſome to a ſpecies of ſea ſwallow. The bird whoſe neſts are ſo famous an ingredient in ſoops.

SCAB—*Crown* SCAB, in the manege, is a mealy ſcurf upon the paſterns of a horſe, that make the hair briſtle and ſtare.

SCABBARD, in the manege, is the ſkin that ſerves for a ſheath or caſe to a horſe's yard.

SCABBED-*heels or fruſh*, in the manege, is an eating putrefaction upon a horſe's fruſh, which is very hard to cure, and has a noiſome ſmell.

SCABIES, the *itch* (*Cycl.*)—Medical writers diſtinguiſh this hateful diſeaſe into two kinds, the benign and the malign.

The benign *itch* beſide being divided into the dry and moiſt, is alſo diſtinguiſhed into the chronic, which remains on the patient for many years, and the periodic, which returns and diſappears at certain periods. It is alſo divided by others into the ſuperficial and profound, the firſt affecting only the ſkin, and ariſing uſually from contagion, the other lying deeper in the blood and humors.

The malignant *itch* is of many kinds, diſtinguiſhed by the epithets ſerine, ſcorbutic, venereal, and leprous. In theſe caſes the malignant *itch* is ſometimes called alſo the complicated *itch*, as it is complicated with other diſorders, and is attended with various ſymptoms, not properly belonging to it as the *itch*.

Signs of the itch. The moſt obvious and general ſigns of the *itch* are the eruption of pimples, or puſtules, over the whole ſurface of the body, excepting only the head; which contain, in the end, a ſanious and ulcerous matter. Theſe puſtules uſually appear firſt in the hands, and ſuch other parts as are moſt expoſed to the air, and from theſe they gradually ſpread themſelves all over the body; the body is more turgid in thoſe places where the puſtules are ſituated, than in a ſtate of health; and theſe puſtules are attended with a violent itching, eſpecially in the night. After a few days they either break of themſelves, or are opened by ſcratching, and then become ſo many little ulcers; theſe, however, uſually heal of themſelves in a very little time, and leave no ſcar behind them. This kind of benign *itch* occupies no part but the ſkin, and indeed the matter always lies between the cutis and cuticula, whence the cutis not being deeply corroded, the cuticle eaſily heals. *Junker*'s Conſp. Med. p. 448.

In the *benign moiſt itch*, the puſtules contain a large quantity of matter, and when broken diſcharge a large flow of it; there is alſo round the baſis of the puſtules of this kind an inflammatory red circle; and, in fine, the more plainly that appears, the greater is the ſuppuration. The ulcerations, in this kind, are deeper than in the dry, and the puſtules rather give a ſenſation of pain and burning heat than of itching.

In the *benign dry itch*, the puſtules are much ſmaller than in this caſe, and are full of a limpid water; and they ulcerate the ſkin more ſuperficially, and cauſe a violent itching, rather than any ſoreneſs or heat in the parts.

The *malignant itch*, when of the ſerine kind, called alſo by ſome the ſcorbutic *itch*, is dry and ſcaly, and frequently ſhews bloody ſpots under the larger ſcales. The ſkin round about theſe is tinged by the ſtagnating blood, ſometimes to a red, ſometimes to a livid, or bluiſh black colour. The itching from this kind is much more violent than from the benign, and on any ſudden change of the body, either to hotter, or colder, becomes almoſt intolerable. When the ſcabs and cuticle are ſcratched off, as is very frequently the caſe, the cutis underneath is ſeen red and bloody, but neither blood nor lymph are diſcharged from the ſcabs in ſome caſes, in others a yellowiſh ſerous liquor runs out, and almoſt immediately hardens into a ſcab or cruſt like that which was pulled off.

The venereal or pocky itch. This is uſually rather dry than moiſt, and does not ſpread itſelf ſo quickly as the other kinds. It ſometimes occupies the body in general, ſometimes only particular places, as the thighs, the ſcrotum, or the face.

At its firſt appearance there are uſually felt certain little tumors under the ſkin; and after this there appears a ſcab which remains on the part a conſiderable time, and will not eaſily be removed or torn off. The pain of this is ſharp and eroſive, eſpecially when it is exaſperated by ſcratching; and while this is fixed to ſome one part, there are pains felt deep within the fleſh in other places, which are moſt intolerable in the night; and in women the fluor albus, or whites, is uſually an attendant on it; and in men ſometimes a gonorrhœa, ſometimes bubos and other tumors; and in infants, who are thus affected, from the diſeaſes of their parents, there are frequent excoriations, and often criſtated and verrucoſe excreſcences of fleſh about the anus.

The leprous itch. In this the head is frequently affected, the pains are very violent, and the hair and ſkin very frequently fall off. There iſſues from the ſcabs white ſanious matter, and the whole texture of the ſkin is altered; the cuticle being beſet with ſmall ſcales, and feeling rough like the ſkin of an elephant, whence the diſeaſe has been called by ſome *elephantiaſis*.

In other reſpects, this complaint is attended with no ſenſation of pain, or uneaſineſs; but the face is inflated, the teeth become black, the breath becomes fœtid, and tumors of the bubo kind appear on ſeveral parts of the body, all which become finally malignant ulcers; and in the progreſs of the diſeaſe, large ſcabs, with portions of the ſkin, fall from different parts of the face.

Perſons ſubject to the itch. Theſe are principally men of a ſanguineous temperament of body and phlegmatic diſpoſition, who moſt eaſily fall into the moiſt *itch* of the ſimple benign kind, and are of all others moſt difficultly cured of it. Thoſe, on the other hand, who are moſt ſubject to the ſimple dry *itch* are men of a dry temperament and choleric habit. All perſons who eat coarſe foods, with much ſalt, and drink ſour or decayed liquors, eaſily fall into this kind; as alſo ſuch as live in a damp foggy air, and thoſe who are ſubject to obſtructions of the liver, and who have long been afflicted with quartans. Thoſe who have a ſuppreſſion or diminution of the uſual quantity of urine, and by that means have the ſalt ſeroſities of the blood not duly carried off, are alſo more ſubject than others; as alſo, from the ſame cauſe, are ſuch as have had old ulcers ſuddenly ſtopped, or iſſues dried up; people who have been uſed to cupping, at certain regular times, and afterwards neglect it; and finally, thoſe of an idle and ſedentary courſe of life. Ibid. p. 450.

Cauſes of it. The cauſes of the ſimple benign *itch* are a ſtaſis and corruption of the lymphatic humors, and this is often occaſioned by the humid temperament of the air, which in cold ſeaſons prevents the going off of thoſe humors by ſweat, which had been directed to the ſkin by nature for that purpoſe, hence they remain there and corrupt; and there are other things which more or leſs concur to cauſing it; theſe are a change of the food and drink continued for ſome time, and with this a plethoric habit of body. It is ſometimes the criſis of other diſeaſes, as of a quartan, *&c.* Theſe are the cauſes, and theſe the perſons ſubject to the *itch*, as a primary diſeaſe beginning with them; but its uſual method of propagating itſelf is by contagion; fifty people, at leaſt, having it by this means, for one, on whom it appears of itſelf. A free uſe of ſalted food greatly exaſperates the *itch* in all perſons, but this alone can have but little effect toward the original producing it. The malignant or complicated *itch* owes its origin to other cauſes. The ferine *itch* is always cauſed by the ſcurvy, and the venereal or pocky *itch* owes its origin to a corruption of the lymph in the venereal diſeaſe.

Prognoſtics in the itch. The ſimple benign *itch*, of the moiſt kind, is the mildeſt of all the kinds, and in general the moſt eaſily cured; but as it is more ſubject to ulcerations than the other kinds, this ſometimes makes the cure in bad habits of body more difficult. The dry *itch* is more troubleſome, and takes more time in the cure than the moiſt, and is more troubleſome to the patient; but in the moiſt ſanious and ſuppurating *itch*, when it is raſhly treated by mercurial and ſulphureous ointments, by quickſilver girdles, by aſtringents and refrigerants, and is driven in, which is a very common caſe, there always ariſe very unhappy ſymptoms, ſuch as anxieties of the præcordia, aſthmas, ſuffocative catarrhs, intermittent fevers, and ſometimes inflammatory acute ones, both which are of a different appearance from thoſe diſtempers in their uſual ſtate; not unfrequently alſo terrible chronic complaints are brought on by this, as cachexies, anaſarcas and œdemas. The *itch*, in general, when newly caught by infection, is always much more eaſily cured, than when it ariſes from a fault in the humors, and is conſequently much more deeply rooted: for the ſame reaſon, the chronic *itch* is of all others the moſt difficult to be cured; and where there concurs with it a defect or fault of ſome of the viſcera, as is too often the caſe, the cure is yet greatly the more difficult. The malignant *itch* is always much more deeply rooted in the patient, and of conſequence is much more difficult of cure than the ſimple; and in particular, the ferine or ſcorbutic *itch* is one of the moſt ſtubborn diſeaſes we know of. In this caſe the food, and other circumſtances, often make the cure much more difficult than it naturally would be: poor people are often infeſted with this; and their diet not being in their choice, are with difficulty cured of it. The venereal *itch*, though generally accounted the moſt terrible of all the kinds, is yet much more eaſily cured than the ſcorbutic, and ſometimes than the ſimple chronic kind, when treated in a proper manner. *Junker's* Conſp. Med. p. 452.

Method of cure. The corrupt ſtate of the humors is to be corrected according to the ſeveral kinds. In the benign *itch*, this is effected by alexipharmics and diuretics, ſuch are decoctions of the woods of guaiacum, ſaſſafras, and the like, with elecampane and pimpernel roots, and the common abſorbents fated with acids, as the crabs eyes, or oiſter ſhells, ſaturated with lemon juice, or the like; and the acrimony of the humors is greatly taken off by ſulphur and nitre given in powders, or by the ſimple balſam of ſulphur in oil of almonds. After this external applications compleat the cure; of this kind are the mercurial ointments, and thoſe which contain ſulphur. In the dry *itch* fomentations and baths do much more than ointments; of this kind are decoctions of the oxylapathum root, and a lixivium of quick-lime and ſulphur, or the general bathing in mineral ſprings.

In the malignant itch, the ferine or ſcorbutic is to be treated as the ſcurvy, to which it owes its origin. The antiſcorbutic juices ſhould be taken for ſome time, and the decoction of tobacco made very ſtrong, is a good external application; mercurial ointments have alſo their uſe here, and the violent heat of the eruptions may be mitigated by camphor, and by the frogs ſpawn plaiſter.

In the venereal itch, the method to be uſed for a cure is the ſame with that for the venereal diſeaſe in any other appearance, but in this there muſt be always kept up a gentle perſpiration: mercurial ointments have peculiarly a place here: and when the diſeaſe is ſo rooted as to give way to no other means, recourſe is to be had to a ſalivation; and finally, the cure is to be completed by evacuating the corrected humors by ſtool, in which caſe calomel is a very uſeful ingredient in purges, and the decoctions of the diaphoretic and diuretic vegetables are of great ſervice in compleating it, and preventing a return. Ibid. p. 454.

SCABIOSA, *ſcabious*, in the Linnæan ſyſtem of botany, a diſtinct genus of plants; the characters of which are, that there is both a common and a proper perianthium, of which the latter is alſo double. The common perianthium is expanded, and compoſed of many leaves, and containing many flowers; its leaves are inſerted in the receptacle, and ſurround it in various ſeries, the inner ones becoming gradually leſs than the outer. The proper perianthium is double, but both are fixed on the germen of the piſtil. The outer perianthium is ſhort, membranaceous, and folded, and remains after the flower is fallen; the inner is divided into five ſegments, which are narrow, and pointed; the flowers are monopetalous, they are placed erect, and the petal forms a tube, which is widened at the extremity, and ſlightly divided either into five, or four ſegments, the exterior of which are the larger. The ſtamina are four ſmall and weak filaments. The antheræ are oblong, and laid cloſely upon them. The germen of the piſtil is placed below the proper receptacle of the flower; and is incloſed, as in a caſe, in its proper vagina. The ſtyle is ſlender, and of the length of the flower. The ſtigma is obtuſe, and is obliquely rimmed round the edge. The ſeeds are ſingle to each flower, of an oval oblong figure, and crowned with their proper cups, and contained in the common receptacle, which is convex, and divided by the perianthia of the ſeveral flowers. See Tab. 1. of Botany, Claſs 12. and *Linnæi* Gen. Plant. p. 23.

The characters of this genus, according to Tournefort, are theſe. The flower is of the floſculous kind, and is compoſed of ſeveral unequal floſcules, contained in one general or common cup. Thoſe floſcules, which are placed in the middle of the flower, are divided at the ends into four or five ſegments, and thoſe which make the outer circle or rim of the flower are bilabiated. Each of theſe ſtands on the coronated top of an embryo, and each is contained in its proper and peculiar capſule, which afterwards becomes either a ſimple or a funnel faſhioned capſule, containing a coronated ſeed. *Tourn.* Inſt. p. 464.

The ſpecies of *ſcabious* enumerated by Mr. Tournefort are theſe. 1. The common hairy field *ſcabious*, or *ſcabious* of the ſhops. 2. The greater *ſcabious* with purpliſh blue flowers. 3. The broad leaved white ſhrubby *ſcabious*. 4. The broad leaved ſhrubby *ſcabious* with bluiſh flowers. 5. The tall annual *ſcabious* with leaves like agrimony. 6. The narrow leaved white flowered ſhrubby *ſcabious*. 7. The larger white flowered, narrow leaved ſhrubby *ſcabious*. 8. The yellow flowered *ſcabious* with multifid leaves. 9. The double headed white *ſcabious*. 10. The broad leaved white proliferous *ſcabious*. 11. The proliferous *ſcabious* with gingidium leaves. 12. The ſmall fine leaved poliferous *ſcabious*. 13. The Alpine *ſcabious* with great centaury leaves. 14. The ſmooth mountain *ſcabious* with leaves like the common *ſcabious*. 15. The red flowered mountain *ſcabious* broad not

jagged

jagged leaves. 16. The red flowered mountain *ſcabious* with broader and longer undivided leaves. 17. The *ſcabious* with the virga paſtoris, or ſmall dipſacus leaf. 18. The narrow leaved ſilvery *ſcabious*. 19. The long headed red flowered exotic *ſcabious*. 20. The long headed *ſcabious* with fleſh coloured flowers. 21. The long headed *ſcabious* with variegated flowers. 22. The long headed *ſcabious* with blackiſh flowers, with the ſmell of civet. 23. The proliferous Indian *ſcabious*. 24. The Portugal *ſcabious* reſembling the Indian. 25. The greater round headed *ſcabious*, called the leſſer *ſcabious*. 26. The leſſer round headed *ſcabious*. 27. The leſſer *ſcabious* with deeply divided leaves. 28. The little *ſcabious* with ſweet ſcented heads. 29. The great leaved Spaniſh ſtarry *ſcabious*. 30. The ſtarry *ſcabious* with great jagged leaves. 31. The leſſer or ſea ſtarry *ſcabious* with jagged leaves. 32. The ſmalleſt ſtarry *ſcabious*. 33. The ſtarry *ſcabious* with undivided leaves. 34. The annual proliferous ſtarry *ſcabious*. 35. The Sicilian *ſcabious* with heart-wort leaves. 36. The ſhrubby procumbent mountain *ſcabious*, with leaves like the young leaves of the achillea. 37. The Sicilian ſhrub *ſcabious* with laureola leaves hoary underneath. 38. The ſhrub *ſcabious* with ſtock July flower leaves. 39. The narrow leaved umbelliferous and proliferous *ſcabious*, with leaves cut into the middle rib. 40. The fleſh coloured flowered *ſcabious*, with leaves like the hairy jagged devil's bit. 41. The great tree *ſcabious* of Africa, with undivided, wrinkled, and crenated leaves. 42. The ſmall ſea *ſcabious*. 43. The cut leaved *ſcabious* with large flowers in membranaceous cups, and with woolly ſeeds. 44. The leaſt annual erect *ſcabious* with angular ſeeds. 45. The daiſy leaved annual *ſcabious*. 46. The greyiſh hoary Pyrenean *ſcabious* with large flowers. 47. The ſmooth graſſy leaved *ſcabious*. 48. The hairy creeping Alpine *ſcabious* with divided leaves. 49. The *ſcabious* with hairy undivided leaves, called the devil's bit. 50. The *ſcabious* with ſmooth undivided leaves and blue flowers. 51. The *ſcabious* with undivided leaves and white flowers. 52. The fleſh coloured flowered *ſcabious* with undivided leaves. 53. The *ſcabious* with whole leaves, proliferous heads, and blue flowers. 54. The *ſcabious* with leaves like fraxinella. *Tourn.* Inſt. p. 465.

The muſk *ſcabious* and other garden kinds are propagated by ſowing their ſeeds in May or the beginning of June, and the next year they will be very ſtrong, flowering from June to September, and producing ripe ſeeds, which they will not do if ſown early in the ſpring, and ſo made to flower the ſame year. The ſeeds are to be ſown on ſhady borders, and at Michaelmas the young plants are to be removed to the places where they are to remain. They are very hardy, and ſeldom periſh, till after they have ripened their ſeeds. *Miller*'s Gardner's Dict.

The common *ſcabious*, of our corn fields, is accounted a great alexipharmic and pectoral; it is made an ingredient in ptyſans, and infuſions given in coughs and all diſorders of the lungs, and is recommended greatly by authors in pleuriſies, quinzies, coughs, aſthmas, and conſumptions. Some even recommend it in malignant fevers, and even in the plague.

It is alſo uſed externally, either in a ſtrong decoction, or elſe boiled into an ointment with lard in the itch, and many other diſorders of the ſkin.

Scabious, though ſo much celebrated with us for its medicinal virtues, has been ſuppoſed by many to have been wholly unknown to the antient Greeks: others who could not give into the opinion of their not knowing ſo common a plant, have ſuppoſed the *ſtæbe* of Theophraſtus and Dioſcorides to be the plant we call *ſcabious*, but there is no more juſtneſs in this than in the former opinion.

The antient Greeks knew two very different plants by the name of *ſtæbe*, but neither of theſe at all anſwered to the characters or virtues of *ſcabious*; the one was a ſhrub, the other an aquatic plant with woolly leaves. The ſhrub called *ſtæbe* was the ſame with the *pheos* and *hippopheos*, a prickly ſhrub of a cubit in height, but very full of branches, which grew on the ſhores of the iſland of Crete, and other the like places; and the plant *ſtæbe* was a ſmall gnaphalium, or cudweed, growing in wet places, and uſed for the ſtuffing of beds, and the packing up of earthen ware, and other brittle things, to prevent their breaking. The other was uſed by the fullers about cloaths.

It is ſufficiently evident, from theſe accounts, that neither the one nor the other of theſe *ſtæbes* had any of the qualities of *ſcabious*; but though neither of theſe was *ſcabious*, yet it does not follow that *ſcabious* was unknown.

Dioſcorides and Theophraſtus have deſcribed a plant called *pſorice*, from its virtues in curing cutaneous eruptions; and this agrees, in all reſpects, in figure, as well as qualities with our *ſcabious*. The later Greek writers have called this *pſora*, and thus it ſtands in Aëtius, and many others.

In times long after theſe, however, the names were forgot, though the plant and its virtues remained well known; the modern Greeks willing to deſcribe ſo uſeful a plant, but ignorant of its name, in their own language, called it *ſcampiuſa*, a name formed out of the Latin word *ſcabioſa*, by the common change of *b* into *mp*, and *o* into *u*. This was long retained in uſe; and as it was common with the Greeks to leave out the initial letter, *ſ*, in many words, ſo they ſometimes wrote this *campiuſa*.

Fuchſius, who was very deſirous of underſtanding the writings of Myrepſus, confeſſes, that he knew not what to make of the words *ſcampiuſa* and *campiuſa*, which he ſo frequently met with in that author; but though he gives no deſcription of the plant, the virtues he attributes to it are thoſe of *ſcabious*; and the names are ſo eaſily diſcovered to be derived from the Latin *ſcabioſa*, that there is no room for doubt of its being the ſame plant.

SCABROUS *leaf*, among botaniſts. See LEAF.

SCABROUS *ſtalk*. See the article STALK.

SCAD, the Engliſh name of a fiſh of the cuculus kind, reſembling the mackrel in ſhape, called by writers the *trachurus*. *Willughby*'s Hiſt. Piſc. p. 290. See TRACHURUS.

SCÆNANTH, or SCHÆNANTH, in the materia medica, the dried ſtalk of a plant brought to us from Arabia.

This plant is called, by the generality of botaniſts, *juncus odoratus* and *aromaticus*; but Linnæus gives it the name of *iſchæmum*, under which head its botanical characters are deſcribed. See ISCHÆMUM.

The ſtalk is uſually eight or ten inches in length, ſometimes conſiderably more; it is ſmooth and gloſſy on the ſurface, and about the thickneſs of a wheat-ſtraw, but much more rigid and firm. It is round, jointed, and not ſolid, but has a cavity in it filled with a central pith like that of our common ruſhes. Its colour is yelloviſh at the baſe, or toward the root, but toward the top it is purpliſh or greeniſh; it is very light, yet conſiderably hard, and is of a fragrant or aromatic ſmell, in which we may diſcover ſomething of a mixed ſcent, between that of the roſe and penny-royal. Its taſte is acrid and bitteriſh, but not unpleaſant.

It ſhould be choſen freſh, ſound, and clean, not duſty or decayed, of a good ſmell and ſtrong acrid taſte. *Hill*, Hiſt. Mat Med. p. 413.

The word *ſchænanth* ſignifying the flower of the ruſh, might naturally lead us to ſuppoſe, that what we now receive under that name, is not the drug that was ſo called by the antient Greeks and Romans, and ſome have very vigorouſly ſupported this opinion. But on enquiry into the Grecian materia medica, we find that none of their *ſchænanth* had flowers on it any more than ours.

Among the moderns, Garcias tells us, that though he bought up vaſt quantities of this drug in the Indies to ſend into Portugal, he never ſaw ſo much as one flower upon any of it; and among the antients Galen makes the very ſame obſervation. He ſays he wonders how this drug obtained the name of *ſcænanth*, for that he never met with any one piece that had a flower upon it. The reaſon alledged for this is very frivolous and trifling; namely, that the camels of that part of the world where it grew, cropped off the tops, and with them the flowers; but among the vaſt quantities of this drug, at one time or other ſent, there would be found ſome that had eſcaped the mouths of theſe creatures, and have preſerved its fine flowers, had it any ſuch as are aſcribed to it; ſo that the opinion advanced, by ſome, of its having flowers like roſes, is wholly falſe and groundleſs.

Anthos was a word uſed by the Greeks, as its Engliſh flower is, to ſignify the moſt perfect, or beſt of any kind of thing. We call the fineſt ſpecies of any thing the flower of it, and thus they called the fineſt gold the anthos and anthimion of gold, in the ſame manner this ruſh was called *ſcænanth*, or the flower of ruſhes, not for its being full of flowers, but for being the moſt excellent and valuable of all kinds of ruſhes.

The very oldeſt among the Greek writers do not uſe the term *ſcænanth*, but they call this drug *juncus aromaticus*, or *juncus odoratus*, σχοινον ἀρωματικον, and σχοινον ἐυωδη. are the names it goes by. Hippocrates calls it by the latter of theſe names; and Meleager, though he mentions it as an herb to be put into the poets crowns, yet ſays nothing of any flowers it has, but recommends it for its fragrant ſmell.

The antients uſed the whole plant in medicine, ſtalk, leaves, and flowers; its virtue reſiding pretty equally in every part of it, as is manifeſt from every part's poſſeſſing the ſame ſmell and taſte, and having the ſame pungency in the mouth. They preſcribed it as a deobſtruent and promoter of the menſes, but at preſent it is never heard of in extemporaneous preſcription, only kept as an ingredient in ſome compoſitions. Id. ibid.

SCALARE, in natural hiſtory, a name given by Rumphius to a peculiar ſpecies of *turbo*, or *ſcrew ſhell*; the ſeveral wreaths of which having an opening between them form an open ſpiral. See TURBO.

SCALE, (*Cycl.*)—Many have been the diſputes among antient and modern muſicians, about the conſtitution of muſical *ſcales*. Some of the antients, with Euclid, will have it compoſed of tones major, and limma's; ſo that the ſeven intervals of an octave would be thus expreſſed, $\frac{9}{8}$, $\frac{256}{243}$, $\frac{9}{8}$, $\frac{9}{8}$, $\frac{256}{243}$, $\frac{9}{8}$, $\frac{9}{8}$. Some modern authors have from hence inferred the imperfection of the Greek muſic. They alledge, we here find the ditonus, or an interval equal to two tones major

major expreſſed by $\frac{81}{64}$, inſtead of the true third major expreſſed by $\frac{5}{4}$. As there can be no queſtion of the beauty and elegance of the latter, the former therefore muſt be out of tune by a whole comma, which is very ſhocking to the ear. In like manner, the trihemitone of the antients falls ſhort of the third minor by a comma; which is alſo the deficiency of their hemi-tone, or limma, from the true ſemi-tone major, ſo eſſential to good melody. All which errors would make their *ſcale* appear much out of tune to us. A late learned author [a] ſays he readily grants the objection, but adds, that ſuch a *ſcale* alſo appeared out of tune to the antients themſelves; ſince they expreſsly tell us, that the intervals leſs than the diateſſaron, or fourth, as alſo the intervals between the fifth and octave, were diſſonant, and diſagreeable to the ear. Their *ſcale* here mentioned, and called by ſome *ſcala maxima*, was not intended to form the voice to ſing accurately, but was deſigned to repreſent the ſyſtem of their *modes* and *tones*, and give the true fourths and fifths of every key a compoſer might chooſe. Now if inſtead of tones major and limmas we take the tones major and minor, with the ſemi-tone major, as the moderns contend we ſhould, we ſhall have a good *ſcale* indeed, but a *ſcale* adapted only to the concinnous conſtitution of one key; and whenever we proceed from that into another, we find ſome fourth or fifth erroneous by a comma. This the antients did not admit of. If to diminiſh ſuch errors, we introduce a temperature, we ſhall have nothing in tune but the octave: ſo that this *ſcale* of the antients was not deſtitute of reaſon, and no good argument againſt the accuracy of their practice can from thence be formed [b].—[[a] Dr. *Pepuſch*, ap. Philoſ. Tranſ. N° 48. p. 268. Ibid. p. 269.]

The names of the notes of the Greek *ſcale*, ſee under the head DIAGRAM.

Hour SCALE. See the article HOUR.

SCALES, in natural hiſtory. What the naturaliſts underſtand by *ſcales*, are certain flat and ſemipellucid bodies, common to the fiſh, the ſerpent, and the lizard kind; conſiſting of a ſubſtance ſomewhat analogous to that of the horns and hoofs of other animals, as is found by cutting and burning them, and by their ſmell.

The *ſcales* in fiſhes are of ſo many different kinds and ſhapes, that they afford, in many caſes, very good characters for the diſtinction of the ſpecies. The differences of theſe parts of fiſh ariſe from their number, ſituation, figure and proportion, and to ſome other qualities peculiar to a few of them. Their differences, in regard to number, are theſe. There are none on ſeveral kinds of fiſh, as on the petromyza, the dolphin, and the whales. Upon ſome other fiſhes they are but very few in number, as on the conger, the eel, the clariæ, *&c.* And they are on others found in vaſtly great numbers, and placed in cluſters one over another, as in the pearch, ſalmon, *&c.*

In regard to their ſituation they differ in theſe particulars. 1. On ſome fiſh they are placed extremely thick and cloſe upon one another. 2. In others they ſtand in imbricated rows. The eſoces give us an example of the firſt, and the cyprini, in general, of the ſecond kind. And 3. in ſome they are ſcattered, and at ſuch diſtances, that they do not touch one another; as in the congers, the eels, the clariæ, *&c.* Their differences in figure are not leſs evident than thoſe in poſition. 1. Some are roundiſh, as thoſe of the clupeæ and ſalmons. 2. Some are oval, or of an oblong round figure, as thoſe of the gadi. 3. In ſome fiſh they are ſtrait on one ſide, and rounded on the others, as in the pearch and mullet. The proper deſcription of theſe is, that they have a rectilinear baſe, and rounded ſides.

Their differences in proportion are theſe; they are either in regard to one another, or to the *ſcales* of other fiſhes, or according to our ſenſes, in regard to the ſize of the fiſh, either very large, great, ſmall, middling, or extremely minute. Theſe are words, which give a ſort of uſeful idea in the deſcription, though they are far from being determinate or regular in their ſignifications. As to the other peculiar qualities of the *ſcales* of fiſhes, they are in ſome ſoft and ſmooth, as in the ſalmon and cyprini; and in others hard and rough, and as it were a little prickly: of this ſort are the *ſcales* of the pearch, the capriſcus, and ſome of the pleuronecti. *Artedi*, Ichthyol.

Scales of fiſhes make a ſet of very curious objects for the microſcope; they are formed with a ſurpriſing beauty and regularity, and in the different kinds exhibit almoſt an endleſs variety in their figure and contexture. Some are longiſh, ſome round, ſome triangular, and ſome ſquare; and there are others of all the ſhapes that can well be imagined. Again, ſome are armed with ſharp prickles, as thoſe of the ſoal and pearch; others have ſmooth edges, as thoſe of the cod, tench, carp, *&c.* and there is a great variety even in the *ſcales* of the ſame fiſh; for the *ſcales* of the back, belly, ſides, and head, are all different in ſhape and arrangement: theſe bear a very great analogy to the feathers, as they are called, on the wings of butterflies.

Theſe *ſcales* are not ſuppoſed to be ſhed every year, nor during the whole life of the fiſh, but to have an annual addition of a new *ſcale* growing over, and extending every way beyond the edges of the former, in proportion to the fiſhes growth; ſomewhat in the manner as the wood of trees encreaſes annually, by the addition of a new circle next the bark. And as the age of a tree may be known by the number of ringlets its trunk is made up of, ſo in fiſhes, the number of plates compoſing their *ſcales* denote to us their age. It is alſo probable, that as there is a time of the year when trees ceaſe to grow, or have any farther addition to their bulk, the ſame thing happens to the *ſcales* of fiſhes; and that afterwards, at another time of the year, a new addition, encreaſe, or growth begins.

Mr. Lewenhoek took ſome *ſcales* from an extremely large carp, forty two inches and a half long, Rynland meaſure, which were as broad as a dollar; theſe he macerated in water, to make them cut the eaſier, and then cutting obliquely through one of them, beginning with the firſt formed, or very little ſhell in the center, he by his microſcope plainly diſtinguiſhed forty lamellæ, or *ſcales*, glewed as it were to one another; whence he concluded the fiſh to be forty years old.

It is generally imagined that an eel has no *ſcales*; but if the ſlime be wiped clean away, and the ſkin then examined by a microſcope, it is found covered with extremely ſmall *ſcales*, ranged in a very orderly and pretty manner; and probably very few fiſhes, except ſuch as have ſhells, are truly free from *ſcales*.

The way of preparing *ſcales* for the microſcope is to take them off carefully with a pair of nippers, waſh them very clean, and then place them between the leaves of a book to make them dry flat; and when thoroughly dry, they are to be put between two ſlips of talc. The ſnake, viper and eft afford alſo a very beautiful and very different ſeries of *ſcales* from thoſe of fiſhes. *Baker*'s Microſcop. p. 237. *Lewenhoek*'s Arc. Nat. Tom. 3. p. 214.

SCALENI, (*Cycl.*) compound muſcles irregularly triangular. The antients call them only two in number; afterwards they were divided into ſix, three lying on each ſide, but uſually there are only two on each ſide, one lying upon the other.

The firſt, or *ſcalenus primus*, is fixed to the upper parts of the outſide of the firſt rib by two portions, commonly called its anterior and poſterior branches; the anterior is fixed to the middle portion of the rib, about an inch from the cartilage; and the poſterior more backward in the firſt rib, an interſtice of about an inch being left between it and the other branch; and they are both, at their other extremities, inſerted in the tranſverſe apophyſes of the vertebræ of the neck.

The ſecond, or *ſcalenus ſecundus*, is fixed a little more backward in the external labium of the upper edge of the ſecond rib; ſometimes by two ſeparate portions; and ſometimes without any diviſion. The anterior portion is fixed immediately under the poſterior portion of the firſt *ſcalenus* by a ſhort flat tendon, and is afterwards fixed by inſertions, partly tendinous, and partly fleſhy, in the tranſverſe apophyſes of the four firſt vertebræ of the neck. The poſterior portion is fixed in the ſecond rib, more backward than the other, and from thence is divided into two portions, and runs up to the tranſverſe apophyſes of the vertebræ of the neck; where the firſt is inſerted in the three firſt vertebræ, the other only in the two firſt. The vertebral inſertions of both the *ſcaleni* vary, being ſometimes confounded with each other, and ſometimes with thoſe of the neighbouring muſcles. *Winſlow*'s Anatomy, p. 230.

SCALENUS *lateralis*, in anatomy, a name given by Albinus to a muſcle, called by Cowper and others *ſcalenus ſecundus*, and by Winſlow, and the French anatomiſts, *portion anterieur du ſeconde ſcalene*. Morgagni calls it *ſcaleni pars a coſta ſecunda enata*; and Fallopius deſcribes it under the name of *octavi thoracis muſculi pars quæ inſeritur in ſecundum.*

SCALENUS *medius*, in anatomy, a name given by Albinus to a muſcle called the ſecond *ſcalenus* by Douglaſs, and the third *ſcalenus* by Cowper. The French call it by the name given by Winſlow, *la portion ou branche poſterieure du premier ſcalene*; and Veſalius has deſcribed it under the name of *pars tertii et quarti dorſum moventium.*

SCALENUS *minimus*, in anatomy, a name given by Albinus to a very ſmall muſcle, which other writers on this ſubject have omitted to deſcribe, and which the author acknowledges to be ſometimes wanting.

It is very ſmall, and ariſes from the upper edge of the firſt rib, and has two caudæ; the one of which is inſerted into the lower part of the ſpine, and the other a little higher. It often wants one, and ſometimes the other, or latter of theſe two caudæ, and is of the ſame uſe with the other *ſcalenus*.

SCALENUS *poſticus*, in anatomy, a determinate name given by Albinus to one of the *ſcaleni*, too much confounded by other authors with the reſt of the muſcles of that name, as they are in general with one another.

This is the muſcle deſcribed by Fallopius under the name of the *nonus thoracis muſculus*, and by Morgagni under the name of the *ſcaleni pars a ſecunda coſta enata*. The French call

call it *la portion poſterieure du ſecond ſcalene*; a name given it by Winſlow.

SCALLION, or ESCALLION, a ſort of onion which never forms any bulb at the root, but is uſed green in ſpring, before the other ſorts ſown in July are large enough.

This is however very ſcarce in London, the gardiners uſually ſelling in its place the ſhoots of ſuch decayed common onions, as have ſprouted in the houſe. Theſe they plant in a bed early in the ſpring, and they ſoon grow large enough for uſe, when they pull them out; and taking off all the old outer coat of the roots, they lay them in bunches, and ſell them at market for *ſcallions*.

The true *ſcallion* is eaſily propagated by parting the roots in autumn, and planting them three or four together in a hole, at ſix inches diſtance. Theſe will grow in any ſoil or ſituation, and will multiply very quickly, and in a very great abundance; and their being hardy enough to endure the ſevereſt winter, and fit for uſe ſo early in ſpring, makes them worthy a place in all kitchin gardens. *Miller*'s Gardner's Dictionary.

SCALLOP. The anatomy of this fiſh lets us greatly into the knowledge of the ſtructure of the parts of other bivalve ſhell fiſh.

The *ſcallop* is compoſed of two ſhells, which, as in many others, are one concave, and the other plane or flat. The cardo, or hinge, is lightly bent from the concave ſhell, and thence carried over a part of the plane ſhell, and all the way between it is firmly connected to a cartilage. In the middle of the length of the cardo there is placed another ſhort, black, and very ſtrong cardo.

It is eaſy to ſee, from hence, to what is owing that remarkably ſtrong power, which this creature has of ſhutting and opening its ſhell; and it is very poſſible, that by means of ſo ſtrong an apparatus of tendons or ligaments as it has in this part, it may be able to move the plane ſhell in ſo ſwift and regular, as well as forcible and eaſy a manner, that it may uſe it in moving from place to place; and poſſibly it may make a ſort of wing of it, to beat againſt the water, as the pinion of a bird does againſt the air; and what the antients have ſo frequently ſaid of its moving about in a very ſwift manner, from place to place, may be true, though we have been wanting in later obſervations to ſee it.

When the two ſhells are opened, the following particulars offer themſelves to the view. Firſt, the mouth: this is covered with a ſort of membranous hood, as in the oiſter; it does not ſtand on the center of the head, but toward the right hand, and the covering is only an elongation of the branchiæ, or gills of the fiſh: theſe are of a membranous nature, and ſurround the whole body from the mouth to the anus, which ſtands toward the left hand from the mouth, where they are connected again.

That branchia of the exterior pair, to which the flat or plane ſhell adheres, is fixed in its center to an immenſely ſtrong muſcle, which grows from the ſhell, and is fixed into the body of the fiſh at right angles: this branchia is fixed to the upper limb of that muſcle, and the other branchia is, in like manner, connected to the lower limb of the ſame ſtrong muſcle. Theſe two exterior, or ſpurious branchiæ, from this muſcle to a conſiderable extent, are formed only of a thin and pellucid membrane, and being carried to the middle of the valves on each ſide, they are there fixed down in ſuch a manner, that they cannot be removed by any means, without injuring or deſtroying them.

The uſe of theſe is to defend the body of the animal from the injuries of the water, and other ſubſtances let in with it, on the opening of the ſhell. From the place of this adheſion there is propagated a ſtrong and thick muſcle, of a truly wonderful ſtructure; this is a ſort of limb, or verge to the animal. It is contracted inward when the animal is dead, but while it is alive it is expanded, at the creature's pleaſure, a great way out beyond the edges of the ſhell, and is jagged, and variegated with lines and ſtreaks, in an amazing and elegant manner.

The uſe of this part ſeems eaſily gueſſed, it being, when expanded out at the mouth of the ſhell, a ſort of net, for the catching whatever the creature chuſes to feed upon. It is, at the pleaſure of the animal, either laid flat on the ſurface of the mud or rock, or arched into a part of a circle: when in any of theſe poſitions, any thing comes in its way which is proper food for the creature, it immediately gathers up like a net round about it, and withdrawing itſelf into the ſhell, takes in the prey with it. In this caſe, the uſe of its being cut or fringed, is alſo plainly ſeen; for it can, by means of this ſtructure, let out the water taken in with the prey through the jags, and yet retain the prey itſelf. Philoſ. Tranſ. N° 229. p. 567.

The uſe of this admirable muſcle, is not only the ſerving as a net for the taking the food, and afterwards as a ſtrainer for the ſeparating the water from it, but its muſcular force is ſo great, that it alſo ſerves as a weapon of death to the little animal it has ſeized, by compreſſing it to pieces if neceſſary, at leaſt by ſqueezing it till no life remains. This is a very neceſſary article in the preying of an animal, which can neither follow or reſiſt an animal in motion; but this is not all. When the prey is brought into the ſhell, it might there remain, where firſt laid down, without being of any uſe to the *ſcallop*, who cannot turn about her mouth to come to it: in this caſe the ſame wonderful muſcle, by its undulatory motion, ſerves to convey the prey to a part of the ſhell nearer the mouth of the animal; and when there, taking it up between the jags of the fringe, it holds it to the opening of the mouth; in this laſt office ſerving in the place of a hand. Theſe are the many and neceſſary uſes of this part.

But to come to the branchiæ, or gills, properly ſo called. The true branchiæ are four in number; they are of a yellowiſh colour, and are fringed in a very elegant manner: theſe every way ſurround the great central muſcle, and ſerve as a covering to the uterus of the animal, or its ovary; certainly, however, to the parts of generation, by whatever name they may be called.

The lower part of the body of the *ſcallop* is yellow, and its upper part white, and near its mouth there is very plainly to be diſcovered a proceſs with a double aperture. It ſeems probable, from all obſervation, that the *ſcallop* is an hermaphrodite animal, and contains the parts of generation of both ſexes in each individual; and it appears that the female part of generation is, on occaſion, puſhed out from one of theſe apertures, and the penis, or male part, from the other.

The mouth of the *ſcallop* is furniſhed with reddiſh lips, reſembling the branchiæ, or gills, in their ſtructure, but very ſhort and ſmall; and near the hinge there are two large circular cavities, reſembling the eyes of the turbot. Near the head there is a large maſs of blackiſh matter toward the left hand, and under that, or rather behind it, is ſituated the creature's heart. The pericardium is pellucid, and is of ſo fine a ſtructure, that the heart is eaſily ſeen through it: it is of a reddiſh colour, and its aorta, or large artery, is divided into a great number of branches, which are ſent every way round to the gills.

It is ſome doubt, however, whether this their membrane, before deſcribed, ſerves alone in the capacity of a pericardium; or whether all this black matter, that lies about it in a ſort of rhombic form, does not alſo, in ſome degree, ſupply that office. The lower part of this gives place to the urinary bladder, and the ſtrait gut ariſes from the baſe of this black ſubſtance, and is thence carried ſtrait over the pericardium; whence it runs on to the branchiæ, and is at length affixed to the great central muſcle.

This central muſcle is of a rounded figure, very ſmooth, and white, and even in the greater part of its bulk, where it is connected to the ſhell; but on the left it is divided, and forms another white and lacerated muſcle, which runs along a part of the ſhell, and ſtrengthens the connection of the body of the fiſh with this part of the plane valve. Philoſ. Tranſ. N° 229. p. 569.

SCALMUS, among the Romans, a block or round piece of wood in a boat, to which the oars were tied with a thong of leather called *ſtrappus*. See the article STRAPPUS.

Scalmus was alſo uſed to denote the boat, a part being taken for the whole. *Pitiſc.* in voc.

SCALPRA *dentalia*, inſtruments uſed by the ſurgeons to take off thoſe black, livid, or yellow cruſts, which infeſt the teeth, and not only looſen and deſtroy them, but taint the breath.

According to the varieties of the occaſion, the ſurgeon has theſe inſtruments of various ſhapes and ſizes; ſome are pointed, and narrow at the end, others are broader pointed, and have edges, others are hooked, or falciform, but theſe are uſually, for convenience of carriage, all adapted to one handle.

The manner of uſing them is to begin near the gums, ſupporting the blade with the left hand, and ſcraping all along the tooth, till the cruſt is taken off, taking care not to wound the gums, or diſplace the teeth. *Heiſter*'s Surgery, p. 456.

SCAMMA, Σκαμμα; among the Greeks, the mark in leaping, or throwing quoits; ſo called, from its being made by digging up the earth. *Potter*, Tom. I. p. 442.

SCAMMATHA, in the Jewiſh cuſtoms, a kind of excommunication, and the moſt terrible of all in uſe among that people. See the article NIDDUI.

SCAMMONY (*Cycl.*)—SCAMMONIA *Monſpeliaca*, *Montpelier ſcammony*, a name given by ſome botanical writers to a ſpecies of periploca, diſtinguiſhed by Mr. Tournefort by the name of *periploca Monſpeliaca foliis rotundioribus*.

SCAMPIUSA, in botany, a name uſed by Myrepſus and others for a plant, which they greatly recommend in the itch, and other cutaneous diſorders.

Fuchſius confeſſes himſelf at a loſs to gueſs what plant was meant by this name; but a little knowledge of the cuſtoms of the later Greeks, in adopting the Roman names for things, would have explained this to him. We find, by familiar inſtances without number, that in the words they adopted from the Latin, they uſually changed the *o* into *u*, and the Roman *b* into *mp*. If we look upon the word *ſcampiuſa* in this light, ſuppoſe it formed from a Roman word,

word, as moſt of the names of plants at that time were, and change the *u* into an *o*, and the *mp* into *b*, we immediately bring back the word to *ſcabioſa*; a very well known Latin word, and the name of a plant poſſeſſed of the ſame virtues they have given to the *ſcampiuſa*.

They ſometimes alſo wrote this *campiuſa*, without the initial *ſ*; but this cannot appear wonderful, when we recollect that the *milax* was in the ſame manner *ſmilax*, and the *ſmaragdus* was written *maragdus*, even by the antient Greeks themſelves.

SCANDIACA, in botany, a name given by ſome authors to the white flowered *lamium*, called archangel by others. *C. Bauhin*, Pin. 155. See LAMIUM.

SCANDULÆ, in antient houſe building, ſhingles, or flat pieces of wood, uſed by the Romans inſtead of tiles to cover houſes. This, according to Cornelius Nepos, was the only covering uſed in Rome till the war with Pyrrhus, or 470th year of the city. *Pitiſc.* in voc.

SCANDULARII, among the Romans, mechanics who prepared the *ſcandulæ* uſed in covering houſes, who were exempted from all public ſervices. See SCANDULÆ.

SCANDYX, *venus comb*, in botany, the name of a genus of plants of the umbelliferous kind, the characters of which are theſe. The flower is of the roſaceous kind, conſiſting of ſeveral petals, which are arranged in a circular order on a cup, which afterwards becomes a fruit compoſed of two oblong bodies, reſembling needles, and containing the ſeeds.

The ſpecies of *ſcandyx*, enumerated by Mr. Tournefort, are theſe. 1. The common *ſcandyx* with roſtrated ſeeds. 2. The larger Cretic *ſcandyx*. And 3. the ſmaller Cretic *ſcandyx*. *Tourn.* Inſt. p. 326.

SCANELLO, in the Italian muſic, is uſed for the bridge in violins and other inſtruments. It is the ſame with *ponticello* and *magas*. See the articles BRIDGE and MAGAS.

SCANSOR, in ichthyology, a name given by Geſner to the fiſh called by the generality of writers *lupus piſcis*. See the article LUPUS.

SCANTON, a word uſed by ſome to expreſs the fetid ſmell of wine.

SCAPE *goat*, in the Jewiſh antiquities, the goat which was ſet at liberty on the day of ſolemn expiation. For the ceremonies on this occaſion, ſee Levit. xvi. 5, 6, &c.

Some ſay that a piece of ſcarlet cloth, in form of a tongue, was tied on the forehead of the *ſcape goat*. *Hofm.* Lex. univ. in voc. *Lingua*.

Many have been the diſputes among the interpreters, concerning the meaning of the word *ſcape goat*, or rather of *azazel*, for which *ſcape goat* is put in our verſion of the Bible.

Spencer is of opinion that *azazel* is a proper name, ſignifying the devil, or evil dæmon. See his reaſons in his Book de leg. Hebr. ritual. Diſſert. viii. Among other things he obſerves, that the antient Jews uſed to ſubſtitute the name *ſamaël* for *azazel*, and many of them have ventured to affirm, that at the feaſt of expiation they were obliged to offer a gift to *ſamaël* to obtain his favour. Thus alſo the *goat*, ſent into the wilderneſs to *azazel*, was underſtood to be a gift or oblation. Some Chriſtians have been of the ſame opinion. But Spencer thinks that the genuine reaſons of the ceremony were, 1. That the *goat* loaded with the ſins of the people, and ſent to *azazel*, might be a ſymbolical repreſentation of the miſerable condition of ſinners. 2. God ſent the *goat* thus loaded to the evil dæmons, to ſhew that they were impure, thereby to deter the people from any converſation or familiarity with them. 3. That the *goat* ſent to *azazel* ſufficiently expiating all evils, the Iſraëlites might the more willingly abſtain from the expiatory ſacrifices of the Gentiles.

SCAPHA, in anatomy, is uſed to expreſs the external circumference of the ear.

It is in ſurgery uſed to expreſs a bandage for the head. See the article BANDAGE.

SCAPHEPHORI, Σκαφηφόροι, among the Athenians, an appellation given to the ſtrangers reſiding among them, becauſe they were obliged, at the feſtival Panathenæ, to carry little ſhips, called *ſcaphæ*, σκαφαι, which were a ſign of their foreign extraction. *Potter*, Archæol. Græc. Tom. I. p. 56.

SCAPHIUM, among the Romans, a cup of an oblong form, ſomewhat reſembling that of a boat, whence alſo it had its name. *Pitiſc.* in voc.

Scaphium likewiſe ſignifies a kind of dial, which, beſide the hours, ſhewed alſo the ſolſtices and æquinoxes. *Pitiſc.* Lex. Antiq. in voc.

SCAPHOIDES *os*, *(Cycl.)* in anatomy, the firſt bone of the firſt row in the carpus. It has its name from the Greek σκαφη, a boat, is ſometimes called *os naviculare* in Latin for the ſame reaſon, as ſuppoſed to reſemble a little boat. It has a convex ſide next the radius, by which it is articulated with the baſis of that bone, and with a tubercle, which is one of the four eminences on the concave ſide of the carpus. Toward the thumb it has two half ſides, one large one for the os trapezium, and the other a ſmall one for the os trapezoides. It has likewiſe a hollow ſide for the os magnum, and a ſmall ſemilunar ſide for the os lunare. Its inner and outer ſurfaces are rough. *Winſlow*'s Anatomy, p. 83.

SCAPHOIDES *tarſi*. This bone, which is called alſo *naviculare*, from its reſemblance to a ſmall flat boat, lies before the aſtragalus. It has two cartilaginous ſides, an oval circumference, and a tuberoſity. Its thickneſs is inconſiderable, when compared with its other dimenſions, and it lies as it were on its ſide, before the aſtragalus. The concave ſide is poſterior, and is articulated with the anterior convex ſide of the aſtragalus. The anterior convex ſide is divided by two ſmall lines into three planes, for the articulation of the three oſſa cuneiformia. The circumference forms an oval, which contracts by ſmall degrees, and terminates in an obtuſe point: one ſide of this circumference is more convex and rough than the other, and the inequalities in it ſerve for the inſertion of ligaments. The points of the oval ends in a tuberoſity, marked with a muſcular impreſſion. In the natural ſituation of this bone, the moſt convex ſide is uppermoſt, the other loweſt, and the tuberoſity turned inward and downward. By this ſituation, and the difference of the ſides, it is eaſy to diſtinguiſh the os naviculare of the right foot from that of the left. The ſmaller, or inferior convexity of the circumference has, near the tuberoſity, a ſuperficial notch, and on the oppoſite ſide a ſmall cartilaginous ſurface, and a ſmall tubercle for its articulation with the os cuboides, &c. for the inſertion of ligaments. *Winſlow*'s Anatomy, p. 98.

SCAPULA *(Cycl.)*—This is a large bone, ſituated laterally at the upper and poſterior part of the thorax, from about the firſt rib down to the ſeventh. The neck of the *ſcapula* is the largeſt of its three angles, and ought more juſtly to be called a head with a very ſhort neck, and a ſuperficial, or glenoide cavity in the top of it, which is lined with a cartilage, and of an oval figure, but pointed at the upper part, and rounded at the lower; and is much deeper in the natural ſtate, than when viewed in the ſceleton. In the natural ſituation of the *ſcapula* this cavity is turned obliquely forward, and not directly outward. Between the edge of this cavity and the contracted part, which is the true neck, ſome inequalities are obſervable, which are the remains of the ſymphyſis of oſſification. Above and below the glenoide cavity are two ſmall rough marks, or impreſſions, the loweſt of which extends itſelf a little over the neighbouring coſta. Theſe may be termed the muſcular impreſſions of the neck of the *ſcapula*. In the neck, ſpine, baſis, inferior coſta, and coracoide proceſs of the *ſcapula*, there is a diploe; the reſt of the bone is tranſparent, thin, and almoſt without any middle cellular ſubſtance. The *ſcapula* is articulated with the clavicle by the acromion, and with the os humeri by the glenoide cavity: it is likewiſe joined to the trunk by a fleſhy ſymphyſis, or ſyſſarcoſis. It ſerves to facilitate the motions of the arm, to give inſertion to a great many muſcles, and as a ſhield to defend the back parts of the thorax. *Winſlow*'s Anatomy, p. 73.

Fracture of the SCAPULA. The *ſcapula* is uſually fractured either near its acromion, or head, where it joins the clavicle, or in ſome more diſtant part. If the fracture happens in the proceſs of the acromion, the reduction will be eaſily made, by lifting up the arm to relax the deltoide muſcle, and puſhing the arm evenly upwards, making the fractured parts meet together with the fingers: but notwithſtanding their reduction is ſo eaſy, they eaſily ſlip away again from any ſlight cauſe, and ſo are difficultly agglutinated. They are in particular very eaſily ſeparated by the weight and motion of the arm, and by the contraction of the deltoide muſcle; inſomuch that there is ſcarce ever an inſtance of a fractured acromion being ſo perfectly cured, as to admit afterwards of a free motion of the arm upwards: all means muſt, however, be uſed to endeavour to keep the replaced bones in their proper ſituation. A compreſs, wet with ſpirit of wine, is to be applied to the fracture, a ball is to be put under the arm-pit to ſupport it; the whole is to be bound up with the bandage commonly called *ſpica*, and the arm is to be ſuſpended in a ſaſh or ſling hung about the neck. But if the neck of the *ſcapula*, which lies under the acromion, or its acetabulum, ſhould be fractured, which is a caſe that indeed very ſeldom happens, and when it does is very difficult to diſcover, it is a hundred to one but from the vicinity of the articulation, the tendons, muſcles, ligaments, nerves, and large veins and arteries, there will follow a ſtiffneſs and loſs of motion in the joint; great inflammation is alſo to be expected, and abſceſſes with the worſt ſymptoms, and ſometimes death itſelf.

SCAPULAM *antrorſum agens*, in anatomy, a name given by Veſalius, and ſome of his followers, to the muſcle generally known under the name of the *ſerratus anticus*. He has alſo, in another part of his work, called it *primus ſcapulam moventium*. Riolanus has called it the *ſerratus minor*, and ſeveral other authors the *ſecundus ſcapulæ*. See the article SERRATUS.

SCAPULAM *attollens*, in anatomy, a name given by Spigelius to a muſcle, which he alſo calls *muſculus patientiæ*. It is the *levator ſcapulæ* of Albinus and Cowper.

SCAPULAM *moventium ſecundus*, in anatomy, the name given by Veſalius to a muſcle, called by Winſlow and ſome others the

the *trapezia*, and by Albinus the *cucullaris*. Cowper calls it the *trapezius*, or *cucullaris*. See TRAPEZIUS.

SCAPUS, among botaniſts, a peculiar kind of ſtalk, which ſupports the parts of fructification of a plant. It does not grow from any part of the main ſtalk, but riſes immediately from the root. See STALK.

SCAR *crow*, in zoology, the name of a bird of the *larus*, or ſea gull kind, called by authors *larus niger*, or the black gull, and by the Germans *brandvogel* and *meyvogel*. It is a very long winged bird, and is all over black, and of the ſize of the common blackbird. Its legs are ſhort and red. It is common about the ſea coaſts, and feeds on inſects. It is a well taſted bird. *Ray*'s Ornithol. p. 296.

SCARABÆUS, the *beetle*. This is an extremely numerous genus of inſects; and in order to have a diſtinct idea of the differences of the ſpecies, they are arranged by Liſter into a ſort of method. The firſt general diſtinction is into thoſe which live on land, and thoſe which live in the water; of each of which there is a very great number. Thoſe *beetles* which live on land have ſome of them antennæ laminated at the end, others have them ſharp pointed. The outer wings, or caſes of the wings, in ſome are perfect, in others they ſeem mutilated. Some have the antennæ inſerted into a ſort of promuſcis. Theſe were called by the antients *gurguliones*, and in ſome there is only one juncture in this, in the middle, in others ſeveral near the end. Some have a ſharp pointed inſtrument at their head; theſe are called *cimices*. See the article CIMEX.

Of the water *beetles* there are two principal kinds, one ſort living in ſalt water, the other in freſh.

Of thoſe *beetles*, the extremity of whoſe antennæ are formed like a comb, there are ten ſpecies mentioned by Mr. Ray. 1. The great reddiſh *beetle* with the tail bending downwards, known among us under the name of the *chaffer*. This is too well known to need a deſcription; it is common among trees and buſhes at the end of May, and ſeems particularly fond of the maple. 2. The greyiſh yellow woolly *beetle*. This ſeems nearly allied to the former ſpecies, but is but about half as big. Theſe are very common in the ſouthern parts of England in the month of June; they fly about elms in vaſt ſwarms; they are very rare in the northern counties. 3. The greeniſh black *beetle* with reddiſh brown caſes of the wings. This is of the ſize of a horſe bean, and is found among roſe trees in May. 4. The great purpliſh black *beetle* with ſerrated legs. This is one of our largeſt *beetles*, and is very common on heaths, and in other places, in the month of March; it flies about in the evening, and makes a great noiſe; it is uſually infeſted with a great number of yellow lice, and is thence called the *louſy beetle*. 5. The large black *beetle* with two yellow undulated faſciæ on the caſes of the wings. This is ſometimes found without the faſciæ; it ſometimes flies, but rarely. It is found about human dung, and probably feeds on it, for it has always a very ſtrong ſcent of it. 6. The green *beetle* with red caſes for the wings. This is about the ſize of a horſe bean, and is found in woods in the month of June. 7. The ſmall *beetle*, called the *lady bird*. 8. The *lady bird* with only two large black ſpots, one on each of the caſes of the wings. This is common among buſhes in the beginning of June. 9. The yellow *beetle* with black ſpots. This is much ſmaller than the lady bird; its colour is a pale yellow, or lemon colour, and it has four black ſpots, of an oblong ſquare figure, on the caſes of the wings. 10. The reddiſh *beetle* with two ſpots on the ſhoulders, and ſeven white marks on each of the caſes of the wings. This is about the ſize of the common lady bird, and is found in June near rivers, among the ruſhes, and in cyperus graſſes. *Ray*'s Hiſt. Inſect. p. 384.

Of thoſe *beetles* which have antennæ terminating in ſlender points, there are a great number of ſpecies, which may be ſubdivided into ſome other general claſſes: ſome of them have whole and perfect caſes to their wings, and have long horns; theſe are by ſome called *capricorn beetles*; of theſe there are ſeveral ſpecies. See the article CAPRICORN.

Some *beetles* are covered with a very hard cruſt, and have ſcarce any wings underneath it. Theſe are generally very ſlow creepers, and of theſe we have in England three ſpecies. 1. The ſhort purpliſh black *beetle* with gibbous ſhoulders. This ſeems to be the ſame with the *cat beetle*, or *ſcarabæus feliformis* of Mouffet, and others. This is not unfrequently found on heaths in March, and at that time is often found in coitu. The male is conſiderably ſmaller than the female. This creature feeds on the yellow gallium, and when fatigued will caſt out at its mouth a yellowiſh liquor, which is of a pungent taſte like pepper. 2. The ſlow ſtinking black *beetle*, called the *blatta fœtida* by Pliny and others. This is of a deep duſky black colour, not at all gloſſy or ſhining. This is common in cellars, and other damp places, in the month of April. 3. The great purpliſh *beetle* with a caſt of green. This is common in gardens, and in April is always infeſted with a great number of lice.

Some *beetles* which have wings very rarely uſe them, but run very ſwiftly along the ground; of theſe we have two ſpecies common among us. 1. The black *beetle* with ſulcated wings. This is a very common inſect, and is frequent in pathways in April. 2. The black *beetle* with ſtriated wings, and with yellow legs and horns. This alſo is common in pathways in ſummer.

All theſe *beetles* have the antennæ laminated at the ends. Of the other kind, which have them go off to a ſlender and taper point, there are alſo many kinds: of theſe ſome have only ſhort caſes for their wings, as if they had been cut off near the root. The general characters of this claſs of *beetles* are, that they have oblong and ſlender bodies, and have two appendages forming a kind of fork at the tail. Of this kind are the common earwig, or forficula, and the ſtaphylinus, which is a large and long black *beetle*, with a ſharp fork at its tail, and with a naked body. It is of a deep and duſky black, not at all gloſſy; it has very large yellow wings, folded under the ſmall thecæ on the back; it turns up its tail in a threatning poſture when attempted to be caught, and throws out a ſort of white bladders at it; it runs very nimbly, and is a very voracious creature, feeding on other *beetles*, or on any inſects it can catch.

Some *beetles* are all over ſoft, and have no membranaceous wings. The bodies of theſe *beetles* ſeem covered with a cruſtaceous ſubſtance, but it is ſoft, and yields to the preſſure of the finger like a bladder; theſe all eat herbaceous or vegetable food; we have two ſpecies of them. 1. The oil *beetle*, a bluiſh black ſhining *beetle*, called *proſcarabæus* by Mouffet. This is found in meadows in great abundance, and feeds on the leaves of ſome of the ſpecies of ranunculus. 2. The ſhort legged black ſmooth *beetle*. This has ſcarce any antennæ, and when tired, rolls itſelf up into a round ball. This is found in May feeding on the aperine, or common cleavers; but Liſter ſuſpects whether this be not a worm ſtate of ſome *beetle*, rather than a perfect *beetle*.

Some *beetles* have long heads, ſhaped like the trunks of other inſects, and in theſe the horns are lodged: theſe were called by the antients *gurgulïones*. *Ray*'s Hiſt. Inſect. p. 391. See the article GURGULIO.

Some *beetles* have a forceps at the head, indented on each ſide in the manner of a ſaw. Of this kind we have only one known ſpecies in England; this is the green *beetle* with ten white ſpots on the caſes of the wings. This is found in June in the northern parts of England. It is a very voracious animal, deſtroying great numbers of other inſects, particularly caterpillars.

Some *beetles* have a very remarkable property of leaping, and this of a very peculiar kind; for they do not leap, like other inſects, by means of their hinder legs, but by means of their breaſt. There are ſome general marks by which this genus of *beetles* may be diſtinguiſhed from others; theſe are, 1. they are always of an oblong and flatted figure. 2. Their head is always joined in a very nice manner to the ſhoulders. 3. Their legs are extremely ſhort and ſlender.

Of this kind of *beetles* we have in England only two known ſpecies. 1. The cheſnut coloured leaping *beetle*. This is found frequently in corn-fields, and elſewhere. 2. The greeniſh black *beetle* with horns pectinated on one ſide. This is a ſcarce ſpecies, but is found in dry places in March. *Ray*'s Hiſt. Inſect. p. 387.

SCARABÆUS, in ichthyology, a name given by Gaza to that ſpecies of *ſparus*, which is called by others the *cantharus*. It is diſtinguiſhed by Artedi, by the name of the ſilver eyed *ſparus* with yellow longitudinal and parallel lines on the ſides. See the article SPARUS.

SCARABÆUS *tardipes*, the *ſlow beetle*. We have a very ſingular account of the longevity of this animal, and that without food, given by Mr. Baker from his own obſervation. In the year 1737 he found ſeveral *beetles* of this kind plunging themſelves in the mud at the bottom of an old ciſtern; theſe were about an inch in length, and of a ruſty black colour, and had long jointed antennæ: they had no wings, but only a thick ſhell, covering the whole body, and divided along the middle with a fiſſure, reſembling the meeting of the two caſe wings in other *beetles*; the tail turned up a little, and the legs were long, but moved ſlowly. Mr. Baker chuſing one of the largeſt of theſe, threw it into a cup of ſpirit of wine, in a little time it appeared to be dead, and was ſhut up in a ſmall box, and laid by, but ſome months after it was found alive and well: it was then plunged again into ſpirits of wine, and left a much longer time; and after being taken out as dead, and put in the ſame box again for ſome time, when it was found again come to life. It had now twice eſcaped from being plunged in ſpirits, and lived three months ſhut up without any ſuſtenance. After this the *beetle* was kept a month or two without ſuſtenance under a glaſs, and at the end of this time again put into ſpirit of wine, and left there a whole night; after this, however, it again recovered, and ſeemed the next day as well as before. He lived, in the whole, two years and an half, without any viſible food or drink. Several things were at times offered him by way of food, as bread, fruits, &c. and water ſet in his way, but he never touched either. It ſeems very probable that this creature received a ſufficient nouriſhment from the particles floating in the air; and it is very poſſible that lizards, ſnakes, &c. when they live ſo long without any viſible food, are ſupplied in the ſame man-

manner, though at other times they are capable of digesting more solid matters; as doubtless was also the case with the *beetle*, when in its own natural state. This is an instance of a creature's subsisting without visible food, longer than we have any other account of any kind; but it is possible, that though the larger animals cannot long subsist without supplies of solid food, yet many insects may find nourishment enough for their tender bodies in the particles floating in the air, though we want observations for proof of it.

While kept under the glass it did not walk about much, but usually placed its nose close against one edge of it for the benefit of the air. It was of an agreeable aromatic smell, and when touched communicated its scent to the fingers, which did not go off in a long time. Its smell is stronger in winter than in summer. This creature not only bears the plunging in spirit of wine much longer than any other animal, but it bears the exhausted receiver of an air pump without any injury or uneasiness. It has been kept under it half an hour, and would walk about without any concern; only when the air was let in it appeared startled, and drew up its legs for about a minute.

We know that the Ægyptians had a very high veneration for the *beetle*; this appears not only by the account historians give of its being one of their deities, but by the many images of it we find among their antiquities. As these were a wise and learned people, we cannot suppose they would, without some reason, pay so much regard to so contemptible an animal as this appears to be; and it is very possible they might have discovered this property of its living in this manner without food, and thence esteem it a symbol of the deity. It is not known how long Mr. Baker's *beetle* would have lived in this manner with him, for it at length got away, while a careless servant took up the glass to wipe it. Philos. Trans. N° 457. p. 447.

SCARABÆUS *vorax*, the *cankerworm*. This last term is used in the translation of our Bibles to signify a very destructive insect, of the nature of the locust, and usually mentioned as its companion. The septuagint gives it the name Βρουχος, *bruchus*, a name signifying an animal which makes a great noise, as this insect does both in eating and in flying. We generally understand by this word a reptile, but it certainly means no other than that sort of *beetle*, which we call the *cockchaffer*, or *dor*; a flying insect, very remarkable for the humming noise it makes with its wings when in motion, and which, when it is found in swarms sitting upon the hedges, makes a continual noise in eating, like the sawing of wood. This creature deserves very well to be placed with the locust, as a destroyer of the fruits of the earth. Our own experience in Norfolk has given a very late proof of this; and the histories of Ireland shew that this creature has, in that kingdom, devoured every green leaf from the trees, for whole tracks of land at a time. That we have a wrong translation of the word *bruchus* in *cankerworm*, is evident even from the scriptures themselves; for the prophet Nathan expressly says that it is a fly, and has wings, which cannot agree with any thing of the nature of what we understand by the word worm, which always signifies with us a reptile, or a creeping animal. This prophet has indeed described them so well, that it is wonderful that so obvious a thing should not have been observed by the commentators. He says they spoil, and then flee away; they camp in the hedges in the day, and when the sun ariseth they flee away, and their place is not known where they are. That is, they then retire again to the hedges, and hide themselves among the trees, where they lie quiet and concealed till the sun sets again. It is plain, by comparing these words with the common animal here mentioned, that the *bruchus* of the Old Testament is the same with our *cockchaffer*, and that the prophet has given us the natural history of the animal he describes in this short account.

In another part of the Old Testament, the same word *bruchus* is translated *locust*, or *beetle*; and this explains the rationale of that odd clause in the Jewish law, where Moses tells the Israelites, these may ye eat of: every flying creeping thing that goeth upon all four, which have legs above their feet to leap withal upon the earth; even these of them ye may eat: the locust after his kind, and the bald locust after his kind, and the *beetle* after his kind, and the grashopper after his kind.

It has appeared very strange to many, that here among the pure and clean foods, the *beetle*, and such other dry and nasty reptiles, should be recommended as wholesome food for man; but there appears reason on the side of this when thoroughly considered. It is very evident that neither the Jews, nor any other people, would eat such insects as these, while any thing better was to be had; but as they lived in a country often visited by locusts and these *cockchaffers*, which might at some time eat up all the fruits of the earth, then in the want of these the prophet tells them they might eat up the devourers themselves, and yet be clean. So also it appears that we are to understand what we are told of St. John the Baptist, that he fed on locusts and wild honey; for it was in the desert that he eat these, where no other food was to be had.

The poor people of Ireland have taught us, that the prophet advised his people to a wholesome food in this text; for some years ago, when the county of Gallway, and other neighbouring parts, were so infested with this vermin, that the whole face of the country was destroyed by them, and the trees stripped of their leaves and fruits, as much as in the depth of winter; the poor people wanting other food, eat the vermin themselves that had done the mischief; and the *cockchaffers*, which are doubtless what is meant by Moses under the name of the *beetle*, as they are truly of the *beetle* kind, were found to be a very good and wholesome food.

It is very probable also that this kind of *beetle*, so famous for devouring the fruits of the earth, is that kind to which the Ægyptians paid divine honours, and for which they had such high veneration, that they frequently engraved its figure on their obelisks; though the antiquaries give a very different account of it, supposing that the beetle was held sacred by them, as being an hieroglyphical representation of the sun. This seems a very forced conjecture; whereas nothing can be supposed more natural, than that a nation, addicted to polytheism, as the Ægyptians were, and in a country frequently suffering great mischief and scarcity from swarms of devouring insects, should, from a strong sense and fear of evil to come, give sacred worship to the visible authors of their sufferings, in hopes to render them more propitious for the future. The same Ægyptians, we very well know, worshipped the other great destroyer of their country, the crocodile; and the Romans, a much more civilized people, built a temple to the disease which raged most among them, the fever.

The ignorant people among the Irish, when the vast swarms of these *beetles* first appeared among them, were of the same turn, and rather reverenced than destroyed them, saying that they were the ghosts of their dead friends killed at the battle of Agrhim, who were come in this form to pester and annoy their heretical enemies, the English protestants. They even thought that the English families suffered more by them than the Irish; but this was only because the grounds of the former were better improved, and the creatures found plenty of better food there. Philos. Transact. N° 234.

SCARBOROUGH *water*. The water of this medicinal spring has been the subject of great contests and disputes among the physical people; all allowing it considerable virtues, but some attributing them to one ingredient, others to another. Dr. Witty alledges that its material principles are alum, nitre, and vitriol of iron; but though this author declares, that these principles are all to be separated out of it, Dr. Tonstall, on the other hand, affirms that it has no vitriol of iron in it, but a stone powder and a clay, leaving sand at the bottom of the vessel; and therefore that it is apt to breed the stone, and is bad in the gout, jaundice, and all other diseases where indurations of the parts, or stony concretions in the body, are the cause; and this author seems to speak very experimentally, when he alledges that he never had any symptoms of the stone till he drank the *Scarborough water*, but acquired that disease during the course of it.

Alum stone dissolved in water is always found to yield a purple tincture with galls, and therefore the colouring an infusion of this or other vegetable substances by the *Scarborough water*, which is by all allowed to contain this stone, is no proof of any vitriol of iron being contained in it; other than such a small portion of it, as is always found in this alum stone. All waters, which have dissolved iron, will yield vitriol as a salt from that metal on evaporation. The cliffs about *Scarborough* yield abundance of salt in shoots and efflorescences, plainly owing to the *waters* of the spring; yet all these are nitro-aluminous, none of them at all vitriolic. If the *Scarborough water* is set by for some days, after it is taken fresh from the spring, it precipitates a sediment; which being examined, is found not to be of a ferruginous nature, but a mere glebe of alum.

Upon the whole, the virtues of alum and vitriol are so far different, that it must be easy to see which of the two salts the *water* partakes most of, by its virtues; but as to the stony matter, which the one of these disputants calls an insipid clay, and the other a sandy stone, it is no other than spar, which is contained in all water; and which has been in general so far from being accused of breeding the stone in the bladder, that the general consent of mankind has seemed to esteem it a cure for that disorder. The spar, in the form of the lapis judaicus and ostracites, and the very waters which are so impregnated with it, as to encrust every thing with it that is put into them, are given for the cure of this disease. Philos. Trans. N° 85.

SCARFED, in the sea carpenters language, is the same as pierced, or fastened or joined in: thus they say the stem of a ship is *scarfed* into her keel. They also imply by it, that the two pieces are shaped away slanting, so as to join with one another close and even; which they call *wood and wood*.

SCARIFICATION *of the eye*. See the article EYE.

SCARLATINA *febris*, the *ſcarlet fever*, in medicine, the name of an eruptive *fever* uſually attacking young perſons, and not attended with any great danger. When it is moderate in degree, it may be left to nature alone, and will go off very well without the aſſiſtance of medicines, only obſerving a good regimen; but if it be more violent, it is to be treated with more care: the patient is to be kept warm in bed, and to be made to drink large quantities of warm diluting liquors, acidulated either with lemon juice, or ſpirit of ſulphur or vitriol, and draughts of the attemperating and diluting medicines are to be given every four or ſix hours, and by the attemperating and gently diaphoretic powder; but during the courſe of the cure all hot things are to be carefully avoided, as well in food as medicine, for every thing of this kind renders the diſeaſe worſe, when treated in the proper manner. The *ſcarlet* ſpots, after a few days, dry off, and the ſkin ſcales away, and after this the patient uſually is ſoon well. At this time two or three doſes of ſome gentle purge are to be given; and if the weather be bad, the patient is to be confined to his chamber for ſome days afterward, that the tranſpiration may be free and uninterrupted; by this means, the worſt kinds of this *fever* go well off.

But when this caution is neglected, it is very common to find the patient fall into a ſwelling of the belly after about three weeks, and ſometimes into an anaſarca; ſometimes attended with a fever, ſometimes without one, and often with tumors of the glands, and many other dangerous diſorders. The urine, in theſe caſes, becomes brown and turbid, and many are loſt in this manner. But as this new diſeaſe, as it is uſually called, though it is in reality no other than another period of the *ſcarlet fever*, owes its whole origin to the morbific matter which cauſed the firſt appearance of that, being in part retained in the body, the beſt method of cure is by thoſe remedies which are able to carry thoſe humors out of the body. Gentle purges are to be given at ſhort intervals, and the way nature indicates is to be carefully followed, by giving diuretics in the intermediate days; for the brown turbid urine, voided naturally in this caſe, is an attempt of nature to carry off the matter that way. The beſt of all diuretics in this caſe is a tincture of ſalt of tartar and ſpiritus nitri dulcis mixed together, and taken twenty drops, or more, three times a day. In young ſubjects, who will not take purges in the common way, a glyſter made of an infuſion of ſena purges them very well, and anſwers the purpoſe.

The common hot ſudorifics are not to be given in theſe caſes, for ſweat is ſcarce to be obtained by any means in this diſeaſe; and great care is to be taken to keep the tumid parts from the cold air, otherwiſe the patient is often carried off at once by the chilling them. If there be a fever with this ſecond complaint, as is uſually the caſe, the attemperating medicines are to be given in an afternoon and evening, and draughts of gently diuretic liquors to be drank after them.

In this, and in all other eruptive *fevers*, any thing that cools the patient is of the utmoſt conſequence, and the bed is not to be new made, nor the ſhirt changed by any means, during the courſe of the diſtemper. Immoderate heat, on the other hand, is almoſt as bad, and the middle regimen is the only proper one to be obſerved. The patient lying quiet, and being kept in an equal and moderate heat, in all caſes of eruptive *fevers*, as well as in this, the patient may be allowed, in the beginning, to walk about in his chamber, taking great care to keep out the cold, and need not be confined to his bed, ſo long as his ſtrength will permit his keeping up. *Heiſter*'s Compend. Med. p. 83.

SCARUS, in zoology, the name of a ſea fiſh, of which there have been ſeveral remarkable things aſſerted by the antients, ſome with and ſome without any foundation; as that it ruminates, or chews the cud like our oxen, *&c.* This Ariſtotle, Pliny, Oppian, and others affirm, but none of them of their own perſonal knowledge; they ſeem to have had it by hearſay, or elſe as authors often do, to have taken it from one another; for the thing is not true in fact.

It has been ſaid alſo to be the only fiſh which feeds on herbs; and it is ſo far true that it does feed on them, and that few other fiſh, but not that no other feed in the ſame manner. It has been reported alſo that this is the only fiſh that ſleeps. Geſner would perſuade us, that not only this, but many other fiſh, alſo ſleep. But this does not ſeem to be the fact; for this race of animals have no eye-brows, nor any membrane to cloſe and cover their eyes with, as other creatures have, which nature has allotted ſleep to. *Ray*'s Ichthyogr. p. 304.

The later naturaliſts have deſcribed three ſpecies of this fiſh, Rondeletius two, the *ſcarus onias*, and *ſcarus varius*; and Bellonius one, which is different from both theſe, and ſeems to have been the very fiſh the antients knew by this name.

The *ſcarus onias* is a ſea fiſh, found among rocks and near the ſhores. Its ſcales are large and very thin, and its back of a blackiſh blue; its belly of a fine white, and is of an oblong and rounded ſhape; its teeth are broad, not pointed, and reſemble thoſe in the human jaws; its eyes alſo are large, and its head over the eyes of a fine ſtrong and clear blue.

The *ſcarus varius* is of the ſhape and figure of the former, but its eyes and its belly are of a purple colour; its tail is of a fine clear and ſtrong blue, and the reſt of its body is of a greeniſh or bluiſh black; its ſcales are ſpotted and ſpeckled with duſky dots; its mouth is moderately large, and its teeth broad in the upper jaw, and ſomewhat pointed in the under. From the head to the tail, all along the ridge of the back, there runs a row of ſhort ſpines, which are connected at their bottoms by a membrane; and in the middle of the belly there are ſeveral purple ſpots. It is a very beautiful fiſh. *Rondelet.* de Piſc. lib. 5. cap. 3.

The *ſcarus Bellonii*, which differs from both theſe, and ſeems to be the ſame fiſh which the antients called by this name, is of a mixed bluiſh and red colour; its ſcales are broad and thin, and it has two tranſverſe protuberances near the ſides of the tail. Its body is rounded, but not very long; its teeth are ſtrong and obtuſe, and well fitted for their office, which is the tearing off the tough ſea herbs from the rocks, and chewing them for food. Its mouth is but ſmall, and it has only one fin on the back, which is prickly. Its uſual ſize is about five or ſix inches in length. It is accounted a very delicate fiſh, but is inſipid unleſs eaten with the guts, and all that they contain. The liver and ſtomach of this fiſh, with its contents, are cooked up by the Greeks into a very delicate diſh; the epicures among them not regarding the reſt of the fiſh. *Bellonius*, de Piſc. p. 126.

SCARY, in huſbandry, a term uſed by the farmers for a barren land, which has a poor or thin ſward, or coat of graſs, upon it. *Plot*'s Oxford. p. 247.

SCATARELLO, in zoology, the name of a ſmall bird of the ficedula kind, of a greyiſh brown on the back, and a pale yellow on the breaſt and belly. Its legs are black. It ſeems nearly allied to the beccifago. *Aldrovandus*, de Avibus. See the article BECCIFAGO.

SCATCH-*mouth*, in the manege, a bit-mouth, differing from a canon-mouth in this, that the canon is round, whereas a *ſcatch* is more upon the oval. That part of the *ſcatch-mouth* that joins the bit-mouth to the branch, is likewiſe different; a canon being ſtayed upon the branch by a fonceau, and a *ſcatch* by a chaperon, which ſurrounds the banquet. The effect of the *ſcatch-mouth* is ſomewhat greater than that of the canon-mouth, and keeps the mouth more in ſubjection. Commonly ſnaffles are *ſcatch-mouths*.

SCATEA, a word uſed by Paracelſus for a ſomewhat hard fabulous concretion in the urine.

SCAULEZ, in ichthyography, the name of a fiſh common on the Mediterranean ſhores, and called by authors *hepſetus* and *anguella*. *Willughby*'s Hiſt. Piſc. p. 210. See the article HEPSETUS.

SCAZONE, in ichthyology, a name given by Salvian and others to the fiſh which we call the *pricked dog*, or *hound*, and the generality of authors the *galeus ſpinax*. It is a ſpecies of ſqualus, diſtinguiſhed by the roundneſs of the body, and the having no pinna ani. See the article SQUALUS.

SCELETON, in anatomy. See the article SKELETON, *Cycl.* and *Suppl.*

SCEMI, in botany, a name given by ſome authors to the *carob*, or ſweet pipe tree. See the articles SILIQUA and CAROB.

SCENE (*Cycl.*)—The original *ſcene* for acting of plays was as ſimple as the repreſentations themſelves; it conſiſted only of a plain plat of ground, proper for the occaſion, which was in ſome degree ſhaded by the neighbouring trees, whoſe branches were made to meet together, and their vacancies ſupplied with boards, ſticks, and the like, to compleat the ſhelter; and theſe were ſometimes covered with ſkins, ſometimes only with the branches of other trees newly cut down, and full of leaves.

It does not appear that the antient poets were at all acquainted with the modern way of changing the *ſcenes*, in reſpect of the different parts of the play, but all was performed in the ſame place.

The firſt things repreſented in theſe new theatres were what they called *mimi*. Theſe were a very coarſe ſort of poems, repreſenting, in obſcene and indecent language, the vices and indecent actions of the principal people of the time. Sophrones and Xenarchus ſeem to have been the firſt writers of this ſort of comedy, and they uſed ſometimes proſe, ſometimes verſe, in theſe compoſitions. After the licentious things, thus repreſented, had given great offence to the magiſtracy, the poets hands were tyed up from writing at all, and the actors in theſe *ſcenes* were forbid to ſpeak. Hence aroſe a new way of entertaining the ſpectators, which we ſtill continue, under the name *pantomime*, the ſame by which they expreſſed it. In this all was repreſented in dumb ſhew, and the geſtures and motions of the limbs were all they had to repreſent the actions of others by.

This ſort of public diverſion ſeems to have been in faſhion in the days of Ariſtotle, and to have been continued long afterwards. Salmaſius is of opinion that Pylades was the firſt who ſeparated the pantomime and dancing from the plays,

plays, where the actors ſpoke. But this ſeems an error in that great critic, for they ſeem, by what hiſtories we have left of them, to have been repreſented ſingly long before that time, Pylades living in the time of Auguſtus Cæſar.

Poetry and dancing were early ſuppoſed to have ſome relation to one another; the firſt was called a *ſpeaking dance*, and the latter a *dumb poem*; a name afterwards, and not till long afterwards, given to a picture. Thus they were introduced on the ſame *ſcenes*, as things naturally connected together.

SCENT. Some animal carcaſſes, buried with lime, though ten feet under ground, have been obſerved to give ſo ſtrong a *ſcent*, as to attract dogs to the place. See LIME.

SCENT *bags*, in natural hiſtory, a name given by Tyſon to thoſe peculiar pouches, or bags, which certain animals, as the civet cat and muſk animal, have for the receiving the matter of their perfume. Theſe *bags* are common to more animals than is generally ſuppoſed, and in all have much the ſame qualities, the matter they contain being in moſt of them fœtid, and diſagreeable, while contained in the *bag*, and only becoming ſweet and pleaſant when dried, or taken at leaſt from the animal, and ſmelt in ſmall quantities. The weaſel and polecat with us have *bags* of this kind, and the famous bag, or pouch of the opoſſum, is of the nature of theſe; though it ſerves alſo to the other great purpoſe of receiving and ſheltering the young in time of danger. It contains, like the reſt, a tough and viſcous matter, which ouzes out of the glands, and is of a very offenſive ſmell while the creature lives; but as ſoon as it is taken out and dried, the ſmell changes into a fine perfume. The gland of the aper moſchiferus, as Tyſon calls it, is of this kind, containing a glutinous humor of a very offenſive ſmell when freſh, but when dried, becoming ſweet and perfumed as muſk. Philoſ. Tranſact. N° 239. p. 125. See the article APER.

SCEPASTRA, the name of a kind of bandage for the head, deſcribed by Galen.

SCHADIDA *calli*, in botany, a name given by ſome authors to the plant which affords the euphorbium of the ſhops. *Herm.* Cat. p. 31.

SCHÆNANTH, *ſchænanthus*, in botany, the ſame with *iſchæmum*. See SCÆNANTH and ISCHÆMUM.

Schænanth was much praiſed by the antients as a deobſtruent, and promoter of the menſes; but at preſent it is only kept as an ingredient in ſome officinal compoſitions.

SCHÆNICLOS, in zoology, the name of a bird, which, by the deſcription of Bellonius, ſeems to be the ſame with that called by the French *alouëtte de mer*, the *ſea lark*, and by us the *ſtint*. *Aldrovand.* lib. 20. cap. 56.

SCHAFFILT, in zoology, the name of a very ſmall owl, not larger than a thruſh, called *noctua minor* by authors.

Its eyes are very bright, and of a yellow colour; its ears very large; its feet are feathered to the toes, and the ſoles of its feet are yellow. It is caught in the woods in Germany. *Ray*'s Ornitholog. p. 69.

SCHAKARILLA, or SCHACARILLA, in the materia medica, a name given by ſome authors to the medicinal bark called *cortex thuris*, and *cortex elutherii* by others. *Montani* Exot. p. 8.

SCHAPHAN, in Jewiſh antiquity, the name of an animal declared unclean by the law of Moſes [b]. Interpreters do not agree in their explanations of this word.—[b Levit. xi. 5.] See the article CHOEROGRILLUS.

SCHASIS, a word uſed by ſome of the writers in ſurgery to expreſs ſcarification.

SCHEAT, or, as it is ſometimes written, SCHEAD, or *ſheart*, a name given by many to the jentling, a fiſh of the chub kind, caught in the Danube, and moſt of the larger rivers of Germany, and called by Geſner and Aldrovand *capito cæruleus*. *Willughby*'s Hiſt. Piſc. p. 256. See JENTLING.

This is the *glanus* of Pliny, and the other old Roman authors, and is diſtinguiſhed by Artedi by the name of the *ſilurus* with four beards near the mouth. This is its character in which it differs from the *lake*, another fiſh of this kind; which, though a genuine ſpecies of *ſilurus*, has only one beard.

SCHELLENT, in zoology, the name of a ſpecies of duck, found about the ſea coaſts, of the ſize of the common duck, and differing from the *capo roſſo* in this, that it is twice as large, and the eyes have yellow iris's; though agreeing with it in the colour of the head, which is of a reddiſh brown. Its neck is grey, and its back is of a blackiſh grey; its throat, breaſt and belly white, but near the anus there is a tranſverſe brown line. The long feathers of the wings are black and white, and the tail of a blackiſh grey. *Aldrovand*, de Avib. p. 223.

SCHELLEY, in zoology, a name given in ſome counties of England to the fiſh known among authors by the name of *ferra*. *Willughby*'s Hiſt. Piſc. p. 184. See FERRA.

SCHEME, (*Cycl.*) *ſchema*, σχημα, in the antient muſic, is uſed for the varieties ariſing from the different poſitions of the tones and ſemitones in a conſonance.

SCHETES, was formerly a term for uſury; and the commons prayed that order might be taken againſt this horrible vice, practiſed by the clergy as well as the laity. Rot. Parl. 14 Rich. II. *Blount.*

SCHETIC *diſeaſes*, a term uſed by the old writers in medicine to expreſs ſuch diſeaſes as were not deeply rooted in the conſtitution, but might be eaſily removed.

SCHEUKZERIA, in botany, the name of a genus of plants, the characters of which are theſe. The perianthium is divided into ſix oblong, acute, reflex and expanded leaves, remaining with the fruit. There is no flower of petals. The ſtamina are ſix very ſhort and flaccid capillary filaments. The antheræ are erect and obtuſe, very long, and of a compreſſed figure. The germina of the piſtils are three in number; they are of the ſize of the cup, and of an oval compreſſed figure; though there be no ſtyle. The ſtigmata are oblong, and obtuſe on the upper part; they grow on the outſide to the germina. The fruit conſiſts of as many capſules as the piſtil had germina; they are of a roundiſh figure, inflated and compreſſed, and each compoſed of two valves. The ſeeds are ſingle and oblong.

The number of the germina and capſules vary, from three up to ſix; the three ſeem, however, the moſt natural ſtate of the flower, and are the moſt frequent. *Linnæi* Gen. Plant. p. 152.

SCHILUS, in ichthyology, a name given by many to the fiſh called by the generality of authors *lucioperca*, or the pike fiſh. See LUCIOPERCA.

Artedi refers it to the genus of the *perca*, or pearch, and diſtinguiſhes it from the common pearch, by calling it the pale ſpotted pearch with two large teeth on each ſide the mouth. See the article PERCA.

SCHINELÆON, a word uſed by the antients to expreſs an oil of maſtich, or oil in which maſtich was diſſolved.

SCHINUS, in botany, the name by which Linnæus calls the genus of plants, deſcribed by Tournefort and others under the name of *molle*. The characters are theſe: the cup is very ſmall, and is lightly indented in five places. The flower conſiſts of five expanded petals. The ſtamina are a conſiderable number of oblong ſlender filaments. The germen of the piſtil is roundiſh, and the fruit is a globoſe berry, containing a large ſeed of the ſame globoſe figure. This plant, in its external appearance, reſembles very much the *rhus* and the *lentiſk*, in the fructification, but when cloſely examined, is found to differ from both; from the former, in having more than five ſtamina, and from the latter, in the petals. *Linnæi* Gen. Pl. p. 515.

SCHIRROSIS, a name given to a diſorder of the eye, ariſing from the violence of a long continued inflammation, when the fleſh increaſes in bulk, and aſſumes a livid colour.

SCHISMA, in muſic. Some, as Graſſineau, make this interval equal to half a comma, and ſay that eighteen of them are required to make a compleat tone, reckoning nine commas to a tone. But all this is inaccurate. See the article INTERVAL.

It is alſo uſed by ſome for the difference between the tones major and minor [c], called by others a *comma*.—[c *Deſcartes*, Comp. Muſic.] See COMMA, *Cycl.* and *Suppl.*

SCHIT-ELU, in botany, a name given by ſome authors to the plant, which produces the ſeed called *ſeſamum* in the ſhops. Hort. Mal. Vol. 9. p. 105.

SCHLEMMEN, a term uſed by the ſmalt-makers to expreſs the ſubſtance of the ſmalt after fuſion, when it is ſeparated from the *eſchel*; that is, a ſort of grey aſhes which adhere to it, and is ready for powdering for uſe.

SCHNOT *fiſh*, a name by which ſome call the haſela or haſler, a freſh water fiſh, approaching to the mullet or chub kinds, and at ſome ſeaſons eſteemed a very delicate diſh. *Willughby*'s Hiſt. Piſc. p. 261. See the article HASELA.

SCHOENAS, among the antients, a land meaſure containing two paraſangs, or ſixty ſtadia, according to Herodote; which makes ſeven and an half of our miles. But Pliny computes it at five miles, or fifty ſtadia. *Pitiſc.* in voc. See PARASANG and STADIUM, *Cycl.*

SCHOLARES, an eccleſiaſtic order, inſtituted by Innocent the third in the council of Lateran. *Hofm.* Lex. univ. in voc.

SCHOOL, (*Cycl.*) or SCHOOLING, in the manege, is uſed to ſignify the leſſon and labour both of the horſe and horſeman.

A *ſchool pace* or *gate* denotes the ſame with *ecoute*. See the article ECOUTE.

SCHRAITSER, in zoology, the name of a fiſh very common in the Danube, and in many things reſembling our ruff, or ſmall gilded pearch.

Its common ſize is about three inches in length; its tail is forked, and its back fin is ſupported by thirty rays or nerves, eighteen of which are rigid and prickly, and thoſe which ſtand behind them ſoft and flexile. The upper jaw has a membrane ſomewhat like a lip, which hangs from it, and the coverings of the gills terminate in a ſpine or prickle. The membrane of the back fin is variegated with black ſpots, and its general colour is ſomewhat paler than that of the pearch. It is a very well taſted fiſh. *Ray*'s Ichthyography, p. 335.

SCHWALBEA, in botany, the name of a genus of plants, the characters of which are these. The perianthium consists of one leaf, and is of a very singular figure, being tubular, inflated, and striated on the surface, and terminated by an oblique mouth, lightly divided into four segments. The upper segment is smallest of all, the two side ones are longer, and the bottom one is longer and broader than these, and is emarginated. The flower consists of one leaf, and is of the labiated kind. The tube is of the length of the cup, and the limb erect. The upper lip is erect, hollow, and undivided; the lower lip is of the same size, but is divided into three obtuse and equal segments. The stamina are four capillary filaments, of the length of the flower, but two of them are a little shorter than the others. The antheræ are incumbent. The germen of the pistil is round. The style is of the length and figure of the stamina, and is placed in the same situation. The stigma is thick and crooked. The seed is single, roundish, and small. *Linnæi* Gen. Pl. p. 291. Flor. Virgin. p. 71.

SCIADEPHORI, Σκιαδηφοροι, among the Athenians, an appellation given to the stranger women residing in Athens, because they were obliged, at the festival Panathenæa, to carry umbrellas to defend the free women from the weather. *Potter*, Archæol. Græc. lib. 1. cap. 10. Tom. I. p. 56.

The word comes from Σκιαδειον, an umbrella, and φερω, I carry.

SCIÆNA, in the Linnæan system of zoology, the name of a distinct genus of fishes, the characters of which are; that the opercula of the gills are scaly, and the back fin is bifid. Of this genus are the *umbra*, &c. *Linnæi* Syst. Nat. p. 54. The characters of this genus, according to the Artedian system, are these. The whole head, and the coverings of the gills, are scaly, and one of the laminæ of these coverings is serrated at the edge. The body is compressed and broad; the back is acute; and the teeth are only in the jaws and fauces, the palate and tongue being bare. There is only one fin on the back, but it is bifid, being so deeply divided at the middle, that it seems to make two. The tail is not forked, but even at the end. The appendices of the pylorus are seven or eight in number.

There are only two known species of this genus. 1. The *sciæna* with the upper jaw longest, and the lower jaw bearded. This is the *sciæna* and *umbra* of authors, and is called by Bellonius *chromis*. 2. The *sciæna* variegated with black, and with very black belly fins. This is the *umbrino* of the Italians, and is the fish called *corvulus* and *coracinus* by many authors. The lines are of various lengths and breadths, and are laid obliquely on the sides. The mouth is large, and the eyes brown. *Artedi*, Gen. Pisc. p. 29. See UMBRA and CORACINUS.

The name *sciæna* is of Grecian origin, derived from the word Σκια, a shadow. The fish had this name from its being of a dusky or shadowy colour.

SCIAMACHIA, the fighting with a person's own shadow, a sort of exercise prescribed by the antient physicians, in which the motion of the arms, and other parts of the body, were of very great service in many chronic cases.

SCIAPODES, Σκιαποδες, a fabulous race of men, mentioned by Pliny, who had only one leg.

They were called *sciapodes* from σκια τω ποδος, because in summer they held up their leg, and sheltered themselves from the heat with the shadow of their foot. *Hofm.* Lex. in voc. See the article MONOCOLI.

SCIARRI, in natural history, the matter which runs down in burning torrents from the craters of Mount Ætna.

This matter, when cold and hard, is hewed and employed at Catania, and other places. It is chiefly used for the basements and coinage of buildings. It probably contains mineral and metallic particles, being a ponderous, hard, grey stone. Philos. Trans. N° 481. p. 327, 328. See the article STONE.

Some of the *sciarri* are coarse, and others fine and polished on the surface; some of them are black, others reddish, and others of the colour of iron; and many of them have coverings of pure sulphur over the whole surface, or a part of it. Some very fine and smooth ones, resembling iron, but very light, are found in, or near the mouths of the eruption, and some are very hard and heavy, and of a mixed nature, seeming to be the result of many sorts of minerals melted together. These latter, when the mountains have poured out streams of fire, always remain in the places, and are the substance that was on fire cooled again.

At the time of the most terrible eruptions of this kind, these heaps of *sciarri*, which sometimes appear to be solid rocks of metalline matter, are only a sort of covered arches, under which the melted matter yet continues liquid and running, and bursts out, at times, in the several parts of their sides or surfaces. The general appearance of a train of these *sciarri*, left after the eruption of such a rivulet of fire, is much like that of the Thames, or some other such large river, in the time of a severe frost, the rocks of *sciarri* rising above the general surface, like the clods of ice in that scene; the colour only differing, the great quantities of the *sciarri* in these places being of a deep bluish hue.

It is remarkable, that the substance of these *sciarri*, even while melted and running in streams down the hill, is so firm and solid, that no weight will sink into it, nor any instrument make its way through the surface, any more than a solid mass of cold metal. It has been supposed by some, that the flowing matter concreted into the common pumice stone, but that is a vulgar error, the pumice being a wholly different substance. Philos. Trans. N° 49.

SCIATHERICA, a name given to *dialing*. See DIAL and DIALING, *Cycl.*

SCIATHERICUM *telescopium*, a horizontal dial with a telescope, adapted for observing the true time, both by day and night, to regulate and adjust pendulum-clocks, watches, and other time-keepers. It is the invention of the ingenious Mr. Molyneux, who has published a book with this title, containing an accurate description of this instrument, its uses, and application.

SCIERIA, Σκιηρια, in antiquity, a festival in honour of Bacchus, kept in Arcadia.

It was so called, because that God's image was exposed ὑπο τῃ σκιαδι, *i. e.* under an umbrella. At this time the women were beaten with scourges, in the same manner with the Spartan boys at the altar of Diana orthia, which they underwent in obedience to a command of the Delphian oracle. *Potter*, Archæol. Græc. Tom. I. p. 430.

SCILLONEORTE, Σκιλλων Ἑορτη, in antiquity, the festival of sea onions. It was observed in Sicily. The chief part of it was a combat, wherein youths beat one another with sea onions. He that obtained the victory was rewarded, by the gymnasiarch, with a bull. *Potter*, Archæol. Græc. Tom. I. p. 431.

SCIMPODIUM, Σκιμποδιον, among the antients, a small couch or bed, on which one person only could rest at a time. It was on the *scimpodium* that the Romans used to lay themselves, when weary or indisposed.

The *scimpodium* was sometimes used instead of the *lectica*, to carry both men and women, not only through the city, but likewise in journeys into the country. *Pitisc.* in voc. See LECTICA.

SCINCUS, the *skink*, in zoology, the name of a species of lizard, called also by some the land crocodile, *crocodilus terrestris*, and well known in the druggists shops as an ingredient in several compositions.

It resembles the smaller sort of lizards, being usually about six inches long, and its usual thickness is that of a man's thumb. It is of a silvery greyish colour, scaly, and has a rounded tail; its head is of an oblong figure; its nose sharp; and its feet, as it were, alated, having five toes each, armed with very sharp claws. It is very common in Egypt and Arabia. *Worm.* Mus. p. 86.

The dried flesh of the *scincus* is greatly commended, as possessing all the virtues of that of vipers, but in a more exalted degree. It is said to do wonders as a restorative, and provocative to venery. For this last purpose the belly is preferred to any other part of it; but there appears no reason for this in the dried animal. The people of Egypt cut the flesh to pieces, and boil it down to a strong broth or jelly; in which form it may do some service, though it fails with us. The only use made of it at present in the shops, is as an ingredient in some of the old compositions.

SCINDALMOS, a word used by the antients to express a fissure of the cranium, or of any other part.

SCINTILLA *veneris*, a term used by Paracelsus to express a resolution of the limbs, or deprivation of motion from a venereal cause.

SCIOGRAPHY, the art of shadows, or dialing. Also in architecture, it is sometimes used to denote the draught of a building, cut in its length or breadth, to shew the inside of it; as also the thickness of the walls, vaults, floors, timber works, &c.

SCIOMANTIA, Σκιομαντειια, in antiquity, a kind of divination, by raising the dead, who were said to appear in airy forms like shades. *Potter*, Archæol. Græc. Tom. I. p. 350.

SCIOPODÆ, in history, the name given by Pliny, and other of the old writers, to a nation of people which they place in Æthiopia, on the burning sands; and who they say, when too hot, lie down upon their bellies, and shadow themselves from the sun by lifting up their feet, which are very large and broad, against it. These are some of the *gentes mirabilis figuræ* of Pliny, and are worthy to stand among the monocoli, and other such monsters.

SCIRA, Σκιρα, a festival among the Athenians, otherwise called *scirrophoria*. See the article SCIRROPHORIA.

SCIRONA, a word used by some of the antients to express the autumnal dews.

SCIRPUS, the *rush*, in the Linnæan system of botany, makes a distinct genus of plants, the characters of which are; that the cup is an imbricated spike, made up of oval and bent scales, parting the several flowers. The flowers have no petals. The stamina are three long filaments; and the antheræ are oblong. The germen of the pistil is extremely small. The style is long and thread like. The stigmata are three in number, and extremely slender. The seed is single, three cornered, pointed, and is covered with hairs,

which are ſhorter than the cup. *Linnæi* Gen. Plant. p. 12. See JUNCUS.

SCIRRHUS (*Cycl.*)—The ſeat of a *ſcirrhus* is very various and uncertain; for this diſorder is not confined to the internal parts alone, to wit, to the liver, ſpleen, lungs, meſentery, pancreas, and in females to the uterus; but it frequently happens alſo to the external parts, as to the lips, tongue, tonſils, fauces, palate, gums, neck, mammæ, axillæ, inguina, penis and teſticles, and that generally after inflammations of thoſe parts; though it ſometimes alſo appears without any inflammation, eſpecially in perſons of a heavy phlegmatic habit; ſometimes alſo it is occaſioned by an external injury, as a fall, a blow, &c.

As ſoon as the *ſcirrhus* is formed, the immediate conſequence is, that the indurated part becomes unfit to perform the functions allotted by nature to it, and the neighbouring parts ſuffer preſſure, and become impeded in the performance of their ſeveral functions. It is therefore no wonder that they are found ſubject, in theſe caſes, to inflammations, ulcerations, cancers, gangrenes, tabes, ſtiffneſs, immobility, and the like, according to the nature of the injured part.

The more inveterate a *ſcirrhus* is, the greater will be the difficulty in the cure. When this diſorder happens to young people, and ſuch as are of a good habit of body, it is much more ſafe and tractable, than when it happens to older infirm perſons. When there is any thing venereal in the caſe, the difficulty is yet the greater. The *ſcirrhus* is of the more or leſs conſequence, according to the nature of the part it is ſeated in; and internal ones are always more dangerous, for this reaſon, than the external.

While a *ſcirrhus* continues free from pain, there is little danger from it; but when it becomes painful or ulcerated, it generally threatens a cancer. The cure of theſe diſorders is always difficult and uncertain, but in young robuſt habits ſometimes the knife and corroſives will effect it.

When the *ſcirrhus* is of long ſtanding, and in old people, great care muſt be taken how it is meddled with, leſt, while under treatment, it ſhould become cancerous. On the other hand, when the *ſcirrhus* is but newly formed, and you have no ſigns of vehement pain or hardneſs, where the patient is otherwiſe of a good habit of body, external and internal remedies are to be employed at once, to endeavour to ſet the confined fluids at liberty. The internal remedies, found of moſt ſervice on theſe occaſions, are the decoctions of the woods, digeſtive tinctures, or mild mercurials, giving between whiles relaxing medicines, to reſolve the inſpiſſated humors.

In regard to the external remedies, plaſters made of the warm gums, as ammoniacum, galbanum, ſagapenum, and the reſt, either alone or mixed together, and aſſiſted ſometimes by the powder of bryony root, or of the birthwort, are uſed. Mercurials ſerve greatly to this purpoſe, and the following compoſition is alſo excellent as a plaſter on theſe occaſions. Take galbanum and opoponax of each an ounce, ammoniacum and bdellium of each two ounces, oil of olives two pounds, yellow wax half a pound, powder of long and round birthwort, lapis calaminaris, myrrh and frankincenſe, of each one ounce, Venice turpentine four ounces; melt them all into a plaſter.

Next to plaſters, cataplaſms are found highly ſerviceable in theſe caſes, one of the beſt of which is made in the following manner. Take white bryony root four ounces, round birthwort and angelica of each an ounce, leaves of ſavin, rue, ſcordium, wormwood and camomile flowers, of each one handful; melilot, elder, marſhmallows and centaury, of each half a handful; let theſe be boiled together in a ſufficient quantity of water to the proper conſiſtence for a cataplaſm, adding, toward the end of the boiling, three ounces of galbanum, diſſolved in the yolk of an egg, two ounces of linſeed meal, and as much as is neceſſary of linſeed oil.

It is to be applied warm, and often renewed; and a fomentation made from the ſame ingredients, boiled in vinegar, is often found alſo of great uſe.

Inſtead of theſe remedies ſome highly extol the uſe of acid vapours on this occaſion; ſometimes the ſteam of boiling vinegar is ordered to be received on the part, and that either of plain vinegar, or of ſuch as has been medicated by infuſions of rue, lavender flowers, or other ſuch ingredients, or of the Venice treacle. Some ſprinkle vinegars of theſe kinds over a hot ſtove, and receive the vapour through a funnel; others adviſe the burning of common brimſtone, and holding the part over the fume; and others are fond of fumigations of cinnabar. Great care muſt be taken in theſe caſes not to raiſe too large a fume, nor to keep the patient over it too long; and he muſt be adviſed not to admit it into his noſe or mouth, for all theſe ſteams are injurious to the lungs; and in the laſt caſe, the quantity of mercury raiſed in vapour from the cinnabar may often be enough to raiſe a ſalivation.

Mercurial medicines are alſo found to perform wonders in theſe caſes, either adminiſtered in the beginning, or after all other remedies have failed. Beſide giving mercurials internally, an excellent mercurial ointment may be made, by mixing quickſilver firſt with a ſmall quantity of Venice turpentine, and afterwards with a much larger of hog's lard, by rubbing them together in a glaſs or marble mortar. The *ſcirrhus* ſhould be anointed two or three times a day with this, covering it with a common mercurial plaſter; and to prevent this method from raiſing a ſalivation, ſome purging medicine, as the extract of rudius, or jalap, is to be given in ſmall doſes every fourth or fifth day.

But if all theſe methods prove unſucceſsful, and the *ſcirrhus* is free and moveable, and its ſituation threatens no danger from the neighbourhood of any conſiderable veſſels, and if the patient's ſtrength ſhall be judged ſufficient to undergo the operation, the aſſiſtance of the knife muſt be called in, and the *ſcirrhus* cut out, to prevent its growing cancerous. When the *ſcirrhus* is thus taken out, the wound is to be dreſſed and healed with the common vulnerary balſams: but when the *ſcirrhus* is fixed, knotty, uneven, and deeply rooted; where the patient is of a bad habit of body, is ſubject to form *ſcirrhuſes* from an hereditary taint, or has formed ſeveral already; and laſtly, where the ſituation of the diſorder is ſuch, that from the vicinity of conſiderable veins and arteries, there is danger of bringing on an hæmorrhage, which may prove fatal, then all attempts to cure, whether by the knife, by digeſtives, or by corroſive medicines, are to be neglected; for this kind of *ſcirrhus* is almoſt always attended with very violent pains, and all that can be done is to attempt to alleviate thoſe pains, and prevent a cancer. *Heiſter*'s Surgery, p. 221.

SCIRRHUS *hepatis*, in medicine, a diſeaſe conſiſting in an indurated tumor of the liver, occaſioned by a ſtagnation of the humors which grow thick there, from an exhalation of their more fluid and ſubtle parts.

This differs from the *infarctus hepatis*, not only in degree, but in its ſymptoms, for it almoſt always is attended with a hectic, or with œdemato-hydropic ſwellings. *Junker*'s Conſp. Med. p. 208.

Signs of it. Theſe are a tumor and hardneſs in the right hypochondrium, or region of the liver, always evident to the patient, and often ſenſibly perceived by any body elſe, on touching the part. To this are to be added dull tenſive pains, and a ſenſe of a weight hanging there, and uſually aſthmatic ſymptoms, and a dry cough. It becomes painful to lie on the left, or oppoſite ſide; and with theſe a hectic comes on, with a waſting of the upper parts, and a ſwelling of the inferior ones; firſt of the feet, but afterwards upwards to the belly, which finally become very obſtinate, and truly aſcitic. The urine in this caſe is ſmall in quantity, and of a deep orange colour, and thick conſiſtence. It has uſually a mucid ſediment, and ſometimes a thick one of a roſe colour.

Cauſes of it. Theſe are uſually either an omiſſion of artificial diſcharges of the blood, by habitual bleedings at ſpring and autumn, or a ſuppreſſion of the natural ones, by the menſes or hæmorrhoidal veſſels: an improper treatment of intermittent fevers with aſtringents, of quartans with large quantities of bark, and of acute fevers with too cooling a regimen, or a violent quantity of the volatile ſalts, or a condenſation of the humors in a ſimple infarction, by means of cold external applications. The ſtopping hæmorrhages, which nature had brought on for her relief in plethoras, have alſo been ſometimes known to occaſion a *ſcirrhus* of the liver; as have alſo external injuries by blows, falls, and the like.

Prognoſticks. A recent *ſcirrhus* of the liver admits of a cure, but this not without great difficulty, and in a more confirmed one there is very little hope. This tumor has a continual tendency to corruption, either by ſphacelation, or by an inflammatory ſuppuration; neither of which can happen ſucceſsfully, for the firſt muſt occaſion inſtantaneous death, and the latter exulceration, and a ſucceeding fatal hectic. A *ſcirrhus* of the liver often follows, and ſometimes precedes a jaundice of the moſt violent kind.

Method of treating it. The bowels are firſt to be cleanſed and relaxed by a clyſter, made of a decoction of mallows, camomile flowers, mullein, and fennel ſeed; after this, bleeding in the foot is to be ordered, and then the nitrous and other reſolvent medicines are to be given, ſuch as tartar of vitriol, and the like. After this medicated wines ſhould be drank as the common drink, prepared with bryony and arum roots, centaury, hyſſop, and maidenhair leaves, ſaſſafras, ſenna, black hellebore, and rhubarb; and externally, plaſters of the reſolvent and ſtrengthening kinds are to be applied. But after all directions for the treatment, it is to be acknowledged, that an obdurate and inveterate *ſcirrhus* admits of no remedy. *Junker*'s Conſp. Med. p. 210.

SCIRRONES, a name given to a ſort of ſmall lice breeding under the ſkin.

SCIRROPHORIA, Σκιῤῥοφορια, in antiquity, an anniverſary ſolemnity at Athens, upon the twelfth day of the month *ſcirrophorion*. For its origin and ceremonies ſee *Potter*, Archæol. Græc. lib. 2. cap. 20. Tom. I. p. 430.

SCIRROPHORION, Σκιῤῥοφοριων, in antient chronology, the twelfth and laſt month of the Athenian year. It contained

twenty nine days, and anſwered to the latter part of our May and beginning of June. See MONTH.

It had its name from the feaſt *ſcirrophoria*, kept in it.

SCISSIMA, in botany, a name given by ſome authors to the beech tree. *Ger.* Emac. Ind. 2.

SCISSORS. Mr. Monro has given us the figure and deſcription of a pair of *ſciſſors*, the blades of which are crooked on their flat ſides. Theſe *ſciſſors* are very uſeful for taking off excreſcences from hollow parts, or for cutting in curve lines, which the common *ſciſſors* cannot eaſily be applied to. Med. Eſſ. Edinb. Vol. 5. art. 41.

SCIURUS, the *ſquirrel*, in the Linnæan ſyſtem of zoology, makes a diſtinct genus of animals, the characters of which are; that the creatures have four toes on the fore feet, and five on the hinder, with palms made for climbing and leaping, and all have woolly tails. *Linnæi* Syſtem. Natur. p. 33.

We have five ſpecies of this little animal deſcribed to us. 1. The common Engliſh kind. 2. The great grey Virginian one. 3. The black backed kind of Ceylon. 4. The American flying *ſquirrel*. And 5. the Barbary kind.

The common Engliſh *ſquirrel* is well known, and is diſtinguiſhed from the others by its ſize and colour. It is ſomething larger than the weaſel, but ſhorter bodied; its back and ſides are reddiſh; its throat and belly white; and it generally carries its long hairy tail erect over its back, ſo that it ſerves it for a ſhade. It is common in our woods, and feeds on all ſorts of fruit, but principally on hazel nuts; which it gathers in the ſeaſon, and lays up for its winter ſtore. The ſame ſpecies of *ſquirrel* with ours is found in Poland and Ruſſia, grey or aſh coloured.

The ſecond, or great grey American *ſquirrel*, is very common in Virginia, and is of the ſize of a rabbet. It is of a dark iron grey, ſuch as ſome rabbets are of; its fore feet have only four toes, its hinder ones five.

The third, or black backed *ſquirrel*, is found in the iſland of Ceylon, and called by ſome *rukkaia*, from the noiſe it makes. The hair on its back is ſometimes grey.

The fourth, or flying *ſquirrel*, is a very ſmall kind; its back is of a duſky mouſe-coloured grey; its throat and belly white; its eyes ſmall, black, and prominent, reſembling thoſe of the mouſe kind; its tail is very long, and very broad and flat. It has a thin and lax ſkin on each ſide, which is fixed to the fore and hinder legs, and conſequently, on the extending its legs, this ſkin expands on each ſide like a ſort of ſail: this it always does in leaping, and is by that means carried a great way; and hence has ariſen the opinion of its flying. It is very common in New Spain, and is ſometimes met with in the colder American countries. It very much approaches to the mouſe kind in many particulars, receding from the nature of the *ſquirrel*. Its furr is ſhort like that of the rat or mouſe, not long like the other *ſquirrels*. It never erects its tail on its back, nor turns or twiſts it round, as the other *ſquirrels* do. It has a very beautiful black line on each ſide the face, near the eyes.

The fifth kind, or Barbary *ſquirrel*, is of a mixed colour, between black and reddiſh, and is very beautifully variegated all down the ſides with brown and white longitudinal ſtreaks, laid in a regular alternate order, and each reaching the whole length of the body. Theſe lines are, in ſome of theſe creatures, not brown and white, but black and white; and the tail, when in a ſtate of reſt, is ſeen elegantly ſtreaked with the ſame colours, but when the creature erects it, the hairs ſtanding all upright, the beauty of this variegation is hid. The belly of this creature is blue and white. It is ſmaller than our *ſquirrel*, and has ſhorter ears, which are roundiſh, and lie cloſe on the head. The whole head has much of the figure of a frog's, in all other reſpects it is perfectly like our *ſquirrel*. *Ray*'s Synop. Quad. p. 214.

SCLAREA, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, and is of the labiated kind; the upper lip is hooked like a reaper's ſickle, and the under one divided into three ſegments, the middle one being largeſt, and hollowed like a ſpoon. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower. It is ſurrounded by four embryos, which ripen into as many ſeeds, and are contained in a ſort of tubular capſule, which was the cup of the flower.

The ſpecies of *ſclarea*, enumerated by Mr. Tournefort, are theſe. 1. The *ſclarea*, called *gallitrichum ſativum* and *orvala* by authors. 2. The woolly *ſclarea* with very large flowers, called *Æthiopis* by many authors. 3. The jagged leaved *ſclarea*, called the *Æthiopis* with divided leaves. 4. The large leaved glutinous Portugal *ſclarea*. 5. The aſphodel rooted *ſclarea*. 6. The Indian *ſclarea* with variegated flowers. 7. The glutinous Pyrenean *ſclarea* with ſinuated leaves. 8. The ſtinking hairy white flowered *ſclarea*. 9. The early African annual *ſclarea*. 10. The great annual Bœtic *ſclarea* with pale blue flowers. 11. The blue flowered meadow *ſclarea* with ſerrated leaves. 12. The white flowered meadow *ſclarea* with ſerrated leaves. 13. The bright red flowered meadow *ſclarea* with ſerrated leaves. 14. The greater *ſclarea* with deeply divided leaves. 15. The white flowered Syrian *ſclarea*. 16. The blue flowered Syrian *ſclarea*. 17. The great ſpotted ſage leaved *ſclarea*. 18. The ſmall ſmooth ſage leaved *ſclarea*. 19. The purple flowered ſage leaved *ſclarea*. 20. The *ſclarea* with triangular dentated leaves. 21. The triangular leaved woolly ſtalked *ſclarea*. 22. The blue flowered betony leaved *ſclarea*. 23. The African ſhrub *ſclarea* with leaves like the helianthemum. 24. The large flowered dwarf *ſclarea* with jagged leaves. And 25. the Syrian *ſclarea* with rugged dentated leaves. *Tourn.* Inſt. p. 179.

SCLERIA, a word uſed by medical writers to expreſs a hardneſs of the inner part of the eyelids.

SCNIPS, in natural hiſtory, a name given by authors to the ſmall ſpecies of gnat, always found about the oak tree feeding on the juices of its leaves, which it ſucks by means of its ſharp trunk.

It is ſuppoſed by ſome to be hatched of the ſmall oblong white worm, that inhabits the oak apples.

SCOBS, a word uſed by ſome authors to expreſs the raſpings of ivory, hartſhorn, or other hard ſubſtances. Some alſo have uſed it to expreſs the ſcoriæ of metals; and ſome as a name for the *cineres clavellati*, or pot-aſhes, uſed in ſoap and glaſs-making.

SCODEGHINO, a name given by chirurgical authors to a peculiar ſpecies of inciſion knife, deſcribed by Scultetus, and uſed by Rouſſet in performing the Cæſarean operation.

SCODINEMA, a word uſed by ſome medical writers to expreſs a heavineſs of the head.

SCOLECIA, in the materia medica of the antients, a name given to a kind of verdigreaſe.

Of this there were two ſpecies, the one found native in the earth, the other fictitious.

The latter kind was prepared by rubbing a quantity of vinegar in a braſs mortar, with a braſs peſtle, till it became thick and ropy; when it was in this condition, a ſmall quantity of alum and ſea ſalt, or nitre, were added to it, and it was ſet in the ſun in the heat of the dog days. It was to ſtand thus till it became ropy, thick, and of a green colour; and then being drawn out into long threads, and dried, it had the reſemblance of worms in ſhape, and thence had its name.

SCOLION, among the antients, a kind of Bacchanal ſong uſed at entertainments. See *Pitiſc.* in voc.

SCOLIOSIS, a word uſed by Hippocrates to expreſs a diſtortion of the ſpine ſideways.

SCOLIUM, in antiquity. See the article SCOLION.

SCOLOPAX, the *woodcock*, a very well known bird, diſtinguiſhed by its ſize, which is ſomewhat ſmaller than that of the partridge, and by its colour, which is on the back a variegation of black, grey, and a reddiſh brown; and on the belly a pale grey, variegated with tranſverſe ſtreaks of brown. Its beak is three fingers breadth long, and the upper chap a little longer than the under.

In the Linnæan ſyſtem of zoology, the *ſcolopax* is the general name of a large order of birds, the diſtinguiſhing character of which is, that they have a ſomewhat cylindric beak, which is rounded, and obtuſe at the point. *Linnæi* Syſtem. Natur. p. 47.

SCOLOPAX, in ichthyography, the name of a ſea fiſh called in Engliſh the *trumpet*, or *bellows fiſh*.

It is a very ſmall fiſh, caught very frequently in the Mediterranean, and common in the markets of Rome, Venice, and elſewhere. Its common length is about three inches; its body is flat, and of about one finger's breadth, and covered with rough and harſh ſcales. The ſnout is extremely long, and is hard, ſtrait, and made all of one bone, broad at the head, and narrow at the end, and opening there tranſverſely with a membrane affixed to the under jaw, and ſerving to open and ſhut it at pleaſure. The eyes are large, and their iris's of a pale red. It has a thin fin at each of the gills. The anterior part of the belly is formed into a ſharp edge, and has no fins, but two bony ſubſtances, ſeeming the rudiments of belly fins; and a little lower on the belly it has one, which is longer and notched. Behind the anus there is a long fin, reaching to the tail, and on the back there are two others very oddly placed; the hinder ſtands very near the tail, the other higher up; and this laſt is no other than one long and large bony ſpine of two inches long, and ſet in a joint, by which it is moveable at pleaſure. Before this there ſtands another very fine prickle, and behind it three others, which make the whole a ſort of fin. *Geſner*, de Piſc. p. 1008.

SCOLOPENDRA, in zoology, an inſect of a very ſlender and long body, very ſmooth, and of a yellowiſh or reddiſh colour, furniſhed with a vaſt number of legs, and having two long antennæ, and a bifid tail.

It is uſed by ſome as a depilatory, being boiled in wine. *Dale*'s Pharmacop. p. 355.

There is a ſpecies of this animal, which naturally ſhines in the dark in the manner of a glow-worm, but with a fainter and more general light. Every part of the body of this animal will emit ſparks, if preſſed in the dark. It is covered with a ſoft down, or ſhort and fine hair, much reſembling in texture

ture the downy matter which grows on the back of colts-foot leaves.

The two ſides of the animal are covered alſo with two other liſts or ſtripes; theſe go off from the main ſtripe at the top, and theſe are about a quarter of an inch broad; they are covered with a fine and ſoft hairyneſs, of more than a quarter of an inch long, of a fine changeable red and green colour, and of prodigious beauty and brightneſs. Among this long hair of the ſtripes on the ſides there are ſet a vaſt number of long and ſharp prickles; they are about the ſame length with the hair, but they are as ſtiff as a hog's briſtle, and are very ſharp at the points, and of a black colour; there are ſeveral hundreds of theſe on the two ſides.

The tail, or ſmaller end, terminates on the back in two ſcales, which are very bright and fine; under this is the anus, at which the creature voids its excrements. The larger end has no part of the common characters of a head, except the mouth; but as it has this, and ſtands oppoſite to the tail, it is properly enough called ſo in deſcription. It has no horns, no eyes, nor any other of the common organs of inſects heads.

The mouth is very wide, in proportion to the ſize of the creature, and is not placed at the extremity, but ſomewhat under the belly part; ſo that when the back of the creature is viewed, the mouth is not ſeen. The belly is ſmooth and flat, and is covered with a thin ſkin, much paler coloured than that of the back, and irregularly variegated with a number of brown ſpots, of different ſizes and ſhapes. Within an inch of the tail there are ſeen on this under part ſeveral marks, like thoſe of the annular diviſions of the bodies of inſects, but they do not ſhew themſelves on the back. The legs are placed in two rows, each of the whole length of the body of the fiſh; they begin from the angle of the mouth on each ſide, and are continued to the tip of the tail. Thoſe ſtanding near the mouth are longer than the others, which gradually decreaſe till they are very ſhort at the tail; the longeſt are about a quarter of an inch in length, and the ſhorteſt not a ſixth of that length.

The whole number of legs is ſeventy two, thirty ſix ſtanding on each ſide. From within the body, through the middle of each leg, there paſſes a cluſter of three or four prickles; theſe are larger or ſmaller, according to the ſize of the leg, and vary alſo in number, the longeſt legs having moſt of them; they give ſtrength and firmneſs to the legs, ſerving them in the place of bones, and iſſuing out beyond the end of the leg, in the way of claws; they ſerve the creature for the laying faſt hold of any thing it pleaſes. On each ſide of the upper, or back part of the fiſh, there are alſo placed a number of ſoft, flat, and ſmooth fins; theſe ſtand near the legs, and are placed face to face in ſuch a manner, that each foot has its correſponding fin. The fins are exactly of the ſame number with the legs, and, like them, are largeſt toward the head, and go off gradually tapering toward the tail.

Theſe ſerve the creature in the office of a fiſh, giving it power to ſwim in the water, as the others ſerve it as a reptile to crawl upon the ground at the bottom. The fins on each ſide are fringed with the ſame changeable coloured hair, that the ſtripes on the back are.

On opening the body there appears a muſcular organization, elegantly contrived for the working ſo great a number of legs and fins. This appears in form of one large and broad red muſcular congeries, and from this there are propagated on each ſide thirty ſix pair of rays, or oblong and ſlender muſcles, every pair ſerving for the motion of one leg and one fin. Theſe are very diſtinctly viſible, and repreſent the ſpine and ribs in ſome fiſh. And in this the wonderful care of nature is ſeen, in regard to this little animal, which, by means of theſe diſtinct muſcles, is able to move every ſingle leg or fin ſeparately, and conſequently can put as many, or as few as it pleaſes, in motion at a time. It is plain alſo, from the ſtructure of the body of this creature, that it can at pleaſure roll up its body into a round form, and in that caſe will appear as a globe covered with long and ſharp prickles: this is probably its practice, when in danger of being devoured, and may ſerve it on many occaſions. It has been thought by ſome, that Rondeletius means this creature by his *phyſalus*; but this does not appear to be the caſe on a careful examination. Philoſ. Tranſ. N° 225.

SCOLOPENDRA *marina*, a name given by Dr. Molyneux to a new ſpecies of ſea animal, of the centipede *ſcolopendra* kind. See Tab. of Microſcopical Objects, Claſs. 1.

This remarkable inſect, taken in the Iriſh ſeas, is evidently the ſame animal deſcribed by Oligerus Jacobæus, in the *Acta medica Haffnenſia*, under the name of *vermis aureus*, or *erucæ marinæ ſpecies rarior*. It was caſt on ſhore in Holland, at Katwik op Zee; and Aldrovand ſeems to have meant it alſo under the name of the broad bodied cheſnut coloured ſea *ſcolopendra* with numerous yellow feet. The figures and deſcriptions in both theſe places are however very imperfect, and the account given by Dr. Molyneux is the only one at all to be relied on, of this ſtrange animal. Philoſ. Tranſ. N° 224.

SCOLOPENDRA *ſcutata*, in natural hiſtory, the name of an animal of the inſect kind, found in the year 1736 by Klein in Pruſſia, and at the ſame time by Mr. Brown in ſome parts of Kent.

It was met with in Pruſſia in vaſt abundance, in the places where they take crayfiſh, and having not been met with there before, ſurpriſed the people employed in that fiſhery ſo much, that they brought home many of them. In Kent its appearance was attended with greater ſingularity, Mr. Brown found it in a pond on Bexby common, where the country people had obſerved vaſt numbers of them for five or ſix weeks before. This pond was quite dry on the 24th of June that year, but being filled by the thunder ſhower on the 25th of the ſame month, the pond was obſerved to ſwarm with them in two days, by a farmer watering his cows there; and what is very obſervable is, that there appears no channel into this pond, that could convey them from any other place.

The creature is about an inch and half in length, and ſomewhat leſs than an inch in breadth, and though ſo ſmall, yet bears a great reſemblance, in many of its parts, to the great Molucca crab, called by ſome the *buckler crab*. When the back is viewed, it is ſeen to be covered with a caſe or ſhield, ſo that it in ſome meaſure reſembles a tortoiſe, only it is remarkably gibbous, or prominent all along the middle of the back, and has a triangular opening in the ſhell near the tail. This covering is of the conſiſtence of the upper wings of the beetles, and the eyes are prominent, and placed beyond it. When the creature is turned upon its back, ſo that the belly comes in ſight, there are obſerved a vaſt number of legs, and every one of theſe is furniſhed with a ſort of bag at the end, which finally divides itſelf into ſeveral fingers or toes, and all theſe are compoſed of a number of articulations, in the manner of the antennæ of the common inſects. There iſſue from the tail two long and ſlender bodies, articulated in the ſame manner; theſe are about a third of an inch in length, and greatly reſembling the common antennæ. On the head alſo it has two ſhort horns, ſtanding in the common place of the antennæ. When the caſe or ſhell is taken off, the rings of the body are found to be about thirty in number. The legs are very extraordinary, they are forty two on each ſide; the twenty that ſtand next the head are nearly of the ſame ſize, but then they grow gradually ſmaller towards the tail. The feet conſiſt each of five membranaceous claws; theſe are flat, and have a ſtiff rib in the middle, and are beſet at the edges with hairs, in the manner of the legs of a crab. On the lower ſide of the leg hangs an oval bag; and beyond that grows a large thin membrane, which can be extended at the creature's pleaſure by means of a ſtrong rib, which runs all the way along its middle. This membrane, and alſo the whole foot, are convex toward the head, and concave on that ſide that ſtands toward the tail; the thigh, or firſt joint of the leg, is webbed on each ſide, and indeed the whole ſtructure of the legs ſeems calculated for ſwimming, rather than for walking. Philoſ. Tranſ. N° 447. p. 151.

SCOLOPENDRITES *lapis*, in natural hiſtory, a name given by ſome authors to a ſpecies of the *lapis ſyringoides*, or pipe ſtone, the tubules of which they ſuppoſed to reſemble the figure of the body of the *ſcolopendra*.

SCOLYMUS, in botany, the name of a genus of plants, the characters of which are theſe. The flower is compoſed of a number of ſemifloſcules, each placed on an embryo ſeed, and perforated in its bottom part by the capillament which runs out from the embryo. The ſemifloſcules are ſeparated each from the next by a little leaf, and are all contained in a ſquammoſe cup. The embryos afterward become ſeeds affixed to the thalamus of the flower, and adhering to thoſe little leaves which ſeparated the ſemi-floſcules. See Tab. 1. of Botany, Claſs 13.

The ſpecies of *ſcolymus*, enumerated by Mr. Tournefort, are theſe. 1. The *ſcolymus* with gold yellow flowers, called by authors the *yellow flowered thiſtle*, and the *yellow thorn*. 2. The annual yellow flowered *ſcolymus*. And 3. the tall African yellow flowered *ſcolymus*. *Tourn.* Inſt. p. 489.

It is not certain that any of the antients uſed the word *ſcolymus* as the name of the plant we call the artichoak. Theophraſtus, Dioſcorides, and indeed all the antients, have deſcribed this plant; but Theophraſtus ſays that only its roots were eatable, and Dioſcorides ſays ſo of its young ſhoots. It ſeems, therefore, that they meant our chardon by this name, the ſtalks of which our gardiners have a way of blanching for the table.

Theſe Greek writers had indeed another name for the artichoak, they called it *acanthe*. This cannot be doubted by any, who will obſerve their accounts of the *acanthe*, which tell us that it was of the thiſtle kind, but had a large and roundiſh head, compoſed of ſcaly leaves, in the manner of the cone of the fir or pine, (the pine apple as we vulgarly call it) and that in this head was contained its only eſculent part.

This name *acanthe* being very like the word *acanthus*, the name of the *branca urſina*, or bear's breech, there have been many errors in the editions of the antient Greeks,

by confounding the two words. *Dioſcorides*, lib. 18. *Theophraſtus*, p. 72. See ACANTHE.

SCOMBER, the *mackrel*, a well known ſea fiſh of the thynnus kind, and diſtinguiſhed from the other fiſh of that genus by its extremely ſmall and thin ſcales; by its bluiſh green colour on the back, variegated with undulated and crooked black lines; by the forkedneſs of its tail, and the very ſubſtance of the fin of it, being almoſt entirely wanting at the angle of it; and by the largeneſs of its eye, in compariſon of the *amia*, and other fiſh of this kind, which moſt reſemble it in other reſpects. *Willughby*'s Hiſt. Piſc. p. 181.

In the Linnæan ſyſtem of zoology, the *ſcomber* is a diſtinct genus of fiſhes, of the general order of the acanthopterygii. The characters of this are, that the membrane of the gills has ſeven bones, and that the tail has lateral eminences. Of this genus are the *ſcomber*, *thynnus*, *amia*, and *trachurus*. *Linnæi* Syſt. Nat. p. 54.

In the Artedian ſyſtem of ichthyology, the characters of this genus of fiſh are theſe: the branchioſtege membrane on each ſide contains ſeven ſlender bones, the upper one of which is nearly covered by the covering of the gills. The tail is very forked, ſo as to reſemble the form of a creſcent. There are one or more eminences on each ſide toward the tail. The fins are either only two on the back, or elſe, beſide theſe, there are ſeveral other ſmall and ſhort ones, running all the way to the tail, as well on the upper as the under part of the body. The appendices to the pylorus are very numerous.

The ſpecies of this genus are theſe. 1. The *ſcomber* with five pinnules at the end of the back, and a ſhort ſpine at the anus. This is the common *mackrel*. 2. The *ſcomber* with eight or nine pinnules at the end of the back, and a furrow at the belly fins. This is the *tunny* fiſh. 3. The *ſcomber* with prickly lateral lines, and thirty bones in the pinna ani. This is the fiſh we call the *horſe mackrel*, and in ſome places the *ſcad*. 4. The *ſcomber* with two back fins, and with the laſt ray of the ſecond very long. This is the *amia* of Salvian, and the *glaucus* of Aldrovand. It grows to three feet long. 4. The *ſcomber* with the ſecond ray of the ſecond back fin very high. This is the *glaucus primus* of Willughby and Rondeletius. *Artedi*, Gen. Piſc. p. 25. See the articles GLAUCUS, &c.

SCOPELISMUS, Σκοπελισμος, an audacious crime practiſed by ſome villains among the Arabians.

It conſiſted in placing a certain number of ſtones upon the farm or field of perſons theſe miſcreants had a pique at; which ſtones ſerved as a denunciation of utter deſtruction to thoſe, who for the future ſhould attempt to till the ground on which they were laid. And ſuch terror attended this malevolent and clandeſtine threatening, that none ever ventured to till ſuch fields. *Pitiſc.* in voc.

SCOPS, in zoology, the name of a bird of the horn owl kind.

It is the ſmalleſt of all the owl kind, being ſcarce ſo large as a pigeon, and is grey on the head, and of a whitiſh brown, variegated with ſtreaks and ſpots of brown in other places. Its beak is ſhort, black, and crooked, and it has two ſeries of feathers, like the reſt of the horn owls, reſembling horns, which ſtand over its ears. It is very common in Italy. *Aldrovand.* de Avib. lib. 8. cap. 4. *Ray*'s Ornithol. p. 65.

SCORAX, a word uſed by ſome authors to expreſs the gum of the olive tree.

SCORDIUM (*Cycl.*)—This plant is propagated in our gardens for medicinal uſe, by parting the roots, or planting ſlips or cuttings in March, in beds of moiſt earth, at four or five inches diſtance, in July they will be in flower, and fit to cut for uſe. But every other year the bed ſhould be renewed, and that always on a freſh ſpot of ground, for they do not ſucceed well on the ſame. *Miller*'s Gardner's Dictionary.

Scordium, or *water germander*, is eſteemed a great ſudorific and alexipharmic. It is preſcribed in malignant and peſtilential fevers, and even the plague itſelf. It is an attenuant and diſſolvent, and is uſed to deſtroy worms. Externally it cleanſes foul ulcers, and, applied by way of cataplaſm, mitigates pain. It is never uſed alone, but merely kept in the ſhops as an ingredient in the *confectio Fracaſtorii*, which, though it contains ſeveral medicines of more virtue, yet takes its name *diaſcordium* from it.

SCORIA, (*Cycl.*) in metallurgy, the recrements of metals in fuſion, or more determinately ſpeaking, the maſs, or part of the maſs of a melted metal, converted by the action of the fire into a body, which when cold is brittle, fixed, not diſſoluble in water, but melts again when expoſed to the fire, and is properly a kind of glaſs.

Some authors call by this name that ſaline maſs, which is produced by melting ores and metals together with ſaline, and reducing fluxes. But the word *ſcoria* is not properly to be underſtood of all this maſs, but only of the vitrified particles which are lodged between, and adhere to the ſmall maſſes of the ſalts, and which may be ſeparated from them by water. *Cramer*'s Art of Aſſaying, p. 185.

SCORIFICATION, in metallurgy, is the art of reducing a body either entirely, or in part, into *ſcoria*.

It is uſed by metallurgiſts, in order that any metal, impriſoned in a ſolid body, may, on account of its weight, deſcend and ſeparate itſelf therefrom, and finally if that be required, be itſelf either wholly or in part converted into *ſcoria*. All fixed bodies are ſubject to this alteration, not totally excepting even gold and ſilver. There are alſo, among the volatile bodies, ſome that may be fixed, and which aſſume the form of *ſcoræ*, by adding fixed bodies to them.

It is often proper to make this *ſcorification* in a veſſel that may abſorb the *ſcoriæ*, and retain only the metallic part of the maſs under trial. In this caſe the operation is called *coſſpelling*, and veſſels made of aſhes, called *teſts* and *coppels*, ſerve for this purpoſe. It is evident in theſe proceſſes, that a great attenuation of the *ſcoriæ* is neceſſary, that they may be able to paſs through the veſſel; nor is there any fitter body to promote this operation than lead, which, by its undergoing itſelf a like attenuation in the fire, diſpoſes other bodies to be reduced into a ſubtle *ſcoria* for the ſame attenuation.

SCORITH, a word uſed by the chemical writers to expreſs ſulphur.

SCORPÆNA, in the Artedian ſyſtem of ichthyology, the name of a genus of fiſhes, of the acanthopterygious kind, the characters of which are theſe. The branchioſtege membrane on each ſide contains ſeven bones. The head is large, and very prickly. There is only one back fin, and that is lower in the middle than elſewhere. The body grows ſmall toward the tail. The eyes are placed near one another, and are covered with the common ſkin. There are teeth in the jaws, palate, and fauces; and the appendices to the pylorus are eight or nine.

The ſpecies of this genus are theſe. 1. The *ſcorpæna* with pinnules at the eyes and noſtrils. This is the *ſcorpius minor*, or *ſcorpæna* of authors. 2. The red *ſcorpæna* with many cirri about the mouth. This is the *ſcorpius major* of authors, and is three or four times larger than the other. *Artedi*, Gen. Piſc. 33.

According to Mr. Willughby, the *ſcorpæna* is a fiſh of the anguilliform kind, called by the people of Cornwall *father laſher*.

It is of about ſix inches in length, and in ſhape much reſembles the freſh water bullhead. Its head, and the forepart of its body, are very large, the hinder part ſmaller, the belly is flat and broad, and the whole body is without ſcales. It has a rough line running along both ſides. It is variegated with black and yellowiſh marks, and the belly is white. The mouth is large, and is furniſhed with ſeveral rows of ſmall teeth. It has large fins at the gills, and two on its back, which are ſomewhat prickly, and one ſtrait one on the belly. It keeps about the ſhores, and feeds on ſhrimps and ſmall fiſh. It is common in the Dutch and Engliſh ſeas.

Scorpæna is alſo the name of a fiſh caught in many parts of the Mediterranean. It ſeldom grows to more than a pound weight. Its body is of a long, not flatted form, and is moderately thick. Its head is extremely large, and is armed with prickles, and it grows gradually leſs from thence to the tail. Its belly is not flat, but tumid, and its back riſes in the middle. It ſomething reſembles the river pearch in ſhape, and is of a yellowiſh colour, variegated with ſpots of brown. Its ſcales are ſmall and rigid. The coverings of the gills are armed with ſpines, and there are others about the eyes and about the mouth. The ſpace between the eyes is hollowed, and over each eye there is a ſort of ſmall fin. The eyes are large and prominent, and are placed near one another. Its mouth is extremely large, but its teeth ſmall. It has only one back fin, but that being very low in the middle, gives an appearance of two. The anterior ſpines of this are rigid and prickly, the hinder ones ſoft and flexile. The prickles about the head are accounted venomous, and the fiſhermen uſually cut them off as ſoon as the fiſh is caught. Its tail is not forked, but rounded at the end. The belly and bellyfins are reddiſh. *Geſner*, de Piſc. p. 1018. *Aldrovand.* de Piſc. lib. 2. cap. 24.

SCORPIACA, the name of an antidote recommended by Galen againſt the ſtinging of ſcorpions.

SCORPIO, the *ſcorpion*, in zoology. See SCORPION.

SCORPIO, in botany, a name by which ſome of the old authors have called the *geniſta ſpinoſa*, or common furze buſh. *Ger.* Emac. Ind. 2.

SCORPIOIDES, in zoology, the name of a fiſh of the gottorugine kind, but differing in colour, being of a faint green, variegated with black ſpots; and in either wanting the eyefins, or elſe having them extremely minute. *Rondelet.* de Piſc. See GOTTORUGINE.

SCORPIOIDES, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the papilionaceous kind; the piſtil ariſes from the cup, and finally becomes a jointed pod of an oddly convoluted ſhape, reſembling a ſnail or caterpillar, and uſually containing in each of its joints a ſingle oval ſeed. See Tab. 1. of Botany, Claſ. 10.

The ſpecies of *ſcorpioides*, enumerated by Mr. Tournefort, are theſe. 1. The *ſcorpioides* with beupleurum, or hare's ear leaves. 2. The beupleurum leaved *ſcorpioides* with rough, and more contorted horns. 3. The *ſcorpioides* with thick pods. 4. The *ſcorpioides* with beupleurum leaves, and with ſmooth pods. 5. The *ſcorpioides* with cochleated and ſtriated pods. *Tourn.* Inſt. p. 402.

SCORPION (*Cycl.*)—The opinions of authors are very different as to the ſting of this creature; ſome aſſerting that there is an opening in it, through which a poiſonous liquor is thrown into the wound made by it, as is the caſe in the tooth of the viper, &c. and others affirming that there is no ſuch opening.

Galen affirms that there is none, but moſt of the writers of the middle ages aſſert that there is. But the whole is ſet in the cleareſt light by Segnior Redi, who took the pains of examining microſcopically the ſtings of *ſcorpions* brought alive from Tunis, Egypt, and Italy. Theſe he nicely examined by the beſt glaſſes in the Muſæum of the Great Duke of Tuſcany, and could find no aperture: but not ſatisfied with this, he preſſed the ſtings, to try if he could make any liquor flow out of them; they were, however, ſo hard and horny, that ſqueezing could have no effect on them; and finally he cauſed a *ſcorpion* to ſtrike upon a plate of iron, but no liquid was found thereon; ſo that he began to conclude Galen's opinion right, when he accidentally diſcovered an exceedingly ſmall drop of white liquor upon the ſting, and this he afterwards found in all the trials he made with ſeveral *ſcorpions*. And Mr. Lewenhoek diſcovered an opening on each ſide of the ſting of this creature, for the emiſſion of the poiſon, which he ſuppoſes is not diſcharged, till the ſting is buried in the wound. *Baker*'s Microſcope, p. 213.

Mr. de Maupertuis, having cauſed *ſcorpions* to bite ſeveral animals, of which very few died, or ſuffered any more than the pain of the ſting, is of opinion, that oil of *ſcorpions* and other vulgar antidotes to the poiſon of theſe animals, have rather got their reputation from the innocence of the ſting of theſe creatures, than from any conſiderable virtue in the medicines. Mem. de l'Acad. Scienc. 1731.

Water SCORPION, *ſcorpio paluſtris*, a name given to a very remarkable ſpecies of water inſect. It is a very thin and light little creature, yet is but a very ſlow mover. Its head is very ſmall, and is hard to the touch, and of a paler brown than the reſt of the body; and this is terminated by a very fine and ſharp hollow proboſcis, of the ſame colour and texture. The eyes are ſmall, but prominent, and are very hard and black. The ſhoulders are broad and flat; they are of the ſame colour with the head, and are wrinkled on the ſurface. The triangular ſpot between the wings is black and ſhining, the body is of a bright red lead colour on the back, and of a faint duſky brown on the belly, and is compoſed of ſix joints, covered with a ſort of ſcales. The outer wings are very hard and firm, and lie very far over one another; they are opake, and of a dark muddy brown, without any variations: the inner wings are of a duſky white, veined with a red lead colour. The two fore legs are broader and thicker than the reſt, and end in ſhort blunt claws; theſe the creature never walks with, but always uſes them as arms: the hinder pair are the longeſt, and both they and the middle ones end in a ſharp claw; they are all of a pale brown, and ſomewhat tranſparent. The tail is long and ſtrait, it is compoſed of two ſlender briſtles, of a pale brown; the creature ſcarce ever ſeparates theſe. It lives among the weeds in clear ſtanding waters, and is continually watching for its prey. It feeds on other inſects, and is particularly fond of the *cicada aquatica*, or worm of the great libella. It ſeizes its prey with the fore legs, and holds it faſt in them while the proboſcis pierces into the body, and ſucks the juices. See Tab. of Inſects, N° 8.

SCORPION *fly*, in natural hiſtory, a name given by Mouffet and other writers to a kind of fly, remarkable for carrying the end of its tail turned up in form of the *ſcorpion*'s ſting.

There are two very beautiful ſpecies of theſe. The one has ſilvery wings, variegated with three tranſverſe ſtreaks of black toward the ends; the head is black, and the breaſt, ſhoulders and feet whitiſh; the reſt of the body is black. The tail, which repreſents a ſting, has five joints, three of which are red, and the others black; the end of the tail alſo is forked, and the forks black, and turned up like the ſting of a *ſcorpion*.

The other reſembles this in many reſpects, but the end of the tail is thicker, and the forks blunter; the head is duniſh, the mouth long, and each wing variegated with ſix black ſpots, of a large ſize.

SCORPIUS, in ichthyology, the name of a fiſh caught in the Mediterranean, of a long and rounded body, not flatted, and with a very large head, from whence it gradually grows ſmaller to the tail. See Tab. of Fiſhes, N° 61.

It grows to three or four pounds weight, and is of a reddiſh colour, variegated with brown and blackiſh ſpots. It has ſeveral ſhort filaments or beards about its mouth, and the coverings of the gills are armed with ſeveral prickles. Its head alſo has ſeveral prickles about it, and the wounds they make are ſaid to be very venomous. The fiſh is however eaten, and accounted very well taſted. *Geſner*, de Piſc. p. 1017.

SCORTIUM, among the Romans, a meaſure of capacity of a round form, which uſed always to be heaped. *Pitiſc.* Lex. Antiq. in voc.

SCORZONERA, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the ſemiflоſcular kind, being compoſed of a number of ſemiflоſcules ſtanding on the embryo ſeeds, and contained in one general oblong cup. The embryos uſually ripen into ſeeds, which are covered with a ſort of coat or huſk, and are winged with down.

The ſpecies of *ſcorzonera*, enumerated by Mr. Tournefort, are theſe. 1. The *ſcorzonera* with broad ſinuated leaves. 2. The *ſcorzonera* with broad ſinuated leaves, and bitter roots. 3. The double flowered *ſcorzonera* with broad ſinuated leaves. 4. The Dutch broad leaved *ſcorzonera*. 5. The *ſcorzonera* with nervous leaves. 6. The low *ſcorzonera* with broad nervous leaves. 7. The common narrow leaved *ſcorzonera*. 8. The lower narrow leaved *ſcorzonera*. 9. The narrow leaved *ſcornozera* with little roots. 10. The narrow leaved *ſcorzonera* with bluiſh flowers. 11. The thick leaved Montpelier *ſcorzonera*. 12. The duſty flowered marſh *ſcorzonera*. 13. The *ſcorzonera* with jagged leaves. 14. The *ſcorzonera* with capillaceous leaves. 15. The plantain leaved Portugal *ſcorzonera*. 16. The graſs leaved Portugal *ſcorzonera* with pale yellow flowers. *Tourn.* Inſt. p. 476.

The root of this plant is uſed in medicine, and is eſteemed an alexipharmic and ſudorific. It is given in malignant fevers, and is by ſome recommended in epilepſies, vertigoes, and diſorders of the womb; but it is not frequently preſcribed in the preſent practice.

SCOTAL, or SCOTALE, is uſed where any officer of a foreſt keeps an alehouſe within the foreſt, by colour of his office cauſing people to come to his houſe, and there ſpend their money, for fear of his diſpleaſure. We find it mentioned in the Charter of the Foreſt, cap. 8. *Nullus foreſtarius faciat* ſcotallas, *vel garbas colligat, vel aliquam collectam faciat*, &c. *Manwood*, 216.

The word is compounded of *ſcot* and *ale*, and by tranſpoſition of the words, is otherwiſe called *aleſhot*. Terms of Law. *Blount*, *Cowel*.

SCOTER, in zoology, the name of a ſpecies of duck, called alſo in ſome places the *black diver*.

It is nearly of the ſize of the common duck, but of a rounder body, and is all over of a deep ſhining and beautiful black; in ſome the ſhoulder feathers are of a yet deeper black than the reſt; and in others there is a ſlight admixture of greyiſhneſs in the middle of the breaſt. The wings are black, without any variegation, and the beak is black, but has a little yellowneſs near the noſtrils: the feet alſo are black. It is very common on the ſhores of Lancaſhire, and ſome other counties. It lives only about ſalt waters, and is a very great diver. *Ray*'s Ornitholog. p. 80.

SCOTINUS, in botany, the name of a ſhrub called by the Latins *cotinus*, and *cotinus coriaria*, to diſtinguiſh it from the *cotinus*, κότινος, of the Greeks, which was the *oleaſter*, or wild olive.

The Italians call the *cotinus coriaria* ſometimes *ſcotinus*, and ſometimes *ſcotanus*; the latter word ſeems an erroneous way of writing the former, which is only the Roman name of the ſame tree, with an *ſ* put before the firſt letter: and this is very common with the Italians, in their adopting Latin words; what the Romans called *phalangium*, they call *ſphalangio*; what they called *conchylium*, theſe call *ſcongiglio*; and ſo of a number of other words.

SCOTODINOS, a term uſed by medical writers to expreſs a vertigo, or dizzineſs of the head, attended with a dimneſs of ſight.

SCOTOMA, a word uſed by ſome in the ſame ſenſe as *ſcotodines*, to expreſs a vertigo with dimneſs of ſight.

SCOUP *duck*, in zoology, the name of a ſpecies of duck, ſomewhat ſmaller than the common duck, and of a ſtrange diverſity of colours, even in the different birds of the ſame ſpecies, inſomuch that it is not eaſy to find any two perfectly alike in a flock of forty or fifty. The beak is blue, and its moſt general colours are theſe: the head, and part of the neck, are of a greeniſh black; the lower part of the neck has ſome whiteneſs, and the breaſt is black; the belly is white, with an admixture of yellow in its lower part, and near the anus it becomes black; the upper part of the neck is of a ſooty black; the middle of the back is white, variegated with duſky browniſh lines, and the rump and tail are brown, as are alſo the wings, but theſe have ſome tranſverſe ſtreaks of white. The tail is not above two inches long; the legs are bluiſh. *Ray*'s Ornithology, p. 279.

SCRATCH, in the language of the ſalt-workers of our country, the name of a calcarious earthy or ſtony ſubſtance, which ſeparates from ſea water in boiling it for ſalt.

This forms a thick cruſt in a few days on the ſides and bottoms of the pans, which they are forced to be at the pains

of taking off once in a week or ten days, otherwiſe the pans burn away, and are deſtroyed. See SALT.

This is no other than the ſame ſubſtance which cruſts over the inſides of our tea-kettles, and is truly a ſpar, ſuſtained more or leſs in all water, and ſeparable from it by boiling. The ſhells of ſea fiſh have great affinity in their ſubſtance and nature with this, both being powerful alkalis, and both eaſily calcining into lime.

The *magneſia alba*, ſo celebrated in Germany for its mild purgative and alkaline virtues, ſeems very nearly allied to this earth; and it is probable, according to Hoffman, that the purging virtues of many ſprings are owing to the quantities they contain of this ſubſtance.

SCRATCH *pans*, in the Engliſh ſalt-works, a name given to certain leaden pans, which are uſually made about a foot and half long, a foot broad, and three inches deep, and have a bow, or circular handle of iron, by which they may be drawn out with a hook, when the liquor in the pan is boiling. See SALT.

The uſe of theſe *pans* is to receive a calcarious earth, of the nature of that which incruſts our tea-kettles, which ſeparates from the water in boiling; this ſubſtance they call *ſcratch*; and theſe *pans* being placed at the corners of the ſalt pan, where the heat is leaſt violent, catch it as it ſubſides there.

SCREW (*Cycl.*)—SCREW, in the manege. See SPLENT and THOROUGH-*ſplent*.

SCREW-*ſhell*, the Engliſh name of the *turbo*. See the article TURBO.

SCRIPTULUM, among the Romans, the twenty fourth part of an ounce, and equal to two *oboli*. See the article OBOLUS, *Cycl.*

SCRIPTULUS, a word uſed by ſome inſtead of *ſcrupulus*, a ſcruple, or weight of twenty grains.

SCROFANELLO, in zoology, a name by which ſome have called a ſmall fiſh of the Mediterranean, more uſually known by the name of the *ſcorpæna*. *Salvian*, de Aquat. p. 94. See SCORPÆNA.

SCROPHULARIA, *figwort*, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, and is of a ſort of globoſe form, open at the mouth, and divided as it were into two lips, the upper of which has two ſmall leaves under it. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower, and afterwards becomes a fruit or capſule, of a roundiſh but pointed figure, divided by an intermediate ſeptum into two cells, and containing ſmall ſeeds affixed to a placenta.

The ſpecies of *figwort*, enumerated by Mr. Tournefort, are theſe. 1. The common, or knobby rooted *figwort*. 2. The great hairy *figwort*. 3. The great *figwort* with green ſtalks and leaves. 4. The great water-*figwort*, commonly called *water-betony*. 5. The leſſer water *figwort*. 6. The yellow flowered *figwort*. 7. The nettle-leaved *figwort*. 8. The baum-leaved *figwort*. 9. The betony-leaved *figwort*. 10. The ſhrubby *figwort* with thick leaves, like in ſhape to thoſe of teucrium. 11. The ſmooth elder-leaved Spaniſh *figwort*. 12. The great hairy elder-leaved Portugal *figwort*. 13. The roundiſh thick and black leaved *figwort* with pale yellow flowers, and very turgid ſeed veſſels. 14. The fern-leaved *ſcrophularia*, or broad leaved dog's rue. 15. The ſhining ſtone *figwort* with laſerwort leaves. 16. The narrow leaved *figwort*, commonly called *dog's rue*. 17. The leſſer dog's rue *figwort*. 18. The vervain-leaved ſhrubby Portugal *figwort*. *Tourn.* Inſt. p. 167.

The root of *ſcrophularia* is eſteemed externally as a remedy for the piles and the king's evil. It is generally made into an ointment for theſe purpoſes; but ſome give it alſo internally in diet drinks.

This root is of a very ſingular figure, by which it is eaſily diſtinguiſhed at ſight from all other medicinal roots. It is uſually of the thickneſs of a man's finger, or more, of an oblong figure, nearly as thick at the one end as the other, and full of protuberances on the ſurface, reſembling a kind of little kernels; and between there are a great many fibres, which ſtrike deep into the ground. The root itſelf has no great ſmell, but its taſte is ſomewhat acrid and diſagreeable.

SCROTUM (*Cycl.*)—Many authors have given accounts of the diſtemperatures of this part, of various kinds, impeding the intent of the propagation of the ſpecies, but one of the moſt remarkable of theſe, is the exceſſive growth of that part, as well in length as in breadth and thickneſs. Securgius, in his *Spermatologia*, gives an account of a perſon, whoſe *ſcrotum* grew to ſuch a ſize, that it reached down to his knees, and the penis was ſo wholly loſt in it, that the paſſage for the urine was ſcarce viſible, and ſeveral orifices were made by a ſharp humor ouzing out of it in different places. The perſon lived a long time with it in this condition, and uſed to ſupport it by a bandage worn acroſs the ſhoulders.

The author gives alſo an account of another *ſcrotum* of this kind, which being at length taken off, partly by a mortification, and partly by the operation of a ſurgeon, was replaced again by nature in the ſame unuſual ſize.

SCRUTATORES, among the Romans, certain officers, or ſervants, whoſe buſineſs it was to ſearch every body that came to ſalute the emperor, in order to diſcover if they had any kind of arms concealed about them. They were firſt inſtituted under the emperor Claudius. *Pitiſc.* in voc.

SCULION, in ichthyology, the name given by Ariſtotle, and many other of the antient writers, to the fiſh called by later authors *catulus*, and *catulus major*, and in England the *bounce*. It is a ſpecies of the ſqualus, called by Artedi the reddiſh variegated *ſqualus* with the pinna ani placed in the middle, between the anus and the fin of the tail. See the article SQUALUS.

SCULPONEÆ, among the Romans, a kind of ſhoes worn by ſlaves of both ſexes. Theſe ſhoes were only blocks of wood made hollow, like the French *ſabots*.

SCUMA, a word uſed by ſome of the chemiſts for *ſquamma*, the ſcales of any metal, and particularly applied to the flakes flying off from hot iron under the hammer.

SCURFF, in zoology, an Engliſh name for a ſpecies of ſalmon, called alſo in ſome places the *bull-trout*. It never grows to any great ſize, and differs plainly from the ſalmon of the common kind in this, that its tail is even, and not forked. Its head is ſhort and thick, and its fleſh is leſs red than that of moſt of the ſalmon kind. *Willughby*, Hiſt. Piſc. p. 193.

SCURRA, in zoology, a name by which the antients have called the *monedula*, or common jackdaw. *Ray's* Ornithol. p. 85.

SCURVOGEL, in zoology, the name of an American bird, called by ſome the *nhender-apoa*, and by the Braſilians *jabiru-guacu*.

It is of the crane kind, or nearly approaching to that genus. Its beak is large, ſeven or eight fingers breadth long, rounded, and ſomewhat bent upwards at the end. In the ſummit of the head he has a ſort of boney crown, of a mixed greyiſh and whitiſh colour. Its neck is conſiderably long, and both that and the head are deſtitute of feathers, and are only covered by a ſquammoſe naked ſkin. It is about the ſize of the ſtork, and has a ſhort black tail; all the reſt of the feathers are white, except that the long wing feathers are blackiſh, with ſomewhat of a purpliſh gloſs. When the ſkin is taken off, it is dreſſed ſeveral ways, and is a very delicately taſted bird. *Ray's* Ornitholog. p. 202.

SCURVY (*Cycl.*)—There are ſome who derive all diſeaſes from the *ſcurvy*, which indeed muſt be allowed to create, or mimic moſt other maladies. Boerhaave tells us it produces pleuretic, colic, nephritic, hepatic pains, various fevers, as hot, malignant, and intermitting, dyſenteries, faintings, anxieties, dropſies, conſumptions, convulſions, palſies, fluxes of blood; in a word, it may be ſaid to contain the ſeeds and origin of almoſt all diſtempers. A cachexy, or ill habit, is much of the ſame nature with the *ſcurvy*. It is ſuppoſed by phyſicians, that the immediate cauſe of the *ſcurvy* lies in the blood, the fibrous part of which is thick, and the ſerum too thin and ſharp; and that hence ariſes the great difficulty in the cure, becauſe in the correcting of one part, regard muſt be had to the other. It is well known how extremely difficult it is to cure an inveterate *ſcurvy*; how many *ſcorbutic* patients have grown worſe by an injudicious courſe of evacuations; how many are even rendered incurable by the treatment of inconſiderate phyſicians; and how difficult, tedious, and uncertain the cure is, in the hands even of the beſt, who are obliged to uſe ſuch variety and change of medicines, in the different ſtages of that malady; which nevertheleſs may be cured, ſays the Biſhop of Cloyne, by the ſole, regular, conſtant, copious uſe of tar-water. In the cure of the *ſcurvy*, the principal aim is to ſubdue the acrimony of the blood and juices; but as this acrimony proceeds from different cauſes, or even oppoſite, as acid and alkaline, what is good in one ſort of *ſcurvy* proves dangerous, or even mortal, in another. It is well known, that hot anti-ſcorbutics, where the juices of the body are alkaleſcent, increaſe the diſeaſe; and ſour fruits and vegetables produce the like effect in the *ſcurvy* cauſed by acid-acrimony. Hence fatal blunders are committed by unwary practitioners, who, not diſtinguiſhing the nature of the diſeaſe, do frequently aggravate, inſtead of curing it. The biſhop ſays, if he may truſt what trials he has been able to make, this water is good in the ſeveral kinds of *ſcurvy*, whether acid, alkaline, or muriatic; and he believes it the only medicine that cures them all, without doing hurt in any. In a high degree of *ſcurvy* a mercurial ſalivation is looked on by many as the only cure; which, by the vehement ſhock it gives the whole frame, and the ſenſible ſecretion it produces, may be thought to be more adequate to ſuch an effect: but the diſorder, occaſioned by that violent proceſs, it is to be feared, may never be got over. The immediate danger, the frequent bad effects, the extreme trouble, and nice care attending ſuch a courſe, do very deſervedly make people afraid of it. And though the ſenſible ſecretion therein be ſo great, yet in a longer tract of time the uſe of tar-water may produce as great a diſcharge of *ſcorbutic* ſalts by urine and perſpiration; the effect of which laſt, though

though not ſo ſenſible, may yet be greater than that of ſalivation; if it be true, that inſenſible perſpiration is conſiderably more than all the reſt of the ſenſible ſecretions together. See TAR-*water*.

For the cure of the *ſcurvy* ſome have propoſed, that the patient ſhould be put into a warm or hot bath, till a ſweat is moderately raiſed, and then immediately taken out and immerſed into cold water. *Morgan*, Mech. Pract. of Phyſ. p. 354. ap. Med. Eſſ. Edinb.

SCURVY-*graſs*, *cochlearia*, in medicine, is a powerful attenuant and reſolvent; and on that principle is an excellent medicine in all diſeaſes ariſing from a viſcid ſtate of the fluids, and particularly in the *ſcurvy*. The beſt way of taking it, is to eat the whole herb by way of ſallad.

The *ſcurvy*, however, is a diſeaſe ſo various, that the ſame medicine cannot be good for all the kinds. Accordingly *ſcurvy-graſs* proves hurtful, where the *ſcurvy* is attended with a redneſs in the face, palpitations of the heart, frequent feveriſh heats, head-achs, purgings, and the like; in all which, acrid medicines of any kind do harm. See the article COCHLEARIA.

SCUTARIUS, among the Romans, beſide its ordinary ſignification of a ſhield-maker, was uſed to denote one of the emperor's life-guards, becauſe their whole body was covered with armour. *Pitiſc.* in voc.

SCUTELLARIA, in botany, a name given to a ſpecies of *caſſida*. See CASSIDA.

SCUTHINON, in botany, a name given by the antient Greeks to a yellow wood, called alſo *thapſum*, *chryſoxylon*, and *ſcythicum lignum*. It was of a beautiful yellow colour, and was uſed in dying and in colouring the hair yellow, which was the favourite colour of that time.

The ſame authors have ſometimes alſo called it *cythinon*, or *cuthinon*: this is only the former word with the initial *ſ* taken away, as it was common with them to do in regard to many words; thus they called the ſmilax *milax*, the ſmaragdus *maragdus*, and ſo of many more.

SCUTTLE-*hatch*, in a ſhip, the little hatch that covers the *ſcuttle*. See HATCH.

SCUTUM, in natural hiſtory, the name of a genus of the *echini marini*, the characters of which are; that it is a ſhell of an irregular figure, which on the lower part repreſents, in ſome meaſure, a ſhield; on the ſuperficies it has the ſhape of a five-leaved flower; its mouth is in the middle of the baſe, and the aperture for the anus at the edge. See Tab. of Teſtaceous Animals, N° 6 and 7.

Of this genus of the eſchini there are two kinds, the angular and the oval. The angular kind has its circumference notched into corners; on its back it has the cinquefoil leaf with very turgid marks, the lines being all crenated alſo at the edges, ſo that it in ſome meaſure repreſents the flowers of the gourd kinds when open. The aperture of the anus is at the broader ſide of the circumference.

The oval kind is a ſhell of a tolerably regular oval figure, with the cinquefoil mark upon its back, made up of leaves like thoſe of the olive, but ſplit as it were at the extremities. The mouth in this ſpecies is in the middle, the anus in the edge, and the baſe is a little hollowed.

Of the firſt of theſe kinds, the angular *ſcuta*, there are only two known ſpecies: the firſt a lower flattiſh kind, and the ſecond a more elevated one.

Of the ſecond, or the oval *ſcuta*, there are three known ſpecies. 1. A kind made up of extremely ſmall granuloſe circles. 2. A hollow baſed one ſhielded like the tortoiſe, and with a pentagonal aperture for the mouth. And 3. an echinated one with a very high top, and a ſlight ſulcus, or furrow, on that part where the anus is. *Klein*'s Echnod. p. 28.

SCUTUM, in pharmacy, a name given to a ſolid ſtomachic topic, whether made in form of a bag, with medicinal ingredients ſowed in it, or of a plaiſter. It is always faſhioned into the ſhape of a ſhield. The plaiſters, for this purpoſe, were uſed to be made of the warm ſtomachic gums, and the bags were filled with the warm aromatic powders; and they were worn to warm and ſtrengthen the ſtomach, correct a cold intemperature, and promote digeſtions, and prevent vomiting. The patella, or knee pan, is alſo ſometimes called by anatomiſts *ſcutum*.

SCYBALA, a term uſed by the antient phyſicians to expreſs the excrements of the inteſtines, hardened into lumps while in the body.

SCYBELITES, a term uſed by the antients to expreſs a ſort of muſt, or juice of the grapes, which diſtilled from them ſpontaneouſly without preſſing.

SCYLACION, a word by which the antients expreſſed the fleſh of puppies, which they recommended as of great ſervice in many chronic caſes.

SCYLDWIT, in our old writers, a mulct or fine for any fault. Leg. Hen. I.

It comes from the Saxon *ſcilde*, i. e. *delictum*, and *wite*, i. e. *pœna*. *Blount*.

SCYMNUS, in ichthyology, a name uſed by Ælian, Appian, and many other of the old Greek writers, for the fiſh called *ſculion* by Ariſtotle. This is a ſpecies of the ſqualus, called by Artedi and others the *ſqualus* with the pinna ani placed in the midſt, between the anus and tail; the *catulus vulgaris*, and *catulus major* of authors. See the article SQUALUS.

SCYPHUS, among the Romans, a very large kind of drinking cup. The *ſcyphus* was called the cup of Hercules, as that of Bacchus, *liberi patris*, was named *cantharus*. *Pitiſc.* in voc. See the article CANTHARUS.

SCYRA, in our old writers, a fine impoſed upon ſuch as neglected to attend the *ſcyregemot* court, which all tenants were bound to do. *Blount*, *Cowel*.

SCYRIUM *marmor*, a name given by the antients ſometimes to a white, and ſometimes to a yellowiſh marble, both uſed in the public buildings of the Romans, but ſeldom in ſtatuary, not being capable of a high poliſh.

SCYTALE, in zoology, the name given by the antients to a ſpecies of ſerpent, which was very long and thin, and equally big all along the body, ſo that the tail was not eaſily diſtinguiſhed from the head.

SCYTHÆ, Σκυθαι, among the Athenians, a deſignation ſometimes given to the officers, more uſually called *lexiarchi*.

They had the name *ſcythæ*, becauſe they were often natives of Scythia who were choſen *lexiarchi*, as being brawny and ſturdy fellows. See LEXIARCHI.

SCYTHARION, in botany, a name given by the antient Greek writers to a tree, whoſe wood was of a fine yellow colour, and was uſed in thoſe early times to dye things yellow; it was called alſo *Scythicum lignum*, from its country, and *chryſoxylon*, or golden wood, from its fine yellow colour. It has been ſuppoſed that this was the ſame with the *cotinus coriaria* of the Romans; but this is an erroneous conjecture, ſince the wood of this tree dyed a yellow colour, and that a browniſh red, or a clear and pure red, according as the infuſion was made more or leſs ſtrong. This *ſcytharion*, therefore, could not be the ſame with the *cotinus*, but it certainly is the ſame with the *thapſum* of the Greeks. See CHRYSOXYLON.

SCYTHIAN, a word uſed very often in the old Greek writers on the materia medica, to diſtinguiſh the peculiar ſort of gum, or other drug, brought from that place. The *Scythian* and Indian drugs have been by many ſuppoſed different kinds of the ſame medicine; but this is an error, for it appears very obvious, on comparing the writings of Galen, Aëtius, Ægineta, and other of the later writers among the Greeks, with thoſe of Dioſcorides, Theophraſtus, and the other old ones, that the words *Scythian* and Indian mean the ſame thing, and that what the old writers have called Indian, theſe have called *Scythian*.

The meaning of this is, that thoſe things were called *Scythian*, which were brought from the country of Indoſcythia, or that part of *Scythia* which lay at the oſtia of the river Indus: but it is to be obſerved, that though the later Greek writers mean this by their term *Scythian*, yet the word is uſed in a very different ſenſe by the Arabians, Aviſenna, Serapio, and others; and that wherever they mention a drug under the name of *Scythian*, they mean that it comes from the northern parts of *Scythia*, on the confines of Europe. Theſe authors having underſtood of this *Scythia*, what the Greek writers have ſaid of the other, have made no ſmall errors in regard to the hiſtory of drugs, having given bdellium, and many other gums, the produce of only the *Scythia* of the Greek medical writers, to the frozen *Scythia* beforementioned.

SCYTHICUM *lignum*, in botany, a name given by the antients to a tree, called alſo *ſcytharium* by the later writers of the Greeks. This is by ſome ſuppoſed to be the ſame with the *cotinus* of the antients uſed in dying.

The Greeks called the *oleaſter*, *cotinus* indeed, but that is not meant as the ſhrub ſuppoſed to be the ſame with the *Scythicum lignum*, but the *cotinus Romanorum*, or, as thoſe people expreſſed it, *cotinus coriaria*.

This however ſeems to be an error; for the *cotinus coriaria* was uſed to dye yellow, whereas the *Scythicum lignum* was uſed for a fine pale yellow, or citron colour, and was thence called *chryſoxylon*, the golden wood, or wood dying a gold colour.

Pliny ſays that the *cotinus coriaria* dyed things to the colour of the fine conchs, that is, to a fine bright fleſh colour; and Anguillara tells us, that the *ſcotano* of the Italians, which is the ſame with the *cotinus coriaria* of the Romans, dyes woollen things to a very agreeable red colour. The words of Pliny are, that it dyes things *conchylii colore*. Theſe have been underſtood as expreſſing the colour of the purple fiſh, or murex, which is a kind of ſhell fiſh, and whoſe colour is a true purple; in this ſenſe the colour would not be the ſame with that yielded by the modern *ſcotano*: but this is not the ſenſe of Pliny, for he often mentions the *conchylius color* as a kind of red, and in many places carefully diſtinguiſhes it from the purple colour yielded by the murex; and it ſeems, according to him, to be the fine pale red, which we ſee ſo beautiful in the mouths of the great conchylia, which our collectors of ſhells call *conchs*. See the articles SCOTANO, and CONCHYLIUS.

SEA (*Cycl.*)—The *ſea* differs in ſaltneſs in different parts; it is, in general, obſerved, that in hotteſt climates the water is ſalteſt.

When

When ſalt water freezes, it hath been thought to let fall all its ſalt; the ice of *ſea* water, and the water melted from it, taſting freſh, and being good for boiling meat and peaſe in. Captain Middleton, being in Hudſon's ſtreights in July 1738, took ice from under the ſurface of the *ſea*, which he melted till he got forty quarts of water; theſe he evaporated to dryneſs, and out of that quantity had only ſix ounces of ſalt, or about $\frac{1}{113}$. Philoſ. Tranſ. N° 461. ſect. 13.

The aſcent of the *ſea* water, for the formation of ſprings by a ſubterranean circulation of its water to their ſources, has been a great objection with many againſt the ſyſtem of their being formed of the *ſea*; but Dr. Plot has obſerved, that there are many ways by which the water may aſcend above its own level. 1. By the means of ſubterranean heats. 2. By filtration. 3. By the unequal height of ſeveral *ſeas*. 4. By the diſtance of the center of magnitude from the center of gravity in the terraqueous globe. The ſuperficies of the Pacific *ſea* is ſaid to be farther from the center of gravity, than the top of the higheſt hill on the adverſe part of the globe. And 5. by the help of ſtorms.

The *ſea* water actually aſcends above its own level in coming into wells, whoſe bottoms lie higher than the ſurface of the ſea at highwater mark. *Plot*, de Origine Font.

General motion of the SEA. Mr. Daſſie of Paris, in a work publiſhed about ſixty years ago, has been at great pains to prove that the *ſea* has a general motion, independent of winds and tides, and of more conſequence in navigation than is uſually ſuppoſed. He affirms that this motion is from eaſt to weſt, inclining toward the north, when the ſun has paſſed the equinoctial northward, and that during the time the ſun is in the northern ſigns; but the contrary way, after the ſun has paſſed the ſaid equinoctial ſouthward; adding, that when this general motion is changed, the diurnal flux is changed alſo: whence it happens, that in ſeveral places the tides come in during one part of the year, and go out during the other; as on the coaſts of Norway, in the Indies, at Goa, Cochinchina, *&c.* where, while the ſun is in the ſummer ſigns, the *ſea* runs to the ſhore, when in the winter ſigns, from it. On the moſt ſouthern coaſts of Tonquin and China, for the ſix ſummer months, the diurnal courſe runs from the north with the ocean; but the ſun having repaſſed the line toward the ſouth, the courſe declines alſo ſouthward. Philoſ. Tranſ. N° 135.

Baſon of the SEA, *fundus maris*, a term uſed by geographers, and other writers, to expreſs the bottom of the *ſea* in general.

Our honourable Mr. Boyle is the firſt who has written any thing on this part of the globe, and he has given us a treatiſe expreſsly upon it; but this only gives an account of its irregularities, and unequal depths, and is founded on the obſervations communicated to him by mariners, and people of too little curioſity to be depended upon for great diſcoveries.

The ingenious Count Marſigli has, ſince his time, given us a much fuller account of this part of the globe, in a great part from his own experiments in many places, particularly along the coaſts of Provence and Languedoc.

The entire baſon of the *ſea* is of ſuch immenſe extent, and covered in many places with ſuch an unfathomable depth of water, that it is not to be expected that it can be traced in every part; but as the whole may be gueſſed at, from ſome part of it, and as its general figure is of no conſequence in a ſearch of this kind, the obſervations of this curious author are of great value, in forming a judgment of the whole. *Marſigli*, Hiſt. de la Mer. p. 4.

The materials, which compoſe the bottom of the *ſea*, may very rationally be ſuppoſed, in ſome degree, to influence the taſte of its waters; and Marſigli has made many experiments to prove, that foſſile coal, and other bituminous ſubſtances, which are found in plenty at the bottom of the *ſea*, may communicate in great part its bitterneſs to it.

We are not, however, to judge haſtily, that there are not ſo many beds of theſe at the bottom of the *ſea*, as would be neceſſary for ſuch a purpoſe, or to judge too haſtily againſt the exiſtence of any other ſubſtances there, becauſe we do not find proofs of them by the plummet, which in ſounding brings up other ſubſtances, and not theſe; for the true bottom of the *ſea* is very often covered and obſcured from us by another accidental bottom, formed of various ſubſtances mingled together, and often covering it to a conſiderable depth.

The entire gulf of Lyons, ſituated between Cape Quiez in Rouſillon, and Cape Croiſit in Provence, forms a bank above the ſurface of the water at the ſhore, of the exact and perfect figure of an arch; and within this there is formed another ſuch arch, making the bottom of the *ſea* in that place for a very great way from ſhore, which is of different depths in various places, but uſually between ſixty and ſeventy fathom. See SHORES.

It is a general rule among ſailors, and is found to hold true in a great many inſtances, that the more the ſhores of any place are ſteep and high, forming perpendicular cliffs, the more deep the *ſea* is below; and that on the contrary, level ſhores denote ſhallow *ſeas*. Thus the deepeſt part of the Mediterranean is generally allowed to be under the height of Malta. The obſervation of the ſtrata of earth, and other foſſils, on and near the ſhores, may ſerve to form a very good judgment, as to the materials which are found in its bottom. The veins of ſalt and of bitumen doubtleſs run on the ſame, and in the ſame order in which we ſee them at land; and the ſtrata of rocks, that ſerve to ſupport the earth of hills and elevated places on ſhore, ſerve alſo, in the ſame continued chain, to ſupport the immenſe quantity of water in the baſon of the *ſea*. It is probable alſo that the veins of metals, and of other mineral ſubſtances, which are found in the neighbouring earth, are in the ſame manner continued into the depths of the *ſea*. The particles of metals, in this caſe, are probably carried off into deep water, and ſunk among the ſofter matter of the bottom, but ſome of the lighter minerals ſeem to have given colour to thoſe beautiful cruſts, which are found upon many *ſea* plants, and which loſe their luſtre in the drying. The ſubterranean rivers, and currents of water, make great changes in what would be the natural ſurface of the bottom of the *ſea*, where they ariſe, each having a peculiar baſon of its own. We are informed by numerous inſtances of ſubterranean currents, and as we ſee them break out in rivers on the ſurface of the earth in ſome parts, ſo in others we may be well aſſured that they break up the bottom of the *ſea*, and empty their freſh waters into the ſalt maſs.

In this caſe, the ruſhing up continually of ſuch a body of water makes a roundiſh cavity, and its running ſome one way lengthens and carries on that cavity, till by degrees it is loſt, as the freſh water by degrees becomes blended with the ſalt. Thus every river, that ariſes in the bottom of the *ſea*, alters the form of its ſurface, and makes a baſon for itſelf, in which it runs a conſiderable way. Many *ſeas* near the ſhore, and when the water is tolerably clear, ſhew the traces of theſe currents to the naked eye from the ſurface, and the water taken up from them is found more or leſs freſh. *Marſigli*, Hiſt. de la Mer. p. 13.

The coral fiſheries have given us occaſion to obſerve, that there are many, and thoſe very large, caverns or hollows in the bottom of the *ſea*, eſpecially when it is rocky; and that the like caverns are ſometimes found in the perpendicular rocks, which form the ſteep ſides of thoſe fiſheries. Theſe caverns are often of great depths, as well as extent, and have ſometimes wide mouths, equal to their largeſt diameter in any part, but ſometimes they have only narrow entrances into large and ſpacious hollows. It is the common opinion of the people about the place, that theſe caverns are prepared by nature for the circulating of the *ſea* water; but that operation, however neceſſary, may be performed as well without, as with theſe caverns, and they ſeem in reality to be only accidental.

We daily meet with immenſe hollows and caverns, naturally made in rocky mountains; and as this part of the bottom of the *ſea* is almoſt all rock, and its ſides of the ſame nature, it is no wonder that the ſame accidents ſhould happen, and like hollows be found, though with no particular intent of providence in their uſe. Nay there is this farther reaſon to expect them in the rocks buried under the *ſea* than in thoſe in hills, that the latter are in a ſtate of reſt and quiet, whereas the former are in continual reach of water, which will inſinuate itſelf into every crack or crevice nature has left in them, and may be eaſily ſuppoſed to have burrowed its way in a ſmall hole made by nature, till it has formed of it a very large one.

It ſeems plain from the whole, that the baſon of the *ſea* was at the creation, or at its ſecond formation after the univerſal deluge, covered with, or compoſed of the ſame ſubſtances, as the ſurface of the reſt of the earth is, that is of rocks, clay and ſand, and other ſuch ſubſtances. The common obſervations of ſeamen ſeem indeed to make againſt this opinion, but they may be eaſily ſolved, ſo as not to overthrow it. The plummet which they let down in ſounding, uſually brings up with it a matter compoſed of mud, tartarous incruſtations, or of dead weeds and broken ſhells, or numbers of various bodies of this kind, cemented together into a firm maſs by ſome ſparry or tartarous matter, depoſited from among the water, and agglutinating them together: theſe form an artificial bottom, covering the natural one; but it is eaſy to ſee, that ſuch a cruſt or coat as this muſt needs have been formed over the true bottom, in places where numbers of animals and vegetables are produced, and decay again, and where the waters being at reſt have time to depoſit their ſtony matter, in the ſame manner as the waters of ſeveral of our petrifying, or rather incruſtating ſprings do. And that theſe decayed ſubſtances, and this ſtony matter, falling to the bottom together, and there lying undiſturbed, muſt neceſſarily have formed juſt ſuch a cruſt as is found; and the natural bottom of the *ſea*, whether of ſtone, of ſand, or of clay, muſt be covered by ſuch accidental concretions, and that probably to ſuch a depth, that it is not eaſy now to break through it.

There are places however where, by ſome accidents, this ſort of adventitious cruſt either has never been formed, or elſe has been removed. In theſe places we find the natural

tural bottom, as deſcribed, that is of the ſame nature with the ſtrata in the body of the earth. The ſimile the Count Marſigli has made, between the baſon of the *ſea* and a caſk of wine, is very expreſſive and juſt. When wine has been a long time kept in a caſk, the whole internal ſurface of that caſk is ſo covered and encruſtated over with tartar, that it ſeems within to be really compoſed of it; yet as we know that this caſk is of wood, we are very certain that the true inner ſurface of it is of the ſame texture and nature with the tree from which it was cut, though we cannot get off the accidental ſurface formed by the liquor kept in it, and wholly covering it.

We very frequently meet with fine and pure ſand at the bottom of the *ſea*, and in theſe places are apt to believe that we certainly have the true and original bottom, but this is rather to be looked on as a probability than a certainty; and where the ſand is more than ordinarily fine, there is always reaſon to ſuſpect that the courſe of ſome ſubterranean river has brought it there, by opening into the *ſea* in this part; and that this is one of thoſe particular baſons, which theſe rivers form to themſelves within the baſon of the *ſea*, and which continue only to a ſmall diſtance from their ſource. *Marſigli*, Hiſt. de la Mer. p. 15.

The bottom of the *ſea* is covered with a variety of matters, ſuch as could not be imagined by any but thoſe who have examined into it, eſpecially in deep water, where the ſurface only is diſturbed by tides and ſtorms, the lower part, and conſequently its bed at the bottom, remaining for ages perhaps undiſturbed. The ſoundings, when the plummet firſt touches ground on approaching the ſhores, gives ſome idea of this. The bottom of the plummet is hollowed, and in that hollow there is placed a lump of tallow; this being the bottom of the lead, is what firſt touches ground, and the ſoft nature of this fat receives into it ſome part of thoſe ſubſtances, which it meets with at the bottom: this matter, thus brought up, is ſometimes pure ſand, ſometimes a ſort of ſand made of the fragments of ſhells, beat to a ſort of powder, ſometimes it is made of a like powder of the ſeveral ſorts of corals, and ſometimes it is compoſed of fragments of rocks; but beſide theſe appearances, which are natural enough, and are what might very well be expected, it brings up ſubſtances which are of the moſt beautiful colours. Things of as fine a ſcarlet, vermillion, purple, *&c.* as the fineſt paint could make them, and as yellow as a ſolution of gamboge, are common; and ſometimes, though not ſo frequently, the matter brought up is blue, green, or of a pure ſnowy whiteneſs. Theſe coloured matters ſometimes ſeem to have made up the whole bottom or maſs of the ſurface, but more uſually they have been formed upon other things, as upon the mud, or upon larger pieces of ſhells, corals, and the like, in the manner of tartarous cruſts, and thoſe in ſome degree reſembling the cruſtaceous coats of ſome of the *ſea* plants. The colours of theſe ſubſtances are not merely ſuperficial and tranſient, but many of them are ſo real and permanent, that they may be received into white wax melted, and poured upon them, or kept in fuſion about them; and when thus examined, they ſeem as if a proper care might make them of great value, as paints of the finer kinds, where little is to be uſed.

The ſame coloured matters that thus coat the ſubſtances, found at the bottom of the *ſea* in theſe places, are alſo ſometimes found extended over the ſurface of *ſea* plants of the harder kind, which grow in deep water. They are always, in this caſe, in a ſort of liquid form, being lodged within, or embodied among a ſort of jelly or glue of a tranſparent ſubſtance, which in theſe caſes perfectly coats over the whole plant. In this ſtate it gives the naturaliſt, who is preſent at the fiſhing up his treaſures, a tranſient proſpect of a very elegant kind; but this vaniſhes while he admires it. A piece of coral, or other hard *ſea* plant, thus coated over, appears, as it riſes to the ſurface of the water, of a delicate green, blue, or purple, but when taken above water, it is found that this fine colour is only in the coat of glue or jelly which covers the plant: as ſoon as this is wiped off, the colour is carried away with it, and the coral ſhews its own native tinge; and it is to no purpoſe to attempt the preſerving it, by ſuffering this glue to dry upon the plant, for the colour flies away by degrees, as the moiſture evaporates, and the coral or plant, whatever it be, is only ſo much the leſs beautiful, than it naturally would have been, as it is covered with a dry yellowiſh dirty looking horny matter. Theſe are beauties in the ſubmarine plants, therefore, which can be only ſeen by thoſe who venture out, in order to take them up.

The ſmall quantities of theſe elegant colours, which we thus find ſpread over the ſurfaces of plants and other bodies, as we approach deep water, may give a rational idea of what we ſhould find, were we able to examine the bottoms of the *ſea* in its deep and unfathomable receſſes. It is eaſy to conceive, that in theſe places we ſhould find great quantities of the moſt beautiful ſubſtances. *Marſigli*, Hiſt. Phyſ. de la Mer.

Dead SEA. Dr. Perry made ſeveral experiments on the water of the *Dead ſea*, in order to find what particles it contained. Upon infuſing ſome ſcrapings of galls in it, it becomes of a bright purple colour, but that not till it has ſtood a conſiderable time. On adding oil of tartar *per deliquium* to it, it becomes turbid, and looks as if globules of fat were fluctuating in it; this unctuous matter, upon its long ſtanding in repoſe, comes together in form of a ſediment at the bottom. On pouring ſpirit of vitriol into it, it depoſits a milk-white greaſy ſediment, which, after ſtanding twelve hours, occupies about one fifth part of the liquor. On putting a ſmall quantity of ſaccharum ſaturni to it, it depoſits a ſmall quantity of a greyiſh powder. Being ſeverally and ſeparately mixed with a ſolution of ſublimate, with ſpirit of ſal armoniac, and with ſugar of violets, it neither ferments, nor depoſits any ſediment, nor changes colour, except with the ſugar of violets, with which it becomes green. It is highly ſaturated with ſalt, ſo that it is to common water in ſpecific gravity, as five to four; and it has ſo acrid and ſtyptic a taſte, that on being held in the mouth, it conſtringes it in the manner of alum.

From all theſe experiments it appears, that this water is impregnated with a ſort of an acrid and alkaline nature, and a matter partly of a ſulphureous, partly of a bituminous nature. Philoſ. Tranſ. N° 462. p. 50.

SEA *adder*, an Engliſh name for a ſea fiſh of the acus kind, called by Willughby the *acus lumbriciformis*.

It is a ſmall fiſh of a cylindric ſhape, without ſcales, and of a greeniſh brown colour, with ſome admixture of a reddiſh yellow. The ſnout is long and hollow, and the mouth opens upwards at its end. The eyes are ſmall, and their iris red. The gills are four on each ſide, but are covered by a membrane, and the whole body divided into rings like the common earth-worm. It is uſually about three or four inches long, and of the thickneſs of a gooſe quill. It has but one fin, which is ſituated on the back. The anus is much nearer the head than the tail; and under the ſnout there is always a fleſhy tubercle. The fiſh is common on the coaſt of Cornwall. *Willughby*, Hiſt. Piſc. p. 160.

SEA *breaches*, a term uſed by the farmers to expreſs the overflowing of their low lands near the *ſea* by the *ſea* water.

Sea ſalt, moderately uſed, is a great improvement to all lands, but too much of it kills all ſorts of vegetables, except ſuch as nature has intended to live among it. The *ſea* breaking in upon lands thus, injures them greatly. The owner is to ſtop the breach by which it entered with all poſſible diligence, and then trenches and drains muſt be cut through all parts of the land, to carry the ſalt water into ſome one low place, from which it may be emptied by means of an engine; or if it be ſmall in quantity, it may be laded out by hand over the bank; or if yet leſs, the ſun and winds may dry it away: but in either caſe, the place where it was ſuffered to reſt muſt be covered with a large quantity of freſh earth, to take off from the too great ſaltneſs of the other; and the whole land ſhould be plowed for three or four years, to let in the rains and air to freſhen it. *Mortimer*'s Huſbandry.

SEA *bream*, in ichthyology, the Engliſh name for the fiſh called by the generality of authors the *pagrus* and *phagrus*. According to the new ſyſtem of Artedi, it is a ſpecies of the *ſpari*, and is diſtinguiſhed by the name of the *red ſparus* with the ſkin carried into a ſinus at the roots of the back fins, and the pinna ani. See PAGRUS and SPARUS.

SEA *calf*, *vitulus marinus*, in zoology. See PHOCA.

SEA *cow*, the Engliſh name of the *manati*, a ſpecies of fiſh ſo different from all the other of the cetaceous tribe, to which it properly belongs, that Artedi, in his new ſyſtem of ichthyology, allots it a peculiar generical name, which is *thricechus*.

It is called by Herrera *taurus marinus*, or the *ſea bull*, and by others the *tachas* and *la donna*. The French call it *lamantin*, or *namantin*, and the Portugueſe *pezze mouller*.

It may ſeem ſtrange, that ſo ill ſhaped a creature as this ſhould have given riſe to the ſtories of the ſyrens and mermaids, the *ſea* men and *ſea* women, yet there is great reaſon to believe, that all the fabulous accounts of theſe monſters are owing to the ſeeing this animal raiſe its head and ſhoulders above the water. See SEA *man*.

SEA *crow*, in zoology, a name given by the common people of many counties of England to the *pewit*. See the article PEWIT.

SEA *devil*, in ichthyology, an Engliſh name for the *rana piſcatrix*, or *lophius*. See RANA *piſcatrix*.

SEA *fox*, an Engliſh name for a fiſh of the ſqualus kind, called alſo the *ſea ape*; both names being given on occaſion of the length of its tail in proportion to the body.

It is a very ſingular fiſh, and, according to the new Artedian ſyſtem, is a ſpecies of *ſqualus*, diſtinguiſhed by that author by the name of the *ſqualus cauda longiore quam ipſum corpus*.

The old Greek writers have called it *alopæcia*, and the later *vulpes marina*, and *ſimia marina*, whence the names *ſea fox*, and *ſea ape*. See the articles VULPES and SQUALUS.

SEA-*gate*, at ſea. When two ſhips are aboard one another, by means of a wave or billow, the ſeamen ſay they *lie aboard one another in a ſea-gate*.

SEA *green*. To make this colour in the glaſs trade, the fineſt cryſtalline glaſs only muſt be uſed, and no manganeſe muſt be added at firſt to the metal. The cryſtal fritt muſt be melted thus alone, and the ſalt, which ſwims like oil on its top, muſt be taken off with an iron ladle very carefully. Then to a pot of twenty pound of this metal, add ſix ounces of calcined braſs, and a fourth part of the quantity of powdered zaffer: this powder muſt be well mixed, and put into the glaſs at three times, it will make the metal ſwell at firſt, and all muſt be thoroughly mixed in the pot. After it has ſtood in fuſion three hours, take out a little for a proof; if it be too pale, add more of the powder. Twenty four hours after the mixing the powder the whole will be ready to work, but muſt be well ſtirred together from the bottom, leſt the colour ſhould be deepeſt there, and the metal at the top leſs coloured, or even quite colourleſs. Some uſe for this purpoſe half cryſtal fritt, and half rochetta fritt, but the colour is much the fineſt when all cryſtal fritt is uſed. *Neri*'s Art of Glaſs, p. 39.

SEA *gudgeon*, an Engliſh name given to the fiſh called by the generality of writers *gobius niger*, and the *gobius marinus*.

Artedi, who has made a genus of the *gobii*, excludes the common *gudgeon*, or *gobio fluviatilis*, from it, but he admits this fiſh as a genuine ſpecies of it.

Athenæus tells us of three kinds of *gudgeons*, the black, the yellow, and the white. This ſeems to have been very plainly the black *gudgeon* of that author. Salvian, in his figure of this fiſh, has given three fins on the back, but it really has only two.

SEA *hen*, in zoology, a name given by ſome to the *lomwia*, a webfooted bird, common on our coaſts, and called the *guillemot*, or *kiddow*. See LOMWIA.

SEA *horſe*, the Engliſh name of the *hippocampus*, a ſpecies of the *acus*, according to the older writers, and one of the *ſyngnathi* of Artedi. See theſe heads.

The many idle tales reported of this vaſt amphibious creature, ſuch as his method of bleeding himſelf when diſtempered, his vomiting fire when enraged, and the like, have made people, in almoſt all ages, deſirous of ſeeing the animal. The Romans were fond of exhibiting it in their ſhews of wild beaſts, and the deſcription Pliny gave of it from thence, was all the world knew of the creature for many ages. That author's account, however, of its feeding on graſs on the banks of the Nile, no way agrees with the teeth we find its mouth furniſhed with.

The ſceletons of theſe animals, as rare as they are with us at preſent in their recent ſtate, yet are found not unfrequently, in part at leaſt, buried under ground, and that at great depths. The bones of the head are different from thoſe of any other known animal, and when found in ſome parts of France, had always puzzled the wits of the naturaliſts there, who had in vain compared them with thoſe of oxen, horſes, *&c.* but at length one of the heads of theſe animals being ſent over to France, cleared up the whole difficulty. The two jaws of this weighed forty five pounds, and were two feet long, a foot deep, and a foot and half wide. It is eaſy to conceive from this, that the accounts we have of the ſize of the animal are not fabulous, theſe bones correſponding very well with them. Mem. Acad. Par. 1724.

SEA *louſe*, *pediculus marinus*, a name given to the Molucca crab. See SQUILLA.

SEA *man*. We have many accounts, even from authors of credit, of ſomething reſembling the human figure ſeen at *ſea*, and fancy has carried them to ſuch a height, that the truth of the deſcription is loſt in moſt of them.

The ſyrens, which we have accounts of even in Bartholin, and the *ſea man*, or *homo marinus*, as it was called, ſeen and deſcribed by Barchewitz, give the greateſt credit to the ſtory; but writers are ſo fond of telling marvellous things, that great allowances are to be made in the reading.

The general deſcription of the *ſea man* is, that from the navel downwards the whole is only a ſhapeleſs lump of fleſh, without any the leaſt mark, either of limbs, fins, or tail. On the breaſt there ſtand two pectoral fins, which are each compoſed of five bones or rays, reſembling the human hand, and connected together by a membrane like the toes of a duck, or ſome other water fowl's foot.

Theſe fins are what have the appearance of ſomething human, and when ſeen about the boſom of a white bellied fiſh, may be taken for hands with ſhort arms, and the reſemblance of a head is eaſily fancied. Theſe fins are not peculiar to any one kind of fiſh, but the manati, or *ſea* cow, the rana piſcatrix, or lophius, and many others have them. It is probable from moſt of the accounts we have, that the manati, or *ſea* cow, is the creature, which being ſeen raiſing its head above water at a diſtance, and extending theſe pectoral fins, which are what it ſwims with, has given riſe to the idea of the upper part of a human figure.

As to the deſcription of a ſhapeleſs lump of fleſh making up the lower part of the animal, it ſeems too contrary to the courſe of nature in all other *ſea* animals, to have any foundation in reality, and probably was only the invention of the deſcriber, to make out what he did not ſee above water.

It is true that Barchewitz takes great pains to prove that the *ſea man*, or *homo marinus*, he deſcribes, was a wholly different creature from the *ſea* cow; but his deſcription of it carries too little the air of any thing in nature, to meet with an eaſy credit.

It is wonderful, that ſo judicious a writer as Artedi ſhould give any faith to the exiſtence of ſo ſtrange a fiſh as this, but he mentions it with a great air of diſtruſt, and wiſhes a more perfect hiſtory of it, if it any where exiſts.

The public are often impoſed upon by cheats, who ſhew different things under the name of *ſea men*, mermaids, and ſyrens; but if we may judge of the generality of theſe creatures, thus ſhewn by the lateſt inſtance among us, they are very wretched counterfeits indeed. This creature was ſaid to be a young mermaid, taken on the Acapulca ſhore, and maintained its credit ſo well in London, as to afford the proprietor a comfortable ſubſiſtence for ten months among us, though no other than a human fœtus of about eight months, with a hydrocephalus head, and with the two legs growing together, and covered by one common membrane. The toes of this fœtus were beat out into a reſemblance of fins.

SEA *owl*, in ichthyology, a name given by many to that fiſh, which we more uſually call the *lump fiſh*, the *lumpus* of Willughby, *&c.* and the *cyclopterus* of Artedi, which ſee.

SEA *pheaſant*, in zoology, the name of a bird of the duck kind, but differing from all the other ſpecies in the ſhape of its tail; which has two long feathers, ſtanding out beyond the reſt, and terminating in a point. It is called more generally the *cracker*. See the article CRACKER.

SEA *plants*. Count Marſigli, who was at indefatigable pains to collect the various *ſea plants* of ſeveral places, divides all thoſe productions into three claſſes.

The firſt claſs contains the ſoft, or herbaceous ones; the ſecond the ligneous ones, or ſuch as are of a woody hardneſs; and the third, thoſe which are of the hardneſs of ſtone.

Of the firſt claſs are the algas, called *ſea wracks*, the fucuſes, or *ſea oaks*, the *ſea moſſes*, or confervas, and the different ſpecies of ſpunges.

Of the ſecond kind are thoſe called *lythophyta* by the antients, as if their hardneſs approached to that of ſtones. All theſe conſiſt of two ſubſtances, a cortical and an internal: the cortical part, while in the *ſea*, is ſoft, but in drying it becomes as hard as chalk, or thereabouts, eaſily crumbling to pieces between the fingers; this is what deceived the antients into an opinion of its being of a ſtony nature. The internal ſubſtance, properly ſpeaking, ſeems more the nature of horn than of wood: if it is burnt, it throws out a ſpume, or froth, like that which horns or feathers of animals yield in the fire, and their ſmell in burning is of the ſame kind. The branches of theſe *plants* are very pliable, bending in the manner of whalebone, and they give the ſame reſiſtance to a knife in the cutting.

The ſtony *plants*, which ſhould properly be called the *lythophyta*, but which never are called ſo, are the ſeveral ſpecies of coral, madrepora, and the like. The madrepora differs from the coral, in having its ſurface pierced with almoſt innumerable holes.

The algas are the only *ſea plants* which have any roots, properly ſo called; theſe therefore grow out of the ſoft bottom of the *ſea*, as other plants out of the earth, but all the other *ſea plants*, without exception, appear fixed upon hard and ſolid bodies, incapable of affording them any nouriſhment; ſuch as ſtones, ſhells, pieces of iron, of wood, *&c.* and ſometimes on other *plants*; and they are not faſtened to theſe ſubſtances by fibres paſſing into, or ſurrounding them, but merely by a foot or pediment, capable of only fixing them down, not of drawing nouriſhment from the ſubſtances, were there any there. From this obſervation the author concludes, that all the *plants* which have no roots may be properly ſaid to be all root, or to perform the office of roots in their whole ſubſtance, or that they take in nouriſhment in every part by certain pores, which in many are viſible, and cover the whole ſurface.

This manner of receiving nouriſhment, he alſo obſerves, very well ſuits their condition, ſince they are always ſurrounded, on all ſides, with that water by which they are to be nouriſhed; whereas the plants, which grow at land, have only a part of them buried in the earth, from whence they are to be ſupplied with the proper juices. The roots of land plants, therefore, have only the neceſſary organs for receiving ſupplies; whereas the *ſea plants* he finds to be all over covered with ſmall glandules, whoſe office it is to receive and to convey, into the internal parts of the *plant*, the proper juices for its nouriſhment, and theſe he obſerves are, in general, of a glutinous and milky nature. The great difference between the land and *ſea plants* is ſeen in this familiar inſtance; a land plant will remain freſh for a long time, in all its parts, on one end of the ſtalk only being plunged in water, but a *ſea plant*, if part of it be out of water and part in, will always be freſh and vigorous in that part which is under water, while the part that is dry will wither and decay. It is eaſy hence to ſee, that the ſeveral parts of the land plants have connections with, and dependances on one another; whereas, in the *ſea plant*, every part takes in its

own nouriſhment, and lives and flouriſhes wholly independent of the reſt.

After having gone through this general ſyſtem, the author deſcends to ſeveral remarkable particulars. He mentions an inſtance of a fucus, whoſe ſtalk, when in its growing ſtate, is a quarter of an inch in diameter, yet in drying ſhrinks up ſo much, as to be not thicker than a ſingle thread. Another ſpecies, called by the fiſhermen the *ſea orange*, from its reſemblance to an orange in ſhape, he obſerves is properly a fucus; it has neither ſtalk nor branches, but conſiſts wholly of this globular body; it is not a ſolid ſubſtance, but a membrane of about $\frac{1}{9}$ of an inch in thickneſs, regularly diſtended into this ſhape, by being filled with *ſea* water. All over the ſides of this cavity there are fixed ſlender filaments, which traverſe the whole, and probably receive nouriſhment from the water contained in the cavity, and diſtribute it to the ſeveral parts of the ſides where they are inſerted.

Another *ſea plant* this author mentions, only appears in the ſhape of a bark; it affixes itſelf to the branches of the lythophyta, when they have loſt their natural bark, and ſometimes, in the ſame manner, coats and cruſts over the ſurfaces of ſtones. When it is freſh, it is of a lively red, of the conſiſtence of a muſhroom, and about the thickneſs of the back of a common knife, and its external ſurface is full of ſmall prominences, which contain a glutinous juice; round about theſe alſo there ſtand ſeveral yellow tubercles, which, with the red of the ground of the *plant*, make upon the whole a very beautiful appearance. Its under ſurface is perfectly ſmooth and gloſſy. This ſeems a much more remarkable *plant*, as to the manner of its vegetation, than thoſe which grow on other plants at land.

The ſame author obſerves, that ſeveral of the ſpunges, when taken out of the *ſea*, have a motion of the nature of a ſyſtole and diaſtole, which laſts as long as there remains any of the *ſea* water in their cavities. Some of the *ſea plants*, which while growing are as ſoft as the fucuſes, yet when dried are as eaſily rubbed to powder between the fingers, as the bark of the lithophytons. There is one of the lithophytons, which carries ſo large a quantity of branches, that they make the reſemblance of leaves; but as theſe leaf-like branches are all truly of the ſame nature with the reſt of the *plant*, this is no exception to the general rule, that the lithophyta have no leaves. One of the ſpecies of lithophyton is naturally deſtitute of a bark, and is covered in the place of one with a glutinous ſubſtance, of the nature of varniſh; this is moſt abundant at the foot. The whole *plant* is full of prickles, and theſe appear the moſt plainly on the ſummits of the branches, where this glutinous varniſh is more thinly ſpread. On this part of the *plant*, alſo, there appear certain globules of a glutinous matter, when it is taken out of the water, which, when it is again plunged into it, ſpread themſelves over the whole ſurface of the branches.

The madreporæ grow in the ſame places with the coral; they often hang pendulous from the hollow rocks, and often grow erect on the flat ones. They uſually change colour when taken out of the water, and are of very different kinds and different degrees of hardneſs; many of them are as hard as common ſtones, and many others are ſo brittle, that it is ſcarce poſſible to touch them without breaking their branches.

The flowers of the thorny and naked lithophyton appear to be wholly like thoſe of coral, and like them they are not found to contain any ſolid ſeed. Mem. de l'Acad. Par. 1710.

The many uſes of the numerous *ſea plants* to the ſyſtem of the world are not yet ſufficiently known. Among others, Dr. Liſter has obſerved that they ſerve to render a great deal of the *ſea* water freſh, and give it in miſts to the clouds, whence it again falls on the earth. This is eaſily proved by experiment thus: if a quantity of *ſea* water be put into a long glaſs body, and into it there be put a large and vigorous *ſea plant*, ſuch as the common *ſea* wrack, and the head placed on the glaſs, and a receiver fitted for it without cutting the joints, there will daily diſtil into the receiver, without giving any fire below, a clear and ſweet water, freſh and potable, and without any diſagreeable or unwholeſome quality. The quantity is but ſmall that is obtained this way, but it is evident, that in the ſame manner a very immenſe quantity of the *ſea* water is every hour made freſh, and raiſed up into the air from the infinite number of *plants* that grow in it. Dr. Liſter even thinks that the tropic winds, which blow conſtantly one way, may be owing to this ſort of cauſe. Philoſ. Tranſ. N° 156. See the article TROPIC *winds*.

SEA *ſalt*. The chemiſts have, for many ages, been acquainted with many of the qualities, and much of the nature of this common ſubſtance, but not with the whole; they know what they can ſeparate from it, and what they can afterwards procure, by admixtures with the reſiduum of the diſtillation, which is its baſis; but they do not ſeem to have thought, of a long time, of enquiring into what that baſe was. They have always known how to ſeparate an acid liquor from this *ſalt*, called the ſpirit of it, by breaking its union with the baſis of the *ſalt*; and they know, that if a vitriolic acid be added to this baſis, it makes what is called *Glauber*'s *ſalt*, if a nitrous one, they procure what is called *quadrangular nitre*: but they never procured, and brought into view this baſis of *ſea ſalt* ſeparate and pure, exempted from its acid, and in a ſtate of being known as to what it is; they have found out that the baſis of alum is a white calcarious earth, that the baſis of green vitriol is iron, and that the baſis of blue vitriol is copper; but they have been unacquainted with the baſis of this moſt common of all *ſalts*. For want of this knowledge, no body has been able to recompoſe *ſea ſalt*, or regenerate it after it has been decompounded by fire; and the judicious chemiſt never thinks he is maſter of a ſubject, till he can both deſtroy, and at pleaſure reproduce it.

It has been generally agreed, that the baſis of this *ſalt* is either an earth or an alkali; and it might be very poſſible to reconcile theſe opinions, by ſuppoſing it an alkaline earth, as there are many ſuch, and ſo blending the two opinions in one. Mr. Du Hamel, however, has been at great pains on this ſubject, and has communicated to the Academy of Sciences, as the reſult of them, a very accurate and valuable account of this body.

A haſty obſerver may fancy to himſelf, that he has found out this baſis at a very eaſy rate, by obſerving, that on the diſſolving *ſea ſalt* in oil of tartar by deliquium, there precipitates to the bottom a white earth. This was the firſt ſubject of Mr. Du Hamel's enquiries, but he found this could not be the real baſis of the *ſalt*, nor indeed any thing eſſential to it, ſince it was in too ſmall quantity to have ſufficed for ſo great a purpoſe; and after the precipitation of it, there remained much fine and unaltered *ſalt*, on which the menſtruum did not operate; and on all the trials he could make, he found it impoſſible to reproduce *ſea ſalt* from the mixture of this earth with ſpirit of ſalt. It ſeems therefore moſt probable, that this earth was only accidentally mixed with the *ſalt*, at the time of its formation, but having no eſſential ſhare in its compoſition. When an inflammable ſubſtance is mixed with nitre, its acid diſſipates itſelf with a very little heat, and leaves its baſis naked to the eye. Inflammable ſubſtances, mixed with vitriols, alſo greatly diminiſh the force of the union of their acid to their baſe, and conſequently facilitate their ſeparation; and on this principle Mr. Du Hamel had hopes that powder of charcoal, or filings of iron, might prove happy mediums for the ſeparation of the acid of *ſea ſalt* from its baſis, but theſe had no effect. Chemiſts had obſerved that the *ſea ſalt*, which enters the ſtomachs of animals with their food, was decompoſed in their bodies; hence this gentleman tried animal and vegetable ſubſtances for this purpoſe, as alſo the inflammable minerals, but all theſe alſo without ſucceſs.

When theſe trials had all proved fruitleſs, there appeared no way left, but that of the mixture of the vitriolic and nitrous acids, and the producing the Glauber's ſalt, and quadrangular nitre, for the ſubjects of after experiment. Having carefully made ſome Glauber's ſalt, the buſineſs was to drive off the acid from that mixt by fire; but no ſort of diſtillation was found able to do this, as no fire is ſtrong enough to diſunite this acid from any mixture with an alkaline ſalt. It is well known, however, that the vitriolic acid eaſily unites itſelf to inflammable ſubſtances, and in that union conſtitutes common ſulphur. The mixture of powder of charcoal with this Glauber's ſalt, produced readily a ſulphur, but the acid, in running into this union, had carried the baſis of the *ſea ſalt* along with it, not left it behind as was expected; but the ſeparation was afterwards effected, by pouring vinegar upon this ſulphur; the conſequence of which was, that the baſis of the *ſea ſalt* then remained charged only with the vegetable acid of the vinegar, much weaker than the mineral acid of vitriol, and therefore forming a combination much more eaſily broken, and from which the acid was to be raiſed into vapour, without any great difficulty, as it contained a large portion of an oily matter with it. This having then been wrought over by diſtillation, and the reſiduum ſtrongly calcined, the baſis of the *ſea ſalt* was at length obtained pure.

A ſecond operation of the ſame gentleman in this reſearch, was the adding a nitrous acid to the reſiduum of the diſtillation of *ſea ſalt* inſtead of a vitriolic one, and obtaining by that means a quadrangular nitre, inſtead of a Glauber's ſalt; and diſſipating this ſpirit, by burning in a red hot crucible, with powder of charcoal, the baſis of the *ſalt* was alſo prepared pure; and both this, and that by the former trial, appeared wholly the ſame ſubſtance.

The baſis of *ſea ſalt*, when thus found, appeared not to be an earth, as had been by many ſuſpected, but a true ſalt itſelf, eaſily ſoluble in water, and proving itſelf to be an alkali by its effects with acids. It will not run into a liquor in the air, but moulders away into a fine powder, and is very cold upon the tongue, and has a bitteriſh taſte. This ſalt appears much like the natrum, or nitre of the antients, or our common ſalt of the kali. The firſt of theſe is a native ſalt, found in the eaſtern countries, and which always has with it a large quantity of marine ſalt; and it is no wonder, when we know this to be what might have made

the basis of *sea salt*, that there should be found some places in the world where this basis may have concreted of itself, without any of that acid being near, which would have made it common salt, and that it therefore remained in the state of the base alone, and constituted this natrum. The other is also accounted for on the same principles, it being the salt produced by burning from a common *sea* plant, which must have imbibed a vast quantity of *sea salt*, and which may have been decomposed in its vessels, and left us only the base without the acid; which base cannot therefore but appear on the burning the plant, and evaporating water which had been poured upon its ashes.

This accurate account of Mr. Du Hamel's gives us a very perfect idea of what was, however, no new discovery in him, since Stahl had before affirmed this alkali to be the basis of *sea salt*, though he had wrapt up his meaning in so much obscurity, that it would never perhaps have been perfectly understood, without Mr. Du Hamel's assistance. Mem. de l'Acad. Par. 1736. See SALT.

SEA *sand*. This is one of the best improvements for many sorts of land, and if rightly understood by our farmers, might be of almost universal use; most of our shores are covered with it, where it is unregarded, and there are few places where it might not be had by water carriage. This *sand* is not of the nature of the common sand found in our pits, nor indeed properly to be called by that name, though it will be best understood by it among the people whose use it is recommended to. It is the fragments of *sea* shells beat to pieces against the shore, and ground almost to powder by the waves continually washing upon it. It is sometimes composed of shelly matter alone; but sometimes it is made up partly of this, and partly of broken stones: in this last case it is called *shelfy sand*, and is not much esteemed. See SAND.

In Cornwall they use this with great advantage, and have it of three colours. About Plymouth it is grey, or bluish, like ashes, which is owing to its being in great part made up of muscle and oister shells. Westward, near the Land's End, it is white; and in Scilly glistering, from a mixture of some spangles of talc among it. This last kind is made of the powder of scallop shells, and of the mouldering of a sort of moor stone, or white granite, not so hard as the common kind, and containing, like it, a large quantity of talc. On the northern side the *sand* is rich, and of a browniſh or reddish colour, and is principally composed of the broken shells of cockles; and it owes that colour to the wash of the Severn, which falls foul and dirty with a yellowish mud into the Severn sea.

Beside these differences in the colour of the *sand*, there is also another difference, which is in the largeness or smallness of the grain. In many places the different parts of the same shore afford a larger and a smaller sort, and these are chosen according to the several occasions. The smallest sort gives its virtues out the soonest, but the large kind keeps the land in heart for the longest time together: the tenant therefore is always best pleased with the smaller, and the landlord with the larger. Philos. Trans. N° 113.

SEA *sickness* is said to be prevented by drinking *sea* water mixed with wine.

SEA *swallow*, the name of a bird of the *larus*, or gull kind, called by authors *sterna*, and common on our coasts. See the article STERNA.

SEA-*turtle-dove*, in zoology, the name by which we commonly call the little diver, called by Mr. Ray *columba Groenlandica*.

It very much resembles the coulterneb, or *anas arctica* of Clusius, only it is much smaller, and its legs are red, and it has no hinder toe. Its beak is long, not compressed, or flatted sideways, as in that bird, and a little crooked and sharp at the end. It has a large white spot on each side of the forepart of its head, and excepting that it is all over black. *Ray*'s Ornitholog. p. 245.

SEA *water*. See the article WATER.

SEAH, in Jewish antiquity, a measure of capacity containing six cabs. See CAB.

SEAMS (*Cycl.*)—SEAMS *of a ship*, are places where her planks meet and join together. There is also a kind of peculiar *seam* in the sowing of sails, which they call a *monk's seam*.

SEAMS *of a sail*, are of two sorts, *monk's seam*, and *round-seam*. See MONKS, *&c.*

Round SEAM, of a sail, is so called, because round like the common *seam*.

SEASIN, or SEASING, in a ship, the name of a rope by which the boat rides by the ship's side when in harbour, *&c.*

SEAT (*Cycl.*)—SEAT, in the manege, is the posture or situation of a horseman upon the saddle.

To *seat* a horse upon his haunches or hips, see the article PUT.

SEB, a word used by some chemists to express gold, and by others for alum.

SEBAR, or CEBAR, in the materia medica, a name by which the Arabians call the *lignum aloes*, or aloe wood, a perfumed aromatic drug.

SEBEL, an Arabian name for the disorder of the eye, usually called a *pannus*.

SEBESTENA, in botany, the name given by Dillenius to a genus of plants called *cordia* by Plumier, and under that name characterised by Linnæus. See CORDIA.

SECACUL, in the materia medica of the antients, a name given by Avisenna, Serapion, and others, to a root which was like ginger, and was brought from the East-Indies, and used as a provocative to venery.

The interpreters of their works have rendered this word *iringo*, and hence some have supposed that our eryngium, or eryngo, was the root meant by it; but this does not appear to be the case on a strict enquiry, and there is some reason to believe that the famous root, at this time called *ginseng*, was what they meant.

SECALE, *rye*, in the Linnæan system of botany, makes a distinct genus of plants, the characters of which are these. The cup is a case or cover, composed of two valves, and containing two flowers. The valves are strait, erect, and placed opposite to one another; and are sharp pointed, and smaller than the leaves of the flower. The flower is bivalve; the outer valve is rigid bellied, pointed, somewhat compressed with a rim upon its lower edge, and is terminated by a long awn or beard: the interior valve is flat, and pointed. The stamina are three capillary filaments, hanging out of the flower. The antheræ are oblong, and split at the ends. The germen of the pistil is of a turbinated form. The styles are two, reflex and hairy. The stigmata are single. The flower closely wraps up the seed, and when it is ripe opens, and lets it out. The seed is single, oblong, somewhat cylindric, naked, and pointed. *Linnæi* Gen. Plant. p. 17.

SECAMONE, in botany, a name by which the Ægyptians call a species of periploca common there, and distinguished by Mr. Tournefort by the name of *periploca foliis oblongis angustioribus*, the long narrow leaved periploca. See the article PERIPLOCA.

SECESPITA, among the Romans, a knife with a round ivory handle, adorned with gold and silver, which the flamins and priests used at sacrifices. *Pitisc.* in voc.

SECIUM, among the Romans, a term used to signify every thing the priests cut with the knife *secespita*, as the *libum*, *placenta*, &c. See LIBUM, *&c.*

SECLIA, a name by which some authors have called wormwood. See SANTONICUM *semen*.

SECTINEUS, a small, flat, and pretty long muscle, broad at the upper part, and narrow at the lower; situated obliquely between the os pubis, and the upper part of the os femoris.

It is commonly a single muscle, but is sometimes found double. It is fixed above by fleshy fibres to all the sharp ridge, or crista of the os pubis, and to a small part of the oblong notch, or depression on the foreside of the crista, in which the upper extremity of this muscle is lodged; from thence it runs down obliquely towards the little trochanter, under, and a little behind which, it is inserted obliquely by a flat tendon between the superior insertion of the vastus internus, and inferior insertion of the triceps secundus, with which it is united. *Winslow*'s Anatomy, p. 206.

SECOMIÆ, in natural history, the name of a genus of fossils, of the class of the *septariæ*, the characters of which are; that they are bodies of a dusky hue, divided by septa, or partitions of a sparry matter, into several more or less regular portions, of a moderately firm texture, not giving fire with steel, but fermenting with acid menstrua, and easily calcining.

The *septariæ* of this genus are, of all others, the most common, and are what have been known by the little expressive, or mistaken names of the *waxen vein*, or *ludus Helmontii*. The English name was acquired by the likeness of the body of the mass in some of the species, and of the septa in others, to yellow wax: and the Latin one was owing to this, that the famed Paracelsus, who had the cubic pyritæ in great esteem for dissolving the stone, called those bodies, from their resembling a die in shape, *ludus*; and Van Helmont afterwards mistaking the bodies of this genus for the *ludus* of Paracelsus, gave them in the same cases, and called them by the same name.

We have many species of these bodies common among us. Of the whitish or browniſh kinds we have thirteen; of the yellowish five; and of the ferrugineous ones four.

Of the white or browniſh kinds are, 1. A brown one, externally grey, with yellowish white septa. This is very common in Germany, and the chemists and apothecaries there, who use it as a remedy for the stone, always choose this species. We have it also common among us, and that in the neighbourhood of London; the clay-pits behind Gray's Inn Lane, and about Islington, affording it in great abundance. 2. A hard brown one with fewer septa, common in the same places with the former. 3. A hard blackish brown one with whitish partitions. This is a coarser, and much less beautiful kind than any of the former, and generally lies near the surface. It is common about Pancras, and in many other places. 4. A hard browniſh yellow one, with yellowish white

white ſepta. This alſo is common about London, and generally lies near the ſurface. 5. A hard greyiſh brown one with brown ſepta. This is a very firm and hard one, and is found in the clay pits about London, but generally lies deep. 6. A hard ferrugineous brown one with brown partitions. This is a particularly ſtrong and firm kind, and is leſs common than the preceding kinds. It is found however in Surry, and on the coaſts of Yorkſhire. 7. A ſoft whitiſh one with browniſh yellow ſepta. This is the moſt ſoft, lax, and crumbly, of all the bodies of this genus, and is leſs common than moſt of the kinds. It is found in Leiceſterſhire and Yorkſhire, and has been met with at Paddington. 8. An elegant cruſtated one with a bluiſh nucleus, and browniſh yellow cruſts. This is very rare, and has been found only about Loughborough, and once in the neighbourhood of Deptford. 9. A hard duſky brown one with very thick ſepta. This is common in the cliffs, and on the ſhores of Yorkſhire, and has been found alſo in the clay-pits about Richmond and Deptford. 10. A hard greyiſh brown one, divided into talc by thick whitiſh partitions. This is found in Leiceſterſhire, Yorſhire, and Norfolk. 11. A brown compreſſed kind with yellow ſepta. This is often found of three feet in diameter. It is common in the cliffs, and on the ſhores of Yorkſhire, Suſſex, and Kent. 12. A whitiſh grey very hard kind, looking like flint. This is a very ſingular ſpecies, and greatly ſuperior to all the reſt in the cloſeneſs of its texture. It is found near Peterborough in Northamptonſhire, and ſometimes in the neighbourhood of London. And 13. a bluiſh one, brown on the outſide, with white ſepta. This is a very ſingular, though not very beautiful ſpecies, and is very ſcarce. It is not known of any where, except at Loughborough in Leiceſterſhire, and in the great clay-pit at Richmond. Theſe are the *ſecomiæ* of theſe colours.

The yellow *ſecomiæ* are, 1. A hard pale yellow one with few and thin partitions. This is found about Highgate, and is common on the ſhores of Yorkſhire. 2. A ſoft duſky yellow one with very thick ſepta. This has but little beauty, but it is very frequent in our clay pits, thoſe about Deptford abounding with it. 3. A hard bright yellow one, with variegations of brown. This is a ſingular and very beautiful ſpecies, the brown variegations being ſometimes found in veins, ſometimes as a central nucleus. This is not known of any where, except on Mendip-hills. 4. A very hard browniſh yellow undulated one, with very few, and thoſe whitiſh partitions. This elegant ſpecies is found alſo only on Mendip-hills. And 5. a hard greyiſh yellow one, divided into talc by thin yellow partitions. This is a very beautiful maſs, and is frequently met with on the Yorkſhire ſhores; ſometimes alſo about Highgate.

The ferrugineous *ſecomiæ* are theſe, 1. A round yellowiſh ruſt coloured one, with thin ſtraw coloured partitions, found in Somerſetſhire, and about Iſlington. 2. A roundiſh ferrugineous red one with yellow ſepta, very common in Northamptonſhire and Yorkſhire, and ſometimes found in the clay-pits about Iſlington. 3. A ferrugineous brown one with whitiſh ſepta; a ſpecies of very little beauty, found on the ſhores of Yorkſhire. And 4. a hard blackiſh brown one, with a yellow cruſtated coat, found about Richmond, and in ſome other places. *Hill*'s Hiſt. of Foſſ. p. 510, ſeq.

SECOND (*Cycl.*)—SECOND, in muſic. What is ſaid in the Cyclopædia under this head wants correction; the truth is this. There are three kinds of *ſeconds* occurring in practice, the leſſer, the greater, and the ſuperfluous *ſecond*; to which, if the enharmonic genus were reſtored, we might add, the diminiſhed *ſecond*. The leſſer *ſecond* is the ſemi-tone major, and is nearly equal to $5\frac{1}{5}$ commas. The greater *ſecond* is the tone, which being either major or minor, there muſt alſo be two greater *ſeconds*; one nearly equal to $8\frac{1}{2}$ commas, and the other to $9\frac{1}{2}$ commas: but practitioners uſually confound theſe two. The ſuperfluous *ſecond* is a tone major, and ſemi-tone minor [a]; the other ſuperfluous *ſecond*, ariſing from the tone minor and ſemi-tone minor, is not in uſe. Laſtly, the diminiſhed *ſecond* is a ſemi-tone minor leſs than the leſſer *ſecond*; that is, equal to the dieſis enharmonica. Thus between E and F ^{b}, or between A and B $^{b\,b}$, would be a diminiſhed *ſecond*, as alſo between G ſharp and A ^{b}. This laſt has been practiſed by an eminent muſician of this age [b]. —[[a] See the Table, under INTERVAL. [b] Mr. Handel, in the Oratorio of Samſon, in the ſecond part of the ſong, *Return, return, O God of hoſts.*]

Some authors, as Ozanam [c], call the ſemi-tone minor by the name of *diminiſhed ſecond*; but this is contrary to the analogy in like caſes, where diminiſhed is uſually applied to intervals a ſemi-tone minor leſs than a true diatonic interval. Thus the diminiſhed ſeventh is a ſemi-tone minor leſs than the flat ſeventh, or ſeventh minor.—[[c] Dict. Mathemat. p. 653.] See the Table, under INTERVAL.

Diminiſhed SECOND, in muſic. See DIMINISHED *ſecond*.

SECOND *de l'oreille*, in anatomy, a name given by Vieuſſens and others to a muſcle of the ear, called by Cowper and others *ſtapidaceus*, and *ſtapedis muſculus*; and by Albinus *ſtapedium*. Winſlow calls it *le muſcle de l'etrier*. See EAR.

SECOND *deliverance*, *ſecunda deliberatione*, a judicial writ that lies after nonſuit of the plaintiff in replevin, and a returno habendo of the cattle replevied, adjudged to him that diſtrained them; commanding the ſheriff to replevy the ſame cattle again, upon ſecurity given by the plaintiff in the replevin for a redelivery of them, if the diſtreſs be juſtified. It is a *ſecond* writ of replevin, *&c.* F. N. B. 68. Terms of Law. *Blount*, *Cowel.*

SECRETARIUM, among the Romans, a recluſe room, where the judges conſidered the cauſes that had been litigated before them, and came to a reſolution what ſentence they were to pronounce from the tribunal. It was moſt uſually ſeparated from the tribunal by a veil. *Pitiſc.* in voc.

SECTA (*Cycl.*)—SECTA *ad curiam*, a writ which lieth againſt him who refuſeth to perform his ſuit to the county court, or court baron. F. N. B. 158. *Blount*, *Cowel.*

SECTA *curiæ*, in our old writers, ſuits and ſervice done by the tenants at the court of their lord. *Paroch.* Antiq. 320.

SECTA *facienda per illam quæ habet æniciam partem*, a writ to compel the heir that hath the elder's part among coheirs, to perform ſervice for all the coparceners. Reg. orig. 177. *Cowel.*

SECTA *faldæ*. See FALDEGE, *Cycl.* Not.

SECTA *molendini*, a writ lying where a man by uſage, time out of mind, *&c.* has ground his corn at the mill of a certain perſon, and afterwards goes to another mill with his corn, thereby withdrawing his ſuit to the former. And this writ lies eſpecially for the lord againſt his tenants, who hold of him to do ſuit at his mill. Reg. orig. 153. F. N. B. 122. *Blount*, *Cowel.*

SECTA *regalis*, a ſuit by which all perſons were bound twice in a year to attend the ſheriff's tourn, and was called *regalis*, becauſe the ſheriff's tourn was the king's leet; wherein the people were to be obliged by oath to bear true allegiance to the king, *&c.* *Blount.*

SECTA *unica tantum facienda pro pluribus hæreditatibus*, a writ that lies for an heir who is diſtrained by the lord to do more ſuits than one, in reſpect of the land of divers heirs deſcended to him. Reg. orig. *Blount*, *Cowel.*

SECTILIA, among the Romans, pavements laid with ſtones cut into various forms. Suetonius diſtinguiſhes them from thoſe that were teſſelated. *Pitiſc.* in voc.

SECTION (*Cycl.*)—*Cæſarian* SECTION. Many have exclaimed againſt the cruelty of this operation, and certainly it is too terrible to be uſed on any, but the moſt emergent occaſions; but there ſeem three caſes in which it is juſtifiable, nay abſolutely neceſſary. The firſt is when the mother is dead, either in labour, or by ſome other accident, and the child is perceived to be alive. The ſecond is when the mother is living, and the fœtus dead, and incapable of being extracted by the common paſſages by any help of the midwife. And the laſt, when the mother and child are both living, and there is found an utter impoſſibility of delivery any other way. In all theſe caſes the Cæſarian practice is juſtifiable to ſave life, that muſt otherwiſe be inevitably loſt.

In the firſt caſe, the operation muſt be performed immediately after the death of the mother, otherwiſe it is to no purpoſe, for the child can live but a very little time afterwards in the body. The ſurgeon is, in this caſe, to make a crucial inciſion, as in the common diſſections; or a longitudinal one on one ſide, without regard to the courſe of the fibres or veſſels; and if the fœtus ſhould have fallen into the cavity of the abdomen, through a rupture of the uterus, it ſhould then be taken out; or if it be yet in the womb, or in the fallopian tube, theſe parts muſt be carefully opened, and the child being taken out, muſt have Hungary water, or the like, held at ſome ſmall diſtance from its noſe to revive it, and the navel ſtring be tied up as uſual. The fœtus is not always preſerved, or found alive after this operation; but as there is often a probability of it, it is certainly better to open an hundred dead women in vain, than to loſe the life of one infant.

In the ſecond caſe, when a dead fœtus is contained in the cavity of the abdomen, in the fallopian tube, or in a kind of hernia or ſacculus without the abdomen, of all which caſes there are inſtances recorded; or when from the particular ſtructure of the parts, as is ſometimes the caſe in crooked women, and others; and when, as in many inſtances, there is no poſſibility of the extraction of the infant, even by inciſion of it, there is no way but the opening the abdomen, and, if neceſſary, the uterus of the mother, and taking out the fœtus; and this is often the means of preſerving the mother, and when in parallel caſes the child is alſo alive, there have been not a few inſtances of both being preſerved. *Heiſter*'s Surgery, p. 29.

The Cæſarian *ſection* is recommended by ſeveral authors, and Mr. Helvetius communicated to the Academy of Sciences at Paris, a well atteſted hiſtory of a woman recovering after the operation had been performed upon her by a midwife. Vid. Hiſt. de l'Acad. des Scienc. 1731.

We have alſo an account of this operation ſucceſsfully performed by a midwife in Ireland. See Med. Eſſ. Edinb. Vol. 5. art. 37.

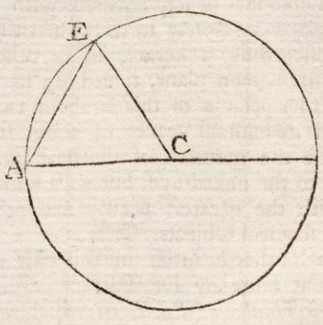
There

There is likewiſe an account of the Cæſarian operation ſucceſsfully performed by a butcher on a woman in Ireland. Vid. Phil. Tranſ. N° 461. ſect. 17.

Cyprianus, profeſſor at Franeker, gives an extraordinary caſe of the Cæſarian operation, whereby a fœtus, which had been dead twenty one months, was drawn out of the tuba uteri, yet the mother preſerved [d]. M. Jobert, phyſician at Chateau Thierri, relates the hiſtory of a woman in the neighbourhood of that place, who was twice delivered of children by the Cæſarian operation; the firſt time in 1682, the ſecond time eleven months after, and recovered from both [e]. —[[d] Act. Erud. Lipſ. An. 1711. p. 82, ſeq. [e] Jour. des Scav. Tom. 21. p. 374.]

SECTIS *non faciendis*, a writ brought by a woman, who for her dower, *&c.* ought not to perform ſuit of court. Reg. orig. 174. *Blount*, *Cowel.*

SECTOR (*Cycl.*)—SECTOR *of a ſphere*. The *ſector of a ſphere*, generated by the revolution of the *ſector* of a circle C A E about the radius A C, is equal to a cone, whoſe baſe is equal to the portion of the ſpherical ſurface generated by the arch A E, or to the circle deſcribed with the radius A E, and whoſe height is equal to C A, the radius of the ſphere. Arch. de Sphær. et Cyl. *Mac Laurin*'s Fluxions, Introd. p. 15.



SECULUM. See the article AGE.

SECUNDA (*Cycl.*)—SECUNDA *ſuper oneratione paſturæ*, a writ which lieth where admeaſurement of paſture hath been made; and he that firſt ſurcharged the common doth it a ſecond time, notwithſtanding the admeaſurement. Old Nat. Br. 73. *Blount*, *Cowel.*

SECUNDANS, in mathematics, an infinite ſeries of numbers, beginning from nothing, and proceeding as the ſquares of numbers in arithmetical progreſſion, as 0, 1, 4, 9, 16, 25, 36, 49, 64, *&c.*

SECUNDINES (*Cycl.*)—It very often happens that theſe are retained in the womb after childbirth, and great miſchiefs enſue from it. The aſſiſtance of a ſkilful hand is, in many caſes, neceſſary to the getting them out; and this is to be done with great care and ſpeed, before the uterus cloſes itſelf upon them, otherwiſe they occaſion terrible hæmorrhages, faintings, and often inflammatory and putrid fevers.

The patient herſelf may greatly promote the expulſion of theſe, by any forcible emotion of the body, as by a forced cough, or by ſneezing; the midwife at the ſame time is gently to pull them by the navel ſtring, but this muſt be done very cautiouſly, for fear of its breaking. If this fails, the cautious introducing the hand often ſets all right, or the uſe of gently pellent medicines may be called in; and to theſe may be added broths, with ſaffron in them, and by the uſe of common clyſters great good is often done: but, if after all this care, there yet remain ſome fragments of them behind, there uſually ariſes a fever within twelve hours; and in this caſe the utmoſt care muſt be taken to prevent putrefaction, and expel the remains of them. To theſe purpoſes medicines prepared with myrrh, amber, ſaffron, and the cortex eleutherii, are of the greateſt ſervice; and to theſe may be added occaſionally the colliquating and attemperating ſalts, ſuch as tartarum vitriolatum, and nitre. *Junker*'s Conſp. Med. p. 723.

Notwithſtanding the great danger that uſually attends the leaving any part of this behind, at the time of delivery, there are inſtances of ſome perſons lucky enough to eſcape; the ſubſtance left behind remaining uncorrupted, till the time of its being afterwards diſcharged.

Kerkring gives us an inſtance of this which fell under his own knowledge. A woman had a large portion of it left behind, where it remained four months, and at the end of that time was diſcharged uncorrupted, and without any hurt to the perſon. *Kerkring*'s Spicileg. Anat.

SECUNDUS (*Cycl.*)—SECUNDUS *mallei*, in anatomy, a name given by Duverney, and ſome others, to one of the muſcles of the ear. It is the *internus auris* of Cowper and others, and is moſt properly named by Albinus *tenſor tympani*.

SECUNDUS *oculum movens*, in anatomy, a name given by Veſalius to that muſcle of the eye, called by Riolanus and others *ſuperbus*, and *elevator oculi*, and by Albinus the *ſubductor*, one of his four muſculi recti of the eye.

SECURIDACA, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the papilionaceous kind, and its piſtil, which ariſes from the cup, finally becomes a ſtrait, flatted, annulated, and jointed pod, which contains in every joint one ſeed, of a rhomboidal form, and marginated on its inner ſide.

There is only one known ſpecies of this genus, which is the yellow *ſecuridaca*. *Tourn.* Inſt. p. 699.

SECURITATEM *inveniendi quod ſe non divercat ad partes exteras ſine licentia regis*, an antient writ lying for the king againſt any of his ſubjects, to ſtay them from going out of this kingdom into foreign parts; the ground whereof is, that every man is bound to ſerve and defend the commonwealth, as the king ſhall think fit. F. N. B. 85. *Blount*, *Cowel.*

SECUTOR, among the Romans, moſt commonly ſignified an attendant upon great men. *Pitiſc.* in voc.

Secutor, in a more limited ſenſe, denoted the gladiator who engaged with the *retiarius*. *Pitiſc.* Lex. Ant. in voc. See the article RETIARIUS.

SEDAB, in botany, a name given by the Arabian phyſicians to the wild, or mountain rue, a plant common in Syria, Greece, and other places. Aviſenna ſuppoſes the gum, which he calls *gentum*, or *jentum*, to be produced from this plant, but very erroneouſly, that gum being obtained from the roots of the thapſia, or deadly carrot.

SEDATIVUM *ſal*. This *ſalt* may be obtained by cryſtallization in the following manner. Take four ounces of borax, and one ounce one drachm of the moſt concentrated oil of vitriol; put the borax into a glaſs retort, pour on it half an ounce of common water after the oil of vitriol, and expoſe the mixture to a fire gradually encreaſed: after the phlegm has paſſed off, and even while it is paſſing, there ariſe flowers, or a volatile ſalt, in beautiful foliated laminæ, ſome of which always melt by the heat of the fire; after the operation is over, the fineſt of the flowers are to be carefully gathered: theſe are what ſtick to the neck of the retort. Thoſe that are grey, are to be thrown upon the remaining maſs; this maſs is to be diſſolved in water, filtrated, and evaporated gradually; ſometimes, even without evaporation, the ſhining talcous laminæ are to be ſeen in the liquor: after twenty four hours ſtanding the water is to be poured off from theſe laminæ, they are to be waſhed with freſh water, and then dried carefully in a warm place. If theſe cryſtals do not calcine in the place where they are put to dry, nor in the ſun's heat, it is a ſign there is nothing cryſtallized but the ſal neutrum; if they do calcine, it is a proof that there is ſome Glauber's ſalt formed of the borax and the vitriolic, and cryſtallized in the maſs. This method of procuring the *ſal ſedativum* by cryſtallization, was an invention of Mr. Geoffroy; every body had before thought it could only be obtained by ſublimation. Philoſ. Tranſ. N° 436. p. 40. See SAL.

SEDEM *attollens*, in anatomy, a name given by Veſalius and others to the muſcle, now more generally known by the name of *levator ani*.

SEDENTARIUM *os*, a name given by ſome anatomical writers to the protuberance of the os coxendicis, on which the whole weight of the body reſts in ſitting.

SEDINA, in the materia medica, a word uſed by ſome writers to expreſs dragon's blood.

SEDITION, among civilians, is uſed for an irregular commotion of the people, or an aſſembly of a number of citizens without lawful authority, tending to diſturb the peace and order of the ſociety.

This offence is of different kinds: ſome *ſeditions* more immediately threatening the ſupreme power, and the ſubverſion of the preſent conſtitution of the ſtate; others tending only towards the redreſs of private grievances. Among the Romans, therefore, it was variouſly puniſhed, according as its end and tendency threatened greater miſchief. See l. 1. cod. *de Seditioſis*, and Math. *de Crimin.* l. 2. n. 5. *de læſa majeſtate*. In the puniſhment, the authors and ringleaders were juſtly diſtinguiſhed from thoſe, who with leſs wicked intention joined, and made part of the multitude.

The ſame diſtinction holds in the law of England, and in that of Scotland. Some kinds of *ſedition* in England amount to high-treaſon, and come within the Stat. 25 Edw. III. as levying war againſt the king. And ſeveral *ſeditions* are mentioned in the Scotch Acts of Parliament as treaſonable. *Bayne*'s Crim. Law of Scotland, p. 33, 34.

The law of Scotland makes riotous and tumultuous aſſemblies a ſpecies of *ſedition*. But the law there, as well as in England, is now chiefly regulated by the Riot Act, made 1 Geo. I. only it is to be obſerved, that the proper officers in Scotland, to make the proclamation thereby enacted, are ſheriffs, ſtewards, and bailies of regalities, or their deputies; magiſtrates of royal burroughs, and all other inferior judges and magiſtrates; high and petty conſtables, or other officers of the peace in any county, ſtewartry, city or town. And in that part of the iſland, the puniſhment of the offence is death and confiſcation of moveables: in England it is felony. See RIOT, *Cycl.*

SEDMA, a word uſed by ſome as a name for the *lapis hæmatites*.

SEDUM, *houſeleek*, in botany, the name of a large genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, conſiſting of ſeveral petals, arranged in a circular form. The piſtil, which ariſes from the cup, finally becomes a fruit, compoſed of ſeveral caſes or ſheaths, conſtipated together into a ſort of head, and containing a number of ſmall ſeeds.

The ſpecies of *houſeleek*, enumerated by Mr. Tournefort, are theſe. 1. The great tree *houſeleek*. 2. The common great *houſeleek*. 3. The narrower leaved great *houſeleek*. 4. The

largeſt

largeſt common *ſedum*. 5. The broad leaved *ſedum* with large white flowers. 6. The large mountain-*ſedum* with dentated leaves. 7. The large mountain-*ſedum* with whole leaves. 8. The woolly mountain-*houſeleek*. 9. The ſmaller woolly mountain-*ſedum*. 10. The large Alpine roſe-*ſedum* with ſharp pointed leaves. 11. The middle ſized Alpine roſe-*ſedum* with red prickles. 12. The greeniſh hairy Alpine roſe-*ſedum*. 13. The long leaved hairy Alpine *ſedum*. 14. The hairy Alpine *ſedum* with the diſk of the flower green, and the corona purple. 15. The ſmaller white flowered cylindric leaved *ſedum*. 16. The larger cylindric leaved white flowered *ſedum*. 17. The ſmall cylindric leaved *ſedum*, called the *leſſer houſeleek* of the ſhops. 18. The ſmaller cylindric leaved yellow flowered *ſedum*. 19. The ſmall round leaved *ſedum*. 20. The ſharp pointed leaved ſmall yellow *ſedum*. 21. The leſſer *ſedum* with broad and thick ſtalks. 22. The leſſer yellow *ſedum* with inflated ſtalks. 23. The deep yellow flowered long leaved *ſedum*. 24. The red flowered field-*ſedum*. 25. The little yellow flowered ſharp taſted *ſedum*. 26. The ſmalleſt yellow flowered *ſedum*, inſipid to the taſte. 27. The little inſipid white flowered *ſedum*. 28. The pale flowered Alpine *ſedum*. 29. The Alpine *ſedum* with large red flowers. 30. The hairy purple marſh-*ſedum*. 31. The white flowered echinated, or ſtellated *ſedum*. 32. The yellow flowered echinated *ſedum*. 33. The *ſedum*, commonly called *cepæa*. 34. The purple flowered *cepæa*. 35. The ſmalleſt mountain-*ſedum* with little purple flowers, and ſtellated ſeeds. 36. The coris-leaved Alpine *ſedum*. 37. The ſhrubby heath-like African *ſedum*. Theſe are the genuine ſpecies of *ſedum*; but beſide theſe, authors have called many other plants by this name, moſt of them properly of the ſaxifrage kind. *Tourn.* Inſt. p. 262.

The great *houſeleek* was called by many names among the Greeks, as *zoophthalmus*, and *buphthalmus*; the latter of theſe confound it with one of the corymbiferous plants, and it is not to be known which of two ſo different vegetables the authors mean, without examining the virtues they aſcribe to it.

There is however another name, by which it is called, which yet more perplexes the ſenſe; this is *ambroſia*, a word by which we expreſs the botrys, or oak of Jeruſalem, a ſmall garden plant, but by which they expreſſed the lilly, the *houſeleek*, and ſeveral other plants.

SEED (*Cycl.*)—The exterior form, and even the internal ſtructure, of the generality of vegetable *ſeeds*, have been ſuppoſed by ſome ſo much alike in the ſeveral kinds, and of ſo little curioſity and beauty in the whole, that they have been little regarded by the curious; but when nearly examined with the help of microſcopes, they are found to be worthy of a greater attention: thoſe which appear moſt like to one another, when viewed by the naked eye, often proving as different, when thus examined, in their ſeveral forms and characters, as the different genera of any other bodies of the creation. If their external forms carry all this variety and beauty about them, their internal ſtructure, when laid open by different ſections, appears yet more admirable.

The *ſeed* of the muſk ſcabious is amazing in its ſhape and ſtructure: it reſembles in figure an octagonal vaſe, with a ſcalloped brim; the whole is bell-faſhioned, having ribs or diviſions, which run down from the mouth of the vaſe, and thence becoming narrower, form the bottom. Between theſe ribs, down to the beginning of the narrow part, it is clear, though not wholly tranſparent, and from thence to the bottom the ribs are hairy. This vaſe contains a *ſeed*, which is like a peſtle ſtanding in a mortar. The peſtle ſtands looſe in an octagonal caſe, but the narrowneſs of the mouth of this vaſe hinders the peſtle's being drawn out, becauſe its extremity within is rounded, and thicker than any other part of it. From its upper end there ariſe five ſpiculated ariſtæ, or awns, whoſe little thorns are directed upwards, and are thereby prepared to cauſe the *ſeed* to recede from any thing that might injure it on being touched. The baſon, from which theſe ariſtæ riſe, is of a fine green colour, and they are of an elegant ſhining brown.

The *ſeed* of the angelica is one of the moſt fragrant in its ſmell in the world. When the outer huſk of this *ſeed* is pulled off, the nucleus appears of a browniſh colour, and of an elliptical ſhape. By the help of the microſcope we ſoon diſcover what it is that produces this charming ſmell; this is a fine amber coloured gum, which appears laid in ridges, diſpoſed alternately with others of a browniſh colour, longitudinally, all over the *ſeed*, and on the flat ſide there is a white part, which is a ſort of theca, which receives a very minute ſtylus from the pedicle that ſupports it.

The medicinal *ſeed*, commonly known in the ſhops under the name of *grain of paradiſe*, is one that promiſes very little from its external appearance, being only a brown *ſeed* of an irregular ſurface, with many flats and angles, and having an apex like the mouth of a purſe when drawn together with a ſtring; from this unpromiſing aſpect, however, there ariſes a very wonderful appearance on diſſection. In a longitudinal ſection we ſee firſt the edge of the brown cortex, next within that appears a black pitchy ſubſtance, and within that a very white matter, lodged in a radiated form: this reſembles a fine white ſalt, and is probably a mixture of a volatile ſalt, and a farinaceous matter. Its radiated diſpoſition, and extremely pungent taſte, favour alſo this opinion. But there is in this *ſeed* a yet far more curious particular than theſe; the center of every *ſeed* is occupied by a ſmall piece of perfect camphor: this is, in all reſpects, the ſame with the common camphor ſold in the ſhops, and is always of the figure of a vinegar cruet, having a round large bottom, and a long and narrow neck. This is invariably the appearance in every *ſeed*, and that not only in this, but in other *ſeeds* of the ſame kind.

The *ſeed* of the great maple, which we commonly, but improperly call the *ſycamore-tree*, conſiſts of a pod and its wing: two of theſe grow upon a pedicle with the pods together, which makes them reſemble the body of an inſect with its expanded wings. The wings are finely vaſculated, and the pods are winged with a fine white down, reſembling ſilk: this contains a round compact pellet, covered with a brown membrane, that ſticks very cloſely to it. When this is pulled off, inſtead of diſcerning a kernel, as in other *ſeeds*, there appears an entire green plant, folded up in a moſt ſurpriſing manner. The pedicle of this is about two eights of an inch long, and its ſeminal leaves of about ſix eighths each: between theſe the germina of the next pair of leaves are plainly viſible to the naked eye, but with a microſcope they are ſeen with the greateſt beauty and perfection. See Tab. of Microſcopical Objects, Claſs 2.

Theſe, and a number of ſuch other beauties in this part of the creation, are deſcribed at large by Dr. Parſons in his work, entitled *A Microſcopic Theatre of Seeds*, to which we refer for the reſt. Philoſ. Tranſ. N° 474. p. 187.

The increaſe of the *ſeeds* of plants is ſurpriſing. The upright mallow, for inſtance, has been computed to produce 200000 *ſeeds* from one. See Philoſ. Tranſ. N° 468. ſect. 4.

Moſt kinds of *ſeeds* ſhould be prepared for a microſcopical examination, by ſteeping them in warm water till their coats are ſeparated, and their ſeminal leaves may be opened without laceration. But *ſeeds*, while dry, and without any preparation, are of an almoſt infinite variety of ſhape, and afford a number of pleaſing objects for the microſcope.

The *ſeeds* of ſtrawberries riſe out of the pulp of the fruit, and appear themſelves like ſtrawberries. The *ſeeds* of the ſeveral ſorts of poppies reſemble kidneys in ſhape, but have a number of furrows and ridges on their ſurfaces, very curiouſly diſpoſed with regular ſides and angles. From theſe *ſeeds* there may alſo be commonly ſhaken a duſt, which looks very pretty before the microſcope, having nearly the ſame appearance with the ſurface of the *ſeeds*, but having the advantage of being tranſparent. This duſt is compoſed of the fine membranes which have lain between the *ſeeds*, and which by the preſſure of the *ſeeds* againſt them have received the very marks of every part of the *ſeeds*.

The *ſeeds* of the leſſer moonwort, of tobacco, chervil, lettuce, thyme, parſley, and a multitude of others, afford alſo a very pleaſing entertainment. The antients imagined, that the ferns and capillary plants produced no *ſeeds*, and their miſtake could never have been rectified by the naked eye; but the microſcope has diſcovered, that all the ſeveral ſorts of fern, harts-tongue, maiden-hair, and the like, are ſo far from being barren in this reſpect, that they are really amazingly fruitful. The *ſeed* veſſels of theſe plants are placed on the back part of their leaves, and the duſt which flies off from them in ſuch great quantities, when we handle them, is no other than their *ſeeds*. The *ſeed* veſſels appear to the naked eye like brown or black ſcurff, on the backſide of the leaf, but when viewed by the microſcope, they reſemble little circular tubes, divided into ſeveral cells, and containing a multitude of *ſeeds*. When the *ſeeds* are ripe, the veſſels fly open with a ſpring, and throw them out every way in form of duſt. *Baker*'s Microſcope, p. 250.

Mr. Lewenhoek obſerves, that the mealy ſubſtance in the *ſeeds* of beans, peaſe, wheat, barley, and other kinds of grain, and the generality of other large *ſeeds*, is always encloſed in certain ſmall membranes, repreſenting ſo many little bags or ſacks. On obſerving theſe membranes more nicely, they were found to be all full of ſmall holes, through which he could ſee the light, and which he judged to be no other than the remains of truncated veſſels, which had been torn off in ſeparating the part, and which ſerve to compoſe a great part of the membranes; and it is probable, that each minute particle of the farina of theſe *ſeeds* is nouriſhed by the veſſels, of which we, in this view, ſee the truncated ends. Theſe veſſels are more eaſily ſeen in beans and peaſe, than in the grains of wheat, &c. whoſe membranes are ſo extremely thin and brittle, that they are deſtroyed with the leaſt touch. In wheat, however, there is this ſingularity, that one globule of the farina being broken, is always ſeen to be compoſed of many more, or that many much ſmaller globules were contained in every one of theſe larger ones. The membranes in barley, in which the ſmall globules of farinaceous matter are contained, are much thicker and ſtronger than in wheat, but much leſs ſtrong than in the leguminous *ſeeds*. See Tab. of Microſcopical Objects, Claſs 2.

There is great reaſon to believe, that in all *ſeeds*, which contain a large quantity of farinaceous matter, the caſe is the ſame as in theſe, and that they all conſiſt internally of ſmall globules, collected into larger ones, and encloſed in membranes; which, on a ſtrict examination, appear to be little other than congeries of veſſels deſtined to ſend nouriſhment to the ſeveral incloſed globules.

The oil in almonds, and other ſuch *ſeeds*, is in the ſame manner contained in a ſort of ſmall veſſels, which are very numerous, and diſtinctly viſible. When a ſmall piece of the pulp is examined with a good microſcope, all theſe ſmall veſſels, and the membranes they make a part of, proceed from the ſkin or inner covering of the *ſeed*, in which they are found; and as the meally ſubſtance receives its encreaſe from the veſſels which are in the cells; and as the plant is formed between the cells, during the time that the *ſeed* lies in the earth; and as the little orifices in the ſkins of animals, and of fruits, are ſo formed, as to diſcharge the ſuperfluity of their moiſture, and are ſhut in ſuch a manner, that no moiſture from the common air can be received into them: ſo, on the contrary, the orifices of *ſeeds* are ſo formed, that they will admit moiſture to paſs inwards, and accordingly moiſture is driven into them as they lie in the earth. The *ſeed* upon this muſt neceſſarily ſwell, after this a fermentation ariſes, it requires then a greater ſpace, and according to the particular ſtate of the fibres, and the particles which lie in the cells, and which have derived their nouriſhment from the cells, the meally ſubſtance is by degrees driven out of them into the ſubſtance of the young plant; which by this means encreaſes ſo much in bulk, that the root is become able to furniſh it with nouriſhment from the earth. The office of the internal part of the *ſeed* is then over, and we ſee accordingly, that it is by that time almoſt wholly waſted. Phil. Tranſ. N° 368. p. 203. See Tab. of Microſcopical Objects, Claſs 2.

Many experiments have been made, in order to prove that the *ſeeds* of all plants derive their conſtituent matter from the woody central parts of the plant. Thus apple trees, when they grow hollow, will bear good fruit, but with empty and imperfect *ſeeds*. Barberry trees, when the roots are bored through, are ſaid to bear fruit abſolutely without *ſeeds*; and the gardiners ſay, that if the woody part of the roots of parſley be cut out, the plant will continue to thrive in all appearance, but that it will never afterwards produce *ſeeds* that will propagate the ſpecies. It is to be acknowledged that hollow oaks and elms produce *ſeed* that is as good as that growing on the ſoundeſt trees of the ſame ſpecies; but the elm is all timber to the bark, and an oak, when it is putrid to the heart, may ſtill have firm wood enough to convey a proper nouriſhment from the root to the acorn. The roots may be ſound, when the body of the tree is very much decayed by water let in at the top of the pollard tree, or at the loppings of the branches; and we ſee that beans, wheat, and other grain, grow well, if the eyes and parts next adjoining be whole, though the beans be full of great holes in other parts, or the main body of the wheat be cut off with ſciſſars.

The people who recommend boring of the barberry roots, to have fruit without ſtones, order therefore that the borings be very compleat in the roots for that purpoſe. It is obſerved, in countenance of this doctrine, that ſome trees are leſs fruitful, or even altogether barren, by the exceſſive growth and hardneſs of the timber, and theſe are cured by croſs hackings or cuts, done with ſharp inſtruments through the bark, and into the wood: they alſo do the like injuries to the roots on the ſame occaſion, and often ſplit them lengthwiſe, putting a ſtone into the ſlit, that they may not grow together again. When this remedy is applied both to the ſtem and roots, it ſeldom fails of ſucceſs, but when only to one, it ſometimes miſſes.

As the heart of the wood, or its more ſolid ſubſtance, are ſuppoſed thus to furniſh the matter of the *ſeeds*, the bark is ſuppoſed to furniſh the matter of the pulp of the fruit. The experiment has been made, by debaſing and vitiating its juice, and the fruits have accordingly been debaſed. Thus if reſts be made for water on the body of a Kentiſh codling tree, and water poured frequently into theſe cavities, ſo as always to keep up a ſupply for the bark, the apples will grow to an immoderate ſize, and be inſipid; part of their pulp will be ſo relaxed, as to look like the pulp of a lemon, and on hanging but a moderate time on the tree, they will be as rotten, as if laid on heaps when fully ripe. Philoſ. Tranſ. N° 46.

Change of SEED, a term uſed by the farmers to expreſs the common, and, as they ſuppoſe, neceſſary cuſtom, of changing among one another the *ſeed* of their lands, as wheat, and the like, it being a received opinion, that the *ſeed* produced on one land will grow better on another, than on that which produced it, though the ſame ſpecies of plant be ſown.

Seeds, in their natural climate, do not degenerate, unleſs culture has improved them; they then indeed are liable, upon omiſſion of that culture, to return to their natural ſtate again. Whatever benefit ariſes to the farmer from the changing the *ſeed* of the ſame ſpecies, is from cauſes which are themſelves the effects of different climates, ſuch as heat and moiſture, which may vary very much in the ſame neighbourhood. There is a mountain in the Mogul's country, which on the ſouth ſide produces Indian plants, and on the north ſide European ones, from different expoſures. Some land retaining water longer is colder, and ſome letting it paſs off quicker is warmer; as it may alſo be from the nature and figure of its parts, which retain more of the ſun's heat than others. Sandy and gravelly grounds are always warmer than others, if they have ſome hollow and ſpungy ſtratum underneath, that will let the water paſs off.

The benefit ariſing from the change of *ſeed* is owing to theſe changes, not to the change of food, and theſe cauſes ſhew their effects chiefly in the generation of the *ſeed*. Flax *ſeed*, brought from Holland, and ſown here, will produce as fine flax as it does there, but in the next generation it will degenerate, and become coarſer; by this means it will continue to degenerate every year, till after two or three years it is no better than our own *ſeed* produces, and yet the land ſhall be as good for this coarſe ſort, as when it produced the fine; ſo alſo it is, when the *ſeeds* of our own wheat are changed between farmer and farmer. And thus ſilk worms hatched and bred in France, of eggs brought from Italy, will make as fine ſilk as the Italian; but the eggs of thoſe laid in France, will produce worms that make no better ſilk than thoſe produced in France, though their food is all the while the ſame.

Common barley, once ſown in the burning ſands in Wiltſhire, will for many years after, if ſown on indifferent warm ground, be ripe ſooner than any other barley by two or three weeks; but if ſown on cold grounds farther north, it will be as late as any other barley, after two or three years. The weeds, which perplex the farmers in every field, grow as ſtrong and troubleſome one year as another, and that without any change of *ſeed* at all. Theſe ſeem therefore to have been the natural produce of our ſoil, and corn and other uſeful plants to have been brought from other places, and improved by culture; theſe will therefore no longer retain their perfection and value, than ſuch culture is continued to them.

Laurembergius has carried this notion of degeneracy and change from the ſoil, ſo far as to affirm that wheat will, in ſome places, degenerate into rye; and in other places, rye will be exalted into wheat by the ſoil: but thoſe who are acquainted with botany know, that a horſe might as ſoon be changed into a bull by feeding in an improper paſture, as one plant degenerate into another by fault of the ſoil. *Tull*'s Huſbandry, p. 116.

SEEDY, in the brandy trade, a term uſed by the dealers to expreſs a fault that is found in ſeveral parcels of French brandy, and which renders them unſaleable. The French ſuppoſe that theſe brandies obtain the flavour, which they expreſs by this name from the weeds which grew among the vines, from whence the wine, of which this brandy was made, was preſſed.

However it be, the thing is evident, and the taſte not of any one kind; but ſome pieces of brandy ſhall taſte ſtrongly of anniſeed, ſome of caraway ſeed, and ſome of other of the ſtrong flavoured ſeeds of plants, principally of the umbelliferous kind; ſo that it ſhall be rather taken for anniſeed, caraway, or ſome other water, than for brandy.

The proprietor of ſuch brandies is always at great trouble to get them off, and uſually is reduced to the neceſſity of mixing them in ſmall quantities with pieces of other brandies, ſo as to drown and conceal the taſte; and where he has not opportunities of doing this, is obliged to ſell them on very diſadvantageous terms.

The buſineſs of rectification of ſpirits is very little underſtood abroad, though very much practiſed with us; and a man in France or Holland, who could take off this taſte from theſe brandies, might get great advantages by it. There is no doubt but that the ſame means, which we uſe to rectify malt ſpirits, that is to clear it of its nauſeous and ſtinking oil, which always riſes with it in the firſt diſtillation, would alſo ſerve to purify theſe brandies, and by leaving theſe extraneous oils behind, render them as well taſted as any others; ſince there is no queſtion, but that the oil of malt, which is a principle of the ſame ingredient with the ſpirit, is more firmly united to it than theſe flavouring oils in the brandy, which are not the produce of the grape, but of ſome foreign matter only accidentally mixed with it. See the article RECTIFICATION.

It is a miſtake to imagine, that all the brandies made in France are ſo fine as thoſe which we meet with on the keys of London; on the contrary, there are many hundred pieces made every year, which are as badly flavoured as our coarſeſt malt ſpirit. But the caſe is this, they ſend the beſt brandies, and the beſt wines to England, where they can get the beſt prices for them. In Holland, on the contrary, the mart of goods of all ſorts, it is ſometimes difficult to pick one piece of good brandy out of fifty, the general run of them being either *ſeedy*, or muſty, oily, or otherwiſe infected with ſome unnatural and diſagreeable flavour; and

theſe are the ſorts which in France they deſpair of curing by re-diſtillation, or bringing to the ſtate of three fifths, or *trois cinques*, as they expreſs their ſtronger brandies. *Shaw*'s Eſſay on Diſtillery. See TROIS *cinques*.

SEELING (*Cycl.*)—SEELING, at ſea, is uſed in the ſame ſenſe nearly with heeling. When a ſhip lies down conſtantly, or ſteadily on one ſide, the ſeamen ſay ſhe *heels*; and they call it *ſeeling*, when ſhe tumbles on one ſide violently, and ſuddenly, by reaſon of the ſea forſaking her, as they call it; *i. e.* the waves leaving her for a time in a bowling ſea. When a ſhip thus tumbles to leeward, they call it *lee-ſeel*; and in this there is not much danger, even in a ſtorm, becauſe the ſea will preſently right her up again; but if ſhe rowls or *ſeels* to windward, there is fear of her coming over too ſhort or ſuddenly, and ſo by having the ſea break right into her, be either foundered, or elſe have ſome of her upper works carried away.

SEGITH, a word uſed by ſome of the chemical writers as a name for vitriol.

SEGMENTUM, among the Romans, an ornament of lace uſed by the women on their ſhoulders, which, according to ſome, reſembled our ſhoulder knots. *Pitiſc.* in voc.

Segmenta were likewiſe a kind of teſſelated, or Moſaic pavements, made up of pieces of various ſhapes and colours, but which had an uniform and regular arrangement. *Pitiſc.* Lex. Ant. in voc.

SEGUE, in the Italian muſic, is often found before *aria*, *alleluja*, *amen*, &c. to ſhew that thoſe portions or parts are to be ſung immediately after the laſt note of that part over which it is writ. But if theſe words, *ſe piace*, or *ad libitum*, are joined therewith, it ſignifies that theſe portions may be ſung, or not, at pleaſure.

SEGUENZA, in the Italian muſic, a kind of hymn ſung in the Roman church, generally in proſe. The *ſeguenze* are often ſung after the gradual, immediately before the goſpel, and ſometimes in the veſpers before the magnificat. They were formerly more uſed than at preſent.

The Romiſh church has retained three *ſeguenze*, called *le tre ſeguenze dell' anno*. They are *lauda Sion ſalvatorem*, &c. *victimæ paſchali laudes*, &c. *veni ſancte Spiritus*, &c. Theſe are ſung to muſic in many places. There is alſo one called *dies iræ*, *dies illa*, in the funeral ſervice, which is admirably well ſet, and on which Legrenzi, Lully, and others, have made excellent compoſitions. *Broſſard.*

SEIGNETTE's *ſalt*, a name given in France to a kind of ſal polycreſtus, famous a long time in that kingdom as a purge. It was otherwiſe called *ſal rupellenſis*, and was invented by Mr. Seignette. The Paris Academy took it into conſideration, and Mr. Geoffroy diſcovered that it was only a kind of ſoluble tartar, formed of cream of tartar and common pot-aſhes. See RUPELLENSIS *ſal.*

SEIGNIORY, *dominium*, in our law, is uſed for a manor or lordſhip. *Blount*, *Cowel.*

SEIM, in agriculture, a term uſed by the farmers of Cornwall to expreſs a certain determinate quantity of ſea ſand, which they uſe as manure to their lands.

They dredge this up on the ſea coaſts, and carry it as far toward the lands, where it is to be uſed, as they can by water. At the landing place the farmers bring a train of horſes to receive it, each horſe carrying a *ſeim*, that is a ſack of it, containing thirteen gallons. The land carriage of this ſand, in Cornwall alone, is ſuppoſed to coſt thirty two thouſand pounds annually; and yet the farmers find abundant encouragement to continue the uſe of it, it is ſo rich a manure. Philoſ. Tranſ. N° 103.

SEISACHTHEIA, Σεισαχθεια, in antiquity, a public ſacrifice at Athens, in memory of Solon's ordinance; whereby the debts of poor people were either entirely remitted, or at leaſt the intereſt due upon them leſſened, and the creditors hindered from ſeizing upon the perſons of their debtors, as had been cuſtomary before that time. *Potter*, Archæol. Græc. Tom. I. p. 430.

The word ſignifies the ſhaking off a burden.

SEISINA *habenda, quia rex habuit annum, diem et vaſtum*, in law, a writ that lies for delivery of *ſeiſin* to the lord of lands or tenements, after the king, in right of his prerogative, hath had the year, day, and waſte, on a felony committed. Reg. orig. 166. *Blount*, *Cowel.*

SEITAN, a name given by Aviſenna, and other of the Arabian writers, to a ſpecies of prickly tree, often recommended in their preſcriptions.

The word is ſometimes alſo written *ſeten*, *ſitan*, *ſetah*, or *ſetim.*

Pliny mentions this as a wood remarkably durable. He ſays it grew moſt plentifully in Egypt, and that it remained uncorrupted in waters. It is called by him, and others of the old Latin writers, *ſpina nigra*, the black thorn: and the durable nature of our common ſloe tree, or black thorn, growing in our hedges, has tempted ſome to believe it to be the ſame with the *ſetin*, or *ſpina nigra* of the antients; but this is overthrown by the common account of Pliny, and others, of ſhips being built of this wood, the ſmall ſize of our black thorn rendering it wholly impoſſible to put it to ſuch uſes.

Theodotion is to be underſtood of this wood, when he ſpeaks of the *ſetah*, or *acanthina.*

It is plain from Aviſenna, that this *ſetan*, or *ſeitan*, is no other than that ſpecies of *acacia*, which, from its producing our gum arabic, is called the gum arabic tree. Aviſenna calls the fruit of this *alcarad*, or *alcarath*; and in his account of it, he ſays that it is the fruit of a great thorny tree growing in Egypt, and in the region called Baſſera, and that the gum arabic exſudates from its trunk, and the acacia juice is prepared from its fruit alcarath. He adds, that the Ægyptians themſelves call it *ſitan*; and Proſper Alpinus tells us, that at this time they call it *ſant*. This word is eaſily derived from *ſitan*, and then the name is not a little inſtrumental to the proving what the tree was, as the *ſant* is evidently what Aviſenna ſays of the *ſitan*, the gum arabic tree.

We find the word *ſant* in ſome of the Arabians alſo, and they write it *ſatn*, whence the ſofter word *ſant* is as eaſily formed, as *botn*, the name of turpentine, is formed into *bont*, or, as ſome write it, *botin* or *botim*, and many other words in the materia medica of the antients, are ſpelt in the ſame manner. *Proſper Alpinus*, de Plant. Ægypt.

SEL, in the materia medica of the antients, a name given to the fruit of an Indian plant, reſembling the cucumber in its manner of growth, but bearing a fruit like a piſtachia nut.

There are three of theſe fruits mentioned by the Arabian writers, the *bel*, *fel*, and *ſel*. See BEL and FEL.

They tell us expreſsly that the *bel* and *fel*, as alſo the fruit *ſel*, were not the fruit of a tree, but of a plant, and that of the creeping kind. It is very probable, that the other *fel* of Aviſenna is the root of the *nymphæa indica*, which he mentions in the chapter of *nenuphar*, as poſſeſſing the ſame virtues which he attributes to this ſort of *fel*, that is the ſame with thoſe of mandrake.

SELAGINOIDES, in botany, the name of a genus of moſſes, the characters of which are theſe. The capſules are produced in the alæ of the leaves, in the manner of thoſe of the ſelago, but they are of a different form, being tricoccous, and ſometimes quadricoccous, and opening, when mature, into ſo many valves. See Tab. of Moſſes, N° 16.

Of this genus of moſs we have only one known ſpecies, which is the prickly *ſelaginoides*, commonly called *ſeeding mountain moſs*. This is found in the mountainous parts of Yorkſhire, and in Wales, and loves rocky and moiſt places. *Dillen.* Hiſt. Muſc. p. 461.

SELAGO, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe. The perianthium is ſmall, and remains after the flower is fallen. It is compoſed of one leaf, divided into four ſegments at the edge. The flower conſiſts of one petal, formed into a tube, which is very ſmall, and ſcarce ſenſibly perforated, and a limb or verge, which is expanded, and divided into five ſegments; the two upper of which are the ſmalleſt, and the under one the largeſt of all. The ſtamina are four capillary filaments, of the length of the flower, into which they are fixed at the baſe; the two upper ones of theſe are longer than the reſt, and their antheræ are ſimple. The germen of the piſtil is roundiſh. The ſtyle is ſlender, and of the length of the ſtamina. The ſtigma is ſimple and acute. The flower finally involves the ſeed, which is ſingle, and of a roundiſh figure. *Linnæi* Gen. Plant. p. 300.

The characters of this genus of moſſes, according to Dillenius, are theſe. The capſules are produced in the alæ of the leaves, and are either reniform, or globular, and have neither pedicle, operculum, nor calyptra, like the capſules of the other moſſes. They have only one cavity, and part into two valves when ripe. To this it may be added that the plants are all rigid and ſhrubby, and the ſtalks as well as roots are dichotomous. See Tab. of Moſſes, N° 13.

Of this genus of moſſes the following are all the known ſpecies. 1. The common upright fir moſs, or *ſelago*, reſembling the common ſpruce fir. This grows to four or five inches high, and is found in the crevices of ſtones, and in ſome places on the ground, in the mountainous parts of Yorkſhire and in Wales. There are three or four varieties of this moſs, found in different places, which might lead a new obſerver into the error of ſuppoſing them new ſpecies. 2. The American *ſelago* with notched and reflected leaves. This grows in Penſylvania, in wet clayey ſoils. 3. The camphorated leaved *ſelago*, called by ſome authors the *coris-leaved american moſs*. It is found in North America, and its branches are often a foot long, divided at different parts in a dichotomous manner; ſo that it ſpreads greatly, taking root all the way that it paſſes. It generally creeps upon the barks of trees. 4. The coris-leaved *ſelago*, called by Plumier the *great ſavin-leaved moſs*. This alſo grows in North America. 5. The toad-flax-leaved *ſelago*. This alſo is an American moſs, and grows on the trunks and branches of trees. *Dillen.* Hiſt. Muſc. p. 436.

SELANION, in botany, a name by which ſome authors have called the common *crocus vernus*, or the garden ſpring flower we call the *crocus*. *Ger.* Emac. Ind. 2.

SELATUS, one of the many names by which the chemical writers have called quickſilver.

SELENÆ,

SELENÆ, Σελῆναι, in antiquity, a kind of cakes uſed in ſacrifices, and ſo called from their being broad and horned, in imitation of the new moon. *Potter*, Tom. I. p. 214.

SELENDERS, in the manege, are chops or mangy ſores in the bending of a horſe's hough, as the malenders are in the knees. See MALENDERS.

SELENEUSIACA *terra*, *earth of Seleneuſia*, in the materia medica of the antients, a light fungous earth called by later naturaliſts *agaricus mineralis*, and when found in form of powder, or in a diſcontinuous ſtate, *lac lunæ*.

It is an earth common enough, wherever there are ſtone quarries, all over the world; but the fineſt ever met with, is that from Sicily, the place where the antient *Seleneuſia*, or *Selinus* ſtood, and from whence the antient phyſicians had it. Some of them have called it the *creta Seleneuſiaca*; but all their deſcriptions agree in proving it to be this very earth now found there. Dioſcorides and Galen mention its remarkable diffuſibility in water, and Pliny mentions its melting into a kind of juice, or ſmooth homogene ſubſtance with it; properties ſo very applicable to this earth, and ſo little ſo to any other, as to leave no doubt of their having been originally applied to the very ſame ſubſtance.

The antients gave it internally as an aſtringent; but its principal uſe was external, as a coſmetic among the ladies. And Dr. Plot recommends our lac lunæ, on perſonal experience, for the ſame purpoſes. *Hill*'s Hiſt. of Foſſils, p. 40. See the article AGARICUS *mineralis*.

SELENIACON, a name for a kind of amulet worn for the epilepſy.

SELENITES, (*Cycl.*) in natural hiſtory, the name of a large claſs of foſſils, the characters of which are theſe. They are bodies compoſed of ſlender, and ſcarce viſible filaments, arranged into fine, even, and thin flakes; and thoſe diſpoſed into regular figures, in the ſeveral different genera, approaching to a rhomboide, or hexangular column, or a rectangled parallellogram: fiſſile, like the talcs, but that not only in a horizontal, but alſo in a perpendicular direction: they are flexile in a ſmall degree, but not at all elaſtic: they do not ferment with acid menſtrua, but readily calcine in the fire. See Tab. of Foſſils, Claſs 2.

Of this claſs there are ſeven orders of bodies, and under thoſe ten genera. The *ſelenitæ* of the firſt order are thoſe compoſed of horizontal plates, and approaching to a rhomboidal form. Of the ſecond are thoſe compoſed of horizontal plates, arranged into a columnar and angular form. Of the third are thoſe whoſe filaments are ſcarce viſibly arranged into plates, but which, in the whole maſſes, appear rather of a ſtriated, than of a tabulated ſtructure. Of the fourth are thoſe which are flat, but of no determinately angular figure. Of the fifth are thoſe formed of plates, perpendicularly arranged. Of the ſixth are thoſe formed of congeries of plates, arranged into the figure of a ſtar. And of the ſeventh, are thoſe of a complex and indeterminate figure. *Hill*'s Hiſt. of Foſſ. p. 119, 120.

Of the firſt of theſe orders there are three genera. 1. The *leptodecarhombes*. Theſe are thin *ſelenitæ* of a rhomboidal figure. 2. The *pachodecarhombes*. Theſe are thicker *ſelenitæ* of a rhomboidal figure. The *ſelenitæ* of both theſe genera conſiſt of ten planes each. 3. The *tetradecarhombes*. Theſe are *ſelenitæ* of a rhomboidal figure, but conſiſting of fourteen inſtead of ten planes. See the articles LEPTODECARHOMBES, PACODECARHOMBES, and TETRADECARHOMBES.

Of the ſecond order there are alſo three genera. The firſt the *iſchnambluces*. Theſe are *ſelenitæ* of a flatted columnar octohaedral figure, conſiſting of ſix ſides, and two broken ends. 2. The *iſambluces*. Theſe are *ſelenitæ* of an octohaedral columnar form, but not flatted. 3. The *oxuciæ*. Theſe are *ſelenitæ* of a columnar form, but not truncated, or with broken ends, but tapering off at each end to a point. See the articles ISCHNAMBLUCIS, &c.

Of the third order there is only one known genus, the *inambluciæ*. Theſe are columnar *ſelenitæ* with abrupt ends, and of a fibroſe, not tabulated texture.

Of the fourth order there is alſo only one known genus, the *ſanidia*. Theſe are *ſelenitæ* of no determinate figure, but of a tabulated ſtructure, and reſembling the foliaceous tubes. See the articles INAMBLUCIA and SANIDIA.

Of the fifth order there is alſo only one known genus, the *cathetolipes*. Theſe are octohaedral *ſelenitæ* with perpendicular plates, and obtuſe angles. *Hill*'s Hiſt. of Foſſ. p. 121, 122, 123.

Of the ſixth order there are two genera. 1. The *lepaſtra*. Theſe are *ſelenitæ* compoſed of filaments, arranged into plates, and diſpoſed in form of a ſtar. 2. The *trichestra*. Theſe are *ſelenitæ* compoſed of filaments, ſcarce viſibly arranged into plates, but diſpoſed in threads into the form of a radiated ſtar, and appearing merely of a ſtriated texture. See the articles LEPASTRA and TRICHESTRA.

Of the ſeventh order there is only one genus, the *ſymplexia*. Theſe are *ſelenitæ* compoſed of various irregularly connected bodies, of the ſtructure and general figure of one or other of the former genera. See the article SYMPLEXIUM.

The ſtructure of the *ſelenitæ* of all the genera of the firſt order is exactly alike, they are all compoſod of a great number of broad flakes or plates, in a great meaſure externally reſembling the flakes of the foliaceous talcs. Theſe are of the length and breadth of the whole maſs. The top and bottom being each only one ſuch plate, and thoſe between them, in like manner, each compleat and ſingle, and the body may always be eaſily and evenly ſplit, according to the direction of theſe flakes. Theſe differ, however, extremely from the talcs; for they are each compoſed of a number of parallel threads, or filaments, which are uſually diſpoſed parallelly to the ſides of the body, though ſometimes parallelly to its ends. In many of the ſpecies they are alſo divided by parallel lines, placed at a conſiderable diſtance from each other, and the plates in ſplitting often break at theſe lines: add to this, that they are not elaſtic, and that they readily calcine. *Hill*'s Hiſt. of Foſſ. p. 120.

The ſtructure of thoſe of the ſecond order is the ſame with that of the firſt; but that in many of the ſpecimens of them, the filaments, of which the plates are compoſed, run in two directions, and meet in an obtuſe angle; and in the middle there is generally ſeen in this caſe a ſtrait line, running the whole length of the column, and ſmall parcels of clay inſinuating themſelves into this crack, repreſent in it the figure of an ear of graſs ſo naturally, as to have deceived many into a belief, that there was really an ear of graſs there. The other orders conſiſting only of ſingle genera, the ſtructure of each is explained under the generical name. *Hill*'s Hiſt. of Foſſ. p. 121. See the articles LEPTODECARHOMBIS, &c.

SELF (*Cycl.*)—SELF *opens*, a term uſed by the miners in the north of England to expreſs certain natural cavities, or chambers, which are frequently met with, ſome near the ſurface, ſome at very great depths, ſome ſmall, and others very large.

Theſe are of various figures, and often run into ſtrange ſinuſes. Dr. Liſter, in accounting for the origin of earthquakes, ſuppoſes the whole cruſt of the earth to be more or leſs hollowed in this manner; which he alſo argues for, from the ſtreams of waters which ariſe in large quantities from the ſides of mountains, and muſt have communication with theſe *ſelf opens* and ſupplies from them.

Theſe natural hollows the doctor thinks to be the means of continuing, and propagating earthquakes; the firſt cauſe of which he aſcribes to the breath of the pyrites, which he alſo ſays is the pyrites itſelf *tota ſubſtantia*. This he obſerves takes fire of itſelf, on being expoſed to the air in our ſight, and may do ſo, from various other cauſes, underground. The ſulphureous ſmell of the air and waters, before and after earthquakes, in the places where they happen, ſeems a proof that they owe their origin to ſome ſuch ſulphureous matter as this ſtone; and the rolling, and deſultory noiſe of an earthquake, ſeems alſo to ſhew that it is not expanded every way at once, but is propagated through a chain of theſe ſubterranean hollows.

It is not neceſſary that we ſhould ſuppoſe a continued chain of them, from the place where the earthquake begins to be felt, to the ſpot where it ends; but if there are many of them irregularly ſcattered about the earth, the force of the exploſion will be ſufficient to burſt through the ſolid parts between, and open a paſſage from one to the others, which may continue open no longer than the force continues, and after the ſhock is over cloſe together again, ſo as to leave no trace where it was.

Our miners not only find the natural caverns, but they alſo find them often full of what they call *fire damps*, which are inflammable vapours, of the very nature of thoſe which occaſion earthquakes, and when fired make the ſame exploſions, and cauſe the ſame effects in a certain degree. Theſe ſometimes require a candle, or other actual fire, to come in contact, in order to kindle them; but ſometimes they are found kindled of themſelves, and flaming on the ſurface of the waters, in the bottoms of the pits, or at the fiſſures of the coal. Philoſ. Tranſ. N° 157.

SELI, in botany, a word formed by an abbreviation of the word *ſeſeli*, and ſignifying the ſame plant. See the article SESELI.

SELICHA, a name given by the Arabians to a kind of cinnamon. See the article CINNAMUM.

SELIGONION, in botany, a name by which ſome authors have called piony. *Ger.* Emac. Ind. 2.

SELION *of land*, *ſelio terræ*, is derived from the French, *ſeillon*, which ſignifies a ridge of land, or ground ariſing between two furrows, and contains no certain quantity, but ſometimes more and ſometimes leſs. Therefore Crompton ſays, that a *ſelion of land* cannot be in demand, becauſe it is a thing uncertain. *Crompt.* Juriſ. 221. Terms of Law.

SELKIE, the name in Zetland for a ſeal. Many of theſe are found in that iſland. Philoſ. Tranſ. N° 473. ſect. 8.

SELL *bed*, in mining, a term uſed in ſome parts of England to expreſs ſome particularly rich parts of the vein of ore.

In Cornwall they ſometimes find the tin ore ſo pure, that it requires only bruiſing to dreſs it, without the waſhing and ſeparation by grates, launders, and the like means: they call theſe collections of ore the *ſell beds* of tin; and it is obſerved

ſerved that theſe never have any ſtrings iſſuing from them, as the other lands have. Philoſ. Tranſ. N° 69.

SELLA, among the Romans, a chair in which the old and infirm were carried by ſervants through the city, and in journeys. Sometimes the phyſicians preſcribed it as an exerciſe. *Pitiſc.* in voc.

SELLA *curulis*, among the Romans. See CURULE *chair*, *Cyc.*

SELLIGA, in the materia medica, a name by which ſome authors have called the *nardus Celtica*, or Celtic ſpikenard of the ſhops. *Ger.* Emac. Ind. 2.

SELLI, Σελλοι, in antiquity, an appellation given to thoſe who firſt delivered oracles. Theſe, according to Strabo and Euſtathius, were men, and the name *ſelli* is ſaid to come from *Sellæ*, a town in Epirus, or from the river called by Homer *Selleis*. *Potter*, Archæol. Græc. l. 2. c. 8. Tom. I. p. 267, ſeq.

SELTZER-*water*, the name of a mineral water of Germany, which ariſes near Neider Seltz, and is now uſed in England and many other countries.

We called it *Seltz*, or *Seltzer water*, and the phyſicians preſcribe it in many caſes, as ſcurveys, ſpaſmodic affections, and in conſumptions; in the laſt caſe, mixing it with aſſe's milk.

Hoffman, in his examination of the principles of this water, obſerves, 1. That on the mixing any acid with it, whether it be a weak or a ſtrong one, there is an immediate effervescence; and on the mixing it with Rheniſh wine and ſugar, there is a very remarkable emotion and noiſe, and the whole body of the liquor appears milky for ſome time. 2. If they are mixed in equal quantities with fine old Rheniſh wine alone, they become turbid, and acquire a brown colour, with a caſt of reddiſhneſs; like that produced by mixing oil of tartar, or the urinous ſpirit of ſal armoniac, with good wine. 3. The taſte of theſe waters is not of that penetrating, ſubacid kind, which moſt of the other mineral waters are of, but rather has a flavour like that of a diluted ſolution of a lixivial ſalt. 4. On putting powder of galls into them, they do not become purple, nor do they blacken the ſtools of thoſe who drink them. 5. On adding oil of tartar to them they become milky, but throw down no precipitate. 6. A quart of theſe waters gently evaporated, yields a drachm and twelve grains of a ſaline matter, and this diſſolved and filtrated, yields, on a ſecond evaporation, two ſcruples of a pure alkaline ſalt. This ſalt diſſolved in water, and added to a ſolution of corroſive ſublimate, precipitates a yellow powder, or turbith mineral; and mixed with an infuſion of rhubarb, gives it a reddiſh colour; mixed with ſal armoniac, it raiſes a pungent ſmell. 7. A quart of this water being ſaturated with ſpirit of vitriol, to the ceaſing of the ebullition on dropping it in, and afterwards gently evaporated, affords a drachm and a half of ſalt, no way diſtinguiſhable from tartarum vitriolatum. 8. No medicinal water is ſo ſubject to ſpoil and corrupt as this in the keeping; for which reaſon the jars muſt be well filled, and nicely ſecured with ſound corks, pitched over. 9. If a quantity of this water be ſet for a day or two in an open veſſel, it wholly loſes its natural flavour, and taſtes only as if oil of tartar had been mixed with common water: in this change it is obſervable alſo, that there is no earthy matter precipitated.

It appears from all theſe obſervations, that this water abounds with an alkaline ſalt in a much greater quantity, than any other of the known mineral waters; and it ſeems to contain no particle of the common ingredients of the other mineral waters, which are a ferrugineous earth, and a bitter purging ſalt, of the nature of Glauber's ſalt. Hence it does not purge by the belly, but generally goes off by urine. It is one of the mildeſt, and moſt innocent of all the mineral waters, and may be taken by perſons of the weakeſt conſtitution. *Hoffman*, Opera, Vol. 5. p. 144.

SEMAMPLEXICAULE *leaf*. See LEAF.

SEMBELLA, among the Romans, a ſmall ſilver coin, equal in value and weight to half the *libella*. *Pitiſc.* in voc. See the article LIBELLA.

SEMICIRCULARIS *palpebrarum muſculus*, in anatomy, a name given by Spigelius, and ſome others, to one of the muſcles of the face, called by Albinus and Winſlow the *muſculus orbicularis palpebrarum*. See MUSCULUS.

SEMI-CUBICAL *parabola*, a curve of the ſecond order, wherein the cubes of the ordinates are as the ſquares of the abſciſſes. Its equation is $axx = y^3$.

SEMI-DITONUS, in muſic, is uſed by ſome writers, as Salinas, for the third minor.

SEMIFLOSCULOUS, in botany, a term uſed to expreſs the flowers of a certain claſs of plants, of which the dandelion, hawkweed, and the like, are kinds.

This ſort of flower conſiſts of a number of *ſemifloſculi*, which are either diſpoſed into one or more circles, and all comprehended in the ſame cup, which often becomes inverted as the flower ripens. Theſe *ſemifloſcules* are petals, hollow in their lower part, but in their upper half are flat, and continued in the ſhape of a tongue. Theſe are often ſeparated from each other by intermediate leaves, and are placed upon the embryo fruit, from which there ſtands out a ſlender capillament, divided at the end into two parts; often carried beyond the vagina, ſupported by five props. The embryos are placed in the thalamus, or bottom of the cup, and finally become ſeeds, ſometimes winged with down, ſometimes naked, ſometimes coronated, and ſometimes foliated. See Tab. 1. of Botany, Claſs 1. *Tourn.* Inſt. p. 467.

SEMI-INTEROSSEUS *indicis*, a ſmall ſhort flat fleſhy muſcle, very like the antithenar, or internal *ſemi-interoſſeus* of the thumb. It is ſituated obliquely on one ſide of that of the thumb, between the firſt phalanx thereof, and the firſt metacarpal bone. It is fixed by one end to the outſide of the baſis of the firſt phalanx of the thumb, and a little to that bone of the carpus, by which this phalanx is ſupported; and by the other end it is fixed near the head of the firſt phalanx of the index, on that ſide next the thumb. It lies almoſt parallel to the antithenar, croſſing it a little; this muſcle lying on the convex ſide of the hand, and the antithenar on the concave. *Winſlow*'s Anatomy, p. 202.

SEMILUNARES *cochleæ*, in natural hiſtory, the name of a genus of ſea ſnails, ſo called, from their having ſemicircular mouths. See Tab. of Foſſils, Claſs 9. and Tab. of Shells, N° 6.

The characters of the genus are theſe. They are univalve ſhells of a compact body, with a flat ſemicircular, and often dentated mouth. Some of the ſpecies have exerted apices, and ſome depreſſed.

There are many diſtinctive and ſpecific characters in the ſeveral ſpecies of this genus, which arrange together conſiderable numbers of the ſpecies under each. Thus the *neritæ*, which are of this genus, are ſome of them umbilicated, and others have teeth, and a kind of gums. The *ſnail* kinds, diſtinctly ſo called, that fall under this genus, are very different from the *neritæ*, in that they have no teeth, no gums, and no palate. The term *ſemilunares cochleæ* was invented by Rumphius to expreſs their mouths, being of the ſhape of half of a circle.

Bonani is of opinion that the *neritæ* were ſo called, from their being born of the ſea, and called by a name expreſſive of that origin by way of eminence, as an honour to their watery parent. To make out the juſtice of this derivation, it was neceſſary to ſuppoſe the *nerita* more beautiful than other ſhells; and in order to give them a claim to this character, the author has introduced into the family of the *neritæ* the trumpet ſhells and porcellanes. Some authors have called them *natrices*, from their ſwimming, affirming that they ſwim in the manner of the nautilus, by ſetting their mouths before the wind. This is an opinion as old as Pliny, but it is as erroneous as many others of the opinions of that author. The *neritæ* generally inhabit caverns in the ſides of rocks, and uſually ſtick faſt to the ſtone. *Bonani*, Recreat. Ment. et Ocul. p. 56. *Aldrovand.* de Teſtac. l. 3. c. 80. *Plin.* l. 9. c. 33.

All the ſpecies of the *ſemilunar* ſhells have few convolutions, and have the extremity of the voluta ſmall, and uſually ſtanding a little out.

The ſpecies of the *ſemilunar cochleæ* are theſe, as arranged under the two general diviſions of dentated *neritæ*, and umbilicated *cochleæ*. 1. The dentated *nerita*, commonly called the *gum-ſhell*. 2. The bloody tooth-*nerita*. 3. The ox-palate-*nerita*. 4. The ſtriated and punctulated *nerita*. This ſpecies, when robbed of its outer coat, and poliſhed, aſſumes a very different appearance, and is ſeen in the cabinets of the curious, under the name of a faſciated *nerita* with black and yellow variegations. 5. The canaliculated *nerita*. 6. The furrowed *nerita*. 7. The thruſh-*nerita*. 8. The partridge-*nerita*.

Of the *neritæ* which have no teeth, the following are the known ſpecies. 1. The jaſper-*nerita* with a long beak. 2. The jaſper-*nerita* with an operculum. 3. The lemon-coloured pea-*nerita*. 4. The yellow pea-*nerita*. 5. The prickly *nerita*. 6. The reticulated *nerita*. 7. The *nerita* variegated with black ſpots. 8. The red and white faſciated *nerita*. 9. The lightly ſtriated green *nerita*. 10. The undulated *nerita*.

Of the umbilicated *ſnails*, we have the following ſpecies. 1. The long umbilicated *cochlea*. 2. The *cochlea* with an exerted apex. 3. The *cochlea* with a depreſſed apex. 4. The teſticulated *cochlea*. 5. The hermit *cochlea*. 6. The umbonated *cochlea*. 7. The ſmall nipple *cochlea*. 8. The heavy white *cochlea*. And 9. the orange-coloured *cochlea*. Hiſt. Naturel. Eclairc. Part 2. p. 256.

SEMIMEMBRANOSUS, in anatomy, a long thin muſcle, partly tendinous, and ſituated on the backſide of the thigh, a little toward the inſide.

It is fixed above by a ſtrong broad tendon, or long aponeuroſis, in the irregular obtuſe, prominent line, which goes from the acetabulum to the tuberoſity of the iſchium, a little above the inſertion of the ſeminervoſus, and between thoſe of the gemellus inferior, and quadratus; mixing ſome fibres with the triceps tertius. From thence it runs down fleſhy, in an oblique direction, behind the inner condyle of the os femoris; below which it terminates in a thick tendon, which is inſerted in the poſterior and interior ſide of the inner condyle of the tibia, by three ſhort branches; the firſt,

or uppermoſt of which, goes a little toward the inſide, the ſecond more backward, and the third lower down. Before it is inſerted, it ſends off ſometimes an aponeuroſis, like that of the biceps. *Winſlow*'s Anatomy, p. 216.

SEMINAL (*Cycl.*)—SEMINAL *leaves*, two ſoft, plain, and undivided leaves, that firſt ſhoot forth from the greateſt part of all ſown ſeeds, and are different from thoſe of the ſucceeding plant in figure, texture, and all other reſpects.

SEMINAL *root*, in natural hiſtory, a name given by Grew to that part of the ſeeds of plants, which may otherwiſe be called the inner body of the ſeed: this is diſtributed through the parenchyma of the ſeed, but is wholly different from it, and diſtinguiſhed by Dr. Grew from the radicle, which becomes the plant root in its future growth. The parenchyma of the ſeed is, in ſome degree, that to the *ſeminal root*, which the mould or earth is to the plant root, or radicle; and the *ſeminal root* is to the plant root, what the plant root is to the trunk. *Grew*'s Anat. of Plants.

SEMINALIS, in botany, a name by which ſome authors have called horſetail. *Ger.* Emac. Ind. 2.

SEMINARY, (*Cycl.*) in gardening, the term uſed for the ſeed plot, or place allotted for raiſing plants from ſeed, and keeping them till they are fit to be removed into the garden, or nurſery.

When the *ſeminary* is intended for trees, it muſt be large, and of a ſoil adapted to the generality of the trees intended to be raiſed in it: but that which is moſt in uſe, is for the ſupply of the flower-garden, and is the place where flowers are to be raiſed from their ſeeds, to procure varieties, or, as the floriſts expreſs it, new flowers; as alſo for the ſowing all the biennial plants, to ſucceed thoſe which decay in the flower garden.

The *ſeminary* ſhould always be ſituated at ſome diſtance from the houſe, and be walled or paled round, and kept under lock and key, to keep out dogs, *&c.* and to prevent a great deal of damage, that is frequently done by thoſe who are not acquainted with gardening, before they are aware of it. The ſeveral directions, for the management of the *ſeminary*, are to be ſeen under the names of the ſeveral plants intended to be raiſed in it. *Miller*'s Gard. Dict.

SEMINERVOSUS, in anatomy, a name given by Riolan, and ſome others, to a muſcle of the thigh, more generally known by the name of the *ſemitendinoſus*. The French in general, however, call it *le demi nerveux*. Cowper calls it *ſeminervoſus ſeu ſemitendinoſus*; and Albinus ſeems to claim the merit of aſcertaining its true name of *ſemitendinoſus*.

It is a long muſcle, half fleſhy and half tendinous, or like a nerve. It is ſituated a little obliquely on the poſterior and inner part of the thigh. It is fixed above to the poſterior part of the tuberoſity of the iſchium, immediately before, and a little more inward than the biceps. It is afterwards fixed by fleſhy fibres to the tendons of the biceps, for about the breadth of three fingers, much in the ſame manner as the coraco-brachialis is fixed to the biceps of the arm. From thence it runs down fleſhy toward the lower part of the inſide of the thigh, having a ſort of tendinous interſection in the inner part of its fleſhy portion. Having reached below the middle of the thigh, it terminates in a ſmall long round tendon, which runs down to the inſide of the knee, beſide that of the gracilis, where it expands in breadth. It is inſerted in the inſide of the upper part of the tibia, about two or three fingers breadth below the tuberoſity of the ſpine, immediately under the tendon of the gracilis internus, with which it communicates. It has the ſame oblique form with the gracilis and ſartorius, and ſends off a like kind of aponeuroſis. *Winſlow*'s Anatomy, p. 215.

SEMINIUM, a term uſed by the writers on foſſils to expreſs a ſort of firſt principle, from which the ſeveral figured ſtones, or, as they are more uſually called, the extraneous foſſils, are ſuppoſed to have their origin.

The generality of the learned world, at this time, ſuppoſe theſe to be the remains of real ſhells, *&c.* brought from the ſea to the places where they are now found, at the time of the univerſal deluge. See the article FIGURED *ſtones*.

But thoſe who diſſent from this ſyſtem pretend, that theſe foſſile bodies, though they exactly repreſent ſhells, *&c.* yet never were in the ſea at all, but that their minute firſt principles, or, to uſe their own term, their *ſeminia* have been carried from the ſea, through ſubterranean paſſages, to the places where we now find the compleat ſhells, *&c.* into which they have grown. Langius, who has written expreſsly on this ſubject, though he has candidly collected all that has been ſaid in favour of the diluvian ſyſtem, by the abettors of it, yet is not convinced by thoſe arguments, but rather inclines to the other ſide of the queſtion, or the riſe of ſuch foſſils from *ſeminia*.

The ſubſtance of this hypotheſis is as follows: that the ſenſible and perfectly formed ſeeds, or principles of growth of ſhell-fiſhes, and other ſea productions, which, yet extremely ſmall and light, is raiſed from among the fleſh of putrid, or at leaſt of dead ſea fiſh of theſe kinds; and thence, by its extreme lightneſs, is wafted up and down in the water, and after that is raiſed among the vapours iſſuing from that water; and being then received into the air, fluctuate about in that vehicle alſo, till it is received into the pores or inteſtines of the earth; and when there, is wafted about by the aſcent and motion of the vapours, and a number of other accidents, through the fiſſures of the ſeveral ſtrata, and even through the pores of ſtone; and that it thus wanders about, at the will of ſuch irregular agents, till in its courſe it chance to find ſome bed, or matrix, proper to its growth or expanſion, and when received into that it adheres firmly to it, and is no more the ſport of the paſſing exhalations, but remains there, till by the mediation of the ſubterranean heat its principles of growth are put in action, and its latent plaſtic power excited. Then they ſay, that by means of its ſeminal aura, and the lapidific, or petrifying nature of the place where it lies, all ſuch fluid matter, as is fitted to make a part of its ſubſtance, is collected to it, and is petrified, or hardened into ſtone, and conſequently that a ſtony body is thus found, of the ſame ſhape and figure in which a ſhelly one would have been formed in the ſea, where there would have been no petrifying principle to have made it aſſume the nature of a ſtone.

The arguments uſed, in ſupport of this hypotheſis, are theſe. That there are difficulties attending every ſyſtem, by which men have attempted to account for the finding of ſea ſhells at the tops of mountains; but that this ſyſtem is liable to leſs than the others, as it is much more eaſy to conceive how the *ſeminia*, or minute firſt principles of theſe things, ſhould be carried to ſuch diſtant and high places, than how the full grown bodies themſelves ſhould; and particularly, that it is very difficult to conceive how ſuch large and tender ſhells, as thoſe of the cornua ammonis, ſhould be carried unhurt to ſuch heights; though not very wonderful, that the *ſeminium* of ſuch a ſhell ſhould be carried thither, and there grow into the ſhape of its parent animal.

The congeries of extremely minute ſhells, that we find in ſome places immerſed in hard ſtones, are urged as another argument againſt the diluvian hypotheſis, as it is ſuppoſed that their tender ſtructure in that ſtate could never have ſupported the toſſing about in an ocean of waters; and Langius adds to theſe general arguments two others, from the cornua ammonis of the foſſile kingdom, which were in his own poſſeſſion; the one of which he ſays was truly in an embryo ſtate, and very incomplete, and the other had a vaſt number of ſmall ſhells of other kinds encloſed in it, which he ſuppoſes to have grown there. To this he adds the impoſſibility, as it appears, of certain conchitæ, which are compoſed of thin laminæ, bearing the daſhing of the waters, by which they muſt have been brought to the places where we find them, without being broken all to pieces, which yet are found whole and unhurt on mountains; and finally, that there occur in ſome ſtones the figures of ſhell-fiſh, of an uncommon, and even monſtrous kind, ſuch as it is ſuppoſed never exiſted in their mutilated or compleated figures in any living ſtate.

Theſe foſſile ſhells are uſually found throughout of one and the ſame ſubſtance, and that the moſt different imaginable from the ſubſtance of the living creatures which they repreſent; and often, though found in pairs, and perfectly cloſed on all ſides, yet when broken they are found full of the ſubſtance of the ſtone in which they lie, and the armature of ſeveral kinds of them, particularly of many of the cornua ammonis, is ſuppoſed to plead greatly in favour of this hypotheſis; as it is not of the nature of, or at all owing to the ſubſtance of the matrix, in which they lie, or of the matter of which they are formed, and is therefore to ariſe ſolely from the nature of the *ſeminium*, from which they are formed.

The immenſe number of the ſea ſhells, as they are called, thus found foſſile, is alſo thought to argue much on this ſide of the queſtion; as the favourers of this hypotheſis ſuppoſe that the ſea could not, at any one time, have given up ſuch numbers as the earth is ſtocked with, though there are no limits to the numbers ſuppoſed to be raiſed from *ſeminia*; and the immenſe columns of black marble, found in Ireland, and found of ſuch regular joints, are brought as a proof of the poſſibility of ſuch a formation of foſſils as this from *ſeminia*, which they ſuppoſe muſt have given origin to thoſe pillars.

The ſyſtem of the deluge, as delivered by Woodward, is the hardeſt thing for the abettors of this doctrine of the *ſeminia* to get over; but tho' they affirm that this author's account is contrary to reaſon, and to the ſcripture account of that fatal cataſtrophe, yet it is not eaſy to account for many things, in regard to foſſils, on any other foundation. They obſerve that as this deluge was univerſal, all places throughout the earth ought to have been furniſhed with foſſile ſhells by it; but that this is not the caſe, ſince many large tracts of land have none of them. It is uſually obſerved, that the deluge only could carry ſhells into the heart of mountains; but the aſſertors of this doctrine affirm, that this may be done according to their ſyſtem, ſince the *ſeminia* of foſſils may be as eaſily ſuſtained in the air, as thoſe of plants and animals, and that they may ſo be conveyed into the inmoſt receſſes of the earth through pores and cracks, not viſible to us: and they ſay, that when there they do not want a

proper nutritious matter, ſince the ſtony particles they find there are much of the nature of their natural ſhells in the ſea.

The growth of the foſſile ſhell from its *ſeminium* is ſuppoſed, by theſe writers, to be inſtantaneous, not progreſſive; and the reaſon they give for this is, that there is abundant matter for the formation of it in readineſs altogether. They advance, that it is not at all more difficult for nature to form a ſhell from ſuch a *ſeminium* in the earth than in the ſea, provided all the neceſſary requiſites are in readineſs, which they ſuppoſe, in this caſe, to be plainly the fact; and they diſallow the analogy between the formation of theſe bodies and cryſtals, becauſe they obſerve that theſe are formed from *ſeminia*, thoſe only from appoſition of particles. They alſo obſerve that theſe ſhells, as they are formed in the earth, can never have been inhabitants of the ſea in that form, becauſe they never have any thing truly of the nature of ſhelly matter about them. This is, however, abſolutely an error. The foſſile nautili have uſually a great deal of the true pearly matter of the ſhell about them, and all the arguments, given in favour of this ſtrange hypotheſis, ſeem as eaſily confuted. The reader has an opportunity, however, of examining this ſyſtem in its full force; and on comparing it with the diluvian ſyſtem, delivered under the article of FIGURED *ſtones*, will be able to judge whether the preſent age be in the right or not, in giving the preference to that ſyſtem. *Langii* Hiſt. Lap. Fig.

SEMIORBICULARIS *labiorum*, a name given by Winſlow, and others, to the muſcle called by Albinus *orbicularis oris*, and by others *conſtrictor*, and *ſphincter labiorum*.

SEMIREVERBERATORY *fire*, in chemiſtry, a term uſed to expreſs ſuch a reverberatory fire, in which the flame is only beaten back upon the bottom of the veſſel.

SEMIS, among the Romans, the half of the *as*. See the article As, *Cycl.*

SEMISICILICUS, a word uſed by ſome pharmaceutic writers to expreſs a drachm.

SEMISIDERATUS, a word uſed by ſome for a perſon ſtruck with a hemiplegia.

SEMI-SOSPIRO, in the Italian muſic, a little pauſe, of the eighth part of a bar in common time. See PAUSE, REST, CHARACTER, *Cycl.*

SEMI-SPINALIS, a muſcle, called alſo *tranſverſo-ſpinalis dorſi*. It is a fleſhy maſs, which, from all the ſpinal and tranſverſe apophyſes of the back and loins, is extended in diſtinct faſciculi over the vertebræ themſelves.

It is made up, like that of the neck, of ſeveral oblique converging muſcles, the uppermoſt of which is fixed below to the third tranſverſe apophyſis of the back, and above to the firſt ſpinal apophyſis. The loweſt is fixed below to the third tranſverſe apophyſis of the loins, and above the laſt ſpinal apophyſis of the back. They are divided by anatomiſts into the external, which are firſt diſcovered, and the internal, which lie immediately on the vertebræ. The external, from the firſt vertebra to the ſeventh incluſively, appear to be longer than the internal, which are covered by them. *Winſlow*'s Anatomy, p. 248.

SEMI-SPINALIS *colli*, a muſcle, called alſo *tranſverſo-ſpinalis colli*, and taking into its compoſition all that fleſhy maſs, which lies between the tranſverſe and ſpinal apophyſes, from the ſecond vertebra of the neck to the middle of the back, under the ſplenius and complexus major.

It is compoſed of ſeveral oblique converging muſcles, which may be divided into external and internal, of which the external are the longeſt. Theſe are fixed below to the tranſverſe apophyſes of the ſixth, ſeventh, eighth, or ninth vertebræ of the back, by tendinous extremities, which as they aſcend become fleſhy, and mix with each other. Their ſuperior inſertions in the neck are ſix in number, whereof the firſt, which is tendinous, is in the ſeventh ſpinal apophyſis, and the others, which are fleſhy, are in the five next ſpinal apophyſes. The internal are ſhorter, and more oblique than the external, and are partly covered by them. They are fixed, by their lower extremities, to the tranſverſe apophyſes of the three or four upper vertebræ of the back, and to the oblique apophyſes of the four or five lower vertebræ of the neck, and by their other extremities, they are inſerted in the ſix ſpinal apophyſes of the neck. Some of theſe internal muſcles are very ſhort, lying wholly between the ſpinal apophyſes, and the oblique or tranſverſe apophyſes next them. *Winſlow*'s Anatomy, p. 243.

SEMISPINATUS, (*Cycl.*) in anatomy, a name given by Riolanus, and ſome others, to the muſcle, more generally known by the name of *longiſſimus dorſi*.

SEMITALES, among the Romans, a name given to the Gods, who were the protectors of roads. See Hiſt. de l'Acad. des Inſcrip. Vol. 2. p. 22.

SEMI-TONE, (*Cycl.*) in muſic, is of two kinds, diſtinguiſhed by the addition of greater and leſs. The firſt is expreſſed by the ratio 16 to 15, or $\frac{16}{15}$; and the ſecond by 25 to 24, or $\frac{25}{24}$. Theſe two are ſo far from being nearly equal, as it is ſaid in the Cyclopædia, from Malcolm, that they differ by a whole enharmonic dieſis; which is an interval practicable by the voice [b], and was much in uſe among the antients, and not unknown even among the modern practitioners [c].—[[b] See DIESIS. [c] See Handel's Oratorio of Samſon, in the ſecond part of the ſong, *Return, return, O God of hoſts.*]

SEMI-TONE *major*.—The octave contains ten *ſemi-tones major*, and two dieſes, nearly; for the meaſure of the octave being expreſſed by the logarithm 1.000000, the *ſemi-tone major* will be meaſured by 0.093109. *Euler*, Tent. Nov. Theor. Muſ. p. 107. See INTERVAL.

SEMI-TONE *minor*.—The octave contains ſeventeen *ſemi-tones minor*, nearly. If the meaſure of the octave be the logarithm 1.000000, the meaſure of the *ſemi-tone minor* will be 0.058894. *Euler*, Tent. Nov. Theor. Muſ. p. 107. See the article INTERVAL.

SEMIVULPA, in zoology, a name by which Geſner, and ſome others, have called the *opoſſum*. See OPOSSUM.

SEMODIUS, among the Romans, a meaſure equal to half the modius, or the ſixth part of the amphora. See MODIUS and AMPHORA, *Cycl.*

SEMONES, among the antients, a claſs of Gods that were of a middle nature, between the celeſtial and terreſtrial Gods. Juſtin Martyr has miſtaken one of theſe for Simon Magus. Mem. de l'Acad. des Inſcrip. Vol. I. p. 270.

SEMYDA, in botany, the name of a tree, mentioned by Theophraſtus, and by ſome ſuppoſed to be the ſame with the *betula*, or birch tree, but very erroneouſly.

Gaza indeed has tranſlated the word by *betula*, and moſt of the later authors having conſulted only the Latin tranſlation, in their references to this author, have taken it upon credit that he meant the birch by this name.

Theophraſtus ſays that the *ſamyda*, or *ſemyda*, has a leaf like the walnut tree, only ſomething narrower; now that the *betula*, or birch tree, has no ſuch leaf, every one muſt know that ever ſaw it. He ſays alſo, that the bark of the *ſemyda* is variegated. This as little agrees with the *betula*, as the uſe he ſays was made of it. It was eſteemed the lighteſt of all woods, and therefore cut out into all things that required ſtrength without much weight. The uſe of the birch in rods for malefactors, is as old as any thing we know; and had it been the birch that the author was here deſcribing, he would not have omitted this uſe.

SENA, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, being uſually compoſed of five petals, diſpoſed in a circular form. The piſtil finally becomes a pod of a flatted ſhape, uſually ſomewhat crooked, and compoſed of two membranes, between which are lodged ſeeds, reſembling grape ſtones, and divided from one another by thin partitions. See Tab. 1. of Botany, Claſs 21.

The ſpecies of *ſena*, enumerated by Mr. Tournefort, are theſe. 1. The Alexandrian *ſena* with ſharp pointed leaves. 2. The Italian *ſena* with obtuſe leaves. And 3. the privet-leaved American *ſena*. *Tourn.* Inſt. p. 618.

The purgative virtue of this plant is found, though very different in degree, in infuſion, according to the manner in which that infuſion is made. In a cold infuſion it purges very gently, but this, according to the time it remains in the water, is different in degree; and in a warm infuſion it purges much more briſkly. It is eaſy to ſee from this, that its operation is very difficult to aſcertain, ſince the degree of heat, which it is not eaſy to reduce to any certainty, makes it ſtronger or weaker, though the quantity of the medicine be the ſame, and the variety of its effect depends on the manner in which it is penetrated by the water, which is to diſſolve its active principles.

It is obſerved that the follicles, or pods of *ſena*, operate more gently in infuſion, than the *ſena* itſelf: the reaſon of this is, that the texture of theſe pods is much more firm than that of the leaves, and therefore the water penetrates leſs into it, and extracts leſs of its active principles. It is certain that theſe pods are equally purgative with the leaves, nay every part of the plant is ſo; the very ſtalks, or pedicles of the leaves, having as much virtue as the reſt, but only requiring a longer time to boil, to communicate it to water, becauſe of their cloſer texture. See the article INFUSION.

The moſt certain way, therefore, of giving this medicine is in the form of Mr. Geoffroy's dry extract, which is made of a very ſtrong infuſion, evaporated to a dry and pulveriſable ſubſtance, eaſily taken, and of no ill taſte, and which operates in a very ſmall quantity, one third part containing the virtue of the whole, or nearly ſo; the niceſt calculations ſhewing, that twenty four grains of the extract, ſome part of which may be ſuppoſed to be earth, or other accidental or uſeleſs matter, poſſeſſes the virtues of a drachm in ſubſtance. Mem. de l'Acad. des Scienc. Par. 1738.

SENATE (*Cycl.*)—It has been a queſtion among the learned how ſenators were created, and how the vacancies of the *ſenate* in old Rome were ſupplied.

Dr. Middleton is of opinion, that the conſtant and regular ſupply of the *ſenate* was from the annual magiſtrates; who, by virtue of their ſeveral offices, acquired an immediate right to ſit and vote in that aſſembly. The uſual gradation of theſe offices was that of quæſtor, tribune of the people, ædile,

ædile, prætor, and conſul; which every candidate, in the ordinary forms of the conſtitution, was obliged to take in their order, with this exception only, that he might forego either the tribunate, or the ædileſhip, at his own choice, without a neceſſity of paſſing through them both. *Middleton's* Treat. of Rom. Senate, p. 6. See the articles QUÆSTOR, TRIBUNE, *&c.*

But though theſe offices gave both an immediate right, and actual entrance into the *ſenate*, yet the ſenatorian character was not eſteemed complete, till the new ſenators had been enrolled by the cenſors at the next luſtrum, or general review of all the orders of the city, which was generally held every five years. Yet this enrolment was but a matter of form, which could not be denied to any of them, except for ſome legal incapacity, or the notoriety of ſome crime, or infamy upon their characters; for which the ſame cenſors could expel, or deprive any other ſenator, of what rank or ſtanding ſoever. *Middleton* of Rom. Sen. p. 8. See the article CENSOR.

M. Vertot ſeems to perplex the queſtion; firſt, by conſidering the authority of the people, and that of the cenſors, as oppoſite and inconſiſtent with each other in the creation of ſenators, whereas they were both of them jointly neceſſary to make the act complete. Secondly, by aſſerting the cenſorian power to be the original and principal in that affair, whereas it was but ſecondary, or miniſterial to the ſovereign prerogative of the people. *Middleton* of Rom. Sen. p. 13.

It has been the opinion of ſome, that under the kings of Rome the choice and nomination of all the ſenators depended wholly on the will of the prince, without any right in the people, either direct or indirect; and the conſuls, who ſucceeded to the kingly power, enjoyed the ſame prerogative, till the creation of the cenſors, who ever after poſſeſſed the ſole and abſolute right of making and unmaking ſenators. But Dr. Middleton is of opinion, that the kings, the conſuls, and the cenſors, acted in this affair but miniſterially, and ſubordinately to the ſupreme will of the people, in whom the proper and abſolute power of creating ſenators always reſided. And the Doctor aſſures us, upon the ſtricteſt ſearch into the ſtate of the preſent queſtion, as it ſtood under the kingly government, he cannot but conclude, from the expreſs teſtimony of the beſt hiſtorians, the concurrence of ſimilar facts, and the probability of the thing itſelf, that the right of chuſing ſenators was originally and conſtitutionally veſted in the people. *Middleton* of Rom. Sen. p. 36.

The ſupreme power at home was in the collective body of the people, yet where haſte perhaps, or ſecrecy was required, and where the determinations of the *ſenate* were ſo juſt and equitable, that the conſent of the people might be preſumed, and taken for granted, the *ſenate* would naturally omit the trouble of calling them from their private affairs, to an unneceſſary attendance on the public; till by repeated omiſſions of this kind, begun at firſt in trivial matters, and proceeding inſenſibly to more ſerious, they acquired a ſpecial juriſdiction and cognizance in many points of great importance, to the excluſion even of the people; who yet, by the laws and conſtitution of the government, had the abſolute dominion over all. For example:

1. They aſſumed to themſelves the guardianſhip and ſuperintendence of the public religion; ſo that no new God could be introduced, nor altar erected, nor the Sibylline books conſulted, without their expreſs order. *Liv.* 9. 46. *Tertull.* Apol. 5. *Cic.* de Div. 54. ib. 1. 48.

2. They held it as their prerogative, to ſettle the number and condition of the foreign provinces, that were annually aſſigned to the magiſtrates, and to declare which of them ſhould be conſular, and which prætorian provinces. *Cic.* pro Dom. 9. Vid. in Vatin. 15.

3. They had the diſtribution of the public treaſure, and all the expences of the government; the appointment of ſtipends to their generals, with the number of their lieutenants and their troops, and the proviſions and cloathing of their armies. *Polyb.* l. 6. 461. *Cic.* pro Balb. 27.

4. They nominated all ambaſſadors ſent from Rome, out of their own body, and received and diſmiſſed all who came from foreign ſtates, with ſuch anſwers as they thought proper. *Cic.* in Vatin. Vid. *Polyb.* 461.

5. They had the right of decreeing all ſupplications, or public thankſgivings, for victories obtained, and of conferring the honour of an ovation, or triumph, with the title of emperor on their victorious generals. *Liv.* 5. 23. *Cic.* Phil. 14. 4, 5.

6. It was their province to inquire into public crimes or treaſons, either in Rome, or the other parts of Italy; and to hear and determine all diſputes among the allied and dependent cities. *Polyb.* 461. *Liv.* 30. 26. *Cic.* Off. 1. 10.

7. They exerciſed a power, not only of interpreting the laws, but of abſolving men from the obligation of them, and even of abrogating them. *Cic.* pro Dom. 27. pro Cornel. 1. pro Leg. Manil. 21. *Val. Maxim.* 8. 15. It. *Cic.* Phil. 5.

8. In the caſe of civil diſſenſions, or dangerous tumults within the city, they could arm the conſuls by a vote with abſolute power, to deſtroy and put to death, without the formality of a trial, all ſuch citizens as were concerned in exciting them. *Salluſt.* de Bell. Catilin. 29. *Cic.* in Cat. 1. 11.

9. They had a power to prorogue, or poſtpone the aſſemblies of the people, to decree the title of king to any prince whom they pleaſed; thanks and praiſe to thoſe who had deſerved them; pardon and reward to enemies, or the diſcoverers of any treaſon; to declare any one an enemy by a vote; and to preſcribe a general change of habit to the city, in caſes of any imminent danger or calamity. *Cic.* Epiſt. ad Att. 4. 16. pro Mur. 25. pro Deiat. 3. Vid. *Liv.* 30. 17. *Salluſt.* Bell. Cat. 30. *Cic.* in Catil. 4. 3. 3. 4. Phil. 11. 12. Ep. Fam. 12. 10. pro Sext. 12. *Middleton*, ibid. p. 118. ſeq.

The tribunes ſoon ſnatched from them that original right, which they had enjoyed from the very foundation of the city, of being the authors, or firſt movers of every thing, which was to be enacted by the people, and excluded them from any ſhare or influence in the aſſemblies of their tribes [d]: and though in the other aſſemblies of the curiæ and the centuries, they ſeemed to have reſerved to them their antient right, yet it was reduced to a mere form, without any real force; for inſtead of being what they had always been, the authors of each particular act, that was to be propoſed to the people's deliberation, they were obliged, by a ſpecial law, to authoriſe every aſſembly of the people, and whatever ſhould be determined in it, even before they had proceeded to any vote [e]. And C. Gracchus afterwards, in his famous tribunate, uſed to boaſt that he had demoliſhed the *ſenate* at once, by transferring to the equeſtrian order the right of judicature in all criminal cauſes, which the *ſenate* had poſſeſſed from the time of the kings [f].—[[d] Vid. *Dionyſ. Hal.* l. 41. 49. *Cic.* pro Planc. 3. [e] *Liv.* 8. 12. [f] *Appian.* de Bell. Civ. l. 1. *Middleton*, ibid. p. 125, ſeq.]

In the early ages of the republic, when the precincts of the city were ſmall, the ſenators were perſonally ſummoned by an apparitor [g]; and ſometimes by a public crier, when their affairs required immediate diſpatch [h]: but the uſual way of calling them, in later days, was by an edict, appointing the time and place, and publiſhed ſeveral days before, that the notice might be more public [i]. Theſe edicts were commonly underſtood to reach no farther than to thoſe who were reſident in Rome, or near it; yet when any extraordinary affair was in agitation, they ſeem to have been publiſhed alſo in the other cities of Italy [k]. If any ſenator refuſed, or neglected to obey this ſummons, the conſul could oblige him to give ſurety for the payment of a certain fine, if the reaſons of his abſence ſhould not be allowed [l]. But from ſixty years of age they were not liable to that penalty, nor obliged to any attendance, but what was voluntary [m].—[[g] *Cic.* de Sen. 16. [h] *Liv.* 3. 38. *App.* Bell. Civ. 1. [i] *Cic.* Phil. 3. 8. [k] *Cic.* de J. Cæſare ad Att. 9. 17. [l] *Liv.* 3. 38. *Cic.* Phil. 1. 5. [m] *Middleton* of Rom. Senate, p. 130, ſeq.]

The *ſenate* could not regularly be aſſembled in any private or profane place, but always in one ſet apart, and ſolemnly conſecrated to that uſe by the rites of augury. *A. Gell.* 14. 7. *Middleton*, ibid. p. 133.

The *ſenate* frequently met in certain curiæ. See CURIA. But their meetings were more commonly held in certain temples, dedicated to particular deities; as in that of Jupiter, Apollo, Mars, Vulcan, Caſtor, Bellona; of Concord, Faith, Virtue, the Earth, *&c.* *Middleton*, ibid. 134.

Theſe temples, on account of the uſe which the *ſenate* made of them, were called likewiſe *curiæ*; as well as the proper curiæ, or *ſenate* houſes, on account of their ſolemn dedication, are frequently called temples. *A. Gell.* 14. 7. *Cic.* pro Mil. 33. *Alex. Sev.* c. 6.

The *ſenate* uſed to meet on ſome occaſions in the open air, and eſpecially whenever a report was made to them in form, that an ox had ſpoken; which prodigy, as Pliny tells us, was common in the earlier ages. *Liv.* 26. 10. *Plin.* Hiſt. Nat. 8. 45. *Middleton*, ibid. p. 135, ſeq.

On two ſpecial occaſions the *ſenate* was always held without the gates of Rome, either in the temple of Bellona, or of Apollo. 1ſt. For the reception of foreign ambaſſadors; and eſpecially of thoſe who came from enemies, who were not permitted to enter the city. 2dly. To give audience, and tranſact buſineſs with their own generals, who were never allowed to come within the walls, as long as their commiſſion ſubſiſted, and they had the actual command of an army. *Liv.* 34. 43. Id. 42. 36. Id. 36. 39. *Senec.* de Benef. 5. 15. *Middleton*, ibid. p. 137, ſeq.

The *ſenate* met always of courſe on the firſt of January, for the inauguration of the new conſuls, who entered into their office on that day. *Middleton*, ibid. p. 140, ſeq.

The month of February, generally ſpeaking, was reſerved intire by old cuſtom to the *ſenate*, for the particular purpoſes of giving audience to foreign ambaſſadors. *Cic.* ad Frat. 2. 3. *Aſcon.* in Verr. 1. 35. Ep. ad Fra. 2. 12.

In all months, univerſally, there were three days, which ſeem to have been more eſpecially deſtined to the *ſenate*, the kalends, nones, and ides, from the frequent examples found in hiſtory, of its being convened on thoſe days. But Auguſtus

guſtus enacted afterwards, that the *ſenate* ſhould not meet regularly, or of courſe, except on two days only of each month, the kalends and ides. *Suet.* Aug. 35. *Middleton*, ibid. p. 142.

On their days of meeting, they could not enter upon any buſineſs before the ſun was riſen, nor finiſh any after it was ſet; every thing tranſacted by them, before or after that time, was null and void, and the author of it liable to cenſure [n]. Whence it became a ſtanding rule, that nothing new ſhould be moved after four o'clock in the afternoon [o]. —[n *A. Gell.* 14. 7. [o] *Middleton*, ibid. p. 143.]

The *ſenate*, as has been ſhewn above, was compoſed of all the principal magiſtrates of the city, and of all who had borne the ſame offices before them; and conſiſted therefore of ſeveral degrees and orders of men, who had each a different rank in it, according to the dignity of the character which he ſuſtained in the republic.

At the head of it ſat the two conſuls in chairs of ſtate [p]. Manutius thinks that the other magiſtrates ſat next to the conſular chair, each according to his rank; the prætors, cenſors, ædiles, tribunes, quæſtors [q]. But Dr. Middleton rather thinks that the conſular ſenators, who, in all ages of the republic, were the leaders and firſt ſpeakers in the *ſenate*, uſed to ſit next in order to the conſuls; and after them the prætors, and all who were of prætorian dignity, or had been prætors; then the ædiles, the tribunes, and the quæſtors, on diſtinct benches; and on the ſame bench with each, all who had borne the ſame offices: but the curule magiſtrates, as the prætors and ædiles, were perhaps diſtinguiſhed, at the head of their ſeveral benches, by ſeats ſomewhat raiſed, or ſeparated at leaſt from the reſt, in the form of our ſettees, or of that *longa cathedra*, which Juvenal [r] mentions, to denote the curule dignity.—[p *Cic.* in Cat. 4. 1. [q] Vid. *Paul Manut.* de Senatu Rom. cap. 9. [r] Sat. 9. 52. *Middleton*, ibid. p. 144, ſeq.]

All the private ſenators ſat on different benches, and in a different order of precedency, according to the dignity of the magiſtracies which they had ſeverally borne. Firſt the conſulars, then the prætorians, ædilitians, tribunitians, and quæſtorians; in which order, and by which titles, they are all enumerated by Cicero [s]. And as this was their order in ſitting, ſo it was the ſame alſo in delivering their opinions, when it came to their turn.—[s *Cic.* Phil. 13. 13, 14.]

The *ſenate* being aſſembled, the conſuls, or the magiſtrate, by whoſe authority they were ſummoned, having firſt taken the auſpices, and performed the uſual office of religion, by ſacrifice and prayer, uſed to open to them the reaſons of their being called together, and propoſe the ſubject of that day's deliberation; in which all things divine, or relating to the worſhip of the Gods, were diſpatched preferably to any other buſineſs [t]. When the conſul had moved any point, with intent to have it debated and carried into a decree, and had ſpoken upon it himſelf as long as he thought proper, he proceeded to aſk the opinions of the other ſenators, ſeverally by name, and in their proper order, beginning always with the conſulars, and going on to the prætorians, *&c.* It was the practice originally to aſk the prince of the *ſenate* the firſt; but that was ſoon laid aſide, and the compliment transferred to any other antient conſular, diſtinguiſhed by his integrity and ſuperior abilities; till in the later ages of the republic, it became an eſtabliſhed cuſtom to pay that reſpect to relations, or particular friends, or to thoſe who were likely to give an opinion the moſt favourable to their own views and ſentiments on the queſtion propoſed [u]. But whatever order the conſuls obſerved, in aſking opinions on the firſt of January, when they entered into their office, they generally purſued the ſame through the reſt of the year. Julius Cæſar indeed broke through this rule; for though he had aſked Craſſus the firſt, from the beginning of his conſulſhip, yet, upon the marriage of his daughter with Pompey, he gave that priority to his ſon-in-law, for which, however, he made an apology to the *ſenate* [w].—[t *A. Gell.* 14. 7. [u] Ibid. [w] *Suet.* Jul. Cæſar. 21. *A. Gell.* 4. 10.]

This honour of being aſked in an extraordinary manner, and preferably to all others of the ſame rank, though of ſuperior age or nobility, ſeems to have been ſeldom carried farther than to four or five diſtinguiſhed perſons of conſular dignity [x]; and the reſt were afterwards aſked according to their ſeniority. And this method, as has been ſaid, was obſerved generally throughout the year, till the election of the future conſuls, which was commonly held about the month of Auguſt; from which time, it was the conſtant cuſtom to aſk the opinions of the conſuls elect, preferably to all others, till they entered into their office, on the firſt day of January following [y].—[x *Cic.* ad Attic. 1. 13. *A. Gell.* 4. 10. [y] *Cic.* Epiſt. Fam. 8. 4. Vid. It. in Phil. 5. 13. *Middleton*, ibid. p. 149, ſeq.]

As the conſuls elect had this preference given in ſpeaking before all the conſulars, ſo the prætors, and tribunes elect, ſeem to have had the ſame, before the reſt of their particular orders. Vid. *Salluſt.* Bell. Cat. 51, 52. *Cic.* Ep. ad Att. l. 12. 21. It. *Pigh.* Annal.

None were allowed to ſpeak till it came to their turn, excepting the magiſtrates, who ſeem to have had a right of ſpeaking on all occaſions, whenever they thought fit; and for that reaſon, perhaps, were not particularly aſked, or called upon by the conſuls. *Middleton*, ibid. p. 153.

Several different motions might be made, and different queſtions be referred to the *ſenate* by different magiſtrates, in the ſame meeting [b]. And if any buſineſs of importance was expected or deſired, which the conſuls had omitted to propoſe, or were unwilling to bring into debate, it was uſual for the *ſenate*, by a ſort of general clamour, to call upon them to move it; and upon their refuſal, the other magiſtrates had a right to propound it, even againſt their will [c]. If any opinion, propoſed to them, was thought too general, and to include ſeveral diſtinct articles, ſome of which might be approved, and others rejected, it was uſual to require that it might be divided, and ſometimes by a general voice of the aſſembly calling out *divide*, *divide* [d].—[b *Cic.* Phil. 7. 1. [c] *Liv.* 30. 21. *Cic.* Ep. Fam. 10. 16. *Cic.* pro Leg. Man. 19. [d] *Senec.* Epiſt. 21. *Cic.* Ep. Fam. 1. 2. Vid. *Aſcon.* in Orat. pro Mil. 6.]

If in the debate ſeveral different opinions had been offered, and each ſupported by a number of ſenators, the conſul, in the cloſe of it, uſed to recite them all, that the *ſenate* might paſs a vote ſeparately upon each: but in this he gave what preference he thought fit to that opinion which he moſt favoured, and ſometimes even ſuppreſſed ſuch of them, as he wholly diſapproved. *Cæſ.* Comm. Bell. Civ. 429.

In caſes, however, where there appeared to be no difficulty or oppoſition, decrees were ſometimes made, without any opinion being aſked or delivered upon them. *Cic.* Phil. 1. 1.

When any queſtion was put to the vote, it was determined always by a diviſion, or ſeparation of the oppoſite parties, to different parts of the *ſenate* houſe; the conſul, or preſiding magiſtrate, having firſt given order for it in this form: *Let thoſe, who are of ſuch an opinion, paſs over to that ſide; thoſe, who think differently, to this. Feſt.* in voc. *Cic.* Ep. Fam. 1. 2.

What the majority of them approved was drawn up into a decree, which was generally conceived in words prepared and dictated by the firſt mover of the queſtion, or the principal ſpeaker in favour of it; who, after he had ſpoken what he thought ſufficient to recommend it to the *ſenate*, uſed to conclude his ſpeech, by ſumming up his opinion in the form of ſuch a decree as he deſired to obtain [e]. Which decree, when confirmed by the *ſenate*, was always ſigned and atteſted by a number of ſenators, who choſe to attend thro' the whole proceſs of it, for the ſake of adding their names to it, as a teſtimony of their particular approbation of the thing, as well as of reſpect to the perſon, by whoſe authority, or in whoſe favour it was drawn [f].—[e Vid. *Cic.* Philip. 3. 5. 89. x. 13. 14. [f] *Cic.* Ep. Fam. 15. 6. It. 8. 8. *Middleton*, ibid. 156, ſeq.]

When the *ſenate* appeared to be diſpoſed, and ready to paſs a decree, it was in the power of any one of the ten tribunes of the people to intercede, that is, to over-rule it. See the article INTERCESSION.

In all caſes, where the determinations of the *ſenate* were over-ruled by the negative of a tribune, of which there are numberleſs inſtances, if the *ſenate* was unanimous, or generally inclined to the decree ſo inhibited, they uſually paſſed a vote to the ſame purpoſe, and in the ſame words, which was called *an authority of the ſenate*, and was entered into their journals. *Cic.* Ep. Fam. 1. 2. *Liv.* 4. 57. Vid. *Dio.* 55. 550. See SENATUS *auctoritas.*

In order to deter any magiſtrate from acting factiouſly and arbitrarily, in affairs of importance, they often made it part of the decree, which they were going to enact, that if any one attempted to obſtruct it, he ſhould be deemed to act againſt the intereſt of the republic [g]. Yet this clauſe had ſeldom any effect on the hardy tribunes, who uſed to apply their negative in defiance of it as freely, as on any other more indifferent occaſion [h].—[g *Cic.* Ep. Fam. 88. ad Att. 4. 2. [h] *Middleton*, ibid. p. 160, ſeq.]

The factious, and leaders of parties, had ſeveral arts of obſtructing, or poſtponing a decree, by many pretexts and impediments which they could throw in its way. Sometimes they alledged ſcruples of religion, that the auſpices were not favourable, or not rightly taken; which, if confirmed by the augurs, put a ſtop to the buſineſs for that day [i]. At other times, they urged ſome pretended admonition from the Sibylline books, which were then to be conſulted and interpreted to a ſenſe, that ſerved their purpoſe [k]. But the moſt common method was to waſt the day, by ſpeaking for two or three hours ſucceſſively, ſo as to leave no time to finiſh the affair in that meeting: yet when ſome of the more turbulent magiſtrates were groſsly abuſing this right, againſt the general inclination of the aſſembly, the ſenators were ſometimes ſo impatient as to ſilence them, as it were, by force, and to diſturb them in ſuch a manner, by their clamour and hiſſing, as to oblige them to deſiſt [l].—[i *Cic.* Ep. Fam. 10. 12. [k] *Dio.* 39. p. 98. *Cic.* ad Fra. 2. 2. *Cic.* Ep. Fam. 1. 1. [l] *A. Gell.* 4. 10. *Cic.* ad Att. 4. 2. *Middleton*, ibid. 162, ſeq.]

It seems probable that a certain number of senators was required by law, as necessary to legitimate any act, and give force to a decree: yet there is no certain number specified by any of the old writers, except in one or two particular cases. *Middleton*, ibid. p. 164, seq.

The decrees of the *senate* were usually published, and openly read to the people soon after they were passed; and an authentic copy of them was always deposited in the public treasury of the city, or otherwise they were not considered as legal or valid. *Cic.* Phil. 5. 4. *Tacit.* Ann. 3. 51. *Middleton*, ibid. p. 166, seq.

As to the force of these decrees, it is difficult to define precisely what it was. It is certain that they were not considered as laws, but seem to have been designed originally as the ground-work, or preparatory step to a law, with a sort of provisional force, till a law of the same tenor should be enacted in form by the people; for in all ages of the republic, no law was ever made, but by the general suffrage of the people. *Middleton*, ibid. p. 167, seq.

Even under the kings, the collective body of the people was the real sovereign of Rome, and the dernier resort in all cases. But their power, though supreme and final, was yet qualified by this check, that they could not regularly enact any thing, which had not been previously considered and approved of by the *senate* [m]. This indeed continued to be the general way of proceeding in all quiet and regular times, from the beginning of the republic to the end of it: and the constant style of the old writers, in their accounts of the public transactions, is, that the *senate* voted or decreed, and the people commanded such and such an act [n].—[m *Dionys. Hal.* l. 7. 38. Edit. Oxon. *Middlet.* of Rom. Sen. p. 115. n *Liv.* 37. 35. *Middleton*, ibid. p. 117.]

SENATOR (*Cycl.*)—In antient Rome, the number of *senators* is commonly supposed to have been limited to three hundred, from the time of the kings to that of the Gracchi. But this must not be taken too strictly. The senate generally had that number, or thereabouts, and upon any remarkable deficiency, was filled up again to that complement by an extraordinary creation. But as the number of the public magistrates increased with the increase of their conquests and dominions, so the number of the senate, which was supplied of course by those magistrates, must be liable also to some variation. Sylla, when it was particularly exhausted, added three hundred to it at once from the equestrian order, which might probably raise the whole number to about five hundred; and in this state it seems to have continued, till the subversion of their liberty by Jul. Cæsar. For Cicero [o], in an account of a particular debate, in one of his letters to Atticus, mentions four hundred and fifteen to have been present at it, which he calls a full house [p].—[o Ad Attic. l. 1. 14. p *Middlet.* of Rom. Sen. p. 93, seq.]

In antient Rome, a certain age was required for a *senator*, as is often intimated by the old writers, though none of them have expressly signified what it was. The legal age for entring into the military service was settled, by Servius Tullius, at seventeen years [q]; and they were obliged, as Polybius [r] tells us, to serve ten years in the wars, before they could pretend to any civil magistracy. This fixes the proper age of suing for the quæstorship, or the first step of honour, to the twenty eighth year; and as this office gave an admission into the senate, so the generality of the learned seem to have given the same date to the *senatorian* age. Some writers indeed, on the authority of Dion Cassius, have imagined it to be twenty five years; not reflecting that Dion mentions it there as a regulation only, proposed to Augustus by his favourite, Mæcenas [s]. Dr. Middleton takes the quæstorian age, which was the same with the *senatorian*, to have been thirty years complete [t].—[q *A. Gell.* 10. 28. r *Polyb.* de Instit. rei milit. l. 6. p. 466. s Vid. *Dio.* l. 52. p. 477. *Lipsius* de Magistratib. Rom. t *Middleton* of Rom. Sen. p. 96.]

The laws concerning the age of magistrates were not very antient; and were made to check the forward ambition of the nobles, and to put all the citizens upon a level in the pursuit of honours [u]. And Livy [w] tells us, that L. Villius, a tribune of the people, was the first who introduced them, A. U. 573, and acquired by it the surname of Annalis [x].—[u *Cic.* Phil. 5. 17. w Lib. 40. 44. x *Middlet.* of Rom. Sen. p. 99.]

There was another qualification also required, as necessary to a *senator*, an estate proper to support his rank, the proportion of which was settled by the law. We may collect from Suetonius, that it was settled at eight hundred sestertia before the reign of Augustus [y], which are computed to amount to between six and seven thousand pounds of our money; and must not be taken, as it is by some, for an annual income, but the whole estate of a *senator*, real and personal, as estimated by the survey and valuation of the censors [z].—[y *Sueton.* in Aug. cap. 41. z *Middleton*, ibid. p. 100.]

This proportion of wealth may seem perhaps too low, and unequal to the high rank and dignity of a Roman *senator*, but it must be considered only as the lowest to which they could be reduced; for whenever they sunk below it, they forfeited their seats in the senate. *Middlet.* ibid. p. 101.

There was some law also subsisting from the earliest times, concerning the extraction and descent of *senators*, injoining that it should always be ingenuous; and as their morals were to be clear from all vice, so their birth likewise from any stain of base blood. In consequence of which, when Appius Claudius, in his censorship, attempted to introduce the grandsons of freed slaves into the senate, they were all immediately turned out again. *Middleton*, ibid. p. 104.

These are some of the laws by which the censors were obliged to act, in the enrollment of the new, or the omission of old *senators*: and when we read of any left out, without any intimation of their crime, it might probably be for the want of one or other of these legal, or customary qualifications. *Middleton*, ibid. p. 106.

It was from the *senatorian* order alone, that all ambassadors were chosen and sent to foreign states: and when they had occasion to travel abroad, even on their private affairs, they usually obtained from the senate the privilege of a free legation, as it was called; which gave them a right to be treated every where with the honours of an ambassador, and to be furnished on the road with a certain proportion of provisions and necessaries, for themselves and their attendants [b]: and as long as they resided in the Roman provinces, the governors used to assign them a number of lictors, or mace-bearers, to march before them in state, as before the magistrates in Rome [c]. And if they had any law-suit, or cause of property depending in those provinces, they seem to have had a right to require it to be remitted to Rome [d].—[b *Cic.* Epist. Fam. 11. 1. It. ad Att. 15. 11. *Cic.* Ep. Fam. 12. 21. *Suet.* in Tiber. 31. c *Cic.* Ep. Fam. 12. 21. d *Cic.* ibid. 13. 26. *Middleton*, ibid. p. 173, seq.]

At home, likewise, they were distinguished by peculiar honours and privileges; for at the public shews and plays they had particular seats apart, and appropriated to them, in the most commodious part of the theatre [e]: and on all solemn festivals, when sacrifices were offered to Jupiter by the magistrates, they had the sole right of feasting publickly in the capitol, in habits of ceremony, or such as were proper to the offices which they had borne in the city [f].—[e *Cic.* pro Clu. 47. Vid. It. *Plutarch.* in Flaminin. p. 380. A. f *Suet.* Aug. 35. *A. Gell.* 12. 8. *Dionys.* 55. 554. C. *Middlet.* ibid. 175, seq.]

The peculiar ornament of the *senatorian* tunic was the *latus clavus*, as it was called, being a broad strip of purple sewed upon the forepart of it, and running down the middle of the breast, which was the proper distinction between them and the knights, who wore a much narrower stripe of the same colour, and in the same manner [g]. The fashion also of their shoes was peculiar, and different from that of the rest of the city: this difference appeared in the colour, shape, and ornament of the shoes. The colour of them was black, while others wore them of any colour perhaps, agreeable to their several fancies; the form of them was somewhat like to a short boot, reaching up to the middle of the leg, as they are sometimes seen in antient statues and basreliefs; and the proper ornament of them was an half moon sewed, or fastened upon the forepart of them, near the ancle [h].—[g *Suet.* Jul. Cæs. 80. *Plin.* Hist. 33. 1. h *Juv.* 7. 192. *Hor.* sat. 1. 6. 28. *Middlet.* ibid.]

Consuls, prætors, ædiles, tribunes, *&c.* during the year of their magistracy, always wore the prætexta, or a gown bordered round with a stripe of purple [i]. In which habit also, as has been signified above, all the rest of the senate, who had already borne those offices, used to assist at the public festivals and solemnities [k].—[i *Cic.* post. red. in Sen. 5. k *Cic.* Phil. 2. 43. *Senec.* Controv. l. 1. 8. *Middleton*, ibid. p. 176, seq.]

As to other matters, relating to Roman *senators*, see SENATE, *supra*.

SENATUS *auctoritas*. In cases where the determinations of the senate were over-ruled by the negative of a tribune, if the senate was generally inclined to the decree so inhibited, they usually passed a vote to the same purpose, and in the same words, which, instead of a decree, was called *senatus auctoritas*, or the authority of the senate, and was entered into their journals; yet had no other force than to testify the judgment of the senate on that particular question, and to throw the odium of obstructing an useful act on the tribune who hindered it. Vid. *Cic.* Ep. Fam. l. 2. & 8. 8. ad Attic. 4. 2. *Liv.* 4. 57. *Dionys.* 55. 550. *Middlet.* of Rom. Senate, p. 161, 162. See SENATE.

SEND, is used by seamen, when a ship, either at an anchor or under sail, falls with her head, or stern, deep into the trough of the sea, *i. e.* into a hollow made between two waves, or billows. They say she *sends* much that way, whether it be a-head or a-stern.

SENDAL, in our old writers, a kind of thin fine silk, mentioned in the Stat. 2 Rich. II. cap. 1. *Blount.*

SENECIO, *groundsel*, in botany, the name of a genus of plants, the characters of which are these. The flower is of the flosculous kind, being composed of several small floscules, divided into many segments at the ends, and contained in a one-leaved cup; which is first of a cylindric shape, and afterwards of a conic, and is divided into many segments at

the end, which, as the ſeed comes to maturity, uſually turn downwards and backwards. The floſcules ſtand on embryos, which finally ripen into ſeeds, winged with down.

The ſpecies of *groundſel*, enumerated by Mr. Tournefort, are theſe. 1. The common ſmall *groundſel*. 2. The taller *groundſel* with ragwort leaves. 3. The tall, large-leaved American *groundſel*. And 4. the American *groundſel* with bluiſh purple flowers. *Tourn.* Inſt. p. 456.

The common *groundſel*, taken in a ſtrong infuſion, is an emetic. It is preſcribed in ſmaller doſes in dropſies, jaundices, and hæmorrhages. Externally it is uſed in ointments againſt cutaneous foulneſſes.

SENECTA *anguium*, the exuviæ, or ſloughs of ſerpents. The ſnakes caſt their whole ſkin, and with it were ſuppoſed to caſt off their age, and be born anew; whence the name of theſe caſt ſkins. A decoction, or infuſion of theſe, is recommended by medical writers againſt pains of the ears and eyes; and ſome ſuperſtitious people recommend it to women, to tye about their waſtes, to prevent miſcarriages, and about their thighs, in time of labour, to haſten delivery.

SENEKA, *rattleſnake-root*. This is a root lately brought into uſe among us, and which ſeems to deſerve very great regard. It is the root of a ſpecies of *polygala*, or milkwort, diſtinguiſhed by Gronovius, in his *Flora Virginica*, under the name of the erect *polygala* with a ſimple ſtalk, with oval leaves pointed at the end, and with an erect cluſter of flowers. We generally call it the *rattleſnake-root*, and the French, from the place whence it comes, *Seneka*. See POLYGALA.

The *root* is perennial, the thickneſs of it is generally about that of a man's little finger. It is four or five inches, or more, in length, and is variouſly contorted and twiſted, and divides into many branches, furniſhed with ſmall fibres, and with a membranaceous rim running all along it. It is yelloviſh on the outſide, and white within; very acrid, and ſomewhat bitter to the taſte, and has ſomewhat of an aromatic flavour. From this *root* ariſe numerous ſtalks, all ſimple, and without branches; ſome lie on the ground, others ſtand erect. Theſe are ten or twelve inches high, when full grown. The leaves ſtand alternately on the ſtalks, and the flowers are white, and perfectly like thoſe of our own kinds of polygala.

Dr. Tennent, who brought over a vaſt quantity of this *root* from America ſome years ago, and took great pains to introduce it into practice, praiſes it very largely as a diuretic, a diaphoretic, and an alexipharmic, and a very powerful attenuant and reſolvent. He ſays it will ſometimes vomit and purge.

The Indians firſt taught the uſe of it to the Europeans: they eſteem it a ſovereign remedy againſt the bite of the *rattleſnake*; and Dr. Tennent aſſures us that he ſaw two perſons, who had been bitten by this creature in the month of July, when its poiſon is moſt fatal, perfectly reſtored to health by it.

He afterwards gave it in pleuriſies and peripneumonies with great ſucceſs, and in all other caſes where the blood is inſpiſſated. If the firſt doſes of it provoke a vomiting, it is not at all the worſe, except in caſes in which the patient is very weak; and in ſuch this effect is eaſily prevented, by giving ſome of the teſtaceous powders with it.

In pleuriſies it is beſt to take away ten ounces of blood, before the entering on the uſe of the medicine; in other caſes no precaution is required, but it is to be given in powder, or tincture, in white wine, and the ordinary drink, during the uſe of it, ſhould be marſhmallow tea. *Gronov.* Flora Virgin. p. 80. *Geoffroy*, Mat. Med. Vol. 2. p. 140. *Tennent*'s Eſſay on the Pleuriſy.

This medicine may be given either in powder or decoction; but Dr. Tennent prefers the decoction, having obſerved it to give relief ſooner than the powder does. The doſe of the powder is thirty five grains, and he gives at once three ſpoonfuls of the decoction, prepared by boiling three ounces of the *root* bruiſed in a quart of water to near the half. The doſe is repeated every ſix hours. He is alſo fond of this *root* in the rheumatiſm, dropſy, and gout, in which laſt diſeaſe, he ſays, he has given it with ſucceſs. See his letter concerning the *Seneka*, or *rattleſnake-root*.

Meſſrs. Lemery, Du Hamel, and Juſſieu, vouch for the good effects of the *Seneka-root* in pleuriſies, and other inflammatory diſeaſes. Mem. de l'Acad. des Scienc. 1739.

SENEMBI, in zoology, the name of a ſpecies of Braſilian lizard, more commonly known by the name *iguana*. See IGUANA.

SENESCHALLO *et mareſhallo quod non teneant placita de libero tenemento*, a writ, directed to the ſteward and marſhal of England, inhibiting them to take cognizance of an action in their court that concerns freehold. Reg. Orig. 185, 191. *Blount*, *Cowel*.

SENORIÆ, in botany, a name by which ſome authors have called the bonana-tree, or *muſa fructu breviore*. Jonſ. Dendr. p. 143.

SENSITIVE (*Cycl.*)—SENSITIVE *fluid*. Some have imagined a *ſenſitive fluid* as the principle that preſerves animals from corruption, and to which we owe our ſenſation and motion. This animal fluid paſſes in the proper nervous tubes to the organs of motion, but is contained in the fibrous coats of the nerves to become an organ of ſenſation. This *ſenſitive fluid* is, according to Mr. Le Cat, capable of thinking, and is ſo modified by the ganglions, that what is lodged in each part, is capable of being impreſſed by the object proper to each organ. And from the doctrine concerning this animal fluid, he endeavours to account for moſt operations, which are generally ſaid to depend on the ſoul. Med. Eſſ. Edinb. Abrid. Vol. 2. p. 481.

But all theſe attempts to account for ſenſation and thought, from the properties of matter, ſeem to be very deſperate undertakings, not to ſay abſurd.

SENSITIVE *plant*. This is an herb ſufficiently known to the world for its remarkable property of receding from the touch, and giving ſigns, as it were, of animal life. Philoſophers in general have, however, contented themſelves with admiring the fact, without giving themſelves any trouble about the cauſe.

Mr. Hook indeed has made ſome conjectures about it; but the greateſt light, that has been given into the thing, is from the inquiries which Meſſrs. Du Fay and Du Hamel, gentlemen of the Academy of Sciences at Paris, concerted together, and afterwards made ſeparately on different ſhrubs, or at different times, that each might be able to correct the errors of the other.

The ſtructure of the *ſenſitive plant* is this. From the large ſtems, or main branches of the whole, there part off ſeveral other leſſer ones, and from theſe there go off others ſtill leſs, which by way of diſtinction may be called the ribs of the leaves, as they ſerve to ſupport a number of leaves arranged on each ſide, and ſtanding on ſhort pedicles in pairs, over againſt one another. Several other plants have theſe ſort of compound leaves, as the caſſia, colutea, and the like; and all theſe ſhut their leaves together at night, and open them again in the morning, in the ſame manner as the *ſenſitive plant* does. This periodical opening and ſhutting of the leaves is therefore common to many plants, not peculiar to the *ſenſitive plant*; but the marvel in this is, that beſide having this motion periodical and regular, it is to be brought on at other times, and by accidents, there requiring no more than the touching the *plant* to make it cloſe its leaves at any time of the day, which it ſoon afterwards naturally opens again. This is peculiar to this *plant*, and reſembles the action of an animal which had been injured or frighted. A cloſe obſervation alſo of the manner in which this is performed, will give many hints toward the finding its cauſe. It is a very difficult thing to touch the leaf of a vigorous *ſenſitive plant* ſo lightly, as not to make it cloſe. Its ſenſation is extremely delicate, and its large rib or nerve, which runs along its middle, is as it were a hinge, on which the two halves of the leaf move when they turn up on being touched, till they ſtand erect, and by that means meet one another. The ſlighteſt touch imaginable gives this motion to the ſide of the leaf which is touched, which is communicated immediately to the other ſide, or half, and they move together; and if the touch have been a very little rougher, the oppoſite leaf on the ſame rib receives the impreſſion, and cloſes up in the ſame manner with that which was actually touched.

Nor is this all; for when the two ſides of each of theſe leaves move upwards, the pedicle of each half moves upwards at the ſame time, and by this means they in ſome meaſure approach toward each other, and make the angles of their pedicles with the main rib, or ſtalk of the compoſit leaf, leſs than before; and the total motion of each leaf is compoſed of theſe two motions.

If the touch be ſtill rougher, the whole arrangement of leaves on the ſame rib feel its influence on each ſide, and all cloſe in the ſame manner with the ſingle pair in the precedent inſtance: and if the touch be yet ſtronger than this, the rib itſelf feels it, and attempts to cloſe in its way; moving itſelf upwards toward the branch from which it is produced, juſt as the ſingle pedicles of the leaves did toward it: and if the touch be yet more hard and rough, the very branches have the ſenſation propagated to them, and apply themſelves to the main ſtem, or trunk of the ſhrub, as the ſimple leaves did before to their rib, and that rib to the branch; ſo that the whole *plant* in this ſtate forms itſelf from a very complexly branched figure, into a ſort of ſtrait cylindric one. That motion which has, of all others, the greateſt effect upon this *plant*, is a ſhaking one.

Theſe three motions of the *plant* are performed by means of three diſtinct and ſenſible articulations; the firſt that of the ſingle leaf to its pedicle, the ſecond that of the pedicle to its branch, the third that of the branch to the trunk. The primary motion of all which, is the cloſing of the two halves of the leaf upon their rib, which ought alſo to be performed in a ſimilar manner, and by a ſimilar articulation. This, however, is much leſs viſible than the others.

Theſe motions are wholly independent on one another, as may be proved by experiment. It ſhould appear, that if the ſtalks are moved and collapſe toward the branches, or theſe toward the trunk, that the leaves, whoſe motion is uſually primary to theſe, ſhould be affected alſo; yet experiment

ment proves that it is poſſible to touch the branches in ſuch a manner, as to affect them only, and make them apply themſelves to the trunk, while the leaves feel nothing of the touch: but this cannot be, unleſs the branches are ſo diſpoſed, as that they can fall to the trunk without ſuffering their leaves to touch any other part of the *plant* in their paſſage; becauſe if they do, they immediately become affected. Winds and heavy rains cauſe the *ſenſitive plants* to ſhut up their leaves, while eaſy ſhowers do not at all affect them: it is plain hence, that the agitation of the *plant* by the wind, and the ſtrokes given by the large and haſty drops of rain, are what cauſe the contraction.

By whatever accident the *plant* has been made to cloſe its leaves, it always regularly opens them again afterwards. This however requires different times, according to ſeveral circumſtances, as the time of the day, the ſeaſon of the year, and the more leſs or vigorous and healthy ſtate of the *plant*: ſometimes this is done in ten minutes, ſometimes it requires half an hour. And the manner is not leſs different than the time; for ſometimes the leaves unfold themſelves firſt, and ſometimes the branches, whereas ſometimes all is done at once, and the whole *plant* ſeems in motion at a time.

In endeavouring to account for the motions of this *plant*, theſe gentlemen have conjectured that they are performed by means of a ſort of very nice and fine hinges, which communicate one with another by means of very minute and ſlender cords, which occaſion them to act as we ſee when the *plant* is ſufficiently diſturbed, and theſe cords ſhaken; and what gives a ſtrong probability to this conjecture is, that the decayed and dying leaves of the *plant* perform this motion as regularly and vigorouſly, as thoſe which are freſh and full of juice. It ſeems plain, that while the juices are evaporating, and the parenchymatous ſubſtance of the leaves drying up, theſe more ſolid parts, the lines and cordages, retain their figure; and conſequently, if it is by means of theſe that the motion is always performed, it will be as well performed in theſe as in the freſher leaves; which could not be the caſe, were it owing to the juices.

The natural opening and ſhutting of the leaves of this *plant* at night and morning, are not ſo fixed but that they are variable alſo, according to circumſtances of place, temperature, *&c.* In the month of Auguſt a *ſenſitive plant* was carried in a pot out of its uſual place into a dark cave, the motion that it received in the carriage ſhut up its leaves, and they did not open till twenty four hours afterwards. At this time they became moderately open, but were afterwards ſubject to no changes at night or morning, but remained three days and nights with their leaves in the ſame moderately open ſtate. At the end of this time they were brought out again into the air, and there recovered their natural periodical motions; ſhutting every night, and opening every morning, as naturally and as ſtrongly, as if it had not been in this forced ſtate; and while in the cave, it was obſerved to be very little leſs affected with the touch than when abroad in the open air.

Repeated experiments have proved, that it is not the light of the day that opens the leaves of this *plant*, nor the darkneſs of the night that cloſes them; neither is it the alternate warmth of the day, and cold of the night, that have this effect, ſince it ſhuts in nights which are much warmer than the days often are in which it opens; and the encreaſing the heat of the place in which it is kept, and marking the encreaſe or decreaſe on the thermometer, have been found to have not the leaſt effect, as to its ſooner or later opening or ſhutting its leaves.

The moſt probable conjecture ſeems, that it is not great heat, or great cold, ſuch as it can bear, that bring on this effect, but the ſudden change from one to the other; and this is confirmed by this experiment, that if one of theſe *plants* be raiſed under a glaſs bell, or caſe, and the bell or covering be taken off, it immediately cloſes, even though it be in the middle of the day; and this is alſo obſerved, that the more open or expoſed the *plant* ſtands, the more ſtrong and lively are its ſhutting and opening; and that they are moſt obſervable in ſummer, and much leſs ſo, when it is kept in a cloſe ſtove in winter.

The great heats of ſummer, when there is open ſunſhine at noon, affect the *plant* in ſome degree like cold, cauſing it to ſhut up its leaves a little, but never in any very great degree. The *plant*, however, is leaſt of all affected about nine o'clock in the morning, and that is conſequently the propereſt time to make experiments on it. A branch of the *ſenſitive plant* cut off, and laid by, retains yet its property of ſhutting up and opening in the morning for ſome days; and it holds it longer if kept with one end in water, than if left to dry more ſuddenly.

The leaves only of the *ſenſitive plant* ſhut up in the night, not the branches, and if it be touched at this time, the branches are affected in the ſame manner as in the day, ſhutting up, or approaching to the ſtalk or trunk, in the ſame manner, and often with more force. It is of no conſequence what the ſubſtance is with which the *plant* is touched, it anſwers alike to all; but there may be obſerved a little ſpot, diſtinguiſhable by its paler colour in the articulations of its leaves, where the greateſt and niceſt ſenſibility is evidently placed.

The *ſenſitive plant*, plunged into water, immediately cloſes its leaves, which is partly owing to the touch, partly to the coldneſs of the water; afterwards the leaves expand again, and if they are then touched, cloſe again as before, as if in the open air, only that they do it with leſs force.

If the end of one of the leaves be burned with the flame of a candle, or by a burning glaſs, or by touching it with hot iron, it cloſes up in a moment, and the oppoſite leaf does the ſame, and after that the whole ſeries of leaves on each ſide the rib, then the rib itſelf, then the branch, all do the ſame, if the burning has been in a ſufficient degree. This proves that there is a very nice communication between all the parts of the *plant*, by means of which the burning, which only is applied to the extremity of one leaf, diffuſes its influence through every part of the ſhrub.

If a drop of aquafortis be carefully laid upon a leaf of the *ſenſitive plant*, ſo as not to ſhake it in the leaſt, the leaf does not begin to move till the acrid liquor corrodes the ſubſtance of it; but at that time, not only that particular leaf, but all the leaves placed on the ſame rib, cloſe themſelves up. The vapour of burning ſulphur has alſo this effect on many leaves at once, according as they are more or leſs expoſed to it; but a bottle of very acrid and ſulphureous ſpirit of vitriol, placed under the branches unſtopped, produces no ſuch effect. The wetting the leaves with ſpirit of wine, has been obſerved alſo to have no effect, nor the rubbing oil of almonds over them; though this laſt application deſtroys many *plants*.

A branch of the *plant* was cut away longitudinally, till only a third part of the ſubſtance remained, yet it communicated the effects of the touch, in the ſame manner as before, to thoſe branches which aroſe lower on the ſhrub. The tranſpiration of the *plant* being retarded, is of no effect as to its periodical opening and cloſing; for one kept under a cloſe glaſs bell ſhuts and opens as regularly, night and morning, as when it ſtands in an open green-houſe. A branch of it put into the exhauſted receiver of an air-pump, is found to have its force of opening and cloſing up much impaired, but not wholly taken off. Mem. de l'Acad. des Scienc. Par. 1736.

SEPHIROS, a word uſed by Paracelſus, and his followers, to expreſs a ſort of dry and hard impoſtume, or kind of ſpurious ſcirrhus.

SEPHIROTH, a Hebrew word ſignifying brightneſſes; and the cabbaliſts give the name of *ſephiroth* to the moſt ſecret parts of their ſcience.

The knowledge of the *ſephiroth* is not acquired but with much ſtudy and labour, and is the higheſt ſtep of the contemplative theology. They reckon up ten *ſephiroths*, which are ſometimes repreſented by ten different circles, included in each other; and ſometimes by the figure of a tree, pretty much like what, in the ſchools, they call Porphyry's tree, to ſhew the different categories of ens or being. *Calm.* Dict. Bibl. in voc.

SE PIACE, in the Italian muſic, ſignifies that the part it is joined to may be repeated, or not, at pleaſure.

SEPS, in zoology, the name of a very peculiar animal of the lizard kind, but ſeeming as if of a middle nature between that genus and the ſnakes, and appearing rather a ſerpent with feet than a lizard. See Tab. of Quadrupeds and Serpents, N° 31.

It is a ſmall ſpecies; its body is rounded, and its back variegated with longitudinal lines of black. Its eyes are black; it has ears, and a ſmall and very ſlender tail. What appears moſt ſingular in it is, that it has four legs with feet, divided into toes; but theſe are wholly uſeleſs to the creature in its motions, and not at all aſſiſting it in walking. The firſt pair are placed very near the head, the other by the anus. The ſcales are laid in a reticulated manner; they are of an oblong figure, approaching to a rhomboides, and laid longitudinally. Its belly is white, with a ſlight caſt of blue, and it has noſtrils near the end of the ſnout. Columna took five living young ones out of the body of one of this ſpecies, ſome of which were included in membranes, and others looſe, as is the caſe in the fœtus found in the viper. *Ray*'s Syn. Quad. p. 272.

The bite of the *ſeps* is ſaid to occaſion an inſtant putrefaction of the fleſh of the whole body.

SEPTANA, a word uſed by the antient phyſicians for a ſeptenary fever, or one that performs its regular period in ſeven days.

SEPTARIÆ, in natural hiſtory, the name of a large claſs of foſſils, called by ſome *ludus Helmontii*, and by others the *waxen veins*. They are defined to be foſſile bodies not inflammable, nor ſoluble in water, naturally found in looſe detached maſſes of a moderately firm texture, and duſky hue, divided by ſeveral *ſepta*, or thin partitions, and compoſed of a ſparry matter greatly debaſed by earth, not giving fire with ſteel, fermenting with acids, and in great part diſſolved by them, and calcining in a moderate fire.

Of this claſs there are two diſtinct orders of bodies, and under thoſe ſix genera. The *ſeptariæ* of the firſt order are thoſe which are uſually found in large maſſes, of a ſimple uniform

uniform conſtruction, but divided by large *ſepta* either into larger and more irregular portions, or into ſmaller and more equal ones, called *talc*.

Thoſe of the ſecond order are ſuch as are uſually found in ſmaller maſſes of a cruſtated ſtructure, formed by various incruſtations round a central nucleus, and divided by very thin *ſepta*.

The genera of the firſt order are four. 1. Thoſe divided by *ſepta* of ſpar, called *ſecomiæ*. 2. Thoſe divided by *ſepta* of earthy matter, called *gaiophragmia*. 3. Thoſe divided by *ſepta* of the matter of the pyrites, called *pyritercia*. And 4. thoſe divided by *ſepta* of ſpar, with an admixture of cryſtal, called *diaugophragmia*. See all theſe under their ſeveral heads.

Of the ſecond order there are only two genera. 1. Thoſe with a ſhort roundiſh nucleus, encloſed within the body of the maſs. And 2. thoſe with a long nucleus, ſtanding out beyond the ends of the maſs. *Hill*'s Hiſtory of Foſſils, p. 500.

SEPTERION, Σεπτηριον, in antiquity, a Delphic feſtival, celebrated every ninth year, in memory of Apollo's victory over Python. The chief part of the ſolemnity was a repreſentation of Python purſued by Apollo. *Potter*, Archæol. Græc. Tom. I. p. 430.

SEPTIMONTIUM, among the Romans, a feſtival celebrated in December on all the ſeven hills of Rome; whence alſo it had this name, being otherwiſe called *agonalia*. See the article AGONALIA, *Cycl.*

SEQUATUR *ſub ſuo periculo*, a writ that lies when a *ſummons ad warrantizandum* is awarded, and the ſheriff returns that the party hath nothing whereby he may be ſummoned; then goes forth an *alias* and a *pluries*; and if he comes not in on the *pluries*, this writ ſhall iſſue. Old Nat. Br. 163. *Cowel.*

SEQUESTRATION (*Cycl.*)—SEQUESTRATION, *ſequeſtratio*, in chemiſtry, a term uſed by ſome writers to expreſs ſeparation.

SEQUESTRO *habendo*, a writ judicial for the diſcharging a *ſequeſtration* of the profits of a church benefice granted by the biſhop at the king's commandment, thereby to compel the parſon to appear at the ſuit of another. The parſon, upon his appearance, may have this writ for the releaſe of the *ſequeſtration*. Reg. Judic. 36. *Blount*, *Cowel.*

SERACH, in the Turkiſh military orders, an officer who holds the ſtirrup of the caia of the janizaries in charge, attends him when he goes out on horſe-back, and ſerves him as a meſſenger on all occaſions. After this office he has the title of *chous*; and after he has paſſed through this, he has the ſame office under the aga of the janizaries. *Pocock*'s Egypt, p. 168.

SERANGODES, a word uſed originally as an epithet for the pumice ſtone, and expreſſing cavernous, ſpungy, or full of holes. It has been hence uſed to ſinuous ulcers, and to all ſorts of things that are cavernous, or of a ſpungy texture.

SERAGE, in zoology, an Engliſh name for a bird of the larus, or gull kind, more uſually called the *ſea-ſwallow*, and by authors *ſtema*. See STEMA.

SERAPIAS, in the materia medica, the officinal name of the dried root, called *ſalep*. *Dale*'s Pharm. p. 254.

SERBAJEE, in the Eaſtern military orders, is a captain in the horſe in the ſervice of the grand ſeignior. *Pocock*'s Egypt, p. 166.

SERIANA, in botany, a name given by Plumier to a genus of plants, the ſame in its generical characters with his *cururu*; both which are compriſed by Linnæus under one genus, with the new name *paulinia*. *Plumier*, Gen. 35. See the article PAULINIA.

SERICH, the name of a ſeed uſed in the food of the Egyptian coptis. It is produced by an herb called *ſimſim*, and is pounded and put into oil. In this they dip their bread, which is always new, being baked as often as they eat in ſmall flat cakes. Theſe they eat dipped in this oil with raw onions, or elſe they break the cakes to pieces, and put them into a ſyrup of ſugar, made when the canes are green. *Pocock*'s Egypt, p. 183.

SERICUM, *ſilk*. See the article SILK.

SERICUM is alſo a name given by ſeveral chemical writers to the flowers of zink raiſed by ſublimation in an inclined open crucible. Theſe flowers are not reducible into zink again, and are of a fibroſe texture, and a beautiful bright white colour. This has made them be called alſo the *philoſophic cotton*, and others have named them the *aqua ſicca philoſophorum*. What has given the greateſt confuſion, however, in regard to them is, that ſome writers have choſen to call them talc, and a ſort of ſolution of them in vinegar, oil of talc. Others have reſtrained the word oil to a genuine oil, ſeparated from a ſolution of theſe flowers in vinegar; and have attributed to this oil the power of concentrating metals, and fixing ſilver, or reducing it to the ſolidity and weight of gold, and making it, like that metal, ſoluble only in aqua regia. Theſe, however, are mere chimeras, and this boaſted oil is, in reality, no other than the eſſential oil of the grape, and can have no ſuch properties.

SERINUS, in zoology, the name of a ſmall bird common in Germany and Italy, and called by the Auſtrians *haerngril*, or *hirngryl*. See Tab. of Birds, N° 37. Its back is of a reddiſh brown, and its head yellow; the colour being deeper in the male, and paler in the female. The rump is of a beautiful yellowiſh green, as is alſo the breaſt. The belly is white, and the ſides have ſome oblong blackiſh ſpots. The tail, and long feathers of the wings, are black, and a little greeniſh at their extremities. The beak is very thick, ſtrong, and ſhort, and is very ſharp at the point. It is kept in cages, and ſings very ſweetly. *Geſner*, de Avibus. *Aldrovand.* de Avib. lib. 18. cap. 20.

SERMOCINATION, *ſermocinatio*, in rhetoric, denotes diſcourſe in general, whether held by a perſon alone, or in company, and is the ſame with what is called *dialogiſm*. See the article DIALOGISM.

SERPEGER, in the manege, was uſed to denote the riding a horſe in a ſerpentine way, or in a tread with waved turnings, like the poſture of a ſerpent's body; but is now become obſolete.

SERPENT, (*Cycl.*) *ſerpens*, in zoology, the name of a genus of animals, which Mr. Ray defines to be creatures breathing by means of lungs, having only one ventricle in the heart, having no feet, and having a long body, covered with ſcales. To which he adds, that in cold ſeaſons they can bear hunger a long time. The greater part of the *ſerpent* claſs are poiſonous, and dangerous in their bite, leaving a miſchievous liquor in the wound made by their tooth, which mixing by this means immediately with the blood, is of fatal conſequence; though the whole creature may be eaten with ſafety, or even the poiſonous liquor, which does this miſchief in the wound, taſted without hurt.

Notwithſtanding that *ſerpents* reſpire by means of lungs, they do not take in and diſcharge their breath by ſuch ſhort intervals as other animals, but what they have once inſpired will ſerve them a long time; for as they are of a cold nature, and their naturally neceſſary vital warmth very ſmall, they do not require ſuch an eternally renewed ſupply of that pabulum of vital heat, as thoſe which have more of it; and as with us they lie half the year torpid, and half dead, their vital warmth at that time, like fire ſmothered under aſhes, barely exiſts, and needs perhaps no more air than what the creature took in at one inſpiration, before its laying itſelf down for the ſeaſon, which ſerves it till the life-renewing ſpring returns.

Serpents, according to Mr. Ray, may be divided into the poiſonous and the harmleſs; the firſt having long dentes exerti, with poiſonous liquors contained at their bottom, which on biting they diſcharge into the wound; the others wanting theſe teeth, and this poiſon.

They may alſo be divided, in regard to their generation, into the oviparous and viviparous; but this is a leſs firmly founded diſtinction than may be ſuppoſed, ſince all *ſerpents* are truly and properly produced of eggs; and the only difference is, that ſome depoſit their eggs in dung-hills, and the like places, to be hatched by accidental heat; while others retain thoſe eggs to be hatched in their own bodies, and ſo bring forth living young ones. Of the firſt kind is the common ſnake, of the latter the viper. *Ray*'s Syn. Quad. et Serp. p. 284. See Tab. of Quadrupeds and Serpents.

SERPENS *bubalinus*. Mr. Cleyer has given a very remarkable account, in the German Ephemerides, of the prodigious ſize, and voracious appetite of this *ſerpent*, and its manner of feeding.

This gentleman aſſures us that they grow to the length of twenty five feet, and are ſurpriſingly daring in attacking large creatures for prey. Their neck, he obſerves, is ſo ſmall, in proportion to the creatures they ſeize, that it is a wonder that they can ſwallow them whole, which yet experience ſhews they certainly do, having no power of tearing them to pieces. This gentleman ſaw a compleat ſtag taken out of the belly of one of theſe *ſnakes*, with all its limbs remaining on; and at another time a wild goat, which had been ſwallowed in the ſame manner; and from another a compleat porcupine, a very troubleſome morſel; and there was once an inſtance, in the Molucca iſlands, of a woman big with child being thus ſucked down whole by one of theſe creatures. *Ray*'s Syn. An. p. 333.

The method of their managing their prey is this. When thoroughly lank, lean, and hungry, the *ſnake* lies in wait for any thing it can ſeize; he darts out upon the prey, and ſeizing it with his mouth, winds his body round that of the creature; and this he is able to do with ſuch force, that he will often, in twiſting himſelf firmly round the creature, break the bones within its ſkin. This he continues, and at the ſame time is biting with his terrible mouth all the tender parts of the creature, till he has deſtroyed it; or if it be an animal too ſtrong to be killed by theſe ſimple folds, it will drag it to ſome neighbouring tree, and tying it faſt againſt that, draw its body ſo forcibly round it, as to cruſh all its bones to pieces by the help of that ſolid reſiſting body. The part it uſually ſeizes with its teeth, at the ſame time, is the creature's noſe, which he bites ſo forcibly, as not only to ſtop the breath, but to occaſion a diſcharge of blood, which helps to forward its deſtruction.

But the moſt ſingular attack, ever known to have been made by this creature, is that recorded by the ſame author,

of its ſeizing a buffalo; which it deſtroyed in the manner above deſcribed, though it was a long time about it, and was obliged to have recourſe to the method of tying it up to a tree, againſt which it broke its bones ſeverally, with a noiſe that was heard to a great diſtance. When the creature had thus deſtroyed its prey, it continued breaking of the bones, till there was not one left whole in the body, and the whole reſembled a ſhapeleſs maſs of matter.

The jaws and throat of this, and of the other *ſerpent* kind, though ſmall and narrow, are prodigiouſly extenſible, and made ſo by nature for the ſwallowing theſe morſels. The *ſnake*, when the prey lay in this ſtate before it, licked it all over, and covered it thick with its ſaliva, and that ſo regularly, that the whole carcaſe looked as if daubed over with glue. This done, it opened its jaws to a monſtrous extent, and ſucked in the head of the prey, and continuing inceſſantly ſucking, at length drew down the whole body.

This is a work of time, and very often two or three days are employed in it. And when the animal is thus got down, the *ſnake* is ſwelled and bloated up all over with it, and is no longer in a ſtate of offending, or even of defending itſelf, or ſo much as running away; and the people of the places where this ſpecies is common, well know this, and find it an eaſy thing to deſtroy them in this ſtate, and are very happy when they catch one, as their fleſh is a very delicate food. Ephem. Germ. Ann. 12. Obſ. 7.

SERPENS *marinus*, *ſea ſerpent*, the name of a fiſh of the eel kind, uſually of five or ſix feet in length, and a furrowed body, continuing all the way of the ſame thickneſs, till near the tail. See Tab. of Fiſhes, N° 12.

Its back is of a duſky yellow, and its belly a ſhining blue. Its ſnout is long, ſlender, and pointed, and the opening of its mouth extremely large. Near the end of the under jaw it has four or five large and ſharp teeth, which bend backwards, the reſt of the teeth are very ſmall, and ſtand cloſe together. At the very extremity of the upper jaw it has four very large teeth, and all the reſt are ſmall, and like thoſe in the under one; but the largeſt teeth of all are placed in a row, in the middle of the palate. It has only one pair of fins, which are placed near the gills. The openings of the gills are at a conſiderable diſtance from the head, and it is marked with dotted lines down its ſides. It is common in the Mediterranean, and its fleſh is very fine taſted, but full of ſmall bones. *Willughby*, Hiſt. Piſc. p. 108.

SERPENS *rubeſcens*, the *red ſerpent fiſh*, in ichthyography, the name of a fiſh, properly of the tænia kind.

It reſembles the common ſnake in figure, and is of a fine ſtrong red in colour, and marked with oblique lines all down the ſides, and long ones from the gills to the tail, one on each ſide. Its mouth is but ſmall, and its teeth ſharp and ſerrated; and it has all over its back a number of fine capillaments, ſet at diſtances from one another, even to the tail, and the ſame on the belly. Its tail ends in a ſingle fin. *Aldrovand.* de Piſc. lib. 3. cap. 28.

SERPENT-*ſtones*, a name given by ſome to the cornua ammonis, a beautiful foſſile ſhell, which reſembles a *ſerpent* coiled up.

Theſe are frequent in many parts of the world, beſide the plenty we have of them in England, and elſewhere. The accurate obſerver, Mr. Harenberg, found prodigious numbers of them on the banks, and among the ſand of a river in Germany. He traced this river through its ſeveral windings for many miles, and among a great variety of belemnitæ, cornua ammonis, and cochlitæ, of various kinds. He found alſo great quantities of wood, of recent petrifaction, carrying in it at that time the plain marks of the axe, by which it had been cut from the trees then growing on the ſhore. The water of this river he found, in a dry ſeaſon, and when the ſupplies of its natural ſprings were not diluted with rains, to be conſiderably heavier than common water; and many experiments ſhewed him that it contained ferrugineous, as well as ſtony particles, in great quantity, whence the petrifactions in it appeared the leſs wonderful, though many of them of recent date.

Of the cornua ammonis, or *ſerpent-ſtones*, he there obſerved more than thirty different ſpecies, and doubts not but there are many more yet unobſerved. They lie immerſed in a bluiſh foſſile ſtone, of a ſoft texture, and fatty appearance. They lie in this in prodigious numbers, and of a great variety of ſizes, from the larger known ſorts, down to ſuch as could not be ſeen without very accurate inſpection, or the aſſiſtance of a microſcope. Such as lie in the ſofteſt of theſe ſtones are ſoft, like their matrix, and eaſily crumble to pieces; others are harder. In a piece of this ſtone, of the bigneſs of a finger, it is common to find thirty, or more of theſe foſſils; and often they are ſeen only in form of white ſpecks, too minute to ſhew their figure, till examined by the microſcope. But what is moſt obſervable of the cornua ammonis of this place is, that they are often found growing not only to, but into one another, in ſuch a manner, that they cannot be ſuppoſed ever to have been inhabited by any living fiſh, eſpecially the ſpecimen which is pierced by the other. This author is of opinion that they grow, and are formed where they are; and attempts to prove it by affirming, that they have an actual increaſe in ſize there in a little time, and that not only if left in their beds, but if taken out, and put into a glaſs of the water. This is an opinion wholly different from the received one at preſent in the world, and perhaps will be found erroneous on farther trials. Act. Erudit. 1727. p. 140.

SERPENS *terrenus*, the *earth ſerpent*, a name given by ſome of the chemical writers to nitre. It was originally given to the nitre of the antients, a ſalt very different from that which we call nitre, but it has ſince been applied alſo to that ſalt.

SERPENTS *tongues*. The iſland of Malta abounds with *gloſſopetræ*, or the petrified teeth of ſharks, which, from their reſemblance to a tongue, are by the vulgar ſuppoſed to be the tongues of *ſerpents* turned into ſtone by ſome miracle of St. Paul, when he was there. This iſland abounds not only with theſe, but with bufonitæ, and vaſt numbers of other remains of ſea productions. Theſe things, notwithſtanding their perfect reſemblance of the ſame bodies now found recent in the mouths of living fiſhes, *&c.* are by ſome ſuppoſed never to have been real parts of fiſhes, but to have been formed where they now lie by ſome luſus of nature, or plaſtic ſeeds. This, however, is an idle and abſurd opinion; and Aguſtino Scilla, who has written at large on the foſſils of this iſland, gives a very rational account of their being the real remains of animals, which, according to his ſyſtem, it is no way wonderful to find there. The univerſal deluge has doubtleſs been of power to bring all the foſſils we find into the places where we now ſee them buried, even in the midſt of quarries of ſtone, in the middle of inland countries; but in regard to the iſland of Malta, which ſo abounds with them at this time, he ſuppoſes that long ſince the time of the creation, and even without the aſſiſtance of the general deluge, it may have been formed out of the ſea, and that it appears plainly to have been at firſt no other than a maſs of ſoft mud, with an immenſe number of ſea ſhells, teeth of fiſhes, and other remains of ſea animals, mingled among it; and that theſe ſubſiding as low as they could among that thickening matter, have made the iſland what we now find it, that is, a heap of earth with theſe things, in vaſt quantities, buried in it, and that at different depths, but principally not far from the ſurface. Philoſ. Tranſ. N° 219. p. 182.

That this collection of matter was occaſioned by a flood of ſome kind, is highly probable, but it is not neceſſary to have recourſe to Noah's flood for it, though that might as well cauſe it as any other; but it might alſo be formed by an irruption of the ocean into the Mediterranean, or by an inundation of the Tuſcan ſea driven by vehement winds, or any other means, that way: and when the origin of this iſland is thus allowed, it is not to be wondered at, that an immenſity of the refuſe parts of animals, inhabitants of thoſe waters, ſhould be left in the places where they had time to ſubſide. And though there are found among theſe teeth, *&c.* in the iſland of Malta, great quantities of ſhells, of ſuch ſpecies as are not natives of thoſe ſeas, this is no objection to the opinion; ſince it is well known that the winds when violent, as they probably were about the time of the formation of that iſland, will bring ſuch light bodies as ſhells a vaſt way in water.

It is a common obſervation, that the eaſt, and ſouth-eaſt winds, bring to the coaſt of Calabria great quantities of beautiful ſhells, none of which are found living in the ſeas thereabout. The *bufonitæ*, or toadſtones of Malta, are plainly the grinder teeth of the lupus and ſargus dentex, as alſo of the aurata, and ſeveral other fiſh, which have ſuch round teeth in the hinder part of their jaws. The ſhells found in this iſland, and other places, are ſo plainly thoſe of once living animals, that the remains of the body of the fiſh is plainly to be diſtinguiſhed in ſome of them; and in others the lamellæ are laid together, and coated over one another, in the very ſame manner as in the recent ſhell fiſh. Philoſ. Tranſ. N° 219. p. 186.

It is objected, that theſe ſhells are produced in the places where they lie, becauſe they are found in great cluſters together, all of the ſame kind; but this is no material objection, but is eaſily ſolved upon the common principles: for if we ſuppoſe a number of diſſimilar bodies, ſeveral of every kind, to be ſuſpended in the ſame quantity of water, and that water be put in motion, we ſhall ſee them all confuſedly blended together, while the motion is violent, but they will, as that becomes more calm, ſeparate themſelves, and thoſe of the ſame nature will, in a great meaſure, get together, and ſubſide in parcels ſeparately from the reſt. Thus if ſtraws, ſticks, egg-ſhells, pebbles, and common cockle-ſhells, were to be thus ſhook together, the conſequence would be, that in a large tub of water they would naturally each parcel ſubſide together in different parts of the bottom; and though in the neighbourhood of one another, yet the ſtraws would not be mixed with the pebbles, nor the egg-ſhells with the cockles, any more than it is really found, that the different ſpecies of ſhells are mingled in the earth.

It is to be added alſo, that theſe ſhells have ſubſided, not in water, but in a thicker fluid, compoſed of mud and water, and this has kept them more aſunder than common water alone would have done; and we ſhall find, on examining the bowels of the earth, that though the ſhells, in the ſame maſs of earth, or ſtone, are generally principally of one kind, yet they are neither always ſo, nor perfectly ſo, but that often they are confuſedly blended among other kinds, and more often have ſome few of other ſpecies blended among them; as a few cockle-ſhells might be among the pebbles, in the familiar inſtance mentioned above, and by ſome particular accidents, even in that caſe, the whole ſet of bodies, excepting the very lighteſt, might happen to be blended together.

The mountains of Sicily afford ſome few *gloſſopetræ*, or *ſnakes-tongues*, but they are few in number, and worſe prepared than thoſe of the iſland of Malta; which is probably owing to the high ground of thoſe mountains being leſs likely to receive the refuſe of the ſea, and its ſoil, which is ſandy, being leſs fitted to preſerve them when there, than the marl, of which the iſland of Malta conſiſts.

The *echini marini*, or ſea eggs, and their ſpecies, which are very frequent among the *ſerpents-tongues* of Malta, all lie upon the ſurface of the ground, or near it; whereas the *gloſſopetræ* lie deeper, though at no great depth. This is a plain effect of all theſe things having been really animal bodies, and having floated in the mud, of which that iſland was formed; for in this it could not be otherwiſe, but that the *gloſſopetræ*, or *ſerpents-tongues*, being heavy, would ſubſide in the water, while the light ſhells of theſe other animals would float on, or near the ſurface.

The opinion of theſe bodies growing from ſeminal principles, is alſo greatly weakened by the ſituation of them in the earth. If they grew from ſeeds, as plants, we ſhould doubtleſs ſee them, like plants, all bending one way, the points of all upwards, and their roots downward; but on the contrary, both in the iſland of Malta and elſewhere, theſe things are found in the moſt different directions imaginable; ſome with their bottoms upwards, ſome downwards, ſome horizontal, and others in all the intermediate angles. Some have ſuppoſed the *gloſſopetræ*, in particular, to grow from roots in the earth, becauſe they uſually have roots different from the other parts, and becauſe they ſtick very firmly in the earth at theſe roots, but are very eaſily looſened in any other part. It is certain indeed that theſe parts, at the bottom of the *gloſſopetræ*, are their roots, and that their ſpungy texture was intended for their taking in nouriſhment; but this was their uſe when in the head of the fiſh, not when in the earth; and the reaſon of their adhering more firmly to the earth in this, than in any other part, is only that they are more ſpungy and porous here, and that in other parts, where they are ſmooth and even, the earth can have no hold of them; but where they are thus rough, as they ſubſided with a moiſt earth like mud about them, they naturally become connected ſtrongly to it in drying, as part of it was received into their pores, and not broken from the reſt, till by forcing them out afterwards. Philoſ. Tranſ. N° 219. p. 189.

Some affirm that the *gloſſopetræ* are natural cryſtallizations of ſalt, and that to this their regular figure is owing; but it is to be anſwered, that their figure is not ſo regular as theſe objectors ſeem to ſuppoſe, but that there are as many different ſhapes of them as there are of teeth, in the different parts of the jaw of the ſame ſhark, or in the jaws of different ſpecies of ſharks now found living; and if they were cryſtallizations of ſalt, the whole cryſtallization would be of one and the ſame ſurface and texture; which is not the caſe, ſince the root, as before obſerved, is always very different from the body of the tooth, and the ſubſtance different in even the various parts of the body. Salts are ſalts throughout, and a ruby, a cryſtal, or a diamond, is the ſame in all its parts; but this is not the caſe in the *gloſſopetræ*, but they are compoſed of a cortical and a medullary part, like the teeth of living ſharks: and it is to be obſerved, that when any of theſe *gloſſopetræ* are found broken, as they frequently are, the fracture is found raw and unaltered, which ſhews that it has happened before they came to the place where they are now found, and that they have no growth or vegetation there, to heal or cover it; for if there were, it would be ſkinned over, as the wounds of plants and animals always are, when in a perfect ſtate and living.

Whenever the *gloſſopetræ* are taken carefully up out of the earth in Malta, the marl or earth, which ſerved for their bed, is found to contain all their minuteſt traces and lineaments, like wax from a ſeal. This is a proof that the marl was as ſoft as melted wax when they were put into it, and that they were of their full ſize and growth when placed there, not having grown, or had any encreaſe in that place.

The apophyſes, or proceſſes in the *gloſſopetræ*, are alſo a ſtrong proof of their being no other than real ſharks teeth, ſince they exactly anſwer to thoſe in the teeth of recent ſharks, by which every tooth is received or inſerted into its neighbour in the jaw. Nay, whereas ſharks teeth are mortiſed into one another in ſuch a manner, that a man may eaſily tell which belongs to each ſide, which lie near the throat, and which near the front of the mouth; and whereas in a ſhark's mouth, the teeth on the left ſide will not fit on the right, nor thoſe above ſerve below, but that on ſeeing a recent tooth, a perſon of judgment will be able to ſay what part of the mouth it belonged to; ſo in the foſſile ſhark's teeth, or *gloſſopetræ*, there is not any one which may not be referred to the particular part of the mouth of the living animal, and could have belonged to no other. *Aguſtino Scilla*, de Petrifac.

SERPENTINÆ, in natural hiſtory, a name given by later authors to the marbles which the antients called *ophitæ*, from their ſpots reſembling thoſe of ſerpents. See the article OPHITES.

SERPENTINE, (*Cycl.*) in the manege. A horſe is ſaid to have a *ſerpentine* tongue, if it is always friſking and moving, and ſometimes paſſing over the bit, inſtead of keeping in the void ſpace, called the liberty of the tongue.

SERPYLLUM, *mother of thyme*, in botany, the name of a genus of plants, the characters of which are theſe. The flowers and ſeeds are the ſame with thoſe of the common thyme, but the ſtalks are lower, leſs hard, and leſs woody. The ſpecies of *ſerpyllum*, enumerated by Mr. Tournefort, are theſe. 1. The broad-leaved hairy *ſerpyllum*. 2. The common large *ſerpyllum* with purple flowers. 3. The common large *ſerpyllum* with white flowers. 4. The common leſſer *ſerpyllum*. 5. The common leſſer *ſerpyllum* with white flowers. 6. The common ſmall *ſerpyllum* with flowers variegated with green and white. 7. The common ſmall *ſerpyllum* with woolly heads. 8. The citron-ſcented *ſerpyllum*. 9. The larger citron-ſcented *ſerpyllum*. 10. The narrow-leaved ſmooth *ſerpyllum*. 11. The narrow-leaved hairy *ſerpyllum*. 12. The loweſt thyme-leaved *ſerpyllum*. *Tourn.* Inſt. p. 197. For the medicinal virtues of *mother of thyme*, ſee the article THYMUS.

SERRA-*piſcis*, in zoology, a name given by many authors to the *piſtris*, or ſaw-fiſh. *Rondelet.* p. 114. See the article PISTRIS.

SERRA is alſo a name given by Pliny to a ſpecies of the baliſtes, called by the generality of writers *ſcolopax*. It is diſtinguiſhed by Artedi by the name of the *baliſtes* with two ſpines in the place of the belly fins, and one behind the anus.

SERRATA, a name given by ſome of the Roman authors to the plant which the Gauls, according to Pliny, had named *betonica*, and which the Greeks called *ceſtrum pſuchrotrophon*, and *priorites*. This was evidently the ſame plant with our *ſerratula*, or ſaw-wort. But beſide this there was another plant called by this name, and which, according to Pliny, was the *chamædrys* or *germander* of the Greeks. He ſays that the *chamædrys* of the Greeks was a plant called by the Latins *trixago*, and by ſome *chamedrope* and *teucrion*. He adds, that it had leaves like thoſe of mint in ſhape, but reſembling thoſe of the oak in their colour and diviſion, and that the flower was purple. He adds, that the leaves were ſo nicely ſerrated at the edge, that it was ſuppoſed men had taken the idea of a ſaw from them.

This author is not however to be abſolutely depended upon, and though he here expreſsly ſays that this *ſerrata* is the ſame with the *chamædrys* of the Greeks, yet he ſeems to run away from this aſſertion in his deſcription, and to make it the ſame with the other *ſerrata*. Dioſcorides ſays nothing of the *chamædrys*, but that its leaves were ſmall. And it is much more probable that the world ſhould take the idea of a ſaw from the leaves of the *ſerratula*, than from thoſe of this plant, they being much leſs nicely denticulated than thoſe. So that thoſe who have been influenced by Pliny, to ſuppoſe the *germander* and *ſerrata* of the antients to be the ſame plant, are in the wrong, though they have the countenance of this ſo generally reputed authentic author for it.

SERRATE *flies*, in natural hiſtory, a name given by authors to certain flies, diſtinguiſhed from all the other kinds by their having a weapon, reſembling a double ſaw, placed at the hinder part of the body: this ſerves ſeveral ſpecies of them to make holes in the branches of trees, in which they depoſit their eggs; but there are ſome of them which do not ſeem to make any uſe of this curious inſtrument, though they have it. See ROSE-*fly*.

The *fly* of this kind that lays its eggs on the gooſeberry buſh, depoſits them only on the ſurface of the middle rib of the leaf; and the oſier-fly, which is one of this genus, produced from a baſtard caterpillar of the oſier, lays its eggs on the intermediate ſurface of the leaves between the ribs. There appears to be no uſe made of this curious inſtrument in the depoſiting of theſe eggs, ſince they are only laid in rows upon the leaves, and fixed to them by means of a viſcous fluid which covers them. It is a very remarkable property in the eggs of this genus of *flies*, that they grow much larger after they are laid. This is obſervable in the eggs of the common roſe-fly, which are at firſt buried in the wood, and by their growth force out the ſurface into tumours of an oval figure: but in theſe of the oſier-fly it is moſt beautifully ſeen, and the whole growth of the fœtus in them is clearly ſeen, on examining them at different times

of their growth, which may be eaſily done without diſturbing them, as they lie naked on the ſurface of the leaf.

When firſt laid, theſe eggs are oblong, perfectly pellucid, and of a whitiſh colour; in a few days they are perceived to be much larger than at firſt, and a ſmall yellow ſpeck is ſeen in each of them: they after this continue to grow larger, till they are of twice the bigneſs that they were at firſt, and this yellow ſpot encreaſing, ſoon begins to put on the oblong form of the falſe caterpillar, which is to be hatched from it. After ſome days, there are evidently ſeen two black ſpots on one extremity of it, which are the eyes, and after this the growth of the included animal becomes ſo quick, that in a day or two after, if the egg be examined by holding it againſt a ſtrong light, the compleat animal may be ſeen in it, doubled in two in ſuch a manner, that its head and tail are brought to touch. Theſe eggs, when depoſited on the leaf, are fixed down to it by ſo ſtrongly viſcous a fluid, that they cannot be taken off without breaking; but there does not appear to have been any aperture made by the ſaw of the animal in the places where they are laid. It is poſſible that there might be a ſmall wound made in the leaf under each, which though not capable of receiving the egg, might however ſerve to pour forth a juice ſufficient to keep the egg moiſt; but theſe apertures muſt be very ſmall, if there are any ſuch, ſince the microſcope diſcovers no traces or remains of them. There ſeems a plain proof that the egg receives ſome ſort of benefit, and that a very eſſential one to its preſervation, from the juices of the plant on which it is depoſited, ſince if thoſe leaves be pulled off from the plant, and left to dry, the eggs always dry up with them, and periſh; whereas, if the ends of theſe leaves be put into water, and the leaf be by that means preſerved freſh and juicy, the creature hatches from it as well, as if it was left upon the tree. It ſhould ſeem from this that the eggs of theſe *flies*, when introduced into wounds in the branches of trees, become a ſort of grafts, and live on the juices of the plant, and that thoſe on the leaves have the ſame juices conveyed to them in ſome other manner. This is certain, that whereas the freſhneſs of the plant is abſolutely neceſſary to the hatching of theſe eggs, it is not at all ſo to the eggs of other inſects which lay upon them. The butterfly lays its eggs on ſome particular ſpecies of plant, according to its kind; but this is only that the caterpillar, when hatched from it, may have proper food; for if the leaf, on which theſe eggs are laid, be dried, the eggs nevertheleſs hatch at their proper period, and ſhew that the juices of the plant, or its continuing freſh, were of no neceſſity or uſe to them. The oſier-fly gives yet another difficulty, however, in regard to this ſyſtem, of the eggs of theſe *flies* receiving nouriſhment from the juices of the plant; for it frequently lays ſeveral rows of eggs on a leaf, and the eggs in ſome of theſe lie two deep: now the queſtion is, in what manner the juices of the plant, ſo neceſſary to theſe eggs, are carried to the upper row? unleſs we can ſolve this, by ſuppoſing that the eggs of the under row convey juices to the upper ones, by communications of veſſels, where they touch, the ſolution of this difficulty appears no eaſy taſk. *Reaumur*'s Hiſt. Inſ. Vol. 9. p. 164.

SERRATED *leaf*, in botany. See LEAF.

SERRATULA, *ſaw-wort*, in botany, a name given to ſeveral ſpecies of *jacea*. See JACCA.

It ſeems very expreſsly proved by Dioſcorides, Pliny, Antonius Muſa, and ſeveral other of the antients, that the *betonica*, or, as they ſometimes wrote it, *vettonica*, was our *ſerratula*. They mention its growing in woods, and having leaves deeply ſinuated, or cut in, and indented all about the edges, and ſay it grew in wet ſhady places. All this agrees very well with our cut-leaved *ſerratula*, and with the *betonica*, or *vettonica* of the antients. Apuleius confounds the *brittanica antiquorum* with the *betonica*, and ſays that it has large leaves like the dock.

Pliny and this author ſeem to have drawn their knowledge from the ſame ſource; and if Pliny, though he has not ſaid it, ſuppoſed, as this author does, that *betonica* and *brittanica* were the ſame, it is then no wonder that he ſays the *betonica* had leaves like a dock, for Dioſcorides himſelf ſays this of the *brittanica*.

SERRATUS (*Cycl.*)—SERRATUS *major*, in anatomy, a broad, fleſhy, and pretty thick muſcle, lying on the lateral part ofthe thorax, between the ribs and ſcapula, by which it is covered. Its figure is that of an irregular ſquare, its greateſt breadth being in the back part, where it terminates by digitations of unequal lengths in a radicated diſpoſition, their extremities deſcribing an arch or curve. From theſe digitations it is that it has its name.

It is inſerted backward in the internal labium of all the baſis of the ſcapula, from the ſuperior to the inferior angle; from thence running forward wholly fleſhy, it encreaſes gradually in breadth, and is inſerted in all the true ribs, and often in one or two of the falſe ones, by the ſame number of digitations. Though the digitations of this muſcle give it a radiated appearance from the ſcapula to the ribs, yet theſe radii do not all lie in that diſpoſition, which at firſt ſight one would be apt to imagine. The muſcle is made up of two planes, one great, the other ſmall: the ſmall plane looks like a diſtinct narrow muſcle, cloſely adhering to the ſuperior edge of the great plane. It is fixed by one extremity under the ſuperior angle of the ſcapula, and by the other to the firſt rib by a ſmall inſertion, and to the ſecond rib by a broad one. This plane is eaſily ſeen by turning the ſcapula forward, having firſt ſeparated the rhomboides; but when it is turned back, the pectoralis minor being firſt cut off, this plane does not appear, being covered and hid by the broad one. The broad plane may be divided into two portions, one ſuperior, the other inferior, adhering to each other at their edges.

The ſuperior portion is thin, and takes up about three quarters of the baſis of the ſcapula, reckoning from the ſuperior angle; from thence it contracts by ſmall degrees, and forms two digitations, very like thoſe of the ſmall plane, which they cover by their inſertions in the two firſt true ribs, or in the ſecond and third, and ſometimes in all the three. The inferior portion is fixed in the lower quarter of the baſis ſcapulæ, from whence it expands itſelf by ſix or ſeven very long fleſhy digitations, which decreaſe in breadth as they deſcend, and are inſerted in the manner beforementioned, in the ſix or ſeven ribs which follow the two firſt. *Winſlow*'s Anatomy, p. 176.

SERRATUS *minor*, in anatomy, a name given by Riolanus to the muſcle, more commonly known by the name of the *ſerratus anticus*. See SERRATUS, *Cycl.*

SERRATUS *poſticus ſuperior*, a flat thin muſcle, ſituated on the upper part of the back, fixed on one ſide by a broad aponeuroſis to the lower part of the poſterior cervical ligament, and to the ſpinal apophyſes of the two laſt vertebræ of the neck, and two firſt of the back; from thence it runs down a little obliquely forward, and is inſerted by broad fleſhy digitations in the poſterior part of the ſecond, third, fourth, and ſometimes of the fifth true ribs, near their angles; but ſometimes it has no inſertion in the ſecond rib. It is covered by the rhomboides, and cloſely united with it. *Winſlow*'s Anatomy, p. 231.

SERRATUS *poſticus inferior*, a flat thin muſcle, lying on the lower part of the back.

It is fixed in the laſt ſpinal apophyſis of the back, and in the three firſt of the loins by a broad aponeuroſis; from thence it runs up a little obliquely, and is fixed by fleſhy broad digitations in the laſt four falſe ribs. Its inſertions in the loweſt rib are near the cartilage, and in the other three near their angles. It is covered by the latiſſimus dorſi, to which it adheres very cloſely, and it covers the ſacro-lumbaris, and longiſſimus dorſi. *Winſlow*'s Anatomy, p. 231.

SERTA, *garlands*, among the antients. See the article GARLAND, *Cycl.*

SERTULA *campana*, in botany, a name given by ſome authors to melilot. *Ger.* Emac. Ind. 2.

SERTULARIA, in botany, the name of a genus of ſea plants, comprehending, according to Linnæus, the *corallines* and *acetabulums* of Tournefort, and the *opuntioides* of Boerhaave. The generical character of theſe plants is, that they are a kind of lithophyta, which are jointed and compoſed of ſeparate parts, faſtened to each other by the ends, in the manner of the gems of a bracelet, or beads of a lady's necklace.

SERVE, in the ſea language. To *ſerve* a rope, is to lay ſpun yarn, rope yarn, ſinnet, a piece of canvas, or the like, upon it, which is rolled faſt round about the rope, to keep it from fretting or galling in any place.

SERVITIIS *acquietandis*, a writ judicial that lies for a man diſtrained for ſervices to one, when he owes and performs them to another, for the acquittal of ſuch ſervices. Reg. Judic. 27. *Blount*, *Cowel.*

SERULA, in zoology, the name of a webfooted ſea-bird, a kind of mergus, very common about Venice, and called by Mr. Ray *mergus cirratus fuſcus*, the brown creſted diver, and ſuppoſed to be the *anas longiroſtra*, or long beaked duck of Geſner.

It is very nearly of the ſize of the duck; its head, and the upper part of its neck, are of a duſky yellow. The crown of the head is of a much duſkier and browner colour than the reſt, and has a creſt of feathers hanging down from it. Its back is of a browniſh hue, with a very faint admixture of grey. Its throat is of a pure white in its upper part, but lower down it is variegated with white, black, and a reddiſh brown. Its belly is all white. Its beak is ſlender, and rounded, and is three fingers breadth long. The upper chap is of a browniſh green, and the under one red. It terminates in a hooked point, and both chaps are all the way ſerrated, or notched like the teeth of a ſaw. The wings are very ſmall and ſhort. *Aldrovand.* Vol. 3. p. 281. *Ray*'s Ornitholog.

SERUM (*Cycl.*)—There have been inſtances, in which the blood has been found to contain with its coagulum a ſubſtance, very different from what we uſually underſtand by the word *ſerum*. Dr. Stuart has given an account of a man in an inflammatory fever, from whoſe arm eight ounces of blood was taken, which, when it had ſtood ſome time, afforded, inſtead of *ſerum*, half its quantity of a white liquor, like

like milk, ſwimming on the coagulum. This had no ſmell at firſt; but being kept for obſervation, after ſix days it contracted a ſmell like that of rotten eggs; and after ſtanding three weeks more, it neither altered its conſiſtence nor ſmell.

If this liquor was chyle, then is chyle a ſubſtance very different from milk, milk being apt to turn ſower, and become thick by keeping, and never contracting the ſmell of rotten eggs, as this liquor did. Whether it be not chyle turned putrid, and brought near to purulency by a long circulation in the blood veſſels, without being converted into blood, through ſome defect in the ſanguification, is a queſtion not eaſily decided. Five days after this being blooded again, the blood was found of the common kind, the *ſerum* being a thin pellucid water as uſual. Philoſoph. Tranſ. N° 442. p. 290.

SERUM *aluminoſum*, *alum-whey*, a form of medicine preſcribed in the late London Pharmacopœia, made of a pint of milk boiled to whey with a quarter of an ounce of alum. *Pemberton*'s Lond. Diſp. p. 255.

SERWOY, in natural hiſtory, a name given by Theodore de Bry, and others, to the animal called by us the *opoſſum*, and by the natives of Braſil the *carigueya*. Phil. Tranſ. N° 239. p. 107. See OPOSSUM.

SESAMION, a word uſed by the antients to expreſs a preparation of the *ſeſamum*, or oily grain. It was a cake made of ſeſamum, honey, and oil.

SESAMOIDE *bones* (*Cycl.*)—The *ſeſamoide bones* are very ſmall, and have their name from the ſeed of the *ſeſamum*, or oily grain, to which they are ſuppoſed to bear ſome reſemblance. There are ſeveral of them found, both in the joints of the toes and fingers. They are for the moſt part very ſmall, and affixed chiefly to ligaments, and only two of them are large enough to be commonly preſerved in ſceletons: theſe reſemble a large flat oval pearl, and are hollowed on one ſide.

They are of about the third of an inch in length, and are half as broad as long. They are connected very near each other, by a ſmall ſhort ligament, to the baſis of the firſt phalanx of the great toe, ſo as to ſlide on each ſide of the middle eminence of the double pulley, in the firſt metatarſal bone, like two ſmall patellæ. Though theſe are generally faſtened in ſceletons to the firſt bone of the metatarſus, they nevertheleſs belong only to the firſt phalanx of the great toe, as the patella belongs not to the os femoris, but to the tibia. *Winſlow*'s Anatomy, p. 104.

SESAMOIDES, in botany, the name of a genus of plants, the characters of which are theſe. The flower is wholly the ſame in ſhape with that of the reſeda, but the fruit is very different in the different ſpecies: in ſome it conſiſts of ſeveral horns or capſules, each containing one ſeed of a kidney-like ſhape; and in others it is multicapſular, or ſtellated.

The ſpecies of *ſeſamoides*, enumerated by Mr. Tournefort, are theſe. 1. The white-flowered *ſeſamoides* with hoary leaves. 2. The thick-leaved *ſeſamoides* with purpliſh green flowers. 3. The *ſeſamoides* with ſtellated fruit, called by many the *toad-flax-leaved reſeda*. *Tourn.* Inſt. p. 424.

SESAMUM, in botany, a name given by ſome authors to the *myagrum*, or gold of pleaſure. *Volk.* Flor. Norimb. 312.

SESELI, in botany, the name of a genus of plants, the characters of which, according to Linnæus, are theſe. The general umbel is uncertain in figure; the partial ones are very ſhort, multiple, and almoſt round. There is no general involucrum, and the partial ones are compoſed of ſeveral leaves, of the length of the umbellule, narrow, and pointed. The perianthium is ſcarce obſervable. The general corolla is nearly uniform; and the ſingle flowers are compoſed of five inflexo-cordated, and nearly equal petals. The ſtamina are five ſubulated filaments. The antheræ are ſimple. The germen of the piſtil ſtands under the receptacle. The ſtyles are two, and reflex. The ſtigmata are obtuſe. The fruit is ovated, ſmall, ſtriated, and ſeparable into two parts. The ſeeds are two in number, oval, convex on one ſide, and plane on the other.

Tournefort has referred the ſpecies of *ſeſeli* to the genus of fennel, *fœniculum*, from which, however, they greatly differ, in regard to their involucra. *Linnæi* Gen. Plant. p. 120. See FOENICULUM.

SESELI *ſeed*, in the materia medica, the name of the ſeed of a plant, called alſo by ſome *libanotis*, and growing three or four feet high, with leaves like fennel, but of a paler green. It is a native of warm climates. The *ſeed* ought to be choſen moderately large, of a longiſh ſhape, heavy, clean, and of a greeniſh colour, freſh, and of a grateful ſmell. It affords, by diſtillation, a very large quantity of an eſſential oil, and is hot and dry. It incides, opens, and diſcuſſes, and is cephalic, neurotic, pectoral, and nephritic. It is good againſt epilepſies, apoplexies, vertigos, and all diſorders of the head and nerves. *Lemery*'s Dict. of Drugs.

The ſeeds of the *ſeſeli creticum* are diuretic, uterine, and good in all diſorders of the breaſt and lungs. They are given in ſuppreſſions of urine, and of the menſes, and in all kinds of flatulencies; and are, among the German phyſicians, a common ingredient in medicines, intended to promote expectoration.

The ſeed of the french Hartwort, or *ſeſeli maſſilienſe*, is eſteemed of great virtue in diſeaſes of the head and nerves, in convulſions and epilepſies, and in weakneſſes of the ſight. It is alſo given in electuaries, intended againſt all diſorders of the breaſt and lungs, in coughs, catarrhs, and aſthmas, and in obſtructions of the liver. Some have recommended it ſingly, as a medicine of great efficacy againſt obſtructions of the menſes; and Schroder tells us, that it has the credit of being an antidote to the poiſon of hemlock.

The common hartwort is poſſeſſed of the ſame ſort of virtues with the other two, but its ſeed is more warm and acrid than that of either of them. It is eſteemed a very efficacious remedy in obſtructions of the menſes, and in all diſorders ariſing from indigeſtion, crudities, and flatulencies.

SESERINUS, in zoology, a name given by Rondeletius, and ſome other authors, to a broad and ſhort ſea fiſh, ſeeming the ſame with the *lampuga* of Italian fiſhermen; and deſcribed by authors in general, and by this very author in another place, under the name of *ſtromateus*. *Willughby*, Hiſt. Piſc. p. 137. See STROMATEUS.

SESQUITERTIONAL *proportion*. When any number or quantity contains another once and one third, they are *ſeſquitertional proportionals*.

SESSILE *roots*, among botaniſts, ſuch tuberous roots as adhere to the baſe of the ſtalk. See ROOT.

SESSILE *leaf*, among botaniſts. See LEAF.

SETS, a term uſed by the farmers to expreſs the young plants of the white thorn, and other ſhrubs, which they uſe to raiſe their quick, or quick-*ſet* hedges.

The white thorn is the beſt, of all trees, for this purpoſe, and under proper regulations, its *ſets* ſeldom fail of anſwering the farmers utmoſt expectations.

The firſt thing to be conſidered by the perſon, who is about to plant a quick-*ſet* hedge, is what nature the land is of where it is to ſtand, as whether it be clay, ſand, or gravel. It is always proper to take the *ſets* from a worſe land, than that they are to be planted on, otherwiſe they will never grow well. The *ſets* are about the thickneſs of a man's thumb, and cut within four or five inches of the ground. If the quick is intended only for a hedge, without a bank or ditch, let the *ſets* be planted almoſt perpendicular in two rows, at about twelve inches diſtance from each other; and if there is to be a ditch and a bank, that is to be firſt provided. The ground is to be marked out with a line, and a ditch dug three feet wide at the top, one foot wide at the bottom, and two feet deep. When the ditch is digging, on that ſide where the quick is to ſtand, let the turf be laid evenly on the ground, with the graſſy ſide downwards: upon this ſome fine mould is to be laid, to bed the quick-*ſets* in, and they are to be laid upon it with their ends enclining upwards, and at about twelve inches aſunder. They muſt be carefully gathered, and ſuch as are ſtrait, ſmooth, and well rooted, are only to be choſen. At every thirty feet there ſhould be planted with the *ſets* a young oak, aſh, or ſome other ſuch tree, to grow up along with the hedge. When a compleat row of the *ſets* is thus laid, cover them with a layer of fine mould, and lay over that another layer of the turf; add upon this a third layer of mould, ſo deep, that its ſurface may be a foot above the row of *ſets*: on this bed place another row of the like *ſets* at the ſame diſtances, but placed between the others; cover this as the other, and then make up the bank with the earth dug out of the bottom of the ditch, and on its top ſet the dry, or dead hedge: this will ſhade the under plantation, and will be a defence till the *ſets* are grown up into a live hedge. The ſtakes for the dead hedge are to be driven into the bank ſo low, as to reach the firm ground, and are to be placed at two feet and a half diſtance from one another. Oak ſtakes are the beſt for this purpoſe, and ſallow and black thorn are eſteemed next to theſe. The ſmall buſhes cut from them muſt be laid below, but not too thick, that they may ſhade the young plantation without ſmothering it, and defend its young ſhoots from the biting of cattle: the long buſhes are to be laid at top to bind in the ſtakes, by interweaving them. To add a farther ſtrength to the hedge it may be eddered, as the farmers call it: this is binding the tops of the ſtakes with ſome ſmall long poles, or ſticks, on each ſide. When this is all done, the ſtakes ſhould be new drove a little, becauſe the making the hedge, and the eddering it, are apt to looſen them a little.

The young plants muſt be conſtantly weeded, and great care muſt be taken to preſerve them from the bitings of cattle, eſpecially of ſheep. If they have been cropped, or are not found to grow well, it is a good cuſtom among the farmers to cut them down to the ground, or within an inch of it, for after this they uſually ſend out new roots, and ſhoot very vigorouſly. *Mortimer*'s Huſbandry.

SET-*bolts*, in a ſhip. See BOLTS.

SETACEUS *vermis*, in natural hiſtory, a name given by Dr. Liſter to that long and ſlender water worm, which ſo much reſembles a horſe-hair, that it has been ſuppoſed by the vulgar to be an animated hair of that creature.

Theſe

These creatures, ſuppoſed to be living hairs, are a peculiar ſort of inſects, which are bred and nouriſhed within the bodies of other inſects, as the worms of the ichneumon flies are in the bodies of the caterpillars.

Aldrovand deſcribes the creature, and tells us it was unknown to the antients, but called *ſeta aquatica*, and *vermis ſetarius* by the moderns; either from its figure reſembling that of a hair, or from the ſuppoſition of its having once been a hair of ſome animal. We generally ſuppoſe it, in the imaginary ſtate of the hair, to have belonged to a horſe, but the Germans ſay it was once the hair of a calf, and call it by a name ſignifying *vitulus aquaticus*, or the water-calf.

Albertus, an author much reverenced by the common people, has declared that this animal is generated of a hair; and adds, that any hair thrown into a ſtanding water will, in a very little time, obtain life and motion. Other authors have diſſented from this opinion, and ſuppoſed them generated of the fibrous roots of water plants, and others of the parts of graſshoppers fallen into the water. This laſt opinion is rejected by Aldrovand, as the moſt improbable of all, yet in reality it comes neareſt the truth of any of them. Standing and foul waters are moſt plentifully ſtored with them; but they are ſometimes found in the cleareſt and pureſt ſprings, and ſometimes out of the water, on the leaves of trees and plants, as on the fruit-trees in our gardens, and the elms in hedges. They are from three to five inches long, of the thickneſs of a large hair, and are brown upon the back, and white under the belly, and the tail is white on every part. *Aldrovand.* de Inſect. Phil. Tranſ. N° 83.

See the article AMPHISBÆNA *aquatica*.

SETAH, in botany, a name uſed by the oldeſt writers for the acacia. It is an orginal Hebrew word, and is explained by the lexicographers, by a thorn growing in the deſert. It is rendered by Theodotion *acantha*, one of the names of the acacia.

SETICAUDÆ, in natural hiſtory, a term uſed to expreſs ſuch flies as have one or more hairs growing out at their tails. There are many ſpecies of theſe, diſtinguiſhed by their having one, two, or three hairs.

SETINUM, in botany, a name given by ſome to the larch-tree, and by others to ſome other trees. The reaſon of giving it as the name of a tree is, that Dioſcorides mentions the agaric as growing on it, according to the accounts of ſome writers of his time. But it is an error in the copies of that author, that has given riſe to this imaginary name of a tree. The author ſays only, that it grew ſometimes on beams, and other timber, when expoſed to the weather. He has expreſſed beams by the word *ſtelechos*, and tranſcribers have made this *ſetinos*, or *ſetinum*.

This appears not only from ſome of the old manuſcript copies retaining the word properly written, but alſo by the accounts the Arabians give of this drug. Aviſenna and Serapion have both copied the words of this author, and they do not render the word in the original author, ſignifying the place of growth, or production of the agaric, by the name of any particular tree, but both ſay that it was formed of the putrefaction of trees and beams of timber, when they had been eaten by worms, or corrupted by wet; and they add from the ſame author, that the production of agaric ſeemed like that of the funguſes.

From this, and from Pliny's account, it appears that the female agaric of the antients was not a fungus, or any thing like our agaric; but by Dioſcorides's deſcription of its texture, and Pliny's account of its giving light like a fire in the night, it appears to have been only a peculiar kind of rotten wood, which they knew by that name. The other, or male agaric, was yet more unlike to ours, it being a root of ſome kind, and in ſhape reſembling the ſilphium.

SETSE, in botany, the name of a Chineſe tree, called alſo *chitſe*, and much eſteemed by the people of that country for its beauty, and for the goodneſs of its fruit. In the provinces of Cantong and Honan there are whole plains covered with theſe trees, many of which grow to the ſize of our wallnut-tree. The fruit ripens every where in the Eaſt, where the tree grows, but it is of a much more delicious flavour in ſome places than in others. The leaves are of the colour and ſhape of thoſe of the wallnut-tree, only that they are more round at the ends. The fruit is ſometimes round, ſometimes pointed at one end, ſometimes oval, ſometimes flat, and not unfrequently compoſed of two pieces, as it were, and reſembling two apples cut and joined together. The rind is always green, never changing yellow or red, and the fruit keeps its freſhneſs all the winter. They are about the ſize of the orange, and the ſkin is very tender and thin, and the fruit has a mixed taſte of the ſharp and the luſcious. It is very wholeſome and good. Obſerv. ſur les Coutumes de l'Aſie. p. 198.

SETTEE, a veſſel, very common in the Mediterranean, with one deck, and a very long and ſharp prow. They carry, ſome two maſts, ſome three, without top-maſts. Their yards and ſails are all like the miſen. The leaſt of them are of ſixty tons burthen. They ſerve to tranſport cannon, and proviſion for ſhips of war, and the like.

SETTING, (*Cycl.*) the term uſed by ſportſmen to expreſs a manner of attacking partridges, in order to the taking them, by means of a dog peculiarly trained to that purpoſe. The *ſetting*-dog generally uſed is a long land-ſpaniel, taught by nature to hunt partridges more than any other game, and in his untaught ſtate running over the fields, in ſearch of them, with an alacrity that is truly wonderful; yet by art this creature is brought under ſuch excellent command, that he will, in the midſt of his higheſt career, attend to the leaſt hem from his maſter, and ſtand ſtill to look in his face, and take his orders by the ſlighteſt ſignals; and when he is ſo near his game, that it is almoſt in his mouth, he will ſtand ſtock ſtill, or lie down on his belly, till his maſter arrive, and he receives his directions.

The *ſetting*-dog being taken to the haunt of the partridges, is to be caſt off, and ſent to range; but he muſt be made to keep near the ſportſman, and not to run wildly on, but to beat all the ground regularly. On being reproved for ranging too wildly and too far, he will keep cloſe the whole day, and at times look up in his maſter's face to know if he does right or wrong. If in the dog's ranging he ſtop of a ſudden, the ſportſman is to make up to him, and as there is certainly game before him, he muſt be ordered to advance; if he refuſe this, and look back and ſhake his tail, it is a ſignal that they are cloſe before him, and the ſportſman is then to take a circumference, and look with a careleſs eye before the dog's noſe to ſee where they are, and how they lie; then going up, and ſtaking down one end of the net, he is to command the dog to lie ſtill, and to draw the net gently over the birds, then making in with a noiſe, he is to ſpring them, and they will be entangled and taken as they riſe. It is a rule with fair ſportſmen, when they take a covey in this manner, always to let the cock and hen go.

SETTING *of bricks*. See the article BRICKS.

SETTLING *a deck*, at ſea, a term for taking a deck lower than it was at firſt.

SEVENTH (*Cycl.*)—SEVENTH, in muſic. In thorough baſſes the *ſeventh*, whether double, ſimple, major, or minor, is marked by a figure of 7; but if it be accidentally flat, or minor, thus, $^{\flat}7$, or $7^{\flat}$. If ſharp, or major, thus, $^{\sharp}7$, or $7^{\sharp}$. Again, if when it is naturally minor, it be marked with a flat, it muſt be diminiſhed.

Diminiſhed SEVENTH, in muſic. See the article DIMINISHED *ſeventh*.

SEVERAL (*Cycl.*)—SEVERAL *inheritance*, in law, an inheritance conveyed, ſo as to deſcend, or come to two perſons *ſeverally*, by moieties, or other parts.

SEVERAL *tenancy*, *tenura ſeparalis*, a plea, or exception taken to a writ that is laid againſt two perſons as joint tenants, who are *ſeveral*. Bro. 273. *Blount*, *Cowel*.

SEVERANCE (*Cycl.*)—SEVERANCE *of corn*. The cutting and carrying it from off the ground; and ſometimes the ſetting out the tithes from the reſt of the corn, is called *ſeverance*. 2 Cro. 325.

SEVIL, in the manege. The *ſevil* of the branches of a bridle is a nail turned round like a ring, with a large head, made faſt in the lower part of the branch, called *gargouille*. See the article BANQUET.

SEVIR, among the Romans, an officer who, according to Pitiſcus, commanded a whole wing of horſe; tho' others make him only the commander of a troop, *turmis*, a diviſion anſwering to our regiments.

SEVIRI, were alſo magiſtrates in the colonies, ſo called, from their being ſix in number. *Pitiſc.* in voc.

SEW, in the ſea language. When a ſhip at low water comes to lie on the ground, and to lie dry, they ſay ſhe is *ſewed*; and if ſhe be not quite left dry, they ſay ſhe *ſews* to ſuch a part.

SEWEL-*coronde*, a name given by the natives of Ceylon to a ſpecies of cinnamon, which, when chewed, is of a mucilaginous nature, like the caſſia: this dries well, and is very firm and hard, and has the appearance of a very fine cinnamon; but it has very little taſte, and a diſagreeable ſmell. The natives take advantage of the handſome appearance of this kind of cinnamon, and are very apt to mix it with the good kind, to the great detriment of the buyer. Philoſ. Tranſ. N° 409.

SEXANGLE, in geometry, a figure having ſix ſides, and conſequently ſix angles.

SEXTANS, (*Cycl.*) a word uſed by pharmaceutic writers for the ſixth part of a pound, that is, two ounces troy-weight, or ſixteen drachms. It is alſo uſed by ſome authors for a ſixth part of any other ſtanding weight, or meaſure.

SEXTERY *lands*, are lands given to a church, &c. for maintenance of the ſexton. *Blount*.

SEXTULA, a word uſed by ſome pharmaceutic writers to expreſs the ſixth part of an ounce, that is, four ſcruples, or one drachm and one ſcruple.

SEXTUS *oculi*, in anatomy, a name given by Fallopius to one of the muſcles of the eye, called by Albinus, and others, the *obliquus oculi inferior*, and by ſome the *obliquus oculi brevis*. See the articles OBLIQUUS *inferior*, and EYE.

SEXTUS *thoracis*, in anatomy, a name given by Fallopius, and others, to a muſcle, now generally known by the name of the *triangularis ſterni*.

SEXUALISTÆ, among botanical authors, thoſe who have eſtabliſhed the claſſes of plants upon the differences of the ſexes, and parts of fructification in plants, according to the modern method, as Linnæus, &c.

SEXUNX, in pharmacy, the weight of ſix ounces, or half a pound troy.

SEYGAR, in the materia medica, a name uſed by ſome authors for the nutmeg. *Ger.* Emac. Ind. 2.

SHACKLES, aboard a ſhip, are thoſe oblong iron rings, bigger at one end than at the other, with which the ports are ſhut faſt, by thruſting the wooden bar of the port through them. There are alſo a ſort of *ſhackles* to lift the hatches up with, of a like figure, but ſmaller. They are faſtened at the corners of the hatches.

SHAD, *alauſa*, in zoology, the name of a ſea-fiſh of the herring-kind, called alſo the *mother of herrings*, and by ſome authors *clupea* and *triſſa*, and by the antients *trichis*, or *trichias*. See Tab. of Fiſhes, N° 39.

It very much reſembles the herring in its general form, but it is flatter and broader, and grows to a cubit long, and four inches broad. It is of the colour of the pilchard, of a bluiſh black on the back, and a ſilvery white on the belly and ſides, and the coverings of the gills are ſometimes purpliſh, and ſometimes a little yellow. Near the gills it has alſo on each ſide a large black ſpot, and five or ſix others on each ſide, which are ſmaller, and placed behind them. Theſe are all moſt diſtinguiſhable when the fiſh is ſcaled. The ſcales are large, and eaſily fall off, and are dotted with ſmall black ſpots at their edges.

It is very common in many ſeas, and in ſome of our large rivers which lie near the ſea. They run up theſe in great numbers in the months of March and April, and are then very fat; in May they become lean, and then go down to the ſea again. They uſually ſwim in large ſhoals together. *Willughby*, Hiſt. Piſc. p. 227.

SHAFT (*Cycl.*)—SHAFT, in mining, is the ſame with a groove, or pit. *Shafts* are ſunk ſome ten, ſome twenty fathoms deep into the earth, more or leſs. *Houghton*'s Compl. Miner, in the Explan. of the Terms.

SHAGGE, in zoology, a name by which we commonly call a water fowl common on the northern coaſts, and called by Mr. Ray *corvus aquaticus minor*, or the leſſer cormorant, being properly a bird of the cormorant-kind.

It is ſomewhat larger than the common duck, and weighs about four pounds. Its beak is ſtrait and ſlender, and is not flatted, but roundiſh. It is four fingers breadth long, and is hooked at the end. Its mouth opens very wide, and its eyes are ſmall. Its head, neck, and back are of a fine ſhining black, with an admixture of a purpliſh, or greeniſh gloſs, ſhining like ſattin. Its breaſt is brown, and the middle of its belly greyiſh. Its tail is ſhort, and its wings, when folded, reach juſt to the end of it, and no farther. Its legs are covered with a cancellated ſkin, not a congeries of ſcales, and its toes are all connected by a membrane. It ſwims with its head erect, and moſt of its body under water, and is very ſhy, and with difficulty ſhot. It builds in trees as the common cormorant, and is evidently a ſpecies of that bird, though different in ſize, and in the colour of its belly. *Ray*'s Ornitholog. p. 219.

SHAKER *pigeon*, a kind of pigeons, of which there are two ſorts, the broad tailed, and the narrow tailed.

The firſt is the fineſt, and moſt valued. It has a beautiful long thin neck, which bends like the neck of a ſwan, leaning towards the back. It has a full breaſt, a very ſhort back, and a tail conſiſting of a great number of feathers, ſeldom leſs than four and twenty, which it ſpreads in an elegant manner, like the tail of a turkey-cock, and bends it up ſo, that it meets the head. It is commonly all white, but ſometimes is red, yellow, or blue-pied. The longer the neck of this bird is, the more it is valued.

The ſecond, or narrow-tailed *ſhaker*, has a ſhorter and thicker neck, and a longer back. It is eſteemed by many a different ſpecies, but ſeems only a mixed breed with ſome other pigeon. They are called *ſhakers*, from a tremulous motion which they have with their necks when courting. *Moore*'s Columbarium, p. 54.

SHAMBLE, in mining, a term uſed to expreſs a ſort of nich, or landing place, left at certain diſtances in the adits of mines. The method of digging the tin mines in Devonſhire, and ſome parts of Cornwall, is this; they ſink their way in ſuch a breadth, as is ſufficient for them to ſtand and work, and at every fathom they leave a ſquare place vacant, to which the ore is to be thrown up with ſhovels as it is dug. This they do from caſt to caſt; that is, as far as a man can conveniently throw up the ore with his ſhovel. Thus the ore, as it is dug by the beelmen, is thrown up by the ſhovellers, who follow them from *ſhamble* to *ſhamble*, till it comes to the top of the mine. This, however, is but an inconvenient way, and the uſe of theſe *ſhambles* is generally ſupplied by a winder at the opening of the mine, which manages two buckets, the one of which is ſent down empty, while the other is ſent up full; and one man employed below to load, and another above to empty. Phil. Tranſ. N° 69. See the article DIGGING.

SHAMBRIER, in the manege, is a long thong of leather, made faſt to the end of a cane, in order to animate a horſe, and puniſh him, if he refuſes to obey the rider.

SHANK *of an anchor*, on board a ſhip. See ANCHOR.

SHANK, in the manege, is that part of a horſe's fore leg, which lies between the knee and the fetlock, or paſtern-joint.

SHANK, or *Shank-painter*, in a ſhip, is a ſhort chain faſtened under the foremaſt-ſhrowds, by a bolt, to the ſhip's ſides, having at the other end a rope faſtened to it. On this *ſhank-painter* the whole weight of the aft part of the anchor reſts, when it lies by the ſhip's ſide. The rope, by which it is haled up, is made faſt about a timber-head.

SHARE, the name of that part of the plough which cuts the ground, and the wood to which it is fixed. The extremity of the iron forwards is called the point of the *ſhare*, and the end of the wood behind is called its tail.

The length of the whole *ſhare*, from point to tail, ſhould be three feet nine inches; at the top of the iron it has an upright piece, called the *fin*, and near the iron, at the other end, there is an oblong ſquared hollow, called the *ſocket*; the uſe of which is to receive the bottom of the ſheat. Near the tail there is a thin plate of iron, well rivetted to the wood; by means of this plate the tail of the *ſhare* is held firmly to the hinder ſheat of the plough by a ſmall iron pin, with a ſkrew at the end, and a nut ſkrewed on it, on the inner or right ſide of the ſheat.

The point of the *ſhare* is that part in which it does not run up into the fin: this point is generally made of three inches and a half in length, and ſhould be flat underneath, and round at the top, and the lower part of it muſt be of hard ſteel. The edge of the fin ſhould alſo be well ſteeled, and ſhould make an acute angle with the *ſhare*.

The ſocket is a ſort of mortiſe; it ſhould be a foot long, and about two inches deep: the fore end of it muſt not be perpendicular, but oblique, conformable to the end of the ſheat which enters into it. The upper edge of the fore part muſt be always made to bear againſt the ſheat; but if this end of the ſocket ſhould not be quite ſo oblique as the ſheat, it may be helped, by paring off a ſmall part of the wood at the point. *Tull*'s Huſbandry, p. 140. See the article PLOUGH.

SHARK. We know two different fiſh under the ſame name of *ſhark*, with the addition of their colour, blue and white. See Tab. of Fiſhes, N° 2, 3, 4.

The blue *ſhark* is that ſpecies of ſqualus called *glaucus*, and *galeus glaucus*, by authors, and diſtinguiſhed by Artedi by the name of the *ſqualus* with a triangular dent, or furrow, in the extremity of the back, and with no foramina about the eyes. See GALEUS.

The other is the *lamia*, or *canis carcharias* of authors, commonly called by us ſimply *the ſhark*. This is diſtinguiſhed by Artedi by the name of the *ſqualus* with a flat back, and with numerous teeth, ſerrated at the edges. See the article SQUALUS.

The white *ſhark*, or *lamia*, is a very dreadful and voracious fiſh, the largeſt of all the *ſharks*. They have been ſeen of four thouſand weight, with throats capable of ſwallowing a luſty man whole; nay, men have been found whole in them when opened. Some have, for this reaſon, imagined this, and not the whale, to have been the fiſh in whoſe belly the prophet Jonah lay. Its teeth are very ſharp and terrible; they are diſpoſed in ſix rows, and are all triangular, and notched like a ſaw on their edges. Theſe are, in the whole, a hundred and forty four in number, and are placed in various directions. Their number is not exactly determinate. Its back is ſhort and broad, in compariſon of the other fiſh of this kind, and its tail compoſed of two fins of a cubit in length each. Its ſkin is rough, and its eyes large and round. It is found both in the Ocean and Mediterranean, and is of all fiſh the moſt voracious of human fleſh.

It has its name from the Greek, λαίμος, a voracious feeder, or glutton. The foſſile bodies, called *gloſſopetræ*, or ſerpents tongues, and ſuppoſed to be real ſtones, are the teeth of this fiſh. *Willughby*, Hiſt. Piſc. p. 47.

Hammer-headed SHARK. See the article ZYGÆNA.

SHARP (*Cycl.*)—SHARP, in the ſea language, is to hale taut. Thus when they ſay, *ſharp the bow line*, it ſignifies to hale it taut.

SHARP *third*, in muſic, the third major. See the article INTERVAL.

SHARPLING, in ichthyology, the Engliſh name of the gaſterofteus. See GASTEROSTEUS.

SHASTRAM, the name of the bible of the Bramins. See the article BRAMINS.

SHAW, in our old writers, a grove of trees, or a wood. It is mentioned 1 Inſt. 4. *Blount.*

SHEAR *off*, in the ſea language, the ſame as to get away.

SHEARING (*Cycl.*)—The beſt time for *ſhearing* of ſheep is about the middle, or the latter end of June, becauſe it is good for them to ſweat in the wool before it is cut. They muſt be very well waſhed before the *ſhearing*, for this is a great addition to the price of the wool: after the waſhing, let them go three or four days in a clean dry ground. When they are cut, the ſhearer muſt be very careful not to wound their

their ſkins, becauſe this gives occaſion to the flies to teaze the poor creature in a terrible manner. Some *ſhear* their lambs, the firſt year eſpecially, behind; but before the doing of this they ought to be carefully tagged, as it is called, that is, their tails and thighs behind ſhould be well cleared of wool, that the dung may not hang there, which would elſe make them ſore, and ſubject them to the flies, which would blow them, and make them full of maggots.

In Glouceſterſhire they houſe their ſheep every night, and litter them with clean ſtraw. Their dung makes this a very good manure for the land, and the wool of the ſheep is rendered ſo much finer by it, that the farmers have a double advantage from the practice.

In Middleſex, and about London, they have Way-hill ſheep: theſe come from Hampſhire, Wiltſhire, *&c.* and lamb very early, before Chriſtmas. *Mortimer*'s Huſbandry.

SHEARING, in the ſea language. See CHEST-*rope*.

SHEAT *of a plough*, a word uſed by our farmers to expreſs a part of a plough, paſſing through the beam, and faſtened to the ſhare. The *ſheat*, or, as it is ſometimes called, the *fore-ſheat*, (there being another timber behind it, called the *hinder-ſheat*) ſhould be ſeven inches wide, and is faſtened to the beam by the retch, a piece of iron with two legs, and by a wedge driven with it, into the hole in the beam. The angle made by the *ſheat*, with the beam of the plow, ſhould be forty two, or forty three degrees. *Tull*'s Huſbandry. See the article PLOUGH.

SHEATS, in a ſhip, are ropes bent to the clews of the ſails, ſerving in the lower ſails to hale aft, or round-off the clew of the ſail; but in top-ſails they ſerve to hale home, as the word is, or to hale the clew of the ſail cloſe to the yard-arm.

If the main-ſail-*ſheats* are haled aft, it is in order to make a ſhip keep by a wind, but when the fore-*ſheats* are haled aft, it is that the ſhip may fall off from the wind; and if ſhe will not do it readily, they then hale the fore-ſail, by the *ſheat*, flat in, as near the ſhip's ſides as they can; and this they call *flatting in the fore-ſail*. When they ſay, *eaſe the ſheat*, they mean veer it, or let it go out gently; but when the word is, *let fly the ſheat*, they mean, let it go all at once, and run out as faſt as it can; and then the ſail will hang looſe, and hold no wind. In a very great gale, or guſt of wind, there is another rope bent to the clews of the main-ſail and fore-ſail, above the *ſheat*-block, to ſuccour and eaſe the *ſheat*, and this they call a *falſe ſheat*.

SHEATS, in a ſhip, alſo, are thoſe planks under water which come along her run, and are cloſed into the ſtern-poſt; ſo alſo that part within board, in the run of the ſhip, is called the *ſtern-ſheats*. The ſeamen ſay, when they would have the *ſheats* of the main or fore-ſail haled aft, *tally the ſheats*.

Falſe SHEAT, on board a ſhip, is a rope bent to the clews of the main-ſail and fore-ſail, above the *ſheat*-block, to ſuccour and eaſe the *ſheat* in a violent guſt of wind.

Overhale the SHEAT, in the ſea language, a word of command to hale upon the ſtanding part of the *ſheat*.

SHEAT *anchor*, in a ſhip. See ANCHOR.

SHEATHING (*Cycl.*)—SHEATHING *of a ſhip*, is caſing that part which is to be under water, with ſomething to keep the worms from eating into her planks. It is uſually done by laying tar and hair, mixed together, all over the old plank, and then nailing on thin new boards; but this hinders a ſhip's ſailing, and therefore of late ſome have been *ſheathed* with milled lead.

It is very well worth the trying what the new ſtone-pitch will do in this caſe; if it will defend from the worm, as perhaps it may, a ſhip might be paid with it cheaper than with the crown-pitch; and it will not crack nor ſcale off, as that will do, but keeps always ſoft and ſmooth. It has been found to continue on thirteen months, and to remain very black and ſoft all the time.

SHEDDING *of the hair*, in the manege. See CAST.

SHEEP, *ovis*, in zoology. See the article OVIS.

This is a kind of cattle that is kept at the leaſt expence of any to the farmer, and will thrive upon almoſt any ground, and for this reaſon many prefer them before the larger cattle.

The beſt ſort of *ſheep* for fine wool, are thoſe bred in Herefordſhire and Worceſterſhire, but they are ſmall, and black faced, and bear but a ſmall quantity.

Warwick, Leiceſterſhire, Buckingham, and Northamptonſhire, breed a large-boned *ſheep*, of the beſt ſhape, and deepeſt wool we have good. The marſhes of Lincolnſhire breed a very large kind of *ſheep*, but their wool is not good, unleſs the breed be mended by bringing in *ſheep* of other counties among them, which is a ſcheme of late very profitably followed there.

The northern counties in general breed *ſheep* with long, but hairy wool, and Wales bears a ſmall hardy kind of *ſheep*, which has the beſt taſted fleſh, but the worſt wool of all.

The farmer ſhould always buy his *ſheep* from a worſe land than his own, and they ſhould be big-boned, and have a long greaſy wool, curling cloſe and well. Theſe *ſheep* always breed the fineſt wool, and are alſo the moſt approved of by the butcher for ſale in the market.

For the choice of *ſheep* to breed, the ram muſt be young, and his ſkin of the ſame colour with his wool, for the lambs will be of the ſame colour with his ſkin. He ſhould have a large long body, a broad forehead, round, and well riſing, large eyes, and ſtrait and ſhort noſtrils. The polled *ſheep*, that is thoſe which have no horns, are found to be the beſt breeders. The ewe ſhould have a broad back, a large bending neck, ſmall, but ſhort, clean and nimble legs, and a thick deep wool covering her all over. To know whether they be ſound or not, the farmer ſhould examine the wool, that none of it be wanting, and ſee that the gums be red, the teeth white and even, and the briſket ſkin red, the wool firm, the breath ſweet, and the feet not hot. Two years old is the beſt time for beginning to breed, and their firſt lambs ſhould not be kept too long, to weaken them by ſuckling, but be ſold as ſoon as conveniently may be. They will breed advantageouſly, till they are ſeven years old.

The farmers have a method of knowing the age of a *ſheep*, as a horſe's is known by the mouth. When a *ſheep* is one ſhear, as they expreſs it, it has two broad teeth before; when it is two ſhear, it will have four; when three, ſix; and when four, eight: after this their mouths begin to break. The difference of land makes a very great difference in the *ſheep*. The fat paſtures breed ſtrait, tall *ſheep*, and the barren hills and downs breed ſquare ſhort ones; woods and mountains breed tall and ſlender *ſheep*, but the beſt of all are thoſe bred upon new-plowed land, and dry grounds. On the contrary, all wet and moiſt lands are bad for *ſheep*, eſpecially ſuch as are ſubject to be overflowed, and to have ſand and dirt left on them. The ſalt marſhes are, however, an exception to this general rule, for their ſaltneſs makes amends for their moiſture; any thing of ſalt, by reaſon of its drying quality, being of great advantage to *ſheep*.

As to the time of putting the rams to the ewes, the farmer muſt conſider at what time of the ſpring his graſs will be fit to maintain them and their lambs, and whether he has turneps to do it till the graſs comes; for very often both the ewes and lambs are deſtroyed by the want of food; or if this does not happen, if the lambs are only ſtunted in their growth by it, it is an accident that they never recover. The ewe goes twenty weeks with lamb, and according to this it is eaſy to calculate the proper time. The beſt time for them to yean is in April, unleſs the owner has very forward graſs, or turneps, or the *ſheep* are field-*ſheep*, where you have not encloſures to keep them in, then it may be proper they ſhould yean in January, that the lambs may be ſtrong by Mayday, and be able to follow the dam over the fallows, and water furrows; but then the lambs, that come ſo early, muſt have a great deal of care taken of them, and ſo indeed ſhould all other lambs at their firſt falling, elſe, while they are weak, the crows and magpies will peck their eyes out.

When *ſheep* are turned into fields of wheat or rye to feed, it muſt not be too rank firſt, for if it be, it generally throws them into ſcowerings. Ewes that are big ſhould be kept but bare, for it is very dangerous to them to be fat at the time of their bringing forth their young. They may be well fed indeed, like cows, a fortnight beforehand, to put them in heart. *Mortimer*'s Huſbandry, p. 243.

The feeding *ſheep* with turneps is one great advantage to the farmers, from the crops they raiſe of them: they ſoon fatten upon them, but there is ſome difficulty in getting them to feed on them; the old ones always refuſe them at firſt, and will ſometimes faſt three or four days, till almoſt famiſhed, but the young lambs fall to at once.

The common way, in ſome places, of turning a flock of *ſheep* at large into a field of turneps, is very diſadvantageous, for they will thus deſtroy as many in a fortnight as would have kept them a whole winter. There are three other ways of feeding them on this food, all of their ſeveral advantages.

The firſt way is to divide the land by hurdles, and allow the *ſheep* to come upon ſuch a portion only at a time, as they can eat in one day, and ſo advance the hurdles farther into the ground daily, till all be eaten. This is infinitely better than the former random method, but they never eat them clean even this way, but leave the bottoms and outſides ſcooped in the ground; the people pull up theſe indeed with iron crooks, and lay them before the *ſheep* again, but they are commonly ſo fouled with the creature's dung and urine, and with the dirt from their feet, that they do not care for them; they eat but little of them, and what they do, does not nouriſh them like the freſh roots.

The ſecond way is by encloſing the *ſheep* in hurdles, as in the former, but in this they pull up all the turneps they ſuppoſe the *ſheep* can eat in one day, and daily remove the hurdles over the ground, whence they have pulled up the turneps: by this means there is no waſte, and leſs expence, for a perſon may in two hours pull up all thoſe turneps; the remaining ſhells of which would have employed three or four labourers a day to get up with their crooks out of the ground, trodden hard by the feet of the *ſheep*; and the worſt is, that as in the method of pulling up firſt, the turneps are eat up clean; in this way, by the hook, they are waſted,

the *ſheep* do not eat any great part of them, and when the ground comes to be tilled afterwards for a crop of corn, the fragments of the turneps are ſeen in ſuch quantities on the ſurface, that half the crop at leaſt ſeems to have been waſted.

The third manner is to pull up the turneps, and remove them in a cart or waggon to ſome other place, ſpreading them on a freſh place every day; by this method the *ſheep* will eat them up clean, both root and leaves. The great advantage of this method, is, when there is a land not far off which wants dung more than that where the turneps grow, which perhaps is alſo too wet for the *ſheep* in winter, and then the turneps will, by the too great moiſture and dirt of the ſoil, ſometimes ſpoil the *ſheep*, and give them the rot. Yet ſuch ground will often bring forth more, and larger turneps than dry land, and when they are carried off, and eaten by the *ſheep* on plowed land in dry weather, and on green ſward in wet weather, the *ſheep* will ſucceed much the better; and the moiſt ſoil, where the turneps grow, not being trodden by the *ſheep*, will be much fitter for a crop of corn, than if they had been fed with the turneps on it. The expence of hurdles, and the trouble of moving them, is ſaved in this caſe, and this will counterbalance at leaſt the expence of pulling the turneps, and carrying them to the places where they are to be eaten. They muſt always be carried off for oxen. *Tull*'s Horſehoeing Huſbandry.

The uſe of ſalt preſerves *ſheep* from the rot. The animals muſt be made to take a ſmall handful of it two or three times in a few days, without permitting them to drink any thing for ſome hours afterward. *Boyle*'s Works abridged, Vol. 1. p. 109.

Folding of SHEEP. See the article FOLDING.

SHEEP*'s dung*. This is one of the beſt manures we know. It ſucceeds better upon cold clayey lands, than any other dung whatever; but as it is not ſo conveniently to be collected as the dung of larger animals, it is commonly conveyed to the land, it is intended for, by folding the *ſheep* upon it. The urine, as well as the dung, is thus given to the land, and is of very great advantage; but the farmer always ſhould plow in this ſort of manure as ſoon as he can, for the ſun ſoon robs it of a great part of its virtue.

In Northamptonſhire they begin to fold the *ſheep* upon the lands that they would dung by them, after the month of July, and the drier the lands are, the later they fold them. In Flanders they make many thouſand loads of manure annually from their *ſheep:* they cover the bottom of the folds conſiderably deep with ſome light and ſpungy earth, and when this has received the dung and urine of the animals for ſeven or eight days, they remove it, and lay freſh in its place: the earth thus impregnated, becomes an excellent improvement to land, and they raiſe large crops by means of it, in places where very little could be expected without it. In England we have a contrivance like this, which is the covering the bottoms of the folds deep with ſand, and changing it once in a week, or thereabouts: this is a kind of manure finely calculated for clayey lands, both the ſand, and this peculiar kind of dung, being appropriated things for it. *Mortimer*'s Huſbandry.

SHEEP*-noſe-worms*, in natural hiſtory, a ſpecies of fly-worm, found in the noſes of *ſheep*, goats, and ſtags, and produced there from the egg of a large two-winged fly.

The frontal ſinuſes above the noſe in *ſheep*, and other animals, are the places where theſe *worms* live, and attain their full growth. Theſe ſinuſes are always full of a ſoft white matter, which furniſhes theſe *worms* with a proper nouriſhment, and are ſufficiently large for their habitation; and when they have here acquired their deſtined growth, and come to the ſtate in which they are fit to undergo their changes for the fly-ſtate, they leave their old habitation, and falling to the earth, bury themſelves there; and when theſe are hatched into flies, the female, when ſhe has been impregnated by the male, knows that the noſe of a *ſheep*, or other animal, is the only place for her to depoſit her eggs, in order to their coming to good. *Reaumur*'s Hiſt. Inſ. Vol. 4. p. 552.

Mr. Valliſnieri, to whom the world owes ſo many diſcoveries in the inſect claſs, is the firſt who has given any true account of the origin of theſe *worms*. Though their true hiſtory had been, till that time, unknown, the creatures themſelves were very early diſcovered, and many ages ſince were eſteemed great medicines in epilepſies.

It is very common to find only one *worm* in the head of the creature that has them, often two are found, and ſometimes three, but very ſelom any more than that. *Reaumur*, ibid. p. 554.

Redi has given a very imperfect figure of this creature, nor is that of Mr. Valliſnieri much better. The *worm* is of the firſt claſs, and has two brown hooks at the anterior part of its head, placed parallel, or nearly parallel to one another. It is compoſed of eleven rings, which together form a conic figure, ſomething flatted, of which the head of the *worm* is the point. When the *worm* is young, it is very white, but has two brown ſpots placed over againſt each other, in the hinder part of its body, which are its two poſterior ſtigmata. Each of theſe ſpots is parted into two by a concentric circle, which is ſenſible, as it is whitiſh, the reſt of the ſpot being brown. It is plainly this very ſeparation which gives paſſage to the air. When the creature pleaſes it ſhews theſe, but it can alſo draw them into a ſort of purſe in its poſterior ring. The anus is juſt below, and is uſually hid by the folds of the ſkin. The hooks are brown and ſtrong; juſt above theſe are two little fleſhy horns, and between them is placed the mouth. *Reaumur*, ibid. p. 555.

This *worm*, when at its full growth, is conſiderably large, and becomes browniſh, or of a dirty white. Its belly, examined by the microſcope, is ſeen furniſhed with a number of fine ſhort prickles between the rings: the points of all theſe are turned backward, and one may even feel theſe prickles, in drawing the finger along the belly from the hinder part toward the head.

Theſe *worms* are capable of moving themſelves very ſwiftly; and it is doubtleſs owing to their motions in the head of the creature, and to the pain that the ſenſible membranes there muſt have from being wounded by the hooks and prickles of this creature, that *ſheep* are often ſeen to grow outragious, and ſtrike their heads againſt trees, and other hard bodies. Ibid. p. 556.

When theſe *worms* are taken out of the heads of *ſheep*, if they are put upon the earth, they immediately bury themſelves very deeply in it; and if not, yet at their full growth, or in a proper ſtate for their changes, they die there: but if it be near the time that they would naturally have quitted their antient habitation, which may be known by their being changed from their fine white to a browniſh colour, then they undergo all their proper changes under a ſhell, made by the hardening of their own ſkin. This ſhell is of the ſame ſhape with the animal itſelf, but is of a deep brown. Ibid. p. 557.

It takes ſome time for the creature to undergo its ſeveral changes, and that more or leſs, according to the ſeaſon. Mr. Valliſnieri had one produced in the perfect fly-ſtate, after forty days from the time of its firſt change. Mr. Reaumur found thoſe, which formed their ſhell on the twenty fourth of April, not to produce the fly before the twenty ſeventh of June. Ibid. p. 558.

The creature, when ready to appear in the fly-ſtate, has no great difficulty in the getting out of its caſe; the ſwelling and inflating its head, and throwing out its bladder, which is the practice of theſe creatures on this occaſion, eaſily detaches a piece of the ſhell, originally looſe, and gives the fly a ſufficient paſſage.

The fly, produced from this worm, has all the time of its life a very lazy diſpoſition, and does not like to make any uſe either of its legs or wings. Its head and corcelet togegether are about as long as its body, which is compoſed of five rings, ſtreaked on the back; a pale yellow and brown are there diſpoſed in irregular ſpots; the belly is of the ſame colours, but they are there more regularly diſpoſed, for the brown here makes three lines, one in the middle, and one on each ſide, and all the intermediate ſpaces are yellow. The wings are nearly of the ſame length with the body, and are a little inclined in their poſition, ſo as to lie upon the body; they do not, however, cover it, but a naked ſpace is left between them. The ailerons, or petty wings, which are found under each of the wings, are of a whitiſh colour, and perfectly cover the balancers, ſo that they are not to be ſeen without lifting up theſe. The upper part of the corcelet is full of ſmall black prominences, which, when examined by the microſcope, appear as ſo many corns of gunpowder. Its head is large, in proportion to the ſize of the body, and its reticular eyes are of a deep changeable green. Theſe eyes take up leſs ſpace in the head, than thoſe of moſt other flies; they leave a conſiderable ſpace between them, and in that are placed the three ſmaller, or gloſſy eyes, which are placed in form of a ſmall triangle, and ſtand ſo near, as to touch one another. The reſt of the upper part of the head is yellowiſh, and viewed by the microſcope, appears cavernous like a ſpunge, or morel, and in the bottom of each of theſe ſmall cavities is a little black prominence. There are two other hollows in the anterior part of the head, in which the antennæ are placed: theſe are of the battledoor form, but rather round than flat, and have each a large hair going from them. The under part of the head, which is rounder than the upper, is whitiſh, and very ſmooth; it has two ſorts of bands directed downward, which are the elongations of the rims of the arches where the antennæ are lodged. The ſmoothneſs of the underpart of the head makes one ſee very diſtinctly theſe three little tubercles; the upper one brown, the under ones of a pale deadiſh yellow. The mouth of the fly ſeems to be placed between theſe, immediately under the upper tubercle. Ibid. p. 559, 560.

The fly will live two months, after it is firſt produced from the ſhell, but will take no nouriſhment of any kind; and poſſibly it may be of the ſame nature with the butterflies, which never take any food during the whole time of their living in that ſtate. Ibid. p. 561.

SHEEP-*ſtealing*, is now made felony without benefit of clergy. See the article CATTLE.

The like penalty is enacted for killing *ſheep*, with an intent to ſteal the fat, or any part of the carcaſe, or for aſſiſting in any ſuch offence. Stat. 14 Geo. II. cap. 6. ſect. 1.

SHEERS, aboard a ſhip, a name the ſeamen give to two maſt's yards, or poles, ſet up and ſeized acroſs each other aloft, near the top. This pair of *ſheers*, as they call it, is placed below on the chain-wales of the ſhrouds, and laſhed faſt to the ſhip's ſide, to keep them ſteady aloft. Their uſe is to ſet in, or take out a maſt; for which end there is faſtened at the place where they croſs one another, a ſtrong double block with a ſtrap. They ſerve alſo to hoiſe in or out, of boats that have maſts, ſuch goods as are wanted to be taken in or out.

SHEER-*water*, in zoology, an Engliſh name for a bird common on our coaſts, and not known by any of the common authors, nor honoured with a Latin name. It is nearly of the ſize of a duck. Its head, which is large, neck and back, are of a browniſh black; its throat, breaſt and belly, white; its legs are red. Its three fore toes are connected by a membrane, but its hinder one is looſe. Its wings are very long, and when folded reach to the end of the tail. Its beak is ſtrong and ſharp, and is hooked at the end. It flies very ſwiftly along the ſurface of the water, whence it has its name. *Ray*'s Ornitholog. p. 252.

SHEET, in the manege. See CAPARASON, *Cycl.*

SHEIK, in the Oriental cuſtoms, the perſon who has the care of the moſques in Egypt; his duty is the ſame as that of the imams at Conſtantinople. There are more or fewer of theſe to every moſque, according to its ſize or revenues. One of theſe is head over the reſt, and anſwers to a pariſh prieſt with us, and has under him, in large moſques, the readers, and people who cry out to go to prayers; but in ſmall moſques the *ſheik* is obliged to do all this himſelf. In ſuch it is their buſineſs to open the moſque, to cry to prayers, and to begin their ſhort devotions at the head of the congregation, who ſtand rank and file in great order, and make all their motions together. Every Friday the *ſheik* makes an harangue to his congregation. *Pocock*'s Egypt. p. 171.

SHEIK-*bellet*, the name of an officer in the Oriental nations. In Egypt the *ſheik-bellet* is the head of a city, and is appointed by the paſha. The buſineſs of this officer is to take care that no innovations be made, which may be prejudicial to the port, and that they ſend no orders which may hurt the liberties of the people. But all his authority depends on his credit and intereſt, not his office: for the government of Egypt is of ſuch a kind, that often the people of the leaſt power by their poſts have the greateſt influence; and a caia of the janizaries, or Arabs, and ſometimes one of their meaneſt officers, an oda-baſha, finds means, by his parts and abilities, to govern all things. *Pocock*'s Egypt, p. 163.

SHELF, (*Cycl.*) a term uſed by the miners, in many parts of England, to expreſs a diſtinction of the inner ſtructure of the earth, ſo little known to philoſophers, that they have no word to expreſs it by. Theſe workmen ſometimes alſo expreſs it by the term *faſt ground*, or *faſt country*. What they mean by this, is, that part of the earth, which they find lying even, and in an orderly manner, and evidently having retained its primitive form and ſituation, unmoved by the waters of the general deluge, while the circumjacent, and upper ſtrata, have plainly been removed, and toſſed about.

It is evident to reaſon, that there muſt have been a very violent concuſſion of the ſuperficial part of the earth, in the time of its being covered by the waters of the deluge; and experience as much evinces this as reaſon. Before this concuſſion it appears probable, that the uppermoſt ſurface of mineral veins, or loads, did in moſt places lie even with the then ſurface of the earth. The remains of this ſurface, found at different depths in digging, the miners expreſs by the word *ſhelf*.

In this concuſſion of the waters covering the whole earth, its natural ſurface, together with the uppermoſt ſurface of thoſe mineral veins, were then in many places looſened, and torn off; and the earth, and with it the mineral nodules, called *ſhoad-ſtones*, were carried down with the deſcending waters from hills into the adjacent valleys, and ſometimes into the ſtreams of rivers, by which they were waſhed to yet greater diſtances from their original place. On this depends the method of training mines. Philoſoph. Tranſ. N° 69. See the article TRAINING.

SHELL (*Cycl.*)—SHELL-*fiſh*, *conchylia*. The world has for a long time wanted a regular method of claſſing of *ſhell-fiſh*, which a late author of the French nation has attempted, upon a new and very valuable plan. In this he throws aſide the vulgar diſtinction of *ſhells*, into the ſea, freſh water, and land kinds, and very judiciouſly arranges all under the ſame claſs, which have the ſame general characters.

The *ſhells* are all naturally to be arranged under three principal claſſes; theſe will contain all the ſpecies, and are afterwards to be divided into a number of families, or genera, and under theſe the ſeveral ſpecies regularly recounted; and at the end of each deſcription, the varieties may be added.

The firſt general claſs of *ſhells* contains thoſe which are found all of one piece, or have only one *ſhell*, not a pair. Theſe have been called by the Greeks *monothyræ*, and by the Latin authors *univalvia*, univalves.

The ſecond general claſs contains thoſe *ſhells* which are of two pieces, called *bivalves*, ſuch as oiſters, cockles, and the like. See Tab. of Shells, paſſim.

The third claſs contains thoſe which are compoſed of more than two pieces. Theſe are called *multivalves*; and of this kind are the pholas and balanus.

This method takes in the freſh-water-*ſhells*, as well as thoſe of the ſea; and as thoſe hitherto known are all of one or other of the firſt claſſes, their ſeveral ſpecies will be compriſed among, or after the ſea *ſhells* of each of thoſe claſſes.

The land-*ſhells* are of two kinds, the recent and the foſſile; the firſt kind, as far as hitherto known, are all univalves, and the latter are of all the three claſſes.

As each of theſe general claſſes contains a very great number of ſpecies, it may ſeem difficult to enter on this ſtudy, from the multiplicity of the bodies; but method renders all this eaſy, and it is no way difficult, in the following manner, to find of what claſs, what family, and what genus, any given *ſhell* is, from a bare inſpection.

The *ſhell* is firſt to be examined, to ſee whether it is compoſed of one, two, or more pieces. If it is found to conſiſt only of one piece, it is known thence to belong to the claſs of univalves; if of two, to the bivalves; and if of more, to the multivalves. When it is thus referred to its proper claſs, its family and genus will be found by farther examination of its general form, and the ſhape of its mouth, or aperture.

As ſoon as a given *ſhell* is found to be univalve, the five genera of that claſs are to be uſed in compariſon with it, in order to ſee to which of them it belongs. If it has no turn or twiſt, but forms one ſimple figure, approaching to a cone, and pointed at the top in the manner of the common limpet, or patella, it is known to be of the family of the *patellæ*; the character of which is to have only one valve, and that fixed in its natural ſtate to a ſtone, or other hard body, and of a flatted ſhape, though elevated into a ſort of point in the middle.

If the *ſhell* be not conic, but extremely flat, and ſomewhat of the ſhape of a man's ear, it is of the ſecond family of the *aures marinæ*, diſtinguiſhed by the epithet *planæ*, flat or plane. If it forms a tube or pipe, it is of the nature of the common *tubuli marini*, and is of that family. If, on the other hand, it reſemble a ſort of veſſel or boat, it is of the *nautilus* claſs, and belongs to the *naviculæ*.

Theſe are the diſtinctions, if it be plain, and without turnings; but if it have ſeveral twiſts, or wreaths, its aperture, commonly called the *mouth*, is to be examined, for this forms, in this caſe, the generical character. If the mouth be exactly round, the *ſhell* is of that family of the *cochleæ*, or ſnails, called by the antients *lunares*. If it be of a ſemicircular figure, it is of that family of ſnails called *ſemilunares*; under which family are compriſed the *neritæ*, as one genus.

If the *ſhell* approaches to a conic figure, and grows larger at the baſe, and has a flatted or oval mouth, it is of a ſeventh order of *cochleæ*, or ſnails diſtinguiſhed by the title *cochleæ ore depreſſo*.

If the *ſhell* have the exterior figure of a trumpet, and has a large tail, it belongs to the family of the *buccina*; of which, however, it is to be remarked, that there are ſome ſpecies which have not long tails: in this diſtinction we alſo have recourſe to the mouth, which is larger than that of the murex, leſs long, and its lower part is formed into a crooked beak. Theſe are the eſſential characters which diſtinguiſh this family of *ſhells*; a family, concerning which there is great confuſion among authors.

If the baſe of the *ſhell* be ſmall, and the whole diminiſh gradually in ſize from this to the end, which is pointed, then the *ſhell* is of the family of the *turbines*. If a *ſhell* form a cone, or cornet, there is no occaſion to look at the mouth, this figure alone determines it to be a *voluta*; and if one of its extremities is nearly as large as the other, it is then a rhombus. This genus of *ſhells* has been called *cylindri* by the Latins, and *rouleaux* by the French. When this rhombus, or cylinder, has a pointed baſe, frequently ornamented alſo with ſeveral ſmall eminences; and when its middle is large, and is in the ſame manner ſurrounded with tubercles, and its head is elongated by ſeveral turns, and its mouth of an oblong figure, and furniſhed with teeth; and when, as is often the caſe, there is an excreſcence of the plate that covers the mouth, called by authors an *ala*, or wing, this *ſhell* muſt be placed among the family of the *murex*, or, as the French call it, the *rocher*.

The *purpura* is diſtinctly not a ſynonymous term with the precedent, but expreſſes ſuch a *ſhell*, which, inſtead of being furniſhed with points, is cut and curled from top to bottom, in the manner of the leaves of our curled cabbages, or of the endive raiſed for ſallads. The body in this genus is alſo more compact, and more detached from the other parts,

parts, than in the other genera of this kind, and the mouth is uſually ſmall and round, and the tail long and crooked, furniſhed with long points, and hollowed within in form of a pipe.

If the *ſhell* is round, it belongs to that family of *ſhell-fiſh* called, from their figure, *globoſæ*, and in French *tonneaux*. It is to be obſerved, however, that all *ſhells*, which appear at firſt ſight of a rounded figure, are not to be placed at once in this family; for the helmet *ſhell*, for inſtance, which appears roundiſh, though ſomewhat triangular, is not to be ſuppoſed of this family, but is a murex. The ſummit of the head, and the little tuberoſities, on this occaſion, give the eſſential character, and point out its proper genus: for the *ſhells* of the globoſe kind are truly of a ſpherical figure; they are inflated in the middle, have no tubercles on the head, and have a large and hollowed mouth, but no teeth.

The laſt family of the univalves is the porcelain, or *concha veneris*, a genus ſo well known, that it needs no particular deſcription. Sometimes at the ſummit of this *ſhell* there is a ſmall ſpiral, and ſometimes its opening is not exactly in the middle. Some are light and thin, others very thick and hard: but theſe are only varieties of the ſame genus, the proper family of the *ſhell* being always thus determined by the mouth.

Bivalve SHELLS. The former are all the genera of the *ſhells* compoſed of one piece, and thence called *univalves:* and as any given *ſhell* may, by the characters given of each, be eaſily referred to that to which it belongs, ſo, in regard to the *bivalves*, the taſk is not more arduous, when entered on upon the ſame principles; and it is the eaſier in this reſpect, that the families of this claſs are much leſs numerous than thoſe of the other, theſe being only ſix. The firſt genus, or family of the *bivalves*, is that of the *oiſter*, *oſtreæ*. The variety in this one genus is almoſt infinite, and is extremely agreeable. Some are echinated ſo, as to repreſent the echini; others have excreſcences of parts in undulatory, or jagged forms, repreſenting the ears of animals, or the comb of a cock; and others form themſelves into very remarkable figures, by adhering and growing to trees, ſtones, corals, and other ſubſtances, either naturally growing in the ſea, or ſuch as have accidentally fallen into it. Sometimes alſo, the upper *ſhell* in an oiſter is ſmaller and flatter than the under one. Theſe, however, are all trifling varieties, and the *ſhells* are ſtill of the oiſter kind.

When the *bivalve ſhells*, under examination, differs from the oiſter kind, in being more elevated in the middle, and equally convex, or nearly ſo, in both *ſhells*, then it belongs to the family under the name of *chamæ*. Theſe differ alſo from oiſters, in that they are more ſmooth on the ſurface, and they often do not cloſe ſo evenly and regularly at the mouth, whence ſome have called them *conchylia ore patulo, et hianti*.

The third family is that of the *muſcles*. Theſe are all of the general ſhape of the common muſcle, and are thence eaſily known. It is to be obſerved, however, that ſome of them are equal at both ends; theſe are called *tellinæ:* and ſome others are extremely long at one end, and broad and ſhort at the other; theſe are called *pinnæ marinæ*.

The fourth genus, or family, is the cordiform kind, called in French *cœurs*. The eſſential character of this family is, that the *ſhells* are of a roundiſh elevated figure, and that they have no ears, as the pectens have, and they always repreſent the figure of a heart, in whatever view they are taken; tho' this is ſometimes of a triangular figure. Moſt of the ſpecies of this family, as well as of the following one of the pectens, are ſtriated.

The fifth family of the *bivalves*, is that of the *pectens*, or ſcallop-*ſhells*. Among theſe, ſome have two ears at the head of the *ſhell*; others have only one ear; and others have none at all. Some ſpecies are deeply furrowed, and others are full of ſmall protuberances. The general character of the pectens is to have the upper *ſhell* plain, and the under one ſomewhat hollow; and the ears are alſo a very obvious character in thoſe that have them.

The ſixth, and laſt family of the *bivalves*, is the *ſolen*, or razor-fiſh, called by the French *manche de couteau*. Theſe are very eaſily known by their figure, which reſembles that of a knife-haft, and therefore need no other mark of diſtinction.

Multivalve SHELLS. Theſe are not leſs eaſily diſtinguiſhed, than the other two general claſſes, into their ſeparate families. Of theſe alſo there are ſix families. The firſt is that of the *echini marini*, called in Engliſh *ſea-eggs*, and by the French *ourſins*, *boutons*, and *heriſſons de mer*. Theſe carry a very obvious diſtinction, in their being covered with ſpines, or prickles; and if we meet with them in a ſtate, when theſe are fallen off, they are ſtill eaſily known by the marks of their inſertion. This, and their general figure, which is alike in all, and in all unlike to all other ſpecies, is ſuch a diſtinction, as cannot ſuffer them to be miſtaken.

The ſecond family of theſe, is that of the *vermiculi marini*, particularly characterized in the ſpecies called the *ſea-organ*. Theſe are uſually of a beautiful red colour, and are of a very elegant ſtructure. They generally are found in very large cluſters, and are eaſily diſtinguiſhed from all other genera.

The third family of the *multivalves* conſiſts of the *balani marini*, called by the French *glands de mer*. Theſe are all ſo like one another, that they are eaſily known from all the other genera, by their all reſembling the common balanus, a *ſhell* too well known to need deſcription.

The fourth family is that of the *pollicipedes*, or, as the French call them, the *pouſſepieds*. Theſe are ſo eaſily known by their perfect reſemblance to one another, that there needs no other character than referring to their figure in the plate of *ſhells*.

The fifth family of the *multivalves* is that of the *conchæ anatiferæ*. Theſe were once ſuppoſed to produce a bird of the gooſe kind; and theſe are all ſo like to one another, that the referring to the figure of the common ſpecies, in the general plate, will ſhew the characters of all the ſpecies.

Finally, the ſixth genus of the *multivalves* is that of the *pholas*. Theſe *ſhells* are eaſily diſtinguiſhed by their figure, which is uſually oblong, and their colour, which is ſimply white in all the ſpecies. Theſe *ſhells* are often found encloſed in ſtone in the ſea, and ſome of them are compoſed of five valves.

By theſe characters it will be eaſy for an utter ſtranger to theſe ſtudies, to refer any *ſhell*, he occaſionally meets with, to its proper claſs and family. When this is done, it will be eaſy to obſerve the leſſer differences, which, though not ſufficient to conſtitute different families or genera, yet very well diſtinguiſh different ſpecies of the ſame genus, or family; and by comparing theſe with the names of the ſeveral ſpecies, to be found enumerated under the head treated of, in the name of that genus or family to which the *ſhell* is found to belong, it will be ſoon diſcerned whether, and which of theſe ſpecies it is of, or whether agreeing with none of thoſe names, it is a new ſpecies. In order to enquire into theſe ſpecific differences, it is neceſſary attentively to conſider the exterior parts of the *ſhell*, its figure, its mouth, its volutions, its alæ, and its ſmoothneſs or roughneſs, and its two extremities, the end of the clavicle, and the mouth. After the exterior parts have been thus examined, the interior ones muſt be taken into conſideration, as the length and hollow of the mouth, and whether it be furniſhed with teeth, or with ridges; and whether it have a chamber, or a tongue within.

In regard to *bivalves*, when the ſpecies are to be diſtinguiſhed, we muſt obſerve whether the two valves are equal, or unequal in ſhape and ſize; whether one is, or is not more elevated than the other; and whether theſe valves are ſmooth, or are covered with wrinkles and tuberoſities, or points; whether they have, or have not ears; and whether their ſtriæ are charged with points, or tubercles, or are plain and ſmooth on the ſurface; and finally, whether they are longitudinal, or tranſverſe, and whether the ends of the *ſhells* are even, or are terminated by a point, or beak.

The inſides are next to be obſerved, to find whether the *ſhells* naturally cloſe evenly and exactly, or whether they remain naturally open; and whether the fiſh is affixed to them by a ſingle ligament, as is the common caſe, or by ſix regular muſcles, as the ſea-muſcle does.

The mouth of a *ſhell* generally diſtinguiſhes it from others, but there are ſome ſpecies in which recourſe muſt be had to the other external parts of the *ſhell:* and we are not to be puzzled, on finding in the ſame family ſome ſmall differences in the figure of the mouth, as its being longer in one ſpecies, and wider in another; the one ſpecies having a tail, and the other not; the one having a ſummit elevated very high, the other flatted at the top; or, laſtly, the one being ſmooth, and the other covered with tubercles, do not prevent both from being of the ſame family, when the general characters are the ſame. Theſe then only diſtinguiſh the ſpecies and genera of the ſame family, which are to be placed one after another in the deſcriptions of it.

The ſpecies are diſtinguiſhed, when the generical characters being the ſame, one *ſhell* is umbilicated, another is not; one ſmooth, another rough, and ſo on. The varieties of the ſeveral *ſhells*, which are very numerous, and have by many been taken for real ſpecies, are diſtinguiſhed by leſs eſſential differences; ſuch as the ſize, the length, and the thickneſs of the *ſhell*, the difference of the colours, and the depth, or ſlightneſs of the furrows.

It may not be amiſs to explain all this in ſome one family of *ſhells*, in which there are many different genera, ſpecies, and varieties. When the buccinum, for example, has a long or a ſhort mouth; when its clavicle, or pyramid, is long, or is flatted; or when its beak is ſtrait, or crooked; theſe are the marks of genera, being very great and eſſential characters, and each of them belonging in common to a great number of *ſhells*, which are to be called ſpecies, and are to be diſtinguiſhed from one another only by ſome epithet, expreſſive of their ſlighter differences. Thus if the ſurface is ſmooth, it is called *buccinum læve*; if rough, *buccinum tuberoſum*; if it imitate a ſpindle, it is called *fuſus*; if it be of the figure of a tower, it is called *turris*; and if of a tiara, it is called *mitra papalis*. The varieties are after this diſtinguiſhed by their proper epithets; the white, red, or yellow, are ſo called, and the large and ſmall diſtinguiſhed by thoſe words

added

added to their name: and in this manner are all the claſſes to be ſubdivided.

In the examination of the freſh-water *ſhells*, the ſame method is to be obſerved, and the ſame characters enquired into; but theſe are a much leſs numerous ſeries of *ſhells*; we know of only ſeven families of the freſh water *univalves*, and there are only three families of *bivalves*, and not one of the *multivalve* claſs, ſo far as is yet known.

The land-*ſhells* are alſo to be diſtinguiſhed by the very ſame terms. The living land-*ſhells* conſtitute but a very few genera, and the foſſile ones being remains of marine bodies, are the ſame with the ſpecies found at ſea; only there are many ſpecies, and ſome whole genera of theſe, which we never find recent, or living at preſent: theſe are probably the inhabitants of the deep ſeas, and therefore never can come within our ſight at preſent. The univerſal deluge, which ſo overturned the whole face of the earth, might eaſily bring things from the deepeſt ſeas into our way, and bury them in the hearts of yet ſoft and unformed rocks, and leave them there as laſting memorials of that dreadful cataſtrophe. All theſe, however, are ſo nearly allied to the ſeveral genera of the ſame families found recent, that it is eaſy to reduce them to their proper places. Hiſt. Natur. Eclairc. Part 2. p. 126, ſeq.

There are alſo many kinds of *ſhelly* animals which live on land, not in the ſea-water, or in the freſh rivers or ponds. Of theſe we have ſeveral very elegant ſpecies.

It might be imagined that we had no land-*ſhells* of the limpet, or patella kind, but nature does afford ſuch. Fabius Columna gives the figure of a ſpecies of land-limpet, which he found living on the galls and protuberances of a myrtle in Italy. The *ſhell* of this ſpecies is of an aſh-colour, and is divided into ſeveral ſquares, in the manner of the tortoiſe-ſhell: they have in ſome places a purpliſh tinge, mixed with grey, and are no newly diſcovered animal, ſince Theophraſtus deſcribes them as being found on the protuberances of the fig tree.

Of the land-*ſnails* we have fifteen abſolutely diſtinct ſpecies. 1. The great round *ſnail*, called the *pomatia*. 2. The common great garden-*ſnail*. 3. The faſciated *ſnail*. 4. The common meadow-*ſnail*. 5. The yelloviſh *ſnail*. 6. The grey *ſnail*. 7. The marbled *ſnail*. 8. The land Saint Hubert's horn *ſnail*. 9. The umbilicated *ſnail*. 10. The *ſnail* with an elevated clavicle. 11. The land-*ſnail* with a dentated mouth. 12. The elegant land-*ſnail* of Jamaica. 13. The round mouthed land-*ſnail*. 14. The land-*ſnail* with a flatted mouth. 15. The land-*ſnail* with a twiſted clavicle.

Of the land-*buccina* we have the following ſpecies. 1. The yellow *buccinum* with ſix ſpires. 2. The *buccinum* with five ſpires. 3. The cheſnut-*buccinum* with ſix ſpires. 4. The *trochilus* with ſeven ſpires. 5. The *buccinum* with ten ſpires, and with the mouth turned the wrong way. And 6. the ſeven-ſpired *buccinum*, with its mouth turned the wrong way.

Of the *turbo*, or ſcrew *ſhell*, there is only one known ſpecies. Of the *dolia* we have, 1. the alated *dolium*. 2. The oblong *dolium*. Theſe are all the land *ſhell* animals found living at this time.

The common *ſnails* are never found crawling about, but in wet ſeaſons, or in the morning, while things are covered with dew. They hide themſelves in dry days, when the ſun is up, under the leaves of trees and plants, or in holes in the ground. In the winter they are never ſeen creeping about, but as that ſeaſon approaches, they hide themſelves in holes of walls, and in the cracks in the trunks of trees; and at this time their mouth is covered with a thin film.

The anus of the *ſnail* is an aperture in the neck, very little diſtant from the mouth, ſo that it takes in its nutriment, and voids its fæces very nearly in the ſame part. This is in general the caſe in the univalve *ſhell* animals; and in this they differ greatly from the bivalves, which have the anus in the oppoſite part of the body to that where the mouth is placed.

Every *ſnail* has four horns, two large, and two ſmall ones, and at the end of theſe ſtand ſmall black tubercles, which are the eyes. Hooke, in his Micrographia, ſays that they have nine teeth, and adds, that he had ſeen a common *ſnail* eat a leaf of a roſe-buſh.

The land-*buccina* have no operculum, but they cover themſelves, when withdrawn into the *ſhell*, with a ſort of ſlaver, which they void at the mouth. Theſe alſo have a long head, on which ſtand two pair of horns, a greater and a ſmaller pair, with eyes at the end of each. They are principally found on fruit. Their excrements are black, and are of a twiſted form. When the *ſhell* is broken, and taken off, they are found to conſiſt of a fleſhy body, formed of as many ſpires as the *ſhell* was formed of.

The land-*dolia* are very beautiful, their *ſhells* are ſo thin and tranſparent, that the body of the animal is ſeen through them. The mouth of this *ſhell* is very large, and when the creature moves, it thruſts out the whole body, ſo that the *ſhell* is empty, and it is then that its thinneſs and tranſparence are moſt viſible.

The number of land-*ſhells* is greatly encreaſed by ſome, who ſuppoſe ſeveral ſpecies of buccina, and other genera, to be land-*ſhells*, becauſe they are extremely thin and tender, and, as they ſuppoſe, wholly unfit for being in the ſea. But this is a groundleſs conjecture, and againſt all appearances. The reaſon drawn from the thinneſs of the *ſhell* is inſufficient; ſince we may recollect, that the *nautilus papyraceus*, and the *gondola-ſhell*, are both much thinner than any of theſe ſuppoſed land-*ſhells*, and yet theſe are both very well known to be ſea, and not land-*ſhells*.

Figures and colours of SHELLS. The variety in the figure, colours, and other characters of ſea-*ſhells*, is almoſt infinite. The number of diſtinct ſpecies we find in the cabinets of the curious is very great, and doubtleſs the deep bottoms of the ſea, and the yet unſearched ſhores, contain multitudes more, yet unknown to us. Even the ſame ſpecies differ in ſome degree in almoſt every individual, ſo that it is rare to find any two *ſhells* which are alike in all reſpects. *Bonan.* Recreat. Ment. et Ocul. p. 49.

This wonderful variety, however, is not all the produce of one ſea, or one country, the different parts of the world afford us their different beauties. Bonani obſerves, that the moſt beautiful *ſhells* we are acquainted with come from the Eaſt-Indies, and from the Red ſea. This is in ſome degree countenanced by what is found to this day; and from the general obſervations of the curious, it ſeems that the ſun, by the great heat that it gives to the countries near the line, exalts the colours of the *ſhells* produced there, and gives them a luſtre and brilliancy, that thoſe of colder climates always want: and it may be, that the waters of thoſe vaſt ſeas, which are not ſubject to be weakened by freſh rivers, give a nouriſhment to the fiſh, that may add to the brilliancy of their *ſhells*.

The ſhores of Aſia furniſh us with the pearl-oiſters and ſcallops in great perfection. About Amboina are found the moſt beautiful ſpecimens of the cabbage-*ſhell*, the arroſoir, the ducal mantle, and the coral-oiſters, or echinated oiſters. Here alſo are found a great variety of extremely beautiful muſcles, tellinæ, and volutæ; ſome fine buccinums, and the *ſhell* called the *Ethiopian crown*, in its greateſt perfection. The dolia, the murices, and the caſſandræ, are alſo found on theſe coaſts in great beauty. Many elegant ſnails and ſcrew-*ſhells* are alſo brought from thence; and finally the ſerapion and ſpider-*ſhells*. Hiſt. Nat. Eclairc. p. 168.

The Maldive, and Philippine iſlands, Bengal, and the coaſt of Malabar, abound with the moſt elegant of all the ſpecies of ſnails, and furniſh many other kinds of *ſhells* in great abundance and perfection. China abounds in the fineſt ſpecies of porcelain-*ſhells*, and has alſo a great variety of beautiful ſnails. Japan furniſhes us with all the thicker and larger bivalves; and the Iſle of Cyprus is famous, above all other parts of the world, for the beauty and variety of the patella, or limpet, found there.

America affords many very elegant *ſhells*, but neither in ſo great abundance nor beauty, as the ſhores of Aſia. Panama is famous for the cylinders, or rhombi; and we have beſide, from the ſame place, ſome good porcelains, and a very fine ſpecies of dolium, or *concha globoſa*, called, from this place, the *Panama-purple-ſhell*. One of the moſt beautiful of the cylinders is alſo known among our naturaliſts, under the name of the *Panama-ſhell*. About Braſil, and in the Gulf of Mexico, there are found murexes and dolia of extreme beauty; and alſo a great variety of porcelains, purpuræ, pectens, neritæ, bucardiæ, or heart-*ſhells*, and elegant limpets. The Iſle of Caienne affords one of the moſt beautiful of the buccinum-kind, and the Midas-ear is found principally about this place. Jamaica, and the Iſland of Barbadoes, have their ſhores covered with porcelains, chamæ, and buccina; and at St. Domingo there are found almoſt all the ſame ſpecies of *ſhells* that we have from the Eaſt-Indies, only they are leſs beautiful, and the colours more pale and dead. The pearl-oiſter is found alſo on this coaſt, but ſmaller than in the Perſian gulf. At Martinico there are found, in general, the ſame *ſhells* as at St. Domingo, but yet leſs beautiful. About Canada are found the violet chamæ, and the lakes of that country abound with muſcles of a very elegant pale blue, and pale red colours; ſome ſpecies of theſe are remarkably light and thin, others are very thick and heavy.

The Great Bank of Newfoundland is very barren in *ſhells*, the principal kind found there are muſcles of ſeveral ſpecies, ſome of which are of conſiderable beauty. About Carthagena there are many mother of pearl-*ſhells*, but they are not of ſo brilliant colours as thoſe of the Perſian gulf. The Iſland of Magellan, at the ſouthern point of America, furniſhes us with a very remarkable ſpecies of muſcle, called by its name; and ſeveral very elegant ſpecies of limpets are found there, particularly the pyramidal.

In Africa, on the coaſt of Guinea, there is a prodigious quantity of that ſmall ſpecies of porcelain, which is uſed there as money; and there is another ſpecies of porcelain on the ſame coaſt, which is all over white. The women make bracelets of theſe, and the people of the Levant adorn their hair with them.

The coaſt of Zanguebar is very rich in *ſhells*. We find there a vaſt variety of the large porcelains, many of them of great beauty; and the *nux maris*, or ſea-nut, is very fre-

quent there. Beſide theſe, and many other *ſhells*, there are found on this coaſt all the ſpecies of nautili, many of which are very beautiful.

The Canary iſles are found to abound with a vaſt variety of the murexes, and ſome other good ſhells; and we have, from Madeira great variety of the echini marini, or ſea-eggs, different from thoſe of the European ſeas. Several ſpecies of muſcles are alſo common there, and the auris marina is no where more abundant.

The Red Sea is beyond all other parts of the world abundant in *ſhells*, ſcarce any kind is wanting there; but what we principally have from thence are the purpuræ, porcelains, and echini marini.

The Mediterranean and northern Ocean contain a great variety of *ſhells*, and many of very remarkable elegance and beauty; they are upon the whole, however, greatly inferior to thoſe of the Eaſt-Indies. The Mediterranean abounds greatly more in *ſhells* than the Ocean. The gulf of Tarentum affords great variety of purpuræ, of porcelains, nautili, and elegant oiſters; the coaſts of Naples and Sardinia afford alſo the ſame, and with them a vaſt number of the ſolens of all the known ſpecies. The iſland of Sicily is famous for a very elegant kind of oiſter which is white all over; pinnæ marinæ and porcelains are alſo found in great plenty there with tellinæ and chamæ of many ſpecies, and a great variety of other beautiful *ſhells*. Corſica is famous, beyond all other places, for vaſt quantities of the pinnæ marinæ, and many other very beautiful *ſhells* are found there. *Liſter*, Hiſt. Conchyl.

About Syracuſe are found the gondola-*ſhell*, the alated murex, and a great variety of elegant ſnails, with ſome of the dolia and neritæ.

The Adriatic ſea or gulf of Venice is leſs furniſhed with *ſhells* than almoſt any of the ſeas thereabout. Muſcles and oiſters, of ſeveral ſpecies, are however found there, and ſome of the cordiformes or heart-*ſhells*; there are alſo ſome tellinæ. About Ancona there are found vaſt numbers of the pholades buried in ſtone, and the aures marinæ are particularly frequent about Puzzoli. *Bonani* Recreat. Ment. et Ocul.

The ports of Marſeilles, Toulon, and Antibes, are full of pinnæ marinæ, muſcles, tellinæ and chamæ. The coaſts of Bretagne afford great numbers of the conchæ anatiferæ and pouſſepieds, they are found on old rotten boards, on ſea-plants, and among cluſters of ſpunges. The other ports of France, as Rochelle, Dunkirk, Breſt, St. Malos, and others, furniſh oiſters, excellent for the table, but of the common kind, and of no beauty in their *ſhells*; great numbers of muſcles are alſo found there; and the common tellinæ, the onion-peel-oiſters, the ſolens and conchæ anatiferæ are alſo frequent there. At Granville, in Lower Normandy, there are found very beautiful pectens, and ſome of the cordiforms, or heart-*ſhells*. Our own Engliſh coaſts are not the leaſt fruitful in *ſhells*, though they do not produce ſuch elegantly painted ones as the Indies.

About Plymouth are found oiſters, muſcles, and ſolens in great abundance; and there, and on moſt of our other ſhores are numbers of the aures marinæ and dentalia, with pectens, which are very excellent food; and many elegant ſpecies of the chamæ and tellinæ are fiſhed up in the ſea, about Scarborough, and other places.

Ireland affords us great numbers of muſcles, and ſome very elegant ſcallop-*ſhells* in great abundance, and the pholades are frequent on moſt of our ſhores. We have alſo great variety of the buccina and cochleæ, ſome volutæ, and on the Guernſey coaſt a peculiarly beautiful ſnail, called thence the Guernſey-ſnail.

The coaſts of Spain and Portugal afford much the ſame ſpecies of *ſhells* with the Eaſt-Indies, but they are of much fainter colours, and greatly inferior in beauty. Hiſt. Nat. Eclairc. p. 172.

There are according to Tavernier and others ſome rivers in Bavaria, in which there are found pearls of a fine water. About Cadiz there are found very large pinnæ marinæ and ſome fine buccina. The iſles of Majorca and Minorca afford a great variety of extremely elegant *ſhells*. The pinnæ marinæ are alſo very numerous there, and their ſilk is wrought into gloves, ſtockings, and other things. The Baltic affords a great many beautiful ſpecies, but particularly an orange-coloured pecten, or ſcallop-*ſhell*, which is not found in any other part of the world.

The freſh-water-*ſhells* are found much more frequently, and in much greater plenty than the ſea-kinds. There is ſcarce a pond, a ditch, or a river of freſh water, in any part of the world, in which there are not found vaſt numbers of theſe *ſhells* with the fiſh living in them. All theſe *ſhells* are ſmall, and they are of very little beauty, being uſually of a plain greyiſh or browniſh colour. Our ditches afford us chamæ, buccina, neritæ, and ſome patellæ; but the Nile, and ſome other rivers, furniſhed the antients with a ſpecies of tellina, which was large and eatable, and ſo much ſuperior to the common ſea-tellina in flavour, that it is commonly known by the name of *tellina regia* the royal tellina. We have a ſmall ſpecies of buccinum common in our freſh waters, which is very elegant, and always has its operculum in the manner of the larger buccina; a ſmall kind of muſcle is alſo very common, which is ſo extremely thin and tender, that it can hardly be handled without breaking to pieces. The large freſh-water-muſcle, commonly called in England the *horſe-muſcle*, is too well known to need a deſcription, and the ſize of this, gives it a difference from all other freſh-water-*ſhells*.

Formation of SHELLS. The world, in general, has been much more inquiſitive, into the nature of the colours, and marks of the great variety of *ſhell*-fiſh, than what might appear much more worthy of enquiry, the manner of their production. It has been generally ſaid, that theſe *ſhells*, and thoſe of crabs and lobſters, which are of the cruſtaceous kind, were a ſort of bones, all of which in theſe creatures are placed by nature on the outſide of the body.

It has been ſuppoſed that both the *ſhell* and the body of the animal are produced from the ſame egg, and that the one developes and enlarges as the other does. But this, though a ſpecious reaſoning, does not ſeem to be the true ſtate of the caſe. On the contrary, it ſeems, as if the animal alone is produced from the egg, or contained in it, and that the production of the *ſhell* is a future piece of workmanſhip.

Mr. Reaumur is the firſt author who has publiſhed an account of the true production of *ſhells*, and has been at vaſt pains to make the neceſſary obſervations for this purpoſe. He obſerved, that the *ſhell* of the common garden-ſnail was plainly made of a viſcous matter, which tranſpired from the body of the creature in a liquid form, and hardened by degrees on contact with the air.

It is very well known that all animals continually perſpire, and are ſurrounded with a ſort of atmoſphere of their own, which is of the figure of their body; and all that is ſingular in the perſpiration of ſnails, is, that this atmoſphere of theirs hardens about them, till it forms a ſort of ſtony caſe, which being moulded upon their body muſt be of the ſame ſhape; while that of other animals, in general, diſſipates itſelf, and is loſt among the ambient air; and this difference plainly ariſes wholly from the nature of the matter perſpired, which in the ſnail is of a viſcous, and as it were a ſtony nature. It is evident, that this *ſhell* therefore is not at all of the nature of the bones of animals, being neither formed as they are, nor yet as any other parts of an animal body, but merely by an appoſition of particles: ſo that we have here an inſtance of a part of an animal body, which borrows its manner of formation from the ſtones, and other parts of the foſſile world. The head of the ſnail is always at the mouth or opening of the *ſhell*, and its tail at the other extremity, or as we uſually expreſs it, at the top of the *ſhell*; and the body of the ſnail from whatever cauſe, naturally turning itſelf into a ſpiral, gives origin to the volutæ of the *ſhell*.

When the ſnail is juſt hatched naked from the egg, and is in its utmoſt degree of ſmallneſs, it does not ceaſe to tranſpire, and immediately there is formed a *ſhell*, ſuited to its preſent ſmall ſtate, and exactly fitting every part of its body, which is yet too tender to twiſt itſelf into a ſpiral, ſo that this *ſhell* is only the center of that ſpiral, which is afterwards to be formed on that center, with a little part of the ſpiral proceeding from it. The animal after this grows, and if it now ceaſed to perſpire, it muſt be a neceſſary conſequence that the future part of the body muſt be naked. This, however, is not the caſe: it continues to perſpire, and every part of the body, as it is formed, becomes covered with the ſame ſhelly cruſt made by the hardning of that newly perſpired matter, as it comes in contact with the air. The body of the ſnail, in growing, turns itſelf round the firſt point, and afterwards round that again, ſo there is ſpiral upon ſpiral formed, and at the ſame time the *ſhell* is formed in the ſame ſhape to cover them. The other turns of the *ſhell* are afterwards formed juſt in the ſame manner, and theſe in the garden-ſnail ſometimes run as far as to the number four and an half.

It is a neceſſary conſequence of this manner of formation of theſe *ſhells*, that the firſt circles of a young ſnail, which has not yet above two of them, are of juſt the ſame ſize with the two firſt turns of a grown ſnail, which has four in the whole; for whatever part of the *ſhell* has been once formed, becomes ſubject to no increaſe in ſize afterwards in itſelf, but all the addition to it is made by the continual joining on of more new formed *ſhell* to its extreme edges. There is, however, an addition of matter to the inſides of theſe, to give them a greater ſtrength afterwards; for it may always be obſerved, that though theſe firſt turns, or ſpiral wreathes, in a young ſnail, are of the ſame ſize with thoſe in a more grown one, yet they are thicker afterwards by much than they are at firſt. The new grown part of the animal, which would otherwiſe have been naked, thus forms itſelf a covering by its perſpiration, to which the already covered part adds thickneſs and ſtrength.

In the common ſmaller and more beautiful garden-ſnails, the ground colour of the *ſhell* is uſually yellowiſh, whitiſh, or reddiſh, and is variegated with rays or lines of black, following

lowing the trace of the wreath. The neck of the growing ſnail is the part which principally forms the *ſhell*; this is always naked, and is always making itſelf a covering, which, while the neck grows beyond it, ſerves for the next part. Now if we ſuppoſe this neck to be yellow, with one black ſpot in a particular part; or rather, that it all over exſudates a yellow liquor, except in ſome one ſpot, where it exſudates a black one; then it neceſſarily follows, that as the growth of the animal is performed in a ſpiral line, and the *ſhell* made accordingly, while the yellow matter makes a wreath of yellow *ſhell* ſurrounding the former, the black part muſt alſo be drawn in the ſame ſpiral form, as we ſee a ſpiral line of that colour in the wreath. And accordingly, if there be more points than one of this kind, then there muſt be more rays or lines alſo in the *ſhell*; and if theſe points are of different colours, then the rays formed by them will be alſo of different colours; neither are theſe black points, or ſpots, to be treated as a mere conjecture; they in reality ever appear upon the animal; and if a growing ſnail be nicely inſpected, they are always found placed juſt even with the black lines, or rays, which are carrying round the *ſhell*.

The part of the body of the ſnail which immediately follows the neck, and fills up that part of the *ſhell* it has juſt formed, diſcharges neither a yellow nor a black liquor, but only a thin aqueous whitiſh humour; this condenſing on the inſide of the new formed *ſhell* coats it over, and forms its inner covering, which therefore is always whitiſh, and has no varieties of colour.

It will be very eaſy for every naturaliſt to extend what is here related of the common garden ſnail to all the other animals which are covered in the ſame manner with *ſhells*; and the differences of colour in the matter tranſpired through the neck of the growing animal, with the different number and diſpoſition of the variegating points or dots on it, may give ſufficient room to account for all the beautiful variety of colours, and all the variegations in the moſt elegant ſea-*ſhells*.

The other varieties of them may alſo be accounted for upon the ſame principle; thus, ſuppoſe the growing fiſh of one kind has a number of eminencies on its body, there cannot fail to be prominences of the ſame kind in the *ſhell* that is formed by the regular tranſpiration of its juices; and theſe will go on regularly, enlarging to the end of the *ſhell*, becauſe the prominences which form them will grow larger in the animal as it grows. If there be any certain ſeaſon of the year when the *ſhell* ceaſes to grow, that is when the animal ceaſes to enlarge its body, ſuppoſe this to be the ſummer or the winter, or whatever particular ſeaſon; in this caſe, the traces of the different times of the creature's beginning to grow again, will not fail to be marked upon the *ſhell*; and the age of the *ſhell* might, if theſe times were known, be perhaps, in many caſes, as well determined by theſe ſeveral junctions of new to the old matter, as trees are known by their annual concentric circles. Thus we ſee, that theſe tender animals are themſelves the architects of theſe their elegant habitations, which are ſo beautifully regular, merely becauſe they grow as it were with the body of that architect, whoſe different age and ſtate of life, if perfectly underſtood, they would be found elegantly to denote. Mem. Acad. Par. 1709.

The durable hardneſs and excellent poliſh of many of the *ſhells* of ſea-fiſhes, and that even in the thinneſt and tendereſt kinds, is a thing very amazing. In the ruins of the abbey of St. Edmundſbury, which is built of a kind of ſtone compoſed of grit or ſand, interſperſed with an infinite variety of very minute *ſhells*, principally of the ſmall ſmooth cockle-kind, Mr. Collinſon obſerved, that the ſtone having ſuffered greatly by the injuries of the air, the grit or ſand of which it was compoſed had diſunited and mouldered away, while the ſmalleſt of theſe *ſhells* ſtood the ſame injurious accidents unaltered, and were found ſtanding forth in the utmoſt perfection, and with all their beautiful natural poliſh; yet theſe are as thin and tender a *ſhell* as almoſt any of the ſame ſize that we know of.

It is poſſible, indeed, that theſe *ſhells* might have been altered in their nature, by the inſinuation of ſtony matter into their pores, as is a common caſe in *ſhells* lodged in ſtone; but thoſe, here mentioned, did not ſeem to have undergone any ſuch alteration; and it is very certain, that many of the like thin and tender *ſhells* are found preſerved through a long ſeries of ages, in places where they have been in the way of no ſuch alterations from the inſinuation of ſtony matter into their pores, and out of which they are taken fair and beautiful, and with all their natural poliſh, though not at all hardened in the time. Of this kind are the *ſhells* of the tender buccinums, and other thin kinds, found buried in earth, in the ſtrata of marl, clay, or loam, and even in chalk.

As hard as theſe *ſhells* naturally are, they do not, however, preſerve the fiſh, which inhabit them, from becoming the food of others, which ſeem to have no organs with which to break them. It is common to ſee the ſoal-fiſh with its belly prominent and hard, as if well filled with ſpawn, and yet when opened to find no ſpawn at all; but the prominence and hardneſs is occaſioned by the ſtomach and guts being filled with *ſhell*-fiſh, which the creature had ſwallowed whole, as food, without having any power of breaking or deſtroying them. A ſmall ſpecies of pectunculus, or cockle, is the fiſh that the ſoal uſually feeds upon; and when the guts are taken out of this fiſh, they often reſemble ſo many ſtrings of necklaces, from the continued ſeries of theſe *ſhells* which appear prominent in them. When theſe *ſhells* are taken out, many of them are uſually found in part diſſolved, and many entire and unaltered.

Shell-fiſh are well known to be the food of ſome other fiſhes of the larger kinds, particularly the ſea-porcupine, and a kind of the wray-fiſh, are known principally to feed upon them; but theſe fiſh are provided by nature, with a ſuitable apparatus fitted for the grinding, or reducing them into a ſtate more proper for digeſtion; their jaws being furniſhed with bony ſubſtances, extending to the palate and under part of the mouth, which are capable of reducing much ſtronger *ſhells* than theſe into an abſolute pulp. The ſoal-fiſh has no apparatus of this kind, and neither its jaws nor ſtomach are furniſhed with any thing capable of wearing them to pieces by attrition; but what appears to be the caſe, is, that nature has furniſhed this creature with a menſtruum in the body capable of digeſting them. Phil. Tranſ. N° 473. p. 39.

The crab, like the lobſter, *&c.* caſts its *ſhell* once every year. Againſt this extraordinary event, the creature always chooſes a cloſe and well ſecured retreat in the cavities of rocks, or under great ſtones; there they creep in, and wait till all the parts are by degrees diſengaged, which is effected by withdrawing their legs from their old *ſhells*, and leaving them and the upper part of their body *ſhell* behind. In this naked ſtate they make a very ſtrange appearance, being a mere ill-ſhapen lump of a fleſhy matter, covered with a ſort of jelly; this by degrees hardens into a *ſhell*, a degree larger than the old one caſt off. Phil. Tranſ. N° 478. Sect. 14.

Poliſhing of SHELLS. See the article POLISHING.

Foſſile SHELLS. The number and variety of ſea-*ſhells* which are found far from ſeas buried at great depths in the earth, and often immerſed in the hardeſt ſtones, is an object of great wonder.

Of theſe ſome are found remaining almoſt entirely in their native ſtate, but others are variouſly altered by being impregnated with particles of ſtone, and of other foſſiles; in the place of others there is found mere ſtone, or ſpar, or ſome other native mineral body, expreſſing all their lineaments in the greateſt nicety, as having been formed wholly from them, the *ſhell* having been firſt depoſited in ſome ſolid matrix, and thence diſſolved by very ſlow degrees, and this matter left in its place, on the cavities of ſtone and other ſolid ſubſtances, out of which *ſhells* had been diſſolved and waſhed away, being afterwards filled up leſs ſlowly with theſe different ſubſtances, whether ſpar or whatever elſe: theſe ſubſtances, ſo filling the cavities, can neceſſarily be of no other form than that of the *ſhell*, to the abſence of which the cavity was owing, though all the nicer lineaments may not be ſo exactly expreſſed. Beſide theſe, we have alſo in many places maſſes of ſtone formed within various *ſhells*; and theſe having been received into the cavities of the *ſhells* while they were perfectly fluid, and having therefore nicely filled all their cavities, muſt retain the perfect figures of the internal part of the *ſhell*, when the *ſhell* itſelf ſhould be worn away, or periſhed from their outſide. The various ſpecies we find of theſe are in many genera, as numerous as the known recent ones; and as we have in our own iſland not only the *ſhells* of our own ſhores, but thoſe of many other very diſtant ones, ſo we have alſo many ſpecies, and thoſe in great numbers, which are in their recent ſtate, the inhabitants of other yet unknown or unſearched ſeas and ſhores. The cockles, muſcles, oiſters, and the other common bivalves of our own ſeas are very abundant: but we have alſo an amazing number of the nautilus kind, particularly of the nautilus græcorum, which though a *ſhell* not found living in our own, or any neighbouring ſeas, yet is found buried in all our clay-pits about London and elſewhere; and the moſt frequent of all foſſile *ſhells*, in ſome of our counties, are the conchæ anomiæ, which yet we know not of in any part of the world in their recent ſtate. Of this ſort alſo are the cornua ammonis and the gryphitæ, with ſeveral of the echinitæ and others.

The exact ſimilitude of the known *ſhells* recent and foſſile in their ſeveral kinds, will by no means ſuffer us to believe, that theſe, though not yet known to us in their living ſtate, are as ſome have idly thought, a ſort of luſus naturæ. It is certain, that of the many known ſhores, very few, not even thoſe of our own iſland, have been yet carefully ſearched for the *ſhell*-fiſh that inhabit them; and as we ſee in the nautilus græcorum an inſtance of *ſhells* being brought from very diſtant parts of the world to be buried here, we cannot wonder that yet unknown ſhores, or the unknown bottoms of deep ſeas, ſhould have furniſhed us with many unknown *ſhell*-fiſh, which may have been brought with the reſt; whether that were at the time of the general deluge, or the effect of any other cataſtrophe of a like kind, or by whatever other means, to be left in the yet unhardened matter of our ſtony and clayey ſtrata. *Hill's* Hiſt. of Foſſ. p. 616.

The vaſt beds of foſſile *ſhells*, buried in many parts of the world, are not uſeleſs matter, but will ſerve to one of the greateſt purpoſes of huſbandry, the manuring of barren lands. The people of many parts of France, and in ſome places in our own country, dig up the maſſes of broken *ſhells*, connected into a ſort of ſtrata by marly, or other earths, for this purpoſe; and ſpreading them upon the lands as dung, they ſoon moulder away, and are found extremely beneficial to the earth.

Mr. Reaumur, deſirous of knowing in what manner theſe fragments of *ſhells* fertilized land, at firſt conjectured that they did the ſame as the various ſpecies of marls, diſſolving wholly away in time, and entering into, and fattening the earth; and carried it ſo far, as to believe that the common marls were a ſort of earth, which owed its origin merely to ſuch fragments of *ſhells* more perfectly diſſolved, and conſequently, that the rain and air, in ſome ſort, converted theſe *ſhells* into marl upon the earth. But he was ſoon convinced of the error of this opinion, by the experience of the peaſants, from whom he found that there was marl in the ſame pits whence they dug theſe *ſhells*, and that they uſed it alſo as manure, but to lands of a very different kind; thoſe which received benefit from the marl being always injured by the *ſhells*, and, on the contrary, thoſe which were meliorated by the *ſhells*, receiving no benefit from the marl. It might naturally enough be ſuppoſed that the ſalts, contained in theſe foſſile *ſhells*, helped to fertilize the earth, in the ſame manner with the ſalts of the common ſea-plants, which are uſed as manure in many places. It is not impoſſible, but that the ſalts may indeed have their uſe in the whole, but the great good theſe *ſhelly* fragments do to the lands they are uſed on, is to be explained in a much eaſier manner, when the nature of the lands, on which they are employed, is conſidered.

Theſe are uſually cold clayey lands, on which nothing can grow but heath, and a few uſeleſs weeds, the common plants not ſhooting in any ſtrength or perfection upon them; and they are always very wet upon the ſurface after any little rain, their texture being ſo cloſe and compact, that the water cannot penetrate into them, as it does into the ſpongy texture of the common fertile lands. This ſort of manure, which is very light, and is no other than a maſs of broken, and as it were half calcined *ſhells*, mixing with this earth, breaks its particles, and occaſions a multitude of voids and little cavities in it, which reduce it to ſomething like the common ſtate of other earth, and the rain penetrates it as it does other mould.

The effects of this ſort of manure are very laſting; a land well ſtrewn with theſe *ſhells* is manured for twenty years, and the rain no longer wets its ſurface only, but penetrates its ſubſtance, and moiſtens the roots of plants ſown in it. Theſe find alſo an eaſier paſſage, and penetrate to a proper depth; while the ploughman finds no leſs the benefit, his plough now eaſily turning up an earth, which before it was ſcarce able to cut. Some have imagined, indeed, that all theſe effects are owing to the ſalts in the *ſhells* operating in the manner of thoſe of dung, and by that means breaking the connections of the more minute molecules; but ocular examination will ſhew the *ſhells* to act, in this caſe, merely as particles of hard matter of that ſize and hardneſs, and to do no more than fragments of ſtone of the ſame ſize would do: and the peaſants are well acquainted with this, as they find it neceſſary to dung thoſe lands, which they have before manured with *ſhells*, in the ſame manner as they do any others.

There are in many foreign countries, as well as in our own, lands of ſuch a nature, that they never will become fertile, unleſs a large quantity of ſand is diſperſed over them. Theſe lands are all of the ſame nature with thoſe on which the farmers find their manure of *ſhells* to take effect. The ſand, and this manure of *ſhells*, evidently act upon the ſame principle, in meliorating land, which is only by dividing its parts when naturally too compact; but the *ſhells* are qualified to do it greatly the better of the two, becauſe they are in themſelves ſo conſiderably lighter. Somewhat analogous to this ſort of manure, is that of the throwing pebbles and rough fragments of ſtone on ſome earths, which are naturally tough and compact in a great degree. It is the general practice in huſbandry to take off all the ſtones, as far as it can be done, from the lands; but theſe ſoils are apt to crack, and burſt open in dry ſeaſons, and the more ſtones are mixed in them, the leſs they are obſerved to crack, and what cracks they have, are always the ſmaller and ſhorter. The earth is, by theſe ſtones, divided into ſo many ſeparate parcels, that no very large and continued cracks can be formed; and always is the more fruitful, the more ſtones it has upon it, provided that they be not too large.

The manure of *ſhells*, upon theſe lands, does not produce nearly ſo great an effect for the two firſt years, as it does in the ſucceeding ones; the reaſon of which is, that it is not then ſufficiently mixed, but in ſucceeding time it breaks itſelf into a number of very ſmall particles, and theſe all become intimately blended with the molecules of earth, and produce their effect more perfectly.

It is well known, that the *ſhells* of the common garden-ſnails always become calcined, as it were, in ſome degree, by lying in the earth; this becomes very friable, and may be mouldered to powder between the fingers: and the caſe is juſt the ſame in regard to theſe ſea-*ſhells*; they, by their long abode in the earth, are thus calcined, and happily for the farmer are reduced to a ſort of coarſe powder, the particles of which are juſt of ſuch a ſize, as may properly ſerve for the dividing and breaking the little clods of earth, and forming in the whole certain voids and ſpaces, juſt as large as they could be wiſhed, in order to give roots, and moiſture to ſwell them, an eaſy paſſage. And as theſe pieces of *ſhells* are not expected to act as bodies containing active principles, but merely as inert particles of matter, ſo long as they retain their form, that action will not be impeded; and notwithſtanding all the rude ſhocks they receive from the plough, and other inſtruments of huſbandry, they retain this their form without any great alteration for a long time, and therefore the operation of ſtrewing them on any piece of land, needs not to be repeated in twenty, or ſometimes in thirty years.

The manner in which the effects of this *ſhell*-manure wear off at length, will be eaſily ſeen, if parcels of earth, manured with it at different diſtances of time, be examined, by waſhing away the earth with water; the fragments of *ſhells*, left from the waſhing of earths of different years from the time of their being added to them, will be found growing ſmaller and ſmaller every year, till at length they make only a fine powder, mixing every way equally with the earth, and no longer opening its texture, or dividing its molecules, and it is then that theſe lands require a freſh quantity of it.

This breaking of the particles of the *ſhells* is not to be determined by any regular rule, as to time, but differs from a number of accidents; and accordingly the farmer cannot ſay when he ought to renew the work, till he finds that the fertility it occaſioned decreaſes. The ſize of the fragments in their original beds makes a great difference, the largeſt uſually, and as might naturally be ſuppoſed, laſting the longeſt; but beſide this, they are more or leſs calcined in the earth, and even according to the nature of that earth, upon which they are laid.

Mr. Reaumur concludes this uſeful account of theſe ſubſtances, by obſerving, that it is much more eaſy to account for the manner of their acting upon land, than for the manner of their coming where they are found. It has been the favourite ſyſtem of our Dr. Woodward, that all theſe *ſhells* were the remains of the univerſal deluge, which having overflowed the whole earth, might eaſily leave them in all places; but Mr. Reaumur has much more rationally accounted for their coming to thoſe parts of France, where they are found at this time in ſuch vaſt abundance, by carefully tracing the courſe of the beds of them ſo far as known there, and eaſily proving, that all that extent of country, under which they are found, may have been once overflowed by the ſea, without a deluge; it being the very track that a large body of waters, let in at one part of the kingdom, muſt have taken, in order to getting out at another. Mem. de l'Acad. Par. 1720.

Arabian-SHELL, a name given by ſome to a ſpecies of porcelain *ſhell*, not becauſe it is found on the coaſt of Arabia, but becauſe its lines and variegations are ſuppoſed to repreſent the figures of Arabic characters.

Aurora-SHELL, in natural hiſtory, a very remarkable ſpecies of *ſhell*-fiſh, found in cabinets of the curious. It is of the figure of a bird, having a head, wings, and tail, and is of a flame-colour. It owes much of its beauty, however, to art and accident. The *ſhell* is an oiſter of a peculiar variation of figure from the common one; the head of the bird is the cardo, or hinge; the wings are the body of the *ſhells*; and the tail is a peculiar proceſs, like that of the marteau, only ſingle. See MARTEAU.

It is naturally of a duſky brown on the outſide, and pearly within, but when its rough coat is taken off, it appears of this beautiful flame-colour.

Center-SHELL, in natural hiſtory, a name given to the balanus marinus, a kind of ſea-*ſhell*, of the multivalve kind with an open mouth, frequently found fixed to the bottoms of ſhips, and other things covered with ſea-water.

China-letter-SHELL, in natural hiſtory, a name given by many to that ſpecies of chama, uſually called by authors the *chama arabica*. It is of a pale browniſh ground, and is variegated with a great number of black lines, which are as ſlender as the ſtrokes of a pen, and are of ſuch odd figures, that they repreſent ſome of the Arabic, or, as others fancy, Chineſe characters. See the article CHAMA.

Ear-SHELL. See the article EAR.

Guinea-SHELL, the Engliſh name for a very beautiful variegated ſpecies of voluta, called by the French *la ſpeculation*. See VOLUTA.

Heart-SHELL. See the article HEART.

Helmet-SHELL, in natural hiſtory, the name of a kind of murex, of which there are ſeveral ſpecies. They all approach

ſome-

ſomewhat toward a triangular figure, and are free from any long ſpines. See MUREX.

Leopard-SHELL, in natural hiſtory, the Engliſh name of the pardus, a kind of voluta; ſo called, from its ſpots reſembling thoſe of a leopard. There are three kinds of this, one ſpotted with black, another with yellow, and another with red.

Leveret-SHELL, in natural hiſtory, a name given by many to a ſpecies of porcelain, reſembling a young hair in colour. See the article PORCELLANA.

Lightning-SHELL, in natural hiſtory, a name given by ſome authors to a ſpecies of murex with variegations on its body, reſembling the pictures we commonly ſee of flaſhes of lightning. See the article MUREX.

Map-SHELL, in natural hiſtory, the name given by ſome to a peculiar ſpecies of porcelain-*ſhell*, the figures on which repreſent the lines on a map. See PORCELLANA.

Noah's ark-SHELL. See the article NOAH.

Oiſter-SHELL. See the article OISTER.

Old wife-SHELL, the name given by ſome to that ſpecies of chama, which the French alſo have called *vielle ridée*. See the article VIELLE *ridée*.

Onion-SHELL. See the article OSTREA.

Pipe-SHELL, in the materia medica. See ENTALIUM.

Saddle-SHELL, in natural hiſtory, the name of a ſpecies of oiſter, which in ſome degree repreſents a ſaddle in its ſhape. See the article OSTREA.

St. James's SHELL, in natural hiſtory, a name given by writers on *ſhells* to a very beautiful ſpecies of variegated pecten. See the article PECTEN.

St. Michael's SHELL, in natural hiſtory, a name given by authors to a ſpecies of pecten, or ſcallop-*ſhell*. It is of a bright yellow colour. See PECTEN.

Scorpion-SHELL, in natural hiſtory, the name of a ſpecies of murex, very much approaching to the nature of the ſpider-*ſhell*. This is a common *ſhell* in cabinets. It is of a yellow colour, and very deeply ridged, and full of tubercles; there ariſe from the lip of the *ſhell* five large ſpines, or, as they are uſually called, fingers, and two others, which are very much bent, the one from the head, the other from the tail: theſe are very elegantly radiated with white and a fine violet colour on the lips. See the article MUREX.

Screw-SHELL. See the article TURBO.

Small-pox-SHELL, in natural hiſtory, a name given to a remarkable kind of concha venerea, or porcelain-*ſhell*, the protuberances on the ſurface of which are ſuppoſed to repreſent the puſtules of the ſmall-pox. There are two ſpecies of this *ſhell*, the one white with flattiſh protuberances, the other greeniſh with more elevated ones. See the article PORCELLANA.

Snake-SHELL, in natural hiſtory, the name given by many to that beautiful ſpecies of porcelain-*ſhell*, the ſpots of which repreſent thoſe of a ſnake's ſkin. See the article PORCELLANA.

Spider-SHELL, the name of a kind of murex. See the articles ARANCHA, CONCHA, and MUREX.

Strawberry-SHELL, in natural hiſtory, a name given by collectors of *ſhells* to a very beautiful ſpecies of cordiformis, ſpotted with ſmall round red ſpots.

Swallow-SHELL, in natural hiſtory, the name given by authors to a ſpecies of oiſter, which in ſome degree repreſents the figure of a ſmall bird flying. See OSTREA.

Swan-SHELL. See the article CIGNE.

Tiger-SHELL, in natural hiſtory, the name of a ſpecies of porcelain, or concha venerea, ſuppoſed to repreſent the ſpots on a tiger's ſkin. See PORCELLANA.

Trumpet-SHELL. See the article TRUMPET.

Turban-SHELL. See the article TURBAN.

Turnep-SHELL. This is a ſpecies of ſea-*ſhell*, by others called the *radiſh-ſhell*. It is exactly of the ſhape of a turnep, and is of the dolium, or concha globoſa kind. Thoſe who have called it the *radiſh-ſhell*, allude to the great black round-rooted radiſh, not to our common radiſh. See the article DOLIUM.

SHELL-*apple*, in zoology, an Engliſh name for the loxia, or croſsbill; given from his manner of ſplitting an apple, and feeding on the kernels, leaving the *ſhell* of the pulp untouched. *Ray's* Ornitholog. p. 181. See the article LOXIA.

SHELL-*drake*, in zoology, a common Engliſh name for the tadoma. See the article TADOMA.

SHELL-*fiſh*. Theſe animals are in general oviparous, very few inſtances having been found of ſuch as are viviparous. Among the oviparous kinds, anatomiſts have found that ſome ſpecies are of different ſexes in the different individuals of the ſame ſpecies, but others are hermaphrodites, every one being in itſelf both male and female: in both caſes their encreaſe is very numerous, and ſcarce inferior to that of plants, or of the moſt fruitful of the inſect claſs. The eggs are very ſmall, and are hung together in a ſort of cluſters by means of a glutinous humour, which is always placed about them, and is of the nature of the jelly of frogs ſpawn; by means of this they are not only kept together in the parcel, but the whole cluſter is faſtened to the rocks, *ſhells*, or other ſolid ſubſtances, and thus they are preſerved from being driven on ſhore by the waves, and left where they cannot ſucceed. *Langius*, Method. Teſtac.

SHELL-*gall-inſect*, an inſect of the gall-inſect claſs, ſomewhat reſembling thoſe which are called the boat-faſhioned ones, but differing in this, that as the two ends of that ſpecies are not very different in form, in this kind one of the ends is ſharp and pointed, in compariſon with the other. It has its name of *ſhell-inſect*, from the reſemblance it bears to a muſcle-*ſhell*; as it is, in its whole form, not unlike one of the two *ſhells*, in which the common ſea-muſcle is encloſed, but the pointed end of this *inſect* is much more extended in length, than the ſmaller end of this *ſhell*.

This ſpecies is extremely ſmall, and may be eaſily miſtaken for the minute caſe, out of which ſome ſmall inſect has eſcaped; or in another ſtate, for the neſt in which ſome ſmall inſect had depoſited its eggs: but if the aſſiſtance of the microſcope be called in, they will eaſily be diſcovered to be true gall-inſects, even as ſoon as they are hatched from the eggs. This ſpecies, at its full growth, is ſo ſmall, that it requires good eyes to diſcover it. It is brown, very ſmooth, and poliſhed on the ſurface, and much of the colour of the bark of ſome trees. It has uſually an edge of a cottony matter, viſible where its ſides touch the tree, and its eggs are always depoſited on a fine cottony bed. The young ones are white, flat, and have two ſmall horns, and ſix legs. In this ſtate they are known to be of the gall-inſect claſs; not by their likeneſs to their parent, but to the young gall-inſects of other ſpecies. They march about very briſkly for ſome time after they are hatched, and after that fix themſelves, and then begin to grow, and by degrees alter their form, till they at length are of the ſame ſhape with their parent. *Reaumur*, Hiſt. Inſ. Tom. 4. p. 69, 70.

SHELL-*ſand*, a name given by the farmers, in ſome parts of England, to the fragments of *ſhells* found on the ſea-ſhores, and ground to a ſort of powder, ſo that they reſemble ſand. There is alſo another kind uſed as this is, in ſome parts of Cornwall, and compoſed of fragments of a ſort of tender white coral. This is found principally about Falmouth, and is called by the ſame name of *ſhell-ſand*, though very improperly. All the kinds are of great uſe in agriculture, but they are differently eſteemed by the farmers, as they are more or leſs rich, which they know by their colours. The reddiſh kind is eſteemed moſt of all, next to this the blue is judged the beſt, and after this the white. Such as is dredged up from under the water, is always found better, than ſuch as is found dry on the ſhores; and ſuch as is entirely compoſed of *ſhells* is to be choſen, rather than ſuch as has fragments of ſtone among it, which is a very common caſe.

In Cornwall they uſe this as the general manure of their land; they carry it up in lighters as near the lands, where it is to be uſed, as they can, and thence it is ſometimes carried to the place, where it is to be uſed, by carts, and ſometimes by men with horſes, a horſe being able eaſily to carry thirteen gallons of it at a load. One man drives ſeven or eight of thoſe horſes in a train, and the farmers find it worth their while to carry it ten or twelve mile from the water ſide in this manner. At this diſtance it uſually coſts about eight pence the load, but where the lands lie near the water, the price is very inconſiderable. So much of this *ſand* is uſed in the county of Cornwall, that the land-carriage alone, at this eaſy rate, is found to amount to more than thirty thouſand pounds a year, and the advantages from it is very great; ſo that it is wonderful, that the practice is not extended all over the kingdom where the ſea-coaſts are near. Phil. Tranſ. N° 113.

SHELL-*toothed*, in the manege, an appellation given to a horſe that from five years old to old age naturally, and without any artifice, bears mark in all his fore teeth, and there ſtill keeps that hollow place with the black mark, which is called in French *germe de feve*, i. e. the eye of a bean; inſomuch, that at twelve or fifteen he appears with the mark of a horſe that is not yet ſix: for in the nippers of other horſes, the hollow place is filled, and the mark diſappears, towards the ſixth year, by reaſon of the wearing of the tooth. About the ſame age it is half worn out in the middling teeth, and towards the eighth year it diſappears in the corner teeth: but after a *ſhell-toothed* horſe has marked, he marks ſtill equally in the nippers, the middling, and the corner teeth; which proceeds from this, that having harder teeth than other horſes, his teeth do not wear, and ſo he does not loſe the black ſpot. Among the Poliſh, Hungarian, and Croatian horſes, we find a great many of them hollow-toothed; and generally the mares are more apt to be ſo than the horſes.

SHELTIE, the name of a ſmall, but ſtrong kind of horſe, found in the iſland of Zetland, commonly called *Shetland*. In the country, the price of one of theſe horſes is about a guinea. Phil. Tranſ. N° 473. ſect. 8.

SHERARDIA, in the Linnæan ſyſtem of botany, a diſtinct genus of plants, the characters of which are, that the cup is a ſmall perianthium, divided into four ſegments, ſituated on the germen, and remaining after the flower is fallen. The flower conſiſts of one petal, which is a long cylindric tube, divided into four ſegments at the end; the ſegments are pointed, and the flower placed flatwiſe. The ſtamina are four

four filaments, placed at the upper part of the tube. The antheræ are ſimple. The germen of the piſtil is double, oblong, and placed below the receptacle. The ſtyle is ſlender, and bifid at top; and the ſtigmata are headed. The fruit is an oblong body, ſeparable longitudinally into two ſeeds, which are long, convex on one ſide, and plane on the other, and marked with three points at their ſummit. *Linnæi* Gen. Plant. p. 25.

SHERARDIA is alſo a name given by Pontedera to the genus of plants, called by Linnæus *galenia*. *Ponteder*. Epiſt. 14. See the article GALENIA.

SHERIF, in the Egyptian orders, the relations of Mahomet, the ſame tribe of perſons called *emir* by the Turks.

The word is Perſian, and ſignifies great or noble; and theſe perſons have the privilege of being exempt from appearing before any judge but their own head: and if any of the military orders are obliged to puniſh them for any miſdemeanor, they firſt take off their green turban, in reſpect to their character; and the ſame is done, even when they are puniſhed by their own magiſtrate. *Pocock*'s Egypt, p. 171.

SHIELD (*Cycl.*)—The *ſhield* was that part of the antient armour, on which the perſons of diſtinction in the field of battle always had their arms painted; and moſt of the words, uſed at this time to expreſs the ſpace that holds the arms of families, are derived from the Latin name for a *ſhield*, *ſcutum*. The French *eſcu*, and *eſcuſſion*, and our Engliſh word, *eſcutcheon*, or, as we commonly ſpeak it, *ſcutcheon*, is evidently from this origin; and the Italian *ſcudo* ſignifies both the *ſhield* of arms, and that uſed in war.

The Latin name *clypeus*, for the ſame thing, ſeems alſo to be derived from the Greek word, γλυφειν, to engrave; and it had this name from the ſeveral figures engraved on it, as marks of diſtinction of the perſon who wore it. *Beckman*, Diſſ. 6. cap. 8.

The *ſhield* in war, among the Greeks and Romans, was not only uſeful in the defence of the body, but it was alſo a token, or badge of honour to the wearer, and he who returned from battle without it, was always treated with infamy afterwards.

People have at all times thought this honourable piece of the armour, the propereſt place to engrave, or figure on the ſigns of dignity of the poſſeſſor of it; and hence, when arms came to be painted for families in after-times, the heralds always choſe to repreſent them upon the figure of a *ſhield*, but with ſeveral exterior additions and ornaments, as the helmet, ſupporters, and the reſt. *Niſbet*'s Heraldry, p. 11.

The form of the *ſhield* has not only been found different in various nations, but even the people of the ſame nation, at different times, have varied its form extremely; and among ſeveral people there have been *ſhields* of ſeveral forms and ſizes in uſe, at the ſame period of time, and ſuited to different occaſions. *Baron*'s Heraldry.

The moſt antient and univerſal form of *ſhields*, in the earlier ages, ſeems to have been the triangular. This we ſee inſtances of in all the monuments and gems of antiquity: our own moſt early monuments ſhew it to have been the moſt antique ſhape alſo with us, and the heralds have found it the moſt convenient for their purpoſes, when they had any odd number of figures to repreſent; as if three, then two in the broad bottom part, and one in the narrow upper end, it held them very well; or if five, they ſtood as conveniently at three below, and two above. The other form of a *ſhield*, now univerſally uſed, is ſquare, rounded and pointed at the bottom: this is taken from the figure of the ſamnitic-*ſhield* uſed by the Romans, and ſince copied very generally by the Engliſh, French, and Germans. The Spaniards and Portugueſe have the like general form of *ſhields*, but they are round at the bottom without the point; and the Germans, beſide the ſamnite-*ſhield*, have two others pretty much in uſe: theſe are, 1. The bulging-*ſhield*, diſtinguiſhed by its ſwelling or bulging out at the flanks; and 2. the indented-*ſhield*, or *ſhield* chancrée, which has a number of notches and indentings all round its ſides. The uſe of the antient *ſhield* of this form was, that the notches ſerved to reſt the lance upon, that it might be firm while it gave the thruſt; but this form being leſs proper for the receiving armorial figures, the two former have been much more uſed in the heraldry of that nation.

Beſide this different form of the *ſhields* in heraldry, we find them alſo often diſtinguiſhed by their different poſitions, ſome of them ſtanding erect, and others ſlanting various ways, and in different degrees. This the heralds expreſs by the word *pendant*, hanging, they ſeeming to be hung up not by the center, but by the right or left corner. The French call theſe *ecu pendant*, and the common antique triangular ones *ecu ancien*. The Italians call this *ſcuto pendente*; and the reaſon given for exhibiting the *ſhield* in theſe figures in heraldry is, that in the antient tilts and tournaments, they who were to juſt at theſe military exerciſes, were obliged to hang up their *ſhields*, with their armories, or coats of arms on them, out at the windows and balconies of the houſes near the place; or upon trees, pavilions, or the barriers of the ground, if the exerciſe was to be performed in the field.

Thoſe who were to fight on foot, according to Columbier, had their *ſhields* hung up by the right corner, and thoſe who were to fight on horſeback, had theirs hung up by the left. This poſition of the *ſhields*, in heraldry, is called *couché* by ſome writers, though by the generality *pendant*.

It was very frequent, in all parts of Europe, in arms given between the eleventh and fourteenth centuries. But it is to be obſerved, that the hanging by the left corner, as it was the token of the owner's being to fight on horſeback, ſo it was eſteemed the moſt honourable and noble ſituation, and all the pendant *ſhields* of the ſons of the royal family of Scotland and England, and of our nobility at that time, are thus hanging from the left corner. The hanging from this corner, was a token of the owner's being of noble birth, and having fought in the tournaments before; but no ſovereign ever had a *ſhield* pendant any way, but always erect, as they never formally entered the liſts of the tournament.

The Italians generally have their *ſhields* of arms of an oval form: this ſeems to be done in imitation of thoſe of the popes, and other dignified clergy; but their herald, Petro Sancto, ſeems to regret the uſe of this figure of the *ſhield*, as an innovation brought in by the painters and engravers, as moſt convenient for holding the figures, but derogatory to the honour of the poſſeſſor, as not repreſenting either antiquity, or honours won in war, but rather the honours of ſome citizen, or perſon of learning. Some have carried it ſo far, as to ſay that thoſe, who either have no antient title to nobility, or have ſullied it by any unworthy action, cannot any longer wear their arms in *ſhields* properly figured, but were obliged to have them painted in an oval, or round *ſhield*. In Flanders, where this author lived, the round and oval *ſhields* are in the diſrepute he ſpeaks of; but in Italy, beſide the popes and dignified prelates, many of the firſt families of the laity have them. The ſecular princes, in many other countries, alſo retain this form of the *ſhield*, as the moſt antient, and truly expreſſive of the Roman clypeus. *Niſbet*'s Heraldry, p. 12. *Componille*, Herald.

SHIFTERS, on board a man of war, certain men who are employed by the cooks to ſhift or change the water, in which the fleſh or fiſh is put, and laid for ſome time, in order to fit it for the kettle.

SHILLING (*Cycl.*)—In the year 1560, there was a peculiar ſort of *ſhilling* ſtruck in Ireland, of the value of nine pence Engliſh, which paſſed in Ireland for twelve pence. The motto on the reverſe of theſe, is *poſui deum adjutorem meum*. Eighty two of theſe *ſhillings*, according to Malynes, went to the pound; they therefore weighed twenty grains one fourth each, which is ſomewhat heavier in proportion than the Engliſh *ſhilling* of that time, ſixty two whereof went to the pound, each weighing ninety two grains ſeven eighths; and the Iriſh *ſhilling* being valued at the Tower at nine pence Engliſh (that is one fourth part leſs than the Engliſh *ſhilling*) it ſhould therefore proportionably weigh one fourth part leſs, and its full weight be ſomewhat more than ſixty two grains, but ſome of them found at this time, though much worn, weighed ſixty nine grains. In the year 1598, five different pieces of money of this kind were ſtruck in England for the ſervice of the kingdom of Ireland.

Theſe were *ſhillings* to be current in Ireland as twelve pence each, half *ſhillings* to be current at ſix pence, and quarter *ſhillings* at three pence. Pennies and halfpennies were alſo ſtruck of the ſame kind, and ſent over for the payment of the army in Ireland. The money thus coined was of a very baſe mixture of copper and ſilver, and two years after there were more pieces of the ſame kinds ſtruck for the ſame ſervice, which were ſtill worſe; the former being three ounces of ſilver to nine ounces of copper, and theſe latter only two ounces eighteen pennyweights, to nine ounces two pennyweights of the alloy. *Simon*'s Iriſh Coins.

SHINGLING, in the iron-works, in many parts of England, is the operation of hammering the ſow, or caſt-iron, into blooms. The tongs, uſed for holding the iron in this operation, are called *ſhingling-tongs*, and the iron to be thus wrought is called a *loop*. *Ray*'s Engliſh Words, p. 128. See the articles LOOP and BLOOM.

SHIP (*Cycl.*)—It is highly neceſſary, to the health of ſeamen, that *ſhips* ſhould be cleared of foul air; for it has been found by frequent experience, that air ſhut up, and confined in a cloſe place, without a ſucceſſion and freſh ſupply of it, becomes unwholſome, and unfit for the uſe of life. This is more ſenſibly ſo, if any ſtagnating water be pent up with it. But it grows ſtill worſe, if ſuch an air as this is made uſe of in reſpiration; that is, becomes moiſter and hotter, by paſſing and repaſſing through the lungs. Theſe bad effects in different degrees, according to the different manner in which air is incloſed, are obſerved in many caſes; particularly in deep wells, and caverns of the earth; in priſons, or cloſe houſes, where people are ſhut up with heat and naſtineſs; but moſt of all in large *ſhips*, in which, with the ſtench of water in the hold, many men being crouded up in cloſe quarters, all the mentioned circumſtances concur in producing greater miſchiefs than would follow from any of them ſingle.

Mr. Sutton did therefore, a few years ago, propoſe, in order to clear the holds of *ſhips* of the bad air they contain, that the fire-place and aſh-place of the copper or boiler ſhould be both cloſed up with ſubſtantial and tight iron doors; and that a copper, or leaden-pipe, of ſufficient ſize, ſhould be laid from the hold into the aſh-place, for the draught of air to come in that way to feed the fire. And thus, from the natural elaſticity of the air, it ſeems plain, that there will be from the hold a conſtant diſcharge of the air therein contained; and conſequently, that the air ſo diſcharged muſt be as conſtantly ſupplied by freſh air below the hatches, or ſuch other communications as are open into the hold; whereby the ſame muſt be continually made freſh, and its air rendered more wholſome, and fit for reſpiration. And if into this principal pipe, ſo laid into the hold, other pipes are let in, communicating reſpectively either with the well, or lower decks, it muſt follow, that part of the air, conſumed in feeding the fire, muſt be reſpectively drawn out of all ſuch places, to which the communication ſhall be ſo made. Phil. Tranſ. N° 462. p. 42, 43.

To prevent *ſhips*, whoſe bottoms are worm-eaten, from leaking, this method has been propoſed [b]. Calk well the inſide planks, or lining; then fill the vacant ſpaces between the timbers, and the out and inſide planks with boiling pitch, or reſin, ſo high as the main-gun-deck. The pitch being put in very hot, will run into the ſmalleſt cranny, and make the *ſhip* as tight as a bottle. There will be no room left for vermin, as rats, *&c.* and the pitch will ſerve for other uſes when taken out; therefore the expence will be but ſmall.—[[b] Phil. Tranſ. N° 476. p. 372.]

SHIP *of pleaſure*, among the antients. See the article THALAMEGUS.

SHIP, in the ſalt-works, is a large ciſtern, out of which the ſalt-pans are ſupplied for boiling.

This ciſtern is built cloſe to the ſaltern, and is made either of wood, brick, or clay; and it ought always to be covered with a ſhed, that the ſea water, contained in it, may be kept clean from ſoot, and other impurities, and not mixed with freſh water in rains; and it muſt be always placed ſo high, that the water will eaſily run out of it into the pans, to ſupply them for boiling.

SHIRE (*Cycl.*)—SHIRE-*clerk*, he that keeps the county-court; and his office is ſo incident to that of the ſheriff, that the king cannot grant it away. 4 Rep. *Blount*, *Cowel*.

SHIRE-*man*, was antiently the judge of the *ſhire*, by whom trials for land, *&c.* were determined. Lamb. Peramb. 442. *Blount*.

SHIRE-*mote*, in our old writers, an aſſembly of the county or *ſhire* at the aſſizes, *&c.* *Blount*, *Cowel*. See the article SCYREGEMOT, *Cycl.*

SHIVERS, in a ſhip, the ſeamen's term for thoſe little round wheels, in which the rope of a pulley or block runs. They turn with the rope, and have pieces of braſs in their centers, (which they call the *cocks*) with holes in them, into which the pin of the block goes, and on which they turn.

Theſe *ſhivers* are uſually of wood; but ſome are of braſs, as thoſe in the heels of the top-maſts.

SHIVERY *ſalt*, a name given by the ſalt-workers to a ſort of ſalt, very little different from the common brine-ſalt.

It is prepared in the ſame manner, as that ſalt from the ſalt ſprings in Cheſhire, and other places, and is of a larger and firmer grain than that prepared in the common way, and is ſtronger, and therefore more fit for the preſerving meat. When they would make this *ſalt*, they fill the pans on Saturday night, and then, as they draw out no ſalt on Sundays, there is a very moderate fire kept up all that day, and on the Monday morning all the *ſalt* is taken out at one draught, having had time to form itſelf into larger cryſtals than ordinary, as it is eight and forty hours, inſtead of four and twenty in forming. *Brownrig* of Salt, p. 108. See the article SALT.

SHOAD, in mining, a term for a train of metalline ſtones mixed with earth, ſometimes lying near the ſurface, ſometimes at conſiderable depths; but always ſerving to the miners as a proof, that the load or vein of the metal is thereabout. The deeper the *ſhoad* lies, the nearer uſually the vein is. *Ray*'s Words, p. 120.

SHOAD-*ſtones*, a term uſed by the miners of Cornwall, and other parts of this kingdom, to expreſs ſuch looſe maſſes of ſtone, as are uſually found about the entrances into mines, ſometimes running in a ſtrait courſe, from the load or vein of ore, to the ſurface of the earth.

Theſe are ſtones of the common kinds, appearing to have been pieces broken from the ſtrata, or larger maſſes, but they uſually contain mundic, or marcaſetic matter, and more or leſs of the ore to be found in the mine. They appear to have been at ſome time rolled about in water, their corners being broken off, and their ſurface ſmoothed and rounded. The antimony mines in Cornwall are always eaſily diſcovered by the *ſhoad-ſtones*, theſe uſually lying up to the ſurface, or very nearly ſo; and the matter of the *ſtone* being a white ſpar, or debaſed cryſtal, in which the native colour of the ore, which is a ſhining bluiſh black, eaſily diſcovers itſelf in ſtreaks and threads.

Shoad-ſtones are of ſo many kinds, and of ſuch various appearances, that it is not eaſy to deſcribe, or know them; but the miners, to whom they are of greateſt uſe in the tracing, or ſearching after new mines, diſtinguiſh them from other ſtones by their weight: for if very ponderous, though they look ever ſo much like common ſtones, there is great reaſon to ſuſpect that they contain ſome metal. Another mark of them, is their being ſpungy and porous; this is a ſign of eſpecial uſe in the tin countries, for the tin *ſhoad-ſtones* are often ſo porous and ſpungy, that they reſemble large bones of animals thoroughly calcined. There are many other appearances of tin *ſhoads*, the very hardeſt and firmeſt *ſtones* often containing this metal.

When the miners, in tracing a *ſhoad* up a hill, meet with ſuch odd ſtones and earths, that they know not well what to make of them, they have recourſe to vanning, that is, they calcine and powder the ſtone, clay, or whatever elſe is ſuppoſed to contain the metal; and then waſhing it in an inſtrument, prepared for that purpoſe, and called a *vanning-ſhovel*, they find the earthy matter waſhed away; and of the remainder, the ſtoney, or gravelly matter lies behind, and the metalline matter at the point of the ſhovel. If the perſon, who performs this operation, has any judgment, he eaſily diſcovers not only what the metal is that is contained in the *ſhoad*, but alſo will make a very probable gueſs at what quantity the mine is likely to yield of it, in proportion to the ore. Phil. Tranſ. N° 69.

SHOE (*Cycl.*)—SHOE, in the manege. A horſe-*ſhoe* is a piece of flat iron, with two branches or wings, which being commonly forged according to the form of the hoof for which it is deſigned, is made round at the toe, and open at the heel.

A *ſhoe* for all feet, is one that is cut at the toe into two equal parts, which are joined by a riveted nail; upon which they are moveable in ſuch a manner, that the *ſhoe* is inlarged or contracted, leſs or more, at pleaſure, in order to make it fit all ſorts and ſizes of feet.

To *ſhoe* a horſe after the form of a lunette, a patin, *&c.* See LUNETTE, PATIN, *&c.*

SHOEING-*hammer*, in the manege, a hammer that the ſmith or farrier makes uſe of to adjuſt and fit the ſhoes upon the anvil, both hot and cold.

SHOOT, in the ſea language. They ſay the ballaſt *ſhoots*, when it runs over from one ſide to another.

SHOOTING (*Cycl.*)—SHOOTING *of ſalts*. It is to be obſerved, that the figures ariſing from the *ſhooting* of diſſolved ſalts are not conſtantly the ſame, but vary according to different circumſtances; ſuch as when they happen to *ſhoot* more or leſs haſtily, or in different proportions of liquor. *Boyle*'s Works Abridged, Vol. I. p. 241. See the article SALT.

SHORES (*Cycl.*)—The *ſhores* of the ſea are divided, by Count Marſigli, into three portions, according to which all his deſcriptions, in his accounts of the baſon of the ſea, are given.

The firſt part of the *ſhore*, is that tract of land to which the ſea juſt reaches in ſtorms and high tides, but which it never covers; the ſecond part of the *ſhore*, is that which is covered in high tides and ſtorms, but is dry at other times; and the third is the deſcent from this, which is always covered with water.

The firſt part is only a continuation of the continent, and ſuffers no alteration from the neighbourhood of the ſea, except that it is rendered fit for the growth of ſome plants, and wholly unfit for that of others, by the ſaline ſteams and impregnations; and it is ſcarce to be conceived by any, but thoſe who have obſerved it, how far in land the effects of the ſea reach, ſo as to make the earth proper for plants, which will not grow without this influence; there being ſeveral plants frequently found on high hills, and dry places, at three, four, and more miles from the ſea, which yet would not grow, unleſs in the neighbourhood of it, nor will ever be found elſewhere.

The ſecond part or portion of the *ſhores* is much more affected by the ſea than the former, being frequently waſhed and beaten by it. Its productions are rendered ſalt by the water, and it is covered with ſand, or with the fragments of ſhells in form of ſand, and in ſome places with a tartarous matter depoſited from the water, and the colour of this whole extent of ground is uſually duſky and dull, eſpecially where there are rocks and ſtones; and theſe are covered with a ſlimy matter.

The third part of the *ſhores* is more affected by the ſea than either of the others, and is covered with an uniform cruſt of the true nature of the bottom of the ſea, except that plants and animals have their reſidence in it, and the decayed parts of theſe alter it a little.

SHORLING *and morling*, in our old writers, words uſed to diſtinguiſh fells of ſheep; *ſhorling*, being the fells after the fleeces are ſhorn off the ſheeps back; and *morling*, the fells ſtead off after they die, or are killed: in ſome parts of England, they underſtand by a *ſhorling*, a ſheep whoſe fleece is ſhorn off; and by a *morling*, a ſheep that dies. Stat. 3 Ed. 4. c. 1. *Blount*. See MORLING.

SHORT (*Cycl.*)—SHORT-*jointed*, in the manege. A horſe is ſaid to be *ſhort-jointed*, that has a ſhort paſtern. When this joint, or the paſtern, is too ſhort, the horſe is ſubject to have his fore-legs, from the knee to the cronet, all in a ſtrait line. Commonly your *ſhort-jointed* horſes do not manege ſo well as the *long-jointed*; but out of the manege the *ſhort-jointed* are the beſt for travel or fatigue.

SHORT-*ſightedneſs*—A learned author thinks it probable, that out of ſo great a number of *ſhort-ſighted* perſons as are daily to be met with, few are born ſo. For it generally grows upon young people at the age of twenty or twenty-five, and therefore might poſſibly be prevented by uſing their eyes, while young, to all ſorts of conformations; that is, by often looking through glaſſes of all ſorts of figures, and by reading, writing, or working with ſpectacles, of ſeveral degrees of convexity. For whatever be the powers by which the eye conforms itſelf to diſtinct viſion, they may poſſibly grow weak, or loſe their extent one way or other, for want of variety of exerciſe. It ſeems an opinion, without foundation, to think that ſuch an exerciſe of the eyes can any wiſe injure them; provided, due care be taken to avoid looking at objects that are too bright. See Dr. Smith's Optics, Vol. 2. Rem. p. 10.

Short-ſightedneſs may come by accidents. Of this we have a remarkable inſtance, mentioned by Dr. Briggs in his Ophthalmographia, of a perſon, upwards of ſeventy years old, who had uſed ſpectacles for ten years, and yet by catching cold, he ſuddenly became ſo *ſhort-ſighted*, that he could not diſtinguiſh objects three feet off; and after the cold and defluxion were cured, he continued to read the ſmalleſt print without ſpectacles for many years. Dr. Smith mentions a young gentleman, who became *ſhort-ſighted* immediately after coming out of a cold bath, in which he did not totally immerſe himſelf, and has ever ſince uſed a concave glaſs for many years. Ibid.

It is commonly thought that *ſhort-ſightedneſs* wears off in old age, but the learned Doctor queſtions whether this be matter of fact, or hypotheſis only. Ibid.

It is remarkable, that *ſhort-ſighted* perſons commonly write a ſmall hand, and love a ſmall print, becauſe they can ſee more of it at a view. That it is cuſtomary with them not to look at the perſon they converſe with, becauſe they cannot well ſee the motion of his eyes and features, and are therefore attentive to his words only. That they ſee more diſtinctly, and ſomewhat farther off, by a ſtrong light, than by a weak one; becauſe a ſtrong light cauſes a contraction of the pupil, and conſequently of the pencils, both here, and at the return; which leſſens their mixture, and conſequently the apparent confuſion: and therefore to ſee more diſtinctly, they almoſt cloſe their eye-lids; for which reaſon they were antiently called *myopes*. Ibid. ſect. 62.

Dr. Jurin obſerves, that perſons who are much, and long accuſtomed to view objects at ſmall diſtances; as ſtudents in general, watchmakers, gravers, painters in miniature, *&c.* ſee better at ſmall diſtances, and not ſo well at great diſtances, as the reſt of mankind. The reaſon is, that in the eye, as well as in other parts, the muſcles, by conſtant exerciſe, are enabled to contract themſelves with more ſtrength, and by diſuſe are brought to leſs ſtrength. Hence, in the perſons beforementioned, the greater muſcular ring of the uvea contracts more eaſily and ſtrongly, and the cornea more readily obeys the contraction of the ring; whence they ſee better at ſmall diſtances. And the cornea, by being thus often and long bent into a greater convexity, does by degrees loſe ſomething of its elaſticity, ſo as not to return to its natural elaſticity, when the muſcular ring ceaſes to act upon it. This is one cauſe of their not ſeeing ſo well at great diſtances. Alſo the ligamentum ciliare, being ſeldom employed to leſſen the convexity of the capſula, does by degrees become leſs capable of performing that office: and the capſula being ſeldom drawn out, and put into tenſion, muſt loſe ſomething of its diſtenſile quality, ſo as leſs eaſily to comply with the action of the ligament. And this is another cauſe of their not ſeeing ſo well at great diſtances. *Jurin*, Eſſ. on diſt. and indiſt. Viſion.

SHORTFORD, an antient cuſtom in the city of Exeter, when the lord of the fee cannot be anſwered rent due to him out of his tenement, and no diſtreſs can be levied for the ſame. The lord is then to come to the tenement, and there take a ſtone, or ſome other dead thing off the tenement, and bring it before the mayor and bailiff, and thus he muſt do ſeven quarter-days ſucceſſively; and if on the ſeventh quarter-day, the lord is not ſatisfied his rent and arrears, then the tenement ſhall be adjudged to the lord to hold the ſame a year and a day; and forthwith proclamation is to be made in the court, that if any man claims any title to the ſaid tenement, he muſt appear within the year and day next following, and ſatisfy the lord of the ſaid rent and arrears. But if no appearance be made, and the rent not paid, the lord comes again to the court and prays that, according to the cuſtom, the ſaid tenement be adjudged to him in his demeſne as of fee, which is done accordingly; ſo as the lord hath from thenceforth the ſaid tenement, with the appurtenances, to him and his heirs.

SHOT (*Cycl.*)—SHOT *of a cable*, on ſhip-board, is the ſplicing of two cables together, that a ſhip may ride ſafe in deep waters and in great roads; for a ſhip will ride eaſier by one *ſhot of a cable*, than by three ſhort cables out a-head.

SHOVELER, in zoology, the name of a ſpecies of ſea-duck, remarkable for the breadth of its bill, and called by authors *anas latiroſtra*, the broad-beaked duck, and *taſchenmul*, and by ſome *anas clypeata*.

It is ſomething ſmaller than the common duck. The beak is remarkably broad, and grows broader and rounder toward the end, where it is hollowed like a ſhield. The iris of its eyes is very yellow, and the legs and feet red. The feet are ſmaller than in moſt other ducks. The head, and upper part of the neck, are of a very beautiful blue, ſometimes of a duſky green; the under part of the neck is white, the upper and the ſhoulders variegated with white and brown. The belly, and lower part of the breaſt, are red, but the feathers behind the anus, and immediately under the tail, are black. The back is brown, with a fine caſt of blue, purple and green. The tail is ſhort, and is variegated with black and white. *Ray*'s Ornithol. p. 280.

SHOULDER (*Cycl.*)—SHOULDER, in the manege, is the joint of a horſe's fore-quarters, that joins the end of the *ſhoulder*-blade with the extremity of the fore-thigh.

SHOULDER *of a branch*, is that part of it which begins at the lower part of the arch of the banquet, overagainſt the middle of the fonceau, or chaperon, and forms another arch under the banquet. The *ſhoulder of a branch* caſts a greater, or leſſer circumference, according as it is deſigned to fortify, or weaken the branch. See the articles BRIDLE, BANQUET, and BRANCH.

SHOULDER-*pegged horſes*, called in French *chevillées*, are ſuch as have their *ſhoulders* gourdy, ſtiff, and almoſt without motion. A horſe charged with *ſhoulders*, is one that has thick, fleſhy, and heavy *ſhoulders*.

Cartilages of the SHOULDER, in anatomy. The ſcapula in many ſubjects has a ſmall cartilaginous border along its whole baſis, which in children is remarkable enough, but in grown perſons it diſappears. The glenoide cavity of this bone is covered with a cartilage, which is thicker toward the circumference than in the middle, and a little raiſed above the edge of the bone. The ſmall cartilaginous ſurface of the acromion is thicker in freſh bones, than it appears in a dried ſceleton, and is a little convex. The ſmall triangular ſurface, at the extremity of the ſpine of the ſcapula, near the baſis, is covered with a very thin, ſmooth cartilaginous lamina; but this being tranſparent, does not appear very white. There are no other cartilages but theſe uſually found in the ſcapula in freſh ſubjects, notwithſtanding that in ſceletons of prepared bones, ſeveral places beſide ſeem to have been cartilaginous; theſe, however, are owing only to the dried remains of ligaments and tendons. *Winſlow*'s Anatomy, p. 137.

Ligaments of the SHOULDER. The articulation of the acromium with the extremity of the clavicle, is ſtrengthened all round by ſeveral ſmall, but ſtrong ligaments, which go directly from one bone to the other. Theſe ligaments lie very near one another, and withal are ſo tightly braced over the joint, as to hide it altogether: they appear indeed more like a cartilaginous covering, than a ligamentary texture; and the internal ſurface of theſe ligaments is lined with the capſula of the joint. When the ſmall inter-articular cartilage is found in this joint, its whole circumference is ever found connected to theſe ligaments. The articulation of the clavicle with the ſternum is ſuſtained by ſeveral ligaments, fixed by one end round the pectoral extremity of the clavicle, and inſerted at the other in the ſternum. There is alſo a long narrow ſtrong ligament, which goes from one clavicle to the other, behind the furca of the ſternum: this is fixed to the internal angle of the contiguous extremities of the bones, and may be properly called the *inter-clavicular ligament*. The neck of the ſcapula, at a ſmall diſtance from the glenoide cavity, gives inſertion to the capſular ligament, or mucilaginous bag, and to the articular ligaments of the joint of the ſcapula and os humeri. And beſide theſe articular ligaments of the ſcapula, there are three ligamentary cords fixed to the tuberoſity of the coracoide apophyſis; two of which, by their other extremities, are inſerted in the oblique eminence on the lower ſide of the humeral extremity of the clavicle, the third under the acromium. There is alſo a thin flat broad ligament, reaching between the criſta of the ſpine of the ſcapula, and the edge of the inferior coſta. *Winſlow*'s Anatomy, p. 138.

SHOULDER *of a baſtion*, in fortification, is where the face and the flank meet.

SHOUT, *clamor*, in antiquity, was frequently uſed both on eccleſiaſtical, civil and military occaſions, as a ſign of approbation, and ſometimes of indignation. Thus as Cicero, in an aſſembly of the people, was expoſing the arrogance of L. Antony, who had had the impudence to cauſe himſelf to be inſcribed the patron of the Romans, the people on hearing this raiſed a *ſhout*, to ſhew their indignation.

In the antient military diſcipline *ſhouts* were uſed, 1. upon occaſion of the general's making a ſpeech, or harangue to the army, from his tribunal. This they did in token of their approving

what

what had been propoſed. 2. Before an engagement, in order to encourage and ſpirit their own men, and fill the enemy with dread. This is a practice of great antiquity, beſides which it wants not the authority of reaſon to ſupport it; for as mankind are endowed with two ſenſes, hearing and ſeeing, by which fear is raiſed in the mind, it may be proper to make uſe of the ear, as well as the eye, for that purpoſe. *Shouts* were alſo raiſed in the antient theatre, when what was acted pleaſed the ſpectators. See ACCLAMATION.

It was uſual, for thoſe preſent at the burning the dead, to raiſe a great *ſhout*, and call the dead perſon by his name, before they ſet fire to the pile. See BURIAL.

SHREW, or SHREW-*mouſe*, in zoology, the common name of the creature called by authors *mus araneus*. See the article MUS *araneus*.

Hardy SHREW. See the article HARDY.

SHRIKE, in zoology, an Engliſh name for the lanius, or butcher-bird, a ſmall bird of the hawk-kind, a terrible deſtroyer of the little birds. *Ray*'s Ornithol. p. 52. See the article LANIUS.

SHRITE, in zoology, a name uſed by ſome for the larger thruſh, or *turdus viſcivorus major*, commonly known by the name of the *miſſel-bird*. It ſtays the whole year with us, and ſings very ſweetly. See MISSEL-*bird*.

SHRUB (*Cycl.*)—*Hardy* SHRUBS. See the article HARDY.

SI *action*, in law, the concluſion of a plea to the action, when the defendant demands judgment, if the plaintiff ought to have his action, *&c.*

SIAGONAGRA, a name given by ſome medical writers to the gout in the jaws.

SIALISMUS, a word uſed by the antients to expreſs a diſcharge of ſaliva, brought on by the holding hot things in the mouth; and by us for a ſalivation by mercury.

SIALOCHI, a term uſed by the antients to expreſs ſuch perſons as had a plentiful diſcharge of ſaliva, by whatever means. Hippocrates uſes it for a perſon in a quinſey, who diſcharges a very large quantity of ſaliva; others expreſs by it perſons, whoſe mouths naturally abound with a bitter ſaliva; and others ſuch perſons, as from having a very large tongue, ſpit into people's faces while talking with them.

SIALOGOGA, a term uſed by medical writers to expreſs ſuch medicines as promote a copious diſcharge of the ſaliva, ſuch as pellitory of Spain, and all the other hot and acrid vegetables; and mercury, the moſt powerful of all.

SIANKE, or SYNKE, in natural hiſtory, a name given by the people of ſome parts of the Eaſt-Indies to the caryophyllus, or clove-ſpice. The people of the Moluccas, according to Garcias, call it *chanque*, which is only a ſmall difference of pronunciation. The Turks and Perſians call the ſame ſpice *calafur*.

SICCHASIA, a word uſed by ſome writers to expreſs that uneaſineſs at the ſtomach, and loathing of food, which women are often afflicted with in their pregnancy.

SICCINNIS, in antiquity, a mixed kind of dance. See the article DANCE, *Cycl.*

SICERA, in the Jewiſh antiquities. The helleniſt Jews give this name to any inebriating liquor. St. Chryſoſtom, Theodoret, and Theophilus of Antioch, who were Syrians, and who therefore ought to know the ſignification and nature of *ſicera*, aſſure us, that it properly ſignifies palm-wine.

Pliny acknowledges, that the wine of the palm-tree was very well known through all the Eaſt, and that it was made by taking a buſhel of the dates of the palm-tree, and throwing them into three gallons of water; then ſqueezing out the juice, it would intoxicate like wine.

The wine of the palm-tree is white: when it is drank new, it has the taſte of the cocoa, and is ſweet as honey: when it is kept longer, it grows ſtrong, and intoxicates. After long keeping, it becomes vinegar. V. *Renaudot*'s Notes upon the Voyage to China, p. 12. *Calm.* Dict. Bibl.

SICILIANA, in botany, a name given by Dodonæus, and ſome other authors, to the great androſæmum, called *tutſan*, and *park-leaves*. *Ger.* Emac. Ind. 2.

SICILICUM, the name of a weight in uſe among the antients, which ſome ſay was equal to three drachms of our weight; others ſay only to two.

SICUB, or SICAP, in natural hiſtory, a name given by the inhabitants of the Philippine iſlands to a ſpecies of hawk, of the bigneſs of their common hawk, or banoy, which is ſomewhat larger than our ſparrow-hawk. This bird is very elegantly variegated all over its body with yellow, white, and black.

SICUS, in ichthyology, a name uſed by ſome authors to expreſs that ſpecies of coregonus, called by the generality of authors *albula nobilis*. See the articles COREGONUS and ALBULA.

SICYOIDES, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, and is ſhaped like a bell wide open at the mouth, and divided into ſeveral ſegments. Some of the flowers on this plant are ſteril, or male-flowers, having no embryo; others are fruitful, or female, having an embryo, which ripens into a fruit of the ſhape of an almond, fleſhy, prickly, uſually collected into a head, and containing only one ſeed under a thin ſkin.

The ſpecies of *ſicyoides*, enumerated by Mr. Tournefort, are theſe. 1. The American *ſicyoides* with angular leaves and echinated fruit, called by ſome authors *cucumis Canadenſis monoſpermos*, or the ſingle-ſeeded Canada cucumber. 2. The American *ſicyoides* with echinated fruit and deeply jagged leaves. *Tourn.* Inſt. p. 103.

SICYONE, a word uſed by Hippocrates to expreſs colocynth, and by others for a ſpecies of hard-ſhelled gourd, in the ſhape of a pear, and by ſome for a cupping-glaſs.

SICYONEUM *oleum*, a word uſed by the antients to expreſs a medicinal oil, of which there was among them three kinds in uſe. The firſt was called *ſicyonium ſimplex*. This was compoſed of two ounces of the root of the wild cucumber boiled ſeveral hours in a pint of oil. The ſecond ſort was called the *compound ſicyonium*, and was made of the root of the ſame plant, with many other ingredients. The third was another compound kind, made not with an infuſion of the root, but with the juice of the fruit of the wild cucumber.

SICYONII, among the Romans, were ſhoes of a more delicate form, and better ornamented than ordinary, and chiefly worn by the ladies and their gallants. *Pitiſc.* in voc.

SIDA, in botany, the name of a genus of plants, conſtituted by Linnæus, and comprehending the *malvinda* of Dillenius, and the *abutilon* of the ſame author and of Tournefort. The characters are theſe: the perianthium is compoſed of one leaf, of the figure of a cup, erect, and lightly divided into five ſegments, and does not fall with the flower. The flower conſiſts of five petals, which are broad at the top, and ſurrounded with a rim: they are much narrower at the bottom, and grow together there. The ſtamina are a great number of filaments, which at the bottom grow into a ſort of tube, and at the top are free. The antheræ are roundiſh. The germen of the piſtil is roundiſh. The ſtyle is ſhort, and is lightly divided into ſeveral ſegments. The ſtigmata are ſlender and obtuſe. The fruit is a roundiſh capſule, terminating in a point, and compoſed of ſeveral horns, which finally ſeparating, tear the complex veſſel to pieces. The ſeeds are roundiſh and pointed, the one ſide convex, and the other of an angular figure.

This genus is very nearly allied to the melochia, but differs in its numerous antheræ. The malvinda and abutilon agree in all the characters of this genus, but differ in this, that the firſt has always only five capſules which compoſe the general fruit, and the other has more. *Linnæi* Gen. Plant. p. 329. *Dillen.* Hort. Elth. p. 171. *Tournefort*, p. 25.

SIDA is alſo uſed by ſome authors for the *althæa*, or marſh-mallow. *Ger.* Emac. Ind. 2.

SIDE (*Cycl.*)—SIDES *of a ſhip*, are diſtinguiſhed into the *ſtarboard* and *larboard*; that is, into the right and left-hand-*ſide*, when ſtanding with the face towards the head of the veſſel. See the articles STARBOARD and LARBOARD.

Broad-SIDE, in the ſea language, is to fire all the guns on one *ſide* of the ſhip.

SIDE-*wind*, at ſea. See the article WIND.

SIDERIA, in natural hiſtory, the name of a genus of cryſtal. The word is derived from the Greek, σίδηρος, iron, and is uſed to expreſs cryſtals altered in their figure by particles of that metal. Theſe are of a rhomboidal form, compoſed only of ſix planes. Of this genus there are four known ſpecies: 1. a colourleſs, pellucid, and thin one, found in conſiderable quantities among the iron ores of the Foreſt of Dean in Glouceſterſhire, and in other the like places. 2. A dull, thick, and brown one, not uncommon in the ſame places with the former. And 3. a black and very gloſſy kind, a foſſil of very great beauty, found in the ſame place with the others, as alſo in Leiceſterſhire and Suſſex. See Tab. of Foſſils, Claſs 3. *Hill*'s Hiſt. of Foſſ. p. 197.

SIDERITIS, (*Cycl.*) *iron-wort*, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, and is of the labiated kind. The upper lip is erect, the lower divided into ſeveral ſegments. The piſtil ariſes from the cup, and is fixed in the manner of a nail into the hinder part of the flower, and ſurrounded by four embryos, which afterwards become ſo many ſeeds, ripening in an open capſule, which was the cup of the flower. To theſe marks it may be added, that in all the *ſideriteſ* the flowers grow in circles round the ſtalks, at the joinings of the leaves.

The ſpecies of *ſideritis*, enumerated by Mr. Tournefort, are theſe. 1. The hairy procumbent *ſideritis*, called *tetrahit* by many authors. 2. The hairy procumbent *ſideritis* with leaves very ſlightly crenated. 3. The hairy *ſideritis* with very deeply crenated leaves. 4. The hyſſop-leaved Alpine *ſideritis*. 5. The hyſſop-leaved Alpine *ſideritis* with leaves notched at the ends. 6. The narrower-leaved erect Spaniſh *ſideritis*. 7. The large procumbent Spaniſh *ſideritis* with crenated leaves, and white flowers. 8. The narrow-leaved crenated bituminoſe *ſideritis*. 9. The ſmooth ſtinking Spaniſh *ſideritis* with purple flowers, and hoary ſpikes. 10. The woody ſhrub Spaniſh *ſideritis*. 11. The ſmall procumbent

hyſſop-leaved Pyrenean *ſideritis*. 12. The mountain-*ſideritis* with trifid leaves. 13. The tall yellow-flowered Canada *ſideritis* with leaves like thoſe of figwort. 14. The purple-flowered tall figwort-leaved Canada *ſideritis*. There are ſome other plants, beſide theſe, called by authors *ſideritis*, but they are properly of the galeopſis, betony, or marrubiaſtrum-kind, which ſee. *Tourn.* Inſt. p. 191.

SIDEROMANTIA, Σιδηρομαντεια, in antiquity, a kind of divination performed with a red-hot iron, upon which they laid an odd number of ſtraws, and obſerved what figures, bendings, ſparklings, &c. they made in burning. *Potter*, Archæol. Græc. l. 2. c. 18. Tom. I. p. 353.

SIDEWAYS, in the manege. To ride a horſe *ſideways*, is to paſſage him, or make him go upon two treads, one of which is marked by his ſhoulders, and the other by his haunches.

SIGAH-*guſh*, in zoology, the name of a Perſian animal, of the lynx-kind, and no way differing from the lynx itſelf, but in that it has no ſpots. Its ears have the fine velvety black pencil of hairs at their top, which are the diſtinguiſhing character of the lynx; and theſe creatures differ ſo much in the variations and different diſpoſitions of their ſpots, that probably this is no other than an accidental variety of the ſame ſpecies. *Ray*'s Syn. Quad. p. 168.

SIGHT (*Cycl.*)—The Acta Leipſienſia give us an account of a man, who received a ſmart ſtroke on the pupil of one of his eyes from the end of a fiddle-ſtring, which broke while he was tuning the inſtrument, and chanced to fly that way. Some cooling things were applied to the eye, and a bandage uſed to ſhade it from the light; but at midnight the patient chancing to wake in the dark, found that he could ſee with that eye, though not with the other: this continued a long time, and on trial he found that he could read a ſmall print at midnight with this eye, but could ſcarce diſtinguiſh any thing with it in a bright and clear day.

We have, in the ſame collections, an account of a man, who, after the cure of a confirmed pox, ſaw every object double for a long time. Act. Leipſ. 1690.

It is a very common, and a very juſt obſervation, that children do not ſee any thing clearly when new-born, and if their eyes be then examined, they are found to want that brilliancy which they afterwards acquire; and finally, when any object is preſented to their view, they at firſt turn their eyes about in ſuch a manner, that it is evident they either do not ſee at all, or at beſt but very imperfectly and obſcurely.

This imperfection may either be owing to a fault in ſome one of the humours, or in their capſules, or, finally, in the retina, or complexly in them all together. It is impoſſible to diſcover whether there be any imperfection in the retina in this ſtate of life, that membrane being ever, in new-born infants, tender and ſoft like a jelly: if it be in any of the other parts that the imperfection lies, it muſt be either in their nature, or extent. Mr. Petit, of the Academy of Sciences at Paris, determined to enquire thoroughly into the cauſe of this, was at the pains of diſſecting the eyes of ſeveral infants which had died ſoon after their birth, and in three fourths of them he found the vitreous, the cryſtalline, and the capſule, all greatly deficient in their tranſparence. The uvea appeared alſo more opake than in adults, and the pupil over large; and that there was either none, or, at the utmoſt, very little of the aqueous humour: and in thoſe eyes, where the humours had not this opacity, they were all, as were alſo the membranes, of a reddiſh colour; and this was obſerved in fœtuſes of ſeven and nine months old.

The cornea in theſe eyes was alſo remarkably thick, which is, in general, found to be the caſe in the eyes of all fœtuſes. The thickneſs and opacity in theſe corneas gradually diminiſh in time, and that ſoon; ſo that the eyes of children appear much brighter at two or three months old, than when new-born. The aqueous humour ſeems alſo, in moſt fœtuſes, to be wholly wanting; and where it is found, is ever greatly in an under proportion to the other humours.

It therefore appears, that the dimneſs and imperfection of *ſight*, in new-born infants, is owing to the over-thickneſs of the cornea, and to the too ſmall portion of the aqueous or watery humour. It appears plainly alſo, from experience, that the eye is not able, in infants, to bear the light, till the pupil is greatly contracted; as is the caſe alſo, though in a leſs degree, in adults: and it is very probable, that the extreme ſoftneſs of the retina in this ſtate may make every ray of light affect it much more plainly, than when grown more firm.

Mr. Petit having continued his examinations of the eyes of infants, up to the age of five or ſix weeks, found in all his diſſections, that the cornea daily grew more and more convex and gloſſy; and this may be rationally concluded to be owing to the daily encreaſe of the aqueous humour, which muſt, by that accretion, throw it out into a greater convexity, and make it daily more and more thin and tranſparent. The uvea alſo acquires a greater extenſion, and its fibres become more moveable; whence the pupil acquires a power of enlarging or contracting itſelf, at the approach or abſence of light, with much more eaſe and readineſs than it could before. The humours thus all become capable of letting in a larger quantity of light; the retina is at the ſame time every day gaining a new firmneſs, and the pupil becomes capable of an eaſy dilatation, or reſtriction, for the letting in occaſionally a greater or leſs number of rays, and the refractions are perfected by the augmentation of the aqueous humour. It is plain, therefore, that the clearneſs of viſion muſt every day encreaſe. All this change comes on in infants only by time; and it may be judged of, as to its ſtate, by inſpection, by the brilliancy and convexity of the cornea, and by the manner of their turning their eyes toward objects ſet before them: and this time is not certain, or limited, but differs greatly in different children, ſome being able to ſee clearly at the end of a month, others not till after many months.

At the time that this gentleman was diſſecting the eyes of human fœtuſes and infants, he alſo curiouſly obſerved the eyes of young quadrupeds. The puppy, when newly brought forth, has always its eyes opake; the kitten, on the contrary, has them clear, and every way like thoſe of adults of the ſame ſpecies. In fœtuſes of other quadrupeds, the lamb has its cornea a little turbid and opake; the calf and the pig have them more or leſs opake, but the calf moſt ſo of all. Mem. de l'Acad. Par. 1727.

SIGIA, a name given by ſome authors to the liquid-ſtyrax.

SIGILLUM (*Cycl.*)—SIGILLUM *mariæ*, *lady*'s *ſeal*, in botany, a name by which ſome authors have called the *bryonia nigra*, or black bryony, a climbing plant, common in hedges. *Ger.* Emac. Ind. 2.

SIGMA, among the Romans, the ſame with the *ſtibadium*. See the article STIBADIUM.

SIGMOIDES, a word uſed by medical writers to expreſs any thing that is in the ſhape of the letter ſigma. The valves of the heart have this epithet applied to them; the coracoide proceſs of the ſcapula is alſo expreſſed by the ſame word; the ſemicircular cavity of the cubit, at the articulation of the fore-arm with the humerus, is ſometimes alſo called the *ſigmoidal-cavity*; and the cartilages of the *ſigmoide*-circles of the *aſpera arteria*, or wind-pipe, have their denomination from the ſame occaſions.

SIGNS, or SYMPTOMS, in medicine. See ASSIDENT.

Negative SIGN. See the article NEGATIVE *ſign*.

SIGNA, *ſtandards*, among the Romans, were of different ſorts; on ſome of them the image of the emperor was repreſented, and they that carried them were called *imaginiferi*; others had a hand ſtretched out, as a ſymbol of concord; and theſe enſign-bearers were called *ſigniferi*; ſome had a ſilver eagle, the bearers of which were called *aquiliferi*; others had a dragon with a ſilver head, and the reſt of his body of taffety, which was blown by the wind as if it had been a real dragon, and the bearers of this enſign were called *draconarii*; laſtly, the emperor's enſign was called *labarum*, and thoſe that carried it *labariferi*, which they carried out when he went in perſon to the field: it was of a purple colour, beſet with gold fringe, and adorned with precious ſtones.

All theſe enſigns were ſuſtained with a half-pike, ſharp at the end, that it might be the more eaſily fixed in the ground. *Danet.* in voc.

SIGNATORES, among the Romans, witneſſes who ſealed wills and marriage-contracts. *Pitiſc.* in voc.

SIGNIFER, among the Romans, an enſign-bearer, or the perſon who carried the ſtandard on which was repreſented a hand ſtretched out. See the article SIGNA.

SIGNINUM, among the Romans, a kind of pavement much eſteemed: it was made of poudered ſhells mixed with lime. *Pitiſc.* in voc.

SIGNUM *pugnæ*, the ſignal of battle, among the Romans, was a coat of arms, of a purple colour, ſet upon the general's pavilion. *Danet.* in voc.

SIGUETTE, in the manege, is a caveſſon of iron, with teeth or notches; that is, a ſemicircle of hollow and vaulted iron, with teeth like a ſaw, conſiſting of two or three pieces joined with hinges, and mounted with a head-ſtall and two ropes, as if they were the caveſſons that in former times were wont to be put upon the noſe of a fiery ſtiff-headed horſe, in order to keep him in ſubjection.

There is a ſort of *ſiguette*, that is a round iron all of one piece, ſewed under the noſe-band of the bridle, that it may not be in view. This *ſiguette* we employ with a martingale, when a horſe beats upon the hand.

SIL, in natural hiſtory, a name given by the antients to a red ochre, of which they had three diſtinct kinds, the *ſil ſyricum*, *ſil atticum*, and *ſil marmoroſum*; all of which are to be had at this time, and all very valuable paints.

SIL *ſyricum* is a ſubſtance well known among the painters of the preſent age, though not by name, being the red ochre, commonly uſed for a purple colour, in their coarſer works; though it is capable of yielding, by proper management, a colour fit for their fineſt. It is very heavy, and of a fine ſtrong red with ſome tendency to purple, of a looſe friable

texture, and very rough and dusty surface. It adheres firmly to the tongue, is somewhat soft to the touch, crumbles easily to pieces between the fingers, and stains the hands very much. It melts freely in the mouth, and has a strongly astringent taste. It burns to a much paler colour, and makes no effervescence with aqua fortis. These are the characters by which this is distinguished from all the other red earths. It is dug in many parts of England, and is sent to London in great quantities. *Hill*'s Hist. of Foss. p. 57.

SIL *atticum* is the purple ochre, called of later times *almagra*. See the articcle ALMAGRA.

SIL *marmorosum* is also a substance in some degree known in the world at this time. It sometimes falls into the hands of our painters who call it Indian stone red, but it has many other valuable qualities extremely worth enquiring into. It is the hardest and driest of all the ochres, and while in the stratum appears absolutely stony, forming thin, flat, regular strata, and is so hard that it is not to be dug without the pick-ax; it is also of an obscurely and irregular laminated structure, and naturally breaks into flat pieces. It is of a fine purplish red, and very heavy, and contains a multitude of fragments of a fine lead ore which are bright and bluish, and make a very pretty appearance, and beside these has always among it a small quantity of pure native cinnabar; both these substances are so nicely mixed with it, that it is scarce possible to break off a piece of an inch square from any part of the strata, that has not more or less of both in it. It is of a dusty surface, and rough to the touch, and adheres very firmly to the tongue, and stains the hands. It is of a very austere and astringent taste, and makes no effervescence with acids. There are considerable strata of it on the borders of China, and it is much used as a paint in the East-Indies. There is some of it at times brought over to us, but not enough to make it a regularly marketable commodity. Beside its use as a paint, it is worth enquiring into an account of the cinnabar it contains; three ounces of it having yielded, on trial, two drams and a scruple of pure quicksilver. *Hill*'s Hist. of Foss. p. 62.

SILACH, a word used by medical authors for a disorder of the eye-lid, consisting in a preternatural thickness of it, or a swelling without inflammation.

SILATUM, a word used by the antient Romans to express a morning's draught of wine. This was usually of a wine medicated with the plant sili, or seseli, and thence had its name. It has always been the custom to medicate the morning draughts of any strong liquor; we do it with wormwood, or the common bitter tincture, the Indians with ginger.

SILAUM, in botany, a name used by some authors for the *saxifraga pratensis*, or common meadow-saxifrage. *J. Bauhin.* Vol. 3. p. 170.

SILENE, in botany, the name of a genus of plants, the characters of which are these. The perianthium is oblong, smooth, and clavated, and consists of one leaf, divided into five segments at the edge. The flower consists of five petals: the ungues of these are as long as the tube of the cup, and their extremities form a limb, which lies flat and expanded: the apices of all the petals are obtuse and marginated. The nectarium is composed of certain denticuli, two of which are inserted near the base of every petal. The stamina are ten subulated filaments, inserted into the ungues of the flower. The antheræ are oblong. The germen of the pistil is cylindric. The styles are either three or five, and are of the length of the stamina, or somewhat more. The stigmata are always bent against the sun. The fruit is the germen enlarged, and divided into as many cells as there were styles: these contain numerous kidney-shaped seeds. Dillenius, in the Hortus Elthamensis, has described these plants under the name *viscago*. *Linnæi* Gen. Plant. p. 197. *Dillen.* Hort. Elth. p. 309.

SILER, in botany, a name given by the Latin writers of the later ages to the plant called by others *seseli*, an umbelliferous herb, growing in mountainous places.

The antient Roman authors, however, mean a very different thing by the word *siler*, a shrub growing in watery places, and having twigs very ductile and tough, and fit for basket-work, or any other use of that kind. The poets have often mentioned it, and always with the epithets of *molle* and *lentum*, soft and tough.

Nothing can be more obvious, than that the *siler* of the later authors is a plant wholly different from this; and it is very properly that some have denominated the umbelliferous plant *siler montanum*, to distinguish it from the shrub-*siler*, which only grows about waters.

Some of the old scholiasts and interpreters of the Roman authors have told us that the *siler*, mentioned by them, is the cyperus; but this must be a mistake. For though this plant grows in watery places, and has considerable tough stalks; yet it is not a shrub, but an herbaceous plant, and is remarkably harsh, and of all plants least deserves the epithet *molle*, which the antients bestowed on their *siler*.

Some have supposed it to be the willow; but this cannot be true: for the willow and *siler* are continually named together, by the same authors, as different plants. The willow, alder and *siler*, being the three shrubs generally mentioned together, as the shrubs that grow about the banks of rivers; the osier is a kind of willow, very frequent at the sides of rivers, and has all the qualities attributed to the *siler* by the antients. It has been supposed by some that this cannot be their *siler*, because as it is a kind of willow, they would have called it by the common name, *salix*; but our own example may plead against this, for we know it to be of the willow-kind, yet we call it by another name: osier is more different in sound from willow, than *siler* from salix, and probably both one and the other signify the same plant.

The error of confounding so different a plant as the *seseli* with this shrub, arises from the unhappy custom of abbreviation, so common among the old Greeks; instead of *seseli* they wrote the word sometimes only *seli*, and *sile*, thence it was easy for people, less acquainted with botanical distinctions, to add an *r* at the end, to reduce the word, which they did not know, to one that they did; and thus grew *siler* as a name for *seseli*. Hippocrates calls the seseli *sili*; and Pliny both *sili* and *seli*. See the article SILI.

SILESIACA-*terra*. See the article TERRA-*silesiaca*.

SILEX, *flint*, in natural history, the name of a genus of semipellucid stones, the matter of which is a crystal, debased by an admixture of a peculiar and appropriated earth, which is of a blackish grey; always free from veins, but, according to the different quantity and disposition of the earth in its composition, subject to clouds of a darker or paler colour, and naturally invested with a thin whitish crust.

Naturalists, in general, have accounted various species of *flint*, but erroneously; nature has established it into a genus of itself, and allowed no other species than one, which is ever composed of the same matter, and differs only in the proportions of its admixture. When crystalline matter is debased by earths of other colours, or clouded and veined, it ceases to be *flint*, and becomes the pebble, the agate, or the onyx; and the not attending to this distinction, has made many describe these variously-coloured bodies twice over: once under the name of *coloured flints*, and a second time under that of *English agates*, &c.

The characters of genuine *flint* are, that it is a stone of an extremely fine and even texture; of a very uncertain surface, sometimes rough, sometimes smooth; of a colour always, in some degree, between blackish and whitish, unless accidentally tinged, as all other fossils are subject to be; very readily giving fire with steel; not fermenting with acids. *Hill*'s Hist. of Fossils, p. 508. See the article FLINT.

SILI, in botany, a name given by the old Greeks to a plant called also *seseli*. Hippocrates always calls this *sili* and *sile*, and Pliny uses the same words as some of its names.

This however is not the only meaning of the word, for the epithet *cyprium* being added to it, it signified a very different plant, namely, the ricinus; and the letter *r* being added to the end, and the word written *siler*, it became the name of the osier, as well as of the seseli. This has occasioned great errors about the meaning of the antients, some misunderstanding them as speaking of the osier, when they are describing the virtues of the seseli.

SILICERNIUM, among the Romans, a funeral supper, which is otherwise called *exequium*. *Pitisc.* in voc. See the article EXEQUIUM.

SILILICON, in botany, a name given by some of the old Latin writers to the carob-tree, or *siliqua dulcis*. The Latins borrowed this name from the Greek *xyloglycon*, ξυλογλυκον, the sweet, or sweet-fruited tree. Isidore mispels the word *sililicon*, and making it only *silicon*, supposes it to be a barbarous way of spelling the word *siliqua*; but the evident derivation of the genuine word from the Greek shews his error, both as to the word itself, and the origin of it.

The Latins called this tree *siliqua*, because its fruit was in pods, and the Greeks *ceratium*, κεραΐιον, because its pods were bent so, as to resemble horns; but the names *xyloglycon*, and its derivative, *sililicon*, were wholly different from these.

The same Isidore observes, that the expressed juice of the fruit of this *silicon* is the drug called *acacia* in the shops; but in this he is guilty of a very great error, the fruit of the *silicon* being esculent, and the acacia a very powerful astringent.

What has led him into this error, has been an observation of the Glossaries on Avisenna, and the other Arabian physicians. These authors have called by the same name, *charub*, or *charnub*, both the carob, or *sililicon*, and the acacia, only distinguishing them by proper epithets. Isidore found in their Glossaries, that charnub was the *siliqua*, or carob-tree, and that the juice of the pods of charnub was acacia; he therefore not observing that there were two charnubs, gave to the latter the properties of the former, and so made the styptic and astringent drug the juice of an esculent plant.

SILICULA, in botany, a name given by some authors to fœnugreek. *Ger.* Emac. Ind. 2.

SILIQUA, (*Cycl.*) in botany, the name of a genus of trees, the characters of which are these. The flower is of the apetalous kind, being composed only of a number of stamina, which arise from the segments of the cup, the middle of which is occupied by a pistil, which finally becomes a

flatted pod of a fleſhy ſubſtance, and containing flat and roundiſh ſeeds.

The ſpecies of *ſiliqua*, enumerated by Mr. Tournefort, are theſe: 1. The common *ſiliqua*, called the *eatable ſiliqua*, or carouge. 2. The eſculent *ſiliqua* with ſhorter pods. 3. The eſculent *ſiliqua* with various pods. 4. The wild carouge, or not eſculent *ſiliqua*. *Tourn.* Inſt. p. 578.

SILIQUA, κεράτιον, among the antients, the third part of an obolus, or, what comes to the ſame, the ſixth part of a ſcruple. See the articles OBOLUS and SCRUPLE, *Cycl.*

SILIQUA *nabathæa*. See NABATHÆA *ſiliqua*.

SILIQUARIUS, among the Romans, an officer who exacted, or raiſed the toll *ſiliqua*. *Pitiſc.* in voc.

SILIQUASTRUM, *Judas-tree*, in botany, the name of a genus of trees, the characters of which are theſe. The flower is of the papilionaceous kind; the wings, however, ſtand over the vexillum, and the carina is compoſed of two leaves. The piſtil ariſes from the cup, and is ſurrounded by ſtamina; this finally becomes a flat membranaceous pod, filled with ſeeds of a kidney-like form. To this it is to be added, that the leaves ſtand alternately. See Tab. 1. of Botany, Claſs 22.

The ſpecies of *ſiliquaſtrum*, enumerated by Mr. Tournefort, are theſe: 1. The common *ſiliquaſtrum*, or *Judas-tree*. 2. The white-flowered *ſiliquaſtrum*. 3. The *ſiliquaſtrum* with large pods and pointed leaves. 4. The round-leaved Canada-*ſiliquaſtrum*. Tourn. Inſt. p. 646.

SILIQUASTRUM was uſed in the botanical writings of the antients for the name of a podded plant, growing wild in ſome places of Italy, and in others cultivated for domeſtic and medicinal uſes. Pliny, and many other of the antients, have mentioned this, but they have given ſuch imperfect accounts of it, that they have led their followers into many errors about it. At this diſtance of time, and with the few lights they have left us, it is not eaſy to ſay what this plant of the antients was; but it may be a means of leading the reader out of many errors, to ſay what it was not.

Many have ſuppoſed it to be the *zinziber caninum* of Aviſenna, and the *hydropiper* of Dioſcorides; but the name *ſiliquaſtrum* implying its having pods, is a ſufficient refutation of its being this plant, which is the common *perſicaria*, or biting arſmart.

Others have thought that the *ſiliquaſtrum* was the capſicum, or *Guinea-pepper*, as we call it; but however well this plant may agree with the name, as being podded, it can by no means be the plant, ſince Pliny deſcribes it as common in Italy, and growing wild, which it is very certain that this plant never did.

Many have ſuppoſed it to be the plant we call *piperitis*, or *dittander*; but though Pliny has called this plant *piperitis*, from its hot taſte of pepper, yet he plainly ſhews that it was not our *dittander*: for he afterwards deſcribes that as another ſort, ſaying, that there is another broad-leaved kind, which approached to the nature of iberis, but that the large leaves diſtinguiſhed it: this is plainly enough our *lepidium*, or *dittander*; and therefore the other *ſiliquaſtrum*, originally and properly ſo called, cannot be that plant. Julius Scaliger obſerves, that there is a ſhrub growing in Provence at this time, called *ſiliquaſtrum*; he ſuppoſes this to be the *ſiliquaſtrum* of Pliny: it has leaves reſembling thoſe of the olive, and ſhort crooked pods. But we do not find any thing either in Pliny, or any other of the antients, to countenance the opinion of the *ſiliquaſtrum* being a ſhrub.

SILIQUASTRUM, in natural hiſtory, the name given by Mr. Lhuyd, and others, to the bony palates of fiſhes, when found foſſile. See the article ICHTHYPERIA.

SILIQUATICUM, among the Romans, a cuſtom or toll paid for merchandiſe. This the Greeks called *ceratiſmus*. See the article CERATISMUS.

SILK (*Cycl.*)—Raw *ſilk*, which is a ſubſtance of no remarkable ſmell or taſte, yet contains a ſurpriſing quantity of a volatile ſalt. Fifteen ounces of raw *ſilk* cut ſmall, and put into a retort, when diſtilled with a gentle fire, will yield two ounces and two drachms of a dry volatile ſalt; whereas fifteen ounces of hartſhorn, a ſubſtance uſually ſuppoſed to contain more volatile ſalt than any other ſubſtance, except ſal armoniac, yields only half an ounce and half a drachm: from the ſame quantity of *ſilk* there may alſo be drawn three ounces and an half of volatile ſpirit; whereas, from the like quantity of hartſhorn, the quantity of ſpirit exceeds this, being four ounces and a half. But we are to conſider, that there requires but a ſmall proportion of volatile ſalt to be diſſolved in phlegm, to make it what they call a volatile ſpirit; and that upon the whole there is no doubt, but that the *ſilk* contains greatly the larger portion of ſalt. The caput mortuum, from this quantity of hartſhorn, weighed nine ounces and two drachms; whereas that from the *ſilk* was only five ounces and five drachms: whence it is plain, that the hartſhorn contains greatly more earth in the ſame quantity, and conſequently leſs active principles.

It has generally been agreed, that the ſpirit of hartſhorn is no other than a phlegm, impregnated with a volatile ſalt, and an extremely penetrating ſulphur: this is proved by the following experiment. If ſpirit of wine be poured upon ſpirit of ſal armoniac, or ſpirit of *ſilk*, there is immediately produced a large quantity of a ſaline concretion; and when the ſpirit of *ſilk* is uſed, this concretion is manifeſtly compoſed of conſiderably large and ſeparate granules of ſalt; whereas, in caſe the ſpirit of ſal armoniac has been uſed, the concretion is perfectly fine, and of an even texture, and it is not eaſy to ſay, at firſt ſight, whether it be ſaline, or ſulphureous: this is what has been called by authors *oſſa Helmontii*. It is proved, however, to be wholly ſaline, on the adding water to it, ſince that readily diſſolves it. The ſulphur, which is contained in theſe volatile ſpirits, manifeſts itſelf ſufficiently by its ſmell.

The ſpirit of raw *ſilk* rectified with ſome eſſential oil, is the medicine commonly known by the name of *guttæ Anglicanæ*, or Engliſh drops. Mem. de l'Acad. Par. 1700. See the article DROPS.

Silk being properly an animal fluid hardened by the air, is uſually much mended or depraved in its nature and qualities, according to the nouriſhment the worm receives from a good or bad leaf; a great deal, therefore, depends on the goodneſs or badneſs of the ſpring of the year, in the value of the *ſilk* produced. A warm ſpring is beſt, and it ſhould be moderately moiſt, not overmuch ſo, becauſe too great a fall of rain is always found to rot the leaves. Southerly winds alſo are to be feared, becauſe they burſt the worms; and northerly ones, when ſtrong, uſually ſpoil the leaves. All theſe being deſtructive, either of the animals themſelves, or of their food, very juſt preſages may be formed upon them of the produce of the enſuing year.

When theſe miſchiefs do not happen, but the ſpring is favourable, the people have little to do but to watch the feeding of the worms, and about Midſummer they are to begin to draw the *ſilk* from its cocoon, to ſee what it yields, and judge of its encreaſe or ſcarcity, and eſtimate its goodneſs and perfections; the principal of which are, that it proves clean, light, and ſtrong.

Great uſe may be made of theſe obſervations, provided the management be good. It requires great care to hatch the eggs, and when hatched, there muſt be a careful eye over the worms, even to the time of drawing off the *ſilk*. If the ſeaſon foretels a ſcarcity, the buſineſs of the prudent manager is to buy up all the old *ſilk* he can procure, and keep as much of the other as he can, to be employed in the beſt fabrics, that ſo they may not be obliged to hazard all the good at the price of the worſt: but when the ſeaſon proves favourable, they collect the new for the beſt fabrics, and compare it with the old, to ſee whether it be of a better quality, before they venture to determine their prices.

The goodneſs of *ſilk* is beſt diſtinguiſhed by its lightneſs, that being its moſt eſſential quality: this every one knows carries a very great profit with it, being bought by weight, and ſold by meaſure, at the firſt hand, after the collectors. The Organcine *ſilk* is the beſt of any made in the country of Piedmont, and two threads are equal in fineneſs, that is in ſmoothneſs, thickneſs, and length, for the thread of the firſt twiſt. For the ſecond, it matters not whether the ſingle thread be ſtrong before the two are joined, unleſs to ſee whether the firſt twiſt prove well. It is neceſſary that the *ſilk* be clean, and it is to be obſerved, that the ſtraw-coloured is generally the lighteſt, and the white the heavieſt of all. The ſkains ſhould be even, and all of an equality, which ſhews that they were wrought together; otherwiſe we may with juſtice ſuſpect that it is refuſe *ſilk*, and cannot be equally drawn out and ſpun, for one thread will be ſhorter than the other, which is labour and loſs.

It will alſo be requiſite to ſearch the bale more than once, and take from out of the parcels a ſkain to make an eſſay; for unleſs it be known by trial what one buys, there is the greateſt danger of being cheated in this commodity. To make an eſtimate, and know the lightneſs, fix the eſſay upon one eighth of a portée, or hand of *ſilk* of a hundred and ten aunes or ells of Lyons in length, and ſee what it makes of aunes by the eighth part. The ſkain, which is of eighty threads, muſt be multiplied by a hundred and ten aunes of Lyons, and from this number muſt be deducted one eighth; as for example, 110 by 80 makes 8800, the eighth part of which is 1100; and this is the eighth part of a portée, or hand of *ſilk*. Now to calculate what theſe 1100 aunes weigh, which is the eighth part of a portée, or of 110 aunes of Lyons, it will be proper to take a ſkain out of the parcels, which you take from out of the bale which you judge may contain, at leaſt, 1100 aunes, to make the one eighth part of a portée, which portée muſt be divided on two bobbings, half on each; then fix the two bobbings on the center, or beam, and from thence paſs it through the comb hurdiſſoir, *viz.* 550 from the two bobbings, will make 1100, which will be one eighth part of what you deſire to know. This done, you cut off your *ſilk*, and carry it to put on the hurdiſſoir; then weigh it, and multiply the weight by eight, it will weigh juſt as much as a portée of 110 aunes of Lyons, which is the general rule for calculating. When they draw the *ſilk* out by this means, one may learn to adjuſt the weight.

There are *ſilks* of Piedmont which are very light and clean, and are to be preferred before any on the ſale: the portée of *ſilk* of the lighteſt weighs near twenty four pennyweights, and

and from this it arises in gravity to twenty five, and twenty six pennyweights the portée, and sometimes to twenty seven and twenty eight; but even these weights may be dispensed with, provided that the other qualities be good, that is, that it be well wrought, even, and clean. When the *silk* is more than twenty eight pennyweights the portée, it must always be proportionably cheaper. Philos. Transact. N° 252. p. 186.

SILK-*worm*, *bombyx*. This insect consists of eleven rings, and each of these of a great number of other smaller ones, joined to each other; and the head, which terminates these rings, is furnished with two jaws, which work and cut the food, not by a perpendicular, but a lateral action. The humours, found in the body of this creature, all seem approaching to the nature of the *silk* which it spins, for on being rubbed in the hands, they leave a hard or solid crust behind them. Under the skin there is always found a mucous rosy-coloured membrane, enveloping the animal, and supposed to be the new skin in which it is to appear, on throwing off the old one. The heart of this creature reaches from the head to the tail, running the whole length of the body: it is indeed rather a series of many hearts connected together, than one. The motion of systole and diastole is very evident in this whole chain of hearts; and it is an elegant sight to observe the manner of the vital fluid's passing from one of them to the other. The stomach of this animal is as long as the heart, reaching, like it, from one end of the body to the other. This large receptacle for food, and the sudden passage of it through the animal, are very good reasons for its great voracity.

In the sides of the belly, all about the ventricle, there are deposited a vast number of vessels, which contain the *silky* juice; these run with various windings and meanders to the mouth, and are so disposed, that the creatures can discharge their contents at pleasure at the mouth; and according to the nature of the juices, that they are supplied with, furnish different sorts of *silk* from them, all the fluid contents of these vessels hardening in the air into that sort of thread, that we find the web, or balls of this creature consist of.

These creatures never are offended at any stench of whatever kind, but they always feel a southern wind, and an extremely hot air always makes them sick. *Malpighi* de Bombyce.

Chrysalis of the SILK-*worm*. See the article FEVE.

SILVER (*Cycl.*)—*Silver* works, as spurs, wrought hilts, *&c.* are boiled in salt, alum and argol, to give it a whiteness and clearness. *Boyle*'s Works Abr. Vol. I. p. 135.

Silver burnt on a glass-plate tinges it of a fine yellow or golden colour. *Boyle*'s Works, Vol. I. p. 147. See also p. 458. and Vol. II. p. 64.

Chemists have made frequent attempts to dissolve *silver* in vegetable acids, but with little success, according to Mr. Marggrave; who says, that he himself, at last, succeeded in the attempt.

The chief art required, is to find a proper precipitate of *silver*. Mr. Marggrave's is formed by precipitating a solution of *silver*, in the best spirit of nitre, with that salt of urine which he says is the basis of phosphorus. See SALT *fusible of urine*.

This precipitate reduced to a fine powder, and digested in a sand-heat with distilled vinegar, well concentrated by freezing, will in part be dissolved thereby.

But if this precipitation of the *silver* be made with salt of tartar, and then dried and pulverized, a considerable quantity of it may be dissolved in distilled vinegar, in juice of lemons, in Rhenish wine, and in other vegetable acids. The like may be done with mercury. Mem. de l'Acad. de Berlin, 1741. See MERCURY.

Purified SILVER. The most commodious and regular manner of purifying *silver* is this: put a large test, inclosed in an iron ring, into a furnace; when the test has been red-hot about half an hour, put into it the *silver* to be purified, wrapt up in pieces of cloth or paper, and divided into small portions; then fill the orifice of the furnace with burning coals, and blow with a pair of hand-bellows, till the *silver* is in fusion; then add, at several times, some lead, reduced to globules of a determined weight; continue adding lead, and keep the fire in such a degree, as is just sufficient to keep the metal in fusion, and continue thus, till the *silver* is rendered quite pure. This may be partly guessed, by the before made trial of its degree of impurity on the touch-stone, and by the quantity of lead, judged necessary for the operation, having been consumed; and farther known, by trial of it on a wire thrust into it while in fusion, and the examining what is found adhering to it when it is taken out. When the operation is finished, pour water in a small stream on the *silver* to make it grow solid, and taking it out of the test, clean it from all impurities that may adhere to its surface with a brush made of small brass wire. *Cramer*'s Art of Assaying, p. 204. 208.

The way of purifying *silver* by means of nitre is this: reduce the *silver* to grains, or small thin plates, put it into a crucible, and add one quarter part of nitre, well dried and powdered: put upon this crucible another of a smaller size, having a hole as big as a pea in its bottom; lute the joint of the two crucibles, and place them in a wind-furnace, put charcoal about them as high as the rim of the lower crucible, but no higher, then light the fire at top, and encrease it till the vessels are middlingly red-hot, then with a pair of tongs hold a burning coal directly over the hole in the upper crucible, but at the distance of one finger; if you see a sudden clear light produced near and about the coal, together with a crackling noise, this shews that the fire has the right degree of strength; but if this does not appear at all, or but very faintly, the fire must be encreased: but if, on the contrary, you hear a violent blast of air from the hole, and a loud crackling noise, without holding the coal over, the fire is then too fierce, and must be diminished, otherwise you will not only lose a large quantity of *silver*, but very often the vessels will burst.

When this is perfectly over, encrease the fire so far, as to be able to melt *silver* without any addition; then take out the vessels, and when they are cooled break the under one, and you will find the regulus of *silver* at the bottom, and an alkaline scoria, commonly green, at the top. If the *silver* is not yet thoroughly purified, put it into another crucible, and this open into a wind-furnace, throwing upon it a little nitre, and as soon as it melts, pour it into a mould for ingots; thus will it be purified from every thing but gold. *Cramer*'s Art of Assaying, p. 246.

When any quantity of this metal is contained in iron, it may, according to the rules of assaying, be precipitated from it by scarification, by the assistance either of strong acid menstrua, or of crude antimony; the latter method is the easier, and is performed thus: put one centner of the iron reduced to very fine filings, and two centners of crude antimony, into a small crucible, close it with a tile, and set it in a strong fire, that it may melt; when it has been in a perfect state of fusion for six or eight minutes, take it out, and let it cool, break the crucible, and you will find a mass, composed of scoria at top, and a regulus underneath; throw away the scoria, and powder the regulus, mix it with twelve centners of granulated lead, and scorify it in a continual, but not over-strong fire, till the lead is seen covered all over its surface with scoriæ, then take it out, and pour the mass into a mould: the regulus should now be tough, and of a light lead-colour, both within and without; if it be blackish and brittle, it must be returned into the test, and scorified again, and when brought to its proper state, and the antimony all consumed, let it be put into the coppel; and when the bead of *silver* is produced pure, subtract from its weight the before known quantity of the *silver* contained in the lead used in the process, and the rest is the weight of the silver obtained from the iron. *Cramer*'s Art of Assaying, p. 223.

SILVER, in medicine, is mightily cried up for its virtues by chemical writers; accordingly, they have endeavoured to introduce a train of lunar medicines, as they call them, such as *argentum potabile*, *diaphoreticum lunare*, *bezoardium lunare*, and fifty others, as pompous as insignificant.

The only preparations of *silver*, which keep up their credit in the shops, are the lunar crystals, and the lunar caustic, called *lapis infernalis*; both which are violent caustics, eating away the flesh, and even the bones, they are applied to. See CAUSTIC.

Inflammable SILVER, a chemical preparation of the lapis infernalis made by a small heat. The process is this: take an ignited piece of Dutch turf, after it ceases to smoak, place it with its upper flat surface parallel to the horizon, make a little cavity in the middle, and therein put a drachm of dry lapis infernalis; it will immediately melt and glow, and finally it will take flame, and hiss and shine like nitre: after the flame ceases, pure *silver* will be found in the hollow, as much in quantity as was used in the making so much lapis infernalis.

This curious experiment shews the physical manner in which acids do but superficially adhere to *silver*; and the manner wherein acids operate, when united to metals, while surrounding their metallic mass, they arm the ponderous principles thereof with spiculæ: it shews also the immutability of *silver* dissolved in an acid, and the various ways in which it may be concealed, yet still have its action: it also shews the difference of potable *silver*, while existing in a saline form, by means of an adhering acid, from that potable *silver* of the adepts, where the principles of *silver* are supposed converted into a fluid, that will mix with the juices of the body, and cannot be reduced to *silver* again; but the great thing to be here observed, is, that the acid spirit of nitre, adhering in a solid mass of *silver*, is in this state as inflammable, on coming in contact with an ignited combustible body, as crude nitre itself: this seems to happen with *silver* alone, which is unchangeable with spirit of nitre. Hence also we see one way, by which *silver* may be obtained pure from other adhering matters, by bare burning: the acid here acts neither upon the mercurial part of the *silver*, nor on its fixing sulphur. *Boerh.* Chem. Part 2. p. 297.

SILVER-*ores*. Some of the *ores* of *silver* are rendered very refractory in the working, by means of a mixture of unmetallic earths, from which no art can wash them clean. The

method to procure the *ſilver* from theſe by an aſſay is this: powder the *ore* very fine, and to a docimaſtical centner of it add an equal quantity of glaſs of lead, mix theſe thoroughly together; the glaſs of lead muſt, for this purpoſe, be reduced to as fine a powder as the *ore*; put this powder, when well mixed, into a teſt, with twelve centners of granulated lead, and put the teſt under a muffel in a furnace, make a ſtrong fire, till the lead boils well; when it is in this ſtate, diminiſh the fire a little, and keep it in this weaker ſtate for ſome time, then encreaſe it again to a great ſtrength, till the lead is reduced to ſcoriæ, and the *ſilver* is ſeen pure in the teſt; or elſe when the ſcorification is perfected, take out the matter together, and putting it into a coppel with more granulated lead, ſeparate the *ſilver* in a bead. Sometimes a refractory *ore* of this kind cannot be thus ſufficiently diſſolved, but a maſs, which has the clammyneſs of pitch, ſwims upon the ſurface of the regulus, and upon the ſcoriæ that are in part ſubdued: in this caſe, diminiſh the fire, and touch this clammy maſs with a ſmall cold iron hook, to which it will immediately ſtick; take it all carefully off, reduce it to fine powder, and mixing it with more glaſs of lead in powder, put it back into the teſt, then continue the ſcorification till it is perfected: but always obſerve that the ſcoriæ of theſe refractory *ores* muſt be examined, to ſee if ſome of the regulus does not remain among them, for ſometimes the ſcoriæ, by their clammyneſs, will retain part of the metal; if this appears to be the caſe, powder the ſcoriæ very fine, and the metal will be diſcovered and ſeparated, as it cannot be reduced to a fine powder. *Cramer*'s Art of Aſſaying, p. 218.

The method of precipitating *ſilver* out of an eaſily fuſible *ore* is this: pound the *ore* very fine in an iron mortar, and for an aſſay weigh one docimaſtical centner of it, and eight centners of granulated lead; pour into a new teſt about half the lead, ſtir it about with a finger, and ſpread it over the cavity of the teſt; put upon this lead the pounded *ore*, and then cover it with the remainder of the lead; put the teſt, thus loaded, under the muffle of an aſſay-furnace, and in the hinder part of it make the fire, and encreaſe it to a conſiderably high degree. The *ore* will ſoon be raiſed out of the melted lead, and ſwim upon it; a little after it will grow clammy, melt, and be thrown toward the border of the teſt; then the ſurface of the lead will appear clear in the middle of the teſt, and will ſmoak and boil; the fire muſt now be made a little leſs, till the boiling ceaſes, for a quarter of an hour, and then made violent again, and the ſurface of the lead will then diminiſh by degrees, and be covered with a maſs of ſcoriæ. At this time have at hand an iron hook ready heated, and with this ſtir all the matter from the ſides into the middle of the teſt; if the matter, adhering to the hook from the ſtirring, melts quickly again, and the extremity of the hook, when cold, is found covered with a ſhining cruſt, the ſcorification is perfected; but if the ſcoriæ feel clammy while ſtirred, and adhere in quantity to the hook, and are of a rough ſurface, the ſcorification is not perfect, but the matter adhering to the hook muſt be ſtruck off with a hammer, and beat to powder, and returned into the teſt, and the fire continued till the ſcorification is perfected; then take out the teſt, and pour the whole contents into a mould, heated and greaſed. This is the firſt proceſs, and this uſually takes up three quarters of an hour: the *ſilver* is now in form of a regulus, and muſt be ſeparated by the coppel in the uſual way. *Cramer*'s Art of Aſſaying, p. 205. See the article REGULUS.

Mundic is a very common thing in *ſilver-ores*, eſpecially in the leſs rich ones, and gives great trouble in working the metal. The method of ſeparating the *ſilver* from an *ore*, rendered refractory by this admixture, is thus: break the *ore* into a rough powder, and put a centner of it into a teſt for an aſſay; put upon this another teſt, by way of a cover, and put it under the muffle in a furnace; when the muffle is near red-hot, encreaſe the fire by degrees, there will be a crackling noiſe, which being ended, take away the upper teſt, for when the veſſels have been red-hot about a minute, the *ore* ceaſes to ſplit; leave the *ore* under the muffle, till the arſenic and ſulphur are in a great meaſure evaporated, which will be known by the ceſſation of the ſmoak from the *ore*, and of the ſmell of garlick, or the acid; then take out the teſt, and leave it in a place not too cold, that it may cool leiſurely of itſelf; take the roaſted *ore* clean out of the teſt, powder it very fine, and mix it with an equal quantity of glaſs of lead in fine powder; and finally, ſcorify the maſs in the ſame, or in a new teſt, if that was cracked, till the *ſilver* appear in form of a bright bead in the middle, after it has ſtood a minute or two; after this take it out of the fire, and when cold take out and weigh the pure *ſilver*. *Cramer*'s Art of Aſſaying, p. 221.

Alonſo Barba tells us, that the original method of extracting *ſilver* from the *ore*, in the mines of Potoſi, was only by quickſilver, but this was very difficult in many caſes. Thoſe *ores* which partake of copperas, which are very numerous there, will not bear quickſilver, but conſume and ſcatter it, breaking its particles, and rendering them unfit for the purpoſes they were intended for, of taking up the *ſilver* contained in the *ore*. Burning the *ore* was another method heretofore uſed with too little caution, and great loſſes were ſuſtained by it. The grinding the *ore* is always proper, and the finer it is ground, the better it will always ſucceed. Alonſo Barba alſo greatly recommends boiling the *ores*, in which the quickſilver is uſed, as of great advantage. The burning of *ores* is of no ſervice, but to render the ſtony matter more friable; but when there is marcaſite among the *ore*, this is never done without loſs, and that often very great. *Alonſo Barba* de Metall.

The largeſt piece of *ſilver-ore* we have account of any where, is at this time preſerved in the king of Denmark's Muſeum of Curioſities at Copenhagen; this was dug in the mines of Norway, and weighs five hundred and ſixty pounds. It is five feet ſix inches long, and meaſures four feet about: it is valued at five thouſand crowns. There is in the ſame place another alſo, which was dug in the ſame mine, valued at three thouſand two hundred and ſeventy crowns. Theſe are both ſo very rich, that they ſeem at leaſt three parts *ſilver*, and the metal appears in very elegant forms in them, and riſes up out of their ſurface in form of ſmall trees and buſhes. There are alſo ſeveral pieces of pure native, or virgin *ſilver* there, all of which repreſent trees or plants.

SILVER-*pill*, a chemical preparation of *ſilver*, formerly highly commended as a remedy for dropſies, and in many other diſeaſes.

The method of making it is this: diſſolve an ounce of pure nitre in diſtilled water, then diſſolve an ounce of cryſtals of *ſilver* made in the common way, with pure *ſilver* and aqua fortis, in three times the weight of water, ſo that the ſolution may be perfectly limpid; mix the two ſolutions together, they will become a clear homogene liquor, evaporate this to a pellicle, and cryſtals reſembling nitre will ſhoot; pour off the remaining nitre as before, and the remaining nitre will ſhoot with the *ſilver*, in form of cryſtals, again, upon a ſecond evaporation: let theſe cryſtals be dried upon a paper, and then placed in a glaſs veſſel in a very gentle heat, enough to make them ſmoak, but not run, ſtir it with a piece of glaſs all the time, and keep it over the fire, till no more fumes ariſe; thus the acid ſpirits will be driven off, and the *ſilver* remain of a very bitter taſte, and purging quality. It muſt be kept in a dry cloſe veſſel. This diſcovery has been made to ſerve to many other purpoſes, beſide its uſes in medicine, and has furniſhed the diſhoneſt pretenders to alchemy with one of their moſt cunning methods of deceit. They have been able, by this means, to conceal *ſilver* in nitre, and that in a very large proportion, as in one tenth part of the whole quantity; and this nitre being projected in an equal quantity on melted lead, gives an increaſe of one tenth part in *ſilver*, which remaining upon the teſt, will deceive the ignorant, as if a tenth part of the lead were converted into pure *ſilver*. People who are upon their guard may, however, diſcover the cheat, by diſſolving the pretended nitre in ten times its weight of water, and putting a poliſhed plate of copper into the ſolution; for every particle of the *ſilver* will then be precipitated out of the liquor upon the copper, and to the bottom of the veſſel. *Boerh.* Chem. Part 2. p. 296.

The medicinal uſe is this: the dried maſs, conſiſting of the ſalts of *ſilver* and nitre, is to be reduced to a fine powder; this powder applied to ulcers, acts in the manner of the lapis infernalis, or *ſilver*-cauſtic, only much milder: but for internal uſe, the quantity of two grains of it is to be ground to a fine powder, with ſix grains of loaf-ſugar, in a glaſs mortar, this is to be then mixed with ten grains of the crumb of bread, and formed into nine *pills*: theſe are to be taken by a grown perſon upon an empty ſtomach, drinking after them four or ſix ounces of hot water, ſweetened with honey. It purges gently, and brings away a liquid matter like water, often unperceived by the patient. It is ſaid to kill worms, and perform great things in many obſtinate ulcerous diſorders. It purges without griping, but it muſt not be uſed too freely, nor in too large a doſe, for it always proves weakening, and in ſome degree corroſive on the ſtomach; but this inconvenience is greatly alleviated by rob of juniper. *Boerh.* Chem. Part 2. p. 297.

SILVERING (*Cycl.*)—To *ſilver* braſs: fine *ſilver* is diſſolved in aqua fortis in a broad bottomed veſſel of glaſs, or glazed earth, and the aqua fortis being afterwards evaporated, water is poured upon the remaining calx. This water muſt alſo be evaporated, and the operation repeated as often as there is occaſion; the fire being increaſed towards the latter end, ſo as to leave a perfectly dry and white calx, which will be thus tolerably freed from the aqua fortis. Of this calx take one part, and an equal meaſure, not weight, of common ſalt, and of the cryſtals of tartar, and mix them together into a fine powder; then having firſt plunged the ſcowered braſs into fair water, rub ſome of the powder upon it with your wet fingers, till the cavities of its ſurface be ſufficiently filled therewith. Laſtly, waſh the metal well in water, and give it a gloſs by rubbing it hard with a dry cloth.

This

This washing, Mr. Boyle observes, is expeditious, cheap, requires no quicksilver, and may be made to last some years, and is easily renewable, when it begins to wear. See his Works Abr. Vol. I. p. 151.

SILVERING *of glasses*. An excellent method of turning spherical, and other glasses, into speculums by *silvering*, is this: take half an ounce of pure lead, and melt it into a mass with the same quantity of fine tin, then immediately add half an ounce of bismuth, and carefully skim off the dross; remove the ladle from the fire, and before the matter is cold, add to it five ounces of pure quicksilver, stir the whole together, and then put the fluid amalgam into a clean glass.

When this is to be used for foiling, or *silvering*, let it be strained through a linnen rag, and then gently pour some ounces of it into the glass intended to be foiled, by means of a paper funnel, reaching almost to the bottom, to prevent its flying up to the sides; then dexterously inclining the glass every way, endeavour thus to fasten the foil. When this is done, let the glass rest for some hours, then repeat the operation, till at length the whole fluid mass is evenly spread and fixed over the whole internal surface; then let the superfluous amalgam be poured out, and the outside of the glass polished. This is the method by which glass spheres are made to look as if full of quicksilver, and deserves to be tried on the common looking-glasses, as having many advantages over the usual way of *silvering* them. *Shaw*'s Lectures, p. 428.

SILURUS, in zoology, the name of a very large fish, commonly called in English the *sheat-fish*.

It is caught in the Vistula, and other large rivers, and grows to an immense size, some having been caught of more than an hundred weight, and of sixteen feet long, and sometimes considerably larger than that. It resembles the eel in colour, but the belly is variegated with black, white, and dusky spots. The body is without scales, and is covered with a mucous substance. The head is flat, short and broad, the opening of the mouth extremely large. The body down to the fundament is thick and cylindric, but the bottom of the belly is flat, and from the anus to the tail it is broader and flat. Its eyes are large, and have two antennæ, or slender excrescences before them; and four beards hang from the lower jaw. The gills are four on a side. It has only one small fin upon the back, and the tail is not forked. Its flesh is much esteemed for food, and is dressed for the table as the eel. It is a very voracious fish, and much dreaded whenever it comes among the smaller fry.

Gesner mentions two other species of it, one flatted toward the tail, and the other of a mixed green and yellow colour, and having two beards on the upper jaw, and three on the under: he only calls these *siluri secunda*, and *tertia species*. *Willughby*, Hist. Pisc. p. 128.

The name is of Grecian origin, and is derived from the words σεὶω, to move or shake, and οὐρὰ, a tail. It is given to this fish, from its remarkable quality of being almost continually moving its tail in the water.

SILURUS is also a name given by some authors to the sturgeon, called by others *accipenser*, but by the generality of writers *sturio*. *Salvian*, de Aquat. See the article STURIO.

SIMARONA, a name given by the Spaniards in America to a species of vanilla, called also *bastard-vanilla*. The pods of this kind are every way smaller than those of the true kind, and have very little liquor, or pulp in them when broken, and contain very few seeds. These are greatly inferior to the true kind, having scarce any smell. It is not yet certainly known, whether this species be the fruit of a different kind of vanilla-plant from the common, or whether it be the same fruit gathered at a different season, or from a plant growing in a different soil. See the article VANILLA.

SIMAROUBA. The bark of this plant is very successful in the cure of dysenteries, as Mr. Jussieu assures us from his experience. It is a thick yellow bark, of an astringent bitterish taste, and resembling, as it is said, the *macer* of the antients. It was first brought into Europe from America, in 1713; but of the tree, which produces it, we have no certain account.

This medicine is more successful in decoctions than in substance. The dose is about the third part of a quart of decoction, having two drachms of the bark in it. See Mem. de l'Acad. des Scienc. Anno 1729.

SIMARUM *musculus*, in anatomy, a name given by some of the old writers to a muscle, called by the moderns the *serratus magnus*. See SERRATUS.

SIMBALATH, in the materia medica, a name given by Avisenna and others to the spikenard, or *nardus Indica*.

The exact interpretation of the word is *spicigera*, and Avisenna, under this general name, distinguishes it into several kinds; the first he calls *alnardin*, or *nardin*. It has been supposed by some that he means the Indian *spikenard* by this word, but, on the contrary, it appears plainly that he means the Celtic *nard*; he calls it the *nardus Romani orbis*, and says that it is of European growth. After this he mentions the Asiatic *nards* of several kinds, which are only the Indian *spikenard*, growing in different places, and such as used to be brought thence in different degrees of perfection. See the article NARDUS.

SIMIA, the *ape* or *monkey*, is made by Linnæus a distinct genus of animals, the character of which is, that the creatures of this kind have teeth, have feet composed of five toes, and made for climbing, and have their paps on the breast. *Linnæi* System Nat. p. 34.

This genus comprehends the *monkey*, *ape*, and *baboon* classes, but more regularly, the word *simia* is the name of that kind only which has no tail, the tailed ones being, in distinction, called *cercopitheci*, or *tailed monkeys*.

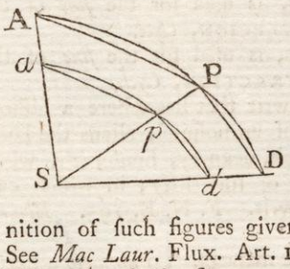
The proper name of the *simia*, in English, is *ape*, and those which have tails, are distinguished by the name *monkey*. See CERCOPITHECUS.

There are many species of *apes*, and even many more than were supposed by authors; America affording us frequent instances of such as have not been described in any book. *Ray*'s Syn. Quad. p. 149.

SIMIA *marina*, the *sea-ape*, a name used by Bellonius, and some other authors, for the fish called *vulpes marina*, a kind of shark, remarkable for its long tail, from which probably it had both one and the other of these names. *Willughby*, Hist. Pisc. p. 54.

SIMICON, in antiquity, a musical instrument of the stringed-kind, with thirty five strings. Mem. de l'Acad. Inscript. Vol. 5. p. 168.

SIMILAR (*Cycl.*)—SIMILAR *curves*, in geometry. The *similarity* of curvilinear figures may be derived from that of rectilinear figures, that are always *similarly* described in them; or, we may comprehend all sorts of *similar* figures, planes, or solids, in this general definition: figures are *similar*, when they may be supposed to be placed in such a manner, that any right line being drawn from a determined point to the terms that bound them, the parts of the right line, intercepted betwixt that point and those terms, are always in one constant ratio to each other. Thus the figures ASD, *a*S*d*, are *similar*, when any line S P being drawn always from the same point S, meeting A D in P, and *a d* in *p*, the ratio of S P to *Sp* is invariable. It is manifest, that the rectilinear inscribed figures *a p d* S, A P D S, are *similar* in this case, according to the definition of such figures given in Euclid's Elements, Book 6. See *Mac Laur*. Flux. Art. 122.



When the *similar* figures are in the situation here described, they are also *similarly* situated, and all their homologous lines are either placed upon one another, or parallel.

SIMILAR *diameters* of two conic sections. When the diameters in two conic sections make the same angles with their ordinates, they are sometimes said to be *similar*.

SIMILAR *solids*, such as are contained under equal numbers of *similar* planes, alike situated.

SIMILAR *bodies*, in natural philosophy, such as have their particles of the same kind or nature one with another.

SIMILAR *animals*. We have a treatise by Dr. Martin, wherein he treats of the laws and proportions of the motions and forces of the solids and fluids of animals, of however different magnitudes, which are supposed of *similar* make and constitution. See Tractat. de Similibus animalibus.

SIMON, in zoology, a name by which some authors have called the dolphin. It is affirmed that this fish loves the name, and will come to a person who calls him by it; but this, though recorded by authors of credit, meets with no faith among the judicious readers. *Ray*'s Ichthyography, p. 31.

SIMPLE (*Cycl.*)—SIMPLE *leaf*, among botanists. See the article LEAF.

SIMPLE, or *single eccentricity*. See ECCENTRICITY, *Cycl.*

SIMPLE *problem*, in mathematics. See LINEAR *problem*, *Cycl.*

SIMPLE *roots*. See FIBROSE *roots*.

SIMPLE *waters*, in distillery. See WATERS.

SIMPULUM, among the Romans, a vessel with a long handle, and made like a cruet. It was used in sacrifices and libations, for taking a very little wine at a time. *Pitisc*. Lex. Antiq. in voc.

SIMULACRUM, among the Romans. See the articles IDOL and IDOLATRY, *Cycl.*

SIMUS, in zoology, the name used by some authors for the *nasus*, or *nase*, a fish common in the large rivers in Germany, and somewhat resembling our chub, and in some respects our common rudd. *Gesner*, de Pisc. p. 213. See the article NASUS.

SINAPI, *mustard*, in botany, the name of a genus of plants, the characters of which are these. The flower is composed of four leaves, and is of the cruciform-kind. The pistil arises from the cup, and finally becomes a long pod, divided by an intermediate membrane into two cells, and containing roundish seeds; the pod also usually terminates in a fungose horn, which has some seeds in it. To this it is to be added, that these plants have all a hot, acrid, and biting taste.

The ſpecies of *ſinapi*, enumerated by Mr. Tournefort, are theſe. 1. The turnep-leaved *muſtard*. 2. The white *muſtard* with hairy pods, and red and white ſeeds. 3. The early wild *muſtard* with black ſeeds, called by many *charlock*. 4. The early black-ſeeded field-*muſtard*, or charlock, with undivided leaves. 5. The rocket-leaved *muſtard*. 6. The Spaniſh *muſtard* with lobated leaves, and ſulphur-coloured flowers. 7. The creſs-leaved Spaniſh *muſtard*. 8. The ſmall radiſh-leaved Spaniſh *muſtard*. 9. The dwarf white Spaniſh *muſtard*. 10. The largeſt Indian lettuce-leaved *muſtard*. 11. The large Indian lettuce-leaved *muſtard* with narrower leaves. *Tourn.* Inſt. p. 227. See MUSTARD.

SINAPI *Perſicum*, *Perſian muſtard*, a name by which ſome botanical authors have called the *thlapſi*, or treacle-muſtard. *Ger.* Emac. Ind. 2.

SINAPISIS, a word uſed by ſome writers as a name for *Armenian bole*. *Caſt.* Lex. Med. in voc.

SINAPISTRUM, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of four leaves, diſpoſed in the form of a croſs. The piſtil ariſes from the cup, and at length becomes a long cylindric bivalve pod, uſually containing roundiſh ſeeds.

The ſpecies of *ſinapiſtrum*, enumerated by Mr. Tournefort, are theſe. 1. The more prickly ſeven-leaved Egyptian *ſinapiſtrum* with fleſh-coloured flowers. 2. The leſſer, not thorny, five-leaved Indian *ſinapiſtrum* with fleſh-coloured flowers. 3. The trifoliate, not thorny, Indian *ſinapiſtrum* with fleſh-coloured flowers. 4. The ſhrubby trefoil American *ſinapiſtrum* with the taſte of creſſes. 5. The trifoliate red-flowered Portugal *ſinapiſtrum* with horned pods. *Tourn.* Inſt. p. 231.

SINASBARIUM, in botany, a name given by ſome authors to the *ſyſimbrium*, or water-mint, common in all our ditches and watery places. *Ger.* Emac. Ind. 2.

SINE (*Cycl.*)—SINE *of incidence*, in catoptrics and dioptrics, is uſed for the *ſine* of the angle of incidence. See the article INCIDENCE, *Cycl.*

SINE *of reflection*, in catoptrics, is uſed for the *ſine* of the angle of reflection. See REFLECION, *Cycl.*

SINE *of refraction*, in dioptrics, is uſed for the *ſine* of the angle of refraction. See REFRACTION, *Cycl.*

SINE *aſſenſu capituli*, in law, a writ that lies where a biſhop, dean, prebendary, or maſter of an hoſpital, aliens the lands holden in right of his biſhoprick, deanery, houſe, &c. without the aſſent of the chapter or fraternity; in which caſe his ſucceſſor ſhall have this writ. F. N. B. 195. *Blount*, *Cowel.*

SINEW (*Cycl.*)—SINEW, in the manege. To *unſinew* a horſe, called in French *enerver*, is to cut the two tendons on the ſide of the head, about five inches under the eyes; which two join in one at the tip, or end of the noſe, in order to perform its motion. This tendon, at the tip of the noſe, is likewiſe cut. We *unſinew*, in order to dry the head, and make it ſmaller.

SINEW-*ſhrunk*, is ſaid of a horſe that is over-rid, and ſo worn down with fatigue, that he becomes gaunt-bellied, through a ſtiffneſs and contraction of the two *ſinews* that are under his belly.

SINEW-*ſprung*, is a violent attaint, or over-reach, in which a horſe ſtrikes the toe of his hinder feet againſt the *ſinew* of the fore legs.

SINF, in the materia medica of the antients, a word uſed to expreſs the ſame as *agallochum*, or lignum aloes.

The Arabians formed an adjective of this word, and called the yellowiſh lignum aloes *ſinficum*, and the blackiſh *indicum*. Not that the ſinficum came from any other place, or that the Indicum was given as the name of the country, but that the colours only were expreſſed by theſe epithets; *indicum* being with the antients as a common word to expreſs black by. The only ſpecies of myrobalan they had of a black colour, was called the *Indian myrobalan*; not for its being peculiarly the produce of that country, but becauſe of its being of the colour they expreſſed by that word.

SINGERS, in the Jewiſh antiquities. See CHANTERS.

SINGLE (*Cycl.*)—SINGLE *caſt*, in huſbandry, a term uſed by the farmers for that ſort of ſowing, that diſperſes the neceſſary quantity of corn at one bout. *Plot*'s Oxfordſhire, p. 251.

SINGULATOR, among the Romans, a horſeman who rode with one horſe only. *Pitiſc.* in voc.

SINKING, or ABSORPTIONS *of the earth*. Kircher has written very largely on this ſubject, and antient and modern hiſtories agree in relating many ſuch facts. The *abſorptions* themſelves are indeed too common, and are the effects of earthquakes, ſubterranean fires, and many other accidents of the macrocoſm; but there are much fewer inſtances of the reſtoring the places thus *abſorbed*, and there are but few of thoſe inſtances, which are recorded of it, that deſerve credit, though ſome are unqueſtionable.

Pliny tells us, that in his own time the mountain Cymbotus, with the town of Eurites, which ſtood on its ſide, were wholly *abſorbed* into the earth, ſo that not the leaſt trace of either remained; and he records the like fate of the city Tantalis in Magneſia, and after it of the mountain Sypelus, both thus *abſorbed* by a violent opening of the earth. Galanis and Garnatus, towns once famous in Phœnicia, are recorded to have met the ſame fate; and the vaſt promontory, called Phlegium, in Æthiopia, after a violent earthquake in the night-time, was not to be ſeen in the morning, the whole having diſappeared, and the earth cloſed over it. Theſe and many other hiſtories, atteſted by the authors of greateſt credit among the antients, abundantly prove the fact in the earlier ages; and there have not been wanting too many inſtances of more modern date. *Kircher*'s Mund. Subter. p. 77. The mountain Picus, in one of the Molucca iſles, was ſo lofty, that it appeared at great diſtances as an immenſe column reared erect in the air, and ſerved as a land-mark to ſailors; an earthquake in this iſland deſtroyed it; at one inſtant the whole mountain was *abſorbed* into the bowels of the earth, and no mark of its place remained but a vaſt lake of water, exactly anſwering to the ſhape of the baſe of the mountain. A like accident, but of a more terrible kind, happened in China, in the year 1556, when a whole province of the mountainous parts of that kingdom was in one moment *abſorbed* into the earth, and all the towns buried, the whole number of the inhabitants *ſinking* with it, and an immenſe lake of water remaining in its place to this time. Of much later date is the deſtruction of a city in the confines of Swiſſerland; but this, though generally ſaid to have been ſwallowed up into the earth, was not properly an *abſorption*; for the whole city was buried by the fall of a mountain upon it.

The burning mountains, Veſuvius and Strongylus, both once very high, have in length of time loſt half their height, the upper part having been undermined by the burning, and having fallen into, and been *abſorbed* by the under part. And in the year 1646, during the terrible earthquake in the kingdom of Chili, ſeveral whole mountains of the Andes diſappeared, and were one after another wholly *abſorbed* in the earth.

Theſe, and a thouſand other accidents of a like kind, prove the truth of *abſorptions* in general; ſome of them leaving level ground in the place of the things *abſorbed*, ſome immenſe chaſms and cracks, and ſome lakes of freſh or ſalt water; and it may be, that many immenſe lakes were formed in ages, of which we have no hiſtories, by the like *abſorptions*.

Pliny gives many accounts of the reſtoring of places thus *abſorbed*, but later obſervations do not give an equal credit to theſe parts of his hiſtory. He tells us, that theſe reſtorations are made ſometimes in the ſame place, where the original mountain or iſland was *abſorbed*; ſometimes in others, as large ſpaces of ground ariſing out of the ſea in one place, which had been taken from the land in another; but theſe ſeem very vague relations. The iſlands of Rhodes and Delos, he ſays, are of this origin, as alſo that of Anephe beyond Melos, and Nea near Lemnos; that of Ajoue between Lebadus and Teus, and Hiera among the Cyclades; and finally, the iſland Thia, which he ſays appeared in his own time. A modern inſtance of this kind, is the ſudden production of the new iſland near Santorini; but this, and probably all the others alſo, was not the reſtoration of any thing before *abſorbed*, but the effect of a vulcano under water, which threw up a vaſt quantity of cinders and ſciarri, the whole iſland, as it is called, conſiſting of nothing elſe. In the ſame manner, in the year 1638, an iſland was raiſed near St. Michael's, in the Atlantic ocean, by ſubterranean fires, which threw up ſtones, and other ſubterranean productions, in ſuch quantities, that they formed an iſland of five miles in length. The mountain raiſed in one night, in the ſea near Puzzoli, is another inſtance of this ſudden production of theſe mountains: this appeared after one night's violent ſubterranean conflict, and ſtill keeps its place, and is known under the name of the *Mons Sanctus*. Not one of theſe, however, appeared in the place of any thing that was *abſorbed*; and there is more imagination, than judgment, in ſuppoſing them to have any connexion in the laws of nature with the *abſorptions* of other places, very diſtant, and at diſtant times. *Kircher*'s Mund. Subter. p. 79.

SINKOO, in the materia medica, a name given by ſome authors to the *lignum aloes*, or agallochum, uſed in medicine. *Dale*'s Pharm. p. 347.

SINNET, aboard a ſhip, is a line or ſtring made of rope-yarn, conſiſting generally of two, ſix, or nine ſtrings, which are divided into three parts, and are platted over one another, and then it is beaten ſmooth and flat with a wooden mallet. Its uſe is to ſerve the ropes, that is, to keep them from galling.

SINOPICA *terra*, in natural hiſtory, the name of a red earth of the ochre-kind, called alſo *rubrica Sinopica*, and by ſome authors *ſinopis*.

It is a very cloſe, compact, and weighty earth, of a fine glowing purple colour, but in ſome ſpecimens much deeper than in others, and in ſome degenerating into paleneſs; but even in its worſt condition, it is a very fine colour. It is of a pure texture, but not very hard, and of an even, but duſty ſurface. It adheres firmly to the tongue, is perfectly fine and ſmooth to the touch, does not crumble eaſily between the fingers, and ſtains the hands. It melts very ſlowly

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in the mouth, and is perfectly pure and fine, and of a very auſtere aſtringent taſte, and ferments very violently with aqua fortis.

It was dug in Cappadocia, and carried for ſale to the city Sinope, whence it had its name. It is now found in plenty in the New Jerſeys in America, and is called by the people there *blood-ſtone*, from its ſtaining the hands to a blood colour, and may probably be had in many other places; and this deſerves thoroughly enquiring into, ſince there ſeems not one among the earths more worthy notice. Its fine texture and body, with its high florid colour, muſt make it very valuable to painters, and its powerful aſtringency equally ſo in medicine. The antients were well acquainted with it in fluxes and hæmorrhages, and experience ſhews it poſſeſſes the ſame virtues at this time. The deepeſt coloured is ever the moſt aſtringent. *Hill*'s Hiſt. of Foſſ. p. 60.

SINOPIS, in natural hiſtory, a name by which ſome authors have called the Sinopic ochre, commonly called *rubrica Sinopica*. *Hill*'s Hiſt. of Foſſils, p. 60. See the article SINOPICA *terra*, ſupra.

SINUATED *leaf*, in botany. See LEAF.

SINUS (*Cycl.*)—SINUS *of an artery*, is uſed by ſome for any part of an artery, where its ſides are ſtretched out beyond the ordinary proportional dimenſions elſewhere. Med. Eſſ. Edinb. Abridg. Vol. 2. p. 410.

Morgagni has obſerved four ſuch *ſinuſes* in the aorta; three of them anſwering to the ſemilunar valves, and the fourth is all that part of the aorta, between the former *ſinuſes* and the origin of the common trunk of the right ſubclavian and carotid arteries. He gives ſome reaſons to prove, that the nervus acceſſorius ariſes from the eighth pair, to be joined to the medulla ſpinalis. Med. Eſſ. ibid.

SINUS *of the womb*, is uſed for any cavity within its ſubſtance. Theſe *ſinuſes* are much of the ſame texture with the cells of the ſpleen, or rather of the corpora cavernoſa penis; being membranous cavities communicating with each other, and having numerous arteries ſpread on them, whoſe lateral branches open into the cells, from which veins go out to be joined to other veins, that return the blood from the other parts of the womb.

Theſe *ſinuſes* are diſtended with blood in the time of the menſes; and their orifices are then alſo enlarged.

During the time of pregnancy the *ſinuſes*, and their canals, that open into the womb, are gradually diſtended and enlarged; ſo that, at the end of nine months, the *ſinuſes* will contain the largeſt fingers, and the canals from them will receive the little finger. Vid. *Monro*, in Medic. Eſſ. Edinb. Vol. 2. Art. 9.

SIPHAC, a name uſed by ſome authors for the *peritonæum*.

SIPHILIS, a name uſed by ſome authors for the *lues venerea*, or French-pox.

SIPHITA, a word uſed by Paracelſus, and his followers, with the addition of *parva* and *magna*, for two diſorders. The *ſiphita parva* ſignifies the *chorea ſancti Viti*, or St. Vitus's dance; and the *ſiphita magna*, walking in time of ſleep.

SIPHNIUS *lapis*, in the natural hiſtory of the antients, a ſubſtance found in great plenty in the iſland Siphnus, in the Ægean ſea.

It was dug up in large maſſes in the neighbourhood of the ſea, and when freſh might be cut or worked by the turner into any ſorts of veſſels, by reaſon of its ſoftneſs; but when afterwards burnt and oiled over, it became black and ſolid, and was fit for any ſervice; and the veſſels made of it bore the fire very well, and as thoſe of earthen-ware with us, for the common offices of boiling, &c. In many parts of Europe they ſtill find the ſame ſubſtance, and call it *lapis lebetum*, uſing it in the ſame manner. It is no other than the *ſteatites*, or *ſoap-rock*, as it is called with us, common in Cornwall, though our people have not thought of putting it to that uſe. *Hill*'s Theophr. p. 106. See the article STEATITES.

SIPHONANTHEMUM, in botany, the name of a genus of plants eſtabliſhed by Dr. Amman. The name is derived from the Greek σιφων, a tube, and ανθεμον, a flower. The characters of the genus are theſe. The flower conſiſts of one petal, and is tubulated and divided into ſeveral ſegments at the edge. The piſtil ariſes from the cup, and finally becomes a fruit reſembling four berries, nicely joined together. It is divided into four cells, and contains a number of roundiſh ſeeds. The ſtalks of the plant are green and ſtriated. The leaves ſtand very cloſely together, and are placed in no order; they are very narrow, about three inches in length, and much reſemble thoſe of the willow; they ſtand on very ſhort pedicles, and are of a very deep green, both on the upper and under-ſide. From the alæ of the leaves, or a little above their inſertions toward the top of the ſtalks, there ariſe ſeveral pedicles, of about an inch in length, which divide into ſeveral others at their tops; uſually each part into three, but often into four or five: theſe are diſpoſed in the manner of the pedicles of the umbelliferous flowers, and each is terminated by a one-leaved cup, divided into five ſegments, from which ariſe flowers compoſed of a ſlender tube, two or three inches long, of a yellowiſh green, which at the end expands into four ſegments of a pale yellow: in the middle of theſe there ſtands a purple ſtyle, which is crooked, and is ſurrounded by four ſtamina of a purple colour, ſuſtaining each a triangular brown apex. In each of the four cells of the capſule there is contained one large greeniſh yellow ſeed. Act. Petrop. Vol. 8. p. 216.

SIPTACE, in natural hiſtory, the name given by the antients to a beautiful bird, of which they were very fond, and which was often kept in their houſes. Some have conjectured this to be the goldfinch, from the fine yellow they deſcribe about it; but Pliny plainly makes it the parrot: he tells us, among other things, that it imitated the human voice the beſt of all birds.

SIRA, a name by which ſome of the chemical writers have called orpiment.

SIRACAUSTUM, a name given by Meſue to a medicine he recommends in acute diſeaſes.

SIRÆUM, a word uſed by ſome to expreſs a ſweet decoction, whether given in that form, or firſt inſpiſſated into a ſort of rob by evaporation.

SIREN (*Cycl.*)—SIREN, in ichthyology, a name given by Artedi to the ſea-monſter often deſcribed by authors, but either not exiſting at all, or not ſo like man as their deſcriptions make it.

Artedi ſuppoſes it to conſtitute a peculiar genus of the plagiuri, or cetaceous fiſhes. The characters he gives of it are theſe: it has no pinnated tail; the head, neck, and breaſt, down to the navel, repreſent thoſe of the human ſpecies; there are only two fins on the whole body, and thoſe ſtand on the breaſt.

Bartholine, in his Hiſtory of Curioſities, deſcribes ſuch a fiſh as this, under the name of *ſyrene*, and Barchewitz under the name of *homo marinus*. This author ſays that he ſaw one at ſea, and that it is wholly different from the manati, and from all other fiſhes. The Philoſophical Tranſactions alſo contain an account of a ſea-man ſeen in the American ſeas, and ſeveral other writers of credit give countenance to the ſtory. Their deſcriptions tell us, that from the navel to the tail it is one ſhapeleſs maſs of fleſh, without any appearance of finny tail, or any other part of the ſtructure of a fiſh. The pectoral fins reſemble hands, and are compoſed of five bones, or fingers, joined by a membrane. With theſe it ſwims. It were much to be wiſhed, that ſome accurate ichthyologiſt might have an opportunity of ſeeing and examining this creature, if it really exiſts different from the other animals of the ſea. Artedi ſeems to doubt the truth of the accounts, but thinks it better not to judge of a thing not yet ſeen, than to pronounce any thing raſhly againſt the accounts of creditable authors. *Artedi*, Gener. Piſc. p. 52.

SIREN is alſo a name given by Mouffet, and other authors, to a ſpecies of bee; of which they diſtinguiſh two kinds, a larger and a ſmaller. Theſe differ greatly from the common bee, in that they live ſolitary, and never unite into ſwarms, or build neſts, or make combs.

SIRI, among the Romans, were ſubterranean caves, or vaults, in which wheat could be kept ſound and freſh for fifty years. *Pitiſc.* Lex. Ant. in voc.

SIRIASIS, a name given by medical writers to a diſeaſe to which children are ſubject; it conſiſts in an inflammation of the brain and its membranes, and is attended with a depreſſure of the fontanella, or hollowneſs of the eyes, a burning fever, a paleneſs and dryneſs of the whole body, and an utter loſs of appetite.

SIRICON *plumbi*, a name given by ſome chemical writers to calcined lead, or the grey powder made of lead by a ſlight calcination in an open fire.

SISARUM, *ſkirret*, in botany, the name of a genus of umbelliferous plants, the characters of which are theſe. The flower is of the roſaceous kind, being compoſed of ſeveral petals, arranged in a circular form. The cup becomes a fruit compoſed of two ſeeds, which are ſlender and gibboſe on one ſide, and flat on the other. To this it is to be added, that the roots are ſeveral large and long ones, hanging from the ſame head.

We know of no other ſpecies of this genus, but the common *ſiſarum*. *Tourn.* Inſt. p. 308. See SKIRRET.

The taſte of the *ſkirret*-root has ſomewhat of a bitterneſs and ſubaſtringency in it. It ſtrengthens the ſtomach, and is of good nouriſhment. It proves diuretic, and is by ſome pretended to be a remedy againſt the ill effects of mercury; but this is an idle opinion.

SISER, in botany, a name given to the ſkirret, otherwiſe called the white carrot, or yellow parſnep. See the article SISARUM.

SISKIN, in zoology, the common Engliſh name of a finging bird, kept in cages in ſome parts of England, where it is common, and called by authors *ſpinus* and *ligurinus*. *Ray*'s Ornithol. p. 192. See the article SPINUS.

SISON *ſyriacum*, in botany, a name given by ſome authors to the ammi, or biſhop's weed, a plant, whoſe ſeeds were once much in uſe in medicine. *Ger.* Emac. Ind. 2.

SISSITIEPTERIS, in botany, a name uſed by Pliny, and ſome others of the old authors, for the *pimpinella*, or burnet. *Ger.* Emac. Ind. 2.

SISTRUM, in antiquity, an inſtrument uſed for beating time in concerts. It was a plate of ſounding metal, of an oval form, the upper part of which was adorned with three figures; that of a cat with a human face in the middle, the head of Iſis on the right-ſide, and the head of Nephthys on the left. It was filled with wires of the ſame metal, which ſerved to beat againſt the plate when ſhaken. Mem. Acad. Inſcript. Vol. 7. p. 249, ſeq.

SISYMBRIUM, *ſpearmint*, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of four leaves, and is of the cruciform kind. The piſtil ariſes from the cup, and is finally turned into a long pod, divided into two cells by an intermediate membrane, and furniſhed with roundiſh ſeeds. To theſe marks it may be added, that there is a peculiar general appearance of all theſe plants, which will eaſily diſtinguiſh them, at firſt ſight, from all the others of the ſame claſs.

The ſpecies of *ſiſymbrium*, enumerated by Mr. Tournefort, are theſe. 1. The water-*ſiſymbrium*, or common water-creſs. 2. The purple-flowered broad-leaved Pyrenean *ſiſymbrium*. 3. The ſmooth rocket-leaved *ſiſymbrium* with yellow flowers, commonly called *barbarea*, and *winter-creſſes*. 4. The ſmall early-flowering ſmooth rocket-leaved *ſiſymbrium*, or winter-creſs. 5. The double-flowered ſmooth rocket-leaved *ſiſymbrium*. 6. The rough rocket-leaved *ſiſymbrium* with yellow flowers. 7. The ſhort-podded radiſh-leaved water-*ſiſymbrium*. 8. The radiſh-leaved ſhort-podded water-*ſiſymbrium* with variegated leaves. 9. The ſhort-podded water-*ſiſymbrium* with more deeply divided leaves. The three laſt are uſually called by authors *water-radiſhes*. 10. The creeping water-*ſiſymbrium* with leaves like thoſe of the naſturtiums. This is called by ſome *water-rocket*. 11. The ſmall rough-podded marſh-*ſiſymbrium*, called by many *rough-podded muſtard*. 12. The ſmall ſmooth-podded marſh-*ſiſymbrium*. 13. The wormwood-leaved annual *ſiſymbrium*, called by many authors *ſophia chirurgorum*. *Tourn.* Inſt. p. 226.

Siſymbrium, among the Romans, was one of the ingredients, whereof the nuptial garlands were compoſed. See NUPTIAL and GARLAND.

SISYMBRIUM, in botany, is alſo a name uſed to expreſs the wild water-mint. *Dale*'s Pharm. p. 205. See the article MENTHA.

SISYRA, among the antients, a woolly ſkin uſed for a covering to beds. *Hofm.* Lex. Univ. in voc.

SISYRINCHIUM, in botany, the name of a genus of plants, the characters of which are theſe. The flower and fruit are the ſame with thoſe of the iris and xiphion, but the root is compoſed of two bulbs, the one lying upon the other, as in the gladiol and crocus.

The ſpecies of *ſiſyrinchium*, enumerated by Mr. Tournefort, are theſe. 1. The large *ſiſyrinchium* with the flower marked with a yellow ſpot. 2. The large *ſiſyrinchium* with the flower marked with a white ſpot. And 3. the leſſer *ſiſyrinchium*. *Tourn.* Inſt. p. 365.

SITHCUNDMAN, in our old writers, one whoſe province it was to lead the men of a town or pariſh. Leg. Inæ. c. 56. Dugdale ſays, that in Warwickſhire the hundreds were formerly called *ſitheſoca*, and that *ſitheſocundman* and *ſithcundman* was the chief officer within ſuch a diviſion, i. e. the high-conſtable of the hundred. *Dugd.* Antiq. Warwick. *Blount.* in voc.

SITHESOCA, in our old writers, is uſed to denote the diſtrict now called an *hundred*. The word is Saxon, ſignifying a franchiſe, or liberty. Rot. Parl. 16 Hen. II. *Blount.*

SITICINES, among the Romans, perſons who ſounded a kind of trumpet, having a very mournful tone, at the burying the dead. *Danet.* in voc. See the articles BURYING and BURIAL.

SITONÆ, Σιτῶναι, among the Athenians, officers appointed to lay in corn for the uſe of the city, for which purpoſe the ταμίας τῆς διοικήσεως, or the public treaſurer, was to furniſh them with as much money as they had occaſion for. *Potter*, Archæol. Græc. l. 1. c. 15. Tom. I. p. 83.

SITTA, in the Linnæan ſyſtem of zoology, the name of a diſtinct genus of birds, uſually confounded with the woodpecker-kind. The characters of this genus are, that the foot has three toes before, whereas the woodpecker has but two fore-toes on each foot; the bill is angular, and ends in the form of a wedge, and the tail is raiſed. The grey, or aſh-coloured picus is of this genus. *Linnæus*, Syſtem. Natur. p. 45.

The *picus cinereus*, or grey woodpecker, is called in Engliſh the *nut-hatch* or *nut-jobber*.

It is a ſmall bird, not quite ſo large as the chaffinch. Its head, neck and back are grey; its ſides under the wings are red, and its throat and breaſt of a pale yellow, with a mixture of a cheſnut brown. The lower part of its belly is covered with red feathers, with white tips or ends, and it has a long black ſtreak on each ſide, running from the angle of the beak to the neck. Its long wing-feathers are black, and its tail variegated with black and grey. Its legs are red, and its toes ſtand three before, and one behind; not as in the woodpecker, two each way. It builds in holes of trees, and when their entrance is too large, artfully ſtops them up with mud. It feeds on inſects and fruits. It hoards nuts for the winter, and breaks them by ſticking them in a cleft of a tree, and ſtriking them with its beak. *Ray*'s Ornitholog. p. 98.

SIUM, in botany, the name of a genus of umbelliferous plants, the characters of which are theſe. The flower is of the umbelliferous kind, being compoſed of ſeveral unequal leaves, arranged in a circular form. The cup finally becomes a roundiſh fruit, compoſed of two ſeeds, which are gibboſe and ſtriated on one ſide, and flat and plain on the other. To this it is to be added, that the leaves ſtand by pairs on the ribs, and have a ſingle one to terminate the ends.

The ſpecies of *ſium*, enumerated by Mr. Tournefort, are theſe. 1. The common, or long-leaved *ſium*, or water-parſnep. 2. The *ſium* with ſerrated leaves. 3. The great broad-leaved *ſium*. 4. The *ſium* with deeply jagged leaves. 5. The creeping umbelliferous *ſium*. 6. The *ſium* which has umbels at the joints of the ſtalks. 7. The field-*ſium*, called *honewort*, or *corn-parſley*, and by authors *ſelinum ſii foliis*. And 8. the aromatic *ſium*, or *ſiſon* of the ſhops, called by many *amomum*, and *Macedonian parſley*. *Tourn.* Inſt. p. 308.

SIXTH (*Cycl.*)—SIXTH, in muſic, is not properly an original concord, as is advanced in the Cyclopædia, ſince it ariſes from the ſubtraction of the third from the octave. There are properly but three original concords, the octave, fifth, and third major. Philoſ. Tranſ. N° 481. p. 267. See the article INTERVAL.

Diminiſhed SIXTH, in muſic. See DIMINISHED *ſixth*.

SIZE (*Cycl.*)—The ſhreds and parings of leather, parchment, or vellum, by being boiled in water, and ſtrained, make *ſize* [b]. This ſubſtance is uſeful in many trades. Mr. Boyle mentions, among other uſes, that fine red ſtands, and hanging ſhelves, are coloured with ground vermilion tempered with *ſize*, and when dry, are laid over with common varniſh [c].—[[b] See GLUE, *Cycl.* [c] *Boyle*'s Works Abridged, Vol. 1. p. 150.]

Gold SIZE. See GOLD *ſize*.

SIZEL, in coining, is uſed where pieces of money are cut out from the flat bars of ſilver, after having been drawn through a mill into the reſpective ſizes or dimenſions of the money to be made; the reſidue is called *ſizel*, and is melted down again. *Lownd*'s Eſſ. upon Coin, p. 96.

SIZING, in mineralogy, a term uſed by the Corniſh miners for a peculiar method of ſeparating the purer from the impurer parts of an ore by means of ſieves. When the ore has been powdered, they put it into a wire-ſieve with fine holes, and in this they ſift it till the fine part goes through: this is properly what is called *ſizing*. They ſend the larger, or coarſer part, to be powdered again, and putting the reſt into a ſieve with a cloſe bottom, they let in a ſtream of water from a cock, and by means of continued ſhaking it about, they cauſe the lighter and fouler parts to be waſhed over the rims of the ſieve, and the remaining powder is the black tin.

SKAITE, in ichthyology, the Engliſh name of a ſpecies of the ray-fiſh, called by the generality of authors *raia undulata*, and *raia lævis*, and by ſome *rubus*.

It is diſtinguiſhed by Artedi by the name of the variegated *ray-fiſh* with the middle of the back ſmooth, and with only one row of ſpines in the tail. See RAJA.

SKEGG, in a ſhip, that ſmall and ſlender part of the keel, which is cut ſlanting, and left a little without the ſtern-poſt. It is now much out of uſe.

SKELETON (*Cycl.*)—We have, in the Philoſophichal Tranſactions, an account of an human *ſkeleton*, all the bones of which were ſo united, as to make but one articulation from the back to the os ſacrum, and downwards a little way. On ſawing ſome of them, where they were unnaturally joined, they were found not to cohere throughout their whole ſubſtance, but only about a ſixth of an inch deep all round. The figure of the trunk was crooked, the ſpinæ making the convex, and the inſide of the vertebræ the concave part of the ſegment. The whole had been found in a charnel-houſe, and was of the ſize of a full grown perſon.

Vegetable SKELETON. The preparations of leaves, fruits, roots, *&c.* called *vegetable ſkeletons*, are made in this manner. Chuſe for this purpoſe the leaves of trees or plants, which are ſomewhat ſubſtantial and tough, and have woody fibres, ſuch as the leaves of orange, jaſmine, bay, laurel, cherry, apricot, peach, plum, apple, pear, poplar, oak, and the like; but avoid ſuch leaves as have none of the woody fibres, which are to be ſeparated and preſerved by this method; ſuch are the leaves of the vine, lime-tree, and the like. The leaves are to be gathered in the months of June or July, and ſuch to be choſen as are ſound and untouched by caterpillars, or other inſects. Theſe are to be put into an earthen or glaſs veſſel, and a large quantity of rain-water to be poured over them; and after this they are to be left to the open air, and to the heat of the ſun, without covering the veſſel; when the water evaporates, ſo as to leave the leaves dry, more muſt be added in its place: the

the leaves will by this means putrefy, but they require a different time for this, ſome will be finiſhed in a month, and others will require two months, or longer, according to the hardneſs of the parenchyma of them. When they have been in a ſtate of putrefaction ſome time, the two membranes will begin to ſeparate, and the green part of the leaf to become fluid; then the operation of clearing them is to be performed. The leaf is then to be put upon a flat white earthen-plate, and covered with clear water; and being gently ſqueezed with the finger, the membranes will begin to open, and the green ſubſtance will come out at the edges; the membranes muſt be carefully taken off with a finger, and great caution muſt be uſed in ſeparating them near the middle rib. When once there is an opening toward this ſeparation, the whole membrane always follows eaſily; when both membranes are taken off, the *ſkeleton* is finiſhed, and it is to be waſhed clean with water, and then preſerved between the leaves of a book.

The fruits are diveſted of their pulp, and made into *ſkeletons* in a different manner. Take, for inſtance, a fine large pear that is ſoft, and not ſtrong; let it be nicely pared without ſqueezing it, and without hurting either the crown or the ſtalk; then put it into a pot of rain-water, cover it, ſet it over the fire, and let it boil gently till it is perfectly ſoft, then take it out, and lay it in a diſh filled with cold water; then hold it by the ſtalk with one hand, and with the other hand rub off as much of the pulp as you can with the finger and thumb, beginning at the ſtalk, and rubbing it regularly towards the crown. The fibres are moſt tender toward the extremities, and are therefore to be treated with great care there. When the pulp is thus cleared pretty well off, the point of a fine penknife may be of uſe to pick away the pulp ſticking to the core. In order to ſee how the operation advances, the foul water muſt be thrown away from time to time, and clean poured on in its place. When the pulp is in this manner perfectly ſeparated, the clean *ſkeleton* is to be preſerved in ſpirit of wine.

Skeletons of roots which have woody fibres, ſuch as turneps, and the like, muſt be made by boiling the root without peeling it till it be ſoft, that the pulp may be ſqueezed away by the fingers, in the ſame manner, in a diſh of water. Many kinds of roots are thus made into elegant *ſkeletons*, and the ſame method ſucceeds with the barks of ſeveral kinds of trees; which when thus treated, afford extremely elegant views of their conſtituent fibres. Philoſ. Tranſ. N° 416.

SKEW, or SKILL *facets*, among jewellers. See FACETS.

SKIN (*Cycl.*)—The cuticle, or ſcarf-*ſkin* of the human body, is remarkable for its ſcales, and for its pores. Its ſcales are wholly a microſcopical diſcovery, for being ſo very minute, that two hundred of them may be covered with a grain of ſand, they never could have been diſcovered by the naked eye. Theſe are placed on our *ſkin* as on fiſhes, that is three deep, or each ſcale ſo far covered by two others, that only a third part of it appears; and theſe lying in this manner over one another, ſeem the reaſon of the *ſkin*'s appearing white; for about the mouth and lips, where they only juſt meet together, and do not fold over, the blood-veſſels are ſeen through, and the parts appear red. The perſpirable matter is ſuppoſed to iſſue from between theſe ſcales, which lie over the pores, or excretory veſſels, through which the watery and oily matters perſpire; and theſe may find vent in a hundred places round the edges of each ſcale: ſo that if a grain of ſand can cover two hundred of theſe ſcales, it may cover twenty thouſand places through which perſpiration may iſſue forth.

A piece of the *ſkin* taken from between the fingers, from the forehead, neck, arms, or any other ſoft part of the body, which is not hairy, ſerves to ſhew theſe ſcales; for where the ſkin is become hard and callous, they are faſtened confuſedly together. They are generally compoſed of five ſides, and may be ſeen very diſtinctly if ſcraped off with a penknife, and applied to the microſcope in a drop of water. *Baker*'s Microſcope, p. 169.

Every part of the *ſkin* of the human body is alſo full of excretory ducts, or pores, which continually emit the ſuperfluous humours from among the maſs of the circulating fluid. In order to view theſe pores, cut a ſlice of the upper *ſkin* with a ſharp razor, as thin as poſſible, then immediately cut alſo a ſecond ſlice from the ſame place, which apply to the microſcope; and in a piece of this, not larger than what a grain of ſand can cover, there may be diſcovered innumerable pores as plainly, as little holes pricked in paper by a fine needle may be perceived, when it is held up againſt the ſun. The ſcales of the upper *ſkin* prevent any diſtinct view of the pores, unleſs they are thus cut off firſt, or elſe ſcraped away with a penknife; but if a piece of the *ſkin* between the fingers, or in the palm of the hand, be ſo prepared, and then examined, the light will be ſeen very beautifully through its pores. *Lewenhoek*, Arcan. Nat. Tom. 3. p. 413.

Mr. Lewenhoek has attempted to give ſome ſlight notion of the number of the pores in the human body: he ſuppoſes that there are a hundred and twenty ſuch pores in a line one tenth of an inch long; however, to keep within compaſs, he reckons only a hundred; an inch in length will then contain a thouſand in a row, and a foot twelve thouſand. According to this computation, a foot ſquare muſt have in it a hundred and forty four millions; and ſuppoſing the ſuperficies of a moderate ſized man to be fourteen feet ſquare, there will be in his ſkin two thouſand and ſixteen millions of pores. Dr. Grew has obſerved that the pores, through which we perſpire, are more remarkably diſtinguiſhable in the hands and feet; for if the hands be well waſhed with ſoap, and examined with but an indifferent glaſs in the palm, or upon the ends and firſt joints of the thumb and finger, there will be found innumerable little ridges parallel to each other, and of equal bigneſs and diſtance; and upon theſe ridges the pores may be diſcovered by a very good eye, even without a glaſs, lying in rows, but viewed through a good glaſs, every pore ſeems like a little fountain, with the ſweat ſtanding therein as clear as rock water; and this, when wiped away, will be found to be immediately renewed again.

Probably fleas, gnats, and other inſects, which feed on our blood and humours, make no new holes, but prey upon us through theſe pores. Philoſ. Tranſ. N 159.

SKIN, in commerce. The Indians in Carolina and Virginia dreſs buck and doe-*ſkins* in this manner: the felt being taken off they ſtrain them with lines, or otherwiſe, much like the clothiers racks, in order only to dry them. When the hunting time is over the women dreſs the *ſkins*, by putting them in a pond, or hole of water, to ſoak them well; then with an old knife, fixed in a cleft ſtick, they force off the hair whilſt they remain wet. This done, they put them into a kettle, or earthen-pot, and a proportion of deers brains, dried and preſerved for this purpoſe, is put in along with them; this veſſel is ſet on the fire till they are more than blood-warm, which will make them lather and ſcour clean; after this, with ſmall ſticks, they wreſt and twiſt each *ſkin*, as long as they find any wet to drop from them, letting them remain ſo wreſted for ſome hours, and then they untwiſt and ſtretch each of them in a ſort of rack, ſo that every part is extended; and as the *ſkin* dries they take a dull hatchet, or ſome ſuch inſtrument, and rub them well over to force all the water and greaſe out of them, till they become perfectly dry, and then their work is done.

In this manner one woman (for the men never employ themſelves in this work) will dreſs eight or ten *ſkins* in a day, that is, begin and finiſh them. Phil. Tranſ. N° 194.

SKINK, *ſcincus*, in zoology, *&c.* See SCINCUS.

SKINUS, σκινὸς, a name given by the antient naturaliſts to the lentiſk-tree, and alſo to a peculiar ſpecies of the ſquill, or ſcilla, which was not nauſeous and emetic as the common ſquill, but eſculent and pleaſant to the taſte.

The generality of writers, even among the antients themſelves, have not obſerved the ſynonymous uſe of this word, and tranſcribing at random paſſages from one another, have confounded the names of the lentiſk-tree and of this eſculent ſquill, and related of the one what the original writer ſaid of the other. Hence many of the abſurdities which we find in the works of ſome, but which are by no means to be attributed to all of them.

Pericles was called, by way of deriſion among the comic writers of his time, *Skinocephalus*, this term expreſſing his having a head like the *ſkinos*, muſt be wholly unintelligible to thoſe, who ſuppoſed it meant as the name of the lentiſk-tree; but when it was underſtood to be meant of the ſquill, the ſatire was plain, as a large and miſhapen head, ſuch as that of Pericles was, could not eaſily be better likened to any thing, than to the irregular, large, and oblong bulbous root of this plant.

Epicharmus, in Athenæus, names the *ſkinos* as a kind of eatable ſquill; and Theophraſtus expreſsly ſays, that the roots of all ſquills were not eatable, but that they only eat thoſe of the *ſkinos*, or, as others called it, the *Epimenedian ſquill*, a ſort of that plant ſo called, after the name of one Epimenides, who firſt brought it into uſe. The after-writers run into great errors about this word, ſome of them tranſlating Theophraſtus's epithet into a ſubſtantive, and diſtinguiſhing the Epimenedium from the ſcilla. Pliny, in particular, is guilty of this error. This is the peculiar ſpecies of ſquill, which the Athenians afterwards diſtinguiſhed from the common kind, by the name *ſkinus*. Theopompus mentions the *ſkinus* as an eſculent kind of ſquill; and, in general, the word oftener occurs as the name of the ſquill, than as the name of the lentiſk-tree.

Theophraſtus mentions the inſerting an eſculent root on the *ſkinos*, or ſkilla, giving the choice of either of thoſe roots, and ſays that it will thrive much better on this, than in the earth alone; the tranſlators have rendered this the lentiſk: but where is the probability of this excellent botaniſt's adviſing the grafting an eſculent root upon a tree, or giving a tree, and a common bulbous plant, as indifferent to the choice which was to be uſed? *Pliny*, lib. 23. cap. 5. *Theophraſtus*, lib. 5. c. 7. See LENTISCUS.

SKIPPER, an Engliſh name for the common gar-fiſh. See ACUS.

SKIRRET, *ſiſarum*, in botany, *&c.* See SISARUM.

The *ſkirret*, though one of the moſt wholeſome and nouriſhing of all the eſculent roots, is very little cultivated with us.

It may be propagated either by ſowing the ſeeds, or by planting the ſlips and off-ſets, but the firſt is much the beſt method. It ſhould be ſowed on a moiſt rich ſoil, in the beginning of February; in April the young plants will come up, when they muſt be cleared of weeds, and houghed up to three inches aſunder; and about a month afterwards they muſt be thinned a ſecond time, leaving them only ſix inches diſtant. After this they muſt be carefully kept clear from weeds, and when their leaves are decayed, they ſhould be taken up for uſe; but this ſhould only be done as they are wanted, for they ſpoil with lying out of the ground. The leaves decay in October, and from that time till the middle of March the roots are in ſeaſon; after this the roots become good for little. *Miller*'s Gard. Dict.

SKITTISH, in the manege. A horſe is ſaid to be *ſkittiſh*, in French *ecouteux*, or *retenu*, that leaps inſtead of going forward; that does not ſet out, or part from the hand freely, nor employ himſelf as he ought to do.

SKOUT, in zoology, a name given by the people of Yorkſhire to the *lomwia*, called in many places the *kiddaw*, and in Scotland the *auk*, or razor-bill, another of the webfooted water-fowl. *Ray*'s Ornitholog. p. 244. See the articles ALKA and LOMWIA.

SKRABBA, in ichthyology, a name given by ſome to a fiſh called by Jonſton and Schoneveldt the *ſcorpius marinus*, but wholly different from the *ſcorpæna* of other authors.

It is a ſpecies of cottus, and is diſtinguiſhed by Artedi by the name of the *cottus* without ſcales, with ſeveral prickles upon its head, and with the upper jaw ſomewhat lower than the other. See the article COTTUS.

SKULL (*Cycl.*)—It is not uncommon to find in ſome human *ſkulls* a different ſtructure and conformation from that which nature has given to others, or to the generality of the ſpecies.

Frequently there are met with heads, the ſagittal ſuture of which is prolonged to the root of the noſe, and divides the coronal bone into two parts: and there have been anatomiſts, who have judged this ſort of conſtruction of the *ſkull* peculiar to one ſex, rather than common to both.

To find the true cauſe of this, we are to have recourſe to the ſtate of the *ſkull* in the infancy. This bone is, at that time, always found divided into two lateral portions; ſo the ſame ſeparation, which is found between the two ſides, is found alſo between the two pieces, which afterwards compoſe the coronal bone. The two pieces of this coronal bone unite one with another, by means of their indented edges, and theſe afterwards coaleſce ſo perfectly, that the ſuture is obliterated; and this coaleſcence, which thus in proper time takes place in the coronal bone, ſometimes extends itſelf, alſo, to almoſt all the other bones of the *ſkull*; but this only happens in old age. But if, on the contrary, the two pieces, of which the coronal bone is compoſed, acquire their full thickneſs and hardneſs, before this coaleſcence is brought about, the ſuture remains, and is not obliterated, except in extreme old age. This reflexion may be alſo carried much farther.

In the *ſkulls* of a great number of infants, the coronal and the two ſides ſo perfectly unite, as not to leave the leaſt trace of their original ſeparation. It ſeems as if the bones, having expanded and grown in theſe early ſtages too faſt for the brain, have been united to one another while yet ſoft and tender: but when the brain, on the other hand, grows too faſt for the bones of the *ſkull*, theſe bones, preſſed more from within outwards than any other way, have little diſpoſition to unite with one another; and thus acquiring their thickneſs and hardneſs before their coaleſcence, they become much leſs inclined to coaleſce than before.

From theſe conſiderations we may conclude, that in thoſe infants, in which the growth of the brain is ſlow, and that of the bones of the *ſkull* quick, the ſuture, which is between the two portions of the coronal bone, is very quickly obliterated; and, on the contrary, when the encreaſe of the brain is quick, and the growth of the bones is ſlow, the ſuture, which divides the coronal bone into two pieces, is found to a great age.

That which is the *ſkull* in the more advanced ſtate of the infant, is originally no other than a membrane, which is afterwards to oſſify: not unfrequently the oſſification is impeded, in different parts of this membrane; and in the *ſkulls* of young ſubjects it is common to ſee theſe diſtinct parts, which remain membranous while the reſt of the *ſkull* has acquired its proper bony hardneſs. If the cauſe, which impeded the progreſs of the oſſification, ſubſiſts ſo long, as till the other parts of the *ſkull* are hardened into bone, and have their full growth and hardneſs, then will that, which ſhould have been naturally only one bone, form two.

This is the origin of the ſingular and unnatural ſutures, found in ſome human *ſkulls*, and called by ſome *ſupernumerary ſutures*. Sometimes there are, from this cauſe, ſuch ſupernumerary ſutures in almoſt all the bones of the *ſkull*. The os planum frequently is found thus divided into two; and from the ſame principle in nature it is, that a ſmall ſuture is ſometimes found in the maxillary bone, below the orbit, along the canal, which forms the lower orbitary cavity: the place where this little ſuture is found has happened to remain a long time membranous, and the oſſification at laſt taking place on the two edges of the remaining membrane, there has been found a ſuture.

In other bones of the *ſkull* we alſo frequently meet with larger or ſmaller ſpaces, which have continued membranous; and there are inſtances, in which the oſſification may be plainly perceived juſt begun in the center of the membranous ſpots.

It might be ſuppoſed that the brain was little liable to an unnatural growth, or expanſion, when we conſider that the brain is no other than a vaſt aſſemblage of pipes, or tubes, of a moſt extreme fineneſs, and that the particles, which compoſe theſe tubes, have but a very weak band of union one with another. Indeed we know very well, that when an injection has penetrated to the cortical ſubſtance of the brain, if that ſubſtance be macerated a little in water, its parts detach themſelves from one another, the veſſels become wholly deſtroyed, and there remains nothing but a number of extremely fine filaments of the matter of the injection, which has found its way into theſe veſſels, and been formed into their ſhape by cooling in their cavities. As there are found, however, a great number of *ſkulls*, which have a ſingular and odd configuration, it cannot but be, that the brain muſt be expanded into the ſame form. We are informed, that the people of ſome nations preſs the forepart of the heads of their children, as ſoon as born, with conſiderable violence, and continue this, in order to reduce the forehead to a flatneſs; but theſe *ſkulls* are always found to get in length behind what they want before.

Sometimes there has been obſerved, in the *ſkulls* of perſons of an advanced age, in the middle of the ſagittal ſuture, a deep impreſſion, or ſinking in, which had remained there from infancy; but nature, in this caſe, ſupplies the cavity with two protuberances of bone from the ſides of the adjoining parts; and ſome *ſkulls* are found very narrow, and of a remarkable length, nature giving one way the room ſhe denied the other. Many other ſingular conſtructions of the *ſkull* have been obſerved by anatomiſts; and probably in the perſons, to whom they have belonged, the brain has been able to perform its functions but badly. Be that as it will, it is certain that the brain has expanded, and formed itſelf to the ſhape of the *ſkull* in all theſe its unnatural figures; and neceſſarily the parts, of which the brain in ſuch caſes is compoſed, have taken a very different figure and arrangement from what nature intended: and in this caſe it cannot be, but that ſome portions of the brain have extended themſelves farther than they naturally ſhould have done, and others much leſs than was allotted to them. Mem. Acad. Scienc. Par. 1740.

Bones of the SKULL. The eight principal bones of the *ſkull* are ordinarily divided into common and proper. By proper bones anatomiſts mean thoſe, which are wholly employed in forming the globe of the *ſkull*, and of theſe they reckon ſix; the os frontis, the two parietal bones, the occipital bone, and the oſſa temporum: the common bones are thoſe which contribute to form the face, as well as the *ſkull*, *viz.* the os ethmoides, and the os ſphenoides. But this diviſion is not juſt, for the os frontis, and oſſa temporum, deſerve as much to be called common, as the two that are uſually reckoned ſo; and thus, inſtead of ſix, there would be only three proper bones, the oſſa parietalia, and os occipitis; and inſtead of two, there would be five common ones, the os frontis, oſſa temporum, os ethmoides, and os ſphenoides. *Winſlow*'s Anatomy, p. 21.

The adheſion of the pericranium to the *ſkull*, has been thought a ſure ſign of the bones being entire, but this is a miſtake; and the ſeparation of the cranium from the *ſkull*, is as uncertain a ſign of the cranium's being broken. Mem. de l'Acad. de Chirurg. Tom. 1.

We have ſome very particular obſervations on the bones of the human *ſkull*, by Mr. Hunauld, in the Memoires de l'Acad. Royale des Sciences, An. 1730.

Concealed injuries of the SKULL. When a blunt inſtrument is the occaſion of an injury on the cranium, if the injured part does not ſufficiently appear of itſelf, great induſtry is to be uſed to diſcover it. Where the common integuments appear tumid and ſoft, they are in this caſe to be divided to the bone; but in making the inciſion, great care muſt be taken not to lay too much ſtreſs upon the knife, leſt ſplinters of the fractured cranium ſhould by that means be forced in upon the brain. The beſt way to make this inciſion is in form of the letter X, and about an inch and half in length; lifting up the ſkin at each angle, and leaving the bone bare. The blood that is ſpilt is to be taken up with a ſponge, and dry lint ſtuffed between the ſkin and the cranium; and having thus found out the injured part of the cranium, the trepan is to be applied, if it be found neceſſary. If ſplinters of the bone are now found, they muſt be removed either with the fingers or the forceps, or, when they hang to the pericranium, with ſciſſors; but when they adhere pretty firmly to the neighbouring parts of the cranium, it is more adviſeable to replace them, than to endeavour to remove them by violence. *Heiſter*'s Surgery, p. 85.

Fiſſures of the SKULL, cracks in the bone of the *ſkull*, made by falls, blows, or other injuries. When theſe are attended with no other bad ſymptoms but white, yellow, or brown ſpots upon the face of the bone, they may be remedied with boring ſeveral ſmall holes through the ſurface of the *ſkull*, down to the diploe, and dreſſing with balſamic medicines: but where violent ſymptoms come on, which demonſtrate an extravaſation of blood in the cavity of the cranium, the trepan is to be uſed without delay.

Depreſſions of the SKULL, a denting in of the bone of the *ſkull* by a blow, without any manifeſt fracture, or, at the utmoſt, with ſuch a fracture, that from its flexibility it does not ſtart out by means of it, but continues to adhere firmly to the neighbouring bones. The *ſkulls* of infants are frequently ſubject to this, but in adults this caſe cannot happen; for the bones in them are become ſo rigid, that it is impoſſible to beat in any part of the cranium, without beating the bone to pieces. Theſe injuries of the cranium are called by the ſurgeons *fractures*, and the brain is frequently injured by theſe accidents, and its actions diſturbed. The firſt thing to be done, to give relief in this diſorder, is to lift up any part of the bone that is depreſſed, or beaten in upon the brain, or to remove any other body by which it is compreſſed. Sometimes a ſplinter, which is quite ſeparated from the reſt of the bone, is driven into the cavity of the cranium, and lies conſtantly vellicating the brain and its membranes with its pointed parts; this is to be removed without delay.

When ſlight depreſſions are made in the *ſkulls* of infants, without bringing on any bad ſymptoms, the forcible methods of raiſing the depreſſed part are not to be uſed, but medicated bags, boiled in ſpirit of wine, warm fomentations, and ſuch remedies, are to be applied; and laſtly, a plaſter of melilot to cover all. Theſe ſlight applications frequently cure ſuch little depreſſions, and prevent the miſchievous conſequences which might be expected from them. When a very large depreſſion, however, happens to infants, the elevation, or reſtitution of the parts is to be performed in the following manner. After ſhaving the part, apply a plaſter made of gummy and very ſticking ingredients, and ſpread upon very ſtrong leather, with a cord faſtened to the middle of it: this plaſter is to be laid on pretty warm, and left in its ſituation till grown cold; the ſurgeon then taking hold of the cord, which is faſtened to it, is to pull it directly upwards, and with it the depreſſed part of the cranium will often riſe, and be reſtored to its place. When this method does not ſucceed at the firſt trial, it is to be repeated; and when this fails, the application of a cupping-glaſs to the depreſſed part will ſometimes ſucceed, eſpecially if you ſtop the patient's breath, both at the noſe and mouth, during the operation: but if neither the plaſter nor cupping prove ſucceſsful, it will be neceſſary to take in the aſſiſtance of an inſtrument.

But when the cranium is ſo depreſſed, whether in adults or infants, as to ſuffer a fracture or diviſion of its parts, it muſt inſtantly be relieved. Some praiſe very much the uſe of a ſternutatory powder on this occaſion, affirming, that the diſtention of the brain is ſo violent in the act of ſneezing, that it will reſtore the depreſſed parts of the bone to their former ſituation: but the ill conſequences, that may attend this practice, are ſo grievous, that it ought wholly to be rejected, and the trepan and elevatories always to be uſed. *Heiſter*'s Surgery, p. 87.

Wounds of the SKULL. In wounds of the cranium, or *ſkull*, the firſt buſineſs is to find whether they are terminated in the external parts of the cranium, or whether they penetrate into its cavity. This is to be known by the eye. 2. By the probe, which however muſt be uſed very gently here, for fear of bringing on farther miſchief. 3. By examining the inſtrument with which the blow was given, and conſidering the degree of force with which it was impelled. And laſtly, the preſence, or abſence of violent bad ſymptoms. A violent blow upon the head will always be attended with vomitings and vertigoes, and blood will be diſcharged by the noſe, ears, and mouth, and the wounded perſon will loſe alſo his ſpeech and ſenſes. Theſe diſorders will appear ſometimes ſooner, ſometimes later, but always are more violent than otherwiſe, when the wound is made by a fall, or by ſome blunt inſtrument; in which caſes the cranium is uſually much ſhattered. The blood which diſcharges itſelf by the wound, when that is made by a ſharp inſtrument, will inſinuate itſelf between the common integuments and the cranium: in the contuſions that are made with blunt inſtruments, ſometimes it will be concealed under the cranium, and by corrupting the periofteum and cranium, will bring on ulcers, and caries of the bone, and frequently occaſions fevers, convulſions, and death. *Heiſter*'s Surgery, p. 82.

SKY (*Cycl.*)—SKY-*colour*. To give this colour to glaſs, ſet in the furnace a pot of pure metal of fritt from rochetta, or barillia, but the rochetta fritt does beſt; as ſoon as the metal is well purified, take for a pot of twenty pound of metal ſix ounces of braſs calcined by itſelf, put it by degrees, at two or three times, into the metal, ſtirring and mixing it well every time, and diligently ſcumming the metal with a ladle: at the end of two hours the whole will be well mixed, and a proof may be taken; if the colour be found right, let the whole ſtand twenty four hours longer in the furnace, and it will then be fit to work, and will prove of a moſt beautiful *ſky-colour*. *Neri*'s Art of Glaſs, p. 40.

SLABBERING-*bit*, in the manege. See the article MASTIGADOUR.

SLABS *of tin*, the leſſer maſſes, which the workers at the tin-mines caſt the metal into: theſe are run into moulds made of ſtone. *Ray*'s Engliſh Words, p. 124.

SLACK *a leg*, in the manege, called in French *mollir la jambe*, is ſaid of a horſe when he trips or ſtumbles.

SLACK *the hand*, is to ſlack the bridle, or give a horſe head.

SLACKEN, in metallurgy, a term uſed by the miners to expreſs a ſpungy and ſemivitrified ſubſtance, which they uſe to mix with the ores of metals, to prevent their fuſion. It is the ſcoriæ or ſcum, ſeparated from the ſurface of the former fuſions of metals. To this they frequently add limeſtone, and ſometimes a kind of coarſe iron-ore, in the running of the poorer gold-ores.

SLATCH, at ſea. When a rope or cable hangs ſlack, the ſeamen call the middle part, which hangs down, *the ſlatch of the cable*, or rope: ſo alſo, after long foul weather, if there come a ſmall interval of fair, they ſay, *this is a ſlatch of fair weather*.

SLATE (*Cycl.*)—The ſtrata of this ſtone uſually lie very much inclining, and are of a conſiderable extent. At Mullinecke, in Wales, the *ſlate* lies thus, and reaches from near the ſurface to the level of the tide that flows up the river, in the cliffs of which it lies. It may go much deeper, for it has not been examined to the bottom there; but what is obſervable in this place, is, that there are evident flexures or bendings in ſeveral parts of the ſtrata, and theſe always run from the top downwards; in the other parts of the ſame ſtrata there are ſeveral perpendicular fiſſures or cracks, but they are ſmall like cracks, and always empty.

It appears from this, that at the time when the bed of *ſlate* cracked in ſome places, it was ſo tough, as to abide being bent in others, by which means theſe flexures were formed. Sometimes the beds of *ſlate* are cracked at the angles of theſe flexures, the intermediate maſs, though parted from the reſt, lying obliquely. It is obſerved thus cracked, alſo, in many parts of Yorkſhire. *Woodward*'s Cat. of Foſſils, Vol. 2. p. 5.

Iriſh SLATE. See TEGULA *Hybernica*.

SLAVE. For the cuſtom of marking, or ſtigmatizing ſlaves, ſee STIGMATIZING.

SLAUGHTER (*Cycl.*)—SLAUGHTER-*ſkins*, a term uſed by our curriers and leather-dreſſers for the ſkins of oxen, or other beaſts, when freſh, and covered with the hair: ſuch as they receive them from the *ſlaughter*-houſes where the butchers flea the carcaſe.

SLEDGE (*Cycl.*)—SLEDGE is a large ſmith's hammer, to be uſed with both hands: of this there are two ſorts, the *uphand-ſledge*, which is uſed by under workmen, when the work is not of the largeſt ſort; it is uſed with both the hands before, and they ſeldom raiſe it higher than their head. But the other, which is called the *about-ſledge*, and which is uſed for battering or drawing out the largeſt work, is held by the handle with both hands, and ſwung round over their heads, at their arm's end, to ſtrike as hard a blow as they can.

SLEDGE, among miners. See DIGGING.

SLEEPERS, in natural hiſtory, a name given to ſome animals which *ſleep* all the winter: ſuch are bears, marmotes, dormice, bats, hedge-hogs, ſwallows, *&c.* Theſe do not feed in winter, have no ſenſible evacuations, breath little, or not at all, and moſt of the viſcera ceaſe from their functions. Some of theſe creatures ſeem to be dead, and others to return to a ſtate like unto that of the fœtus before birth. In this condition they continue, till by length of time maturating the proceſs, or by new heat, the fluids are attenuated, the ſolids ſtimulated, and the functions begin where they left off. See Dr. Stevenſon in Med. Eſſ. Edinb. Vol. 5. Art. 77.

SLEEPERS, in the glaſs trade, are the large iron bars croſſing the ſmaller ones, and hindering the paſſage of the coals, but leaving room for the aſhes. *Neri*'s Art of Glaſs, Appendix.

SLEEPERS, in a ſhip, timbers lying before and aft in the bottom of a ſhip, as the rung-heads do: the lowermoſt of them is bolted to the rung-heads, and the uppermoſt to the futtocks, in order to ſtrengthen and faſten the futtocks and rungs.

SLICH, in metallurgy, the ore of any metal, particularly of gold, when it has been pounded, and prepared for farther working. The manner of preparing the *ſlich* at Chremnitz, in Hungary, is this: they lay a foundation of wood three yards deep, upon this they place the ore, and over this there are four and twenty beams, armed at their bottoms with iron; theſe, by a continual motion, beat and grind the ore, till they reduce it to powder: during all this operation, the ore is covered with water. There are four wheels uſed to move theſe beams, each wheel moving ſix; and the water, as it runs off, carrying ſome of the metalline particles with it, is received into ſeveral baſons, one placed behind another;

and

and finally, after having paſſed through them all, and depoſited ſome ſediments in each, it is let off into a very large pit, of almoſt half an acre of ground; in this it is ſuffered to ſtand ſo long, as to depoſit all its ſediment, of whatever kind, and after this it is let out. This work is carried on day and night, and the ore taken away, and replaced by more, as often as occaſion requires. That ore which lies next the beams, where it was pounded, is always the cleaneſt, or richeſt.

When the *ſlich* is waſhed as much as they can, an hundred weight of it uſually contains about an ounce, or perhaps but half an ounce of metal; which is not all gold neither, for there is always a mixture of gold and ſilver, but the gold is in the largeſt quantity, and uſually is two thirds of the mixture: they then put the *ſlich* into a furnace with ſome lime-ſtone, and ſlaken, or the ſcoriæ of former meltings, and run them together. The firſt melting produces a ſubſtance, called *lech*; this lech they burn with charcoal, to make it lighter, to open its body, and render it porous, after which it is called *roſt*; to this roſt they add ſand in ſuch quantity as they find neceſſary, and then melt it over again. They have at Chremnitz many other ways of reducing gold out of its ore, but particularly one, in which they employ no lead during the whole operation; whereas, in general, lead is always neceſſary, after the beforementioned proceſſes. See the article GOLD-*ore*.

SLING (*Cycl.*)—SLING, at ſea, a word uſed variouſly. There are *ſlings* to hoiſe up caſks, or any other heavy things; which are made of ropes ſpliced into themſelves at either end, with an eye big enough to hold the thing to be *ſlung*.

There are other *ſlings*, which are made longer, and with a ſmall eye at each end; one of which is put over the breech of a piece of ordnance, and the other eye comes over the end of an iron crow, which is put into the mouth of the piece, to weigh and hoiſe the gun as they pleaſe.

There are alſo *ſlings* for the yards; which is done by binding them faſt to the croſs-tree aloft, and to the head of the maſt, with a ſtrong rope or chain, that if the tie ſhould happen to break, or to be ſhot to pieces in fight, the yard, nevertheleſs, may not fall down upon the hatches.

SLINGING (*Cycl.*)—SLINGING *a man overboard*, in order to ſtop a leak in a ſhip, is done thus: the man is truſſed up about the middle in a piece of canvaſs, and a rope to keep him from ſinking, with his arms at liberty, a mallet in one hand, and a plug, wrapped in oakum and well tarred in a tarpawling clout, in the other, which he is to beat with all diſpatch into the hole, or leak.

SLOANEA, in botany, the name of a genus of plants, deſcribed by Linnæus and Plumier, the characters of which are theſe. The perianthium conſiſts of one leaf, divided into ſeven ſegments. There are no petals. The ſtamina are a great number of ſlender filaments, broader at the end than in any other part, and of the length of the cup. The antheræ grow to the ſides of theſe filaments. The germen of the piſtil ſtands in the bottom of the cup. The ſtyle is ſubulated, and longer than the ſtamina. The ſtigma is acute. The fruit is a large roundiſh echinated capſule, compoſed of four valves. The ſeeds are oval, obtuſe, and fleſhy, and have oblong nuclei. *Linnæi* Gen. Plant. p. 242. *Plumier*, p. 15.

SLOATH, in natural hiſtory, the name of an animal remarkable for its ſlow motion. This creature is ſo very tedious in all its motions, that it will be three or four days in climbing up, and coming down a tree, and does not go the length of fifty paces upon even ground in a day. The ſound of its voice ſeems only to expreſs the word *haii*, for which reaſon the Braſilians call him by that name; but he uſually repeats the ſound about ſix times together, deſcending, as if one ſhould ſing, *la*, *ſol*, *fa*, *mi*, *re*, *ut*. Whatever he takes hold of, he does it ſo ſtrongly, or rather ſo ſtiffly, that he will ſometimes ſleep ſecurely while he hangs at it. *Bartæus*, de Reb. Braſ. p. 222.

Cluſius, Margrave, Piſo, and others, have given deſcriptions of this animal, but they none of them mention the length of his fore feet; which, according to the animal preſerved in the Muſeum of the Royal Society of London, is double that of the hinder pair. *Grew*'s Muſ. p. 11.

From the ſhag of his body, the ſhape of his legs, and his having little or no tail, as alſo from the ſlowneſs of his gate, and his climbing up trees, as little bears uſe to do, he ſeems to come near the bear-kind; from which he differs chiefly, in having but three claws upon a foot. This creature breeds principally in Florida and Braſil. Id. ibid.

SLOATS *of a cart*, the underpieces which keep the bottom of the cart together. See CART.

SLOE, *prunus ſylveſtris*, the Engliſh name for the wild plum. See the article PRUNUS.

SLOE-*worm*, in natural hiſtory, the name of an inſect found on the leaves of *ſloe*, or black-thorn, and ſometimes on thoſe of the garden-plum.

This, and a like worm, found on the leaves of the oak, both remarkable for the hairs which cover them, each of which is forked or divided into two at the ends, are uſually eſteemed caterpillars, but they are in reality animals of a very different claſs; the caterpillar has, at the utmoſt, but ſixteen legs, theſe have each twenty two, and have all the other characters of that claſs of inſects, called by the French naturaliſts *fauſſes-chenilles*, or baſtard-caterpillars.

All the animals of that claſs are very remarkable for the different figure they make after the laſt change of their ſkins, but this is in none ſeen ſo obviouſly, as in theſe two ſpecies; that of the oak is of a greeniſh colour, and its hairs, which are ſo ſtiff that they almoſt deſerve the name of ſpines, are black: that of the *ſloe* is of a greyiſh hue, and its ſpines longer, and of a deep brown; every one of theſe is, toward the extremity, divided into two, in the manner of the tines of a fork. Theſe give the animal a very remarkable figure, and are caſt off with the ſeveral ſkins, while the new ſkins leave others in their place; but in the laſt change, before that into the nymph ſtate, the change made into the creature is ſuch, that it could never be ſuſpected to be the ſame animal by any one, who was not an eye-witneſs of the change.

The creature in this, throwing off its ſkin, becomes perfectly ſmooth, and of a dirty yellowiſh colour, with not the lighteſt variegation on it, nor the leaſt appearance even of the remains of the ſpines. In this ſtate it remains till it goes into the nymph ſtate, and from that, after about ſixteen days, it comes out in the ſhape of a four-winged-fly. The whole proceſs of the change is the ſame, in the two ſpecies of the oak and the *ſloe*, but the flies they produce are very different. *Reaumur*'s Hiſt. Inſ. Vol. 9. p. 119.

SLOT, (*Cycl.*) in the ſportſman's language, a term uſed to expreſs the mark of the foot of a ſtag, or other creature proper for the chaſe, in the clay or earth, by which they are able to gueſs how long the creature has been gone by, and which way he went. The *ſlot*, or treading of the ſtag, is very nicely ſtudied on this occaſion: if the *ſlot* be large, deep printed in the ground, and with an open cleft, and added to theſe marks, there is a large ſpace between mark and mark, it is certain that the ſtag is an old one. If there be obſerved the *ſlots*, or treadings of two, the one long, and the other round, and both of one ſize, the long *ſlot* is always that of the larger beaſt. There is alſo another way of knowing the old ones from the young ones by the treading; which is, that the hinder feet of the old ones never reach to their fore feet, whereas thoſe of the young ones do.

Old ſtags alſo are long jointed, and they never tread doubly, or falſely, as the young ones do, becauſe the tendons, that hold the joints of their feet, are ſtronger; but the feet of the young ones are ſometimes forced, for want of theſe ſtrong ſinews, to turn away double. It is to be obſerved alſo, that there is a great difference between the *ſlot* of a ſtag or hart, and that of a hind; for there is no hart of the ſecond head ſo young, but that he leaves a larger and wider *ſlot* than the hind, excepting when the hinds are big with young, for on that occaſion their claws will open as wide as thoſe of the hart.

Another method of knowing the age of a ſtag is by his fumets, though ſome general rules are to be known, before any thing can be judged from this article. Theſe are, that in April and May, they caſt their fumets, as it were, in cakes, and in June and July they caſt them in thin, long, and large crotels, and from thence to the end of Auguſt they hold the ſame form and ſize; but they are in this laſt month always hard and knotty. In all theſe caſes, the largeſt and longeſt fumets are eſteemed to be the marks of the largeſt and oldeſt ſtags. If they have been diſturbed, or if they have received any hurt, they uſually caſt them ſharp at one end, and dry. This alſo is conſtantly the caſe, when their new horns are juſt grown to their hardneſs, and they rub them againſt the trees to get off the cracked membranes, which were the velvetings in their firſt ſtate. There is always alſo a difference between the fumets of the morning and thoſe of the evening: thoſe made at night, when they go to relief, are better digeſted, and conſequently moiſter than thoſe made in the morning, becauſe having taken their reſt all day, there is a more perfect digeſtion made than can be in the night, as they are, during that time, ſeeking food.

There are alſo ſeveral other ways of judging of the growth and ſize of a ſtag, as by his carriage, or bearings, according to the huntſman's phraſe; that is, according to the breaking of the tender branches of trees which he makes with his horns in paſſing through. When the boughs are found bruiſed and broken very high, and to a good width, there is no doubt of his being an old one: but this judgment is not to be made in the months of March, April, May, and June, becauſe their horns are at that time either wholly wanting, or they are young and velvety. The heighth of the creature's entries into the woods is alſo another mark of his ſize, for the old ones are always proud and ſtately, and go in erect, but the young ones will creep.

The older the ſtag is the ſooner he goes to fray, and the larger are the trees he chooſes for this uſe; the young ones go later to it, and always chooſe the weaker and lower trees. Notwithſtanding that, after the ſixth year, the age is not certainly known by the horns, as there is, after this time,

time, no increaſe in the number of their branches, yet a probable gueſs may be made from their being all thicker and more robuſt, and the tops more open.

SLOUGH (*Cycl.*)—SLOUGH-*ſilver*, in our old writers, a rent paid in ſome places in lieu of certain days work in harveſt, heretofore reſerved to the lord from his tenants. *Blount.*

SLOW (*Cycl.*)—SLOW-*worm*, the Engliſh name of the *cæcilia*, called alſo the *blind-worm*, and by ſome the *deaf-adder*. See the article COECILIA.

SLUDS, a term uſed by the miners in Cornwall for half-roaſted ores. See the article ORE.

SMALL (*Cycl.*)—SMALL-*craft*, in the ſea language. See the article CRAFT.

SMALL-*pox*. See the article POX.

SMALL-*ſtones*, among jewellers, denote diamonds under the weight of a carrat. *Jeffreys* on Diamonds, p. 21.

SMALL-*work*, among jewellers, is uſed to denote the ſtar and ſhell-facets of diamonds. *Jeffreys* on Diamonds. See the article FACETS.

SMALLAGE, in botany, *&c.* See APIUM.

SMALT (*Cycl.*)—There is not a more precarious proceſs in all metallurgy, than the preparation of this fine blue glaſs from cobalt, nor any manufacture, in which ſo expert workmen are neceſſary. The carrying the heat to too great a degree, in the roaſting the cobalt, is a very miſchievous error, and the ſuffering as much of the arſenic, as may be, to remain in the earth, is greatly to the advantage of the *ſmalt*; and its colour may be greatly heightened, by adding common arſenic to it while it is in fuſion.

It is always neceſſary to make careful and repeated experiments on a new ore, or a kind of cobalt, which has not been worked before; by trying it with various degrees of heat in the roaſting, and with different proportions of the flints and pot-aſh in the fuſion. On comparing the ſeveral products of theſe experiments, it will eaſily be ſeen which yields the fineſt colour, and this muſt be always after followed in the great operations.

It is well known that the beautiful blue glaſs, called *ſmalt*, is prepared from the fixed earth of cobalt; but experiments have proved, that this earth alone will not acquire that fine colour. Dr. Link tried ſome of it, by keeping it eight hours in the moſt intenſe heat, yet on taking it out, it was only a grey glaſs, excepting that there were a few blue ſpecks in it near the edges of the crucible. Theſe ſpecks make no objection to this doctrine, when properly conſidered; for they were owing, doubtleſs, to the ſame ſubſtance which is found neceſſary to be uſed, in order to procure the blue colour.

Flints are the neceſſary addition to cobalt for the making the blue glaſs, or *ſmalt*, and the crucible being made of earth, might eaſily contain ſome particles of ſand. Every piece of ſand is a ſmall ſtone, of the nature of flint; that is, a piece of cryſtal debaſed by earth; and theſe ſmall flints mixing with the glaſs of the cobalt-earth, while in fuſion, rendered the ſmall ſpecks, where they were mixed, true *ſmalt*, while the reſt remained grey and unaltered.

This earth of cobalt evidently contains ſome portion of copper, though ſo ſmall in quantity, that it can never be diſcerned by the common ſigns, and ſo intimately blended with the earth, that it can never be procured ſeparate. The lightneſs of this earth alſo, in which the copper reſides after the ſublimation of the arſenic, is a proof that its quantity muſt be very ſmall; yet that it exiſts there, is evident from the colours it affords.

Copper is well known to yield a green colour with acids, and a fine blue with alkalies. Thus a ſolution of this earth in aqua fortis is of a deep green, and its glaſs, when mixed with the alkali of flints and of pot-aſh, is the fine deep blue *ſmalt:* nor is it wonderful, that the vitrified earth of cobalt will never become blue by calcination alone, ſince, if it owes this colour to copper, it cannot be ſuppoſed to ſhew itſelf till called forth by an alkali. Philoſ. Tranſ. N° 396. p. 201.

Some cobalt yields *ſmalt* before roaſting, even better than it would afterwards; this is a peculiar kind of cobalt, but is ſo like the reſt, that it cannot be diſtinguiſhed by the eye, but experiment alone ſhews this property in it. Though cobalt in general requires roaſting, in order to fit it for yielding the *ſmalt*, yet its different kinds require ſome more, and ſome leſs roaſting; and the degree can never be judged of by the inſpection of the mineral, but is only known by the experienced artiſt in the proceſs. Hence it is, that expert and intelligent perſons are neceſſary in the *ſmalt*-works more than in almoſt any other branch of this ſort of buſineſs.

The addition of a ſmall quantity of arſenic, or of the arſenical flowers, during the time that the *ſmalt* is in fuſion, adds greatly to the beauty of the colour: this is a practice kept ſecret by the workmen of ſome places; and by this means their *ſmalt* is always rendered better than that of their neighbours. It is eaſy to ſee from this, that the roaſting of the cobalt is the neceſſary beginning of the *ſmalt*-work, not the diveſting it of its arſenic, which only happens accidentally in that proceſs; and it would be much better if it did not happen, ſince we find the arſenic added afterwards exalts the colour. From hence it is evident, that thoſe cobalts which will make *ſmalt* without previous roaſting, muſt, as they are found to do, make the very fineſt *ſmalt*, becauſe their arſenic is yet left in them in great part: and from this alſo appears the neceſſity of having expert workmen for the *ſmalt*-making; ſince the knowing the degree of fire neceſſary to the ore is a moſt eſſential article, and after the roaſting has been carried to a ſufficient degree, every moment's heat diveſting it of more of its arſenic than was neceſſary, makes the colour of the *ſmalt* to be made afterwards ſo much the worſe. From this alſo appears the reaſon why the blue, made by precipitation from a ſolution of cobalt, is ſo much ſuperior to the common *ſmalt* made by fire; becauſe in this the arſenic is all preſerved, whereas, in the common way of preparing it by fire, it is driven off. Philoſ. Tranſ. N° 396.

SMARAGDUS, the *emerald*, (*Cycl.*) a very beautiful gem of a fine green colour.

The gem known by the antients under the name of the *ſmaragd*, or *emerald*, was the ſame with that we call at this time by the ſame name, which has not been the caſe in the hyacinth, ſapphire, and many others.

In the days of Pliny we find, however, that a great deal of error and confuſion had crept into the world in regard to this gem, that author giving a long liſt of the different kinds of *emeralds*, as he calls them; among which there are evidently jaſpers, coloured cryſtals, and ſpars, reckoned among the ſpecies of this gem.

Our jewellers know only what they call two ſpecies of the *emerald*, the Oriental and the Occidental, and ſuch there are without queſtion; that is, the *emeralds* of the Eaſt-Indies are, in their pureſt ſtate, much finer than thoſe of any other part of the world, as is the caſe in the other gems: but our jewellers ſeldom meeting with theſe fine ſtones, call the American *emeralds* Oriental, and uſually ſell cryſtal, accidentally tinged green, under the name of *Occidental emeralds*. Theſe laſt being alſo greatly more common than the others, there has grown an opinion among our lapidaries, that the *emerald* is no harder than cryſtal; and this has no other foundation, than their uſually meeting with cryſtal under the name of the *emerald*.

The genuine *emerald*, when in its moſt perfect ſtate, is perhaps the fineſt and moſt beautiful of all the gems. It is found of various ſizes, but uſually ſmall. Multitudes are met with of about the ſixteenth of an inch in diameter, and they are found from this up to the ſize of a wallnut. We have accounts of ſome of immenſe ſize among the antients; but they were evidently not *emeralds*, but jaſpers, or other green ſtones. The large ſpecimens at preſent are very ſcarce, and whether they are Oriental or Occidental, are of very great value. *Hill*'s Hiſt. of Foſſ. p. 596.

The *emerald* is naturally of different figures, like the diamond, and many of the other gems. It is ſometimes found in a roundiſh, or pebble-like form, but much more frequently in a columnar, or angular one, reſembling common cryſtal. The pebble *emeralds* are always the hardeſt and brighteſt, but are ſeldom found exceeding the ſize of a pea, very rarely coming up to that of a horſe-bean. The cryſtalliform uſually grow ſeveral together, and are often conſiderably large. The pebble *emeralds* are found looſe in the earth of mountains, and in the ſands of rivers; the columnar are uſually found adhering to, or bedded in a white opake cryſtalline matter, and ſometimes to the jaſper, or to the pruſius; which laſt has been therefore called by ſome the mother of the *emerald*.

The rough *emerald*, of whatever form, is uſually of a very bright, and naturally poliſhed ſurface, and is ever of a pure and beautiful green, without the leaſt admixture of any other colour. It is of all the various ſhades of green, from the deepeſt to the paleſt, and doubtleſs is ſometimes wholly colourleſs; but it is then eſteemed a ſapphire, all the harder gems, when colourleſs, being called by our jewellers *white ſapphires*.

The Oriental *emerald* is of the hardneſs of the ſapphire and ruby, and is ſecond only to the diamond in luſtre and brightneſs; the American is of the hardneſs of the garnet; and the European is ſtill ſofter than that, but conſiderably harder than cryſtal; yet the coloured cryſtals, uſually ſold under the name of *emeralds*, have very much debaſed the credit of this gem. It loſes its colour in the fire, and becomes undiſtinguiſhable from the white ſapphire.

The Oriental *emeralds* are very ſcarce, and are at preſent found only in the kingdom of Cambay: very few of them have of late been imported into Europe, inſomuch, that ſome have ſuppoſed that there were in nature no Oriental *emeralds*; but within theſe few years ſome have been brought from Cambay into Italy, which greatly exceed all the American ones in beauty, as well as hardneſs.

The American *emeralds*, which, as they are the fineſt that come to us, are called by our jewellers *Oriental*, are found principally about Peru, in the earth of ſome mountains. The European *emeralds* come principally from Sileſia, though there are of them in other places; and the coloured cryſtals,

which are what we uſually meet with under the name of *Occidental emeralds*, are from the mines of Germany.

The ſcarcity of *emeralds* from the Eaſt-Indies has ſo generally confirmed the opinion of there being none there, that the moſt ſkilful of our dealers in gems generally tell us, that there is no ſuch ſtone as an Oriental *emerald*, but that the fine ones are all from Peru; and Tavernier ſuppoſes that many *emeralds*, which, in the memory of the jewellers in his time, had certainly been brought from the Eaſt-Indies, were originally brought from Peru; and to ſupport this, he gives us an account of the Peruvians trading by the South-Sea to the Eaſt-Indies before the Europeans diſcovered America: but this is a far-fetched conjecture, as no footſtep of ſuch a trade ſubſiſts. The truth, in regard to the preſent ſcarcity of the Oriental *emeralds* with us, ſeems to be this; that though the people of the Eaſt-Indies were once in an humour to part with their *emeralds*, they have ſince choſe to keep them in their own hands; as it is well known to travellers, that the princes of the Eaſt are at leaſt as well acquainted with the value of gems as we, and are willing to purchaſe thoſe, which are not of the produce of their own country, at as great a price. *Hill's* Hiſt. of Foſſ. p. 597.

SMARIS, in zoology, the name of a ſmall fiſh caught in the Mediterranean, and common in the markets of Rome, Venice, and elſewhere, and ſold to the poorer ſort of people at a very ſmall price.

It is ſeldom of more than a finger's length, and of a round, not flatted body, of a duſky blackiſh green on the back and ſides, and not marked with any variegations, but having on each ſide, near the middle of the body, one large black ſpot. Its gill-fins and tail are of a faint red. The iris of the eyes is of a browniſh white, and the tail is forked. *Geſner*, de Piſc. p. 616.

SMATCH, in zoology, a name by which the common œnanthe is called in many parts of England. See the article OENANTHE.

SMECTIS, in natural hiſtory, a name uſed by ſeveral authors for the common fuller's earth, more commonly called *cimolia purpuraſcens*. *Hill's* Hiſt. of Foſſ. p. 49. See the article FULLER'*s earth*.

The *fuller's earth* of England is a much more valuable article of commerce, than many would believe. It has the property of imbibing oil or greaſe, or any other fat ſubſtance; and the great uſe that is made of it, is for the cleanſing of woollen-cloth. Every one knows, that tar is often employed in the external diſtemperatures of ſheep, as are alſo tallow, greaſe, and many other fatty and unctuous ſubſtances. The wool itſelf, after ſhearing, cannot be worked up without being firſt oiled, or greaſed. For theſe, and many other reaſons, all our woollen-cloth muſt neceſſarily be greaſed, but then all this greaſe muſt neceſſarily alſo be taken out of it again, before it can be ſold or worn, and nothing yet known ſerves to this purpoſe ſo well as this *earth*.

The *fuller's earth* is very plentiful in England, and as much excels that of all other nations in goodneſs, as in quantity and cheapneſs, and this is one great reaſon why we have the advantage of other nations in the woollen manufacture; to preſerve and ſecure this to us, the *fuller's earth* is forbid to be exported, under large penalties, by Act of Parliament. This *earth* is one great inſtance of the value of the Engliſh foſſils; and Dr. Woodward's love for his native country has carried him ſo far, as to make him affirm, from his own obſervation, that this iſland wants no foſſile ſubſtance known in the world, except diamonds, and ſome other gems, and quickſilver ores. *Woodward's* Cat. Foſſ. Vol. 1. p. 8.

SMEGMA, a kind of waſh in uſe among the antients. See the article DETERSORIUM.

SMELL, (*Cycl.*) is uſed as the name of a peculiar ſort of wine, of which there are two ſpecies; the one ſort is very fragrant, muſcatelline, and aromatic; this is called ſimply the *ſmell-wine*: but the other, which is very rank and offenſive to the noſe, is called by the Germans *ſmel-bruntzer*. Many have been the conjectures about the occaſion of the rank ſmell of this wine, it not being owing to the grape it is made from, thoſe of the ſame vineyard often affording the aromatic, and often the rank wine: ſome have imputed the ſtrange difference to the veſſel, others to the vine, and others to the earth it grows in; but the firſt of theſe is too trifling a cauſe for ſuch an effect, and the others are confuted by experience of the ſame vine, in the ſame place, yielding both. The opinion of Portzius, that the rankneſs of the *ſmell* of ſome of this wine is owing to ſome irregularities in the working; this is certain, that it never is perceived before the working. The *ſmell* is truly urinous, and is that of a volatile alkali; which not being embodied in, or ſubdued by the acid of the grape in this imperfect fermentation, ſhews itſelf in this rank manner. It is evident that the *ſmell* is of a volatile nature, for it is often loſt in the drawing the wine ſeveral times out of one veſſel into another, evaporating during the time of the drawing it out. *Portzius*, de Vin. Rhen.

SMELLING (*Cycl.*)—The ſenſe of *ſmelling* ſeems extremely fine in ſome inſects. It is reported of bees, that they will ſmell honey or wax above a mile; and on this quality, in that little creature, is founded a very profitable ſort of hunting in the woods in New-England, and ſome other places, for the honey which the wild bees collect. Theſe inſects are very numerous in the woods there, and have great ſtores of wax and honey; but it was always very difficult to find them, till this method was invented.

The hunter always chooſes for his purpoſe a fine, clear, and ſun-ſhiny day: he then goes out into the woods with a trencher in his hand, on which there is ſome honey; this he ſets down upon the ſtump of a tree. The bees ſoon find this out, and come to feed on it: as ſoon as three or four are come about it, he catches them ſeverally in little boxes, and after a few minutes he lets them out one by one, and obſerves their courſe. The creature always mounts to a little height in the air, and then goes directly forward in a ſtrait line to the tree in which the hive is. As the hunter cannot purſue this little creature in her flight through a thick wood, he always takes with him his pocket-compaſs, rule, and other inſtruments, with a ſheet of paper, and on this he ſets down the courſe; ſuppoſe it, for inſtance, to be weſt. By this he is certain, that the tree where the hive is muſt be ſomewhere in a line due weſt from the place where he is; but he wants to know the exact diſtance from his ſtation. In order to do that, he makes an off-ſet, either ſouth or north, ſuppoſe north, of an hundred perches, or rods; if it be more, it will be ſtill more exact, becauſe the angle will not be ſo acute. Then he goes to this ſecond ſtation, and lets out another bee, and obſerves its courſe alſo very carefully; for being loaded it will certainly, after mounting to a ſmall height in the air, fly directly to the hive as the former did. This ſecond courſe the hunter finds to be ſouth fifty four degrees weſt; then there remains nothing but to find out where the two courſes interſect, for in that place the tree, and the hive in it, certainly is.

The foundation of all this, is the ſtrait or direct motion of bees, which, when loaded with honey, always fly directly to their hive; and this is found to be an unalterable law of nature in theſe animals, ſo that the hunter is never diſappointed, when he takes his meaſures rightly, and vaſt quantities of honey are thus taken every year.

One very remarkable part of this hiſtory is, that though the bees are now ſo vaſtly plentiful in this part of the world, they are not natives there, and are only the produce of ſuch bees as were carried thither from England about an hundred and fifty years ago: for the firſt planters never ſaw a bee in the woods till long after the place was ſettled, and hives of bees, among other things, had been brought from us. What is a greater proof of this, is, that the natives of the place knew nothing of the bee till they ſaw ours; they have no word in their language to expreſs that creature, but commonly called it, for a long time, the *Engliſhman's fly*. Before this method of finding the hives was brought into practice, the planters uſed to watch the bees which they found in the woods by the eye, and after obſerving ſeveral, one after another, fly the ſame way, they would ſometimes hit upon the place; but it was with great uncertainty, as well as great difficulty. It is obſerved of the bees in that part of the world, that in ſwarming they never move northward, but always either due ſouth, or ſomething inclining that way. Philoſ. Tranſ. N° 367.

SMELT, *apua phalerica*, in ichthyology. See APUA.

Theſe fiſh will live almoſt any where, but they are very apt to degenerate. They are common in the rivers of New-England, and are as large as with us, often weighing two ounces and a half; but a pail-full of theſe being taken from one of their rivers, and put into an adjoining pond, they all degenerated in ſuch a manner, that they were afterwards found ſo ſmall, that the largeſt did not weigh more than five pennyweights. Though thus ſmall, however, they are much valued, and are better taſted than the others. They are very tranſparent, and of a beautiful ſhining pearl colour. Philoſ. Tranſ. N° 374. p. 232.

They are called *ſmelts*, becauſe they melt, as it were, or diſſolve between the fingers in handling them.

SMELT, among the fiſhermen in Yorkſhire, and ſome other parts of England, is alſo a name given to the ſalmon while in its firſt year. *Willughby's* Hiſt. Piſc. p. 189. See the article SALMON.

SMELTING (*Cycl.*)—SMELTING-*houſe*, a houſe where they run and melt the ore into lead; one of theſe will run a ton in ten or twelve hours; a fodder is their uſual day's work, that is, twenty two hundred and an half weight. *Houghton's* Compl. Min. in the Explan. of the Terms.

SMEW, in zoology, the Engliſh name of the common mergus, known among authors by the name *albellus*, and *mergus cirratus*. See MERGUS.

SMILAX, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, being compoſed of ſeveral petals arranged in a circular form. The piſtil finally becomes a ſoft roundiſh berry, containing a roundiſh or oval ſeed.

The ſpecies of *ſmilax*, enumerated by Mr. Tournefort, are theſe. 1. The rough *ſmilax* with red berries. 2. The rough *ſmilax* with fewer prickles, and with black fruit. 3. The

rough

rough *ſmilax* with broad and blunt-pointed leaves, and no notches or prickles at their edges. 4. The one-leaved dwarf *ſmilax*, called *one-leaf*, *unifolium*, and *little lilly of the valley*. 5. The rough racemoſe *ſmilax* with Solomon's ſeal leaves. 6. The ſpiked *ſmilax* with Solomon's ſeal leaves. *Tourn.* Inſt. p. 654.

SMILAX *aſpera*, is uſed for great ſcarlet oak, or ilex. *Tourn.* Inſt. p. 553.

SMILAX *lævis*, in botany, a name given by many authors to our common great white bind-weed. See the article CONVOLVULUS.

SMIRIS, in natural hiſtory. See EMERY.

SMITING-*line*, in a ſhip, is a ſmall rope faſtened to the miſſen-yard-arm, below at the deck, and is always furled up with the miſſen-ſail, even to the upper end of the yard, and from thence it comes down to the poop. Its uſe is to looſe the miſſen-ſail without ſtriking down the yard, which is eaſily done, becauſe the miſſen-ſail is furled up only with rope-yarns; and therefore when this rope is pulled hard, it breaks all the rope-yarns, and ſo the ſail falls down of itſelf. The word of art is, *ſmite the miſſen* (whence this rope takes its name) that is, hale by this rope that the ſail may fall down.

SMOKE *(Cycl.)*—SMOKE-*ſilver*, in our old writers. Lands were held in ſome places by the payment of the ſum of ſixpence yearly to the ſheriff, called *ſmoke-ſilver*. Pat. 4 Edw. 6. *Smoke-ſilver*, and *ſmoke-penny*, are to be paid to the miniſters of divers pariſhes as a modus, in lieu of tithe-wood; and in ſome manors, formerly belonging to religious houſes, there is ſtill paid, as appendant to the ſaid manors, the antient Peter-pence, by the name of *ſmoke-money*. *Blount.*

SMORZATO, in the Italian muſic, is uſed to ſignify that the bow, or fiddle-ſtick, ſhould be drawn to its full length, not with the ſame ſtrength of hand throughout, but bearing lighter and lighter on it by degrees, till at laſt ſcarce any ſound be heard. This term is not much uſed at preſent. *Broſſard.* Dict. Muſ.

SMUT *(Cycl.)*—SMUT, in huſbandry, a diſeaſe in corn, in which the grains, inſtead of being filled with flower, are full of a black ſtinking powder.

Many things have been ſuſpected as the cauſes of this diſtemperature in corn; but Mr. Tull ſeems convinced by experiment, that it is cauſed only by too much moiſture, the ſeveral plants of corn, which he had taken up by the roots and planted in troughs of very moiſt earth, all bringing forth *ſmutty* ears, while very few ſuch were found in the corn of the field from whence theſe plants were taken. It is obſervable, alſo, that thoſe ears, the grains of which are to be *ſmutty*, never ſend up any flowers at all.

The two things, recommended by writers of huſbandry as remedies, or preventions of this diſeaſe, are brining, and changing the ſeed. The firſt of theſe methods was accidentally diſcovered about a century ago: a ſhip load of wheat was, about autumn, ſunk near Briſtol, and afterwards was taken up at the ebbs at ſeveral times, after being thoroughly ſoaked in ſea-water. When the wheat was all taken up, it was found unfit to make bread of, but a farmer trying ſome of it for ſowing, found it anſwer very well, and himſelf, and the neighbouring farmers, bought it all up at a ſmall price; the country all about was ſown out of this cargo. It happened that *ſmuttyneſs* in the wheat-corn was a reigning diſtemper in all parts of the kingdom at that time, but it was remarkable, that all the fields ſown with this ſalt wheat were abſolutely free from the miſchief: this eaſily introduced the practice of ſoaking wheat, before ſowing, in a brine of ſalt and water, to prevent it in other places, and it has ſucceeded well. Mr. Tull gives an inſtance of the certainty of its effect, in the caſe of two farmers whom he perſonally knew, and whoſe farms lay intermixed: theſe men bought the ſame ſeed between them from a very good change of land, and parted every land between them in the field; the oldeſt farmer believed the brining to be a fancy, and ſowed his ſeed unbrined, the other brined all his ſeed, and the conſequence was, that the old farmer had a great deal of *ſmut* in his corn, while the other had not one *ſmutty* ear.

When wheat is intended for drilling, it muſt be ſoaked in no other brine than that of pure ſalt and water, for if there be any greaſe among it, it will never be dry enough for this manner of ſowing. If ſeed wheat be ſoaked in urine, it will not grow, and if it be only ſprinkled with it, it will moſt of it die, unleſs it be planted preſently. The moſt expeditious way of brining wheat for drilling, is to lay it in a heap, and waſh it with a ſtrong brine ſprinkled on it, ſtirring it up with a ſhovel, that it may be all equally brined, or wetted with it; after this ſift on ſome fine lime all over the ſurface, and ſtir it up, ſtill ſifting on more in the ſame manner till the whole is duſted with the lime, it will then be ſoon dry enough to be drilled without farther trouble. It muſt be quick lime, in its full ſtrength, that is uſed on this occaſion.

Bad years will cauſe *ſmut* in corn, and good years will prevent it: it is, however, obſervable, that the crops in which there is *ſmutty* corn will, if uſed for ſeed, be liable to produce *ſmutty* corn again, rather than other ſeed. The brining is a defence againſt bad years, and againſt the miſchiefs attending the ſowing corn among which there has been *ſmut*.

The other method of changing the ſeed is by many held effectual to prevent *ſmuttyneſs* in the crop; ſeveral, who have tried this with due care, have found perfect ſucceſs from it: and it is to be obſerved, as to the great ſucceſs of the drowned wheat at Briſtol, that it was a change of ſeed to the lands on which it was ſown, as well as a brined ſeed.

Seed-wheat ſhould be bought from the crop on a ſtrong clay-land, whatever kind of land it is to be ſowed upon. A white clay is a good change for a red clay, and a red clay for a white; but whatever the land be, from which the ſeed is taken, it may be infected, if that be not changed there the preceding year; and then there may be danger, though it be had from ever ſo proper a land. It is a rule among the farmers, never to buy ſeed-wheat from a ſandy ſoil; they expreſs their diſlike of this by the coarſe rhime; *ſand* is a change for no *land*.

A crop of wheat, very early planted, is not ſo apt to be *ſmutty*, as one planted leſs early; and the farmers have obſerved, that the largeſt and plumpeſt ground fat wheat is more liable to be *ſmutty* than the ſmall ground wheat. *Tull's* Horſehoeing Huſbandry.

The *ſmut* of corn uſually happens after rain, followed by a bright ſunſhine; and when the *ſmutted* ſtalks are examined, they are found to be ſpotted, and pricked as it were with ſmall burnt places. The cauſe of the malady, therefore, probably is, that thoſe ſmall drops of rain, which remain upon the ſtalks before they are dried up by the ſun, act as ſo many lenſes, or ſmall burning-glaſſes, and their focus being very near them, their effect falls upon the ſtalk which ſupports them; wherefore the ſun's rays, collected in this point, muſt burn, and this burning dries up the ſtalk, and prevents the ear from graining, or producing its proper ſeeds. See the article BLIGHT.

Smutty corn is of a very miſchievous nature to thoſe who eat it. Schober has publiſhed a diſſertation on a terrible epidemical malady that raged, in the year 1722, in many parts of Germany, and carried off a great many people of all ages and ſexes: this he attributes wholly to their eating flower and bread made of corn, among which a larger than ordinary quantity of this *ſmut* had been produced the year before, and ground down with it. From this it appears, that theſe black ears have a ſtupefactive and narcotic quality, depending on a peculiar ſulphur they are endowed with, and to this ſulphur it is owing, that they are ſo inflammable beyond other corn. This ſulphureous principle is very hurtful to the nerves, and never fails to cauſe diſorders of them, of various kinds, when taken in any quantity; contractions, and convulſions of the limbs, vertigos, ſleepineſs, and, in fine, light-headedneſs, were the ſymptoms of the diſeaſes brought on by the eating it on the occaſion abovementioned; and ſometimes true, and incurable epilepſies come on. Some were ſeized with fevers, and children in particular were found more ſubject to the ſmall-pox that year, than they had been obſerved to be, and they had commonly very bad kinds.

SMYRHIZA, in botany, a name uſed by Pliny, and ſome other of the old authors, for the common myrrhis, or chervil. *Ger.* Emac. Ind. 2.

SMYRNIUM, *Alexanders*, in botany, the name of a genus of the umbelliferous plants, the characters of which are theſe. The flower is of the roſaceous kind, conſiſting of ſeveral petals, arranged in a circular order on a cup, which afterwards becomes a fruit of a ſort of globular figure, compoſed of two thick and, in ſome degree, lunated ſeeds, being gibboſe and ſtriated on one ſide, and flat and ſmooth on the other. See Tab. 1. of Botany, Claſs 7.

The ſpecies of *ſmyrnium*, enumerated by Mr. Tournefort, are theſe. 1. The common great *ſmyrnium*, or herb *Alexanders*. 2. The round-leaved Candy *ſmyrnium*. 3. The leſſer parſley-leaved Portugal *ſmyrnium*. *Tourn.* Inſt. p. 31.

The antient Greeks have plainly deſcribed two different plants under this name; the one the common *Alexanders*, the other the *petroſelinum Cilicium*, or Cilician parſley. The former of theſe plants loves moiſt and rich ground, and the other grows no where but on rocky hills, and in the drieſt and moſt barren places. Pliny, not obſerving that the antient writers knew two plants under this name, accuſes them of an error, in ſaying that the *ſmyrnium* loved dry and barren places, whereas the Romans, who cultivated the *ſmyrnium* at that time, found it delighted only in rich moiſt ſoils; but the antients, whom he cenſures thus, had ſpoke what he records of the *petroſelinum*, not of the great water-*ſmyrnium*.

SMYRUS, in ichthyology, a name ſometimes given by Pliny to the fiſh called by authors *myrus*, and by Willughby the *ſea-ſerpent* with a compreſſed tail.

It is a ſpecies of the muræna, according to Artedi, and is diſtinguiſhed from all the others by that author, under the name of the *muræna* with a ſharp ſnout, variegated with white

white ſpots, and with the edge of the back fin black. See the article MURÆNA.

SMYTHAM, in mineralogy, lead-ore ſtamped and pounded down, like powder or ſand, to cleanſe the ſtones and earth from the ore. *Houghton*'s Compl. Miner in the Explan. of the Terms.

SNAFFLE, in the manege, a well known kind of bridle. The *ſnaffle*, after the Engliſh faſhion, is a very ſlender bit-mouth without any branches: they are much uſed in England inſtead of true bridles, which are only employed in the ſervice of war. The French call them *bridons*, by way of diſtinction from *brides*, i. e. bridles.

The *ſnaffle*, or ſmall watering-bit, is commonly a ſcatch-mouth, accoutred with two little very ſtraight branches, and a curb, and mounted with a head-ſtall and two long reins of Hungary leather.

SNAIL, in ichthyography. See LIPARIS *noſtras*.

Perrault doubts of *ſnails* having eyes, and Dr. Brown denies it; but according to Dr. Porterfield, a good microſcope ſhews them diſtinctly. Med. Eſſ. Edinb. Vol. 3. Art. 12.

The eyes of *ſnails* are lodged in their four horns, one at the end of each horn, which they can retract at pleaſure. Id. ibid.

The manner of examining theſe eyes is this: when the horns are out, cut off nimbly the extremity of one of them, and placing it before the microſcope, you may diſcover the black ſpot at the end to be really a ſemiglobular eye.

The diſſection of this animal is very curious; for by this means, the microſcope not only diſcovers the heart beating juſt againſt the round hole near the neck, which ſeems the place of reſpiration, but alſo the liver, ſpleen, ſtomach, and inteſtines, with the veins, arteries, mouth, and teeth, are plainly obſervable. The guts of this creature are green, from its eating of herbs, and are branched all over with fine capillary white veins. The mouth is like a hare's, or rabbet's, with four or ſix needle-teeth, reſembling thoſe of leeches, and of a ſubſtance like horn.

Snails are all hermaphrodites, having all each ſex united in the individual; they lay their eggs with great care in the earth, and the young ones are hatched with ſhells compleatly formed.

Cutting off a *ſnail*'s head, a little ſtone appears, which is ſuppoſed to be a great diuretic, and good in all nephritic diſorders. Immediately under this ſtone the heart is ſeen beating, and the auricles are evidently diſtinguiſhable, and are membranous, and of a white colour; as are alſo the veſſels which proceed from them.

Snails diſcharge their excrements at a hole in their neck; they alſo breathe by this hole, and their parts of generation are ſituated very near it. The penis is very long, and in ſhape reſembles that of a whale. *Baker*'s Microſcope, p. 217.

So ſmall an animal as the *ſnail* is not free from the plague of ſupporting other ſmaller animals on its body; and as in other animals we find theſe ſecondary ones either living only on their ſurface, as lice, &c. or only in the inteſtines, as worms, it is very remarkable that this creature infeſts the *ſnail* in both theſe manners, being found ſometimes on the ſurface of its body, and ſometimes within its inteſtines.

There is a part of the common garden-*ſnail*, and of other of the like kinds, commonly called the *collar*; this ſurrounds the neck of the *ſnail*, and is conſiderably thick, and is the only part that is viſible, when the animal is retired quietly into its ſhell. In this ſtate of the animal theſe inſects, which infeſt it, are uſually ſeen in conſiderable numbers marching about very nimbly on this part: this nimble motion is almoſt peculiar to them, moſt other creatures of this kind being very ſlow in their motions: they may be ſeen in many other circumſtances of the animal, but it is this in which they are moſt obvious to the naked eye. Though they are very ſmall, they cannot however make their way under the ſhell, to run over the reſt of the body of the *ſnail*, every part of it adheres too firmly to the ſhell to ſuffer that; but they have another very different way of enlarging their place of abode: the *ſnail*, every time it has occaſion to open its anus, gives them a place by which to enter into its inteſtines, and they often ſeize the opportunity. The anus of this creature is ſituated not within the ſhell, but in this collar, which ſurrounds the mouth of it; and the *ſnail* ſeldom moves, to go a little way out of its ſhell, without opening it, as it does alſo in many other circumſtances.

Theſe inſects always take advantage of the opening, and ſwiftly get in and run up into the inteſtines, inſomuch that their natural reſidence ſeems there, and that they never are upon the ſurface of the animal but by accident, and much againſt their will; they ſeem to be driven thither by this accident: the fæces of the *ſnail* fill up the whole width of the inteſtine, and when they are diſcharged, muſt neceſſarily carry out with them whatever is between them and the anus; now it may eaſily happen, that a number of theſe ſmall animals may be in that part of the inteſtine, which is between the anus and the fæces: all theſe muſt be diſcharged with them, and while they are walking about upon the neck of the animal, the aperture of the anus cloſes, and leaves them no power of entering back again, till another opportunity; and the frequency of this accident may eaſily drive out enough of theſe inſects, to keep always ſome upon the neck, though every one of them, while there, is ſeeking the firſt opportunity of getting into the inteſtines again.

Theſe inſects infeſt every kind of *ſnail*, though they are moſt frequent on the common large garden-kind; but there is a ſmall ſpecies of *ſnail*, remarkable for a ſort of cover, nearly as hard as the ſhell, with which the creature cloſes up its mouth upon occaſion: in this theſe creatures may be diſtinguiſhed, even within the inteſtines. The ſkin of this *ſnail* is very thin and tranſparent; and if the ſhell be broken off a little way, and the eye kept attentively on that part, theſe little inſects will be diſtinguiſhed through the ſkin running nimbly about in the inteſtines.

Though theſe inſects are found in all ſorts of *ſnails*, they are not to be ſeen at all times; rainy ſeaſons ſeem particularly diſadvantageous to them, and it is only in dry times that they are always to be found when looked for; whether it be that the rain deſtroys the animals, when already formed, or that they are in themſelves but ſhort-lived, and the rain prevents the hatching of the eggs for more. The inſects are content with the naked body of the *ſnail* alone as their habitation, they never get upon the ſhell, and if they are forced to it, they as ſoon as poſſible quit it again, and get to their old poſt. They appear of a whitiſh colour to the naked eye, ſome of a dirty greyiſh white, and ſome of a white with a mixture of reddiſhneſs; but a microſcope is neceſſary to give us a view of their different parts and ſtructure. They have a regular trunk, in the manner of many other inſects, which they occaſionally can bend downwards, and in a great meaſure hide from the ſight: this trunk, which ſerves them to ſuck in their nouriſhment from the body of the *ſnail*, is placed between two little horns, which are extremely moveable every way, and are capable of being extended in length, or ſhortened, in the manner of the horns of the *ſnail*, which is a circumſtance not obſervable in the horns, or antennæ of other inſects. The body is divided into ſix rings, beſide the anterior part, on which are placed the horns and the trunk. The creature has four legs on each ſide, two of which on each are articulated into the anterior part, which gives riſe to the horns and trunk, and the other two into the firſt ring of the body; ſo that they ſtand in pairs, the ſecond and third on each ſide being greatly more diſtant from one another than the firſt and ſecond, or the third and fourth: theſe legs are all furniſhed with very long hairs, and ſeem to terminate, each in two or three points, in the manner of the legs of many of the beetles. The back is elevated into a convex form, the ſides alſo are rounded, and each ornamented with three or four hairs; but there are none under the belly. Mem. Acad. Par. 1711.

Snails are great deſtroyers of fruit in our gardens, eſpecially to the bitter ſorts of wall-fruit. Lime and aſhes ſprinkled on the ground where they moſt reſort, will drive them away, and deſtroy the young brood of them. It is a common practice to pull off the fruit they have bitten, but this ſhould never be done, for they will eat no other till they have wholly eat up this, if it be left for them.

The Romans were fond of *ſnails*, and had them fed on purpoſe for their tables. Their taſte is not delicious, but rather diſagreeable; but this they diſguiſed by means of good ſauces, and had other reaſons for the receiving them into the liſt of foods. They uſed them as provocatives, or inciters to venery, and with this intent they eat only the necks, as the part in which the parts of generation of the creature were placed; and they had the greater opinion of the efficacy of theſe, as the parts of generation were double in each individual, that is, the male and female parts both ſituated in the neck of every *ſnail*.

Ariſtotle, and the old Greeks, had no idea of the generation of theſe inſects, in the manner of other animals, but ſuppoſed them produced ſpontaneouſly; but the Romans ſhew, by many paſſages in their writings, that they had got over this error, and even ſeem, by the preference they gave to the neck of this animal, in this intention to have underſtood the hermaphrodite ſtructure of this inſect, which much later ages have pretended to make a new diſcovery.

The Eaſtern nations at preſent run much into the opinions of the Romans of old, as to provocatives; they uſe, as the others did, every thing that ſerves to the purpoſes of generation in other animals, and every thing that has but the reſemblance of the external figure of the parts ſubſervient to it. The orchis roots, which reſemble the teſticles of animals in ſhape, and contain a white and ſlimy, or viſcous liquor, have introduced themſelves into uſe on this plan, and ſo of many other things. Phil. Tranſ. N° 50.

Oat-SNAIL, a name given by Dr. Liſter, in the Philoſophical Tranſactions, to a ſmall *ſnail*, which he obſerved under the looſe bark of old willows, elms, and others trees, and which is of a very ſingular ſtructure; the ſhell reſembling an oat-corn, whence the name, and its volutæ, or wreaths, running contrary to the direction of them in other *ſnails*, that

is eaſt and weſt, as the philoſophers expreſs it, referring it to the motion of the ſun; but theſe ſhells, to uſe that language, have the turns weſt and eaſt, or more plainly, they have the turns running from the right-hand to the left, not from the left to the right as other ſnails. Philoſ. Tranſ. N° 250.

SNAKE, *(Cycl.) anguis.* See the article ANGUIS.

The poiſonous qualities of ſome of the *ſerpent*-kind, have given the generality of the world a diſtaſte to all of them, but our common *ſnake* is a harmleſs and inoffenſive animal, and might even be kept tame in our houſes, where it would deſtroy vermin, and never be of any hurt to any thing. This animal may be ſuppoſed as far from tameneſs in its nature, as any that could be thought of, yet, in the Acta Leipſienſia, we have an account of ſeveral which were kept tame in a houſe, and taught ſo far, as to go regularly into their boxes every night. The perſon, who diverted himſelf with keeping theſe, had the entertainment of ſeeing them change their ſkins ſeveral times, and of obſerving their laying their eggs, of which they would depoſit twelve or thirteen in the ſpace of half an hour. Act. Leipſienſ. Anno 1670.

That *ſnakes* are viviparous, ſee Philoſ. Tranſact. N° 8. p. 138.

SNAKE *with two heads*, a kind of *ſnake* in Braſil, having a ſwelling at its tail, which at a diſtance has the appearance of a head.

The Portugueſe call it *ſnake* with two heads; their fear of this creature, for the bite of which they pretend there is no remedy, having prevented their examining into the truth. They alſo pretend that it is dangerous to meddle with theſe *ſnakes* after they are dead, and that barely touching them will give the itch. Mr. Couplet was, notwithſtanding, bold enough to flea ſeveral of them, but found himſelf, after having performed this operation on two or three, all covered with puſtules filled with a reddiſh water. Theſe remained on him a conſiderable time, and he was not quite well in three months.

The country of Braſil abounds with large *ſnakes*, the bite of which is venomous; but the natives and blacks make no ſcruple of eating them. Mem. de l'Acad. des Scienc. 1700. p. 228, 229.

Blood-SNAKE. See the article HÆMORRHOUS.

Rattle-SNAKE. See RATTLE-*ſnake*.

Sea-SNAKE. See the article SERPENS *marinus*.

Spectacle-SNAKE. See COBRAS *de capello*.

SNAKE-*ſtone*, *ammonitæ*, in natural hiſtory, the name of a large genus of foſſile ſhells, very few, if any, of which are yet known in their recent ſtate, or living either on our own, or any other ſhores, ſo that it ſeems wonderful whence ſo vaſt a number and variety of them ſhould be brought into our ſubterranean regions. They ſeem indeed diſperſed in great plenty throughout the world, but no where are found in greater numbers, beauty, and variety, than in our own iſland. See SERPENT-*ſtones*.

They are of very different ſizes, as well as ſpecies, ſome being found of the ſize of a ſixpence, or leſs than that, and others of more than two feet in diameter: they are all made up of ſeveral circles, like thoſe of a *ſnake* when rolled up, the tail lying in the center, and the larger end, where was the mouth of the fiſh, at the other. Some of them are rounded, others greatly compreſſed, or flatted, and they are at times found lodged in almoſt all the different ſtrata of earth or ſtone.

Some of them repreſent the nave of a cart-wheel, and of theſe ſome are plain, and others ſtudded; ſome alſo are ſmooth, or wholly free from ridges, and others have ridges more or leſs broad; and among theſe, the ridges in ſome only reach acroſs the ſides, without going to the back, and others paſs the back, and form continued lines, going quite round the ſeveral volutæ of the ſhell; and ſome are plain, others ſtudded at their ends; ſome ſpecies have ſimple, and others bifurcated ſtriæ, and ſome are ſtudded and umbilicated; ſome alſo, both of theſe and of the nautili, have a ſort of foliaceous work about their ſutures, which gives a great beauty to the whole. The back of theſe ſhells alſo greatly differs in the different kinds; many of them have a ridge running all the way along the back, which in ſome is plain, and in others is denticulated, or ſerrated; and of theſe ſome have a furrow on each ſide of the ridge, which others want, and ſome have elegant rows of ſtuds running on each ſide this furrow; and finally, ſome have only a ſingle furrow running all the way along their backs. They all conſiſt of ſeveral volutæ, which are different in number in the different ſpecies; and their ſtriæ are alſo extremely various, ſome very deep, and the ridges very high between them, others very ſlight, ſome ſtrait, others irregularly crooked, others undulated, and ſome terminating in dots, tubercles, or cavities, toward the back, and others having tubercles in two or three places.

They are all compoſed of a great number of chambers, or cells, in the manner of the *nautilus Græcorum*, each having a communication with the others, by means of a pipe or ſiphunculus. There is a ſmall white ſhell-fiſh of Barbadoes, which ſeems truly a recent animal of this genus; and in the Eaſt-Indies there is another alſo, ſmall and greyiſh; but the large, and beautifully marked ones, are found only foſſile. They are compoſed of various foſſile bodies, often of quarry-ſtone, ſometimes of the matter of the common pyrites, and of a great variety of other ſubſtances; and though they appear uſually mere ſtones, yet in ſome the pearly part of the original ſhell is preſerved in all its beauty. Sometimes alſo, while the outer ſubſtance is of the matter of the pyrites, or other coarſe ſtony, or mineral matter, the inner cavity is filled with a pure white ſpar of the common plated texture. This gives a great beauty to the ſpecimen. *Hill*'s Hiſt. of Foſſ. p. 649, 650.

The cornua ammonis, or *ſnake-ſtones*, are found in many parts of England, particularly in Yorkſhire, where it is very plentiful in the alum rocks of ſeveral ſizes. See Tab. of Foſſils, Claſs 9.

The people of the place have a tradition, that all the country hereabouts was very much annoyed with *ſnakes*, but that by the prayers of St. Hilda, who lived there, they were all ſent down into the earth, and there turned into ſtone. The common people of this part of the kingdom pay an unſhaken credit to this idle ſtory; but they ſhould conſider, that if a miracle at all, it muſt have been a much more extenſive one of their ſaint than they imagine, for theſe foſſils are found not only in Yorkſhire, but in almoſt every part of the known world. Phil. Tranſ. N° 142.

SNAKE-*weed*, in botany. See BISTORT.

SNAPDRAGON, *antirrhinum*, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf of a tubular form, perſonated, and having two lips, the upper of which is bifid, and the lower trifid. The piſtil ariſes from the cup, and is fixed, in the manner of a nail, in the hinder part of the flower; and afterwards becomes a ſeed-veſſel, of the ſhape of the head of a hog, divided into two cells, and uſually filled with ſmall ſeeds fixed to a placenta. See Tab. 1. of Botany, Claſs 3.

The ſpecies of *ſnapdragon*, enumerated by Mr. Tournefort, are theſe. 1. The common *ſnapdragon*. 2. The larger long-leaved *ſnapdragon* with purpliſh white flowers. 3. The white-flowered *ſnapdragon* with reddiſh edges. 4. The white-flowered *ſnapdragon* with very red edges. 5. The white-flowered *ſnapdragon* with yellow edges. 6. The yellow-flowered *ſnapdragon*. 7. The broad-leaved *ſnapdragon* with large pale yellow flowers. 8. The great narrow-leaved *ſnapdragon* with bright red flowers. 9. The Portugal *ſnapdragon* with very large and beautiful red flowers. 10. The great long-leaved Italian *ſnapdragon* with large ſnow-white milky flowers. 11. The hairy origanum-leaved Spaniſh *ſnapdragon*. 12. The hairy Spaniſh *ſnapdragon* with red valerian leaves. 13. The talleſt Spaniſh *ſnapdragon* with very narrow leaves. 14. The middle-ſized *antirrhinum* with a large and wide-open white flower. 15. The greater field-*ſnapdragon* with red flowers. 16. The greater field-*ſnapdragon* with white flowers. 17. The great ſtone *ſnapdragon* with very narrow leaves, and a ſmall purple flower.

The plant called by Caſpar Bauhine, and ſome others, the *cut-leaved ſnapdragon*, is properly a ſpecies of *pedicularis*, and the leſſer field-*ſnapdragon*, and the ſtone mother-of-thyme-leaved *ſnapdragon*, are both ſpecies of toad-flax, or *linaria*. Tourn. Inſt. p. 168. See the articles PEDICULARIS and LINARIA.

Many of the ſpecies of this plant are very beautiful, and much eſteemed in gardens, and are all eaſily propagated from ſeeds, which muſt be ſown in a dry ſoil, not too rich, in April or May. In July the plants may be planted out into large borders, where they will flower the ſpring following, or they may be ſown early in ſpring, and they will then flower in the next autumn; but then they are not ſo likely to ſtand the winter, and if the autumn prove not kindly, they will hardly produce a perfect thin ſeed. They all grow very well on old walls, where they have happened to ſow themſelves. *Miller*'s Gard. Dict.

SNATCH-*block*, in a ſhip, is a great block with a ſhiver in it, having a notch cut through one of its cheeks, for the more ready receiving in of any rope; for by this notch, the middle part of a rope may be reeved into this *block*, without paſſing it in endways. This ready *block* is commonly faſtened with a ſtrap about the main-maſt, cloſe to the upper-deck, and is chiefly uſed for the fall of the winding-tackle, which is reeved into this *block*, and then brought to the capſtan.

SNIEGULKA, in natural hiſtory, a name given by the common people of Poland to a bird of paſſage, that only comes to them in the colder months.

The name ſignifies the ſnow-bird, and Rzaczinſki, in his Hiſtory of Poland, calls it *nivalis avis*. The people preſage, from its coming, the mildneſs or ſeverity of their winter.

SNIGGLING, a method of fiſhing for eels, chiefly uſed in the day-time, when they are found to abſcond themſelves near wears, mills, or flood-gates. It is performed thus: take a ſtrong line and hook, baited with a lob or garden-worm, and obſerving the holes where the eels lie hid, thruſt your bait into them by help of a ſtick, and if there be any, you

ſhall be ſure to have a bite; and may, if your tackling hold, get the largeſt of eels. Vid. *Cox*, Gentl. Recr. Part 4. p. 39.

SNIPE, in zoology. See the article GALLINAGO *minor*.

Theſe birds are eaſily taken, by means of lime-twigs, in this manner: take fifty or ſixty birchen-twigs, and lime them all very well together; take theſe out into places where there are *ſnipes*, and having found the places which they moſt frequent, which may be ſeen by their dung, ſet the twigs in theſe places, at about a yard diſtance one from another. Other places, are thoſe where the water lies open in hard froſty and ſnowy weather: in theſe places alſo, and where-ever they are ſuſpected to come to feed, let more lime-twigs be placed in the ſame manner. The twigs are not to be placed perpendicularly in the ground, but ſloping, ſome one way, ſome another; the ſportſman is then to retire to a diſtance, and watch the coming of the birds to theſe places. When they fly to them, they naturally take a ſweep round the earth, and by this means they will almoſt always be caught by one or other of the twigs. When a firſt *ſnipe* is taken, the ſportſman is not to run to take it up, for it will feed with the twig under its wings, and this will be a means of bringing down more of them to the place. When three or four are taken, they may be taken up, only leaving one faſt to entice others; and thus the ſport may be continued, as long as there are any birds of this kind about the place. It may be very proper, when the twigs are planted, to go about, and beat all the open and watery places near, that they may be raiſed from thence, and fly to thoſe places where the twigs are placed to receive them.

SNORT, in the manege, called in French *ebrouer*, denotes a certain ſound which a horſe of fire makes by breathing through his noſtrils; as if he had a mind to expel ſomething that was in his noſe, and hindered him to take breath.

This noiſe or ſound is performed by means of a cartilage within the noſtrils, called in French *ſouris*. Horſes of much mettle *ſnort*, when you offer to keep them in. See the article SOURIS.

SNOTTOLF, a name uſed by ſome authors for a ſpecies of the *orbis*, or globe-fiſh, called by Cluſius, and other authors, the *orbis ranæ ritu*, or frog-mouthed globe-fiſh.

It is uſually of about ſixteen inches in length. It is of a brown colour, variegated with white ſpots. Its head is very thick, and its mouth large and wide, and very much reſembling that of a frog. It has one irregular fin on the back, running nearly all the way to the tail, and two rows of tubercles on each ſide, one on the middle part of the body, the other nearer the belly. It is frequent in the German, and in many other ſeas. The name is Dutch. *Geſner*. p. 747. *Bartholin*. Cent. Obſ. 2. Hiſt. 1.

This fiſh is the *cyclopterus* of Artedi, and the *lumpus* of other authors. See the article LUMPUS.

SNOW (*Cycl.*)—*Snow* may be preſerved by ramming it down in a dry place underground, and covering it well with chaff. At Leghorn they uſe barley-chaff for this purpoſe. See Phil. Tranſ. N° 8. p. 140.

Snow and ice are alſo preſerved with ſtraw or reeds. Mr. Boyle has deſcribed the manner in his experimental hiſtory of cold.

It is uſual in hot countries to mix *ſnow* and ice with their wine. Hence Pliny [b] ſays, *Hi nives, illi glaciem potant, pœnaſque montium in voluptatem gulæ vertunt.*—[[b] Lib. 19. cap. 4. Martial has an epigram on this ſubject, Lib. 14. Epigr. 117.]

SNOW-*drop-tree*, a very beautiful American tree, which bears the cold of our climate in the open air; but it is very difficult to encreaſe, the layers being two years before they take root, nor will they ever take root at all, except the branches are very young, and are ſlit in the joint, as in the laying carnations. When thoroughly rooted, they may be tranſplanted into ſmall quarters of flowering-ſhrubs, where, among thoſe of a middling growth, they add much to the variety. *Miller*'s Gard. Dict.

SNOW-*ſtone*, in natural hiſtory, a name given by ſome to a very beautiful ſtone found in America; of which the Spaniards are very fond, making it into tables, and other ornaments in their houſes. Alonſo Barba, who had ſeen much of it, tells us, that it is found in the province of Atocama, and is uſually found in pieces of four feet long, and four or five inches broad; ſo that it is forced to be joined in the working. Its general thickneſs is about two inches. It has a great variety of colours, which form clouds and variegations of a very beautiful kind. The principal colours are red, yellow, green, black, and white. The white is generally formed into ſpots on the very blackeſt parts of the maſs, and is ſo beautifully diſpoſed, that it repreſents *ſnow* falling in all its whiteneſs upon a jetty ſurface. *Alonſo Barba* of Metals.

SNUFF (*Cycl.*)—The many miſchiefs attending an unnatural practice of taking this powder of tobacco at the noſtrils, have been deſcribed by the writers in general on theſe ſubjects, ſince this pernicious cuſtom has reigned in the world; but one of the moſt remarkable accidents, occaſioned by it, is related in the Acta Eruditorum.

The caſe is this. A fat perſon, greatly addicted to the taking Spaniſh *ſnuff*, after many years continued uſe of it, complained one day of a mighty uneaſineſs which it occaſioned in the middle of his œſophagus, and ſoon after this he began to find his ſwallowing difficult. He applied for relief to a phyſician, and naming nothing of the pain which had preceded this difficulty of ſwallowing, it was treated as a complaint ariſing from ſome glutinous humor in the œſophagus, it is no wonder that the medicines in this intention had no effect. The patient grew worſe, and tired of this doctor, applied to another, who ſuppoſing the complaint aroſe from ſome ſharp humor vellicating the parts, gave medicines in that intention, equally without ſucceſs. After this a common quack tried the moſt violent medicines on him, but without ſucceſs; and finally he applied to the uſe of the excutia ventriculi, an inſtrument made to be thruſt down the œſophagus into the ſtomach, but this he never could get down; and in the uſe of this inſtrument he firſt felt, that there was abſolutely a lump of fleſh, which ſtopped its paſſage farther than the place where the ſeat of his complaint was. The diſtemper after this encreaſed upon him, till he could only ſwallow liquids, and thoſe at laſt by no other means, but the ſucking them through a quill, by which means he could get down milk, water-gruel, and the like, by a little at a time. At length conſulting another phyſician, and telling him of the immoderate quantity of Spaniſh *ſnuff* he had been uſed to take, and that it often happened to him on taking the drieſt *ſnuff* of this kind; that it got into his œſophagus, and occaſioned violent pain, coughing, and ſpitting of blood, he ſoon concluded that a polypus had formed itſelf in the œſophagus, wounded by this ſharp powder, and that there was no relief, but that the death of the patient was quickly approaching. The man, from a very corpulent habit, was ſo extenuated, that he appeared a mere ſceleton; he died ſome little time after of abſolute hunger, the œſophagus being ſo entirely filled up by this unnatural ſwelling, that not the leaſt drop of a liquid could get down.

After death the œſophagus was opened, and a fleſhy excreſcence, or polypus, was diſcovered, of the bigneſs of the cavity of the part, and taking its origin about the middle, from the back part of the œſophagus, it reached down to the pylorus. This was of a whitiſh colour, and much reſembled a large worm, and its ſubſtance was fibrous, and very tender. Act. Erudit. Anno 1715. p. 457.

SNUFF, or *Snuffler*, in the manege. See the article SNORT.

SOAGGIO, the name of a fiſh common in the markets of Rome and Venice, and of the turbot-kind.

It is the *rhomboides* of Rondeletius, and the *rhombus non aculeatus ſquammoſus* of Willughby.

We have it alſo on our own ſhores, and the Corniſh people, who frequently catch it, call it the *lug-a-leaf*. It has no rough lines at the roots of its fins. Its eyes are large, and ſet at a conſiderable diſtance, and it is covered with extremely minute ſcales. It is extremely flat and thin, and of an aſh-colour.

It is a very ſingular ſpecies of fiſh, differing, in ſome particulars, from both thoſe genera to which it ſeems allied. It differs from the plaiſe-kind, in that it has the eyes, fins, *&c.* of the turbot, or rhombus; and from that fiſh, in that it is ſcaly, as the plaiſe, and the other fiſh of that genus. *Willughby*, Hiſt. Piſc. p. 95. *Rondel.* de Piſc. p. 358.

SOAL, in ichthyology, the Engliſh name of the fiſh, called by the generality of authors the *bugloſſus*, by ſome *ſolea*.

It is, according to the new ſyſtem of Artedi, a ſpecies of the pleuronectes, and is of that kind which have the eyes placed on the left ſide. Some authors call it the *linguacula*. See BUGLOSSUS and PLEURONECTES.

SOAP (*Cycl.*)—The making of *ſoap* depending only on the mixing the ſalt of pot-aſh with oil or fat, though this is at preſent procured by a tedious operation, and long boiling, it ſeems very practicable to ſhorten, and make the proceſs much eaſier, and leſs expenſive, by ſubſtituting motion in the place of fire. This motion might be eaſily given by an engine to any quantities of the ingredients at a time; and we find it practicable to make *ſoap* by this means, only by mixing in a large vial half a pint of *ſoap*-lees, and an ounce, or more, of oil-olive; for by ſhaking theſe together for a quarter of an hour, an abſolute *ſoap* is procured in a cake at the top of the liquor, which hardens on being expoſed to the air. *Shaw*'s Lectures, p. 160.

The uſe of *ſoap* has, of late, been much extolled in medicine; but then thoſe, who magnify it moſt, except againſt the uſe of it in ſuch caſes where obſtructions are attended with a putrefactive alkali, or where an inflammatory diſpoſition appears. It is acknowledged to be very dangerous in a pthiſis, fever, and ſome other caſes. The biſhop of Cloyne, in his Siris, ſeems to think tar-water an uſeful and ſafe ſubſtitute for it. See the article TAR-*water*.

SOAP-*rock*, or *Soap-earth*, in natural hiſtory. See the article STEATITES.

There is great reaſon to believe, that when we know the proper manner of working, this will, one way or other, make a great ingredient in our porcelain manufactures.

The

The Chineſe have of late diſcovered a ſort of earth, which they call *hoache*. They ſay that this is hard, ſmooth, and ſoft to the touch, like *ſoap*; theſe, and its other qualities, ſeem to prove it to be the ſame with our *ſoap-rock*, and this with them makes a ſort of porcelain, ſuperior to the common kind in beauty, and in the compactneſs of its texture, but it is more apt to crack. They uſe it ſeveral ways, ſometimes alone, ſometimes with the petunſe, which is a ſtone, and ſometimes they make a varniſh, by diſſolving this in water, with which they coat over the common China, covering it finally with the other varniſh. All theſe ways of uſing it produce very beautiful wares, and it will be extremely worth our while to try them all round, before we give up the uſe of ſo valuable a thing. Obſerv. ſur les Coutumes de l'Aſie. See the article HOACHE.

SOAR-*hawk*. See the article FALCON.

SOATTO, a Venetian name of a fiſh, common in the markets there, and of a middle nature between the plaiſe and turbot. *Willughby*, Hiſt. Piſc. p. 95. See the article SOAGGIO.

SOAVE, or SOAVEMENTE, in the Italian muſic, ſignifies to ſing or play in a ſweet and agreeable manner.

SOBRE *buena*, a name given by the Spaniards in America to a ſpecies of vanilla, which is greatly ſuperior to all the other kinds.

The pods of this are of the ſame ſhape with thoſe of the common vanilla, but are nearly twice as large. A bundle, of about fifty of theſe, uſually weighs five ounces, and ſuch a bundle of the *ſobre buena* kind often weighs eight. Theſe are full of a blackiſh balſamic liquor, in which are contained a number of ſmall ſeeds.

SOCAGERS, in our old writers, ſuch tenants as held by the tenure called *ſocage*. They were otherwiſe called *ſockmen*. See the article SOCKMEN.

SOCCELLI, among the Romans, were ſwaths or bands, which covered the leg down to the ſoccus. *Pitiſc.* in voc. See the article SOCCUS, *Cycl.*

SOCII, *allies*, among the Romans. See ALLIANCE, *Cycl.*

SOCK (*Cycl.*)—SOCK and ſythe-land. See the article HUSBAND-*land*.

SOCKET (*Cycl.*)—SOCKETS, in a ſhip, are the holes which the pintles of the murthering pieces go into.

SOCMEN, or SOKEMEN, *ſocmanni*, ſuch tenants as held their lands and tenements in *ſocage*; but the tenants in antient demeſne ſeem moſt properly to be called *ſocmans*. F. N. B. 14. Briton. c. 66. Terms of Law. *Blount*, *Cowel.*

SOCNA, in our old writers, a privilege, liberty, or franchiſe. *Blount*. The word is Saxon.

SOCO, in zoology, the name of a Braſilian bird of the heron-kind, but remarkable, beyond all the reſt of that genus, for the length of its neck. It is very common in the Braſils. It is ſmaller than the common heron; its beak is ſtrong, ſtrait, and ſharp; its tail ſhort; its head and neck brown, and variegated with black; and its body is of the ſame colours in different variegations, but its wings have a mixture of whiteneſs. *Marggrave*'s Hiſt. Braſil.

SODA, in medicine, the name of a diſtemper, conſiſting in an uneaſy and troubleſome ſenſation of heat about the orifice of the ſtomach, which ſometimes is owing to external, ſometimes to internal cauſes. It is to be obſerved, that what we underſtand by the word *ſoda* is to be diſtinguiſhed from the *ſoda* of the antients, for they expreſſed by this word a peculiarly ſharp and terrible pain in the head.

Signs of a SODA. The perſons afflicted with it complain of a diſagreeable ſenſation in the ſtomach, particularly about the œſophagus, which they do not well know whether to term cold or heat; but it ſeems rather ſuch a ſenſation of heat as is produced by the violent colds of winter, than any other, according to the old phraſe, that *frigus adurat*, cold burns. With this ſenſation there is always joined a tenſive and preſſing weight of the other parts of the ſtomach, and a light conſtriction running all the way up the œſophagus, from the ſtomach to the fauces, attended with a running up of water into the mouth, and a nauſea, and frequently a reaching to vomit. It is a diſtemper that moſtly affects perſons of plethoric habits, and ſuch as are ſubject to commotions of the blood.

The internal cauſes of this diſorder are congeſtions of blood about the ſtomach and inteſtines; a bilious foulneſs in the primæ viæ, and a tremulous motion of the fibres of the ſtomach. The external cauſes are the eating great quantities of fat things, and drinking immediately after them, and taking great quantities of the hot aromatics, which exagitate the blood, and bring on a continual irritation. A ſudden cooling of the ſtomach, while the body is very hot, will alſo occaſion this; and the taking of hot medicines, under a notion of ſtrengthening the ſtomach; and finally, the drinking of feculent liquors, and the eating ſower foods.

This is in itſelf a diſtemper of no great conſequence, but when it is ſuffered to grow upon the patient, and eſpecially when injudiciouſly treated, it often is attended with bad ſymptoms, and ſometimes brings on dangerous diſorders.

Method of cure. It is often a diſeaſe ſcarce worthy the conſideration of a phyſician, but when it is ſo, the fixed alkalis, combined with ſome volatile ſalt, ſeem the moſt proper remedies; ſuch are the tincture of ſalt of tartar, mixed with ſpirit of hartſhorn, or the alkalis alone, as ten or twenty drops of the oil of tartar: but in thoſe particular caſes, where it ariſes from great commotions of the blood, gentle acids are, on the contrary, the proper means of cure, or the compound powders of nitre and cinnabar. When a bilious foulneſs is in the cure, the nitrous medicines, with the teſtaceous abſorbents, as crabs eyes, oiſter-ſhells, and the like, are the proper remedies; and in all caſes, the frequently taking draughts of warm liquors, as of tea, and the like, is extremely proper: and people, who are very much troubled with returns of this complaint, and are of a plethoric habit, are to be adviſed to bleed and purge every ſpring and autumn.

The common opinion being, that this complaint is merely owing to an acid humor, has given riſe to the uſe of chalk in it as an univerſal remedy; and people, who are afflicted with it, uſually ſwallow chalk alone, and that in large quantities, for their cure. But this is by no means a ſafe, or adviſable method: for the chalk meeting with an acid, becomes a violent aſtringent on mixing with it, and powerfully contracts the tender fibrillæ of the ſtomach. Whence it often happens, that inſtead of a cure, the conſequences are more painful cardialgias, with obſtructions of the viſcera, anorexies, and often in women ſuppreſſions of the menſes. Some give the powder of bricks inſtead of chalk: but this is more dangerous than the chalk, as it is in itſelf more aſtringent. In people, who are afflicted with this complaint from eating fat things, a draught of brandy often proves an immediate cure. *Junker*'s Conſp. Med. p. 589.

SODA *ſubethica*, a term uſed to expreſs a heavy and dull pain in the head.

SODDING *of brick*. See the article BRICK.

SODE-*ſhoats*, in botany, a name given by ſome to the tree, whoſe inſpiſſated juice is the gum tachamahacca of the ſhops. Par. Bat. Prodr. p. 379.

SODOMY (*Cycl.*)—There is no Statute in Scotland againſt *ſodomy*; the libel of this crime is therefore founded on the divine law, and practice makes its puniſhment to be burning alive.

SOFFIETTA, the bellows-fiſh, a name by which ſome have called the ſcolopax, a ſmall ſea-fiſh, common in the markets of Rome and Venice. *Willughby*, Hiſt. Piſc. p. 161. See the article SCOLOPAX.

SOGETTO, *ſubject*, in the Italian muſic, is uſed for a ſong or melody, on which ſome counterpoint is to be made: this may be done variouſly; thus, 1. *contrapunto ſopra il ſogetto*, a counterpoint above the ſubject, is that of which the ſubject is the baſs. 2. *Contrapunto ſotto il ſogetto*, when the given ſubject is the higher part. If the ſubject, in either caſe, does not change its notes, it is called *ſogetto invariato*. But if the notes be changed, either in figure or poſition, it is called *ſogetto variato*. 3. *Sogetto* is alſo uſed for the words to which a ſong is to be made. 4. *Sogetto* is likewiſe applied to a ſeries of notes, from which a fugue is formed. See the article FUGUE.

SOIL (*Cycl.*)—The land of England, as conſidered by the farmer, is reduced into nine ſorts of *ſoils*; the ſandy, the gravelly, the chalky, the ſtony, the rocky, the hazely, the black earth, the marſh, and the clay land. Of this laſt kind there are four varieties, diſtinguiſhed by their colours; the black, the blue, the yellow, and the red.

In many places theſe *ſoils* are mixed and blended together, and where it is ſo, it is much better than where they are ſeparate or ſingle; eſpecially where the mixtures happen to be of a right kind, as thoſe of the hot and the dry *ſoils* blended with the cold and the moiſt. Nature does this often, and art may imitate it. All ſands are hot, and all clays are cold, and therefore the laying clay upon ſandy lands, or ſand upon clayey lands, is the beſt of all manure: this alters and changes for the better the very nature of the land itſelf, whereas dung only improves it for a time, and after that leaves it as bad as it was before. Mixt ſoils, that tend to the clayey-kind, are the beſt of all others for corn. It is not only the natural *ſoil* we are to conſider, but the depth of it, and what *ſoil* is underneath; for the richeſt *ſoil*, if it be only eight or ten inches deep, and lies upon a cold clay, or upon ſtone, will not be ſo fruitful to the farmer as the leaner *ſoils* that lie upon better under-ſtrata. Gravel or ſand are the beſt under-ſtrata, of all others, to make the land above prolific. *Mortimer*'s Huſbandry, p. 64.

Cold and wet clays are much more fruitful in the ſouthern parts of England, than in the north. The climates, therefore, are to be conſidered, and the quantities or proportions of the different kinds in the mixed ſoils. The natural produce of the land, as to weeds or graſs, is alſo to be greatly regarded by the perſon who intends to improve upon it. What is the effect of plowing is next to be enquired into, and experiment muſt ſhew what kind of corn agrees beſt with it.

All land that moulders into duſt with froſt, with all ſorts of warm lands, black mould, yellow clays, if not too ſpewy when wet, and all that turn black after rain, are in general good lands for corn. Land that produces large trees, as alſo ſuch as produces black thorn, weeds, thiſtles, rank graſs, and the like, and that lies in bottoms open to the eaſt or ſouth, being well ſheltered from other winds, may be always eſteemed to bid fair for good land. Thyme, ſtrawberries, betony, and wild ſage, direct to the places where woods will thrive beſt; and camomile is always an indication of a land being diſpoſed to bear corn in large crops.

All land that binds after froſt and rain, all that turns white, and is full of worms, or is very moiſt and cold, or that is too hot and dry, and that lies open to the north on the ſides of hills, expoſed to cold winds and froſts in winter, and to the ſun's ſcorching heat in ſummer; and all that bears naturally holly, box, ivy, juniper, fern or brakes, furzes, broom, and heath; and lands that bear moſſes, ruſhes, yarrow, and wild tanzy, with flags, and other ſuch weeds, which betoken a cold and damp ground, are leſs fit for corn, though other things may ſucceed on it. Where plants appear blaſted, ſhrubby, and curled, theſe are diſtempers in them occaſioned by ſudden changes of wet and cold, and a dry heat. All theſe lands are, by their natural produce, to be judged leſs fruitful than the others. Blackiſh, dun, or yellow ſand, and very hot ſtony gravel, are generally eſteemed very unfruitful. Chalky lands are naturally cold, and therefore they require warm compoſts; and this is the reaſon why chalk itſelf is ſo good a manure for hot and dry lands. Sandy land, well manured with marl, will bear turneps, or white or blue peaſe, to great advantage. *Mortimer*'s Huſbandry, p. 68.

The very greateſt article, in the culture of plants, trees, *&c.* is the *ſoil*; and in many caſes it is not ſufficient to have found a *ſoil*, which once tried proves convenient, to ſuppoſe that it will always continue ſo. In track of time the *ſoil*, which was once proper for the nouriſhment of ſome peculiar vegetable, loſes its virtue; and this ſooner in ſome lands, and later in others. All who are converſant in huſbandry, are well acquainted with this. If a good piece of ground be choſen for the ſowing of wheat, and it produces very well the firſt year, it will not for ever continue to do ſo; the ſecond year's crop will be perhaps good, and the third and fourth tolerable: all this while the land is in heart, as the farmers expreſs it, but after this it becomes improper, and very little wheat will be raiſed if ſown upon it; yet when it refuſes to produce wheat, it will, without any alteration, produce barley in ſufficient plenty for ſome years; when it will yield no more good crops of barley, it may be ſtill ſowed with oats, and will produce that grain as well as freſh land; and when it has been worn out with all theſe, it will produce peaſe. After this it is made quite barren, and can be of no farther uſe to the farmer, the vegetative quality of it being worn off by theſe ſucceſſive crops, each ſort of grain taking off that part which is more peculiarly fitted for its own nouriſhment; the wheat firſt, and the reſt in their order. While one of theſe plants is taking up what belongs to its particular nature, the reſt all remain quiet and undiſturbed; and theſe are afterwards carried away by ſucceſſive changes of plants, which require them; and at length, by the whole, all the vegetable matter is carried away, and the lands ſo drained of it, that there muſt be a ſupply of ſomething in its room, before any thing more of any kind can be raiſed from it. Philoſ. Tranſact. N° 253. p. 217.

The ſupply of freſh vegetable matter, in the place of that which was drained away by the ſucceſſive growths of plants, is done by ſeveral ways, but by none ſo well, as by letting it lie fallow for ſome time; in this caſe the rain falling upon it, the vegetable earth, which this water contains, is depoſited in ſufficient quantity, and this is alone ſufficient to give nutriment to new crops; and it is proved by this, that the rain water, as well as other water, does contain ſuch earth as is neceſſary to vegetation. The other means of giving a ſupply to the exhauſted earth are the manures laid on it by the farmer, and theſe are, all of them, ſome animal or vegetable remains, and their uſe is to drain into the earth thoſe particles from themſelves, which may be again received into the bodies of new productions of the ſame kinds. Blood, urine, the excrements of animals, with their ſeveral parts, as horns, hoofs, hair, feathers, calcined ſhells, and vegetable bodies in an altered ſtate, ſuch as lees of wine and beer, aſhes of burnt vegetables, leaves, ſtraw, roots, ſtubble, and the like, when in a decaying ſtate, turned under the earth again by plowing, there become diſunited into their component parts, and theſe again are carried up into other new plants.

If we take off our thoughts from the fields, and look among the gardens, we there meet with farther confirmations of the ſame thing: the trees, ſhrubs, and herbs cultivated in theſe, after they have continued in one ſtation, till they have derived thence the greater part of the matter fitted for their encreaſe and nouriſhment, will either decay, or degenerate, unleſs they have a new ſupply of manure added to the earth about their roots, or are themſelves tranſlated into other earth, not ſo drained of that particular matter out of which they are to be fed.

The older trees have ſome more ſupplies of fit matter than the younger, by means of the length of their roots, which, when they have drained one ſpot of ground, uſually are carried much farther into another, and reach a very great way; but at laſt they can reach no farther, and all fails, unleſs ſuch a ſupply of manure, or the being removed into freſh earth, ſupply that nouriſhment they can no longer have where they ſtand. The gardiners, when they tranſplant trees, cut off theſe long roots; but though they only do this to prevent the trouble of opening a larger hole than neceſſary for their reception, yet there is in nature this good reaſon for it, that they have, when brought to a freſh *ſoil*, no occaſion for thoſe long roots to draw nouriſhment from afar off, when there is enough of it every where about them. What is to be learned from the whole of this, is, that the modern ſyſtem is erroneous, which ſays that water is the only thing that gives nouriſhment and encreaſe to plants; ſince, if this was the caſe, there could be no need of manures, nor any need of altering the crop, in order to its ſucceeding, or of tranſplanting trees to make them thrive. It is plain that ſome ſort of terreſtrial matter, taken from among the *ſoil*, is what gives encreaſe and bulk to plants; for were it only water, the rain falling in all places alike, all would alike be at all times ſuited to produce all plants; and if the earth, according to Lord Bacon's ſyſtem, ſerved to no other purpoſe to plants and trees, but to keep their roots firm, and to defend them from over-heat, and over-cold, one earth would do as well for theſe uſes as another, and the ſame earth would do as well for the ſame plant as a different earth. Philoſoph. Tranſact. N° 253. p. 219.

Mr. Tull thinks, that the only difference of *ſoil*, except the richneſs, is the different degree of heat and moiſture it has; the earth is equally proper, of whatever kind it be, and if theſe additions be properly adjuſted, any *ſoil* will nouriſh any plant. Let a bed of thyme and a bunch of ruſhes be removed into each other's place, without any farther care, and both will die: but let them change their ſoil, by removing the earth wherein the thyme grew, from the dry hill down into the watery bottom, and plant ruſhes therein; and carry the moiſt earth, in which the ruſhes grew, out of its wet place, up the hill, and ſet the thyme in it, it will be found, that the ſame quantity of unchanged earth will ſerve for either: the ruſhes will grow in the earth of the hill when carried into the bogg, and the thyme will grow in the earth of the bottom where the ruſhes before grew, as ſoon as it is carried up the hill. So that while the earth is the ſame, it is only the accidental addition of more or leſs water that makes it fit for the growing of thyme, or the growing of ruſhes.

Earth is the true food of all plants, it is that alone which gives them their encreaſe, and any earth will do for any plant, with the addition of the other acceſſories in due proportion; that is, an acceſſory to vegetation, as water is, but then it does no more than that to give the matter of encreaſe to the plant. The earth of England, when a proper degree of heat is given it in a ſtove, will nouriſh the plants of the Indies; and, on the other hand, the earth of the Indies, when expoſed to the natural cold of the Engliſh climate, will nouriſh Engliſh plants. There is no need, in conſidering the nature of a *ſoil* for plants, to have recourſe to tranſmutation; for whether air or water, or both of them, be, or be not transformed into earth, the thing is the ſame in regard to the plant, if it be earth, when it is taken up by its roots: and it is very certain, from experiments, that neither air alone, nor water alone, as ſuch, can nouriſh plants. Theſe kind of metamorphoſes may properly enough be conſidered in diſſertations purely concerning matter, and to diſcover what the component particles of earth are; but they are not at all neceſſary to be known, in order to the maintaining of plants. *Tull*'s Horſehoeing Huſbandry, p. 14.

Brickiſh SOIL, a term uſed by our farmers to expreſs a kind of hazely earth, or land, with a reddiſh caſt. It is frequent in Eſſex, and ſome other counties, and approaches to the nature of a loam. It has no ſtones in it, and does not bind after wet as clay does, but lets all the water in that comes, and has no ſtones in it; whereas all clays hold the water till the ſun exhales, and after rain with a froſt moulder into duſt.

Theſe loams are an excellent mixture for other earths, being a happy medium between two extremes, uniting what is too looſe, cooling what is too hot, and entertaining a moderate ſhare of moiſture.

The beſt produce of the brick earth is rye; if well dunged it will bear white oats, turneps, barley, wheat, buckwheat, and peaſe. The natural produce, in weeds, is broom, fern, quick-graſs, and the like. If it be well dunged, it will produce large crops of clover, but it ſoon wears out of it, and ſhould therefore be ſowed mixed with rye-graſs. The beſt manure for theſe lands is chalk, mixed with coal-aſhes:

marl makes a great improvement in them, and there is a ſtiff yellow kind of clay, that moulders with the froſt, that anſwers the ſame purpoſe. Whatever amendment is beſtowed upon this ſort of land by dung, and other enriching things, that do not abſolutely alter the nature of the earth, laſts but a little while. Theſe lands bind very much after rain, and turn whiter; no froſt will diſſolve the clod, and if they are newly plowed up, and never ſo much rain comes on them, people may walk or ride over them almoſt as firm as over gravel. If they are not frequently plowed, they are very ſubject to worms, which deſtroy the winter corn. They yield but poor crops in wet years; the weeds are generally very rank, and the wheat runs all into ſtraw. Plowing is a great improvement of them, they always grow well the year after it. Theſe lands are to be ordered for corn in the ſame manner with the clay land, only as they are rank, and carry the crop much into ſtraw, it is beſt to dung them on the etch crop, and to ſow them with barley, and never to dung the fallows. Where the farmer has not a mind to plow them, but keep them for graſs, they ſhould be mowed one year, and then kept ſhort fed with ſheep, which will in time ſweeten them very much. The red ſandy lands in Northamptonſhire are of this kind; they will not hold manure, ſo they plow but once for the year's crop, which is juſt before the ſowing-time, and manure juſt before they plow it; for if they plow it oftener, and manure it ſooner, they find a great quantity of the beſt mould waſhed away below the ſurface, and out of the reach of the roots of the corn.

In Oxfordſhire they have a ſort of red land, which they begin fallowing as ſoon in the year as they can, before the ſun is too high: if it is moderately moiſt, when fallowed, they eſteem it the better, but it ſhould not be too wet. They ſeldom give it a ſecond ſtirring, and they reckon that if it is too fine and light, it runs to weeds. *Mortimer*'s Huſbandry, p. 73.

SOIL, in ſome parts of England, is uſed as the name for the *phoca*, or ſea-calf. See PHOCA.

This creature, in Cornwall, they frequently find ſleeping on the ſhore, and kill him; ſometimes by ſhooting, ſometimes by ſtriking over the head with long poles. He defends himſelf, when on ſhore, by throwing ſtones backward with great violence. *Ray*'s Engliſh Words, p. 107.

SOJOURNERS, among the Athenians, were permitted to dwell in the city, and follow their own buſineſs, without diſturbance, provided they obſerved all the laws and cuſtoms of the country; but were allowed no ſhare in the government. However, they were not allowed to act any thing, or manage any buſineſs in their own names, but were obliged to chooſe out of the citizens one, to whoſe care and protection they would commit themſelves, whoſe duty it was to defend them from all violence and oppreſſion. He was called *proſtates*. *Potter*, Archæol. Græc. l. 1. c. 10. Tom. I. p. 55. See the article PROSTATES.

SOKE (*Cycl.*)—SOKE-*reeve*, in our old writers, the lord's rent-gatherer in the *ſoke*, or *ſoken*. *Fleta*, *Blount*.

SOKHIO, in the materia medica, a name uſed by ſome authors for a peculiar ſpecies, if it may be ſo called, of the lignum aloes.

It is of a greyiſh colour, and ſeems to have been the blea, or outer part of the wood next the bark. *Camell.* Syll. p. 87.

SOLÆUS, in anatomy, a large fleſhy flat muſcle, nearly of an oval figure, and thicker in the middle than at the edges. It has its name, from its ſuppoſed likeneſs to a ſole. It is ſituated on the backſide of the leg, lower down than the gaſtrocnemii, by which it is covered, and with which it forms the calf of the leg. It is fixed below, partly to the tibia, and partly to the fibula: it is fixed to above one third of the upper part of the backſide of the fibula, and a little to the articular ligament of the head of this bone. It is likewiſe fixed to the backſide of the tibia from the oblique line, or impreſſion, which terminates the inſertion of the poplitæus, down to the middle of the internal angle of the bone; afterwards leaving theſe two bones, it ends in a broad ſtrong tendon, which, together with that of the gaſtrocnemii, forms what is called the *tendo Achillis*. This ſtrong tendon contracts a little in its paſſage to the os calcis, and then expanding a little, it is inſerted obliquely in the backſide of that bone all the way to the tuberoſity. The fleſhy body of the *ſolæus* ſeems to conſiſt of, at leaſt, two planes of fleſhy fibres, that on the backſide of the muſcle being the moſt ſimple, and the other, or that next the bone, penniform. This muſcle, with the two gaſtrocnemii, form what anatomiſts call a *true triceps*. *Winſlow*'s Anatomy, p. 219.

SOLAND, or SOLEN-*goose*, in zoology. See the article GOOSE.

SOLANUM, *night-ſhade*, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, and is of a rotated form, and divided into ſeveral ſegments. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the middle part of the flower, and finally changes into a roundiſh or oval berry, or ſoft ſucculent fruit, which contains many ſeeds, uſually of a flatted form. *Tourn.* Inſt. p. 148.

The ſpecies of *ſolanum*, enumerated by Mr. Tournefort, are theſe, 1. The common *night-ſhade* with black berries. 2. The common *night-ſhade* with red berries. 3. The common *night-ſhade* with yellow berries. 4. The common *night-ſhade* with greeniſh yellow berries. 5. The berry-bearing African *night-ſhade* with frequent and deeply indented leaves. 6. The great Surinam *night-ſhade*, reſembling the common *night-ſhade* in leaves, &c. 7. The perennial Portugal *night-ſhade* with large indented leaves, and red fruit. 8. The common climbing *night-ſhade*, or bitter-ſweet. 9. The white-flowered climbing *night-ſhade*. 10. The double-flowered climbing *night-ſhade*. 11. The climbing *night-ſhade* with variegated leaves. 12. The ſea-*night-ſhade*, or dulcamara. 13. The common berry-bearing ſhrubby *night-ſhade*, called *ſtrychno dendron*, and *pſeudo capſicum*. 14. The tuberoſe eſculent *night-ſhade*, or potatoes. 15. The white-flowered *potatoes*. 16. The prickly African large-fruited ſhrubby *night-ſhade* with deeply indented leaves, and flowers like thoſe of borrage. 17. Black annual Virginian thorny *night-ſhade*, ſpreading very far, and bearing white flowers. 18. The thorny American ſhrubby *night-ſhade* with fire-coloured ſpines. 19. The red-fruited Indian ſhrubby *night-ſhade*. 20. The borrage-flowered Indian thorny *night-ſhade*. 21. The thorny and deeply woolly *night-ſhade*. 22. The leſs thorny woolly *night-ſhade* of China with ſmall flowers, diſpoſed in a ſort of umbels. 23. The Indian *night-ſhade* with indented leaves, and purpliſh black prickles. 24. The ſmooth American *night-ſhade* with yellow nerves to the leaves, and yellow thorns, and with large fruit. 25. The thorny American *night-ſhade* with leaves like thoſe of the mad-apple, or melongena, and large fruit. 26. The ſhrubby acanthus-leaved American *night-ſhade*. 27. The prickly peach-leaved American *night-ſhade*. 28. The prickly bay-leaved ſhrub American *night-ſhade*. 29. The woolly-leaved climbing American *night-ſhade*. 30. The woolly mullein-leaved American *night-ſhade* with ſmall yellow fruit. 31. The American ſhrubby *night-ſhade* with the common *night-ſhade* leaves, and ſmall red fruit. 32. The tree American *night-ſhade* with undulated almond-like leaves, and large white flowers and red fruit. 33. The ſingle ſeeded ſhrubby American *night-ſhade* with polycanthus leaves. 34. The prickly climbing American *night-ſhade* with henbane leaves, and flowers, purple without, and white within. *Tourn.* Inſt. p. 149.

SOLANUM *pomiferum*, *apple-bearing night-ſhade*, a name given by writers to the *night-ſhades*, and plants of ſeveral genera, allied to thoſe, and bearing large fruits. See the articles MELONGENA and LYCOPERSICON.

SOLANUM *ſomniferum*, *ſleepy night-ſhade*, a name given by Caſpar Bauhine, and ſome others, to a ſpecies of winter-cherry, the whorled alkekengi with ſmall fruit. See the article ALKEKENGI.

SOLAR (*Cycl.*)—SOLAR *comet*. See the article DISCUS.

SOLATRUM, in botany, a name given by many authors to the common night-ſhade. *Ger. Emac. Ind.* 2.

SOLDANELLA, *ſea bind-weed*, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, formed into the ſhape of a bell, and jagged or fimbriated at the edges in moſt ſpecies; from the cup of this flower riſes a piſtil, which perforates the bottom of the flower, and is fixed like a nail to its hinder part; this afterwards ripens into a cylindric fruit, which opens at the top, and is filled with ſeeds fixed to a placenta.

There are only three known ſpecies of this plant. 1. The common round-leaved kind. 2. The white-flowered round-leaved Alpine kind. 3. The Alpine kind with leſs rounded leaves. *Tourn.* Inſt. p. 82.

In the Linnæan ſyſtem of botany, the characters of this genus are theſe. The cup is an erect perianthum, divided into five pointed ſegments, and remaining when the flower is fallen. The flower conſiſts of one petal, in the ſhape of a bell, widening by degrees to the mouth, where it is notched and jagged. The ſtamina are five tapering filaments. The antheræ are ſimple. The germen of the piſtil is roundiſh. The ſtyle is ſlender, of the length of the flower, and remains when that is fallen. The ſtigma is obtuſe. The fruit is an oblong cylindric capſule, obliquely ſtriated, containing only one cell, opening, and having ten indentings on the top. The ſeeds are very numerous, extremely ſmall, and pointed, and their receptacle is columnar in figure, and looſe. *Linnæi* Gen. Plant. p. 64.

SOLDANELLA is alſo a name very improperly given by many authors to ſome of the proper and genuine ſpecies of bind-weeds; as the purging ſea-bind-weed with roundiſh leaves and purpliſh flowers, the great Italian ſea-bind-weeds with ſinuated leaves, and the common round-leaved ſea kind. See the article CONVOLVULUS.

SOLDER (*Cycl.*)—*Silver*-SOLDER. Though ſpelter *ſolder* be much cheaper than *ſilver-ſolder*, yet workmen in many caſes prefer the latter. And Mr. Boyle [b] informs us, that he has found it to run with ſo moderate a heat, as not much to endanger

endanger the melting of the delicate parts of the work to be *ſoldered*; and if well made, this *ſilver-ſolder* will lie even upon the ordinary kind itſelf; and ſo fill up thoſe little cavities, that may chance to be left in the firſt operation, which is not eaſily done without a *ſolder* more eaſily fuſible than the firſt made uſe of.—[b Works Abridged, Vol. I. p. 135.]

SOLDIDO, a name given to the *tamoato*. See TAMOATO.

SOLDIER (*Cycl.*)—The profits attending the profeſſion of a *ſoldier*, among the Romans, were very conſiderable. 1. Booty and plunder, with which they frequently returned home loaded, eſpecially after taking any cities or towns; for theſe were generally given up to be plundered. 2. The ſubdued countries, which were often divided among the *ſoldiers*. 3. Their pay. 4. Cloaths. 5. Proviſions. 6. Farms and houſes in provinces were alſo given them. 7. Many privileges and immunities, as that none could touch his goods in his abſence in the camp. 8. Legacies, which the emperors left to be diſtributed among them. 9. Donatives. 10. Promotions to military honours lay open to every brave man, though of the meaneſt birth. *Pitiſc.* in voc.

SOLEÆ, among the Romans, were a kind of ſandals or ſlippers, which covered only the ſole of the feet, and were bound on with thongs of leather; inſtead of which the women, and effeminate perſons of the other ſex, tied them on with purple-coloured ribbands, or ſuch as were variouſly adorned with gold and ſilver. *Pitiſc.* in voc.

SOLEN, the *razor-fiſh*, in natural hiſtory, the name of a genus of ſhell-fiſh, the characters of which are theſe. They have bivalve ſhells with an oblong body, and are open at both ends. They are uſually ſtrait, but in ſome ſpecies crooked. It had its name *ſolen* from the Greek, in which language that word expreſſes a pipe or tube; this fiſh, when the ſhells are cloſed, very aptly reſembling a tube. The Latin writers have called it *unguis*, from its reſemblance in colour and conſiſtence to the human nail. The common people, in many parts of France, call it *coutelier*, and in Italy it is commonly called *cannolichio*.

Rondeletius obſerves that there are, among the *ſolens* of the ſame ſpecies, males and females, which are eaſily diſtinguiſhable from one another; and that the females are larger, have no variegations on the ſhells, and are much better taſted than the males. Rumphius has deſcribed a very remarkable ſpecies of *ſolen*, which always remains buried in ſand, and which is not properly a bivalve, conſiſting only of one piece, though of the ſhape of the *ſolen*; he calls this *ſolen arenarius*. Liſter has called the crooked ſpecies *ſolenes curvi*, and ſome call them the *ſcymitar ſolens*.

We have ſeveral ſpecies of the ſtrait *ſolens*, though but few of the crooked ones. Of the firſt kind are, 1. the common white *ſolen*. 2. The red American *ſolen*. 3. The variegated *ſolen*. 4. The zoned *ſolen*, called the *onyx-ſhell*. 5. The brown *ſolen*. 6. The large duſky *ſolen*. 7. The *unguis*, properly ſo called. This exactly, in texture and appearance, reſembles the human nail. 8. The finger *ſolen*, called *dactylus* by the antients. 9. The flute or pipe *ſolen*. 10. The reed *ſolen*. 11. The long brown *ſolen* with a thick black muſcle at the cardo. See Tab. of Shells, N° 23.

Of the crooked *ſolens* the following two are the only known ſpecies. 1. The ſcymitar *ſolen*. 2. The *ſolen arenarius*, always found in ſand.

The ſhell of this fiſh is compoſed of two pieces, which are the two halves of a hollow cylinder with an elliptic baſe, divided in a longitudinal direction. Theſe two pieces are faſtened together near one end by a ligament, like that which joins the ſhells of the muſcle or the oiſter. From the place where this ligament is fixed, quite to the other end of the ſhell, there is a membrane faſtened to each edge of the ſhells, and this encreaſes in breadth in proportion to its diſtance from the place of its origin; ſo that viewed externally, it forms a ſort of iſoſceles triangle, the baſe of which has about two lines in breadth. The colour and conſiſtence of this membrane give it very much the appearance of a piece of parchment; it has a conſiderable ſpring in it, and ſerves on occaſion to open, or draw together the two ſides of the ſhell.

There is another membrane, of the ſame kind with this, faſtened to the other ſide of the fiſh, there adhering to each ſhell, but this is of an equal breadth all the way down: this ſerves alſo to ſhut or open the edges of the ſhell. When the *ſolen* ſhuts its ſhell, it folds itſelf into ſeveral longitudinal wrinkles, which open again when the ſides of the ſhells ſeparate.

Hence it is to be obſerved, that though this ſhell has a power of opening and ſhutting, yet the body of the fiſh is always ſecured, and is no more expoſed to ſight at one time than at another, and there is no part where the fiſh can be ſeen but at the ends.

This fiſh lives in the ſand on the ſea-ſhore, where it buries itſelf often a foot and a half, or two feet deep; the length of the ſhell is, at this time, nearly in a vertical poſition, and the fiſh has a power of raiſing itſelf at pleaſure up to the ſurface, and ſinking down again, while the ſhell remains all the time buried in its place. Almoſt all other animals have an horizontal motion, and the ſhell-fiſh of the ſea crawl along upon its bottom under water, as the common land animals do on dry ground; but this creature's progreſſive motion is only vertical, and that confined to a very ſmall compaſs, all that it is able to do for itſelf, being only to raiſe itſelf higher or lower, and ſink deeper or riſe higher in the ſand, within the narrow compaſs of about two feet at the utmoſt, as the going beyond that muſt occaſion its deſtruction. Where theſe ſhell-fiſh are buried in the ſand, there is a hole reaching from every one of them to the ſurface, by means of which they have a free communication with the water: theſe holes generally are placed in great numbers near one another, and are eaſily diſtinguiſhed at a time when the tide has left the ſhore uncovered. They are not round, but oblong, and ſomewhat reſemble the key-hole of a lock, but that they have a roundneſs at each end, whereas that uſually is rounded only at one. When the winds are violent, they blow the ſand about, and ſtop up theſe holes, otherwiſe, whenever there are any of theſe fiſh, they are eaſily diſcovered. When the ſea is down, theſe fiſh uſually run deep into the ſand, and to bring them up, the common cuſtom is to throw a little ſalt into the holes, on which the fiſh raiſes itſelf, and in a few minutes appears at the mouth of its hole. When half the ſhell is diſcovered, the fiſherman has nothing more to do than to take hold of it with his fingers and draw it out, but he muſt be cautious not to loſe the occaſion; for the creature does not continue a moment in that ſtate, and if by any means the fiſherman has touched it, and let it ſlip away, it is gone for ever, for it will not be decoyed again out of its hole by ſalt; ſo that there is then no way of getting it but by digging under it, and throwing it up with the ſand. This fiſh has two pipes, each compoſed of four or five rings or portions of a hollow cylinder, of unequal lengths, joined one to another, and the places where they join are marked by a number of fine ſtreaks or rays. Now the reaſon why the ſalt makes theſe creatures come up out of their holes, is, that it gives them violent pain, and even corrodes theſe pipes: this is ſomewhat ſtrange, as the creature is nouriſhed by means of ſalt water; but it is very evident, in that if a little ſalt be ſtrewed upon theſe pipes in a fiſh taken out of its habitation, it will corrode the joinings of the rings, and often make one or more joints drop off: the creature, to avoid this miſchief, ariſes out of its hole, and throws off the ſalt, and then retires back again. The uſe of theſe pipes to the animal, is the ſame with that of many other pipes of a like kind in other ſhell-fiſh, they all ſerve to take in water; they are only a continuation of the outer membrane of the fiſh, and ſerve indifferently for the taking in and throwing out the water, one receiving, and the other diſcharging it, and either anſwering equally well to their purpoſe.

When one of theſe fiſh is taken out of its hole, and laid upon the ſand, if any thing touches it, it immediately gets in order for its progreſſive motion. It throws out a long cylindric part, of half the length of the ſhell, and of the ſhape of a clapper of a bell; this is ſuſpended to the middle of the animal by a ligament, but in all other parts it is looſe; this ſerves as a leg to the creature: as it lies upon the ſand, it extends this about an inch from the end of the ſhell, and changes its cylindric figure to a flat one, which terminates in a point, flat and ſharp at the edges; with this it opens its paſſage into the ſand. When the opening is made, it extends this part ſtill farther, and buries it deeper, and after this bends it back again in ſuch a manner, that its point turns up towards the ſhell; thus it gives this part a figure of a hook, and by this hook it draws its whole body and ſhell down. In this attempt it brings the edges of the ſhells every where cloſe together, and inſtead of lying flat upon the ſand, it now by degrees gets into a vertical poſition, and then there remains nothing to do, but to draw it deeper into the ſand. To effect this, it now again extends its leg, which it eaſily paſſes into the ſand in its flatted ſhape, and when it has thus pierced to its utmoſt length, the creature inflates, and extends it by degrees to the ſize of the ſhell, and to a round or cylindric figure; the conſequence of which is, that there is now a hole made of the ſhape of the ſhell, and equal to its diameter, into which it can eaſily ſink: to facilitate this, however, the creature ſwells out the extremity of the leg into a ſort of button, which holding faſt in its place, nothing more is neceſſary than to contract the reſt of the leg, in order to pull down the ſhell after it. This operation is repeated as often as is neceſſary, and the creature, at every movement of this kind, getting down half the length of its ſhell, or thereabouts, is very ſoon plunged as deep as its occaſions require.

When it has occaſion to aſcend out of its hole, the ſame leg ſerves for that purpoſe; nothing more being required, than the putting out the end of the leg, ſwelling it, and thus thruſting itſelf up to the length of that leg; then retracting it into the ſhell again, and thruſting out, and inflating its end for a ſecond movement of the ſame kind. Theſe motions may be all perceived in the creature when out of the ſand, particularly that by which it buries itſelf; for if held up in the fingers, it thruſts out the leg, and performs all the motions as if in the ſand, making a fruitleſs attempt to

ſave itſelf in its old way. Mem. Acad. Par. 1712. See the article DACTYLUS.

Klein, and ſome others, have given the name *ſolen* to the ſeveral ſpecies of *tubuli marini*.

The word is derived from the Greek, σωλην, tubulus. Of theſe there are ſeveral genera, diſtinguiſhed by their proper characters.

1. *Solen lignorum*, the wood tubule. This is a *tubulus marinus*, or ſhelly caſe of a ſea-worm, of a white colour, not cut, of the thickneſs of a gooſe-quill, more or leſs, and very irregularly bent and contorted.

2. *Solen arenarius*, the ſand tubule. This is defined to be a *tubulus marinus*, in form of a very long tube, which is thick, jointed, and gradually tapering from one end to the other, and divided into new pipes of the ſame kind. *Klein*, de Tub. Mar. p. 12.

3. The *ſolen anguinus*, or ſnake tubule. This is defined to be a *tubulus marinus*, which is variouſly bent and waved, in the manner of a ſnake. Of theſe there are ſeveral ſubdiviſions; ſome are ſmooth, and terminate in a beautifully twiſted end; others are variouſly and very elegantly folded, and others are of a triangular form, and are triangular tubes terminated at one end with a number of ſlight obtuſe notches or teeth, as they are called by ſome; and finally, ſome are found with a fiſſure running down their whole length, and regularly marking the middle of all their ſnail-like volutions. *Klein*, de Tub. p. 3.

4. The *ſolen vermicularis*, or worm tubule. Theſe are diſtinguiſhed from the others by being very long, and folded like our large earth-worms. Of theſe alſo there are ſeveral kinds; ſome deſcribed by Rondeletius, Johnſon, and other authors, under the name of worms hiding themſelves in tubes, *vermes in tubulis delitescentes*. Theſe are of a cylindric figure, white, rough on the outſide, but very ſmooth within, and are ſometimes perfectly ſtrait, ſometimes crooked and folded. Within theſe ſhells the exuviæ of the animal-inhabitant may be often diſtinguiſhed. *Klein*, de Tub. p. 4.

Others of theſe are of an angular figure, often trigonal, and not unfrequently theſe are found twiſted into beautiful ſpiral lines.

Others, from their ſimilitude to the inteſtines of ſmall fiſh, have been called *viſcera piſcium* by authors. Theſe are uſually ſomewhat rough, and lie hid in the mud, under and among the rocks: they are commonly of an earth colour, or duſky brown.

Others are ſo tough and ſoft as to be flexile; theſe reſemble an earth-worm, or the gut of ſome ſmall animal in form, and are of a rough ſandy conſtruction, and often are found above a foot long.

Others are ſmall, lightly ſtriated, or cancellated, and uſually of a reddiſh colour; and finally, others are very ſmall, perfectly white, and often turned like a nautilus: theſe are very common on almoſt all marine bodies, being ſometimes found adhering to the leaves of the ſea-fucuſes, often to ſhells of various kinds, and very frequently to the claws of lobſters, &c.

5. The *ſolen corallorum*, or coral tubule. This is a very capacious tubule, reſembling parts of the thicker and larger inteſtines, whether empty or ſtuffed; and are at one end affixed to the rocks, particularly to thoſe on which the corals are found, and open at the other. Of theſe there are two principal kinds, the one ſmooth, the other corrugated or wrinkled. Of the ſmooth ones ſome reſemble a boot in figure, and have been called *ocreati*, and *boot-ſhells*; others are low and vaulted, and reſemble the hollow of an oven; theſe alſo, for this caſe, have been called *clibaniformes*. *Klein*, de Tub. p. 5.

6. The *ſolen phalloides*, or tubule reſembling in figure the membrum virile. This is a large, white, and ſmooth tubule, much reſembling in figure the part from which it has its name. It frequently reſembles a ſort of thick root, and at its lower end there ſtands out a ſort of ſiphunculus, which is perforated. Liſter has deſcribed this under the name of *phallus*. *Klein*, de Tub. p. 6.

7. The *ſolen fragilis*, or brittle tubule. This is diſtinguiſhed from the reſt by its fragility, being compoſed, in a manner, only of looſe ſand, and always falling to pieces with a ſlight touch. Of theſe ſome are of a finger's length, rough on the outſide, and ſmooth within, ſlender, and uſually found full of water; others have a great deal of ſand in their compoſition, but are ſo contrived, that they are ſmooth both within and without, and pellucid. *Klein*, de Tub. p. 7.

SOLE, in the manege, is a nail or ſort of horn under a horſe's foot, which is much more tender than the other horn that incompaſſes the foot, and by reaſon of its hardneſs is properly called the *horn*, or *hoof*. A horſe's ſhoe ought to be ſo ſet upon the hoof, as not to bear upon the *ſole*; for otherwiſe the *ſole* would be hurt, and not only make the horſe lame, but corrupt the fleſh that ſeparates it from the coffin-bone.

To take out the *ſole*, is to do it without touching the horn of the hoof; for if you take off the horn, you make a *hoof-caſt*. We take out the *ſole* for ſeveral infirmities, as may be ſeen in Mr. Solleyſel's Compleat Horſeman. A horſe that is *unſoled*, may recover in leſs than a month.

High-ſoled, called in French *pied comble*, is ſaid of a horſe whoſe *ſole* is round underneath, ſo that it is higher than the hoof, and oftentimes makes the horſe halt, and hinders the ſhoeing of him, unleſs the ſhoe be vaulted.

SOLEA, the *ſoal-fiſh*, a well known fiſh, and much eſteemed at table.

It is diſtinguiſhed from the fiſh of the plaiſe-kind, in that it is of a longer and narrower ſhape. Its upper part is of a blackiſh grey, its under, or belly, white. It is covered with ſmall ſcales, armed at their extremities with a ſort of ſhort prickles. The fins that ſurround the body are all inclined from the head toward the tail. The eyes are ſmall, and covered with a looſe ſkin. The pupils are of a fine bright green. It is a firmer fiſh, by much, than the plaiſe. It is common in the Mediterranean, Engliſh, and German ſeas. *Willughby*, Hiſt. Piſc. p. 100.

SOLFEGGIAMENTO, in the Italian muſic, compoſitions, of which the ſyllable *ut*, or *do*, *re*, *mi*, *fa*, &c. are the ſubject. See SOLFEGGIARE.

SOLFEGGIARE, SOLFIZARE, or SOLMIZARE, in the Italian muſic, is the uſing the ſyllables *do*, *re*, *mi*, *fa*, &c. in learning to ſing, otherwiſe called *ſolfaing*. See the article SOLFAING, *Cycl.*

From this muſicians have made what is called a *ſolfeggiamento*, which properly intimates no more than the practice abovementioned; but the name is more particularly applied to certain compoſitions, be they fugues, or others, of which theſe ſyllables are the ſubject. Several very fine pieces of this kind are extant. *Broſſard.*

SOLFIZARE, in the Italian muſic. See the article SOLFEGGIARE.

SOLID *body in geometry*, that which has three dimenſions, length, breadth, and thickneſs. *Ozan.* Dict. Math. p. 117. *Wolf*, Elem. Geom. ſect. 421.

Such are priſms, cubes, ſpheres, parallelopipeds, cylinders, cones, pyramids, &c. *Wolf*, lib. cit. cap. 2. p. 186. See each under its proper article, PRISM, CUBE, CYLINDER, &c. *Cycl.*

For the ratio of geometrical *ſolids*, all priſms, parallelopipeds, cylinders, pyramids, and cones, are in a compound ratio of their baſes and altitudes: ſo that if the baſes be equal, they are in the ſimple ratio of the altitudes; or, if the altitudes be equal, of the baſes. And as the baſes of cylinders and cones are circles, and circles are in the duplicate ratio of their diameters, it follows that all cones and cylinders are in a ratio compounded of the direct ratio of their altitudes, and the duplicate one of their diameters. *Wolf*, Elem. Geom. ſect. 510, ſeq. Ejuſd. Elem. Anal. ſect. 106.

Regular SOLID. See the Cyclopædia.

Irregular SOLID, a *ſolid* which is not terminated, or contained under equal and ſimilar ſurfaces. *Wolf*, lib. cit. ſect. 428. *Ozan.* Dict. Math. p. 120.

The *ſolidity* of a regular body is eaſily found from principles of geometry [c]; for that of irregular bodies, mechanical methods are uſed: one is by putting the body in a hollow parallelopiped, and filling up the remaining ſpace with water or ſand; then taking out the body, and obſerving the heighth to which the water or ſand riſe alone [d]. This gives us a parallelopiped, equal to the given body, whoſe ſolidity is eaſily found.—[c *Wolf*, lib. cit. ſect. 497. d Ibid. ſect. 498.] See the article PARALLELOPIPED.

SOLID *root*, among botaniſts, expreſſes the whole *root* to be one uniform lump of matter. See the article ROOT.

SOLEIL *de mer*, in zoology, a name given by the French writers, and by Rondeletius, to a peculiar ſpecies of ſtar-fiſh, of a ſmall ſize, the legs of which reſemble very much the tails of lizards, and are very brittle.

Geſner deſcribes alſo a ſpecies under the name of the ſea-moon, *luna marina*, which he ſays is remarkably fragile, and which, from what elſe he has ſaid of it in its deſcription, appears alſo to be the ſame creature. The great character, however, of the creature's legs reſembling, both in colour and figure, the end of the common brown land-newt's tail, is ſo expreſſive, that it cannot but be always known by it.

Theſe rays are ſo extremely friable, that it is ſcarce poſſible to touch them without their breaking, and they are not beſet with points in the manner of the common rays of the creatures of this kind: their upper ſurface is rounded, and covered with a ſort of circular ſcales; the under ſurface is, in the ſame manner, covered with ſcales, but it is flat: theſe ſcales alſo differ in figure, being only ſegments of circles, whereas the others are compleat rings; thoſe on the underſide are beautifully arranged, in an alternate order, of two and one all the way along the rays.

The other rays of ſtar-fiſhes being furniſhed with many hundred legs, and theſe wanting them entirely, it follows, that in this ſpecies the rays themſelves muſt ſupply the place of legs, and aſſiſt the creature in walking; and thence its manner of walking muſt neceſſarily be different from that of any other kind. Theſe rays are five in number, and are inſerted very near the mouth of the creature, which is always placed in the center of the ſtar: the part where this aperture is ſituated, and which may be called the body of

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the animal, is of a roundiſh figure; the diameter of it is about a third part of the length of the rays; its under ſurface is flat, and its upper convex; and it is covered, both above and below, with ſcales, but they are arranged in different manners. At the inſertion of each of the rays, there is placed a triangular membrane, terminating in a ſharp point; and theſe membranes only appear, when the creature is immerſed in water, and moves itſelf about.

The common habitation of the ſea-ſtars, on the rough ſhores of the ſea, is no place for theſe tender creatures, every daſh of a wave againſt a ſtone, if they were in the way, would break off their limbs; they have the caution, therefore, to fix their reſidence only in calm places, and where the ſhore is covered entirely with a deep ſmooth ſand. They are often buried in the ſand, and often, when the water has forſaken them, are ſeen walking ſlowly on the ſhore; and in this caſe they uſe their rays as ſo many legs. As they divide the body of the fiſh into equal parts, there is no ray before or behind any where, ſo that the creature goes with equal eaſe to any ſide that it likes. The beſt motion they are able to make is, however, very ſlow, and the ground on which they march ought to be very even; for if they attempt to haſten their pace, or if they find any thing uneven in their paſſage, one or more of their legs uſually breaks; and this is the reaſon why this ſpecies is ſeldom found with its rays perfect. They never bury themſelves deep in the ſand, but juſt get under it, ſo as to be covered; and this they do by advancing two of the rays together, and burrowing carefully with them, and then following them with the reſt of the rays and the body. Mem. Acad. Par. 1712.

SOLIFUGA, in natural hiſtory. See SOLIPUGA.

SOLIPUGA, in natural hiſtory, that name given by the Romans to a ſmall venomous inſect of the ſpider-kind, called by the Greeks *heliocentros*, both words ſignifying an animal which ſtings moſt in the country and ſeaſons where the ſun is moſt hot.

Solinus makes this creature peculiar to Sardinia; but this is contrary to all the accounts given us by the antients. Pliny tells us of its being common in Ethiopia, and that in ſome places there the inhabitants had been all killed by the ſerpents and *ſolipugæ*; and Lucan gives the hiſtory of it among the poiſonous reptiles of Africa.

Almoſt all the hot countries produce this venomous little creature. It lies under the ſand, to ſeize other inſects as they go by; and if it can meet with any uncovered part of a man, will bite him, and the wound will prove very painful and envenomed. It is ſaid that the bite is abſolutely mortal, but probably this is not true. Solinus writes the word *ſolifuga*, and ſo do many others, erroneouſly deriving the name from its flying from the ſun's rays, and burying itſelf in the ſand.

Pliny ſays that it was an ant of the ſhape of a ſmall ſpider, but his accounts of this kind are too confuſed to be much depended on. Some of the old commentators wander yet farther from the truth, and call it a kind of fly; but the deſcriptions of it, by thoſe moſt to be truſted, make it a ſpider, and it ſeems to be that called by Ariſtotle *phalangium dectícum*, the deadly ſpider. It is plain that even Pliny, in ſome part of his works, has underſtood the creature to be this phalangium; for where he has tranſlated the old Greek writers on the ſubject of the phalangium, he has very frequently rendered the word not phalangium, but *ſolipuga*: ſo that it is wonderful he ſhould, in other places, treat of the phalangium, without any mention of the *ſolipuga*, and of the *ſolipuga*, in a different part, as not at all allied to the phalangium. It appears from this, and a great many like things, that Pliny wrote his book at different times, and tranſcribed his accounts from different authors; ſo that he ſometimes forgot what he had before written on the ſame ſubject under a different name.

SOLLECITO, in the Italian muſic, is ſometimes uſed to expreſs that a piece is to be played in a mournful manner, fit to enforce grief upon the hearer; at other times, that it ought to be done carefully and with exactneſs. *Broſſard.*

SOLMIZARE, in the Italian muſic. See SOLFEGGIARE.

SOLO, in the Italian muſic, is frequently uſed in pieces conſiſting of ſeveral parts, to mark thoſe that are to perform alone; as *fiauto ſolo*, *violino ſolo*.

It is alſo uſed for *ſonatas* compoſed for one violin, one German flute, or other inſtrument, and a baſs: thus we ſay, *Coralli*'s *ſolos*, *Geminiani*'s *ſolos*, &c.

When two, or three parts, play or ſing ſeparately from the grand chorus, they are called a *doi ſoli*, a *tre ſoli*, &c.

Solo is ſometimes denoted by *S*.

SOLOMON's *ſeal*, a plant, called by authors *polygonatum*. See the article POLYGONATUM.

SOLSEQUIUM, a word uſed by ſome chemical writers as a name for ſulphur.

SOLOS, σολος, in antiquity, an inſtrument with which the exerciſe of the quoit was performed, which ſome will have to be diſtinguiſhed from the diſcus, becauſe that was of iron, this of ſtone: but others, with more reaſon, report that the difference conſiſted in this, *viz.* that the σολος was of a ſpherical figure, and the diſcus broad. *Potter*, Archæol. Græc. Tom. I. p. 443.

SOLVENTS (*Cycl.*)—Among the ſeveral liquors, which are called *ſolvents* of the metals, there are ſome which entirely diſſolve them, others which diſſolve only a part of them. Common water is the moſt general of all *ſolvents*; it diſſolves all metals by attrition alone. Mercury does not eaſily diſſolve iron, but it readily enough diſſolves all other metals. Acids in general alſo diſſolve them all; but theſe acids being of different natures, ſome of them diſſolve ſome particular metals, and do not touch the reſt. The general diviſion of the acid *ſolvents* is into two kinds, thoſe of the nature of aqua fortis, and thoſe of the nature of aqua regia. The laſt are either the ſpirit of ſea-ſalt alone, or any of the other acids, with the addition of ſea-ſalt, or its diſtilled ſpirit; and the firſt are ſpirit of nitre, and all other mixed menſtruums, in which ſpirit of nitre makes a part, provided there be no ſpirit of ſea-ſalt, or of that ſalt in ſubſtance in them. There is alſo a third claſs, beſide theſe, of what are called the ſimple acids; theſe are ſuch acid liquors as contain neither nitre nor ſea-ſalt, nor any preparation of them; and of theſe ſome are obtained from the animal, ſome from the vegetable, and ſome from the mineral kingdom.

All the *ſolvents* of the aqua regia claſs diſſolve gold, without diſſolving ſilver, and all thoſe of the aqua fortis claſs diſſolve ſilver, without touching gold: but the other acid ſpirits, and the aquæ regales, and aquæ fortes, all equally diſſolve the leſſer metals, if made of a proper degree of ſtrength for each metal. It was long ſuppoſed, that mercury was only ſoluble in the aqua fortis claſs, but Mr. Homberg has proved that the aquæ regales will alſo diſſolve it; and the ſame accurate chemiſt has alſo advanced another fact, which more than this contradicts the received opinions: this is, that ſilver is alſo ſoluble in aqua regia, if proper circumſtances are obſerved. The occaſion of his advancing this, was the following obſervation. He often made his aqua regia, by diſtilling together two parts of ſalt-petre, three parts of vitriol, and five parts of ſea-ſalt; in the diſtillation he uſed to ſeparate the phlegm which roſe firſt, and keep it in a vial by itſelf, and the ſpirit that followed in another.

One day having ſome gold to diſſolve, he by miſtake took down the vial which contained the phlegm of the aqua regia, inſtead of that which contained the ſtrong ſpirit; he poured on a quantity of this phlegm to the gold, and ſet it in a proper heat for two hours, when taking it out, the liquor was found to be tinged yellow, but the gold was not diſſolved. Not recollecting the miſtake, he ſuppoſed he had taken aqua fortis inſtead of the aqua regia, and taking out the gold he weighed it, and found it had not loſt a grain. On this he put in a piece of ſilver to the liquor, and placing it again in the ſame heat, this metal was ſoon diſſolved into a ſort of black mud. In this ſolution there appeared nothing of that ebullition, which always attends the diſſolving ſilver in aqua fortis; and Mr. Homberg, ſurpriſed at this, was for repeating the operation; when pouring the liquor upon ſome freſh ſilver, it did not appear to diſſolve it at all: in enquiring into the cauſe of this, he found that the liquor he had taken was not aqua fortis, but the phlegm of aqua regia. On this the event ſeemed much more remarkable than before, and he repeated the proceſs ſeveral times, and always with the ſame ſucceſs; but trying it a year afterwards, he found the event exactly contrary, the ſame liquor then diſſolving gold, and not touching ſilver: after this making ſome of the phlegm afreſh, he found it would diſſolve ſilver, and not gold, as in the firſt experiment; and this, when it had been kept a year, again changed its nature, and would then diſſolve gold, and not ſilver. So that, from the whole, there appear three neceſſary circumſtances for the making aqua regia diſſolve ſilver; the firſt, that it be very weak; the ſecond, that it have before had gold in it; and the third, that it be freſh diſtilled.

This phlegm of aqua regia is pellucid, and colourleſs as water, before it has been poured upon the gold; after this it becomes lightly tinged with yellow, and when after this it is powered upon the ſilver, it becomes as black as ink. The ſolution of ſilver, in this menſtruum, is very different from that in aqua fortis; in the laſt it is made with great ebullition, and the ſolution, when perfected, is limpid as water; in the other there is no ebullition, and the ſolution appears rather a diſunion of the parts, for the whole becomes black and turbid, and differs much from a clear ſolution. Mem. Acad. Par. 1706.

SOLUTION (*Cycl.*)—*Chemical* SOLUTION. The great Boerhaave has ſummed up the doctrine of *chemical ſolution*, by its ſeveral agents, in the following ſuccinct manner.

1. *Solution* is performed by water, by diluting, infuſing, boiling, diſtilling, mixing, fermenting, putrefying, and ſeparating.

2. With oil, by diluting, infuſing, boiling, diſtilling, mixing, ſeparating, but not by fermenting, or by putrefying.

3. With fire, by calcining, roaſting, burning, melting, ſubliming, mixing, ſeparating, and by the promoting ſeveral other operations.

4. With the assistance of air, by fermenting, putrifying, agitating, exciting, and adding other parts capable of dissolving.
5. With fermented spirits, by diluting, infusing, boiling, distilling, mixing, and making oils thinner.
6. With alkaline salts, by calcining, torrefying, burning, melting, mixing, and separating, according to the various force of a dry fire employed.
7. By volatile alkaline salts, by subliming in the dry way, and by diluting, distilling, and digesting in the moist way.
8. With fixed alkali salts, assisted and moved by water and fire, by digesting, boiling, diluting, separating, and mixing.
9. With fixed acid salts, as those of alum, sulphur, and vitriol; either separately in a liquid form, or in their calxes, by diluting, boiling, distilling, digesting; or in a dry form, by calcining, roasting, burning, and distilling.
10. With volatile acid salts, by diluting, digesting, distilling, and insinuating.
11. With compound salts and soaps, by calcining, subliming, distilling, and digesting, either in a dry or a liquid form.
And 12. with metals, by fusion and amalgamation.
This seems an accurate and perfect table of the whole work of *solution*, and will easily be understood in every article, on recollecting the several chemical processes. *Boerh.* Chem. Part. 2. p. 338. See MENSTRUUM, *Cycl.* and *Suppl.*
No phænomenon in nature is more universally known, than the *solution* of salts in common water, but the world has not yet attended to all that might be learned from the observations on it.
Mr. Lemery, who examined into this point with great assiduity, has observed, 1. That the first effect of water upon a salt, is the reducing it into an inexpressibly fine powder. 2. That it is merely the consequence of this pulverisation carried greatly farther, that every particle of salt which, while in larger moleculæ, subsided to the bottom of the water, according to the known laws of hydrostatics, becomes capable of being elevated and suspended in the water, though in itself greatly heavier than that fluid; that while in a proper state of separation in this manner, they remain imperceptible in all the water, and when by certain accidents they again approach one another, they form concretions like their original ones, and again subside in that fluid, in which they floated while in form of this imperceptible powder.
In the *solutions* of salts, the same author observes, that all the particles of water do not serve to the same purpose; some officiating only in the keeping the saline particles suspended, others in the keeping them asunder, and, as barriers, preventing their reunion.
The quantity of water, necessary to sustain the particles of all salts in solution, is the same, but the quantity, required to keep those particles from joining again, is different, in regard to every salt. Hence though a quantity of water, equal to the weight of the salt, be sufficient to the suspension of its particles, yet every salt requires its own appropriated quantity of water to keep it in a state of solution; that is, to keep its particles from cohering together again. In such salts, the particles of which are not subject to form hard concretions, such as the fixed salt of tartar, and the like, there requires no more water for a *solution* than is necessary to suspend the particles of the salt; but in those which readily form solid concretions, such as common salt, nitre, borax, and the rest, there requires a large quantity beside to act as a barrier.
The more the particles of any salt are disposed to reunite, the more water they require to keep them in a state of *solution*; and hence follows a very remarkable phænomenon, which is the *solution* of several salts successively in the same water: this is known to be possible, and the reason of the whole is this, that when a given salt, requiring a large quantity of water for its *solution*, is dissolved in that water; the greater part of that water, which in this *solution* serves only to the second purpose of keeping the particles of the salt asunder, is still at full liberty to act as water upon another salt that shall be thrown into it.
This, however, can be only the case in regard to salts which do not naturally ferment with one another, because the whole process is disturbed by such a fermentation, and, in consequence of it, there is a third salt formed, which is not the same with either of the two; and the consequence of the formation of this salt, is the precipitation of the metallic, or earthy matter, which was the base of one of the other salts. Thus an alkaline salt, added to a *solution* of alum, or saccharum saturni, takes up the acid of either of these salts, and becomes, by its mixture with that acid, a new concrete salt, and at the same time throws down, in precipitation, the terrestrial base of the alum, and the metallic one of the salt of lead.
To return to those salts which excite no fermentation with one another. In regard to these, when a quantity of water has dissolved as much as it can retain of one, it will readily take in and dissolve a second; and the particles of this not fermenting with those of the salt first dissolved, will remain suspended, and the water which dissolves them, and which in the first *solution* served only as an intermedium to keep the particles of that salt asunder, serve as well to that purpose, now they are impregnated with this new salt, as they did before.
The reason hitherto given for this phænomenon was, that the particles of different salts, though suspended in such manner in the same fluid, that they were every moment coming into contact with one another, yet had no tendency from nature to cohere, or precipitate one another; but that whenever, by future accidents, they should be brought to concrete, they would do it separately, each in its own pure state; but this reason, though true, is an imperfect one. In these successive *solutions* of salts in the same water, the second salt produces a remarkable effect, which no body, till Mr. Lemery, seems to have taken notice of; which is, that while this is dissolved in a liquor, which before served as an intermedium to keep the particles of another salt asunder, it encreases by its whole quantity the quantity of that intermedium, and becomes itself a sort of intermedium to the particles of the first dissolved salt; and by this means the liquor, which had before dissolved as much as it could contain of the first salt, now becomes able to take up some more of it, and will, in reality, perfectly dissolve an additional quantity: this was an experiment well known, but never understood before.
It is well known that salt of tartar does not ferment with salt petre, nor does it take any thing from this salt, or at all alter by being mixed with it, which is quite different from the effect on mixing it, as before observed, with alum, or saccharum saturni; on this principle, and on the known property of salt of tartar being dissolved in a smaller quantity of water than any other salt; or, in other words, of water's dissolving more salt of tartar than of any other salt, Mr. Lemery resolved on the trial, whether water, which had already dissolved as much nitre as it could contain, would not, on the addition of salt of tartar, dissolve a larger quantity of fresh nitre, than on the addition of sal armoniac, or any other salt: but what appeared very strange was, that after two days standing of a *solution* of nitre, with about a fourth part of the quantity of salt of tartar added, there was found a white powder at the bottom. The liquor being examined on this, was found to be a lixivium of salt of tartar, and the powder at the bottom, salt petre.
On adding fresh quantities of salt of tartar, new precipitations were afterwards formed, and, in fine, all the salt petre which had been dissolved was separated. The salt petre being examined, by all trials proved true salt petre, as pure and unmixed as when put in; and the liquor being evaporated, the salt of tartar was found equally pure. Salt of tartar tried afterwards in the same manner with *solutions* of other salts, with which it does not raise any fermentation, was found to have the same effect, precipitating all equally out of the *solution*.
In the common precipitations of salts, such as alum and sugar of lead, by means of an alkali, the alkali seizes upon the acid of those salts, and by that means effects the thing, and therefore itself becomes changed into another salt, and the precipitate, robbed of that acid, is no longer the salt it was, but merely its base: but here the salts, both alkali and neutral, remain the same they were before, both pure and unmixed, and the whole process seems only one of them taking the place of the other.
The salts which are capable of successive *solutions* in the same water, and of remaining suspended together in it, must be all of the neutral kind; that is, they must be salts composed of acids, engaged in such manner in the pores of their bases, as to fill the whole, and leave no void spaces for the penetration of other acids. But this is by no means the case with salt of tartar, which being wholly spunge-like in its structure, readily admits all sorts of acids, and ferments with them; and therefore is very capable of divesting other salts of that, on the presence of which their natural state, as salts of a particular kind, depends.
Every alkali salt is, as it were, an essential salt, in part decompounded; that is, it is the earthy part of such salt, the acid parts of which have been driven off by fire, and when there is only so much left, as may give the whole a saline form; for if all the acids were to be driven off, the remainder would not be an alkali, nor yet a salt, but a mere simple earth; as is the case in the caput mortuum of spirit of nitre distilled by a retort, the residuum from this distillation being a mere dead earth, indissoluble in water, and altogether different from the fixed alkali produced by burning the same nitre with charcoal. What proves, also, that these alkalis are only the matrix of the compound salts divested of their acids, is, that if spirit of nitre be poured upon the alkali salt of nitre made with charcoal, true nitre is regenerated. Mem. Acad. Par. 1724.
When *solutions* of salts are congealed, the ice often affords very pretty figures; but it is to be observed, that the same salt does not always give the same figures. Thus the same *solution* of verdigrease, frozen by means of snow and salt, affords

affords a different figure, from what is produced by the natural cold of the air. And the former ice being thawed, and left to freeze in the same vial, did not give the same figures as at first. See *Boyle*'s Works Abridged, Vol. I. p. 168.

SOLUTION, in metallurgy, is distinguished into dry and moist. The dry *solution* is the blending imperceptibly a small quantity of a metal, or mineral, with a very large one of some other body, dry, hard, and not fluid when cold. The moist *solution* is the distributing a body through the very minutest parts of an aqueous, or in great part aqueous fluid, in such manner, that both may turn into a fluid, to appearance, homogeneous, which goes through all filters, without being detained or separated by them, and the smallest part of which contains in it a proportionable quantity of both the menstruum or dissolvent, and of the dissolved body. The *solution* of gold in aqua regia, and of silver in aqua fortis, as also that of any of the salts in water, are *solutions* of this kind. *Cramer*'s Art of Assaying, p. 194.

In the making the several *metallic solutions*, for the necessary processes in chemistry, the operator is subject to great danger in his health, from the noxious vapours. This has been an accident complained of indeed by many, but scarce attempted to be remedied or obviated by any, in a rational way, till Mr. Geoffroy, whose experiments subjected him greatly to the mischief, employed his thoughts for his own sake, as well as that of the world in general, to the effectual preventing it.

The dissolutions of the metals, in the corrosive acid spirits, are those which send out the most copious and most dangerous vapours. The exhalations of quicksilver, of antimony, and of lead and copper, are all in themselves greatly hurtful, as well as the fiery vapours of spirit of nitre, sea-salt, or vitriol; and if either of these is singly so, how pernicious must they need be in those cases, where two of them are joined together in such a manner, as that this union sends up infinitely more vapours than would otherwise arise? in this case, the utmost care is necessary to prevent the chemist from falling a sacrifice to his zeal for his discoveries.

The common way of avoiding this danger, is by making the *solution* either abroad in the open air, or in a chimney; but sometimes these cautions cannot be used, and under some circumstances they are ineffectual. This gave occasion to Mr. Geoffroy to use a method, which he afterwards proposes to the public, of stopping the rise of the vapours entirely, or at least of diminishing them so greatly, that they shall be harmless and unperceived. All that was necessary to this, seemed to him to be the contriving to cover the surface of the fluid with some body, capable of retaining those vapours, yet not capable of disturbing the operation of the menstruum on the metal; and the common expressed oils of fruits, as the oil of olives, almonds, or the like, were found capable of happily performing this effect; and that particularly, as they would easily receive into themselves the acid salts which arise in the conflict. The thing which gave this gentleman the hint of the discovery was, that in the boiling of sugars, honey, or the like substances, when there is any danger of their boiling over the vessel, the pouring in a little oil stops the swelling. In the *metallic solutions* it has the same effect; and that heightened by this good consequence, that by keeping in the fiery vapours of the acid, it returns them back upon the metal, and by this means does, in effect, add greatly to the power of the menstruum.

This method of using oil has indeed three advantages, 1. The preserving the operator from the injuries from the vapours. 2. The greatly moderating that violent rarefaction which is often of ill consequence. And 3. the same quantity of the menstruum, by this means, dissolves more of the metal.

The best method of making *solutions* with this advantage is this: first wet the surface of the metal to be dissolved with water, or spirit of wine; then pour a little water, or spirit of wine, into the glass in which the *solution* is to be made, this will prevent the oil from sticking to the surfaces of either; then put the metal into the glass, and pour in the oil upon it; last of all, pour on the menstruum: this being greatly heavier than the oil, will sink to the bottom and work upon the metal, while the oil perfectly covers the whole surface. There is no need to be exact as to the quantity of the oil, but more or less is to be used, in proportion to the greater or less ebullition which the mixture is expected to make.

The air-bubbles, which arise to the surface with great impetuosity in the making of these *solutions*, are here seen to break by degrees as they enter the covering of oil, and generally are quite dissipated before they arise to the surface of it. The few of them which retain their figure till they arrive at the surface, there burst and give a slight exhalation; and one may continually see the drops of the menstruum falling back again out of the oil into it, after being deserted by the bubbles of air which had raised them so far. On the contrary, in the common way of making *solutions*, the air-bubbles push one another up to the surface, where they form a sort of skum, which continually thickens by their fresh rising and supporting one another, till it often rises over the top of the vessel. These bubbles of air seem to be formed of small parcels of air extremely condensed in the pores of the metal, which, when the particles of it are separated for *solution*, find themselves at liberty to dilate and expand, and arise to the surface in their proper form.

If it be thought necessary, in any *solution* which raises a more than ordinary quantity of vapours, to prevent the flying off of that small quantity which may escape through the oil, there is nothing more necessary than to pour a little spirit of wine upon the oil; for the acid vapours which pass the oil will then be received in the spirit, and will be dulcified in it, and instead of a disagreeable odour, will yield only a very sweet and safe one. Spirit of wine alone, used instead of oil, and poured gently on the *solution*, has very great effects; insomuch, that if used to the *solutions* in spirit of nitre, which usually send up very noxious and coarse red vapours, they by this means are made to send up only very fine light white ones, and those of a very agreeable smell: the bubbles raised in this case are very small, and usually burst before they arrive at the surface of the spirit. The only objection to this method, is, that the spirit of wine soon mixes itself with the menstruum, and there are some cases in which this may be of ill consequence to the process. Mem. Acad. Par. 1719.

SONCHUS, *sowthistle*, in botany, the name of a genus of plants, the characters of which are these. The flower is of the semiflosculous kind, being composed of a number of semifloscules, each standing upon an embryo seed, and all contained in a general cup, which is considerably thick, and becomes of a conic figure when ripe. The embryos finally become seeds, winged with down, and affixed to the thalamus. See Tab. 1. of Botany, Class 13.

The species of *sonchus*, enumerated by Mr. Tournefort, are these. 1. The prickly *sonchus* with undivided leaves. 2. The prickly *sonchus* with leaves jagged in the manner of those of dandelion. 3. The prickly *sonchus* with undivided leaves, in shape resembling those of the lettuce, or of dipsacus. 4. The Cretic jagged prickly *sonchus*. 5. The great tree prickly *sonchus*. 6. The great creeping *sonchus*, called by many the *great creeping hawk-weed*. 7. The smooth *sonchus* with broad jagged leaves. 8. The white-flowered broad-leaved jagged smooth *sonchus*. 9. The smooth *sonchus* with leaves divided into numerous fine segments. 10. The lesser smooth *sonchus* with less jagged leaves. 11. The smooth narrow-leaved *sonchus*. 12. The narrow-leaved sea-*sonchus*. 13. The smooth *sonchus* with poppy leaves. *Tourn.* Inst. p. 474.

The common *sowthistle* is greatly recommended by authors as a refrigerant and attenuant. It is prescribed by many of the old physicians in stranguries, and other disorders of the urinary passages; and is ordered externally, in cataplasms, in all kind of inflammations.

SONTAGE, in our old writers, a tax of forty shillings laid upon every knight's fee, according to Stow, p. 284. *Blount*, *Cowel*.

SOOT *(Cycl.)*—This is an excellent manure, particularly for cold lands, which have been long over-run with moss; but sea-coal-*soot* is much better for this purpose than wood-*soot*. They usually allow forty bushels to an acre, but some lands require more. It produces an extremely fine and sweet grass, and destroys weeds of all kinds. *Mortimer*'s Husbandry.

The chemical analysis of *soot* shews us, that it is composed of several parts; 1. a fetid, oily, bitter spirit. 2. Water. 3. A sharp volatile alkaline oily salt. 4. A sharp alkaline fat oily spirit. 5. A fetid black bitter inflammable, and almost caustic oil, mixed with an oily salt. 6. A true sal armoniac. And 7. a black fixed earth.

Wood-SOOT has been long known as a good medicine in many cases, but the principles upon which it acted as such were never well understood, till Boerhaave gave a regular analysis of it. The directions he gives for the process are these.

Choose the blackest and driest *wood-soot* from the chimney of an oven, where nothing is baked but bread, and nothing burnt but vegetables; gather this in a dry day, and fill with it a glass retort almost up to the neck; clean the neck of the retort, and luting on a receiver, give a fire of a hundred and fifty degrees, and keep it up equably, a large quantity of transparent water will come over with considerable violence. When no more water will come over, cleanse the receiver, and raising the fire to a little above two hundred degrees, there will then come over a whitish fat liquor; this also comes over with great violence, and the fire must be gradually encreased, till no more of this will come. Change the receiver, and raise the fire to a yet greater degree, and a yellow, copious, volatile salt will come over, and stick all over the sides of the new receiver. When no more of this salt will arise, encrease the fire to the utmost that sand can give, and with a heat of suppression there will arise a black thick oil; when this is all come over, and the vessels cooled, there will be found in the neck of the retort a salt, which could be raised no higher, even by that violent fire; and in the

the bottom of the retort there remains a black feculent matter, the upper ſurface of which is covered with a white ſaline cruſt, which, both in figure, colour, and the ſtructure of its ſtriæ, reſembles the common ſal armoniac. If the milky liquor be rectified, it affords a very penetrating volatile ſpirit, and ſome ſharp volatile ſalt.

Here we are taught what the agitation of an open fire can move, change, expel, and drive through the air by burning; firſt in the form of ſmoak, then of flame, and laſtly of exhalation, and how high it is able to carry them; for a chimney is a kind of ſtill-head, converging in an open top, and *ſoot* is often carried up thirty or forty feet, or more, to the top of theſe, and after this a black ſmoak is diſcharged out of the orifice, which diſperſes in the air, and finally ſeems to vaniſh.

This ſmoak and *ſoot* conſiſt of ſeveral parts; as 1. a fetid, oily, unpleaſant bitter ſpirit, reſiding in the water that firſt comes over, and is afterwards found diſperſed alſo through all its other parts; this ſpirit ſeems to be the oily and more ſubtile part of the vegetable, acted on by the force of fire. 2. A water, which is here contained in great plenty in this ſpirit; in the firſt limpid, and in the ſecond milky liquor, as alſo in the ſaline ſpirit, and the volatile ſalt itſelf, and even in ſome degree in the oil. This water can ſcarce be ſeparated pure by any art, being always impregnated with the bitter taſte and nauſeous ſmell of the ſpirit. 3. A ſharp volatile alkaline oily ſalt, which firſt comes over, and ſticks to the ſides of the receiver. From this principle we are well aſſured, that ſuch a volatile alkaline ſalt always ſtrongly impregnates the whole air, where wood fuel is burnt. 4. A ſharp alkaline fat ſpirit, conſiſting of the ſalt juſt now mentioned diſſolved in water, and ſo reſembling ſpirit in fluidity, pungency, volatility, and the other qualities. 5. A fetid black bitter nauſeous, and almoſt cauſtic oil, mixed with an oily ſalt. 6. A true ſal armoniac, raiſed to the neck of the retort, and covering the ſurface of the black matter left at its bottom. If this ſalt be carefully collected and ſeparated from the alkaline kind, it proves to be a perfect and genuine ſal armoniac; it is of a whitiſh colour, ſomewhat tranſparent, and makes no efferveſcence with acids, and if mixed with fixed alkalis, it eaſily yields a volatile ſalt, wholly agreeing with that from the commom ſal armoniac; whence by the by it is evident, that all ſal armoniac owes its origin to *ſoot*. 7. The laſt ſubſtance found in *ſoot*, is the remaining black earth left at the bottom of the retort: this has an oil which tenaciouſly adheres to it, and when this is driven off in a ſtrong open fire, there remains a white calx.

By this accurate analyſis of *wood-ſoot*, we learn what parts of vegetables are volatile, and fly off by an open fire, and what are fixed and remain behind, and finally, what fire throws off from vegetables into the air; and hence, among other things, we may learn that even earth, which appears ſo very fixed in the fire when ſeparated from the other principles, yet when mixed with them is, by the force of fire, thrown up to the height of forty feet, and more, in the air; whence it aſcends to yet greater heights, and finally diſperſes in form of a thin cloud.

Hence we may alſo learn that *ſoot*, which contains ſo many active principles, muſt be qualified for a powerful medicine. Pills of dry *ſoot* are found very beneficial in all cold diſtempers; the volatile ſalt of *ſoot* poſſeſſes the virtues of the volatile ſalts of animals. The ſalt which riſes laſt is recommended greatly by Hartman for giving relief in cancers; and this is very probable, ſince ſal armoniac of the common kind, properly applied, is known to be of great uſe in caſes of running cancers. *Soot* of different fuels is not to be ſuppoſed all to poſſeſs the ſame virtues; that of pit-coal is found to be a ſubſtance of a very different kind from that of wood, and that of the common turf, or peat, and of the oak wood, have alſo been found, on experiment, to be very different. Boerhaave very juſtly obſerves, that the *ſoot* from kitchen-chimneys, where the ſmoak muſt have been impregnated with the effluvia of the victuals, muſt be very different from pure *wood-ſoot*. *Boerhaave*'s Chemiſtry.

The tincture of *ſoot* is in uſe; and Dr. Cheyne recommends it as a great and ſudden relief in vapours. Nat. Meth. of curing Diſeaſes.

SOPHORA, in botany, the name given by Linnæus to a genus of plants called by Dillenius, in his Hortus Elthamenſis, *ervi ſpecies*; the characters are theſe. The perianthium is ſhort and campanulated; it conſiſts of one leaf, divided into five obtuſe ſegments at the end. The flower is of the five-leaved papilionaceous kind. The vexillum is oblong and ſtrait; it grows broader as it approaches the apex, and is bent back at the edges. The alæ are two; they are oblong, of the length of the vexillum, and appendiculated at the baſe. The carina conſiſts of two petals, of the ſize of the alæ, the under edges of which ſtand near together, ſo that they form a ſort of boat. The ſtamina are ten diſtinct parallel ſubulated filaments; they are of the ſame length with the flower, and are hid in its carina. The antheræ are ſmall and aſſurgent; the germen of the piſtil is oblong and cylindric; the ſtyle is of the length and ſituation of the ſtamina; and the ſtigma is obtuſe. The fruit is an extremely long and ſlender pod, it contains only one cell, and is marked with protuberances where the ſeeds are contained. The ſeeds are numerous, and of a roundiſh figure. This genus of plants agrees with the other papilionaceous and diadelphous genera, except that in this the ſtamina are diſtinct and ſeparate. *Dillen.* Hort. Elth. p. 112. *Linnæi* Gen. Plant. p. 177.

SOPHRONISTÆ, σωφρονισται, among the Athenians, were ten officers appointed to take care that the young men behaved themſelves with ſobriety and moderation. *Potter*, Archæol. Græc. l. 1. c. 15. Tom. I. p. 84.

SOPHRONISTERIUM, σωφρονιστηριον, among the Athenians, a houſe of correction like our Bridewell. *Potter*, Archæol. Græc. l. 1. c. 25. Tom. I. p. 130.

SOPIO, a name uſed by ſome of the old writers for opium, from its ſoporific virtue.

SOPORARIÆ *arteriæ*, a name given by ſome authors to the carotid arteries.

SOPOROUS (*Cycl.*)—SOPOROUS *diſeaſes*, a term by which medical writers expreſs the *lethargy* and *coma*, and ſome others even the *carus* and *apoplexy*.

The firſt of theſe, the lethargy, is an idiopathic affection, depending on a congeſtion of blood about the head, whence there ſoon ariſes a ſtaſis both of that and the other humors; the conſequence of which is an univerſal oblivion, or forgetfulneſs of all things. The coma is a ſymptomatic *ſoporous* affection, uſually complicated with deliriums, and taking its origin from a reſtriction of the fluids about the head in acute fevers. This is the generally received ſenſe of the moderns, as to theſe diſeaſes, though ſome invert the meaning of the words, and make lethargy ſignify a ſymptomatic affection attending perſons in fevers; and the coma to be the idiopathic diſeaſe, particularly the ſleeping coma. To theſe ſome alſo add the carus, which they ſay is a ſlighter kind of lethargy; while others will have that diſeaſe to be a more violent diſorder than the lethargy, and of a middle nature between that and the apoplexy, or little better than the laſt. *Junker*'s Conſp. Med. p. 666.

Signs of them. A lethargy is uſually preſaged by an univerſal laſſitude and inaptitude to motion, and a vertigo, or tremor in the head, or an intenſe pain in its hinder part; by a continual inclination and deſire to go to ſleep, and ſleeping more ſound than uſual; and finally, by a ringing in the ears, and a general hebetude or dulneſs of the ſenſes. When preſent, it is known by the patient's falling into a particularly ſound ſleep, out of which it is very difficult to wake him, and when awaked he is wholly forgetful, both of himſelf, and of every thing about him, and has an immediate propenſity to ſleep again; the pulſe, reſpiration, colour, and heat of the body, are all the while nearly the ſame as in health; and when there is a fever attendant on it, it is ever a very ſlow, and ſcarce ſenſible one. The coma is of two kinds, the ſleepy and the waking, or *coma vigil*. In the ſomnolent, or ſleepy coma, the patients fall into a long and ſound ſleep, but that not ſo profound as in the lethargy; for in this caſe, though they be immoveable, yet they are much more eaſily waked than in lethargies, and are not ſo perfectly forgetful of all things when waked, as they are in that diſeaſe. In the coma vigil, or wakeful coma, the patient has an eternal propenſity and deſire to ſleep, but cannot really get to ſleep; with this he is uſually delirious, and commonly keeps his eyes ſhut, but is all the time very quick of hearing whatever is ſpoken in the room, and opens his eyes immediately on being touched; and ſometimes their delirium proceeds ſo far, that they endeavour to get out of the bed, and to do ſeveral mad actions.

Perſons ſubject to them. Lethargies principally affect fat people, who are of a ſanguineo-phlegmatic habit, and particularly ſuch as are advanced in years, and live upon rich and moiſt diets, and have accuſtomed themſelves to ſleeping after dinner. Old people alſo, who have been ſubject to catarrhs, whether of the head or breaſt, and ſuch as have been long uſed to have iſſues, and have cloſed them up, or to regular cuppings at certain ſeaſons of the year, but have omitted them, on account of their advanced age, uſually fall into it. Thoſe alſo who have been much uſed to tobacco, whether ſmoaked or taken in ſnuff, and have ſuddenly left it off, very often alſo fall into this diſeaſe, or into apoplexies. There are alſo many other cauſes, from which old men are ſubject to lethargies, ſuch as long waking, cares and troubles upon the ſpirits, the uſe of narcotic medicines, drunkenneſs, contuſions, or heavy blows upon the head, and, as ſome affirm, the being for a long time together expoſed to the rays of the moon. Infants alſo, which are fat, are ſubject to the ſame diſeaſe, from the ſtriking back of any watery humor.

Comas uſually happen to people in acute malignant fevers, and are preceded by violent pains in the head, and raging deliriums, and are very often owing to the improper uſe of opiates, and ſtupifying medicines. *Junker*'s Conſp. Med. p. 670.

Prognoſtics in them. Old perſons, who are ſubject to frequent ſleepineſs, unleſs they change their courſe of life, and uſe a

coarſer diet and more exerciſe, uſually fall into fatal lethargies. In perfect lethargies, in which the patients cannot be wakened at all, they uſually die between the fourth and the ſeventh day, unleſs an eruption of ſome matter from the noſe or ears happen; which is not unfrequently the caſe in perſons who fall into this diſeaſe, after violent blows on the head. The coma is much the ſame in its prognoſtics as the lethargy; but in this a cold ſweat uſually preſages immediately approaching death. It is much better that a phrenitis ſhould happen to perſons in a lethargy, than that a lethargy ſhould happen to thoſe in a phrenitis.

Method of cure. In a lethargy the ſenſes are to be rouſed, and the humors deduced from the head to the lower parts by ſtimulating glyſters, and acrid ſuppoſitories, by ligatures on the oppoſite parts, by frictions, bliſters, and ſinapiſms, or ſuch cataplaſms as bring on heat and redneſs of the parts, applied to the ſoles of the feet and the palms of the hands; as alſo by twitching off the hairs in very ſenſible parts, by applying volatile ſalts to the noſe, by pricking with a needle, and by loud calling: and in plethoric habits, immediately after the clyſter, a vein ſhould be opened, and after that leeches applied to the temples; and internally, powders of nitre and cinnabar, with the gentle alexipharmics, are to be given; and all ſorts of camphorated medicines are proper to be applied externally, after ſhaving the head. In many caſes, crudities in the primæ viæ have a great ſhare in bringing on theſe diſeaſes, and in ſuch vomits and briſk purges are very proper.

In a coma, whether it be of the ſomnolent, or wakeful kind, the fever, which is the primary diſeaſe, is firſt to be regarded; but with the antifebrific medicines, the nitrous and cinnabarine ſhould be joined, and the camphorated ones uſed externally.

Preſervatives againſt them. Every preſervative muſt tend to the taking off what may prove the cauſes of theſe diſorders. For this purpoſe, in old perſons of mucous habits, the matter muſt be by all poſſible means derived from the head, and carried off by ſome ſafe way. In this intention, briſk purges of jalap and colocynth, and for thoſe of very ſanguine habits, of black hellebore, are to be given every quarter of a year. To theſe ſhould be added the bitters, and ſulphureous medicines, with the gum reſins, in form of pills: theſe ſhould be taken regularly at the equinoxes; and a proper diet muſt be obſerved, namely, drier foods muſt be principally eaten, and the ſpices frequently uſed, and the patient adviſed not to eat too heartily. Roaſted meats, in general, are better than boiled; and wine ſhould be drank in moderation, and ſome of it impregnated with bitters. *Junker*'s Conſ. Med. p. 678.

SOPRANO, in the Italian muſic, ſignifies the treble.

SORA, in botany, the name given by the people of Guinea to a kind of ſhrub which they uſe in medicine, boiling it in water, and giving the decoction in caſes of pain of any kind.

The leaves of this ſhrub are of the ſize and ſhape of thoſe of ſena; they ſtand upon ſhort footſtalks, and are woolly underneath. Philoſ. Tranſ. N° 231.

SORBUS, the *ſervice-tree*, in botany, the name of a genus of trees, the characters of which are theſe. The flower and fruit reſemble thoſe of the cratægus, but differing, in that the leaves are winged as thoſe of the aſh.

The ſpecies of *ſorbus*, enumerated by Mr. Tournefort, are theſe. 1. The common *ſervice*. 2. The cultivated *ſervice* with a large red fruit of a turbinated form. 3. The cultivated *ſervice* with large turbinated pale-red fruit. 4. The cultivated *ſervice* with a reddiſh middle-ſized turbinated fruit. 5. The cultivated *ſervice* with a reddiſh middle-ſized oval fruit. 6. The cultivated *ſervice* with a ſmall reddiſh turbinated late-ripening fruit. 7. The cultivated *ſervice* with ſmall turbinated fruit. And 8. the wild *ſervice*, or *ſorbus aucuparia*. *Tourn.* Inſt. p. 633.

SORE, among ſportſmen, denotes a buck of the fourth year.

SOREL, in the language of ſportſmen, a buck of the third year. See the article BUCK.

SOREL, in botany. See SORREL.

SOREX, in zoology, the name of a ſpecies of wild or field-mouſe, called the *dormouſe*, or *ſleeper*. There are two kinds of this creature, a larger and a ſmaller.

The larger *dormouſe* is nearly of the ſize of the common rat. Its colour is a browniſh grey, like that of the common mouſe, but variegated with ſomewhat of a reddiſh caſt on the ſides, and on the head. The ears are large and ſmooth; the belly is white; and the inner part of the legs, and the lower part of the tail, eſpecially toward the extremity, are of the ſame colour. The noſtrils and the feet are red; the tail is all over hairy, and is terminated by a thick tuft of white fur. The eyes are large and prominent, and of a fine jetty ſhining black. The beard is partly white, and partly black. Round about the eyes, and round the ears, there is a fine blackneſs; the upper part of the tail is alſo black. The ſmell of this creature is the ſame with that of the mouſe, and its dung is of the ſame kind. It lives in caverns underground, and ſleeps all the winter, as ſome affirm. It feeds on vegetables, and is particularly fond of hazel-nuts, which it uſually hoards up, when ripe, for a ſcarcer ſeaſon. *Ray*'s Syn. Quad. p. 219.

The ſmaller kind is much more common than the larger one. This is of the ſize of the common mouſe, and in different countries varies much in colour. In Italy Mr. Ray obſerved it all over of a reddiſh tawney on the upper part, except the end of the tail, and all its under part white, the tail only excepted; the tail covered with long and thick-ſet hairs, and looking ſomewhat like a ſquirrel's. The eyes are very black and prominent. Thoſe which the ſame author obſerved in England were leſs of the reddiſh hue on the back, and were not white under the belly, but only on the throat; neither had they the white tip at the end of the tail. Poſſibly the Italian and Engliſh may be really diſtinct ſpecies. This creature feeds on nuts and other ſuch fruits. It retires into caves in winter, and ſleeps much, but not through the whole winter, as has been ſuppoſed, for it lays up its winter-proviſion in its hole in autumn, and feeds on it at that time. *Ray*'s Syn. Quad. p. 220.

The *ſorex*, according to the Linnæan ſyſtem, makes a diſtinct genus of animals; the diſtinguiſhing character of which, is, that its dentes inciſores, or cutting-teeth, are two in number, and are ſerrated, or notched on each ſide. *Linnæi* Syſt. Nat. p. 40.

SORGLUM, in the materia medica, the name of the grain of the *milium arundinaceum*, called *Indian millet*. *Dale*'s Pharm. p. 262.

SORNI, a name given by ſome of the chemical writers to iron. *Caſt.* Lex. Med.

SORRANCE (*Cycl.*)—SORRANCE-*water*, a name given by our farriers to a ſolution of vitriol and ſome other ingredients in vinegar, a medicine much eſteemed in many of the diſeaſes of horſes: it is prepared in the following manner.

Take Roman-vitriol and roach-alum of each an ounce and half, verdigreaſe an ounce, copperas two ounces; reduce all theſe to powder together, and put them into a two-quart bottle, into which pour a quart of the ſtrongeſt and beſt wine-vinegar; this is to be ſet in balneo mariæ. The ſhort way of doing which by the farrier, is this: he puts a wiſp of hay into the bottom of a kettle, and then tying ſome pieces of lead or iron about the neck of the bottle, to make it heavy enough to ſink in water, it is ſet upon the hay ſo, as to ſtand very upright; then three notches are cut lengthwiſe in the cork to give paſſage to ſome of the vapours when the bottle is heated, that it may not burſt. When every thing is thus prepared, ſo much cold water is to be put into the kettle, that the neck of the bottle may ſtand two or three inches above it; the kettle is then to be ſet over the fire, and the water is to be made to boil, and kept boiling about half an hour, the bottle being at times taken out, and thoroughly ſhaken. When the ſalts are thus thoroughly diſſolved in the vinegar, the whole is to be kept for uſe.

The method in which they uſe it is this. Take an earthen pan, which will hold about twelve quarts, let this be filled with urine that has been made by ſound, healthy, and young perſons; the ſtaler the urine is, the better it is for uſe, and it ought indeed always to ſtand, at leaſt, three weeks before it is uſed. It is proper for the farrier, therefore, always to keep a quantity of this ready, and when the *water* is to be uſed, half a pint of it is to be mixed with a quart of the urine, or if it be required ſtronger, more of the *water* is to be added: theſe are to be thoroughly mixed together, and the legs, or other affected part of the horſe, bathed with it with ſoft rags twice a day.

The virtues of this *water* are highly extolled; it is ſaid to cure the malanders in two, or three times dreſſing; it is alſo a ſovereign remedy for the mange, either dry or wet, and for the rat-tails, ſcratches, gourded, or ſwelled legs and heels; and it alſo cures horſes when the greaſe is fallen into their heels, as the farriers expreſs it. The farcy is alſo ſaid to be often cured by a long continuance in the uſe of it, purging the horſe two or three times, at different diſtances of time, during the time of his being under cure by the *water*. They alſo find it a good cleanſer and healer of foul ulcers, and that it prevents the breeding of proud-fleſh and worms in wounds, and drives away a flux of humours that were falling upon any part. They uſe it alſo in clefts and cracks of the heels, and in windgalls, eſpecially in the prevention of the laſt by its repellent qualities. The green *water* alone is an excellent remedy for fiſtulas, cankers, and the galled backs of horſes; diſpoſing ſuch *ſorrances*, as they are called, not to feſter, rot, and grow worſe, as all greaſy and oily medicines do, but cleanſing them, and laying the way to a very ſound and ſtanding cure.

SORREL, *acetoſa*, the name of a genus of plants, the characters of which are theſe. The flower is of the ſtamineous kind, being compoſed of a number of ſtamina ariſing from a ſix-leaved cup. The piſtil, which is ſurrounded by theſe, finally becomes a triangular ſeed, wrapt round in a cup: this is compoſed of three of the ſix leaves of the cup, the other three withering away.

The ſpecies of *ſorrel*, enumerated by Mr. Tournefort, are theſe. 1. The common meadow-*ſorrel*. 2. The white-

flowered meadow-*sorrel*. 3. The meadow-*sorrel* with curled leaves. 4. The great mountain-*sorrel*. 5. The Pyrenean *sorrel* with very long and narrow leaves. 6. The mountain-*sorrel* with a broad and roundiſh leaf, ſomewhat reſembling that of arum. 7. The mountain-*sorrel* with leaves like thoſe of the lemon-tree, and with branched twigs. 8. The mountain-*sorrel* with undulated leaves, and not branched twigs. 9. The dwarf mountain-*sorrel* with the fagopyrum leaf. 10. The mountain-*sorrel* with knotty points. 11. The tuberoſe-rooted *sorrel*. 12. The *sorrel* with pale green ariſarum leaves. 13. The mountain-*sorrel* with narrow arrow-headed leaves. 14. The marygold-leaved *sorrel*. 15. The atriplex-leaved ſhining *sorrel*. 16. The great Italian *sorrel* with round glomerated ſeeds. 17. The lanceolated field-*sorrel*. 18. The tall narrow-leaved lanceolated, or ſheep's *sorrel*. 19. The narrow-leaved creeping lanceolated *sorrel*. 20. The ſmall *sorrel* with leaves not lanceolated. 21. The Cretic *sorrel* with prickly ſeeds. 22. The ſmall Cretic *sorrel* with utriculated ſeeds. 23. The baſil-leaved *sorrel*. 24. The American *sorrel* with leaves ſtanding on very long foot-ſtalks. 25. The roundiſh-leaved tree-*sorrel*. 26. The round-leaved garden-*sorrel*. 27. The round-leaved Alpine *sorrel*. 28. The round-leaved creeping Yorkſhire *sorrel* with leaves ſinuated in the middle. 29. The creeping ſhielded-*sorrel*. 30. The little erect *sorrel* with multifid leaves. 31. The trifid-leaved Indian *sorrel*. *Tourn.* Inſt. p. 502.

Sorrel ſeeds are found to contain a vaſtly larger proportion of the active principles this plant abounds with, than either the leaves or the roots. They are eſteemed aſtringent, and good in diarrhœas, dyſenteries, and hæmorrhages.

We much neglect this plant, becauſe it is common; yet this plant alone has very often proved a remedy for the ſcurvy. Mr. Morin, of the Academy of Paris, who in the Hotel Dieu had many hundred ſcorbutic patients, cured the greater part of them only by *sorrel* boiled and eaten with eggs.

Wood-SORREL, *lujula*, in medicine, is a very grateful acid; in fevers it quenches thirſt, and takes off the heat of the ſtomach. It is recommended in fevers of all kinds, and the ſcurvy; alſo in obſtructions of the liver and of the viſcera. It is ſometimes given in decoction in fevers, and the expreſſed juice is mixed with the juices of the other antiſcorbutic plants againſt the ſcurvy.

Externally, it is extolled againſt inflammatory eruptions of all kinds in decoction, which is to be uſed by way of fomentation. There uſed to be a ſyrup, but, at preſent, only a conſerve of this plant is retained in the ſhops.

SORREL, in the manege, is uſed for a reddiſh colour. The mane ought to be red, or white, in a horſe of this colour. It is diſtinguiſhed, according to the degrees of its deepneſs, into a *burnt sorrel*, and a *bright*, or *light sorrel*. Generally ſpeaking, it is a ſign of a good horſe.

SORY, in natural hiſtory, the name of a foſſile ſubſtance, much ſpoken of by the antients, but ſuppoſed to be now loſt: this, however, proves to be an error, for it is plentifully produced in the eaſtern parts of the world, and is in common uſe there, only under another name; neither indeed is it peculiar to that part of the world, though the inaccuracy of the late writers of foſſils has made them overlook or miſtake it.

It is a firm and not brittle ſubſtance, though of a ſpungy and cavernous ſtructure, and is conſiderably heavy. It is found in maſſes of no regular ſhape or ſize, ſome being roundiſh, others angular or flatted, and ſome of the ſize of a wallnut, others of many pounds weight. It feels very harſh and rough to the touch, and is covered with no inveſtient coat or cruſt, but ſhews its natural ſurface, which is always corrugated or wrinkled, and uſually full of ſmall protuberances and cavities, and when broken, is found to be of a rugged and ſpungy ſtructure within.

Its natural colour is a ruſty black, but it is ſometimes reddiſh, and ſometimes bluiſh; and is commonly ſtained, in different places, with ſpots of a bluiſh or ruſt colour, when black; and of a greeniſh hue, when it is of a reddiſh colour: in the places where it is free from theſe, it is uſually ſomewhat bright and ſparkling. It is of an acrid and diſagreeable taſte, and of a ſtrong and nauſeous ſmell: put into the fire it burns to a deep purple, and if boiled in water a great part of it becomes diſſolved in it; and this may again be ſeparated from the water by evaporation and cryſtallization, and then appears in the form of pure blue vitriol, forming regular rhomboidal cryſtals, and tinging iron to a copper colour, on being firſt wetted, and then rubbed upon it. *Hill*'s Hiſt. of Foſſ. p. 606.

It is found in many parts of the Turkiſh dominions, particularly in Gallo-Græcia; as alſo in ſome parts of Germany. In this country it is boiled for the blue vitriol it contains. In Turky it is mixed with lime, and made into a paſte with water, which is laid on ſuch parts of the body as they would eradicate the hair from, and effects that purpoſe in a very few minutes. In the eaſtern nations, where it is thus uſed, it is known by the name *ruſma*.

The antients uſed it externally to take off pimples, and put a piece of it into a hollow tooth, as a remedy for the tooth-ach. There can be no doubt of their *sory* being the ſame ſubſtance with this; ſince Dioſcorides has deſcribed it to be blackiſh in colour, full of ſmall cavities, moiſt on the ſurface (as ours always is in moiſt weather) and of a diſagreeable taſte and ſmell.

This ſubſtance, as alſo the chalcitis, miſy, and melanteria, are all properly ores of vitriol, the particles of thoſe ſalts being ſo perfectly blended in them, as not to be at all diſtinguiſhable to the naked eye, yet being always regularly ſeparable from them by water, which is to the ſaline ores what fire is to thoſe of the metalline kind. *Hill*'s Hiſt. of Foſſ. p. 607.

SOSPIRO, in the Italian muſic, a pauſe or reſt, equal to the time of a crotchet. See the articles PAUSE, REST, CHARACTER, *Cycl.*

Canone al SOSPIRO. See CANONE *al ſoſpiro*.

SOSTENUTO, in the Italian muſic, denotes that the ſound is to be held out in an equal and ſteady manner for the whole time of the note. Thus they ſay *arcate ſoſtenute*. See *Corelli*, Concerto 8.

SOTIRELLA, a name given by ſome to a compound medicine, in form of a hard maſs, and conſiſting of opium and ſome other narcotics, with camphor, wood-ſoot, and nutmeg. It is deſcribed in the Auguſtan Diſpenſatory, and is intended to be put into hollow teeth, as a remedy for the tooth-ach.

SOUGH, otherwiſe called an *addit*, in mineralogy, is a paſſage like a vault cut out under the earth, to drain the water from the mines. *Houghton*'s Compl. Miner in the Explan. of the Terms.

SOUL (*Cycl.*)—SOUL-*ſcot*, a certain fee paid by our Saxon anceſtors to the prieſt on opening a grave. See the article BURIAL.

SOUL-*trees*, in mining. See the article STOWS.

SOUND (*Cycl.*)—Mr. Euler [b] is of opinion, that no *ſound* making fewer vibrations than 30, or more than 7520 in a ſecond, is diſtinguiſhable by the human ear. According to this doctrine, the limits of our hearing, as to acute and grave, is an interval of eight octaves.—[b Tentam. Nov. Theor. Muſ. cap. 1. ſect. 13.]

SOUND, in the manege. A horſe is ſaid to be *ſound* that does not halt. When a jockey ſells a horſe, he warrants him *ſound* hot and cold; that is, that he does not halt either when you mount him, or when he is heated, nor yet after alighting, when he ſtands and cools.

SOUNDING (*Cycl.*)—SOUNDING *the pump*, at ſea, is done by letting fall a ſmall line, with ſome weight at the end, down into the pump, to know what depth of water there is in it.

SOUR *land*, in agriculture, a term uſed by the farmers to expreſs a cold and ſomewhat wet clayey ſoil.

This muſt have its tilth according to its ſtate and condition, when they ſet about it. If it have a ſtrong ſwarth upon it, then they give it a fallow, by turning it up when the ſun is in Cancer: this they call a ſcalding fallow, and eſteem it of great uſe, becauſe it kills the graſs roots, and makes the land fine; but if it be light, and have but a thin ſwarth, they leave it for a cooler tillage, and plow it early in the year, when their clay is fallowed.

Pigeon's dung and malt-duſt are the moſt proper manures for this ſoil. The malt-duſt is to be ſown with the winter-corn, and plowed in with it, for then it lies warm at the roots of the corn all winter. *Plot*'s Oxfordſhire, p. 246.

SOURDON, in zoology, the name of a bivalve ſhell-fiſh found on the coaſt of Poitou, and other places. It is a ſmall fiſh, its length being little more than an inch, and its breadth about three quarters of an inch. Its ſhells are both conſiderably convex, the outer ſurface is deeply furrowed, but the inſide is perfectly ſmooth. The fiſh buries itſelf lightly in the ſand, and has a pipe of communication, which it raiſes to the ſurface; but as this creature never buries itſelf deep, the pipe is neceſſarily very ſhort; but they are cut into ſeveral ſegments at the extremity, and appear as if were fringed, and have ſeveral hairs growing from theſe ſegments. The *ſourdon* is capable of a progreſſive motion by means of a limb, ſomewhat reſembling that of the other chamæ; but more than any approaching to the nature of a leg, as it in ſome meaſure repreſents, in miniature, a human leg with a clumſy boot upon it: by means of this limb the creature can eaſily bury itſelf in the ſand, or riſe up out of it, or move horizontally on the ſurface, and that as well backwards as forwards, and that with more ſwiftneſs than could be well ſuppoſed. Mem. Acad. Par. 1710.

SOURIS, in the manege, is a cartilage in the noſtrils of a horſe, by means of which he ſnorts. See SNORT.

The cutting of this cartilage is called in French *eſſouriſſer*.

SOUTHERNWOOD, *abrotanum*, in botany, the name of a genus of plants, the characters of which are wholly the ſame with thoſe of wormwood, and the plants are only to be diſtinguiſhed by their very different general face and appearance.

The ſpecies of *ſouthernwood*, enumerated by Mr. Tournefort, are theſe. 1. The broad-leaved ſcentleſs *abrotanum*. 2. The great narrow-leaved male *abrotanum*. 3. The greateſt narrow-

narrow-leaved male *abrotanum*. 4. The leſſer narrow-leaved male *abrotanum*. 5. The field-*abrotanum* with white ſtalks. 6. The broader-leaved field-*abrotanum*. 7. The field-*abrotanum* with red ſtalks. 8. The hoary field-*abrotanum* with the carline ſmell. 9. The low *abrotanum* with very large yellow tufts of flowers. 10. The ſweet-ſcented flax-leaved *abrotanum*. 11. The Spaniſh *abrotanum* with pontic wormwood leaves. 12. The ſea Spaniſh *abrotanum* with thick ſhining and rigid leaves. 13. The lightly hoary male *abrotanum* of Surinam. And 14. the tall hoary *abrotanum* with very thick-ſet leaves. *Tourn.* Inſt. p. 458.

Southernwood is an attenuant, and recommended by ſome in ſuppreſſions of urine, a drachm of it in powder being the doſe. Its decoction is good for recovering the hair when fallen off; and its juice is ſaid to cleanſe and heal old ulcers. The leaves of this plant dried and powdered, or given in a ſtrong infuſion, are good in all obſtructions of the liver and ſpleen; they are alſo of conſiderable virtue as antihyſterics, and are given in nephritic caſes. The good women give the expreſſed juice, of the tender tops of the plant, as a remedy againſt worms, and that with ſucceſs. There are accounts of perſons being cured of jaundices ſolely by the ſame medicine. Matthiolus recommends the leaves dried, and taken in powder, as a remedy for the fluor albus.

Female SOUTHERNWOOD. See the article SANTOLINA.

SOUTHING, in navigation, the difference of latitude a ſhip makes in ſailing to the ſouthward.

SOW, in the iron works, the name of the block or lump of metal they work at once in the iron-furnace. The ſize of theſe *ſows* of iron is very different, even from the ſame workmen, and the ſame furnace. Theſe furnaces having ſandſtone for their hearths and ſides, up to the height of a yard, and the reſt being made of brick, the hearth, by the force of the fire, is continually growing wider; ſo that if it at firſt contains as much metal as will make a *ſow* of ſix or ſeven hundred weight, at laſt it will contain as much as will make a *ſow* of two thouſand weight. *Ray*'s Engliſh Words, p. 126.

Sow, in zoology. See the articles HOG and SUS.

Sow-*bread*. See the article CYCLAMEN.

Sow-*thiſtle*, in botany. See SONCHUS.

SOWING (*Cycl.*)—One very great article in *ſowing* to advantage, is to know exactly at what depth the ſeed may be planted, without danger of burying it. Seed is ſaid to be buried, when it is laid at a depth below what it is able to come up at. Different ſorts of ſeeds come up at different depths, ſome ſix inches, or more, and others will not bear to be buried at more than half an inch. The way to come at an accurate knowledge of the depth, at which every ſeed will come up beſt from the *ſowing*, is by making gages in the following manner. Saw off twelve ſticks of about three inches diameter, bore a hole in the end of each ſtick, and drive into each a taper peg; let the peg in the firſt ſtick be half an inch long, the next an inch, and ſo on, every peg being half an inch longer than the other, till the laſt is ſix inches long: then in that ſort of ground, in which you intend to plant, make a row of twenty holes with the half-inch gage, put therein twenty good ſeeds, cover them up, and then ſtick the gage at the end of that row. Proceed in the ſame manner with the eleven other gages, making the holes in the ſame row all with the ſame gage, and ſticking it at the end of the row: when the ſeeds begin to appear, it will be eaſy to ſee at what depth they come up beſt, by obſerving the moſt flouriſhing row, and taking up the gage at the end, and ſeeing what is its length.

By this means we not only know what is the depth in that ſort of ground, at which this ſort of ſeed will come up beſt, but alſo we are able to judge of the nature of the ſeed; for by obſerving how many of the twenty ſeeds that were *ſown* come up, and how many fail, it is eaſy to calculate how much bad ſeed there is among any given quantity, and to allow properly for it in the *ſowing*, that the field may be neither overſtocked with plants, nor too bare of them. The farmer often ſuſtains great loſſes by *ſowing* bad ſeed, or by burying good ſeed, and both might be effectually prevented, by making theſe eaſy trials. One caution is to be obſerved in this, that it is not proper to *ſow* the ſeeds of all plants at the greateſt depths at which they will come up, becauſe in wheat, and ſome other grain, a moiſt ground will rot the roots at this depth, Experience alone, added to theſe rules, can perfectly inſtruct the farmer in the certain way of ſucceeding; the nature of the land, the manner how it is laid, either flat or in ridges, and the ſeaſon of planting, muſt all be conſidered.

The quantity of ſeed is to be different alſo, according to the manner of the *ſowing*. The proper quantity to be drilled into an acre, is much leſs than muſt be *ſown* in the common way; not becauſe the hoeing will not maintain as many plants as the other way, for, on the contrary, it will maintain many more, but the difference is upon many other accounts, as that it is impoſſible to *ſow* it ſo evenly by hand as the drill will do. For let the hand ſpread it never ſo exactly, which yet is difficult enough to do with ſome ſeeds in windy weather, yet the unevenneſs of the ground will alter the ſituation of the ſeeds, the greateſt part of them rebounding into holes, and the loweſt places, or elſe the harrows, in covering, drawing them down thither; ſo that theſe low places may have ten times too much ſeed, and the higheſt may have much too little, or even none of it, and this inequality leſſens in effect the quantity of the ſeed, becauſe fifty ſeeds, in the room of one, will not produce ſo much as one will do; and where they are too thick, without being in theſe cluſters, they cannot well be nouriſhed, their roots not ſpreading to near their natural extent, for want of hoeing to open the earth, and give them way. In the common way of *ſowing*, ſome of the ſeeds are buried out of all hope of ever coming up again, and ſome others are left naked upon the ſurface, where they become the food of birds, and of vermin: as ſo many muſt, therefore, periſh in the common way of *ſowing*, and ſo few can be loſt in the way by drilling, there is plain reaſon why the ſeed, neceſſary to *ſow* any given quantity of ground, ſhould be much leſs for the drill-way, than for the other. The farmers, in general, know nothing of the proper depth at which they ſhould *ſow* their ſeed, nor of the difference in quantity that is to be obſerved in different circumſtances; they allow the ſame quantity to an acre of rough ground, as they do to an acre of fine, and forget that what is too little for one, may yet be too much for the other; it is all mere chance-work, and they put their confidence in good ground, and a large quantity of dung to cover their errors.

The farmers in Wiltſhire allow more corn for the *ſowing*, than in any other part of England; they uſe ſometimes eight buſhels of barley to an acre, ſo that if it produce four quarters for an acre, there is but four grains for one encreaſe. This is ſown on land plowed once, and double dunged, the ſeed only harrowed into the hard and ſtale ground, ſo that it is very probable that not ſo much as two buſhels out of the eight take place, or come to any thing. Sometimes, in a very dry ſeaſon, an acre ſcarce produces four buſhels at the harveſt.

Inſtead of all this uncertainty and loſs in the common way, in drilling all the ſeed lies juſt at the ſame depth, not one grain of it being placed deeper or ſhallower than the reſt. As none of the ſeeds, therefore, can be loſt by being buried, or by being expoſed on the ſurface to vermin, no allowance is to be made for theſe accidents; all that is to be allowed for in the *ſowing*, is the miſchief that may happen from the worm, the froſt, or the like unavoidable accidents, common to all ſeeds.

When a man has (by the uſe of the gages, and the growth of the ſeeds planted in the rows marked by them) proved the goodneſs of the ſeed, and found the depth it is to be planted at, he is to calculate what number of ſeeds a buſhel, or any other weight or meaſure, contains; for one buſhel, or one pound of ſmall ſeed, may contain double the number of ſeeds of a buſhel, or a pound of large ſeed of the ſame ſpecies. This calculation is made by weighing an ounce, and then calculating the number of ſeeds this ounce is compoſed of; then weighing a buſhel, and multiplying the number of ſeeds in an ounce by the number of ounces in the buſhel, and the product will give the number of ſeeds in the buſhel with ſufficient exactneſs. When this is known, the ſeeds are to be proportioned by the Rule of Three to the ſquare feet in an acre; or elſe it may be done, by dividing the ſeeds of the buſhel by the ſquare feet in an acre, and the quotient will give the number of ſeeds for every foot. Then the farmer is to conſider how near he intends to plant the rows, and whether ſingle, double, treble, or quadruple; for the more numerous the rows are, the more ſeed will be required. The narrow ſpaces between double, triple, or quadruple rows, ſuppoſe ſeven inches, the double having one, the treble two, and the quadruple three, are called *partitions*. The wide ſpace, ſuppoſe of five feet, between any two of theſe double, treble, or quadruple rows, is called an *interval*.

Examine next what is the produce of one middle ſized plant of the annual, but the produce of the beſt and largeſt of the perennial ſort, becauſe that, by hoeing, will be brought to its utmoſt perfection; proportion the ſeed of both to the reaſonable product, and when it is worth while adjuſt the plants to their competent number with the hand-hoe after they are up, and plant perennials generally in ſingle rows. Laſtly, plant ſome rows of the annual thicker than others, which will ſoon give experience, preferable to all the rules in the world, for the quantity of ſeed neceſſary for the drilling.

The diſtances of the rows is one extremely material point in the obtaining a good crop; but as a much larger diſtance is to be allowed in theſe, than common practice has been uſed to, it is very difficult to perſuade the farmer to venture a trial at ſuch diſtances as he may have experience from. There is a method of planting the rows by the drill at very near diſtances, and in this work one horſe may draw a drill with eleven ſhares, making the rows at three inches and a half diſtance from each other, and at the ſame time *ſowing* in them three different ſorts of ſeeds, which do not mix, and theſe at different depths. Thus the barley-rows may

be

be ſeven inches aſunder, and the barley four inches deep; a little more than three inches above that, in the ſame channels, clover-ſeed; and betwixt every two of theſe rows, a row of ſaint foin ſeed covered half an inch deep.

Mr. Tull, who tried this method, obtained the firſt year a very good crop of barley, the next year two crops of broad clover, where that was *ſown*; and where hop-clover was *ſown*, a mixture of that and of ſaint foin, and every year afterwards a crop of ſaint foin. But the ſame gentleman was afterwards ſo fully convinced of the folly of theſe, or any other mixed crops, and of *ſowing* with theſe narrow ſpaces, that he never practiſed it afterwards.

Every row of vegetables to be horſehoed, ought to have an empty ſpace, or interval, of thirty inches, on one ſide of it at leaſt, and of near five feet in all ſorts of corn: this will ſeem a monſtrous allowance to thoſe who have not experienced the good effects of it, but all who have will readily come into the practice of it ever afterwards. The line of corn is called one row, though it be double, triple, or quadruple, becauſe when four of theſe rows grow up in the ſpring, they unite, and ſeem to be all one row. Wide intervals are neceſſary for perfect horſehoeing, and the largeſt vegetables have generally the greateſt benefit by them, though ſmall plants may have conſiderable benefit from much narrower intervals than thoſe of five feet.

In handhoeing there is always leſs ſeed, fewer plants, and a greater crop, *cæteris paribus*, than in the common *ſowing*; yet there the rows muſt be much nearer than in horſehoeing, becauſe as the hand moves many times leſs earth than the horſe, the roots will be ſent out in a like ſmaller proportion; and if the ſpaces, or intervals, where the broad hoe only ſcratches a little of the ſurface, ſhould be wide, they would be ſo hard and ſtale underneath, that the roots of perennial plants would be a great while in running through them, and the roots of annual plants would not be able to do it at all. The advantage of the horſehoeing is principally owing to the depth to which it ſtirs the ground, and familiar inſtances have proved, that the ſtirring it to a like depth, by whatever inſtrument, is of the utmoſt advantage to whatever plants are ſet in the place. A poor fellow in Wiltſhire was obſerved to have always his cabbages much larger and finer than his neighbours, though his ground was no better, and he could afford leſs dung; but the reaſon was, that inſtead of clearing away the weeds between them with a handhoe, he uſed to dig between with a ſpade, which goes as deep as a horſehoe, and comes the neareſt anſwering its purpoſes of any inſtrument whatever. *Tull*'s Horſehoeing Huſbandry. See the article INTERVALS.

Man has found out many advantageous ways of propagating, whether by *ſowing* or planting ſuch trees and herbs as he beſt knows the uſes of, but nature as much excels him in this article as in all the reſt, when any compariſon can be made; and it appears evident to the naturaliſt, that ſhe has taken more care to propagate and *ſow* the moſt trivial weeds, as we eſteem them, than we can employ in regard to the choiceſt plant. It is owing to this care, that no one ſpecies of plant has ever been loſt, notwithſtanding all the accidents they are daily ſubject to.

There is not, perhaps, a more eminent inſtance of this care of nature, than in that plant, commonly known in America under the name of the *wild pine*, and called by botaniſts *viſcum caryophylloides*. This is a large plant with leaves like the pine-apple, and it grows on the boughs of other trees, as miſletoe does with us, but that its roots do not pierce into the ſubſtance of the wood, as is the caſe in this plant, but only ſpread themſelves upon the ſurface. The ſeeds of this plant are ſmall and light, and they have a very long and fine down adhering to them, by means of which, as ſoon as they are diſlodged from the capſules, they are taken up by the winds, and ſupported in the air till they ſtrike againſt ſome branch of a tree which is proper to give them a place of growth: here the downy fibres become of a ſecond uſe, in that they hold faſt the ſeed, and will not let it drop down, but it remains thus ſupported till the time of its ſtriking root, which it does from many points at once, and conſequently a number of roots are immediately propagated, in different directions, over the ſurface of the bark. Philoſ. Tranſact. N° 251. p. 116.

It is neceſſary, to the ſupport of this plant, that it ſhould always have a quantity of water within itſelf to ſupply its juices. This water is retained in the center of the leaves, which are hollow within, and form a ſort of bulb for this purpoſe; but as it cannot be preſerved, unleſs the plant ſtands erect, and as the ſeeds, in their various flight before the wind, are as often ſtruck againſt the lower, or ſide parts, as againſt the upper ſurface of a bough, ſo the plant generally begins to ſhoot in a wrong direction; but ſo provident is nature, that it immediately turns itſelf up, whether from the ſide, or from the very bottom of the branch. This reſervatory is not only of uſe to the plant, but ſerves alſo to the birds, and to ſeveral ſmall animals, who, in times of ſcarcity of water, go to it, and ſeldom fail of finding enough there: nay, Dampier tells us that himſelf and his ſailors, when on ſhore in ſome of the American iſlands, and in diſtreſs for water, have been often relieved by it; for that, on ſtriking in a knife a little above the root, the water always came out in large quantities, and they uſed to catch it in their hats, and drink as much as they had occaſion for.

The faſtening of the ſeeds of this plant to the branches of trees, on which they are to grow, is not a ſingle inſtance of the providence of nature in propagating vegetables: we ſee in the ſea fucuſes ſomething of a like kind. The proper place of growth of theſe is on rocks and ſtones, and accordingly, as the ſeeds of the viſcum are made light, that they may fly in the air, and aſcend to the places where they are to grow, ſo thoſe of the fucuſes are made heavy, that they may deſcend even in water, and fall upon the ſtones that are to give them ſupport. This peculiar gravity is given to the ſeeds of the ſea plants, by means of a glutinous jelly with which they are ſurrounded while in the capſule, and which falls out with them; and is not only of uſe in carrying them to the bottom, but alſo in faſtening them to the ſtones on which they alight, otherwiſe they would eaſily roll off again, and be toſſed about, and loſt among this immenſe bed of waters; but by means of this jelly they are firmly kept in their place, till they have made ſuch ſhoots as are ſufficient to ſupport them againſt the waſhing of the waves; then the jelly dries away, and leaves the water free acceſs to them, to nouriſh them.

The moſſes have been by former ages ſuppoſed to have no ſeeds at all; but it has of late been found that they have immenſe numbers, and thoſe of the only kind that could be of ſervice to their propagation; that is, ſuch as are extremely ſmall and light. It is neceſſary that the ſeeds of theſe minute plants ſhould often be carried upward, in order to their being placed on trees, walls, and other eminences: this is eaſily performed by the winds, when the ſeeds are ſo ſmall, that, on being diſlodged, they look like ſmoak, not like any ſolid ſubſtance; but it could not have been ſo well executed, had they been larger. The common cup-ſeeding muſhroom produces, on the contrary, large and ſolid ſeeds; theſe cannot grow in any ſeaſon but a very moiſt one, and nature providing for this, has ſo ordained it, that the cup remains cloſed, and the ſeeds firm in its bottom, in dry weather; but as ſoon as a ſhower of rain falls the cup opens, and the ſeeds are waſhed out and thrown upon the wet ground, where they immediately grow. Philoſ. Tranſ. N° 251. p. 118.

Many of thoſe plants, whoſe ſeeds ſtrike well from the ſurface, and do not require to be buried as others do, are furniſhed with a downy ſubſtance to every ſeed, which makes the whole ſo light, that it floats in the air, and is carried to great diſtances; by this means every ſeed is carried a vaſt diſtance its own way, and if one falls on an improper ſoil, another ſucceeds better. We have a very remarkable late inſtance of the ſpreading of plants, from this proceſs of nature, in the ſmall Canada fleabane with toad-flax leaves. This plant was, ſome years after the ſettlement of the French in America, brought into Europe, and firſt *ſown* in the gardens of France, and then in thoſe of England; out of both which its downy ſeeds were wafted by the winds into the fields, and there produced the plant, which thence became a wild inhabitant, both of France and England, and continues ſo to this day, thriving as well with us as in its native ſoil.

Other plants, which are deſtined to grow at ſome ſmall diſtances from one another, have been provided by nature with elaſtic, or ſpringy ſeed-veſſels, which throw their ſeeds to a diſtance, without the help of man. The yellow arſmart, and ſome of the cardamines, called for this reaſon *noli me tangere*, are of this kind, as alſo our wild wood-ſorrel, and many others. In all theſe plants, as ſoon as the ſeed is perfectly ripe, and fit for *ſowing*, the ſeed-veſſel burſts at the firſt rude ſhock of wind, and toſſes out its ſeeds to three feet diſtance in ſome caſes. This diſtance is alſo encreaſed by the action of the wind, which burſts the capſule, and the ſeparated ſeeds are often carried thus to five, ſix, or ſeven feet diſtance from the mother plant, and ſcattered different ways, ſome falling by the way, and the reſt ſpreading abroad as they go along.

There is one remarkable inſtance of the care of nature of one plant in this way, which is the *ſpirit weed* of Jamaica. The ſeeds of this plant can only grow in a wet ſeaſon; and in conſequence of this it is ſo provided, that the pods containing them can only open in wet weather; they will remain ever ſo long whole upon the plant in a dry time, but as the firſt ſhower falls, the ſeed-veſſels being wetted, burſt open, and ſcatter their ſeeds ſeveral ways, and every one immediately ſtrikes root and grows.

The lychniſes, poppies, and ſnapdragons, all have their ſeed-veſſels open at the top only, and in theſe the ſeeds lie ſecurely till a windy ſeaſon happens, then they are diſlodged; and do not fall all together, as they otherwiſe would, in one ſpot, raiſing a cluſter of young plants to ſtarve and ſpoil one another; but they are, according to the ſame great intent of nature, ſcattered to ſuch diſtances, that every one may produce

a plant in such circumstances as it may thrive under. Philos. Trans. N°251. p. 120.

SPA (*Cycl.*)—Spa-*water*. The contents of this *water*, by means of which it is able to do such great things in many chronical cases, are understood by the following experiments and observations.

1. When the *Spa-water* is carried to any distant place, though ever so well stopped down, they always, after a time, will precipitate a small quantity of a yellow ochreous earth.

2. If a single grain of galls be put into an ounce of *Spa-water*, it tinges the whole with a beautiful purple; but if the *water* be heated before the galls are put in, there will not be the least change of colour produced in it.

3. Mixed with milk they do not coagulate it, but when mixed with wine they make a great ebullition, and throw up a large quantity of air-bubbles with a peculiarly pleasing smell.

4. The *waters* drank at the spring cause a sort of drunkenness, but it does not last above a quarter of an hour.

5. A small vial being filled up to a certain height with *Spa-water*, and afterwards exactly to the same height with pure distilled water, and weighed, when filled with each, in a nice balance, was found, when the *Spa-water* was in it, to weigh three ounces, four drachms, and forty grains, and with the other, three ounces, four drachms, and forty one grains; so that the *Spa-water*, notwithstanding its mineral particles, is somewhat lighter than the purest common water.

6. And finally, a pint of the *Spa-water* evaporated over a very gentle fire, leaves behind only a grain and half of a white powder.

Hence it appears, that the *Spa-waters* are the lightest and most subtle of all the mineral waters; and the small quantity of earth, and large portion of subtle mineral spirit they contain, bespeak their possessing the most exalted virtues of all the mineral waters.

One very remarkable virtue of this *water* is, that it greatly relieves in all disorders of the kidneys, ureters, and bladder, whether occasioned by stone, gravel, or ulcerations. It possesses, beside, all the virtues of the other mineral waters, and is of the greatest service in edulcorating sharp, and dividing viscous humours, and removing all diseases arising from these causes, by disposing them to pass off by the proper emunctories.

SPADE, (*Cycl.*) is an instrument for digging up the ground; the handle, or shaft, is about three feet long; the head of it is all of iron, the upper part being flat, for the workman to set his foot on to force it into the ground; the length of the head is a foot, or fifteen inches, and the breadth six or eight.

SPADO, among the Romans, differed from an eunuch only in this, that the latter was deprived both of the penis and testes, but the *spado* of the testes only. *Hofm.* Lex. univ. in voc. See Eunuch, *Cycl.*

SPAGIRIC *art*, *ars spagirica*, a name given by authors to that species of chemistry which works on the metals, and is employed in the search of the philosopher's stone.

SPAGNUOLA, in the Italian music, denotes a guitar.

SPANIEL. This sort of dog is of great use, but subject to many distempers; among these the mange is a very frequent one, and is the most pernicious of all others to his quiet and his beauty, and is very apt, when one dog has it, to spread to others that come in its way. The best cure is a decoction of a large quantity of brimstone, with some common salt and wood-ashes, in water and urine, of each equal quantities; this is to be used three or four times a day, washing the creature well with it before the fire, or in the warm sun. If this is not strong enough, the same ingredients, with the addition of a considerable quantity of wood-soot, are to be boiled in strong vinegar, and the liquor used in the same manner; but this must never be used in cold weather, as it would then endanger the creature's life.

When this disease is not in a violent degree, it may be cured by the herb agrimony internally taken. The method is to pound the roots, leaves, and seeds of this plant in a mortar, and mix them with a large quantity of wheaten-bran; they are to be then made into dough in the common way, and baked in an oven; the dog is to have no other bread but this for some time, but he is to eat of this as often, and as much as he will: this, without any farther care, has cured many.

Another very troublesome disorder in this creature, is what is called the *formica:* this infests only the ears, and is caused by flies, and by the dog's scratching for them. The best medicine for the cure of these is this: take a quantity of pure and clean gum tragacanth, infuse it in white-wine vinegar; let as much vinegar be used as will serve to soften it, and when it has lain a week in it, let it be taken out and ground on a marble, as the painters grind their colours, adding to it roach-alum and galls, reduced to powder, of each two ounces; all this is to be well mixed together, and the matter, if it grows too stiff in the grinding, is to be moistened with some of the vinegar in which the gum was soaked: when all is thoroughly mixed, and ground fine, it is to be put by in a gallypot, and a small quantity of it applied to the creature's ear every night till the complaint is removed.

The swelling of the throat is another disease very common to *spaniels*, but the cure of this is easy, there needs only to bath it well with oil of camomile, and afterwards wash it with a mixture of vinegar and salt; this done night and morning will, in a few days, wholly remove the complaint. *Spaniels* will sometimes, when they have much rest and good food, lose their sense of smelling, but this is recovered by a brisk purge and repeated airings; a very common dose, on this occasion, is a drachm of jalap, and two drachms of sal gem, mixed up into a bolus with oxymel of squills: this is to be rubbed over with some butter, and will be got down in that manner pretty easily, and will work briskly.

SPAR, (*Cycl.*) in natural history. *Spars* are defined to be fossils not inflammable, nor soluble in water. When pure, pellucid and colourless, and emulating the appearance of crystal, but wanting its distinguishing characters; composed of plane and equable plates, not flexile nor elastic; not giving fire with steel; readily calcining in a small fire, and fermenting violently with acids, and wholly soluble in them.

Of this class of bodies there are ten orders, and under those twenty one genera, many of which, from their accidental admixtures, deviate greatly in appearance from the natural state of pure *spar*.

Of the first order are the pellucid crystalliform and perfect *spars*, composed of a column terminated at each end by a pyramid.

Of the second are those composed of two pyramids joined base to base, without any intermediate column.

Of the third are the crystalliform columnar *spars*, adhering by one end to some solid body, and terminated at the other by a pyramid.

Of the fourth are the pyramidal crystalliform *spars* without columns.

Of the fifth are the *spars* of a parallellopiped form.

Of the sixth are the *spars* externally of no regular form, but breaking into rhomboidal masses.

Of the seventh order are the crustaceous *spars*. These are of a crystallino-terrene structure, or debased from their native pellucidity by an admixture of earth, and formed into plates or crusts of a striated figure within.

The eighth order comprehends the crustaceous terrene *spars*; bodies so highly debased with earth, as to appear merely earthy, of an irregular structure, and not striated within. These often encrust fissures of stone, and sometimes vegetable and other extraneous bodies in springs.

Of the ninth order are the *spars* formed into oblong cylindric bodies, known by the name of *stalactitæ*, or stony icicles.

And the tenth comprehends those formed into small round figures, composed of various crusts enclosing one another, and generally known by the name *stalagmitæ*; and adding to these the *spars*, influenced in their figures by metalline particles, we have the whole series of these bodies. These are, 1. the *cubic*, owing their figure to lead. 2. The *pyramidal* with four planes, owing their figure to tin. 3. The *rhomboidal*, consisting of six planes, owing their figure to iron. *Hill*'s Hist. of Fossils, p. 201.

The genera of these several orders are these.

Of the first there are three. 1. The *triexahedria*, those which are composed of a hexangular column, terminated at each end by a hexangular pyramid. 2. The *tripentahedria*, those composed of a pentangular column, terminated at each end by a pentangular pyramid. And 3. the *enneahedria*, which are composed of a trigonal column, terminated at each end by a trigonal pyramid.

Of the second order there are three genera. 1. The *dioctahedria*, *spars* composed of two octangular pyramids joined base to base. 2. The *diexahedria*, composed of two hexangular pyramids joined base to base. And 3. the *ditrihedria*, which are composed of two trigonal pyramids joined base to base.

Of the third order there are also three genera. 1. The *hexaedrostyla*, which are hexangular columns, terminated by hexangular pyramids. 2. The *pentaedrostyla*, composed of a pentangular column, terminated by a pentangular pyramid. And 3. the *triedrostyla*, composed of a trigonal column, terminated by a trigonal pyramid.

Of the fourth order there are only two genera. 1. The *hexapyramides*, *spars* in form of hexangular pyramids without columns. And 2. *tripyramides*, those in form of trigonal pyramids without columns.

Of the fifth order there is only one known genus, the *parallellopipedia*, *spars* of a regular parallellopiped figure, as well in their whole masses, as in their constituent particles.

Of the sixth order there is also only one known genus, the *anomorhomboidia*, *spars* of no regular external figures, but breaking into rhomboidal masses.

Of the seventh order there are two known genera. 1. The *placagnodiaugia*, semipellucid, and of a striated texture within, and

and of cruſtaceous external figures. And 2. the *placagnoſcuria*, opake cruſtaceous *ſpars* of an irregular ſtructure within.

Of the eighth order there are two genera. 1. The *cibdeloſtracia*, terrene *ſpars*, found in form of thin plates on the ſurfaces of fiſſures in ſtone quarries. And 2. *cibdeloplacia*, terrene *ſpars*, uſually found coating over vegetable, or other extraneous matter in ſprings, *&c.*

Of the ninth order there are two genera. 1. The *ſtalactagnia*, cryſtalline *ſparry* ſtalactitæ. And 2. *ſtalacto-cibdela*, cryſtallino-terrene, *ſparry* ſtalactitæ.

And of the tenth order there are alſo two genera. 1. The *ſtalagmodiaugia*, or pellucid *ſparry* ſtalagmitæ. 2. *Stalagmoſcieria*, dull and opake *ſparry* ſtalagmitæ. *Hill*'s Hiſt. of Foſſils, p. 203.

The obſervation that *ſpar* is continually formed at this time in caves and grottos under ground, has given birth to many different conjectures as to the origin of that ſubſtance. We have accounts from Swiſſerland, and other places, that the ſnow by long lying on the earth, and being ſubject to repeated freezing, is at length hardened into *ſpar*: this is much of the nature of that opinion of the antients concerning cryſtal, that it was water frozen by ſevere colds to a ſort of ice, much harder than the common kind; both are equally erroneous and abſurd. But more rational conjectures, as to its origin, are, that it is produced either by effluvia alone, or by the joint force of effluvia iſſuing up from the depths of the earth, and mixing with water ouzing out of rocks into their cracks and cavities, or by the ſame water or effluvia paſſing through beds of this *ſparry* matter contained in clay. In the firſt place we are to obſerve, that *ſpar* is capable of being diſſolved either by water or vapour, and ſuſpended imperceptibly in either; and that though it remains ſuſpended a long time, yet there are occaſions of its ſeparating itſelf from either of theſe vehicles, ſuch are long ſtanding ſtill, and evaporation. What is called the growth and formation of *ſpar*, therefore, is properly perhaps only the change of place in this ſubſtance, and all that theſe agents, water and vapours, do, is only to waſh it out of the ſtrata of earth or ſtone, in which it lay in ſcattered particles, and bring it together into the cracks and crevices of ſtones, where it may again ſeparate itſelf, and become more pure and perfect. The operation of nature, in this caſe, is very like that of art in the extracting of ſalts from the various bodies they are mixed with; and *ſpar* in its two ſtates, when blended in the ſtrata of ſtone, *&c.* and when pure, and in form of cryſtals in the cracks, may be compared to alum, for inſtance, in its bed, and when purified. The alum in the common ſtones, from which it is made, is not perceptible to the eye, but lies in ſcattered particles; water being added to this takes up the ſalt, and when it has been managed by evaporation and reſt, yields it again purified and alone, and it forms ſuch cryſtals on the ſides of the veſſel as the other does on the ſides of the fiſſures of ſtone, which are the veſſels where the water, out of which it was formed, was ſet to evaporate, and to reſt a proper time. That ſome *ſpars* grow from vapours alone, is evident from the *ſtalactitæ*, or ſtony icicles, hanging down from the roofs of our caverns, which, though they grow downwards, yet have many times little plants of the ſame ſubſtance growing out at their ſides, and ſtanding upwards, contrary to the growth of the other, and evidently formed of the matter ſeparated from the vapours in their aſcent, as the ſtalactitæ themſelves are from ſuch as have aſcended to the roof, and there been condenſed into water, and ſent down again in drops. Nor is the *ſparry* matter alone thus raiſed in vapour, for even the metals, and other bodies, as little likely as thoſe to be thus raiſed, yet are found to form ſtalactitæ. The mundics in general, though they never form regular ſtalactitæ, yet often are found adhering to the ſides of them, and the metals, particularly iron and lead, form regular ſtalactitæ; the iron ones very common, and very perfect; the lead leſs perfect, and more rare; and Dr. Brown gives us abundant inſtances, of *ſpars* growing entirely from vapours in the baths of Buda in Hungary. Phil. Tranſ. N° 129.

Mr. Beaumont [b] is of opinion, that earth by degrees will ripen into *ſpar*; but this is an error. He founds his opinion on certain ſtalactitæ, and ſtalagmitæ, found in caverns, partly earth and partly *ſpar*, and ſuppoſes, that the whole would in time become *ſpar*; but there is nothing in nature to warrant this conjecture.—[b Phil. Tranſ. ibid.]

Mr. de Juſſieu has given us, in the Memoirs of the Paris Academy, a very remarkable account of the recryſtallization, or reproduction of the parts of *ſpar*, after ſolution, in the following inſtance.

There are found in the mines near St. Bell, where they dig copper-ore, a ſort of ſtones, which uſually cover the vein of the ore; theſe are compoſed of ſeveral flat plates laid evenly on one another, as our rhomboidal and parallellopiped *ſpars*, and theſe, as the diſtinctions of foſſils were not at that time eſtabliſhed, the author called, from their eaſy calcination, a ſort of gypſum, which he diſtinguiſhed from the reſt by their plated ſtructure. They are white on their outſide, and greyiſh within; and their internal part being heavy, and full of ſparkling points, they were ſuppoſed to contain ſome copper, and were thrown into the furnace uſed for roaſting the other ſtones in which copper was lodged. The calcination reduced theſe ſtones into a ſort of plaſter, or gypſum: After this theſe calcined ſtones, which were now as red as colcothar of vitriol, were thrown into tubs, and large quantities of water were poured on them; this took up their cupreous, their vitriolic, and their *ſparry* particles. From theſe tubs the impregnated liquor was let out into a baſon, in the midſt of which were placed ſeveral pieces of iron; theſe were all immediately changed in appearance into copper by the liquor. The liquor ſent up all this while a thick white vapour, which covered all its ſurface, and aroſe to the height of a foot above the edge of the baſon. This vapour by degrees diſſipated itſelf into air; but where it had touched, not only the ſides of the baſon that were above the ſurface of the liquor, but alſo the earth about the edges, were covered with ſmall regular cryſtals, of a figure approaching to a parallellopiped, and of an inſipid taſte, in ſome degree tranſparent, and very thin and flat in proportion to their breadth or length. Theſe were the ſingle cryſtals, but the continual formation of them, one upon another, at length formed of them concrete maſſes, reſembling large cakes of tartar. Theſe were like the other a true *ſpar*, being indiſſoluble in water, and eaſily calcining in the fire, and having all the other qualities of the ſtones from which they were originally obtained. This proceſs is the more ſingular, as calcination is a very ſtrange method of procuring the cryſtals of a body, and in this ſubſtance ſeems entirely to deſtroy them in their original ſtate; ſo that chance alone could have diſcovered a property of their riſing in vapour from this, and again aſſuming their proper form; but it would deſerve a trial whether the common *ſpars*, which will recryſtallize after ſolution in the acid menſtrua, will alſo do it after calcination. Mem. Acad. Par. 1719.

SPARS, in medicine, have from the earlieſt times been recommended in nephritic complaints. Some have uſed one kind, ſome another, as the *lapis judaicus*, the *ſparry* incruſtations of caverns, petrified oyſter-ſhells, and water in which large quantities of *ſpar* are ſuſtained. After all, the nephritic virtues of *ſpar* want ſufficient proof; ſome even ſuſpect its uſe to be more hurtful than beneficial. See CRYSTAL.

It were to be wiſhed, that whoever attempts to aſcertain this point, would chooſe for the experiment ſome determinate kind of *ſpar* in its natural form, rather than under appearances, whereby its efficacy may be confounded with that of other bodies. See the articles BELEMNITES and OSTRACITES.

SPARAGUS, or ASPARAGUS, *ſperage*, in botany. See the articles ASPARAGUS and SPERAGE.

SPARGANOSIS, a word uſed by ſome to expreſs a milk-tumor in women's breaſts.

SPARGUS, in ichthyology, a name given by Gaza to the common ſparus, which he calls alſo *fluta*.

Artedi calls it the plain yellow *ſparus* with an annular ſpot near the tail. See SPARUS.

SPARLING-*fowl*, in zoology, a name given in ſome places by the country people to the female merganſer, called more uſually the *dundiver*. This ſo much differs from the male of the ſame ſpecies, as to have deceived the generality of authors into thinking it a different bird.

SPARRING, or SPARING, among cock-fighters, a term uſed to ſignify the fighting of a cock with another to breathe him; in which fights they put hotts on their ſpurs, that they may not hurt one another. Sportſm. Dict. in voc. See the article HOTTS.

SPARROW, in zoology. See the article PASSER.

SPARROW-*graſs*, in botany, *&c.* See ASPARAGUS.

SPARSE-*leaves*, *ſparſa folia*, among botaniſts. See LEAF.

SPARTIUM, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the papilionaceous kind; the piſtil, which ariſes from the cup, finally becomes a ſhort roundiſh turgid pod, which uſually contains a kidney-ſhaped ſeed.

The ſpecies of *ſpartium*, enumerated by Mr. Tournefort, are theſe. 1. The yellow-flowered *ſpartium* with a kidney-ſhaped ſeed. 2. The white-flowered Spaniſh *ſpartium*. 3. The prickly ebony-like purſelain-leaved American *ſpartium*. And 4. the climbing citron-leaved American *ſpartium* with white flowers growing in cluſters at the joints. *Tourn.* Inſt. p. 645.

SPARTOPOLIAS *lapis*, in natural hiſtory, a name given by ſome authors to a whitiſh agate, variegated with long and ſlender ſtreaks of grey diſpoſed in a variouſly undulated order, and reſembling grey hairs.

SPARUS, in the Linnæan ſyſtem of zoology, the name of a genus of fiſhes of the general order of the acanthopterygii, the characters of which are, that the opercula of the gills are ſcaly, and the mouth is furniſhed with grinders covered with lips. Of this genus are the ſargus, cantharus, melanurus, *&c.* *Linnæi* Syſt. Nat. p. 54.

In the Artedian ſyſtem of ichthyology, the characters of this genus of fiſhes are theſe. The coverings of the gills are ſcaly. The teeth are covered with lips, as in quadrupeds.

The teeth in the jaws reſemble the dentes canini of men. The molares, or grinders, are like thoſe of quadrupeds. The teeth are placed only in the jaws and fauces, their palate and tongue being ſmooth. There is but one back fin. The eyes are covered with a lax ſkin, and the tail in moſt of the ſpecies is forked. The inteſtines are long, and they are twiſted in ſpiral forms, and often fixed to the meſentery. The appendices to the pylorus are large, and few in number, from three to ſeven being the uſual numbers.

Of the *ſpari* ſome have acute and cylindric teeth; of theſe the following are the ſpecies of them. 1. The *ſparus* with a very acute back, and an arched yellow ſpire between the eyes. This is the *aurata*, or gilt-head. 2. The ſilver-eyed *ſparus* with yellow parallel longitudinal lines on each ſide. 3. The red *ſparus* with ſilver eyes. This is the *rubellio* of authors. 4. The reddiſh *ſparus* with the ſkin formed into a ſinus at the root of the back fin and the pinna ani. This is called the *brama marina*, or ſea-bream. The tail is forked, and the mouth has granulous tubercles in it. 5. The variegated *ſparus* with an acute back, and with four large teeth. This is the *dentex* and *ſynodon* of authors. 6. The *ſparus* with four longitudinal parallel lines, of a golden and ſilvery colour. This is the *boops* of authors. 7. The variegated *ſparus* with a black ſpot in the middle of each ſide, and with four large teeth. This is the *mana* of authors. 8. The *ſparus* with a black ſpot on each ſide, and with the pectoral fins and the tail red. 9. The *ſparus* with the upper jaw longeſt, and with two tranſverſe black lines on each ſide. 10. The *ſparus* with the ſecond bone of the belly fins extended into a long hair. This is the *chromis* of authors. 11. The variegated *ſparus* with an equal tail, and a black ſpot in it near the end. This is the *orphus* of authors. Its head is reddiſh. 12. The yellowiſh *ſparus* with a ſingle annular ſpot in the tail. This is the *ſparus* of authors, Artedi only having uſed the name in this extenſive generical ſenſe. 13. The *ſparus* variegated with yellow tranſverſe lines, with a large and remarkable ſpot at the tail. This is the *ſargus* of authors. 14. The *ſparus* variegated with longitudinal lines, with a black ſpot on each ſide of the tail. This is the *melanurus* of authors. 15. The *ſparus* with eleven lines on each ſide, which are gold coloured, and run longitudinally and parallel to one another. This is the *ſalpa* of authors. Thus have the ſeveral fiſhes, which are only ſo many ſpecies of the ſame natural genus, been treated of under almoſt as many generical names, to the great confuſion of thoſe who apply to this ſtudy. *Artedi*, Gen. Piſc. p. 28.

The *ſparus* is common in the Adriatic, and ſome other ſeas, and eſteemed a very delicate fiſh. *Aldrovand.* de Piſc. lib. 2. cap. 18. *Geſner*, Paralip. p. 1056.

The name *ſparus* is of Greek origin, being derived from the verb σπαιρειν, to palpitate, or tremble; and was given to this fiſh from its remarkable quality of trembling or palpitating all over the body, as ſoon as taken out of the water.

SPARUS, among the Romans, a kind of ruſtic weapon, bent backwards like the foot. It was likewiſe uſed for a ſmall dart, or miſſive weapon. *Pitiſc.* in voc.

SPASM (*Cycl.*)—A *ſpaſm* may be either univerſal, extending itſelf over the whole body, which is a very rare caſe; or partial, occupying only ſome one part of the body: theſe are very frequent, and ſeize at times on every part, from the head to the foot.

Of the nature of the univerſal *ſpaſms* are, 1. the *tetanus*, which ſeizes upon the whole body, and makes it ſtiff and rigid in every part. 2. The *emproſthotonos*, which bends the body forwards, ſo that the head is brought to meet the knees. 3. The *opiſthotonos*; this enclines the whole body forcibly backwards. And 4. the *catalepſis*, which ſeizes the whole ſyſtem in a moment, and fixes it rigidly and unalterably in that poſture in which it finds it; ſo that the poſition of every limb, and the very turn of the countenance, and look of the eyes, is the ſame as when the patient was ſeized. This is a very rare caſe.

To the claſs of particular and partial *ſpaſms* belong 1. many of the arthritic complaints. 2. The *incubus*, or nightmare, which is a *ſpaſm* of the breaſt. 3. The *convulſive aſthma*. 4. The *cynic ſpaſm*, which is a peculiar diſtortion of the face, reſembling that of a perſon while laughing. This endures uſually many hours, and is often of very fatal conſequence, frequently terminating in an apoplexy, or in the moſt terrible convulſions. 5. The *ſardonic laugh*, which only differs from the former in that it is attended with an abſolute delirium, which is not the caſe in the other. 6. The *priapiſm*, which is an involuntary and painful erection of the penis. 7. The ſpaſtic contraction of the colon in flatulent colics. 8. The *fixt ſpaſms* of Paracelſus, which the author deſcribes as often afflicting podagric and arthritic patients. *Junker*'s Conſp. Med. p. 608.

Spaſms in general, beſide theſe diſtinctions, are divided by authors into the ſudden, or inſtantaneous, which ſeize upon any muſcle in a moment, and keep it for a conſiderable time in a painful ſtate of contraction, and the ſlow ones.

The *ſlow ſpaſms* are alſo divided into two kinds. 1. The *muſcular* and *tendinous*. And 2. the *fibrillary*. In the firſt of theſe the whole muſcle is affected with tenſive pains, and the limb becomes finally contracted. In the other, the ſeparate fibres in the muſcle are only affected. This is uſually the caſe in *ſpaſms* in arthritic caſes, which ſeize a few fibres only at firſt, but finally faſten upon more, and extend themſelves over the whole muſcle, in which caſe the pain uſually becomes leſs. A tenſive pain in the neck, occaſioned by ſitting or lying in an uneaſy poſture, uſually called a *crick in the neck*, is alſo to be enumerated among the partial *ſpaſms*; and finally, theſe affections are not reſtrained wholly to the external parts, but often ſeize alſo upon the internal, as the œſophagus, the ſtomach, the bladder, &c.

It is a common error to confound the word *ſpaſm* with *convulſion*; their difference is evident, the one being ſtationary and immoveable, the other erratic, and flying from one part of a muſcle to another, and from one muſcle to another; the convulſion alſo uſually extends itſelf farther than the *ſpaſm*, and is greater in degree; and finally, the *ſpaſm* is a much leſs dangerous complaint than the convulſion. Men are more ſubject to *ſpaſms* in general than women, and among them, ſuch as are of a ſanguine and plethoric habit, are moſt of all ſubject to them. The general cauſe of *ſpaſms* is an abundance of blood in a body where the veſſels are ſmall, and nature is endeavouring to throw off the load of the plethora from veſſels, where it is troubleſome to her, by this means; which, though an erroneous one, is therefore not without its end.

Prognoſtics in SPASMS. The univerſal *ſpaſms* are greatly the moſt dangerous, as they are frequently attended with internal inflammations; and the partial *ſpaſms* too often degenerate into convulſions. If *ſpaſms* are very frequent in young people, they are to be ſuſpected of threatening arthritic complaints in old age; and when perſons have been free from *ſpaſms* in their youth, and become ſubject to them when old, it is much to be feared that they portend apoplexies, palſies, and ſuffocative catarrhs: and in general all *ſpaſms*, as they are in reality no other than the incomplete attempts of nature to free herſelf of ſomewhat that offends her in particular parts, portend ſome worſe miſchief, when they are obſerved to return frequently, and with violence. *Spaſms* happening in acute diſeaſes, and from wounds, are all very dangerous ſymptoms, and threaten convulſions, and other miſchiefs.

Method of cure. The means to be uſed, when the fits are off, are bleeding in any manner, by the lancet, by leeches, or by cupping, as may be moſt proper in regard to the part principally affected, and other circumſtances; after this the primæ viæ are to be cleared by purges from any foulneſſes that may adhere to them; and finally, ſuch medicines are to be given, as are known to attenuate the blood; and with all this, gentle exerciſe is of great ſervice. In the time of the fit, lenient and paregoric medicines of this kind are amber, and the ſpirit of hartſhorn: to theſe are to be added the acrid vegetables, ſuch as the more temperate carminatives, and the emulſive diluent medicines, with nitre and cinnabar. This laſt drug is famous alone in all theſe caſes, and indeed in all emotions of the blood; but neither this, nor any of the others, will take effect till after bleeding, if the *ſpaſm* be violent. The volatile alkalis alſo ſucceed beſt when mixed with a fixed one; ſuch as the ſpirit of hartſhorn with the tincture of ſalt of tartar, or of antimony. *Junker*'s Conſp. Med. p. 612. See CONVULSION, *Appendix*.

SPATAGOIDES, in natural hiſtory, the name of a genus of the *echini marini*, the characters of which are; that it has the aperture for the anus on one ſide of the upper ſurface, and has a large furrow on the back, which makes it of a cordated form; but has no furrows on the vertex, but only four or five ſmooth rays, made of a number of ſlight tranſverſe ſtriæ. See Tab. of Teſtaceous Animals, N° 14.

SPATANGI, in natural hiſtory, the name of a genus of the *echini marini*, including all thoſe which are marked in the ſhape of a heart, and have the aperture for the anus in one of the ſides of the upper ſuperficies. Theſe have all a remarkable furrow on the back; their baſe is nearly flat, and they have ſeveral furrows on the vertex. By theſe characters they are diſtinguiſhed from the briſſi, with which they have in common the marks of two lips to their mouth, and want the teeth the other kinds have. See Tab. of Teſtaceous Animals, N° 11. *Klein*'s Echin. p. 35.

SPATHA, is a word uſed by different authors in various ſenſes; ſome expreſs by it a rib; others the inſtrument called by ſurgeons a *ſpatula*, and uſed for ſpreading ointments and plaſters; and Celſus calls a ſort of inciſion-knife by this name. It is alſo uſed for the external covering of the fruit of the palm-tree, and by others for a ſword. This laſt is indeed its proper ſignification, and all the others are only metaphorical applications of it to different things, which bear ſome reſemblance to a ſword.

SPATHA, among botaniſts, expreſſes that ſort of cup which conſiſts of a ſimple membrane growing from the ſtalk. This kind of cup is of various figures; often diphyllous, or divided into two parts; often ſimple; ſometimes more divided: it incloſes ſometimes a ſingle flower, ſometimes ſeveral

flowers together, and these have often no perianthium. The *spatha* is of very different texture, and consistence, in different plants.

SPATHA, among the Romans, is sometimes taken for a broad sword, sometimes for a sort of ladle used by cooks, and also for a surgeon's instrument. *Pitisc.* in voc.

SPATHALIUM, among the Romans, an ornament which the women wore about their hands, not unlike the coral ones of the moderns. *Pitisc.* in voc.

SPATHESTER, the name of a chirurgical instrument used to draw the prepuce over the glands.

SPATHINUS, in natural history, a name given by the Greeks to the stag, or deer, when in its second year.

In the first it was called *nebrus*; in the third year *dicratus*; and after this *cerastes* as long as it lived.

SPATHOMELE, a word used by some to express the spatula, and by apothecaries and surgeons in mixing and spreading ointments and plasters.

SPATLING-*poppy*, a name given to the common field-lychnis, from the white froth found on it in the spring. See the article FROTH-*spit*.

SPATULA, (*Cycl.*)—The use of the *spatula* is to depress the tongue, in order to examine the state of the tonsils, uvula, and fauces, when they are affected with any disorders. It is also used to suspend the tongue, when the frænum is to be divided; for which purpose it has a fissure at its extremity, and should rather be made of silver than of any other metal.

These *spatulæ* are made of different shapes. Vid. *Heister*'s Surg. Introd. sect. 36. and Plate I. P. Q. R.

SPAX, a name given by some authors to the common tænia, a small fish of the anguilliform-kind, frequent on the shores of Italy. *Rondelet.* de Pisc. p. 112.

SPEAR, in the manege. The feather of a horse, called the *stroke of the spear*, is a mark in the neck, or near the shoulder of some Barbs, and some Turky and Spanish horses, representing the blow or cut of a *spear* in those places, with some resemblance of a scar. This feather is an infallible sign of a good horse.

SPEAR-*hand*, or *sword-hand* of a horseman, is his right hand.

SPEAR-*foot*, of a horse, is the far-foot behind. See the article FAR, *Appendix*.

SPEARWORT, the English name of the *ranunculus flammeus*. See the article RANUNCULUS.

This is with us generally esteemed a poison, but the Scotch use it as a medicine. They beat it, and squeeze out the juice, which they take as a purge, drinking a little melted butter or oil before and after it, to prevent its taking the skin off from the throat. It operates very violently, but with their robust constitutions it does very well.

They use it also externally in cases of pain in the head, or any other part of the body. They bruise the leaves to a sort of paste, and apply them to the part; they soon raise a blister, and a large quantity of water is discharged, after which the pain goes off. This is a short way of blistering, and answers as safely, and as well as ours by the cantharides: but it is a wonder that people, who see this quality in the plant, should dare to take it into their mouths and stomachs.

SPECIES (*Cycl.*)—It has been generally allowed to be true, that no *species* of animal, once created, ever became extinct, or ever will be: but though this may be true in general, yet it does not follow, but that a whole species of animals may be extinct in some particular place by various accidents.

This seems to have been the case with the great moose-deer, now found only in America, which was certainly once an inhabitant of Ireland, though now extinct there, and that so long ago, that no historian mentions its ever having lived there.

There are many animals, as well as trees and plants, common to America and to Ireland. The horns of the moose-deer are found with the bones of the head, and sometimes with other bones, in immense quantities, to this day, in that kingdom, buried in strata of marl at great depths. The writers of fossils, who are fond of resolving every thing into the effects of the deluge, affirm, that these horns were brought from some other country by the waters of the flood; but they seem to be as improbable things to be brought by the sea, and left uninjured in other countries, as can well be conceived; and they are too little altered, and too well preserved, to suffer an unprejudiced observer to agree to this account.

We find numerous instances of the surface of the earth altering, in length of time, in many parts of this kingdom; and it is no forced judgment to determine, that the soil, in which these horns are now found buried, was once the surface of the country, though other substances have been since piled upon it, and made a surface over it. The creatures, whose horns we find buried, probably lived on the island when this was the surface; and as they live in herds, so dying in herds, or at least several together, their bodies were left in heaps upon the surface, where they were afterwards consumed and wasted, only the tough substance of the horns preserving them, they have remained, and being covered with the superadded strata, are now found in this fossile state. In countenance of this opinion it is to be observed, that the deer-kind in general are subject to contagious diseases, which often carry off great numbers of them. The rein-deer in Lapland are sometimes almost all destroyed by these diseases; and it is not impossible that such a distemper, raging longer and more violently than ordinary, might destroy the whole *species* in this place. The inhabitants might also promote the destruction by their hunting; for we see by the destruction of the wolves, once so frequent in this kingdom, that this cause alone may be sufficient to extirpate, or extinguish the race of an animal in one kingdom. Phil. Trans. N° 27. p. 501.

What the accurate Artedi has given, as the definition of the *species* in ichthyology, is not confined to fishes alone, but, with proper regulations, may be made the basis of real distinctions of *species* in all other natural bodies. Every fish, which differs from all the other fishes of the same genus in some external part, whether that difference be in excess or defect, in number or in proportion, or even in colour, provided that the difference be fixed and invariable, is properly to be called a distinct *species*. *Artedi*'s Ichthyolog.

The specific differences of fishes are to be drawn from these circumstances; but it is not to be supposed that every *species* differs in all of them, sometimes only one, sometimes more, occasion the variation. See SPECIFIC *names*.

If any one fish, in regard to all the others of the same genus, is found to be possessed of some external part which they all want; as for example, if it have cirri, tubercles in the shape of horns on the head, spines or prickles in the head, or on any other part of the body, the fish is then to be esteemed a distinct *species*. If one fish differs from the others of the same genus in the number of any parts, as fins, spines, or tubercles, it is then also a distinct *species*. If one fish differs from another in the proportion of any essential part, as in the having longer jaws, longer teeth, or the like, it is also to be esteemed a truly different *species*. If one fish differs from another in the figure of some essential part, as of the snout, the back, the teeth, or the tail, or the lineæ laterales, it is to be esteemed a distinct *species*. If one fish differs from another of the same genus in the excess of parts, having some part that is deficient in the other; or if in the number, proportion, or figure of some of the essential parts; the distinction will be the more evident as the greater number of parts differ, and the *species* will easily be found to be truly distinct. *Artedi*'s Ichthyolog.

If a fish differs from all the others of the same genus in colour, while it has no other distinction from some of them, then it is to be examined whether the colour is always permanent and invariable; if not, there is no distinction of *species* to be founded upon it; but if it be, it remains a matter of doubt whether it may be esteemed a specific difference, colour being one of the least essential characters, and, according to Linnæus, what no distinction of *species* can be founded on. As the colour of fishes is very apt to vary, even in the same *species*, and to be sometimes more intense, sometimes more remiss, this is to be considered in a due light, before any judgment is formed on it; and it is to be observed whether the colour, that makes the difference, be wholly of another nature, or only different in degree. The *perca fluviatilis* of Bellonius will be sometimes pale yellow, sometimes deeper, and sometimes even black, according as the water is clear or more muddy; and thus whatever differences are only in degree of the same colour, or in the changes from that degree toward black, without the intermixture of any other colour, are not to be at all depended upon. *Linnæi* Fund. Bot. 27.

We are not to expect the same precision in the differences of the truly distinct *species* of all the genera of fishes: in some they are found so obvious, and so great, that the first look distinguishes them; but there are some other genera, in which the several *species* are so alike one to the other, in the essential characters, that though there is a general external face, in which they all vary, yet it is not easy to say in what the distinction between *species* and *species* consists. Thus, among the several *species* of salmons, the number and figure of the essential parts is the same in all, and their proportion, in regard to the bulk of the fish, differs but little; the jaws are in some indeed wider, and in others longer, but it is not much. The colours and spots vary indeed greatly, in the different *species*, but then it must be allowed, that they also differ in the several individuals of the same *species*: so that, upon the whole, there is no genus of fish, in which the *species* are so difficultly distinguished. The very bones of the fins, which differ in the several *species* of the same genus, in almost all other fishes, are the same in these. The number of the vertebræ is almost the only mark in which the real difference of these consists: this is a troublesome thing to count, but in the boiled fish it is best done, and is always certain, the number being the same in all of the same *species*, of whatever size, and the several *species* all differing as to this number. Great care is to be taken in the counting of these, and by that means the smallest fish and the largest will be found to have the same number, if of the same

ſame *ſpecies*. There are ſome few inſtances of the different *ſpecies* of the ſame genus having the ſame number of vertebræ, but this is very rare. Artedi tells us that he never obſerved it but in a few of the cyprini; and thoſe which have no diſtinction in this character, he obſerves, have ſuch very remarkable external differences, that it is not needful to look for others.

SPECIES *aromaticæ*, a new name given in the late London Diſpenſatory to the compoſition uſually called *ſpecies diambræ*. The College obſerved, that the intention of this medicine was beſt anſwered, by compoſing it of ſuch ſpices as the daily experience of the table ſhews were moſt grateful to the ſtomach, and by avoiding all ingredients which, though of the aromatic kind, are accompanied with any thing nauſeous and diſguſtful in their flavour; and therefore have ordered it to be now made in the following manner. Take cinnamon two ounces, cardamom ſeeds, ginger, and long pepper, of each an ounce; make all together into a fine powder. *Pemberton*'s Lond. Diſp. p. 318.

SPECIES *e ſcordio*, the ingredients of the diaſcordium electuary in a dry form. The recipe is ſomething altered in the late London Pharmacopœia, and ſtands thus: take bole armenic four ounces, ſcordium two ounces, cinnamon an ounce and half, ſtorax, roots of tormentil, biſtort, gentian, dittany of Crete, galbanum, and gum arabic and red roſes each an ounce, long pepper and ginger each half an ounce, opium three drachms; this may be left out at pleaſure; and all are to be beat to a fine powder. *Pemberton*'s Lond. Diſp. p. 319.

SPECIES, in muſic. Here, as in other arts, *ſpecies* denotes the ſubdiviſions of the genus. The antients had three genera, the *enharmonic*, *chromatic*, and *diatonic*. The *enharmonic* had no ſubordinate *ſpecies*. The *chromatic* genus was divided into three *ſpecies*, viz. the *molle*, *ſeſquialterum*, and *toniæum*; or, as others call them, *molle*, *hemiolium*, and *toniçum* [c]. And laſtly, the *diatonic* genus was ſubdivided into the *molle*, and the *intenſum*; ſo that the antients had ſix *ſpecies*, or diviſions of the fourth in uſe. Some of theſe are alſo in uſe among the moderns, but others are unknown, as yet, in theory or practice [d].—[[c] *Wallis*'s Append. Ptolem. Harm. p. 164. [d] Vid. Phil. Tranſ. N° 481. p. 271, ſeq.] See the articles ENHARMONIC, CHROMATIC, and DIATONIC. See alſo GENUS.

SPECIES is alſo applied, in antient muſicians, to the different diſpoſitions of the tones and ſemitones in a fourth, fifth, or octave. Hence they ſay there are three ſpecies of fourths, four of fifths, ſeven of octaves. *Wallis*'s Append. Ptolem. Harm. p. 171.

The Grecians expreſſed this ſenſe of the term *ſpecies* by εἶδος, or by σχημα [e]. The Latin word, *figura* [f], has alſo been taken in the ſame ſenſe.—[[e] *Ariſtox.* p. 6, 74. Ed. Meib. [f] *Wallis*, ibid. p. 170.]

Change of SPECIES. The *change of ſpecies* is a term uſed in huſbandry to expreſs an expedient the farmer often has recourſe to, in order to procure good crops: this is the ſowing firſt one kind of plant, then another, and then a third, and ſo on, upon the ſame land: by this means the moſt is made of the ſoil; and it is found, when it will no longer give a good crop of the firſt corn planted on it, it will ſtill give a good one of ſome other *ſpecies*; and finally, of peaſe after all. After this laſt *change of ſpecies*, it is found neceſſary, in the common method of huſbandry, to renew the land with fallowing and manure, in order to its producing any thing again. See SOIL.

This *change of ſpecies* has been a practice of the farmers of all times, and is recommended, and judged neceſſary, by moſt of the writers on this ſubject; but Tull, in his New Syſtem of Horſehoeing Huſbandry, proves, that it is not neceſſary, and that the land only wants proper tillage, when exhauſted by one ſort of corn, to enable it to produce as good crops of the ſame corn again. The three fundamental propoſitions he lays down to prove this, are, 1. That plants of the moſt different nature feed on the ſame ſorts of food. 2. That there is no plant but what muſt rob every other plant, within its reach, of a part of its nouriſhment. And 3. that a ſoil, which is once proper for any kind of vegetable, will continue to be always proper for it, in reſpect to the ſort of food it gives. If only any one of theſe propoſitions were true, it would follow, that there is no need of a *change of ſpecies* from year to year; and as they are all ſo, this truth is yet the more inconteſtible, and experience proves it yet more evidently, for the ſame land will produce crops of wheat every year, without any change, only by the practice of the horſehoeing huſbandry, inſtead of the common. *Tull*'s Huſbandry. See the articles FOOD *of plants* and HUSBANDRY.

SPECIFIC (*Cycl.*)—SPECIFIC *operation of medicines*. Dr. Martin endeavours to defend the doctrine of the *ſpecific operations* of cathartic medicines, from the different nature of the drugs, and by an appeal to experience. See his Eſſ. Phyſ. and Medic.

SPECIFIC *gravity of metals*. See METALS.

SPECIFIC *names*, in natural hiſtory, are thoſe epithets compoſed each of one or more terms, and placed after the generical name, in the denomination of any ſpecies of plant, animal, or mineral, expreſſing thoſe characters by which it differs from all the other ſpecies of that genus.

The more accurate of the modern naturaliſts have, in their ſeveral provinces, ſet about the reformation of the *ſpecific* names of things. They firſt obſerve, that many of the *ſpecific* names of the antients no way anſwered the intent of their formation, but expreſſed the more trivial diſtinctions, or accidents, while they omitted the realities, and more eſſential grounds of diſtinction. On this foundation the critical writers of our times diſtinguiſh the old *ſpecific* names into the genuine, or true, and the ſpurious, or falſe ones.

The genuine names are thoſe which expreſs thoſe characters, by means of which the thing becomes a different ſpecies; theſe are invariable, and by theſe names the thing is, in ſome ſort, deſcribed. The falſe ones are thoſe *ſpecific* names which do not, nor cannot diſtinguiſh the ſpecies, called by them, from the others of the ſame genus, which may as well belong to ſome other ſpecies as to that, and which therefore are of no uſe to the ſtudent. The true formation of theſe names is on the real characters of the body to be named; but inſtead of this theſe falſe ones are formed, from the following accidental, or variable diſtinctions.

1. From the fiſh being common, or ſcarce. On this difference are founded the diſtinctions of fiſh, for inſtance, in their *ſpecific* names, into *vulgaris* and *rara*; and thus authors abound with *acus vulgaris*, *lupus vulgaris*, *boops rara*, and the like. Names are meant to convey ſome idea of the nature of the thing, but what do theſe convey? or how is the perſon, who is ſhewn a fiſh he does not know, to find out whether it be ſcarce or common?

2. From the number of the ſpecies of ſome genus. Thus we find *acus prima*, and *acus altera*, and the *aſellus primus*, *ſecundus*, *tertius*, and ſo on, in many other genera: theſe convey even leſs than the former.

3. Some of the *ſpecific* names of the antients are formed of the place, or habitation of the creatures. Of this nature are the *alburnus lacuſtris*, the *apua phalerica*, the *brama marina*, the *lampetra fluviatilis*, and a thouſand others; either alluding to the nature of the water, or peculiar place where the fiſh firſt met with, of this genus, chanced to be found.

4. Some are formed on the value or baſeneſs of the fiſh. Of this kind are the *ſalmo nobilis*, the *albula lauta*, the *aſellus luſcus*, the *ſalmo ſpurius*, ſo called, from its not having the fine flavour of the other, and ſo on.

5. The different bigneſs is another foundation of theſe names: thus we have the *acus major*, *albula parva*, *bugloſſus maximus*, *harengus minor*, and the like.

6. The colour, though very variable, or only confined to one part of the fiſh, has given occaſion to others; and in theſe it has been expreſſed, as if generally diffuſed over the fiſh. Thus the *albula cærulea* has only a part blue, though the name ſeems to expreſs that the whole is ſo: the *aſellus flaveſcens*, and *vireſcens*, are names of the ſame kind, the yellow and green expreſſed in them not being general, but only partial: the *torpedo maculoſa*, and *non maculoſa*, ſeem to expreſs two ſpecies different only in the ſpots, whereas theſe ſpots appear and diſappear at times in the ſame *ſpecies*.

All theſe, and many hundred others, founded on the ſame principles with theſe, are falſe and ſpurious, and not at all anſwering the intent of *ſpecific* names, nor diſtinguiſhing the fiſhes one from another. An unknown fiſh carries no figures of 1, 2, 3, &c. marked on it, to ſay whether it be the firſt, ſecond, or third of the author who deſcribes it; nor can it be known, at ſight, whether it be a native of ſalt or of freſh water, whether it lives in rivers or in ponds, and whether it be of American, Aſiatic, or European origin; neither can the taſte, the nature, or the manner of life of the fiſh, be ſeen on the outſide of its body: all theſe, therefore, are to be baniſhed from the names, though they make a proper part of the hiſtory of the ſpecies. On firſt meeting with a fiſh, can any man judge whether it be the greateſt, the middle, or the ſmalleſt of its kind, or ſay whether it is longer or broader than the reſt, before he knows them? nor can the mention of a colour ſignify any thing, when it is not ſaid what part of the fiſh is tinged with it. As the properties, on which theſe *ſpecific* names are founded, cannot be known till the fiſh is well known, and as the uſe of the name is the leading the perſon, yet ignorant, to know it, it follows that all theſe names are falſe, frivolous, and abſurd, and yet theſe are the names by which almoſt all the old authors have called them.

The true, and genuine *ſpecific* name, on the other hand, is that which diſtinguiſhes the fiſh called by it, at firſt ſight, from all the others of the ſame genus; or which, if it require thought and deliberation, yet requires no perſon's knowledge of the fiſh.

Theſe *ſpecific* names are to be taken from ſome external part, which in that peculiar ſpecies differs from thoſe of all the others, either in regard to exceſs, defect, number, proportion, or invariable colour.

The *ſpecific* names, taken from the exceſs of the parts, or from ſome particular parts which that ſpecies has, and which the others want, are preferable to all others. The principal parts, which ſometimes are in exceſs, ſometimes are deficient, and therefore give the proper origin to theſe names, are theſe. The *cirri*, or long-ſhaped fleſhy filaments hanging from the mouth; the tubercles, which in the heads of ſome fiſhes imitate horns; the prickles which are on the heads, and other parts; and the prominences, and other ſoft apophyſes; and other ſuch remarkable things, in whatever part of the body. Inſtances of proper *ſpecific* names, founded on the exceſs or defect of theſe parts, are theſe. *Gadus ore cirrato*, and *gadus cirris carens*. *Cottus cornubus quatuor in capite*. *Cottus cornubus capitis carens*, &c.

After theſe, the beſt names are thoſe which are taken from the number of certain parts differing in exceſs, or ſmall numbers, in the ſeveral ſpecies. The fins, and their bones, and the prickles of them, are parts which give theſe names, as alſo the ſpines on the heads and bodies of ſome fiſhes, and the *lineæ laterales*, or ſide lines, and the teeth.

Of this kind are thoſe expreſſive *ſpecific* names of the *gadus dorſo dipterygio*, *gadus dorſo tripterygio*, *gaſteroſteus aculeis decem*, &c.

Others of theſe names are taken from the proportion of ſome two parts one to another. The difference of this kind is generally in regard to length; and the parts alluded to, are the jaws, the teeth, &c. Of this ſort are the *clupea mandibula ſuperiore longiore*, and the like. In the ſquali, and ſome other cartilaginous fiſhes, the upper part of the tail is always longer than the under part; but as this holds in all the genus, there can be no uſe made of it as a *ſpecific* character.

Others of theſe names are made from the figure of ſome particular part, different from the reſt of the genus. The parts alluded to in theſe names are generally theſe; the ſnout, the back and belly, the tail, the lateral line, and the fixed ſpots and colours. The ſnout of any ſpecies, when different from that of the others of the ſame genus, in being conic, depreſſed, or compreſſed, or long and cylindric, gives great opportunity of good names of this kind. Thus we have the names of *coregonus roſtro conico*, and *coregonus roſtro depreſſo*, and the like. The back and belly, when plane ridged, or carinated, give occaſion to *ſpecific* names in the ſame manner; the cyprini in particular give us inſtances of this. The tail gives alſo occaſion to many names, as it is cuſpidated, rounded, ſtrait, lightly hollowed, or forked; and the lateral lines give the ſame occaſions of names, as they are ſtrait, crooked, ſingle, double, &c. The ſpots, provided they are permanent, are good for the baſis of *ſpecific* names, expreſſing whether they are round or long, large or ſmall, ſtrait, or tranſverſe. The ſituation of the fins, and other parts, is generally ſo regular in all the ſpecies of the ſame genus, when that genus is naturally eſtabliſhed, that very little can be done in the making names from them as *ſpecific* ones; but this ſituation of the parts is of the utmoſt uſe in the generical diſtinctions.

All *ſpecific* names, founded on theſe characters, are genuine and proper, and ſupply real notes for the diſtinguiſhing the ſpecies; and whoever will examine together all the ſpecies of any one genus, however badly named by the old authors, will find, in all the really diſtinct ſpecies, marks ſufficient for the making ſuch names as are here preſcribed. No fiſh can want theſe, ſince its being a diſtinct ſpecies from the reſt conſiſts in ſome of the articles, on the deſcription and diſtinction of which that name is to be formed. *Artedi*'s Ichthyology.

SPECTABILES, among the Romans, a title of honour given to the ſecond rank or degree of nobility under the Roman emperors, being unknown in the time of the republic. There were other two degrees; the firſt had the title of *illuſtres*, and the third that of *clariſſimi*. *Pitiſc.* in voc.

SPECTER, in conchyliology, a name given by the French naturaliſts to a ſpecies of *voluta*, on which there are ſeveral reddiſh broad bands, compoſed of looſe and irregular figures; the ground colour is a fine white. They are called by Latin writers *concha ſpectrorum*. See CONCHA.

SPECTRORUM *candela*, in natural hiſtory, a name by which ſome have called the belemnites. See the article BELEMNITES.

SPECULA, among the Romans, were places whence a good view might be had of what was doing at a diſtance. The word is particularly uſed to ſignify watch-towers and beacons. *Pitiſc.* in voc.

SPECULARES, in natural hiſtory, the name of a genus of foſſils of the claſs of the talcs.

The word is derived from the Latin, *ſpeculum*, a looking-glaſs; the bodies of this kind being naturally of bright gloſſy and poliſhed ſurfaces, and in the thicker maſſes not tranſparent, but reflecting the images of things.

The *ſpeculares* are talcs, compoſed of viſibly ſeparate plates of extreme thinneſs, and each fiſſile again into a number of others yet finer. See Tab. of Foſſils, Claſs 1.

The bodies of this genus are the common Muſcovy talc; the *ſpecularis lucida fuſca*, or brown talc, a ſpecies little inferior to the former in beauty, and found in Germany and England; and the *ſpecularis amethyſtina*, called *talc rouge*, or red talc, by the French. This is found in Muſcovy and Perſia, and no where elſe, as far as is yet known, and is often imported into France in maſſes, which are of a beautiful purple: we have of it brought into England, but only in thin flakes, fit for the covering miniature pictures. In theſe flakes it has none of the redneſs natural to it in the lump, but is the fineſt and moſt tranſparent of all the talcs. *Hill*'s Hiſt. of Foſſils, p. 71. 74.

Pliny, and other of the antient writers, as well as ſeveral of the moderns, uſe the term *ſpecularis lapis* for that ſpecies of talc, commonly known by the name of *iſinglaſs*, or *Muſcovy glaſs*.

This has been a ſubſtance in great uſe among mechanics, from the earlieſt times we have any accounts of. It is found in broad flat maſſes of ten or twelve inches in breadth, and from half an inch to three inches in thickneſs; and is compoſed in theſe of an almoſt infinite number of broad and beautifully even plates, or flakes, laid with a perfect regularity on one another, and ſeldom parting naturally from each other, though by art they may be divided, almoſt without end, into broad and extremely thin laminæ. Theſe are very flexile and elaſtic, and make no efferveſcence with aqua fortis. By the laſt of theſe properties they are diſtinguiſhed from the plated ſpars which ſome have confounded with them, and by their elaſticity from all other foſſile bodies.

It is found in many parts of the world. The iſland of Cyprus abounds with it. It is very common alſo in Ruſſia, and has of late been diſcovered to abound in the Alps, the Apennines, and many of the mountains of Germany. It is imported in large quantities into England, and is uſed by the lanthorn-makers inſtead of horn, in their nicer works; by the painters to cover miniature pictures; and by the microſcope-makers to preſerve ſmall objects for viewing by glaſſes. The antients uſed it inſtead of glaſs in their windows. *Hill*'s Hiſt. of Foſſils, p. 72.

SPECULARIA, among the Romans, a kind of window-caſements, which were uſed before glaſs was introduced for this purpoſe. They conſiſted of tranſparent ſtones, called *lapides ſpeculares*. *Pitiſc.* in voc. See SPECULARIS *lapis*, *Cycl.* and *Suppl.*

SPECULARIS *lapis*. See SPECULARES, ſupra.

SPECULATION (*Cycl.*)—SPECULATION-*ſhell*, in natural hiſtory, a name given by the French writers to a very beautiful ſpecies of the *voluta*, uſually called by us the *Guinea-ſhell*, from its being brought from that part of the world. See the article VOLUTA.

SPECULATIVE (*Cycl.*)—SPECULATIVE *muſic*, called by the Italians *muſica ſpeculativa*, or *theorica*, that which treats only of the ſounds, examines their natures, properties, and effects, without regard to the executive part.

SPECULUM (*Cycl.*)—SPECULUM *linguæ*, a chirurgical inſtrument. See GLOSSOSPATHA.

SPECULUM *indicum*, an affected term uſed by ſome chemical writers to expreſs filings of iron.

SPEEDWELL, *veronica*, in botany. See the article VERONICA.

We have ſeveral of the exotic kinds of this plant propagated in the gardens of the curious. They may all be raiſed from ſeeds, but their roots encreaſe ſo faſt, that they are uſually propagated by parting them. The beſt ſeaſon for doing this is in September, and the ſummer following they will produce their flowers in full perfection. They will grow in any ſituation, but they thrive beſt in a freſh ſoil, that is not too wet. They require no care but the being kept clear from weeds, and having their roots parted every autumn, otherwiſe they multiply too faſt, and both choak up themſelves, and injure whatever is near them. *Miller*'s Gard. Dict.

SPEISSE, in mineralogy, a name given by the Germans, and other workers on cobalt, to a ſort of impure regulus of biſmuth, ſometimes occurring in their proceſſes.

It is not uncommon for ores of biſmuth to be mixed with the cobalt in the ſmalt-works. Both this ore and the cobalt yield the blue vitrifiable earth of which ſmalt is made, but in one of them it is blended with arſenic, and in the other with the biſmuth. The ſeparating it from theſe two minerals requires different proceſſes, and the workmen therefore ſeparate the two minerals, and work each by itſelf; but it ſometimes happens that the ore of biſmuth is ſo like to the true cobalt, that it cannot be diſtinguiſhed by the eye, and ſo intimately mixed with it, that it cannot be ſeparated from it; in this caſe the whole is expoſed to the fire together, and after the arſenic is ſublimed in form of meal, there remains a coarſe and impure regulus of biſmuth, which having mixed itſelf with the earth of the cobalt, and other extraneous ſubſtances, is of a reddiſh white colour, and very impure and friable. This gives them the trouble of a ſecond operation, by which they ſeparate the pure regulus of biſmuth, and the remainder being a mixture of its earth and that of the cobalt, is run together into the blue glaſs, called *ſmalt*, the earth of biſmuth ore being of the ſame nature with that of cobalt. Philoſ. Tranſ. N° 396. p. 199.

SPELTA, in the materia medica, a name uſed for the grain of the zea dicoccos, commonly called *ſpelt corn*. *Dale*'s Pharm. p. 261.

SPELTER (*Cycl.*)—This mineral has been applied lately to ſo large a work as the cylinder of a fire-engine, by Mr. Ford of Colebrook Dale in Shropſhire: it runs eaſier, and caſts as true as braſs, and bores full as well, or better, when warmed a little. While cold it is as brittle as glaſs, but the warmth of the hand will make it ſo pliant, that a ſhaving of it may be wrapt round the finger like a bit of paper. This metal never ruſts, and therefore works better than iron; the ruſt of which, upon the leaſt intermiſſion of working, reſiſts the motion of the piſton. Philoſ. Tranſ. N° 482. ſect. 6.

SPENT, at ſea. The ſeamen ſay a ſhip hath *ſpent* any maſt, or yard, when it is broken down by foul weather, or any ſuch accident; but if it be done by an enemy's ſhot in a fight, they ſay, *ſuch a yard*, or *maſt*, *was ſhot by the board*.

SPERAGE, *aſparagus*, in botany. See ASPARAGUS.

The propagation of this uſeful plant is from ſeed; and as much of the ſucceſs depends upon the goodneſs of the ſeed, it is much better to ſave it than to buy it at the ſhops. The manner of ſaving it is this: mark with a ſtick ſome of the faireſt buds, and when they are run to berry, and the ſtalks begin to dry and wither, cut them up; rub off the berries into a tub, and pouring water upon them, rub them about with your hands, the huſks will break and let out the ſeed, and will ſwim away with the water in pouring it off; ſo that in repeating this two or three times, the ſeeds will be clean waſhed, and found at the bottom of the tub. Theſe muſt be ſpread on a mat to dry, and in the beginning of February muſt be ſown on a bed of rich earth: they muſt not be ſown too thick, and muſt be trod into the ground, and the earth raked over them ſmooth; the bed is to be kept clear of weeds all the ſummer, and in October, when the ſtalks are withered and dry, a little rotten dung muſt be ſpread half an inch thick over the whole ſurface of the bed.

The ſpring following the plants will be fit to plant out for good; the ground muſt therefore be prepared for them by trenching it well, and burying a large quantity of rotten dung in the trenches, ſo that it may lie at leaſt ſix inches below the ſurface of the ground: when this is done, level the whole plot exactly, taking out all the looſe ſtones; this is to be done juſt at the time when the *aſparagus* is to be planted out, which muſt be in the beginning of March, if the ſoil is dry, and the ſeaſon forward; but in a wet ſoil, it is better to wait till the beginning of April, which is about the ſeaſon that the plants are beginning to ſhoot.

The ſeaſon being now come, the roots muſt be carefully taken up with a narrow-pronged dung-fork, ſhaking them out of the earth, and ſeparating them from each other, and obſerving to lay all their heads even, for the more convenient planting them, which muſt be done in this manner.

Lines muſt be drawn, at a foot diſtance each, ſtrait acroſs the bed, theſe muſt be dug into ſmall trenches of ſix inches deep, into which the roots muſt be laid, placing them againſt the ſides of the trench with their buds in a right poſition upwards, and ſo, that when the earth is raked over them, they may be two inches under the ſurface of the ground. Between every four rows a ſpace of two feet and a half ſhould be left for walking in, to cut the *aſparagus*. When the *aſparagus* is thus planted, a crop of onions may be ſown on the ground, which will not at all hurt it.

A month after this the *aſparagus* will come up, the crop of onions muſt then be thinned, and the weeds carefully cleared away. About Auguſt the onions will be fit to pull up. In October following cut off the ſhoots of the *aſparagus* within two inches of the ground, clear well all weeds away, and throw up the earth upon the beds, ſo as to leave them five inches above the level of the alleys. A row of colworts may be planted in the middle of the alleys, but nothing muſt be now ſown on the beds. In the ſpring the weeds muſt be houghed up, and all the ſummer the beds kept clear of weeds. In October they muſt be turned up, and earthed again, as the preceding ſeaſon.

The ſecond ſpring after planting, ſome of the young *aſparagus* may be cut for the table. The larger ſhoots ſhould only be taken, and theſe ſhould be cut at two inches under ground, and the beds every year managed as in the ſecond year. *Miller*'s Gard. Dict.

SPERMACOCE, the name of a plant which, according to the Linnæan ſyſtem of botany, makes a diſtinct genus, the characters of which are; that the calyx is a very ſmall perianthium, divided by four notches at its extremity, placed on the germen, and remaining when the flower is fallen. The flower conſiſts of one leaf, which forms a tube longer than the flower, with its extremity divided into four ſegments, ſomewhat bent back, and obtuſe. The ſtamina are four pointed filaments, ſhorter than the flower. The antheræ are ſimple. The germen of the piſtil is roundiſh, flatted, and ſituated below the receptacle. The ſtyle is ſingle, but bifid at the top. The ſtigmata are obtuſe. The fruit is compoſed of two oblong capſules growing together, convex on one ſide, and flat on the other, obtuſe, and each furniſhed with two horns. The ſeeds are ſingle and roundiſh. *Linnæi* Gen. Plant. p. 25.

SPERMATOPŒA, a name given to ſuch medicines as are ſuppoſed to encreaſe the ſemen.

SPERVERIUS, in zoology, a name by which Bellonius, and ſome other authors, have called the ſparrow-hawk, more commonly known by the names of *niſus*, and *accipiter fringillarius*. *Ray*'s Ornitholog. p. 52. See the article FRINGILLARIUS *accipiter*.

SPHACELUS (*Cycl.*)—In caſes of a perfect *ſphacelus*, or mortification, where the parts are become abſolutely dead, and wholly without ſenſe, and ſoft, ſo as to retain the impreſſions of one's fingers ends, and are plainly fetid and corrupted, all the medicines in the world will be ineffectual to reſtore the part to its life and ſenſe again; and all that remains to be done, is the one miſerable remedy of preſerving the reſt of the body, by cutting off that part, to prevent the mortification from ſpreading farther. A different method is to be taken, however, in this operation, according to the degree of the ſymptoms, and nature of the part affected.

If only ſome extremity of the foot, tarſus, metatarſus, or inſtep, or only the bare ſkin and fat are *ſphacelated*, which is ſometimes the caſe, the whole foot is not to be amputated in that caſe, but preſerving the limb entire, the ſurgeon is only to remove that part which is vitiated; and that is frequently beſt of all done by ſuppuration, or if not to be effected by that means, may be attempted by the cauſtic. When it is to be done by ſuppuration, that is to be brought on as faſt as poſſible, and when it is done, the cruſt or eſchar of the ulcer is to be ſeparated from the ſound parts with proper caution.

To haſten effectually a ſuppuration in theſe caſes, nothing is ſo ſerviceable as the making numerous long and deep ſcarifications near the ſound parts; and afterwards the inciſed parts are to be well anointed with the common digeſtive ointment, and after that treated with the balſamic cataplaſms and fomentations, in common uſe on the like occaſions.

A fomentation, alſo very ſerviceable in theſe caſes, is made by mixing, in a quart of a decoction of ſcordium, or of barley-water, vinegar of rue ſix ounces, ſpirit of wine with Venice treacle four ounces, and an ounce, or two ounces of common ſalt: this is to be applied hot with compreſſes to the part, and frequently repeated, till it is ſeen that the diſorder ſpreads no farther; which is known to be the caſe, when we ſee the tumor of the vitiated parts ſubſide, and the edges of the ſound parts become tumid all round; and on the ſecond or third day after this a ſuppuration is uſually formed, and the ſound parts gradually become ſeparated from the vitiated. After this, to ſoften and promote a ſpeedy ſeparation of the eſchar, the following cataplaſm is always found highly ſerviceable. Take of ſcordium two handfuls, mallows, marſhmallows, and henbane, of each one handful, lavender-flowers half a handful; let theſe be boiled to the conſiſtence of a cataplaſm in vinegar, or oxycrate, and when in that ſtate add to them three ounces of flour of linſeed, one ounce of linſeed oil, and two ounces of ſal armoniac. This is to be applied warm over the whole, and retained in a proper degree of heat, as long as ſhall be found neceſſary, by means of a brick boiled in water, and applied wrapped in a linnen cloth, or ſome other like means. After theſe methods have been uſed, and the whole ſurrounding ſkin is gently tumefied with redneſs, a cruſt, or eſchar is then formed by degrees, and the ſound fleſh begins to ſeparate from the reſt: by this we know that the diſorder has done ſpreading, and that an entire ſeparation of the vitiated parts will very ſhortly follow.

When this ſeparation ſhews itſelf beginning, it muſt be promoted as much as poſſible, by dreſſing the part with the common digeſtive, either alone, or mixed with Venice treacle, which muſt be retained on between the ſound and dead parts. To make way for this, it is ſometimes neceſſary to divide them a little by the lancet; and when that is done, and the dreſſing has been applied, the before deſcribed cataplaſm ſhould be again laid on warm; and in all the ſucceeding dreſſings, whatever is found looſe of the dead part muſt be carefully removed. And if it be neceſſary, from the adheſion of the vitiated parts to the ſound, to uſe the ſciſſors, or ſcalpel, to divide them, this is always to be done with very little, either of pain or of danger; it will then be proper to dreſs the part with the digeſtive, and a plaſter of diachylon, or the like, over it, till the corrupted parts are entirely caſt off, and the ulcer appears perfectly well cleanſed, and then the cure is eaſily perfected in the common way.

This is the gentler, and more common method; ſome ſurgeons, however, from the tedioufneſs of it, have recourſe directly, in theſe caſes, to the cauſtic. They anoint either the edges only, or elſe the whole of the corrupted part, every day, with butter of antimony, or the cauſtic ſtone liquefied, till the living parts are ſurrounded by a ſort of eſchar, applying afterwards the cataplaſms before deſcribed, or

others of the ſame kind, to prevent the diſorder from ſpreading; and to make the corrupted parts ſeparate from the ſound, the corroſive lixivium of Boerhaave is greatly in repute, and much uſed on theſe occaſions. It is made of three ounces of very ſtrong quick-lime, mixed with nine ounces of pot-aſhes, firſt ground ſeparately to powder, and afterwards mixed, adding a little water, they are then to be put into a glaſs veſſel, and ſet in a cellar to run by deliquium.

As ſoon as they are found to become fluid, the matter muſt be put into a filtre of coarſe paper, and the clear liquor that runs through muſt be kept for uſe. It is to be uſed by dipping a bruſh or feather into it, and rubbing it over the part affected once or twice a day; or fine linnen-rags may be wetted with it, and applied all over the part; not forgetting, however, at the ſame time, the uſe of the before ordered cataplaſm: this application is to be continued till the corrupted part begins to caſt off in cruſts or ſcales; and when this is the caſe, it muſt be dreſſed with the common digeſtive, and when perfectly cleanſed, healed with a vulnerary balſam.

Another cauſtic, highly commended by Belloſte in theſe caſes, is made by diſſolving one part of crude mercury in two parts, either of ſpirit of nitre, or of aqua fortis. This is to be rubbed over the parts as the former, and will occaſion a ſpeedy ſeparation. Several great authors, however, adviſe the uſing the knife, and actual cautery in theſe caſes, dividing and burning down to the ſound parts; but the cruelty of this method, and the pain, and ſometimes danger that attend it, make the methods of cure by ſuppuratives, and mild cauſtics, much to be preferred: indeed, the ſurgeons in general are not now ſo fond of calling in the actual cautery as formerly.

Finally, when the *ſphacelus* is ſo deeply affixed in any part of the upper or lower extremity, that it has penetrated thro' the muſcles as far as the bone, and has either reſiſted the force of all medicines, or the proper time for the applying them has been neglected; in this caſe, to preſerve the reſt of the body, the injured part muſt be amputated. *Heiſter*'s Surgery, p. 217.

SPHÆCULÆ, among the Romans, were tickets of wood, *teſſeræ ligneæ*, by which the emperors ſcattered their preſents to people of both ſexes in the theatre, or *circus*. *Pitiſc.* Lex. Ant. in voc.

SPHÆROMACHIA, Σφαιρομαχια, in antiquity, a particular kind of boxing, wherein the combatants had balls of ſtone or lead in their hands, which were called σφαῖραι. *Potter*, Archæol. Græc. lib. 2. cap. 21. Tom. I. p. 448. See the article BOXING.

SPHAGITIDES, a name given by ſome authors to the jugular veins.

SPHAGNUM, in botany, the name of a genus of moſſes, the characters of which are theſe. They produce heads or capſules only of one kind, which differ alſo from thoſe of all the other moſſes, in that they have no calyptra, or other covering: theſe ſtand on very ſhort pedicles, and are therefore ſo guarded by the leaves, as not to need any other covering. The *ſphagna* are divided into two orders, the one comprehending the branched kinds, and the other the unbranched ones: theſe are diſtinguiſhed by ſome by the terms *cauliferous* and *acaulous*. See Tab. of Moſſes, N° 8. *Dillen.* Hiſt. Muſc. p. 242.

Of the firſt order there are nine known ſpecies. 1. The larger ſoft and hollow-leaved bog-*ſphagnum*. This grows in wet places in vaſt beds, and riſes to a foot high, with cluſters of leaves at the heads of all the branches. 2. The ſoft bog-*ſphagnum* with finer leaves. This is as tall, or more ſo, than the former, but is much ſlenderer, and the leaves much ſmaller and finer. The firſt is uſually of a dead white, and this laſt of a ſomewhat reddiſh hue. 3. The bright green-pointed *ſphagnum* with oval heads. This grows in large tufts in the boggy places on the Welch mountains. 4. The rough *ſphagnum* with red heads. The ſtalks of this are not above an inch long, and not branched, but folded, and interwoven one with another into thick tufts. It uſually grows upon rocks, but ſometimes on the ſtumps of old trees. 5. The hoary nodoſe *ſphagnum*. This is all over hairy, the ſtalks are ſomewhat longer than thoſe of the former kind, and the heads are ripe in December. This uſually grows on the ſtumps of old trees. 6. The *ſphagnum* with numerous heads, all bending one way. This is very common on the ſtumps of old trees, and produces its heads in November. It is of a very lively and pleaſant green. 7. The plain-feathered *ſphagnum*. This is an elegant ſpecies, and grows on the bodies of old trees in Patagonia. 8. The wavy-feathered *ſphagnum* with hairy heads. This is of the ſame country with the former, and grows to three or four inches in length. 9. The wavy-feathered *ſphagnum* with ſcaly heads. This is found on the trunks of trees in the woods of Germany. *Dillen.* Hiſt. Muſc. p. 253.

Of the *ſphagna* of the ſecond order, or thoſe which have no branched ſtalks, there are only four known ſpecies. 1. The dwarf hair-leaved *ſphagnum*. This is the ſmalleſt and fineſt of all the plants of this claſs, and is common in ſmall tufts about way-ſides in many places. 2. The larger dwarf bulbous *ſphagnum*. This grows only to the height of a few lines, and is compoſed of numerous leaves, ſurrounding one another ſo, as to form ſeveral bulbs. The heads are eaſier to be diſtinguiſhed by the touch than the ſight, for they lie hid between the leaves, and are ſmaller than poppy-ſeeds. 3. The leſſer dwarf bulbous *ſphagnum*. The leaves of this are much ſmaller than thoſe of the preceding kind. 4. The largeſt dwarf *ſphagnum* with briſtles. The capſules of this ſpecies, as well as the leaves, are much larger than thoſe of any other of the acaulous kinds, and the middle rib of every leaf runs out into a kind of briſtle.

SPHENOIDES (*Cycl.*)—The *ſphenoidal*, or cuneiform bone, is ſituated in the lower part of the cranium, a little toward its forepart, making the middle or baſis of the ſkull, and thence taking its name of *os baſilare*.

It is of a very odd figure, its greateſt extent is tranſverſe, and it may in ſome manner be ſaid to repreſent a bat with its wings extended. Its poſterior, or thickeſt part, by which it is joined to the apophyſis of the os occipitis, may be called its body; the reſt of it is wholly made up of eminences and cavities. And in order to examine theſe methodically, the bone muſt be divided into two ſides, the one external, the greateſt part of which may be ſeen in one entire ſkull, the other internal, which does not appear till the ſkull is opened.

The eminences on the outſide are theſe. Two temporal apophyſes, which are the largeſt of all the proceſſes of this bone, and at the greateſt diſtance from each other, called *the great wings of the os ſphenoides*, and theſe are ſometimes, though rarely, ſeparated from the reſt of the bone by tranſverſe ſutures. Two orbitary apophyſes, which form a conſiderable portion of the orbit next the temples. A ſmall ſharp proceſs, formed like a bird's bill between the orbitary apophyſes. Two pterygoide apophyſes, each of which is divided into two alæ: one internal, which is the largeſt, the other external, the lower end of which is in the ſhape of a hook; and each of theſe alæ is again divided into two ſides, the one internal toward the palate, the other external toward the temples. Two ſpinal apophyſes. A little anterior eminence above the ſharp proceſs, for the articulation of this bone with the os ethmoides; but in ſome ſubjects, inſtead of this eminence, there is only a little notch.

The external cavities of this bone are two portions of the temporal foſſæ; two pterygoide foſſæ; the lower ends of theſe are divided by a little notch, or ſlit, of an irregular figure, which may be called the *fiſſura palatina*: a little oblong foſſula at the root of the internal ala; two ſuperior orbitary, or *ſphenoidal* fiſſures; a little notch at the end of each of theſe fiſſures, for the paſſage of an artery of the dura mater; two temporal notches; two maxillary notches, the edges of which help to form the two inferior orbitary fiſſures, which may be called *fiſſuræ ſpheno-maxillares*: two holes for the ſuperior maxillary nerves; two other holes on one ſide of the former, called *pterygoide*, which, in an entire ſkull, are hid by the other bones: two oval holes, for the inferior maxillary nerves; two little ſpinal holes, each of which tranſmits an artery of the dura mater, but ſometimes theſe are only notches; a little hole between the two maxillary holes; and a little groove on one ſide of the ſpinal apophyſis, which forms part of the euſtachian tube.

The internal eminences are two thin ſharp tranſverſe apophyſes, which form the ſuperior orbitary fiſſures, called *the little wings of the ſphenoidal bone*; a little proceſs, in ſome ſubjects, between theſe two thin apophyſes, for the articulation with the os ethmoides, which in ſome other ſubjects is a notch. Four clynoide apophyſes, two anterior, two poſterior; which laſt are ſometimes united in one, and ſometimes run forward all the way to the anterior proceſſes, forming a kind of bridge, under which the internal carotid artery paſſes at its laſt curvature. This paſſage has alſo ſometimes been found divided into two by a thin bony ſeptum, beſide other varieties; one or two ſmall productions where the internal carotid enters the cranium; two little ſtyloide proceſſes, or hooks, which in ſome ſubjects join the extremity of the os occipitis, before the perfect union of theſe bones.

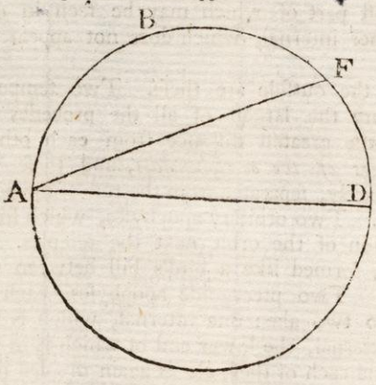
The internal cavities are two portions of the large middle foſſæ of the baſis cranii; two ſuperior, orbitary or *ſphenoidal* proceſſes; two optic holes; a ſmall ſuperior, orbitary hole, near the end of each *ſphenoidal* fiſſure, which is often no more than a notch; a ſmall groove at the extremities of the ſame fiſſures; a depreſſion between the clynoide apophyſes, called *ſella ſphenoidalis*, *ſella turcica*, and *foſſa pituitaria*. Here are alſo ſeen almoſt all the holes mentioned on its outſide, and it appears that the ſuperior maxillary hole ought more juſtly to be called a ſhort canal. Beſide theſe, there are alſo two very conſiderable cavities, called the *ſphenoidal ſinuſes*, ſituated in the thick portion of this bone, under the anterior part of the ſella turcica, and middle ſpace between the two optic holes, reaching as far as the ſharp proceſs, or bill, already deſcribed; theſe are commonly divided by a bony ſeptum, and they open before on each ſide of the ſharp

proceſs, juſt behind the ſuperior conchæ of the noſe, or oſſa convoluta ſuperiora.

The figure, ſize, openings, and ſeptum of theſe vary greatly; ſometimes one is wanting, ſometimes both are ſo; ſometimes there are ſeveral cells without any ſeptum, and ſometimes the ſeptum is placed more on one ſide than the other. The ſubſtance of this bone is for the moſt part compact, having very little diploe; and what there is of this lies in diſtinct parts of the bone, *viz.* in the thick portion behind the ſella turcica, toward the ſymphyſis with the occipital bone, and in the orbitary apophyſes in a ſmall quantity. It is articulated with all the other bones of the cranium, with the oſſa malarum, oſſa maxillaria, oſſa palati and vomer. *Winſlow*'s Anatomy, p. 26.

SPHERE *(Cycl.)*—A *ſphere* is equal to four times the cone, the baſe of which is equal to the generating circle, and the height of which is equal to the radius. Or a hemiſphere is equal to twice the cone of the ſame baſe and height. And a cylinder, of the ſame height and baſe, being triple of the cone, it follows, that the hemiſphere is two thirds of the cylinder, and conſequently the whole *ſphere* two thirds of the circumſcribing cylinder. *Archim.* de Sph. et Cyl.

The portion of a *ſpherical* ſurface, generated by the revolution of an arch A B F, about the diameter A D of a circle, is equal to the area of a circle deſcribed with a radius equal to the chord A F.



The ſurfaces therefore generated by arches, terminated at A, are as the ſquares of their chords, or as their verſed ſines.

Hence parallel planes, which divide the diameter of a *ſphere* into equal parts, divide the ſurface of the *ſphere* into equal parts at the ſame time. *Archim.* de Sph. et Cyl.

SPHERICAL *(Cycl.)*—SPHERICAL *numbers*. See CIRCULAR *numbers*, *Cycl.*

SPHEROID *(Cycl.)*—Dr. Halley has demonſtrated, that in a ſphere Mercator's nautical meridian line is a ſcale of logarithmic tangents of the half complements of the latitudes[b]. But as the earth has been found to be a *ſpheroid*, this figure will make ſome alteration in the numbers reſulting from Dr. Halley's theorem. Mr. Mac Laurin has therefore given us a rule, whereby the meridional parts to any *ſpheroid* may be found with the ſame exactneſs as in a ſphere. We have alſo an ingenious treatiſe of Mr. Murdoch's on the ſame ſubject.—[b See Phil. Tranſ. N° 219. Mr. Cotes has alſo demonſtrated the ſame propoſition, Harm. Menſ. p. 20, 21.] A ſphere, whoſe diameter is equal to the great axis of a *ſpheroid*, is to that *ſpheroid* in the duplicate ratio of the axis to its conjugate. Hence the *ſpheroid* is quadruple of a cone, the height of which is the ſemi-axis, and the baſe of which is equal to a circle deſcribed upon the conjugate axis as its diameter. *Mac Laurin*'s Fluxions Introd. p. 16.

SPHINCTER *(Cycl.)*—SPHINCTER *cutanea*, in anatomy, a name given by Laurence, and ſome others, to the muſcle of the anus, called by Albinus and Winſlow *ſphincter internus ani*.

SPHINCTER *inteſtinalis*. See INTESTINALIS *ſphincter*.

SPHINCTER *labiorum*, in anatomy, a name given by Douglas, and ſome others, to the muſcle of the mouth, called by Riolanus and Albinus *orbicularis*, and *orbicularis oris*, and by Cowper *conſtrictor labiorum*.

SPHINCTER *palpebrarum*, in anatomy, a name given by Molinet, and ſome others, to the muſcle of the eyelids, called by Winſlow and Albinus the *orbicularis palpebrarum*, and *orbicularis*. See the article ORBICULARIS.

SPHINX, *(Cycl.)* in the hiſtory of inſects, a name given by Mr. Reaumur to a very ſingular ſpecies of caterpillar deſcribed in the ſecond volume of his hiſtory of inſects.

The reaſon of the author's having given it that name, is, that when it is not eating it erects its head, and with it more than a third part of its body, into a perpendicular ſituation upon the leaf on which it was before laid all along; it keeps itſelf a long time in this ſituation, looking around it with a ſeeming air of fierceneſs. There are alſo a ſeries of broad belts upon the body, which contribute ſomething towards its reſemblance to the figure of that imaginary monſter.

This caterpillar has a horn on the hinder part of its body, which ſeems to be of no ſort of uſe, but merely a trouble to the creature. It is hollow, and encloſes, in the manner of a ſheath, the new horn which is to appear when the creature changes its ſkin. This the author found to be the caſe by cutting it ſeveral times, and always finding within it the new horn cut off alſo at the ſame place, and had often obſerved the great difficulty the animal had in changing its ſkin, when it came to the horn. *Reaumur*, Hiſt. Inſect. Tom. 2.

SPHONDYLIUM, *cow-parſnep*, in botany, the name of a genus of plants, the characters of which are theſe. The flowers are diſpoſed in umbels, and are of the roſaceous kind, being compoſed of ſeveral petals of a heart-faſhioned ſhape, irregular in ſize, and diſpoſed in a circular order round a cup, which afterwards becomes a fruit, compoſed of two large, flat, oval ſeeds, ſtriated, and uſually marginated at the end, and which frequently depoſit their covering, and are marked with black ſpots on the ſides where they touch one another.

The ſpecies of *ſphondylium*, enumerated by Mr. Tournefort, are theſe. 1. The common hairy *ſphondylium*. 2. The hairy *ſphondylium* with purple flowers. 3. The great *ſphondylium*, called by authors *panax Heracleum*, or Hercules's all-heal. 4. The curled-leaved *ſphondylium*. 5. The hairy *ſphondylium* with narrower leaves. 6. The narrow-leaved *ſphondylium* with blackiſh purple flowers. 7. The little Alpine *ſphondylium*. 8. The ſmooth Alpine *ſphondylium*. *Tourn.* Inſt. p. 319.

The common *cow-parſnep*, which is frequent in our meadows and paſtures, and flowers in July and Auguſt, is recommended by Dr. Willis, and many others, as one of the beſt nervous ſimples our nation produces, and it is pity that it is not brought more into practice. The ſeed is the part in which its virtues are contained in greateſt perfection, and is a very good medicine in hyſteric caſes, given in powder or infuſion.

SPHONDYLUS, in ichthyology, a name given by Pliny, and others of the old authors, to a peculiar ſpecies of the ſyngnathus, or *acus Ariſtotelis*. It is the ſpecies, called by Artedi *ſyngnathus corpore medio hexagono cauda pinnata*; and by other authors the *acus ſecunda ſpecies*; and by Bellonius and Geſner *typhle marina*. *Pliny*, lib. 32. cap. 11.

SPHONDYLUS is alſo uſed by ſome authors, for the ſtones or bones found in the head of a mullet.

SPHRAGIS, the ſeal-ſtone, a name given by ſome authors to the ſingle joints of the aſteriæ, when found looſe, not joined into a column. See the article ASTERIA.

SPHRAGIS is alſo uſed by ſome of the old Greek naturaliſts, to expreſs the ſpots on the back and ſides of a panther.

The ſkin of this creature is of a pale colour, and theſe ſpots are all dark and round, and look like ſo many regular impreſſions of a ſeal, whence the name *ſphragis*. The Romans called any thing, that was variegated in this manner, *pantherina*; and we meet with the phraſe *menſæ pantherinæ*, uſed to expreſs tables found of ſome wood, which was variegated with round ſpots, in the manner of thoſe *ſphrages* on the back of the panther.

SPHYGMICA, in medicine, a term uſed by ſome for that part of the judgment of the phyſician, which regards the differences of the pulſe.

SPHYRÆNA, in zoology, a name by which ſome authors have called the *ſudis*, or *lucius marinus*, the ſea-pike. *Willughby*, Hiſt. Piſc. p. 273. See the article SUDIS.

SPHYRÆNA *altera*, in ichthyology, a name given by Appian, and ſome other of the old Greek writers, to the *eſox*, or common pike. See the articles ESOX and LUCIUS.

SPICCATO, in the Italian muſic, ſignifies that every note ſhould be well ſeparated from others, and diſtinctly ſounded. It is particularly uſed with regard to inſtruments played with a bow; and denotes that every note muſt have a diſtinct bow from that preceding, or ſucceeding.

SPICULUM, in Roman antiquity, a kind of weapon which ſome will have to be the ſame with the haſta, or ſparus. *Hofm.* Lex. in voc.

SPIDER, *araneus*, in zoology, an inſect of which we have a great number of ſpecies common among us, which all agree in the general marks and characters.

They all have weapons iſſuing out of the mouth, but theſe are of two kinds, according to the two principal diſtinctions of the *ſpiders*. They conſiſt, in ſome, of two ſpiculæ, in the manner of a forked hook: this is their ſtructure in all the kinds which have eight eyes. In others they are compoſed of two forcipated arms, or are divided into two claws, in the manner of the legs of a crab: theſe are the weapons of all thoſe *ſpiders* which have only two eyes.

The bodies of all *ſpiders* are covered with a ſort of cruſtaceous coat, but it is tender and brittle; and in the males of all the ſpecies, the forceps, or weapons at the mouth, are larger and ſtronger than in the females.

All *ſpiders* have two antennæ, placed in the forepart of the head over the mouth: theſe are compoſed like the legs of a number of joints. The head of a *ſpider* is not ſeparated from the ſhoulders by any inciſure, but remains fixed to them as all of one piece.

The eyes of the *ſpider* differ greatly in number, ſituation and figure, in the different ſpecies; and ſometimes the different eyes of the ſame *ſpider* are of different ſizes.

All *ſpiders* have eight legs, which are all inſerted into the breaſt, but in the length and figure of theſe there is as much variety as in the eyes in the different ſpecies of *ſpiders*:

they have all three joints in each leg, but in ſome the foremoſt pair are the longeſt, in others the hinder pair are ſo, and in others ſome of the intermediate pairs.

The belly of the *ſpider* is remarkably divided from the head and ſhoulders, ſo as to adhere only by a thread: this is the caſe in all, except the two-eyed kinds, and in the different ſpecies the body is variouſly painted. The appendages near the anus are very obſervable, they ſerve to ſpin the threads out at. Among the many ſpecies of theſe inſects, ſome are ſmooth, others are hairy, and ſome have a harder, ſome a tenderer ſkin. *Ray*'s Hiſt. Inſect. p. 12.

Among the great number of ſpecies of this inſect, theſe are the principal diſtinctions among thoſe which have eight eyes. Some ſpin webs for the catching of flies of a rounded figure; theſe have all their eyes of the ſame ſize and figure; they have four middle ones placed in a quadrangular figure, and the other four beſide theſe, but ſtanding ſomewhat obliquely. The firſt pair of legs of theſe *ſpiders* are always the longeſt, the ſecond pair are the longeſt next to theſe, then the fourth pair, the third being much the ſhorteſt of all. Theſe *ſpiders* are always ſmooth, or nearly ſo, and are elegantly figured on the buttocks. Of theſe ſome always live in the center of the web, others have their habitation in a neighbouring corner. Of the firſt of theſe ſorts we have five ſpecies. 1. The yellowiſh *ſpider* with white back and ſides, and a white head with large pellucid black eyes. This is of a middle ſize, and its legs are variegated with brown and white. The males in this ſpecies are ſlenderer than the females, and of a more reddiſh colour; and in both ſexes the head and ſhoulders are ſomewhat pellucid. 2. The hazel *ſpider* with a croſs on its back, and tubercles on the belly. This ſpecies ſpins very large nets. 3. The ſlender green and gold ſpider with a long body. This is of a middle ſize, and its fore-legs are extremely long. 4. The grey wood-*ſpider* with the body terminating in a three-cornered point. This is a ſmall ſpecies, but it ſpins very large webs. Its belly is black.

Of the ſecond kind of *ſpiders*, which ſpin round webs, and have their habitation at a corner of the web, not in its center, there are five principal ſpecies. Theſe are, 1. the grey full-bodied *ſpider* with various delineations on the back. This is a very large kind; its ſhoulders are hoary, its legs thick, not long and ſpotted. 2. The ſmooth black croſs *ſpider* with an oval body. This is of a middle ſize, its legs are ſhort and ſpotted. It is very common among ruſhes and water plants. 3. The yellow *ſpider* with four great white ſpots, and many ſmall ones. This is one of the largeſt *ſpiders*, and generally builds its habitation on the tops of plants. This is called by Mouffet, and ſome others, the *Colcheſter ſpider:* and there are two other ſpecies which much reſemble it; the one diſtinguiſhed by having a cheſnut-coloured head, and a black belly; the other, by a large brown ſtreak running from the ſhoulders to the tail. 4. The black *ſpider* with figures like oak leaves upon its buttocks. It is a very large *ſpider*. 5. The grey round-headed *ſpider* with foliaceous lines on the buttocks, undulated at the edges. This is a middle-ſized one, and is common about houſes. *Ray*'s Hiſt. Inſect. p. 24.

Another genus of *ſpiders* are diſtinguiſhed by their building conglobated webs; theſe are all ſmall, and have the fore-legs longeſt of all, next theſe the hinder pair, and then the ſecond, the third being the ſmalleſt of all.

Of theſe there are ſix principal kinds. 1. The black ſmooth houſe-*ſpider*. This is the largeſt of this genus, and has elevated ſhoulders. 2. The white *ſpider* with an oval body, ſurrounded with a ſcarlet ring. 3. The brown *ſpider* with a round body, ornamented with foliaceous figures. 4. The reddiſh brown wood-*ſpider* with a round body, marked with the figure of a ſtar. 5. The ſmall grey *ſpider* with a black ſpot upon its buttocks. And 6. the ſmall livid *ſpider* with denticulated figures on the rump. This uſually erects its conglobated nets on the top of the branches of furze buſhes.

A third genus of *ſpiders* are diſtinguiſhed by the thickneſs and cloſeneſs of the webs; ſome of theſe inhabit the bottom, or funnel-end of their webs, others live near them, but not in them. Of the firſt genus there are two remarkable ſpecies. 1. The yellowiſh hairy long-legged houſe-*ſpider*. This is of a middle ſize, and its eyes are very black and ſparkling. 2. The great grey *ſpider* with the appendices of the anus very remarkably prominent. This is a very large kind, and is of a livid colour.

Of the ſecond kind of theſe, which live at a diſtance from their webs, there are alſo two principal kinds. 1. The ſmooth cheſnut-coloured, or blackiſh *ſpider* with elegant ſnow-white ſpots. This is of a middle ſize, and has long and ſlender legs. 2. The black *ſpider* with white ſhoulders, and a denticulated white mark upon the back. This is of the middle ſize. Its legs are hairy.

To theſe is to be added the cave-*ſpider* of Mouffet. This is a large black *ſpider* with a very large ſpot, of a deeper and more ſhining black upon the ſhoulders.

A fourth genus of *ſpiders*, is diſtinguiſhed by the ſmallneſs of the webs they build: theſe are, however, of a very cloſe texture, and the creature always lives within them. Of the *ſpiders* of this kind there are three principal ſpecies. 1. The grey woolly *ſpider* with a broad black ſpot on the belly. 2. The plain livid, or yellowiſh *ſpider*. This is ſometimes of the one, and ſometimes of the other of theſe colours, but never has any variegations. 3. The yellowiſh cylindric-bodied *ſpider*. This is a large *ſpider*, and has ſix eyes. This has a long ſeries, or chain of ſpots on the back, and a yellowiſh line or ſtreak on each ſide. *Ray*'s Hiſt. Inſect. p. 30. See the articles LUPUS and PHALANGIUM.

The *ſpider* affords to the ſagacious obſerver, as well without as with the aſſiſtance of glaſſes, a great many extremely curious particulars. As the fly (which is the *ſpider*'s natural prey) is an animal extremely cautious and nimble, and uſually comes from above, it was neceſſary the *ſpider* ſhould be furniſhed with a quick ſight, and an ability of looking upwards, forwards, and ſideways, at the ſame time; and the microſcrope ſhews, that the number, ſtructure, and diſpoſition of its eyes, are wonderfully adapted to the ſerving all theſe purpoſes.

Moſt *ſpiders* have eight eyes: two on the top of the head or body, for there is no diviſion between them, the *ſpider* having no neck; theſe look directly upwards: there are two more in front, placed a little below theſe, and diſcovering all that paſſes forwards, and on each ſide: a couple more, one whereof points ſideways forward, and the other ſideways backward; ſo that it can ſee almoſt quite round it. All kinds of *ſpiders* have not, however, this exact proviſion; for in ſome we find ten, and in others only ſix, or four. The eyes of the *ſpider* are not pearled; and the field-*ſpiders*, or long-legs, have no more than two eyes.

Whatever be the number of the *ſpider*'s eyes, they are however all immoveable and tranſparent, and are ſituated in a moſt curious manner. The beſt way of viewing them with the microſcope, is to cut off the legs and tail, and leave only the head for examination.

All *ſpiders* have eight legs, which they employ in walking, and two ſhorter, called *arms*, which they uſe in ſeizing their prey. All the legs are thickly beſet with hairs; each has ſix joints, and ends with two hooked claws, which are ſerrated on their inſide; by means of theſe teeth, or jags in their claws, they ſeize very faſt hold of any thing, and behind theſe there is a ſort of ſpur, which is perfectly ſmooth. Beſide theſe, nature has allotted to this creature, for the ſeizing its prey, a pair of ſharp crooked claws, or forceps, in the forepart of its head. Theſe ſtand horizontally, and when not exerted for uſe, are concealed in two caſes contrived for their reception, in which they fold like a claſp-knife, and there lie between two rows of teeth, which are likewiſe employed to hold faſt the prey.

Each of theſe claws, or pincers, has a ſmall ſlit near its point, according to Lewenhoek, like that in a viper's tooth, through which he ſuppoſes that a poiſonous juice is, in like manner, thrown out. But Dr. Mead, in his Eſſay on Poiſons, diſſents wholly from this opinion, having never been able, on repeated examinations, to diſcover any ſuch opening, not even in the claws of the great American *ſpider*; which being above fifty times bigger than any of the European *ſpiders*, would more eaſily have diſcovered this opening, if nature had allotted any to this part of the animal. Beſides, repeated obſervations alſo convinced him that nothing dropped out of the claws, which were always dry, while the *ſpider* bit any thing, but that a ſhort white proboſcis was, at the ſame inſtant, thruſt out of the mouth, which inſtilled a liquor into the wound. And the ſame author obſerves, that the quantity of liquor, emitted by our common *ſpiders* when they kill their prey, is viſibly ſo great, and the wounding weapons ſo minute, that they could contain but a very inconſiderable portion thereof, if it were to be diſcharged that way. *Baker*'s Microſcope, p. 196.

Spiders frequently caſt their ſkins, which may be found in their webs perfectly dry and tranſparent; and from ſuch ſkins the forceps, or claws, for they are always ſhed with the ſkins, may eaſier be ſeparated, and examined with much greater exactneſs, than in the common *ſpider* while living.

The *ſpider*'s manner of weaving its web is very wonderful. The creature has five little teats, or nipples, near the extremity of the tail; from theſe there proceeds a gummy liquor, which adheres to every thing it is preſſed againſt, and being drawn out, hardens inſtantly in the air, and becomes a ſtring, or thread, ſtrong enough to bear five or ſix times the weight of the *ſpider*'s body. This thread is compoſed of ſeveral finer ones, which are drawn out ſeparately, but unite together at two or three hairs breadth diſtance from the creature's body. Theſe threads are finer or coarſer, according to the bigneſs of the *ſpider* that ſpins them. Mr. Lewenhoek has computed, that a hundred of the ſingle threads of a full grown *ſpider* are not equal to the diameter of the hair of his beard; and conſequently, if the threads and hair be both round, ten thouſand ſuch threads are not bigger than ſuch a hair. He calculates farther, that when young *ſpiders* firſt begin to ſpin, four hundred of them are not larger than one which is of a full growth; allowing

which, four millions of a young *ſpider*'s threads are not ſo big as the ſingle hair of a man's beard.

The eggs of ſome *ſpiders* are a very pleaſing microſcopic object; they are round at one end, and flattiſh at the other, with a depreſſion in the center of the flattiſh end, and a yellowiſh circle round it. The colour of theſe eggs is a pearly or bluiſh white, and when the young *ſpiders* hatch, they come out in their perfect form, and run about very nimbly. The female *ſpider* depoſits her eggs, to the number of five or ſix hundred, in a bag compoſed of her own web, which ſhe either carries under her belly, or hides in ſome very ſafe receſs. Philoſ. Tranſ. N° 272.

The young *ſpiders* are always very beautiful objects for the microſcope. The current of the blood may be eaſily diſcovered in their legs, and part of their bodies; and many other curious particulars occur in their diſſection.

There are two or three ſpecies of this animal, peculiarly worthy the attention of the curious in microſcopic diſcoveries. 1. A little white field-*ſpider* with ſhort legs. This is found plentifully among new hay, and its body appears like white amber with black knobs, out of which grow ſhort but ſharp prickles. The eyes of theſe may be very diſtinctly ſeen, being very briſk and lively, and ſome have ſix, ſome eight of them: each eye has a pupil of a violet blue, which is beautifully clear and tranſparent, and is ſurrounded by a circle of pale yellow. 2. The wandering, or hunting *ſpider*, that ſpins no webs, but runs and leaps by fits. This has two tufts of feathers fixed to its fore-paws, which make a very beautiful appearance before the microſcope. The variety and beauty of colouring alſo, all over this little creature, afford a very pleaſing ſight. 3. The *long-legs*, or ſhepherd-*ſpider*. This is a moſt wonderful creature: it has two fore-claws at a great diſtance from the head, tipped with black like thoſe of a crab, and opening and ſhutting like the ſcorpions; theſe are ſerrated or indented on their inſide. When all the legs are cut from this *ſpider*, and it is examined by the microſcope, it will be ſeen that the protuberance on the top of its back is furniſhed with two fine black eyes. *Power*'s Microſ. Obſ. p. 13. *Hook*'s Microgr. p. 200.

The venom of many kind of *ſpiders* is greater than uſually ſuppoſed: we have, in the Philoſophical Tranſactions, an account of a perſon in New-England who was bitten by a ſmall *ſpider* a little above his ankle; he perceived the creature biting, and cruſhed it to death upon the wound, between his ſtocking and his leg; in half an hour he felt a pain in that leg, which in another half hour extended itſelf to the groin, and at the ſame time he had a creeping pain in the calf of his other leg; and in a quarter of an hour after this it affected his ſtomach, his back, and his head. The pains were not conſtant and fixed, but erratic, and very acute, and his pulſe was extremely low and heavy. He was relieved, by taking internally ſpirit and ſalt of hartſhorn in viper-wine, and applying a cataplaſm of garlick to the part, and in three or four days wholly recovered.

Boccone mentions a ſpecies of large *ſpider*, common in the iſland of Sardinia, whoſe bite proves mortal within the ſpace of a few hours; the whole body uſually ſwells almoſt immediately, in conſequence of this bite. The cure is performed by oil of olives, in which the creature is infuſed over the heat of a ſtove. This is a medicine they always keep ready in the houſe, and while they uſe this externally, they give large doſes of Venice-treacle inwardly, diſſolved in ſtrong wine: but many die of this bite, either from the want of power in the remedies, or from their being uſed too late. *Boccon.* Muſ. de Fiſ.

When *ſpiders* aſcend and deſcend by their thread, they do not ſpin a new one at every deſcent; but whenever they aſcend, they wind the thread with their feet into a ſort of coil, and when they deſcend, they only unravel it again. Phil. Tranſ. N° 482. ſect. 16.

Some think the white matter, we often find floating in the a irtowards the end of the ſummer, is produced by *ſpiders*. Ibid. See the articles *Air*-THREADS, OPILIO, PHALANGIUM, *&c.*

SPIDER-*wort*, in botany. See PHALANGIUM.

SPIEI, in the glaſs trade, an iron inſtrument, hooked at the end and pointed, with which the workmen take the metal up out of the melting-pots for proofs or eſſays, to ſee whether it be fit to work. *Neri*'s Art of Glaſs, p. 241.

SPIGNEL, in the materia medica, *&c.* the Engliſh name of the plant called by botaniſts *meum*. See MEUM.

SPIGOLA, in ichthyology, a name given by Paulus Jovius, and ſome others, to that ſpecies of pearch which is generally called the *lupus marinus*. See the article LUPUS.

It is a genuine pearch, and is diſtinguiſhed from the others by Artedi, by the name of the *pearch* with the thirteen rays in the ſecond back fin, and fourteen in the pinna ani. Authors have called two different fiſh by this name *lupus marinus*, which conveying no diſtinct idea of the characters of the fiſh, was applicable to either as much as the other; but this name of Artedi admits of no equivocation, and muſt always diſtinguiſh the fiſh.

SPIKE, or *Oil of* SPIKE, a name given by our druggiſts to an eſſential oil, much uſed by the varniſh-makers and the painters in enamel; and of ſome uſe in medicine.

This *oil*, when genuine, is brought from Provence, and ſome other parts of France, and is there made of lavender. This plant is called in Provence *aſpic*, and thence came the name *oil of aſpic*, which afterwards degenerated into *oil of ſpike*.

The manner of making the *oil* upon the ſpot is this: when the flowers are perfectly ripe, they put them into an alembic with a great quantity of water, and this they diſtil after ſeveral days maceration: there ariſes with the water a large quantity of an oil of a fine pale amber colour, and this ſeparated from the water, is the true and genuine *oil of ſpike*.

The flower of this plant is the part which yields the largeſt quantity of oil; as is the caſe with all the plants with galeated flowers, of which the huſk or flower-cup uſually contains almoſt all the oil of the plant. The aromatic plants, in general, yield indeed but a ſmall quantity of oil, but the vaſt abundance of this plant, in theſe places, makes the expence of gathering it ſo ſmall, that the *oil* is very cheap. The quantity required on ſeveral occaſions is, however, much greater than what all the lavender of the country can yield; and the price it is expected to be ſold at is ſo ſmall, that it is not to be wondered that there are ſeveral common adulterations of it.

The moſt uſual ways of ſophiſticating it, however, are two; the one with the ſpirit of wine, which is eſteemed the leaſt hurtful, and the *oil* thus ſophiſticated is often called the very beſt of the country. The method Mr. Geoffroy took to diſcover the cheat was this: he procured a long and narrow vial, of an equal diameter all the way up, into this he firſt put an ounce of fair water, and to this he added an ounce of the *oil*; he marked the height of the water in the vial, then ſhook the two liquors together, and they became milky, and heated on the mixture, which alone would have been a ſufficient proof that there was ſpirit of wine in the *oil*. After ſome ſtanding the liquor became clear, and the *oil* floated at the top, but in a much ſmaller quantity than might have been expected, there being not more than a quarter of an ounce of it, the reſt having been ſpirit of wine, which mixed with the water, and thus left all the true *oil*, which was only one fourth of the quantity, to float alone on the water, which was greatly encreaſed in height in the vial. A pint of this *oil of ſpike*, therefore, contains only four ounces of the genuine *oil*, and twelve ounces of plain ſpirit of wine.

The ſecond method of adulterating this *oil*, which the ſame gentleman had ſuſpected, was eaſily diſcovered next: for on mixing this quarter of an ounce of pure *oil of ſpike* with three quarters of an ounce of oil of turpentine, there was produced an ounce of a liquor, which appeared wholly the ſame with the *oil of ſpike* commonly ſold in the druggiſts ſhops. And indeed, much of what is uſually ſold is worſe than this, being no other than oil of turpentine ſcented with a ſmall quantity of the true *oil of ſpike*.

The ready way of diſcovering the *oil*, counterfeited with oil of turpentine, is to wet a paper in it, and ſet it on fire; the turpentine will here be diſcovered by the thick ſmoak it yields, it being, of all vegetable oils, that which yields greatly the thickeſt cloud in burning: and, on the contrary, that which has been adulterated with ſpirit of wine, will be diſtinguiſhed by the ſame trial, by its yielding a much finer and thinner ſmoak, and burning with a bright blue flame. If they be tried by firing them in a ſpoon, that which is adulterated with ſpirit of wine will burn very bright, and yield no fume at firſt; but as it grows near the bottom, it will ſmoak a little, and finally will leave no reſiduum, except that it varniſhes over the inſide of the ſpoon: that adulterated with the oil of turpentine will burn more vehemently, ſmoak more, and leave a coarſer varniſh upon the ſpoon; and if it be of the coarſeſt kind, that is, if it have been adulterated with badly-rectified oil of turpentine, the fume will be the more abundant, and there will be left in the ſpoon a fetid matter, reſembling melted pitch.

Mr. Geoffroy tried whether, in the buſineſs of varniſhing, the oil of turpentine alone might not do as well as the *oil of ſpike*; he found that it dried perfectly well, but that it left a ſtinking ſmell upon the work, which never went off; whereas the mixture of this oil, with that of *ſpike*, makes a ſmell like neither, and which ſoon goes off.

An ounce of oil of turpentine, with only twenty drops, either of our common oil of lavender, or the pure *oil of ſpike*, makes a liquor tolerably well ſcented, and which ſerves for the purpoſes of *oil of ſpike*. If two drachms of our oil of lavender be added to ſix drachms of ſpirit of wine, they immediately mix, and this afterwards mixed in a ſmall proportion with oil of turpentine, makes a ſort of *oil of ſpike*. The moſt regular method, however, that the artificer can uſe, if he can get the genuine *oil of ſpike*, is to mix one ounce of it with three of oil of turpentine, which perfectly fits it for his purpoſe, and makes it the ſame with that in common uſe. The method of making this perfectly pure, is to rediſtil it in a balneum mariæ; there will thus be procured

cured an oil highly rectified, and pellucid as water, which will dry away as ſoon as touched on any thing. The great diſadvantage attending the *oil of ſpike* adulterated with ſpirit of wine, is, that it will not readily mix with all the ſorts of varniſh.

Having gone through the properties of *oil of ſpike*, in regard to varniſh, it remains to enquire into them in regard to its other great uſe in enamel, and to conſider the effects of the two uſual methods of adulterating it in this work.

The *oil of ſpike* which wants body, is not at all fit for enamelling, becauſe it dries too ſuddenly, and does not at all aſſiſt the natural dryneſs of the enamel, which is only a ſort of powder of glaſs; and the particles of this powder, with a fluid of too little body, are not manageable by the artiſts, ſo that the colour never is brought to a due conſiſtence: and when the *oil* has too much body, the mixture becomes too tenacious, and is as unmanageable in that extreme as in the other; and this fault is attended with another very great miſchief, which is, that the ſume raiſed by this *oil*, when heated, is often ſo groſs, as to deſtroy the beauty of the colours. In ſhort, thick oil of turpentine is always deſtructive of enamels by its ſmoak.

The true compoſition for enamelling is *oil of ſpike* mixed with ſpirit of wine, but the proportions muſt be nicely regulated from repeated trials: for if the quantity of the ſpirit be too large, it is apt to ſeparate itſelf from the *oil* and colour in the drying, and this always ſpoils the gloſs and beauty of the work. Artificers obſerve, that *oil of ſpike* does beſt for their purpoſes, after it has been kept two or three years. But this is only owing to the *oil*'s being adulterated with ſpirit of wine, and uſually containing too large a proportion of the ſpirit when firſt ſent over, it becomes better for uſe when a part of that ſpirit has had time to evaporate in the keeping. It would be a better way for theſe curious works, to procure the *oil* pure, and then occaſionally mix it with ſuch a proportion of ſpirit of wine, as experience ſhews to be the moſt proper. Mem. Acad. Par. 1716.

SPIKENARD, in botany. See the article NARDUS.

Ointment of SPIKENARD. See NARDINUM *unguentum*.

SPIKES, or, as the ſeamen call them, SPEEKS, in a ſhip, are large long iron nails with flat heads. They are of divers lengths, ſome a foot, or two long, and ſome are jagged, ſo that they cannot be drawn out again. They are uſed to faſten the planks and timbers. They call alſo a kind of ſmall fidd, which ſerves them to open and ſplice ſmall ropes, a *marling ſpike*.

SPINA (*Cycl.*)—SPINA *bifida*, in anatomy, a parting of the *ſpinal* proceſſes into two rows. The exiſtence of ſuch a caſe is doubted. See SPINE.

SPINA *burgi*, in botany, a name uſed by ſome authors for the *alaternus*, or ever-green privet, a garden ſhrub, the fruit of which is a mild aſtringent. *Park.* Theatr. p. 1445.

SPINA *ventoſa*, is properly a ſpecies of corruption of the bones, which takes its riſe in their internal parts, and by degrees enlarges the bone, and raiſes it into a tumor.

The antients were ſtrangers to this name for this diſorder, and called it *ſideratio*, *gangræna*, or *cancer oſſis*, and ſometimes expreſſed it by the word *teredo*. Some among the French call it alſo an *exoſtoſis*, though this is a term more properly denoting certain eminences, or preternatural acuminated excreſcences in the bones, which happen after fracture, or other accident, and are ſome.imes attended with a caries.

The name of the diſorder ſeems to have been borrowed from *ſpina*, a thorn, from the reſemblance the eminences of the bone in this caſe bear to thorns, continually pricking the fleſh, and producing the moſt grievous pains; and the epithet *ventoſa* is added, becauſe the tumor ſeems, to the touch, to be filled with air, though this is very rarely the caſe. This ſeems to have been the origin of the name *ſpina ventoſa*, which ſome after-writers barbarouſly diſtorted into *ſpinæ ventoſitas*. When this diſorder happens to children, Severinus, and many others, call it *pædarthrocaces*.

In the *ſpina ventoſa* the caries, or eroſion of the bone, is occaſioned by a depravity of the contained fluids, and generally ariſes ſpontaneouſly, or without any external cauſe, and does not begin upon the ſurface of the bone, but between its lamellæ, or elſe in its internal cavity; from whence extending itſelf by degrees to the external parts, it at length either affects the whole bone, or a greater or ſmaller part of it, expanding itſelf to different widths, and riſing to a tumor, which is ſometimes hard, and without pain, and at others feels as if it were filled with wind, and is attended with a greater or leſſer degree of pain, pricking and ſhooting, and at laſt grows red, and is attended with other bad ſymptoms, till the diſordered bone being by degrees corroded, the common integuments, and other ſofter parts that lay over it, remaining at firſt entire, but at laſt partaking of the diſorder, foul ulcers of a very terrible ſort break out. When tumors of the bone are hard, and the ſoft parts about them not inflated, and are free from redneſs, inflammation, and pain, as is very frequently the caſe in ricketty diſorders, the bad ſymptoms juſt deſcribed ſeldom come on. This is properly the pædarthrocaces, but the painful, red, inflated tumors happening equally to children, and to adults, are properly the *ſpina ventoſa*.

It differs from a caries by being attended with a tumor, and from the rickets by its being accompanied with pain and eroſion. It generally begins about the heads, or epiphyſes of the larger bones, where they are moſt tender and ſpungy, and where the noxious matter may not only have ſufficient room to lodge in the cellular ſubſtance, but where it will alſo meet with the leaſt reſiſtance in ſoftening and expanding the parts. Sometimes, however, it alſo ariſes in the middle of the bones, between their lamellæ, eſpecially in the tibia. The os frontis is alſo ſubject to diſorders of this kind in venereal caſes, and it is frequently ſituated in the bones of the face, neck and breaſt; though thoſe of the arms, legs, fingers, carpus, meta-carpus, tarſus, and meta-tarſus, are more frequently the ſubjects of it.

Though this diſorder uſually ariſes from internal, yet it is ſometimes found to be owing to external cauſes; eſpecially in perſons conſtitutionally addicted to a diſorder of this kind, when the veſſels between the lamellæ of the bone, or in the medulla itſelf, are by a blow, fall, or other external violence, injured, or torn, and their fluids extravaſated, and by degrees putrefy, corrupt, and deſtroy the medulla, and ſoften the very ſubſtance of the bone, and corrode it; whence proceed pain, tumors, ulcers, and fiſtulas of the bone, and adjacent parts, and all the ſame train of miſchiefs which attend theſe diſorders, when begun ſpontaneouſly from internal cauſes.

The proximate cauſe of this diſorder is a collection, or congeſtion, either of a viſcid and thick, or of an acrimonious and corroding humor, or an inflammation ariſing in the medulla, or in the cellular ſubſtance of the bone, degenerating into an abſceſs, and forming matter, or ichor. As theſe ſtagnating fluids can find no diſcharge from the bones, eſpecially from their cavities, they continue confined there till they putrefy, and become acrimonious, and corrode and deſtroy the neighbouring parts, converting them, particularly the medulla, into a kind of ſanies; and at length they attack the bone and deſtroy it. The collection of viſcid and pituitous humors, and the expanſion of the bones, ſometimes happens without pain, as in ricketty caſes, but the eroſion of the parts can never happen without the moſt acute pains.

When the internal parts of the bones only are affected by this diſorder, the pain does not encreaſe upon external preſſure; when the pain encreaſes upon external preſſure, the external parts are brought into conſent; and when this happens, the perioſteum, and parts which ſurround it, with the ſubſtance of the bone and tunica cellularis, enlarge, from whence a ſenſation frequently ariſes, as if the parts were filled with air, or wind. But when the tumor is opened, either ſpontaneouſly, or by the knife, the bone, if it lies bare, is found full of ſmall eroſions, reſembling a ſpunge or pumice-ſtone.

Of this terrible diſorder there are properly three degrees: the firſt is, when the patient complains of a continual grievous pain in the bone, which ſeems to him to proceed from the marrow, and torments him ſo, that he can have no ſleep, and all this while there is no external pain or tumor; in this caſe the diſeaſe is confined to the internal part of the bone. The ſecond degree is when a tumor appears to be ariſen on the ſurface of the bone, and is attended with external pain, more or leſs. The third degree is when, after the former ſymptoms, an ulcer is formed in the tumor, which diſcharges a fetid ichor, or purulent matter, ſmelling like rank butter or lard.

There are two methods of treating this diſorder, one ſuited to the milder, the other to the more violent ſtate of it, in which the bones, and the parts ſurrounding them, are entirely corroded and deſtroyed. In the milder ſtages, the acrimony of the blood muſt be endeavoured to be corrected by large draughts of the decoctions of the woods, with the China and ſarſaparilla roots. The parts affected ſhould alſo be fumigated with the ſteam of decoctions of aromatic herbs, and twice a day, in the intermediate times, the part may be rubbed over with a mercurial ointment, and afterwards covered with the common mercurial plaſter. Mercurial medicines ſhould alſo be given internally, according to the ſtrength of the patient, and ſometimes a ſalivation is neceſſary.

Mercurial remedies ſeem indeed ſo peculiarly appropriated to this caſe, that nothing is to be done without them; and it hence looks very ſuſpicious, that ſomething venereal is always in the caſe, or elſe that the diſorder is of itſelf very much akin to that diſeaſe. By diligently purſuing this method for ſome weeks, the firſt and ſecond ſtages of this diſeaſe may be cured even where there are bony tumors formed; and the tumors may either be reduced, or at leaſt brought to that ſtate, that they will remain as they are without farther encreaſe, or without pain, or any farther inconveniency.

But when theſe tumors are ſo far advanced, as to be out of the reach of the remedies, the pain and tumors encreaſing, and abſceſſes forming; as there is great reaſon to fear the

the entire deſtruction of the bone, if the abſceſs does not burſt of itſelf, the ſurgeon ſhould not ſtay for its maturation, but lay the bone bare in the loweſt, or in the moſt painful part. When the abſceſs is already burſt, if the opening be too ſmall, it muſt be enlarged with a knife, or if the patient too much dreads the knife, the cauſtic may ſupply its place; and after this ſeveral ſmall holes muſt be made in the bone with a ſmall piercer, perforating it into the medulla, to give way for the diſcharge of the confined matter; and when theſe ſmall holes are not ſufficient, a larger muſt be made by the trepan, if the bone will admit it: this will not only make more way for the diſcharge of the matter, but will alſo give room for the proper application of remedies better than any other method.

While this is under cure, the patient muſt uſe internally the decoctions of the woods, and mild mercurial, and antimonial medicines; and externally the wound muſt be treated with cleanſing, and balſamic remedies, ſuch as decoctions of agrimony, ſanicle, St. John's wort, or birthwort, and eſſence of myrrh and aloes. Theſe ſhould be injected warm with a ſyringe twice every day, as may alſo a ſolution of mercurius dulcis made in plantane-water, or in lime-water. Honey of roſes ſhould be added in a ſmall quantity to either of the decoctions, uſed as eſſences; and after the uſe of them, the wound ſhould be dreſſed with the before-mentioned eſſences, or with thoſe of maſtich or amber, ſpread upon lint, and covered with a mercurial, or other plaſter: this method is to be continued till the parts are healed. The actual cautery is ſometimes neceſſary to root out the diſorder, eſpecially when it is only between the lamellæ of the bone, for in other caſes there is no getting to the bottom with it.

But when all theſe methods are unſucceſsful, and the part is already too much corroded and deſtroyed, there is no hope of ſaving it, nor indeed of ſaving the life of the patient, by any other means than the taking off the limb. When the diſorder is ſituated, however, in ſome ſmall bone, as on the carpus, tarſus, meta-carpus, or meta-tarſus, or fingers, it will not always be neceſſary to take off the whole limb, that is to ſay, the finger, foot, or hand, but it will frequently ſuffice to remove the corrupted bone alone. In larger bones, where the whole bone is not affected, but only a part of its external ſurface is diſordered by either a caries, or *ſpina ventoſa*, the whole limb is by no means to be taken off, but the diſeaſed part of the bone only removed: but when a large bone, as the os humeri, tibia, or femur, or an entire joint of the arm, knee, or foot, is diſeaſed, there is no remedy but amputating it in the ſound parts juſt above. *Heiſter*'s Surgery, p. 264.

Dr. Schlichting affirms, that the *ſpina ventoſa* may be cured by rubbing the tumor twice a day with ung. Neapolit. preventing ſalivation by gentle cathartics. Phil. Tranſ. N° 466. ſect. 10.

It appears likewiſe, from a caſe related in the Philoſophical Tranſactions, that amputation of the limb is not always neceſſary. Vid. Phil. Tranſ. N° 480.

SPINACHIA, *ſpinach*, in botany, the name of a genus of plants, the characters of which are theſe. The flowers are of the apetalous kind, conſiſting only of a number of ſtamina. Theſe flowers are alſo barren, and the embryo ſeeds are found on ſuch parts, or different plants of *ſpinach*, as have no flowers. Theſe finally become ſeeds of a turbinated form, and are contained either in a capſule of the ſame figure, or elſe in a cornuted or angular one.

The ſpecies of *ſpinach*, enumerated by Mr. Tournefort, are theſe. 1. The common *ſpinach* with prickly ſeed-veſſels. 2. The common barren *ſpinach*. 3. The procumbent Cretic *ſpinach* with echinated capſules. And 4. the common *ſpinach* with ſmooth capſules. *Tourn.* Inſt. p. 533.

The common *ſpinach*, intended for winter uſe, ſhould be ſown on an open ſpot of ground in the latter end of July, obſerving to do it, if poſſible, when the weather is rainy. When the young plants are come up, the weeds muſt be deſtroyed, and the plants left at about five inches aſunder. The ground being kept clear of weeds, the *ſpinach* will be fit for uſe in October. The way of gathering it to advantage, is only to take off the longeſt leaves, leaving thoſe in the center to grow bigger; and at this rate a bed of *ſpinach* will furniſh the table for the whole winter, till the *ſpinach* ſown in ſpring is become fit for uſe, which is common in April. *Miller*'s Gard. Dict.

SPINACHIA, in zoology, a name given by ſome authors to our common ſtickleback, or barnſtickle, more uſually known among writers by the names *pugnitius*, or *aculeatus piſciculus*. *Geſner*, de Aquatil. See the article PUGNITIUS.

SPINALIS (*Cycl.*)—SPINALIS *cervicis*, in anatomy, a name given by Albinus to a muſcle of the neck, called by Fallopius the *tertium par muſculorum dorſi*, and by Cowper and Morgagni *ſpinalis colli*.

This is the muſcle which the French anatomiſts call *les vertebraux externes du demi-epineux, ou le tranſverſaire epineux du col.* See TRANSVERSALIS, *&c.*

SPINALES *colli minores*, muſcles lying between the ſix *ſpinal* apophyſes of the neck, and between the laſt of the neck and firſt of the back; being inſerted in theſe apophyſes by both extremities on one ſide of the poſterior cervical ligament, which parts them from thoſe of the other ſide. They are likewiſe termed *interſpinales*. Vid. *Winſlow*'s Anat. p. 244.

SPINALIS *dorſi*, in anatomy, a name given by Albinus to a muſcle of the back, figured by Euſtachius Tab. 37. and called by Fallopius *quintiparis dorſi muſculorum pars implantata in ſpinas vertebrarum thoracis*.

Others, as Spigelius, have called it a part of the *ſemiſpinatus*, and others a part of the *longiſſimus dorſi*. The French have named it *le grand epineux de dos*. See the articles SEMISPINATUS and LONGISSIMUS *dorſi*.

SPINALIS *dorſi major*, a pretty long and ſlender muſcle, lying upon the lateral part of the extremities of the *ſpinal* apophyſes of the back. It is compoſed of ſeveral muſcular faſciculi of different lengths, which croſſing each other, are inſerted laterally by ſmall tendons in the *ſpinal* apophyſes from the ſecond, third, or fourth vertebræ of the back; and ſometimes, though ſeldom, from the laſt of the neck, or firſt of the back, all the way to the firſt or ſecond vertebra of the loins, with ſeveral irregular decuſſations, which vary in different ſubjects. The longeſt faſciculi are all a little incurvated, and the whole muſcle terminates in points at its ends, but is conſiderably broad in the middle. It communicates by ſome fibres with the longiſſimus dorſi, and *ſemiſpinalis*, and ſends off faſciculi to ſeveral tranſverſe apophyſes of the back, from the fourth to the eleventh. It is called by ſome *ſemiſpinalis*, but very improperly. *Winſlow*'s Anatomy, p. 247.

SPINALES *dorſi minores*. Theſe muſcles are of two kinds; ſome go laterally from the extremity of one *ſpinal* apophyſis to another, being often mixed with the ſhort faſciculi of the *ſpinalis* major; the reſt lie directly between the extremities of two neighbouring *ſpinal* apophyſes, being ſeparated from thoſe on the other ſide by the *ſpinal* ligament. Theſe are ſmaller and thinner than thoſe of the neck, and are properly enough termed *interſpinales*. *Winſlow*'s Anatomy, p. 248.

SPINALES *et tranſverſales lumborum*. There are ſome faſciculi which run up from the ſuperior falſe *ſpines* of the os ſacrum to the lower *ſpinal* apophyſes of the loins, which may be looked upon as ſo many *ſpinales lumborum majores*; and there are alſo ſome *ſpinales lumborum minores* between the *ſpinal* apophyſes of the loins, and *tranſverſales minores* between the tranſverſe apophyſes, which are ſometimes of a conſiderable breadth. *Winſlow*'s Anatomy, p. 249.

SPINARELLA, in ichthyology, a name given by Bellonius, and ſome other authors, to the little fiſh called by us the *leſſer ſtickleback*, and diſtinguiſhed by Artedi by the name of the *gaſteroſteus* with ten ſpines on the back. See the article GASTEROSTEUS.

The ſize is an uncertain mark, but this number of the ſpines wholly determines the ſpecies, the common *gaſteroſteus*, or ſtickleback, having only three.

SPINATUS, in anatomy, a name given by Riolanus, and others, to a muſcle of the neck, called by Albinus *ſpinalis colli*, and by Winſlow, and the other French writers, *les vertebraux externes du demi-epineux, ou tranſverſaire epineux du col.* See the articles SPINALIS and TRANSVERSALIS.

SPINDLE (*Cycl.*)—SPINDLE, in mining, is a piece of wood faſtened into either ſtow-blade. *Houghton*'s Compleat Miner in the Explan. of the Terms. See the article STOWS.

Theſe ſtows give a miner, or any other perſon that owns them, as good a right to a meer or meers of ground, (ſo that every meer have a pair of ſtows ſet on them) as a deed of conveyance doth to any purchaſer. *Houghton*, ibid.

SPINDLE, in ſhip-building, a part of the capſtan. See the article CAPSTAN, *Cycl.* and *Suppl.*

SPINE (*Cycl.*)—This takes in all that order of bones which follow one another without interruption, from the os occipitis downward along the poſterior part of the trunk.

It repreſents a very compound folding pillar, round on the foreſide, and on the backſide ſtuck full of prickles or points, repreſenting ſo many *ſpines*. It has a canal in the middle through its whole length, into which a great number of holes open on each ſide. When it is viewed directly on the foreſide or backſide, it appears ſtrait, and to be made up of different portions of pyramids, in a contrary ſituation to one another; but viewed ſideways, it preſents ſeveral different curvatures. The pieces which compoſe the *ſpine* are of two kinds, one ſimple, the other compound; the ſingle pieces are generally twenty four in number, called by the name of *vertebræ*; the compound pieces are two, the os ſacrum and os coccygis. The ſingle ſpecies are alſo called *true vertebræ*, to diſtinguiſh them from the portions which compoſe the other two, which are called *falſe vertebræ*. The true vertebræ are divided into three claſſes, *viz.* ſeven of the neck, twelve of the back, and five of the loins; and to theſe are given the names *cervical*, *dorſal*, and *lumbar*. *Winſlow*'s Anatomy, p. 53.

This bone, when felt through the integuments, ſeems ſometimes divided, and has given riſe to the notion of a *ſpina bifida*, or bifurcation of the *ſpine*. But ſome doubt of the exiſtence

exiſtence of ſuch a caſe, as a perfect *ſpina bifida*, ſuppoſes the very canal and *ſpinal* marrow to divide into two branches, and the *ſpinal* proceſſes to divaricate into two rows. We have a caſe in the Philoſophical Tranſactions, where the *ſpinal* marrow of an infant was found bare, without any bony covering, and which was taken for a *ſpina bifida*. See Phil. Tranſ. N° 472. ſect. 2. and N° 366. p. 98.

See, in the Mem. de l'Acad. Royale des Sciences anno 1730, ſome curious obſervations, by Mr. Winſlow, on the motions of the *ſpine*.

Cartilages of the SPINE. The cartilages of all the vertebræ in general are of two kinds, one proper to each vertebra, the other common to two vertebræ which lie next one another; the firſt may be termed the *cartilages of articulation*, the latter the *cartilages of ſymphyſis*.

The proper articular cartilages of each vertebra of the whole *ſpine* are thoſe four which cover the ſurfaces of the four ſmall articular apophyſes. In the natural ſtate they are very white and ſmooth, and much thicker than in the dried bones. Their circumference is the ſame with that of the articulated ſides of the apophyſes, except in thoſe places where there are ſmall ſuperficial notches. The vertebræ of the back, beſide the four cartilages of their ſmall apophyſes, have others which do not belong to their articulations with one another, *viz.* thoſe which cover the lateral foſſulæ in the bodies of theſe vertebræ, and the foſſulæ in their tranſverſe apophyſes, by both of which they are articulated with the ribs.

The cartilages of the ſymphyſis lie between the bodies of the vertebræ, one of them being contained between, and cloſely joined to the lower ſurface of one vertebra, and to the upper ſurface of the next under it; the breadth and circumference of theſe anſwer exactly to thoſe of the ſurfaces between which they are contained, but their height, or thickneſs, is different in each claſs of the vertebræ. In the vertebræ of the loins they are, according to the ſtature of the ſubject, a quarter or a third of an inch thick, in thoſe of the neck they are not ſo thick, and thinneſt of all in thoſe of the back. Neither are they of equal thickneſs in all their parts, thoſe of the neck and loins appear to be thickeſt on the foreſide, and thoſe of the back rather thickeſt on the contrary part; but theſe differences are moſt remarkable in the vertebræ that lie near the middle of each claſs.

The internal ſtructure of theſe cartilages is different from that of all the other cartilages of the body, and indeed they reſemble the reſt in nothing but in whiteneſs and in elaſticity. When we view their circumferences only, they appear to be one uniform maſs like the reſt, but when divided by an inciſion, parallel to the ſurface of the vertebræ, we ſee that they are made up of a great number of concentric cartilaginous rings, contained within each other, with a ſmall ſpace left between them. Theſe are cloſeſt and thinneſt near the center, and about the middle ſeem to degenerate into another ſofter kind of ſubſtance. Theſe rings do not form an entire circumference, being turned inward on the backſide, anſwerably to the poſterior ſlope in the body of each vertebra. They lie horizontally, one edge being fixed to the lower ſide of one vertebra, and the other to the upper ſide of the vertebra next below the former.

The interſtices between the rings are filled with a mucilaginous ſubſtance, leſs fluid than that of the joints, and their breadth, or heighth, is proportionable to the diſtance of the vertebræ between which they lie.

Each cartilaginous lamina taken ſeparately is very pliable, according to its length, but taken all together they are not ſo eaſily bent, partly becauſe of their circular figure, and partly becauſe of their proximity and multiplicity. They yield, however, in the inflexions of the *ſpine*, and without any inflexion to the weight of the head and upper extremities; but this is done by very ſmall degrees, and moſt of all, when the upper part of the body is loaded with any foreign weight. After theſe compreſſions they reſtore themſelves, merely by being freed from the preſſure; ſo that a man is really taller after lying ſome time, than after he has carried a burthen for a great while. Theſe ſingular obſervations of the different heights of the ſame perſon, at different times, which were firſt made in England, and afterwards confirmed at Paris by Mr. Morand, are moſt naturally and eaſily accounted for, merely by the different ſtate of the intervertebral cartilages.

The intervertebral cartilages of the neck lying, for the moſt part, between the convex ſide of one vertebra, and the concave ſide of another, are of a greater extent, in proportion to the ſize of thoſe vertebræ, than thoſe of the back and loins. The os ſacrum has no cartilage, except that between the upper ſide of the firſt falſe vertebra, and the laſt vertebra of the loins; and thoſe by which it is connected to the oſſa innominata, already deſcribed as the cartilages of that bone. The cartilages, which join the different portions of the os coccygis, are preſerved in ſome ſubjects to a very great age, but in others they very ſoon become entirely bony. *Winſlow*'s Anatomy, p. 145.

Ligaments of the SPINE. The vertebræ are ſtrongly connected to each other by three kinds of ligaments. Each vertebra is connected to thoſe above and below it by a great number of very ſhort and ſtrong ligaments, which croſs each other obliquely, and are fixed round the edges of the body of each vertebra. Theſe crucial ligaments cover the circumference of the intervertebral cartilages, and adhere cloſely to them.

The bodies of all the vertebræ, from the ſecond of the neck to the os ſacrum, are covered by ligamentary half vaginæ on the convex ſide, in which theſe vaginæ are fixed, ſurrounding all the crucial ligaments, and made up of ligamentary filaments partly oblique, but for the moſt part longitudinal. All the vertebræ are likewiſe ſtrongly connected by a ligamentary tube, which lines the inner ſurface of the medullary canal from the occipital hole to the os ſacrum; it repreſents a long flexible funnel, its cavity at the upper part being equal to that of the occipital foramen, and ending in a point at the os ſacrum. The firſt vertebra is fixed to the os occipitis beſide this, by a diſtinct and very ſtrong ligamentary covering; the ſecond has two ligaments peculiar to it, one which connects the apophyſis dentiformis to the os occipitis, and another tranſverſe, which confines this apophyſis within the anterior portion of the cavity of the firſt vertebra. The firſt may be called the occipital, and the ſecond the tranſverſe ligament of the odontoide apophyſis. Along the whole bony canal of the *ſpine*, between the baſes of each *ſpinal* apophyſis, lies a flat and very elaſtic ligament, of a yellowiſh colour, which fills up the poſterior great notches of the vertebræ, adhering to their edges, and to the neighbouring portions of the inner ligamentary tube.

Between the extremities, or apices of the *ſpinal* apophyſes, are ſmall ligamentary ropes, which go from one *ſpine* to the next, which are all really double, though they appear ſo only in the neck, being there fixed ſeparately to the forked extremities of the *ſpines*. Between all the *ſpinal* apophyſes, from their apices to the middle of their baſes, lies a ligamentary membrane, going between each two; and there is a ligament of a like kind between the two tranſverſe apophyſes in all.

The articular ligaments of the *ſpina* dorſi are thoſe which tie the glenoide cavities of the firſt vertebra to the condyles of the os occipitis; thoſe that join the cartilaginous ſurface of the apophyſis dentiformis to the anterior cavity of the firſt vertebra, and thoſe by which all the oblique, or articular apophyſes, are connected together. Theſe are all ſmall, ſhort, and ſtrong. The vertebral ligaments of the ribs, or thoſe which connect the ribs to the vertebræ, are of the ſame kind, and are inſerted round the cartilaginous foſſulæ in the body, and apophyſes of each vertebra. Beſide all theſe ligaments of the *ſpine*, there is one which goes in form of a membrane from the os occipitis, all the way to the laſt two vertebræ of the neck: this is a true intermuſcular ligament, and may be properly called the *ligamentum cervicale poſterius*. There are alſo two lateral ligaments of the ſame kind, fixed to the tranſverſe apophyſes of the vertebræ of the neck. *Winſlow*'s Anatomy, p. 147.

SPINES *of echini*, in natural hiſtory. Theſe in their foſſile ſtate make a great appearance in the cabinets of the curious, and in the works of the learned, and are of an almoſt infinite variety of kinds; and many of them are of the ſame figures and dimenſions with thoſe of the echini now living in our own and other ſeas, and well known to us. But beſide theſe there are an almoſt infinite variety of others, which though allowed on all hands to be truly *ſpines* of ſome echini or other, yet evidently differ from thoſe of all the known recent fiſh of that name, and have certainly belonged to ſpecies of it which we have not yet the leaſt knowledge of. Theſe, however different in ſhape from one another, yet all agree in their texture and conſtituent matter, both with one another, and with the foſſile remains that ſupply the places of the ſhells of the other ſpecies ſo common in our chalk-pits, all being compoſed of a plated, or tabulated ſpar. Both theſe ſhells and the *ſpines*, though they retain every outer lineament of the bodies they owe their form to, yet have they nothing of their interior texture, nor any the leaſt reſemblance of it, but are compoſed of plates ſet edgewiſe, or aſlant, in the ſhells, and in the *ſpines* always obliquely to the axis of the body; ſo that all the foſſile *ſpines of echini* break regularly in an oblique direction, and always ſhew on each part a perfectly ſmooth and gloſſy ſlanting ſurface.

Of the foſſile *ſpines of echini* ſome are long and ſlender, tapering from a broader baſis to a fine point, and ſometimes from a thick part, at or near the middle, to an obtuſe point at each end: theſe are uſually ſtriated, ridged, or furrowed, and often elegantly granulated, though ſometimes they are ſmooth. Theſe moſt reſemble the *ſpines* of the more common ſpecies of recent or living echini we are acquainted with; others of them are of very different and very ſtrange figures; ſome are of the ſame length with the common long ones, but are very flat, and are ridged more or leſs high, or covered with tubercles of different ſhapes; others are ragged, and variouſly jagged, and knotted like a rough branch

branch of fir ſtript of its leaves, or that ſort of fucus called the *ſea ragged ſtaff*. Another very common kind in ſome parts of the world, eſpecially in Syria, but leſs frequent with us, is the body called by authors *lapis judaicus*: theſe are ſuppoſed, in ſome ſort, to reſemble an olive, ſwelling from a ſhort ſtalk to a large thick and ſhort body of an oval figure, and marked very elegantly with longitudinal furrows, and in the different ſpecies with very differently ſhaped tubercles. Of this ſhape there are alſo ſome perfectly ſmooth.

We have alſo with us great numbers of a kind approaching to theſe, but having longer ſtalks and ſmaller bodies, and theſe we meet with of all ſizes, from three inches in length down to the bigneſs of a barley-corn; and there are at times found ſome of all the intermediate figures, between theſe tumid ones and the long and ſlender ſort.

We have numbers alſo of various lengths, and variouſly ſurrounded with granulæ of a ſhape nearly cylindric, and beſide the bodies themſelves, we meet with impreſſions of all the kinds on our flints in gravel-pits. The *ſpines* themſelves are uſually bedded in the ſtrata of chalk, though ſometimes they are found in the ſtone-quarries, and ſometimes, but that moſt rarely, bedded in clay, or looſe among gravel. *Hill*'s Hiſt. of Foſſ. p. 652.

SPINNING (*Cycl.*)—The art of *ſpinning*, which nature has given to many animals of different kinds for their preſervation and other purpoſes, is not confined to the inhabitants of the earth or air alone, but is even extended to thoſe of the ſea. Mr. Reaumur has ſhewn, by a ſeries of curious experiments, that the common muſcle, and ſome other ſhell-fiſh of the ſea, poſſeſs it in a great degree of perfection. See the article MUSCLE.

But he obſerves, that though the workmanſhip is the ſame, the manner of producing it is very different. Spiders, caterpillars, and the like, make threads of any length that they pleaſe, by making the viſcous liquor, of which they are formed, paſs through a fine perforation in the organ appointed for this *ſpinning*: but the way in which the muſcles form their threads is very different, as the former reſembles the work of the wire-drawer, ſo this does that of the founder, who caſts metals in a mould. The canal of the organ, deſtined for the muſcle's *ſpinning*, which from its ſhape is commonly called its tongue, is the mould in which its thread is caſt, and gives it its determinate length. Mem. Acad. Par. 1711.

SPINOSA, in zoology, the name by which the Italians call the porcupine. See the article HISTRIX.

SPINOSE-*leaf*, among botaniſts. See the article LEAF.

SPINOSI *piſces*, in zoology, ſuch fiſhes as have ſome of the rays of their backfins running out into thorns or prickles, as the pearch, *&c.* *Willughby*, Hiſt. Piſc. p. 271.

SPINOZISM (*Cycl.*)—We have an examination of *Spinoziſm*, and of Mr. Bayle's objections againſt this ſyſtem, by Monſ. de Jariges, in the Mem. de l'Acad. de Berlin, Tom. I. p. 121. and Tom. II. p. 295. Wolfius has alſo given a refutation of *Spinoza*, in his Theol. Nat. Part 2.

SPINTHER, among the Romans, a kind of bracelet which the women, in the firſt ages of Rome, uſed to wear on the upper part of their left arm.

SPINUS, in the natural hiſtory of the antients, the name of a foſſile body of a very remarkable quality; for according to the accounts of Theophraſtus, and other authors of the greateſt credit, if broke to pieces, and thrown in an heap expoſed to the ſun, it took fire and burnt, and that the more, if moiſtened or ſprinkled with water.

It ſeems to have been a ſubſtance nearly allied to what they called the *lapis thracius*, but with this remarkable quality, both of them ſeem to have been of the claſs of the harder bitumens, and are wholly unknown to us. Some late writers have imagined, that the common black ſlate-ſtone, ſo frequent with us in the coal-pits, was the ſubſtance called by Theophraſtus, and the antients, by this name, but it has none of the qualities attributed to the *ſpinus*. *Hill*'s Theophraſtus, p. 35.

SPINUS, in zoology, the name of a ſmall bird, called by ſome *ligurinus*, and in Engliſh the *ſiſkin*. Its head is black, and its neck and back green. The neck, however, has ſome ſlight admixture of a blackiſh tinge, and the roots of the backfeathers have alſo ſome blackiſhneſs. Its rump is of a greeniſh yellow, as are alſo its breaſt and throat. Its belly is white, and its tail is yellow underneath, with ſome browniſh ſpots. The female is paler coloured than the male, and its throat, and its ſides, under the wings, are whitiſh, with ſtreaks of brown. It is common in Germany and England, and is kept in cages for its ſinging. In winter theſe birds fly in large flocks. *Ray*'s Ornitholog. p. 192.

SPIPOLA, in zoology, the name of a ſmall bird of the lark kind, of which there are, according to Aldrovand, three ſpecies, ſuſpected by Mr. Ray to be only varieties of the *ſpipoletta*, or *tordino* of the Venetians. *Aldrovand.* de Avib. lib. 17. cap. 26. See the next article.

SPIPOLETTA, in zoology, the name of a ſmall bird of the lark kind, called *tordino* by the Venetians, and ſeeming to be the *ſtopparola*, as alſo the *griſola*, and *ſpipola* of Aldrovandus. It is ſmaller than the common lark; its head, neck, ſhoulders, and back, are of a greyiſh colour, with an admixture of green; its breaſt and belly white, and its throat ſpotted. The female differs from the male, in that her belly is yellow. The wing-feathers are of a duſky brown, with whitiſh or yellowiſh edges. Its tail is moderately long, and part of the feathers are ſnow-white, the reſt brown or blackiſh. The length of the heel diſtinguiſhes this bird from all others, except the lark kind, and it differs from all the ſpecies of larks in the colour of its beak and legs, which are black. It is common in the markets of Venice and other places. *Ray*'s Ornitholog. p. 153.

SPIRÆA, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, being compoſed of ſeveral petals arranged in a circular form. The piſtil ariſes from the cup, and finally becomes a fruit compoſed of ſeveral ſmall pods, containing oblong ſeeds.

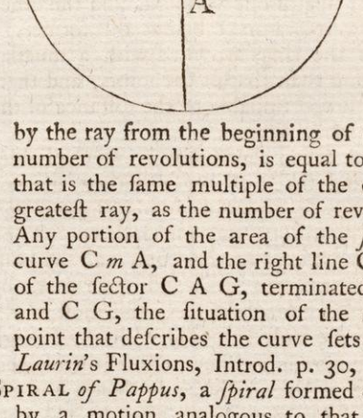
The ſpecies of *ſpiræa*, enumerated by Mr. Tournefort, are theſe. 1. The willow-leaved *ſpiræa*. 2. The opulus-leaved *ſpiræa*. 3. The *ſpiræa* with hypericum leaves, not indented. And 4. the Spaniſh *ſpiræa* with crenated leaves, reſembling thoſe of the hypericum. *Tourn.* Inſt. p. 618.

The ſeveral ſpecies of this plant are very common in our gardens, and make a very beautiful figure. They are propagated either by ſuckers, which they produce in great abundance, or by laying down the tender branches of the old plants. When they have taken root, they ſhould be removed into the nurſery for two or three years, and will then be fit for tranſplanting in the places where they are to remain. *Miller*'s Gard. Dict.

SPIRAL (*Cycl.*)—As a curve may approach continually to a right line, or to another curve, while they are both produced, and yet never meet it, ſo a *ſpiral* line may approach continually to a certain point, and not reach it in any number of revolutions, how great ſoever, that can be aſſigned. This happens in the logarithmic, or logiſtic *ſpiral*, and in ſeveral others. See *Mac Laurin*'s Fluxions, Book 1. p. 283, ſeq.

Some of theſe *ſpirals*, after having made an infinite number of revolutions, is ſaid, in the modern ſtile, to reach that certain point, and yet the length of the *ſpiral* may be finite, or equal to an aſſignable line. Propoſitions, expreſſed in this manner, ſeem the moſt myſterious of paradoxes; but the wonder diſappears, when we know it amounts to no more than that a line may continually increaſe, and yet the increments acquired may decreaſe in ſuch a manner, that it ſhall never amount to a given line.

SPIRAL *of Archimedes*. The *ſpiral* area CABDE, is equal to one third part of the circle, deſcribed with the radius CE.

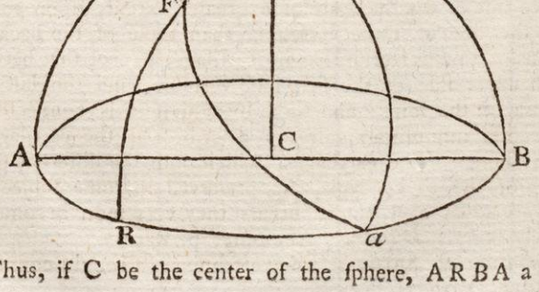


In like manner, the whole *ſpiral* area, generated by the ray drawn from the point C to the curve, when it makes two revolutions, is the third part of a ſpace double of the circle deſcribed with the radius 2 CE; and the whole area, generated by the ray from the beginning of the motion, till after any number of revolutions, is equal to the third part of a ſpace that is the ſame multiple of the circle deſcribed with the greateſt ray, as the number of revolutions is of unit.

Any portion of the area of the *ſpiral*, terminated by the curve C *m* A, and the right line C A, is equal to one third of the ſector C A G, terminated by the right line C A, and C G, the ſituation of the revolving ray, when the point that deſcribes the curve ſets out from C. See *Mac Laurin*'s Fluxions, Introd. p. 30, 31.

SPIRAL *of Pappus*, a *ſpiral* formed on the ſurface of a ſphere, by a motion analogous to that by which the *ſpiral* of Archimedes is deſcribed in plano. See the article SPIRAL, *Cycl.*

This *ſpiral* is ſo called from its inventor Pappus. Collect. Mathem. lib. 4. prop. 30.



Thus, if C be the center of the ſphere, ARBA a great circle,

circle, P its pole; and while the quadrant P M A revolves about the pole P with an uniform motion, if a point proceeding from P move with a given velocity along the quadrant, it will trace upon the ſpherical ſurface the *ſpiral* P F *a*.

Now if we ſuppoſe the quadrant P M A to make a compleat revolution in the ſame time that the point, which traces the *ſpiral* on the ſurface of the ſphere, deſcribes the quadrant, which is the caſe conſidered by Pappus; then the portion of the ſpherical ſurface, terminated by the whole *ſpiral*, the circle A R B A, and the quadrant P M A, will be equal to the ſquare of A B. In any other caſe, the area P M A *a* F P is to the ſquare of the diameter A B, in the ſame proportion as the arch A *a* is to the whole circumference A R B A. And this area is always to the ſpherical triangle P A *a*, as the inſcribed ſquare is to the circle. See *Mac Laurin*'s Fluxions, Introd. p. 31—33.

The portion of the ſpherical ſurface, terminated by the quadrant P M A, the arches A R, F R, and the *ſpiral* P Z F, admits of a perfect quadrature, when the ratio of the arch A *a* to the whole circumference can be aſſigned. See *Mac Laurin*, ibid. p. 33.

SPIRINCHUS, a name by which ſome authors have called the ſmelt. *Willughby*, Hiſt. Piſc. p. 202. See the article EPERLANUS.

SPIRITS (*Cycl.*)—*Brandy* SPIRITS. *Brandy* differs from wine *ſpirit*, in that the former is drawn from the poorer and thinner ſorts of wines, the latter from the richer and fuller bodied wines. *Shaw*'s Eſſ. on Diſtil. p. 128.

Brandy alſo differs from *ſpirit* of wine, as the former is only what they call proof high, or half pure *ſpirit*, half phlegm; whereas *ſpirit* of wine is raiſed higher, or carried by rectification to a further degree of purity.

Brandy alſo differs from ſtrong waters, as the latter is a compound, whereof the former, or pure *ſpirit* of wine, is only one ingredient.

The Portugueze are lately come into the way of making *brandy* [b]. The Greek *brandies* are the worſt, though made of the beſt wines [c].—[[b] Atlas Marit. p. 154. [c] *Tournf.* Voyag. du Levant, Tom. I. let. 2. p. 35.]

The Spaniſh *brandies* are much coarſer than the French, though ſometimes made to paſs for them in Holland, and other places of great traffic [d]. Some prefer Rheniſh *brandy* to that of France; and in Holland particularly, it ſells for double the price. It is indeed a fine *ſpirit*, but the Engliſh know little of it farther, than that a daſh thereof ſerves to fill up a caſk of French [e]. Some tell us of frozen *brandy*, of which Mr. Boyle gives an inſtance in Ruſſia; but it is only the watery part that is capable of congelation. All the effect of the moſt intenſe cold on *brandy*, is to make a ſeparation between its *ſpirit* and phlegm; the former retires to the center in form of pure alcohol, while the latter inveſts it with a circumference of ice [f].—[[d] *Shaw*'s Eſſ. on Diſtil. ſect. 5. p. 139. [e] Id. ibid. p. 141, ſeq. [f] *Boyle*'s Works Abr. Tom. I. p. 594.]

Brandies always differ, according to the different ſpecies and growth of the grapes. We have various kinds of French *ſpirits*, having each their particular flavours, by which the connoiſeurs readily diſtinguiſh one ſort from another; though the vulgar call them all indiſcriminately by the name of *French brandy*. An ordinary judgment may eaſily diſtinguiſh Languedoc *brandy* from that of the iſles of St. Martin and Oleron; or Bourdeaux from Cognac. Nor would the ſimilitude between the ſeveral ſpecies of French *brandies* be ſo great as it is found, but that only the weakeſt and loweſt flavoured wines are diſtilled for this purpoſe; or ſuch as are unfit for other uſes. When out of curioſity, or good huſbandry, the French diſtil the bottoms, or refuſe parcels of the groſſer bodied and fuller taſted wines, the *brandy* got from them is what we in England rather call a wine *ſpirit*, than a *brandy*. Every kind of grape, as it affords a wine, ſo does it alſo a *brandy* of its own peculiar flavour. *Shaw*'s Eſſ. on Diſtil. ſect. 5. p. 130, ſeq.

The too free and frequent uſe of *brandy* is attended with ill effects, as it attenuates the body, and impairs the ſtrength, and ſtupifies the brain. In perſons who have died hereof, the blood has been found thick and coagulated; the pancreas dried; the liver ſchirrous, and almoſt petrified; the glands tumefied beyond their natural bulk [g], *&c.* But what ſhall we ſay to the Pariſian woman, who was burnt to aſhes with a fire only kindled from the *brandy* in her body [h]? Conringius even attributes the degeneracy of the modern from the antient Germans, to the prevelancy of drinking this liquor [i].—[[g] Hiſt. Acad. Scienc. Anno 1706. p. 29. *Barth.* Act. Med. Tom. V. Obſ. 118. p. 313. [h] Philoſ. Tranſ. N° 97. p. 6138. *Barth.* l. c. Tom. I. Obſ. 118. p. 211. [i] *Conring.* de Habit. Corp. Germ. p. 99, ſeq.]

In the hot climates of America, they are ſaid to make clyſters of *brandy*. A perſon who had experienced the uſe of one of theſe fiery enemata, made of a pint of *brandy*, aſſures us, it not only made him dead drunk, but raving mad. Phil. Tranſ. N° 37. p. 721.

Brandy is alſo applied, in a leſs proper ſenſe, to all *ſpirituous* inflammable liquors, drawn from vegetables by diſtillation. In which ſenſe *brandy* includes all ardent, or inflammable *ſpirits*, uſed in the way of beverage. Dr. Shaw adds a further limitation to *brandy ſpirits*, *viz.* that they be proof high, or conſiſt of equal quantities of water and alcohol. On which footing, *ſpirits*, either above or below proof, do not come under the appellation of *brandies* [k]. But in the popular uſe this diſtinction is not kept to.—[[k] *Shaw*'s Eſſ. on Diſtil. ſect. 5. p. 130.]

Arrac, rum, malt and melaſſes *ſpirits*, in this ſenſe, are *brandies*, though under another denomination.

In the iſland of Andros they make brandies from the fruits of the arbutus and mulberry trees. Atlas Marit. p. 176.

A patent was ſome time ago obtained for making *brandy* from carrots and parſneps; the latter of which is ſaid to have nearly reſembled French *brandy* [l]. Of late we meet with frequent advertiſements of raiſin-*brandy*, which, if really made of that fruit, is neareſt akin to wine-*brandy*.—[[l] *Hought.* Collect. Tom. II. p. 382. 461.]

Apple, or cider-*brandy*, is alſo praiſed by ſome.

Cider is found to yield an eighth part of good *ſpirits*, and if cloſe kept a year or two in a cool place, much more. Dict. Ruſt. Tom. I. in voc.

Brandy is alſo uſed to denote certain compound liquors, whereof *brandies* are the baſis.

Such are raſpberry-*brandy*, cherry-*brandy*, gooſeberry-*brandy*, &c.

Cherry-*brandy* is uſually made with black cherries, by filling a bottle half full with them, and adding *brandy* thereto till the bottle be full; this being ſhaken from time to time, within a month will be ready to drink.

If the like quantity of gooſeberries, inſtead of cherries, be put in, it makes a good *brandy*. To dulcify it, and give it a fine flavour, they alſo put in ſugar with raſpberries. Dict. Ruſt. Tom. I. in voc. *cherry-brandy*.

The French method of diſtilling *brandies* is the ſame with that practiſed by our diſtillers, in working from waſh or wines; only that the former throws a little of the natural lee into the ſtill along with the wine, which gives the *ſpirit* a flavour, on which a great part of its merit depends. *Shaw*, lib. cit. p. 132.

When *brandies* prove foul, ſeedy, or retain the taſte of certain weeds apt to grow among the vines, they draw them over again, in order to cleanſe them of that adventitious flavour: in which operation they leave out the faints, or rather change the receiver, as ſoon as the ſtream begins to run proof. Then mixing together all that run off before, they call it *trois cinque*, that is, *brandy* conſiſting of five parts alcohol, and three of flegm; beyond which the French *bruleurs*, or common diſtillers, rarely go.

The yearly export of *brandies* from France is ſaid to amount to 25000 tuns; an article of itſelf ſufficient to enrich a moderate country [m]. While the duty on French *brandy* continued at 9*l.* the tun, the Engliſh alone took 10 or 11000 tuns off their hands [n]; but now that the duty is raiſed to 52*l.* the tun, the importation is greatly reduced, to the advantage of the Engliſh Diſtillery, except that ſmuggling ſtill intervenes.—[[m] Atlas Marit. p. 146. [n] Compl. Engl. Trad. Tom. II. p. 89. Atlas Marit. p. 107. *Hought.* Collect. Tom. II. N° 387. p. 470.]

Divers reaſons may be alledged for the great fecundity of *brandies* in France. All thoſe poor grapes, which prove unfit for wine, are uſually firſt gathered, preſſed, and their juice fermented, and directly diſtilled: this rids their hands of their poor wines at once, and leaves their caſks empty for the reception of better. It is a rule with them to diſtil no wines that will fetch any price as wines, for in this ſtate the profit on them is vaſtly greater, than when reduced to *brandies*. This large ſtock of ſmall wines, wherewith they are almoſt over-run in France, ſhews one great reaſon of their making ſuch vaſt quantities of *brandy*, more than other countries, which lie warmer and better for grapes. But this is not the only fund of their *brandies*; for all the wine that pricks, or turns eager upon their hands, is alſo condemned to the ſtill; and, in ſhort, all that they can neither export, nor conſume at home, which amounts to a large quantity, ſince much of the wine, laid in for their family proviſion, is ſo poor, as not to keep the ſpending. *Shaw*'s Eſſ. on Diſtil. ſect. 5. p. 131, ſeq.

The colour of their *brandies* is acquired from the caſk, and the length of time they uſually lie therein, which is ſometimes twelve or eighteen months, and often two or three years; during which, it is no wonder if they acquire a yellow or browniſh caſt. Their lying thus long, as it were, in a ſtate of ſlow digeſtion, wonderfully takes off from that hot, acrid, and foul taſte, peculiar to all *ſpirits*, or *brandies*, newly diſtilled; and gives them a coolneſs and a ſoftneſs, not eaſily introduced by art. And on theſe properties are founded ſeveral methods of trying their goodneſs, or diſcovering whether they are debaſed or adulterated by the admixture of coarſer *ſpirits*. Phil. Tranſ. N° 391. p. 398, ſeq. *Shaw*'s Eſſ. on Diſtil. ſect. 5. p. 134.

Brandies are rarely adulterated in France, where they have no cheaper *ſpirits* to debaſe them withal; and the like holds, in great meaſure, in favour of the Dutch, though otherwiſe

wiſe ſuſpected to be great adulterators. The chief temptations for adulterating are in England, where the duties are high, and where there are various kinds of *ſpirits* in plenty to mix with them, as malt, melaſſes, cyder, and ſugar *ſpirits*, with all which they are often ſophiſticated, and ſo dextrouſly, as frequently to eſcape all the ways of detection.

Rules for diſtilling brandy SPIRITS. *Brandy*, whether made from wine, malt, ſugar, or whatever elſe, is a compound conſiſting of four different parts, which are inflammable *ſpirit*, eſſential oil, acid and water.

As theſe ſeveral parts do not differ greatly in their ſpecific gravity, or degree of volatility, a ſtrong tumultuary boiling heat will drive them all over promiſcuouſly together. As at the beginning of the operation there uſually ariſes more totally inflammable *ſpirit* than water, ſo after ſome time the ſtream contains more water than *ſpirit*. This gives the foundation for what the diſtillers call *low-wines*, *proof-ſpirits*, and *faints*.

The *low-wines* are the whole quantity of *ſpirit*, ſtrong and ſmall, mixed together; *proof-ſpirit*, a mixture of about equal parts of totally inflammable *ſpirit* and water; and *faints* are what runs after the proof is come off, which is always a mixture of more water than *ſpirit*.

The low-wines are commonly rediſtilled, to get rid of the ſuperfluous aqueous part, and are thus reduced to *brandies*, or proof-*ſpirits*. The faints may alſo be ſerved in the ſame manner; and by this means the produce of the diſtillery, which in the ſtate of faints, or low-wines, could not be judged of, as to its intrinſic value, is reduced to a certain ſtandard, and marketable ſtrength.

In the diſtilling the fermented liquor, when once the ſtream falls from the ſtrength of proof-*ſpirit*, there immediately begins to riſe with it a coarſe and nauſeous oil, which, though not ſo communicative as the firſt, never fails to impregnate the whole ſtream with its flavour. Hence all common *ſpirits*, or *brandies*, are what the chemiſts call dilute quinteſſences; that is, they are mixtures of the ardent *ſpirit* and eſſential oil of the concrete, only here let down to proof with water, and impregnated with a ſmall proportion of a volatile acid. As ſoon as the proof falls off, the liquor grows milky; that is, the oil, which before remained diſſolved in the ſtrong *ſpirit* is let looſe by an over proportion of water, and may be commodiouſly ſeparated by the chemical glaſs made for that purpoſe.

The common cuſtom of the diſtillers is to continue the diſtillation, as long as the liquor that runs off will take flame at a candle applied to the vapour of a ſmall quantity thrown on the hot head of the ſtill; and indeed there is a certain point of time, after which the *ſpirit* that comes will not pay for the fire and labour, as not more than from a twelfth to a twenty fourth part of the *ſpirit* will come over in the water. With other views, however, ſuch as the obtaining a more fixed vegetable acid, and a groſſer eſſential oil, the operation may be continued till the danger of an empyreuma comes on.

The matter remaining in the ſtill, after the operation is ended, has ſeveral uſes, and may in particular be made to afford Mr. Boyle's acid *ſpirit* of wine.

When by repeated diſtillation, without addition, any *ſpirit* is entirely freed from its aqueous part, it is then called *alcohol*, *totally inflammable ſpirit*, *rectified ſpirit*, or, in the vulgar phraſe, *ſpirit of wine*. On theſe general obſervations, it will be eaſy to form ſome new practical methods for the improvement of diſtillation, as uſed in the way of making inflammable *ſpirits*, or *brandies* for ſale.

As the fermented liquor affords different parcels of matter of different degrees of ſpecific gravity, and of volatility, when a pure ſeparation of the lighteſt part is intended, the fire ſhould never be raiſed to a boiling heat, which jumbles and confounds all the parts together, rather than ſeparates them.

In the chemical way this rule may be practiſed to great advantage, but great difficulties will attend the obſervance of it in the common buſineſs of diſtillation. To render it more commodiouſly practicable, theſe two methods may be propoſed. 1. The encreaſing the height of the ſtill above the liquor. And 2. the working by a balneum mariæ, inſtead of a naked fire.

As to the firſt method it has been expected, that by raiſing the ſtill-head to the height of two or three yards above the liquor, a boiling heat would carry up the pure inflammable *ſpirit*, without any conſiderable mixture of phlegm, and yet continue to run in a full ſtream from the noſe of the worm: but this does not anſwer to expectation in all particulars, but all the attempts that have been made towards it ſhew, that the method is ſtill improveable. The ſerpentine-pipe, uſed in this ſort of diſtillation by Lemery, and ſome others, though it occaſions the *ſpirit*, as it creeps up, to depoſit a great part of its phlegm, yet has this great objection attending it, that the *ſpirit* itſelf will not riſe in it without a boiling heat, which never ſhould be uſed in a ſimple ſeparatory diſtillation, becauſe it throws up ſo much oil, as to foul at leaſt the breaſt and head of the ſtill, and bottom of the pipe, whence it infects the ſubſequent *ſpirit* that waſhes them.

It is evident that this method may be brought to a greater perfection than it yet has been, but the other method, by the balneum mariæ, is preferable on ſo many accounts, that it is better to bend our thoughts this way in attempting the improvements ſo much wanted, and which would be ſo beneficial.

By a proper regulation of the balneum mariæ, we may hope for a pure *ſpirit* almoſt at the firſt extraction. Such an expectation will not appear unreaſonable to any one, who will compare the *ſpirit* drawn in the common method by the balneum mariæ, where the water is made to boil violently all the time, with another parcel of the *ſpirit* prepared from the ſame fermented liquor by the hot ſtill. The difficulties of working from waſh, in this way of the balneum mariæ, are indeed very conſiderable, eſpecially in regard to the common malt-diſtillers, with whom cheapneſs and diſpatch are the only things in view; for to work at the ſame time both quick and perfect, is an art not yet learned in the diſtilling trade.

The whole application of the balneum mariæ, in this matter, depends on a ſuitable engine and apparatus, and perhaps a large and long rectangular boiler might be commodiouſly turned into the ſort of balneum we are recommending; and this might be fitted with a great number of low alembics, which would work day and night with a very little fire, and ſtill leſs attendance. The contrivance in general is obvious; but the great art would be the avoiding encumbrance and loſs. A large number of ſtills are abſolutely neceſſary, but no worms or refrigeratories are required to them, and by an eaſy apparatus, the large number of theſe ſmaller ſtills may be charged with as much eaſe as one great one. When the operation proceeds ſo ſlow, as not to anſwer the coſts, the bottoms of all theſe ſtills may be emptied into one large common ſtill, and worked off in the uſual way for a coarſer commodity, that may afterwards be rectified.

In order to procure the *ſpirit* from the ſmaller ſtills perfectly pure, the water of the balneum is to be not quite ſcalding hot.

By this means, when tried in little, a ſurpriſingly cool and almoſt inſipid *ſpirit* has been obtained at the very firſt extraction, though mixed with a conſiderable proportion of phlegm, ſo that it required no manner of rectification to fit it even for the nicer uſes. The method is curious and uſeful, though it were found worth while thus only in ſmall; but will become greatly beneficial to the large dealer, if it could be reduced in the ſame methods to practice.

In the common method of ſimple diſtillations, all means ſhould be uſed to prevent the groſſer eſſential oil from getting into the *ſpirit*.

Theſe means have regard to the preparation of the fermented liquor, the regulation of the fire in diſtilling, the uſe of percolation, and the keeping out the faints.

As to the manner of preparing the fermented liquor, and clearing it of its groſs oleaginous fæces, before it is committed to the ſtill, the beſt method is to let it ſtand ſome time after the fermentation is wholly over, that it may depoſit all that it can, and become as thin and limpid as may be; and one great means of arriving at a perfection in this reſpect, is the making the liquor ſufficiently thin; if it be too thick and rich of the ingredient, the *ſpirit* muſt be coarſe. The liquor thus prepared, muſt never fill above two thirds, at the utmoſt, of the ſtill. A boiling heat is neceſſary in this operation; but then care muſt be taken that this be not carried too far, and that the whole proceeds uniformly and regularly. The fire muſt be kept as even as poſſible, and never raiſed by ſtarts; for that never fails to throw over the coarſe oil, and foul the *ſpirit*; ſo that, if poſſible, the operation ſhould begin and end with the ſame uniform and invariable degree of heat.

Another method of keeping the groſſer oil, at leaſt in ſome degree, from mixing itſelf with the *ſpirit*, is by ſtretching a piece of very thick and woolly flannel over the mouth of the ſtill, or by ſuffering the ſteams to paſs through the ſame ſort of flannel ſeveral times doubled, and placed at the noſe of the worm. It is ſurpriſing what a large quantity of groſs fetid, offenſive, and unctuous matter will be thus collected, eſpecially in the diſtilling of malt *ſpirits*.

The faints ſhould never be ſuffered to run among the finer *ſpirits*, on account of the large quantity of this groſs oil, or greaſy matter, they contain; eſpecially if the fire be encreaſed, as it uſually is, in order to bring them over. Some of the larger dealers, who value proof more than purity, will always have a doſe of this to give their goods a face, and keep up a head a proper time. This prevailing fondneſs for a ſtrong proof, however abſurd in itſelf, is one great reaſon why the generality of malt *ſpirits* are no clearer. This caution of keeping out the faints ſhould alſo extend to the keeping out a little of the firſt running, which alſo, in this operation, is a kind of faints, as containing largely of the oil of the concrete, though much more ſubtle than that in the proper faints. A farther regard muſt alſo be had to the ſtill-head and worm, through which the faints have once paſſed, as theſe depoſit in the head, and along the whole

length of the worm, a coarſe and nauſeous oil, which will give a diſagreeable flavour to a very large quantity of pure *ſpirit*.

When the worm is once infected with this oil, it penetrates ſo deep into the pores of the metal, that a ſimple waſhing will not get it out, but rather it ought to be filled with a lixivium boiling hot, or elſe ſome pure and highly-rectified *ſpirit* ſhould be put into it, and left in it a whole night, to imbibe and carry off with it the oil. Theſe are cautions that may ſeem trifling, but they are in reality of ſo much conſequence, that if rightly attended to, a much purer *ſpirit* will be drawn off this way, than by any other common method. *Shaw*'s Eſſay on Diſtillery.

Proof SPIRITS, or *common ſaleable goods*, are *ſpirits* of any kind of a determinate ſtrength, being the ſame with that of good brandy, and the malt and ſugar *ſpirits* of the diſtillery, as they are uſually ſold; containing equal quantities of rectified *ſpirit* and water.

The common method of examining whether *ſpirits* have this due degree of ſtrength is this. Take a long vial, fill it half way with the common malt *ſpirit*, and give it a ſmart ſtroak by its bottom againſt the palm of the hand, there will then appear on the ſurface a chaplet, or crown of bubbles, which will go off again in a ſtrong manner; that is, firſt remaining a while, and then going off by degrees without breaking into ſmaller bubbles, or ſwelling into larger.

By this experiment all the traders in *ſpirits* judge of the ſtrength of the goods they purchaſe, yet this is a mere fallacy and deception; for if only a little vinous, or ſaccharine matter, as treacle, ſyrup, muſt, rob of fruits, or the like, be added to a quantity of highly-rectified *ſpirit* of wine, this ſlight addition will give a brandy proof to that *ſpirit*.

Whether there be any ſecret for making weaker *ſpirits* ſhew this proof, as well as brandies, *&c.* is not certainly known, but the thing is certainly practicable, ſince arrack, which is but of half the ſtrength of brandy, gives as fair a proof this way; and if a drop or two of any eſſential oil be added to a pint of brandy, it takes off its proof, and makes it appear much weaker than it is. The true ſtrength may, however, always be known, by carefully burning away a meaſured quantity of brandy, *&c.* ſince if it leaves one half water, it is right, if more or leſs, it is too ſtrong, or too weak.

But beſide the falſe method of judging of brandies by what is called *proof*, there is another not leſs fallacious one of judging of their goodneſs, though kept as a great ſecret in the hands of ſome dealers, and imagined a certain criterion to determine whether foreign brandies are mixed with corn *ſpirits*. Theſe diſtillers are provided with a certain yellow liquor, a few drops of which being poured into a glaſs of right French brandy gives it a beautiful blue colour, and by the ſtrength, and goodneſs of this colour, they judge and buy; but if common malt *ſpirit* were tinged with oak, it would give this colour equally with French brandy, and might be purchaſed as ſuch. This proof-tincture is expeditiouſly made, by diſſolving a little green vitriol, firſt calcined to a redneſs in a weak *ſpirit* of ſea-ſalt, which thus becomes a yellow liquor, a ſingle drop or two of which being added to a glaſs of any inflammable *ſpirit*, coloured yellow or brown with oak, or with long remaining in the caſk, will inſtantly turn it of a bright and beautiful blue.

The beſt way of judging in theſe caſes is by the noſe and palate. Dilute a quantity of brandy conſiderably with water, and you will perceive the malt-taſte, if mixed with malt *ſpirits*; or burn a little in a ſpoon, and by the ſmell and taſte of the water it leaves, you will eaſily judge whether there be malt in it. *Shaw*'s Lectures, p. 125, 126.

Proof ſpirits may be diſtinguiſhed into three kinds, *perfect proof*, *more than perfect proof*, and *leſs than perfect proof*. By *perfect proof* is uſually underſtood that crown of bubbles, before mentioned, of a certain ſize, ariſing as a head upon a ſmall quantity of a well-qualified *ſpirit* ſhook in a ſlender vial.

Proof more than perfect, is that in which the bubbles, raiſed by ſhaking the *ſpirit*, are larger than thoſe on the common or perfect proof, and go off more ſuddenly; that is, according as the *ſpirit* is higher, or approaches more to the nature of rectified *ſpirit*, or, as it is uſually called, *ſpirit of wine*.

Proof leſs than perfect, is that wherein the bubbles are ſmaller, and go off quicker and fainter than in perfect proof; the *ſpirit*, in this caſe, being mixed with more than its own quantity of phlegm, or is too poor for ſale.

In commerce, with regard to *ſpirits*, it would certainly be a much better method to aboliſh ſuch uncertain proofs, and to make all the goods of the ſtrength of what we call *ſpirits of wine*; that is, a totally inflammable *ſpirit*, whoſe purity is much greater, whoſe ſtrength may always be found out with exactneſs, and whoſe bulk, ſtowage, carriage, and encumbrance, would be only half, in regard to that of *brandy* or *proof ſpirit*; and it might at all times, as occaſion called for it, be mixed into a great variety of extemporaneous liquors, and the exact degree of ſtrength would be always preciſely known. See the article *Rectified* SPIRITS, infra.

This operation indeed, in the common way, proves ſo tedious and expenſive, and, after all, ſo ſhort of expectation, and ſo generally unſatisfactory, that it is not to be expected that the common diſtillers, till they have fallen into a better manner of working, ſhould come into the propoſal. But if, inſtead of the common way of rectifying by the hot-ſtill, they would try the uſing a large balneum mariæ, made of a large rectangular boiler, and a ſet of tall conical veſſels, they will find that little fire, and little attendance, and conſequently very little expence, will, in this manner, furniſh them with *ſpirits* reduced at once to this ſtandard, and greatly ſuperior, in all reſpects, to the common ones of the ſame ſtrength. In this caſe there would be no need of any addition of ſalts; but the diſtiller may work more perfectly, and more expeditiouſly without them, and thus preſerve the fine eſſential vinoſity of the *ſpirit*, which in the common way of working they conſtantly loſe.

The advantage of this method would be yet greater to the apothecaries, and the makers of compound cordial waters, who want only a pure *ſpirit* of ſuch a ſtrength, and ſuffer greatly in the fineneſs and perfection of their commodities, by the *ſpirit* they are obliged to uſe having in it a fulſome and nauſeous oil of its own, which will always mix itſelf with their compoſitions, and the oils of the aromatics, *&c.* which they add to it. If *ſpirits* were brought to this ſtandard for the market, there would be no poſſibility of deceit, and no farther examination need be made of it by the buyer, than its burning perfectly dry in a ſpoon. *Shaw*'s Eſſay on Diſtillery. See the article STRENGTH.

It is however to be obſerved, that though the burning *ſpirits* away in a ſpoon may ſerve the trader in the common way, yet Mr. Geoffroy has obſerved that they are no proofs for the philoſopher, or the chemiſt, being not at all determinate or exact, though commonly ſuppoſed ſo.

From what has been ſaid, it appears that brandy is much more inflammable than wine, and *ſpirit* of wine much more ſo than brandy, and ought to burn away without leaving any remainder. Hence it is vulgarly ſuppoſed, that ſuch *ſpirit* of wine as burns wholly away contains no phlegm, and that if two parcels of *ſpirit* both burn wholly away in this manner, they muſt be the ſame in ſtrength, and in all their qualities; but Mr. Geoffroy has proved by experiment, that ſuch *ſpirit* as burns wholly away, does yet contain a great deal of water, and that two parcels both may burn thus away, and yet be very different; and that this trial is not determined by the entire abſence of the phlegm, but by its proportion to the oil.

If the ſame *ſpirit* of wine, which in the common way of burning leaves no water, be again tried, by burning it in a hollow veſſel ſet to float in a large quantity of cold water, it will then leave a conſiderable quantity of water; nay, all that is rectified only in the common way leaves a large portion of phlegm on this experiment. The plain reaſon of which is, that this is the only fair trial, the other in the common way being fallacious. In this there is no more water left than was in the *ſpirit*; but in the other, the veſſel becoming heated by the burning of the *ſpirit*, that heat gradually evaporates the water, as the *ſpirit* burns away; ſo that the one is as ſoon gone as the other. But keeping the veſſel cool by external water, prevents that evaporation, and conſequently retains and diſcovers all that cannot burn of the *ſpirit*.

The quantity of water thus diſcovered in *ſpirit* of wine is very great, and it has always been found, that in proportion as the experiment has been made more and more perfect, the *ſpirit* has always appeared proportionably leſs and leſs ſo.

The quality of the phlegm that is left, is alſo of uſe to judge of the *ſpirit* by; if that were perfectly fine, this ought to be perfectly limpid and clear, and without taſte or ſmell: as it wants either of theſe properties, it is a proof of the want of perfection of the *ſpirit* it is obtained from; but the greateſt of all its defects, is its having a coarſe oil ſwimming upon it, and giving the colours of the rainbow in different lights. Mem. Acad. Par. 1718.

Rectified SPIRIT, or *alcohol*. A perfectly *rectified ſpirit* of wine, or ſuch as is entirely freed from water, is a thing of frequent and neceſſary uſe in the nice operations of chemiſtry.

It had uſed to be prepared, either by often diſtilling the *ſpirit*, and every time drawing over only half of it, and repeating this till the half remaining in the cucurbit appeared as ſtrong as that drawn over; or elſe by raiſing it to a great height from the body of the veſſel, and this in a very gentle heat, ſo that *ſpirit* alone could riſe, the water not being capable of being driven ſo far by that degree of heat.

But the accurate Boerhaave always found upon trial, that there was ſtill remaining ſome water in theſe *ſpirits*, whether prepared by the firſt or ſecond proceſs, or both. *Boerhaave*'s Chem. Part 2. p. 124.

The method he therefore invented is this: fill a ſtill half full with the *ſpirit* prepared for *alcohol* in one or the other of theſe ways, add to it half a pound of pure decrepitated, and perfectly dried ſea-ſalt; put this in hot, then place on the head, and carefully lute the junctures; leave this for twelve hours in a heat ſo ſmall, as not to make the *alcohol* boil, then diſtil off the *ſpirit*; keep the firſt two ounces apart, becauſe ſome aqueous vapour may have happened to lodge in the head, or worm of the ſtill, which this certainly waſhes off; after this receive two thirds of the following *alcohol* into a pure dry glaſs-veſſel, and keep it perfectly ſtopped; then draw off the remainder, and keep that by itſelf: there will remain a moiſt ſalt in the ſtill, which has attracted the aqueous matter of the *alcohol*, and held it ſo down, that it could not riſe by the heat of boiling water, which is all that muſt be uſed in this diſtillation; and the ſalt having been firſt decrepitated, never makes any change in the *alcohol*, by adding any thing thereto. By this means an *alcohol* is prepared perfectly pure, and fit for all the uſes of chemiſtry.

The *alcohol* thus perfected is the lighteſt of all fluids next to air; it is extremely pellucid, thin, and ſimple, and is totally inflammable, burning without ſmoak, and without leaving any fæces behind. It has no diſagreeable ſmell in the burning, remains the ſame after diſtillation, is very expanſive with heat, eaſily boils over the fire, is of a grateful odour, and agreeable taſte. This fluid inſtantly coagulates all the juices of the body, except pure water and urine; it hardens the ſolid parts of the body, and preſerves both the ſolids and fluids from putrefaction, or ſpontaneous reſolution; it preſerves the bodies of birds, fiſhes, inſects, and other animals ſuſpended in it, perfect for ages. It mixes almoſt uniformly with water, vinegar, any acid liquors, oils, and pure volatile alkaline ſalts; and diſſolves gummy and reſinous bodies. Hence we are acquainted with no liquor, either natural, or produced by chemiſtry, which will mix with more bodies.

It is in particular an excellent vehicle for the preſiding *ſpirit* of vegetables, as by means of it that *ſpirit* may be commodiouſly extracted from its own body, and fitted for medicinal purpoſes. In the living human body it wonderfully raiſes, gratefully affects, and ſtirs the animal, natural, and vital *ſpirits*, whence it gives encreaſe to the ſtrength, ſenſes, and agility; but by its power of coagulating the blood, ſerum, and other juices, it may kill by being imprudently taken. It inſtantly ſtops bleeding, by at once contracting the veſſels, and coagulating that blood which it touches at the mouths of them; and hence it is a ſudden and powerful remedy in theſe caſes.

If the parts of animals, or vegetables, ſuſpended in *alcohol*, contain any thing oily in them, the *alcohol* immediately extracts it from the matter, which thence becomes ſhrunk, wrinkled, and withered; but ſmall birds with their feathers on, and fiſh that are well covered with ſcales, remain perfectly preſerved in their recent form, by being plunged in hot *alcohol*. When they have been long enough in the *ſpirit* to be perfectly penetrated by it, they may be taken out and dried in a ſlack oven, and afterwards put up in empty glaſſes well ſtopped, where they will remain beautiful ſpecimens for ages. *Boerh.* Chem. Part 2. p. 126.

Alcohol being required on many occaſions to be perfectly pure, and free from the leaſt drop of water, it may be proper to add here the true and infallible rules of judging when it is ſo. Theſe are the following.

1. If any oil be contained in the *alcohol*, it turns milky on being mixed with water.

2. If it contains any acid; when a little of it is mixed with *ſpirit* of ſal armoniac, there will be an effervеſcence, otherwiſe there will be only a ſimple coagulation; and if any thing alkaline be contained in it, this will be diſcovered by the mixing it with acids; as for the other ſalts, they are ſcarce ever contained in the *alcohol*.

Theſe are the teſts of ſuch admixtures, but they are the leaſt common; water is the moſt frequent, and moſt to be ſuſpected in it, and this is the moſt difficult to be diſcovered. To this purpoſe a little of it is to be fired in a ſpoon in a ſtill place, where there is no wind moving, and if no water be left in the ſpoon, this is a fair ſtep toward its anſwering expectation: this, however, alone is by no means to be depended upon. Gunpowder alſo put into a ſpoon, and covered with *alcohol*, if when the whole is burnt away it takes fire, gives another proof that there is but little water contained in it; but this does not prove, any more than the former, that there is none. After theſe trials, the ſureſt is this: take a round chemical vial, capable of holding four or ſix ounces, and having a long neck; fill two thirds of this with *alcohol*, and add to it a drachm of pure ſalt of tartar well dried, and heated very hot; ſhake them well together, and hold them over the fire to make them juſt ſo hot, as that the *alcohol* does not quite boil. If after this the ſalt of tartar is perfectly dry, we may be aſſured that the *alcohol* contains no water, or if any, not to be diſcovered by any experiment hitherto known, unleſs by the water collected from its flame when perfectly burnt.

If after the ſalt of tartar has remained dry ever ſo long at the bottom of this pure *alcohol*, only a drop or two of water be added to it, the ſalt immediately becomes moiſt, and hangs about the bottom and ſides of the veſſel. To this it is to be added, that this pure *alcohol*, when diſtilled, gives no appearance of itſelf, either in the head or neck of the alembic, nor on the ſides of the receiver; neither appearing like the aqueous fluids in moiſt drops, nor like good *ſpirit* of wine, running in veins, but remaining inviſible to the eye, except at the bottom of the receiver. This property of *alcohol* was known to the antient chemiſts, as appears by their writings. *Boerhaave*'s Chemiſtry, Part 2. p. 127.

Water is a ſolvent to *alcohol*, or *ſpirit* of wine, in certain circumſtances, but not ſpontaneouſly, or in all mixtures. If water be gently poured into it, it does not diſſolve it, or mix itſelf with it, but falls through it, and collects itſelf into a ſeparate body at the bottom of the veſſel; as ſoon, however, as they are ſhook together, the *alcohol* begins to blend with the water, though at firſt, or with a little ſhaking, it only is diſperſed in form of unctuous veins through the body of the water, but by continued ſhaking, they perfectly unite. As *alcohol*, therefore, is a pure vegetable oil, produced by a perfect fermentation, its nature is thus perfected, ſo as not only to burn in the fire, but to mix perfectly and eaſily with water: but water impregnated with ſalts will not diſſolve *alcohol*, for a ſtrong ſolution of ſalt of tartar in water, will not be brought to mix with *alcohol* by any ſhaking, nor even by boiling together; but as ſoon as the mixture has ſtood a little, the *ſpirit* gets to the top, and remains perfectly unmixed with the water. Salt of tartar unites itſelf more intimately than many other ſalts to water; and if another ſalt, which more eaſily ſeparates from water, ſuch as Epſom ſalt, be, in the place of ſalt of tartar, diſſolved in water, though the ſolution be ever ſo ſtrong, the liquor will diſſolve *alcohol*; and on their being mixed together, the whole will become turbid and white, and the ſalt will be precipitated in cryſtals. *Boerhaave*'s Chem. Part 1. p. 452.

Water has alſo this remarkable quality, that if mixed with *alcohol*, in which any eſſential oil has been diſſolved, it ſeparates the oil from the *alcohol*. Thus if oil of cinnamon be diſſolved in pure *alcohol*, and water be let fall into this ſolution, the mixture preſently becomes white and opake, though it was perfectly pellucid before; and the oil ſeparates itſelf from the *alcohol*, and gathers into a body. Hence it appears, that *alcohol* is diſqualified by water for the diſſolving of theſe oils; that it alſo more eaſily and readily unites with water than with them; and finally, that theſe eſſential oils, while they appear to be wholly diſſolved in the *alcohol*, and no longer look like oils, but like *ſpirit*, yet are really oils, and eaſily ſeparable in their true form. *Boerh.* Chem. Part 1. p. 453.

Proof *ſpirit* cannot be uſed for burning in lamps, for diſſolving roſins, for making varniſh, and there are a great number of tinctures, ſolutions, and mixtures, for which it cannot ſerve; but *alcohol*, beſide its ready uſe in the medicinal way, may, when the *ſpirit* is of a proper kind, be made into punch, and all other mixtures, with more purity, and a great deal more certainty and exactneſs in point of ſtrength. *Shaw*'s Eſſay on Diſtillery.

Colouring of SPIRITS. The art of giving to diſtilled liquors a colour, which takes off their watery appearance, and gives them a reſemblance of the foreign brandies, *&c.*

The colouring is not only neceſſary on this account, but as we uſually eſteem the *ſpirits* by the proof of the crown of bubbles, it is found that the clean rectified *ſpirit* will not afford this proof till it has received its doſe of the colour. The diſtillers diſpenſe this colour in any proportion that they find convenient or neceſſary: it is always yellow, but according to the degree differs extremely in deepneſs, from the paleſt ſtraw colour to the deepeſt orange. This art of colouring was firſt introduced, from obſerving that all the fine and ſoft foreign brandies, that had the mellowneſs neceſſary to their perfection to the taſte, had alſo a yellow colour. The colour, in this caſe, has indeed nothing to do with the flavour; but that being kept in caſks the ſame age that was neceſſary to give them this mellowneſs, would alſo give them a colour from the wood. It was hence ſuppoſed, that the particular excellence of the foreign brandies depended on the woody colour, and accordingly have been taken to give the ſame colour to our *ſpirits*, by various methods.

The way of obtaining it, by many years ſtanding in the caſk, proved too tedious for our haſty workmen, and accordingly they provided means of giving it extempore by ſtrong tinctures of ſeveral ingredients; the chief of which are logwood, ſaffron, Japan earth, treacle, burnt ſugar, and oak chips: the three former of theſe have but little to recommend them, but the others are found very ready, and very proper for the uſe.

Treacle gives a fine colour, not much unlike that of the foreign brandies, and being neceſſarily uſed in a large quantity, as its colour is but dilute, it not only mends the bubble,

or bead proof, impaired by the rectification, but alſo gives it a fullneſs in the mouth; both which properties are very agreeable to the vulgar, who are the chief retail conſumers of theſe coarſe goods.

Burnt ſugar, that is, ſugar diſſolved in a little water, and ſcorched over the fire till it turns black, goes much farther in the colouring than treacle, and at the ſame time gives no ſweetneſs, but rather an agreeable bitterneſs; and thus recommends itſelf to the nicer palates, that are not for a luſcious *ſpirit*. Indeed ſugar, thus treated, tinges to a great perfection, and that without loſs of time, and with as much cheapneſs as can well be deſired.

The laſt article mentioned, namely, oak chips, is of all others the moſt natural for the imitating the dye of foreign *ſpirits*, as it is the very wood whereof the caſks they come over in are made, and from which they take that colour we are ſo fond of. The colouring with oak has alſo this farther advantage, in *ſpirits* meant as ſophiſtications of the foreign ones, that it will ſtand ſome teſts uſually had recourſe to on the occaſion, which the others will not ſtand.

Common *ſpirit* poured on oak chips, and digeſted in a moderate heat, eaſily fetches out this reſinous part of the wood, on which the colouring depends; but then it does not go near ſo far as the burnt ſugar; a large quantity of oak being required to colour a ſmall parcel of brandy, or *ſpirits*. It is adviſeable not to make the tincture every time, but to have recourſe to an extract of this wood in a liquid form: this extract is beſt made in two menſtruums, alcohol and water, and may be evaporated to any ſtrength, ſo that a very ſmall doſe of it will tinge a great quantity of liquor. The two liquid extracts muſt be mixed together, and as they will be apt to ſeparate in ſtanding, it will be proper to add to them, when newly made, a quantity of fine ſugar; this will give a body to the whole, and it will keep better from mouldineſs than it would without it. *Shaw*'s Eſſay on Diſtillery.

Convertibility of SPIRITS. This is a doctrine that has obtained among many of the moſt curious experimenters, and indeed the moſt intelligent of our chemiſts have always allowed, that provided proper care were taken in the getting together the materials, one *ſpirit* may always be changed into another, as brandy into rum, malt *ſpirit* into brandy, and brandy into malt *ſpirit*. The principles on which this is believed are theſe.

All ſimple *ſpirits* (as they are called) conſiſt of four parts, water, oil, phlegm, and alcohol: the laſt of theſe is the eſſential part, and is what conſtitutes the whole a *ſpirit*. In reducing *ſpirits*, therefore, to their utmoſt degree of ſimplicity and purity, it is evident that the three ſuperfluous parts are to be got rid of, and the fourth left alone; by this means the alcohol is procured diſtinct, and is a liquor *ſui generis* of many peculiar qualities, not to be found in any other fluid.

Among others it has theſe remarkable properties. 1. When abſolutely purified, it is an uniform and homogene liquor, capable of no farther ſeparation, without loſs or deſtruction of ſome of its homogeneous parts. 2. It is totally inflammable, having no ſoot, nor any moiſture behind. 3. It has no peculiar taſte or flavour, any more than pure water, except what is owing to its nature as alcohol, or perfectly pure *ſpirit*. 4. It is an unctuous and criſpy fluid, running veiny in the diſtillation, and its drops rolling on the ſurface of any other fluid, like peaſe upon a table, before they unite. 5. It appears to be the eſſential oil of the body it is obtained from, broken very fine, and intimately and ſtrongly mixed with an aqueous fluid, which is aſſimilated, or changed in its nature in the operation. 6. And laſtly, it ſeems to be a kind of univerſal fluid, producible with the ſame properties from every vegetable ſubject; but to produce it thus, requires ſome care in the operation.

On theſe principles is founded the opinion, that all *ſpirits* may be reduced to a perfect ſimilarity, or ſameneſs, from whatever ſubject they were procured, and on this depends their convertibility into one another; for when once they are brought to this ſtandard of ſimplicity, there needs nothing more than to add the oil of ſuch of the finer *ſpirits* as is required to convert the *ſpirit* into that particular kind. By this means the ſame taſteleſs *ſpirit*, whether obtained from malt, ſugar, or grapes, may be made into either malt *ſpirit*, brandy, or rum, by adding the eſſential oil of the grape, ſugar, or malt; and thus what was once malt *ſpirit*, ſhall become brandy, or whatever elſe the operator pleaſes.

Many methods have been attempted to obtain the firſt point, that is, the reducing the *ſpirit* to perfect and pure alcohol. The moſt practicable means ſeem to be long digeſtion, and the repeated diſtillation from water into water, where the eſſential oil will at once be left upon two ſurfaces, and the acid imbibed. The ſhorter ways are thoſe by rectifying from neutral abſorbent ſalts and earths; ſuch are ſugar, chalk, and the like. And laſtly, the uſe of fixed alkalies may be tried, for theſe very forcibly keep down both the phlegm and oil; inſomuch that this laſt method promiſes to be the ſhorteſt of all, if the art were known of utterly aboliſhing the alkaline flavour, which the alcohol is apt to acquire in this operation, and which, for this purpoſe, is by no means ſuitable, as abſolutely deſtroying all vinoſity, which univerſally conſiſts in a fine volatile, pungent acidity. The diſtillers are the only people, whoſe buſineſs would lead them to make the experiment. This method of converting one *ſpirit* into another, would be of immenſe profit to them if they could perfectly ſucceed in it; but as it would require time and ſlow proceſſes to bring it about, there is but little hope of its ever being brought to bear among them, while they are in their preſent ſcheme of doing every thing with diſpatch and hurry.

Dr. Shaw has ſaid a vaſt deal in the praiſe of a taſteleſs *ſpirit*, which is producible from a vegetable ſubſtance, only overlooked, as he tells us, becauſe it is too common, with which all the foreign *ſpirits* might be imitated to the utmoſt perfection by means of their eſſential oils, all thin fine wines raiſed to any due degree of ſtrength, without giving them the brandy flavour, and many other things of great uſe performed; but he has not told us what the vegetable ſubſtance is from which we are to obtain this. *Shaw*'s Eſſay on Diſtillery.

SPIRITS, in medicine, are of uſe, in external applications, to wounds and ſores. They ſtimulate ſores, reſiſt putrefaction, harden the fibres, coagulate the liquors, hinder ſuppuration, and quicken the pulſe when abſorbed.

Tinctures of abſorbent and aromatic powders are often made with the ſame intention, and partake of the nature of their ingredients, but principally of the *ſpirit*. Med. Eſſ. Edinb. Vol. 5. Art. 24. See the articles ABSORBENTS and AROMATICS.

The power of brandy, or any thing of this kind, in killing worms, is evident from this, that the children of the people in the northern iſlands of Scotland, who are accuſtomed from their infancy to drink that coarſe ſort of brandy which they call *aqua vitæ*, never are troubled with worms. It is a dangerous practice to uſe brandy in this general manner, but on ſome occaſions it may be very ſerviceable. Philoſ. Tranſ. N° 233.

The danger of the frequent and immoderate uſe of *ſpirits* is too well known from experience, and acknowledged by phyſicians; but a late ingenious writer thinks it not improbable that many, eſpecially ladies, are led gradually to the uſe of thoſe poiſons by a certain complaiſant pharmacy, too much uſed in the modern practice: thus palſy-drops, poppy-cordial, plague-water, and ſuch like, which being in truth nothing but drams diſguiſed, yet coming from the apothecaries, are conſidered only as medicines. He therefore recommends to them the uſe of tar-water, a cordial not only ſafe and innocent, but giving health and *ſpirit* as ſurely as other cordials deſtroy them. See TAR-*water*.

The *ſpirits* of wine, or other fermented liquors, produce irregular motions, and ſubſequent depreſſions in the animal *ſpirits*; whereas the *ſpirit*, lodged and detained in the native balſam of pines and firs, is of a nature ſo mild and benign, and proportioned to the human conſtitution, as to warm without heating, to cheer, but not inebriate, and to produce a calm and ſteady joy, without that ſinking of *ſpirits* which is a ſubſequent effect of all fermented cordials.

Acid SPIRITS. *Acid ſpirits* extracted from foſſils, and applied to animal bodies, coagulate the liquids, and mortify the ſolids; by being diluted with water, they approach to vinegar.

By diſſolving metallic ſubſtances in theſe *ſpirits*, their corroding ſphacelating power is increaſed, and ſome of them give ſuch pain, as to bring on convulſions. Med. Eſſ. Edinb. Vol. 5. Art. 2.

Ætherial SPIRIT *of Frobenius*, *ſpiritus ætherius Frobenii*, a name given by Frobenius, and others, to a liquor famous for its extreme volatility, and many other qualities, and prepared by him in this manner. Take four pounds of the beſt oil of vitriol, and the ſame weight of rectified *ſpirit* of wine: firſt pour the *ſpirit* of wine into a glaſs retort, and then pour to it, by little and little, an ounce of the oil of vitriol, ſhake the retort till the two liquors are thoroughly mixed; the veſſel will then begin to grow warm; then pour in more of the oil of vitriol, ſhaking it again, and ſo on, putting in an ounce of the oil of vitriol at a time, and allowing about an hour's time for making the whole mixture, leaſt the ſudden violent heat they excite ſhould burſt the veſſel. When the whole quantity is perfectly mixed, place the retort in a ſand-furnace, the heat of which is as near as poſſible the ſame with that of the veſſel, which will be at this time very conſiderable; take out ſome of the hot ſand, and place the retort in the center of the reſt; then adding more of the hot ſand round it, apply a large receiver to the noſe of the retort; let this receiver be placed on a veſſel of cold water, and covered with a double flannel wetted with cold water; raiſe the fire gradually, till the drops fall ſo faſt, that you may count five or ſix between each; and beſide theſe drops, the upper hemiſphere of the receiver appears filled with a white vapour. This heat is to be continued ſo long as the *ſpirit* ſmells like ſweet marjoram; as ſoon as this aromatic flavour goes off, and the

ſmell

ſmell becomes acid and ſuffocating, like that of brimſtone; take away the receiver, and put out the fire, for all that ariſes after this period is only a gas of ſulphur, and is of no uſe.

The greateſt precaution muſt be uſed in this whole diſtillation, otherwiſe the liquors in the retort will run over into the receiver; the fire muſt ceaſe, as ſoon as the *ætherial ſpirits* are gone over, for there remains behind an oleum vini, which is extracted out of the *ſpirit* by the force of the acid, and will ariſe in the retort, and often runs over, or cauſes exploſions. On the ſecond day, when the retort is cold, pour on the matter that remains in it half as much alcohol, or rectified *ſpirit*, as at firſt, that is two pounds by weight; and then repeating the whole proceſs of the diſtillation, exactly as before, there will come over half as much as at firſt of the *ætherial ſpirit*. On the third day after this proceed in the ſame manner, and you will have ſo much more. In this manner the operations are to be repeated, till no more *ætherial ſpirit* can be raiſed, and all turns to a carbo. Then ſeparate it, and alkaliſe it with *ſpirit* of ſal armoniac, made without *ſpirit* of wine, till all effervescence ceaſes; then diſtil it once more in a balneum mariæ, and it is fit for experiments.

There are more products to be got out of the proceſs. 1. A balſamic oil. 2. A terra-foliata tartari, which is of a glittering hue, and is not fuſible as the common one, prepared with vinegar and the fixed ſalt, is. This is very uſeful in medicine. And 3. a purple earth is to be extracted out of the caput mortuum. Phil. Tranſ. N° 461. p. 870.

The properties of the *ætherial ſpirit* are, 1. That it is ſo extremely volatile, that it evaporates immediately, and does not appear to wet the finger which is dipped in it. 2. That it is ſo extremely inflammable, that it will take fire at a very great diſtance from any flame. 3. That it is of a very pleaſant and aromatic ſmell. And 4. that it does not mix with water.

We have ſeveral curious obſervations on this *æther of Frobenius* by Mr. Groſſe, in the Memoirs of the Academy of Sciences. This Gentleman had obſerved, that in diſtilling *ſpirit* of wine from a ſolution of alum, there was produced a liquor of an agreeable aromatic ſmell, not unlike that of the *æther*; and on this principle he conceived an opinion, that this *æther* was not to be ſought in the common oils of plants, but in ſome mixture of *ſpirit* of wine with a vitriolic acid: and Mr. Geoffroy's papers affording ſome hints alſo to the ſame purpoſe, Mr. Du Hamel, in concert with Mr. Groſſe, determined to attempt the diſcovery with the utmoſt pains on this baſis, and after many unſucceſsful trials, Mr. Groſſe found out three different methods of making it, of which he gives the following account.

Take a pound of pure, uncoloured, and well-rectified oil of vitriol, and two pounds of well-rectified *ſpirit* of wine. The oil of vitriol muſt be firſt put into a retort, and the *ſpirit* of wine afterwards added by a little at a time. There ariſes a very violent heat on the mixing theſe liquors, and the mouth of the retort is to be ſtopt when they are mixed, and the veſſel ſet by for two or three days; in which time the mixture aſſumes a reddiſh colour. After this the retort is to be placed in a ſand-heat, and the diſtillation being made, there firſt ariſes a ſmall quantity of very ſweet ſcented *ſpirit* of wine; after this there ariſes another liquor in white clouds; and after this, on continuing the diſtillation, there comes over another, which is very ſulphureous and volatile, and very ſtrongly affects the noſe, and would indeed ſuffocate a perſon, if its vapours were received in large quantities. After this there ariſes an acid phlegm, and what remains in the retort is a black maſs.

It appeared very plainly by the ſmell, that the *æther* was contained in theſe diſtilled liquors, the manner of ſeparating it was the only difficulty; and after ſeveral tedious experiments with ſal armoniac, and other things, Mr. Groſſe happily thought of trying common water, as the moſt ſimple and eaſy of all methods, to weaken both the ſulphureous acid and the *ſpirit* of wine, which he judged the only obſtacles to the *æther* from ſhewing itſelf in its true form; and this was founded on that remarkable property of the *æther*, of not mixing with water, though blending itſelf very readily with *ſpirit* of wine. On pouring a large quantity of water on theſe diſtilled liquors, the *æther* immediately ſeparated itſelf from the reſt, and by reaſon of its extreme lightneſs roſe all at once to the ſurface of the water. This did not, however, yield it perfectly pure; but adding a little ſalt of tartar to this, the remainder of the acid ſulphureous *ſpirit* was abſorbed, and the *æther* obtained perfectly pure and fine, as that made by Frobenius himſelf.

As the *æther* had been by this means ſeparated from the whole diſtilled matter, it did not clearly appear which of the ſeveral different matters, that ſucceeded one another in the diſtillation, contained it, the reſt ſeeming only a load to the proceſs: with this thought Mr. Groſſe, to try by the ſmell which was moſt likely to contain it, in a ſucceeding diſtillation pricked the bladder, that luted the junctures of the retort and receiver, with a pin, and judging of the ſeveral liquors, as they ſucceeded one another, by their ſmell, he determined that the firſt was only a very highly-rectified *ſpirit* of wine; the ſecond, which came over in white clouds, ſmelt very ſtrongly, and perfectly like the *æther*: this ſeemed indeed the whole matter of the *æther*, the reſt ſerving only to abſorb it. The third liquor had a very penetrating and ſuffocating ſmell of ſulphur.

From theſe obſervations this gentleman attempted the making the *æther* in this ſecond manner. All being prepared as before, he diſtilled off the *ſpirit* of wine, or firſt liquor, and as ſoon as the white vapours began to appear in the retort, he took off the fire, for there was no doubt but the remaining heat was ſufficient for the diſtillation of ſo very volatile a liquor as the *æther*. This ſucceeded accordingly, and the clouds all coming over, and the remaining *ſpirit*, or third liquor, remaining behind in the retort, the *æther* was now found in the receiver, mixed only with a ſmall quantity of *ſpirit* of wine, or with a very ſmall portion, at the utmoſt, of the ſucceeding *ſpirit*. An addition of water ſeparates the *æther* from the *ſpirit*, as in the former proceſs, and if it be not ſufficiently dry and clean when thus procured, it may be diſtilled over again with a gentle heat; and it is remarkable, that if it be diſtilled this ſecond time, without previouſly adding any water, it comes over firſt into the receiver; though the *ſpirit* of wine comes firſt in the common, or primary operation.

Theſe are very ſimple and eaſy ways of making this famous *ſpirit*; but though they uſually ſucceed, yet they have ſometimes failed, even in the hands of the inventor, and that though all the circumſtances of the proceſs have been the ſame, the failure being owing to ſome imperceptible difference, either in the oil of vitriol, or in the *ſpirit* of wine; though this, however, has ſometimes made the proceſs fail in the two former ways, Mr. Groſſe adds a third, in which he obſerves that it always ſucceeded with him.

By this method the *æther* is procured perfectly dry and pure, without the mixture of water, or of the alkaline ſalts. For the ſeparation, or purification of it, the method is this: when the white vapours have appeared, the whole matter in the receiver is to be poured into a ſmall retort, which being placed over a lamp, the *æther* will immediately riſe, and diſtil into the recipient; when half the liquor is come over, or, at the utmoſt, two thirds of it, the lamp is to be taken away, that the *ſpirit* may not riſe, and make a new mixture. Thus the pure *æther* is, without farther trouble, found in the receiver. Mem. Acad. Par. 1734.

Coal-SPIRIT. See the article COAL-*ſpirit*.

Fœtid SPIRIT, *ſpiritus fœtidus*, a new medicine introduced into the practice of phyſic, and directed to be made of any fixed alkaline ſalt a pound and half, ſal armoniac a pound, aſſa fœtida four ounces, and proof-*ſpirit* three quarts, diſtilling off five pints with a gentle heat. *Pemberton*'s Lond. Diſp. p. 205.

Foreign SPIRITS, a general name by which our dealers in theſe things call brandy, rum, and arrack.

It is hard to purchaſe any of theſe genuine and pure, unleſs at the firſt hand, and in large quantities. The dealers generally mix our own *ſpirits* with them. When we had little other *ſpirit* but that of malt made with us, this cheat was eaſily diſcovered, for a nice palate would diſtinguiſh the mixture of only a tenth part of this foul *ſpirit* among the foreign clean ones; but ſince we have the melaſſes *ſpirit* ſo common, and rectified to ſo great a perfection, the deceit is not eaſily found out, though a larger proportion is uſed.

All *foreign ſpirits* are to be ſuſpected of this adulteration, which have not an uniform taſte, and grateful odour. But one of the beſt ways of diſcovering the mixture, is to burn away all that is inflammable in a ſmall quantity by way of trial, and then examine the phlegm.

The great art of this ſophiſtication conſiſts in the purity, and well rectified ſtate of the *ſpirit*; and when the diſtiller can furniſh himſelf with ſuch a *ſpirit* as will not be found out, though mixed in a large quantity with brandy or rum, he is very near the art of making brandy and rum himſelf. *Shaw*'s Eſſay on Diſtillery.

SPIRIT *of lavender*, a form of medicine, which has been uſed to be compounded of a vaſt number of ingredients; but the late London Diſpenſatory has greatly ſhortened the catalogue of them, by ordering this to be made only of lavender flowers and roſemary tops, or the ſimple *ſpirit* of each; and the addition of cinnamon and nutmeg, of each half an ounce, and red ſanders three drachms to two quarts of the *ſpirit*. The ſimple *ſpirits* are to be mixed in the proportion of three parts lavender, and one part roſemary, or elſe the ingredients proportioned in the ſame manner. *Pemberton*'s Lond. Diſp. p. 248.

Malt-SPIRIT. See the article MALT-*ſpirit*.

SPIRIT *of melaſſes*. See MELASSES-*ſpirit*.

Glauber's SPIRIT *of nitre*, *ſpiritus nitri Glauberi*, in pharmacy, a form of medicine made thus: take of nitre three pounds, and of the ſtrong *ſpirit* of vitriol one pound; let them be mixed with caution, and gradually, under a chimney; and afterwards let them be diſtilled, firſt with a gentle heat, and then with a ſtronger. *Pemberton*'s Lond. Diſpenſ. p. 191.

Dulcified SPIRIT *of nitre*, *ſpiritus nitri dulcis*, a form of medicine ordered to be made thus: take of rectified *ſpirit* of wine one quart, and of Glauber's *ſpirit of nitre* half a pound; mix them by pouring the *ſpirit of nitre* on the other, and diſtil the mixture with a gentle heat, as long as what comes off will not raiſe any fermentation with a lixivial ſalt. *Pembert.* ibid. p. 198.

This is much uſed by our diſtillers to give a vinoſity to thoſe *ſpirits*, whoſe natural flavour of that kind they have deſtroyed by the improper uſe of alkaline ſalts in the rectifications. Nothing can be more proper for this purpoſe than this *ſpirit*, as it really gives the brandy flavour, and is not at all prejudicial to health, but very well falls in with the nature of the *ſpirit*, and promotes its medicinal properties as a diuretic, deobſtruent, and lithontriptic.

In order to bring the uſe of this *ſpirit* to a greater certainty and perfection, it is to be obſerved, 1. that there is a great difference in *ſpiritus nitri dulcis*, according to the manner of its preparation; ſuch of it being moſt apt to fly off from the *ſpirit* as had leaſt pains taken about its incorporation by digeſtion, or repeated diſtillation.

2. Any rectified clean *ſpirit*, impregnated with a proper doſe of *ſpiritus nitri dulcis*, and kept in a ſound glaſs veſſel cloſe ſtopt, will a long time retain that vinoſity it obtains from it, and which it would otherwiſe have loſt in a very ſhort time.

3. The caſks long uſed to receive rectified *ſpirits*, impregnated with this acid, uſually appear yellow and rotten, or corroded within like the bottom of a cork, which ſtops a vial of *ſpirit of nitre*. It hence appears no wonder that the vinous taſte, given by this addition, is ſooner loſt in the caſk than in a bottle.

4. When the inflammable *ſpirit* has been rectified with fixed alkalies, it always requires a much larger proportion of the *ſpiritus nitri dulcis*, to give it this vinoſity, than when rectified only by repeated diſtillation; and this vinoſity given by the acid is ſooner loſt, as the *ſpirit* was more impregnated by the alkalies uſed in the rectification. This is the reaſon of that odd obſervation, that melaſſes *ſpirit* retains the vinoſity given it by *ſpiritus nitri dulcis* much longer than malt *ſpirit*; the former having had little, if any, of the alkaline ſalt uſed in the rectifying it, of which the latter, by reaſon of its natural foulneſs, has had a great deal.

5. The beſt way of making this volatile acid, whether with or without external heat, is not uſually practiſed, *viz.* ſo as to render it a perfectly homogeneous and uninflammable liquor, whence it proves much more volatile than it ought to be. Thus when perfect alcohol, and a well rectified ſtrong *ſpirit of nitre*, are by degrees put together for the making of this vinous acid; one half of the mixture evaporates in the conflict, or may be made to diſtil away ſo, as to leave the other half more fixed. The method of making it is alſo improveable, by uſing in the preparation a *ſpirit* of wine impregnated with ſome fine flavoured ingredient, which has not much oil, for acids do not readily mix where there is much oil.

In the preparation of this *dulcified ſpirit of nitre*, the longer it ſtands in digeſtion with the *ſpirit* of wine, the milder it grows; and by the ſame means, alſo, the violently corroſive oil of vitriol may be ſo blunted, as to be rendered ſcarce perceptible to the taſte. In fine, a *ſpiritus nitri dulcis* may be made by a ſlow digeſtion, greatly ſuperior to that commonly uſed, and of ſo fixed a nature, that it will not be ſubject to have its flavour fly off from the *ſpirit* it is mixed with, any ſooner than the native vinoſity of brandy will of itſelf fly off from that *ſpirit*, as it always will in time. A proper care in the preparation of this acid might free the diſtillers from that troubleſome neceſſity they are under of adding their *ſpirit of nitre*, juſt before they ſend their goods away, for fear the flavour ſhould be loſt before the *ſpirit* is all uſed, and ſo the ſophiſtication be found out. There is no fixing any certain proportion, in which the acid is to be mixed with the *ſpirit*, but in general it is beſt not to overdo it; for though it will give an agreeable vinoſity to any tolerably clean *ſpirit*, the perſon will be much deceived, who attempts to drown the bad flavour of a foul one by it. *Shaw*'s Eſſ. on Diſtillery.

SPIRIT *of ſalt*. See the article SALT.

Strength of SPIRITS. See the article STRENGTH.

SPIRIT *of ſulphur*, the ſame as oil of ſulphur. See the article SULPHUR.

SPIRITO, in the Italian muſic, is uſed to ſignify that a performer ſhould ſing or play with vigour, life, and *ſpirit*. Hence we meet with *con ſpirito* in cantatas and ſonatas.

SPIRITUS *rector of vegetables*. See the article ARCHÆUS.

SPIRITUS *tartari*, the name of a medicine very famous in Germany, and probably in the greater eſteem, becauſe of the difficulty of preparing it. It is the *ſpirit* of ſalt of tartar volatilized; and is ordered by Langelot to be made in this manner: let two or three pounds of crude tartar be burnt to a blackneſs, in order to have what is moſt neceſſary, a ferment to ferment the tartar with; put this into a large pot, and pour to it ſo much water as will ſerve to ſtand an inch above it; make this mixture luke-warm, and then pour into it half a handful of crude tartar powdered, bubbles of air will ariſe upon this, and will continue ſome time; when they ſeem to decreaſe, more powdered tartar is to be added from time to time, to keep up this fermentation. The bubbles will be large, and riſe in cluſters, and reſemble bunches of grapes in all but colour. The fire all this time muſt be carefully managed, and the tartar put in gradually, that the fermentation do not become too great, or the pot run over.

After this the matter is to be put together into an iron retort, and a very gentle fire kept under it for ſome time, and gradually heightened, ſo as to force up all the ſalt; this being done, the volatilized ſalt is to be carefully ſeparated, and it is remarkable, that the ſalt is ſo wholly volatilized by this fermentation, that there ſcarce remains any fixed ſalts in the caput mortuum in the retort.

The liquor in the receiver is to be rectified by another diſtillation, the water, neceſſarily uſed in the fermentation, rendering it too weak. When it is rectified ſo far, that it appears whitiſh, it is known to be of a due ſtrength, and it is then the famous *ſpirit of tartar*, not only celebrated for its medicinal virtues, but famous for extracting tinctures that can be obtained from no other menſtruum. *Langelot*, de Digeſt. et Ferm.

SPIRITUS *volatilis aromaticus*, a name given of late to what uſed to be called *ſal volatile oleoſum*. The modern way of making it is this: take eſſence of lemons, and oil of nutmegs, of each two drachms, oil of cloves half a drachm, dulcified *ſpirit* of ſal armoniac a quart; diſtil the whole with a very gentle heat. *Pemberton*'s London Diſpenſatory, p. 205.

SPISSUM, in the antient muſic, was uſed to ſignify thoſe two ſmaller conjunct intervals of a tetrachord, which taken together, were leſs than the third. *Wallis*'s Append. Ptolem. Harm. p. 165.

The Greek term for this was πυκνον. This happened in the enharmonic, and the three chromatic genera; in each of which the interval, between the hypate and the lichanos, was leſs than the interval between the lichanos and the nete. To the *ſpiſſum* was oppoſed the *non-ſpiſſum*, απυκνον, or *rarum*, as Martianus Capella tranſlates it. The απυκνον happened in the two diatonic genera, where the two ſmalleſt intervals were equal to, or greater than the third. They were ſuppoſed equal in the diatonicum molle, and greater in the intenſum. *Wallis*, ibid. See the article GENUS.

SPIZA, in zoology, a name by which the antient naturaliſts called the chaffinch. See the article FRINGILLA.

SPLANCHNICA, a name given to medicines appropriated to diſeaſes of the bowels.

SPLEEN (*Cycl.*)—Mr. du Vernoi has added one opinion more to the many already given, concerning the uſe of the *ſpleen*. From obſerving a large empty ſpace near the *ſpleen*, in the abdomen of a dead body, the proportional largeneſs of its blood-veſſels, and the ſtructure of the *ſpleen* analogous to that of the penis, he concludes the *ſpleen* in a living perſon to be ſubject to inflations like a bellows: but how it is thus to be moved, or to what purpoſe, he does not tell us. See Comment. Acad. Petrop. Tom. 4. p. 156. ſeq.

Mr. Lieutaud argues for the *ſpleen*'s being larger by a greater quantity of blood in it, when the ſtomach is empty, and that this blood is preſſed out, when the ſtomach is full, to increaſe the ſecretion of bile. Hiſt. de l'Acad. des Scienc. 1733.

We have an account, in the Philoſophical Tranſactions, N° 451. of the extirpation of part of the *ſpleen* of a man, which had begun to mortify; notwithſtanding which, the man recovered.

The *ſpleen* has been cut out of dogs without any damage. Mr. Boyle mentions his having ſeen the experiment tried on a young ſetter, who recovered in a fortnight. Works Abridg. Vol. 1. p. 27.

Dr. Pozzi relates the phænomena he remarked in diſſecting a dog, whoſe *ſpeen* was cut out when he was young. The liver, which was larger and more heavy than ordinary, was alſo more brittle; the vena portarum was enlarged; the gall-bladder was full of bile, more acrid than it is commonly. From theſe appearances he thinks the uſe of the *ſpleen* to be for ſeparating a liquor like to ſpittle, which may dilute the bile, and prevent its too great acrimony. Med. Eſſ. Edinb.

The uncertainty we are in, as to the real uſe of the *ſpleen*, has given ground, perhaps, to the notion that men might live without the *ſpleen*; and that, in many caſes, it might contribute much to health to cut out this uſeleſs viſcus. In the Journal des Savans, there is an account of a method of deſtroying it, without the terrors of the operation of opening the body.

This was done by a perſon who applied a wooden knife to the ſurface of the body where the *ſpleen* is lodged, and ſtriking forcibly on it with a mallet, told the patient that he had broken the ſubſtance of the *ſpleen*; and that after this it required only the taking certain medicines which he prepared, utterly to deſtroy and carry it out of the body.

The folly of a pretence of this kind, one would think, ſhould have

have been alone ſufficient to have laughed it out of the world; but numbers of people ſubmitted to the operation, till a youth in Peterſburg unhappily being killed by a blow of the kind here mentioned; and his belly ſwelling greatly, excited the curioſity of his relations to have it opened. The cauſe of his death was found to be an hæmorrhage, which had filled the cavity of the abdomen, and which proceeded from the *ſpleen*'s having been burſt by the blow. This convinced them, that attempts to wound the *ſpleen* were no longer to be looked upon as the means of health. Act. Petrop. Vol. 1. p. 381.

Infarction of the SPLEEN, *infarctus lienis*, a diſeaſe conſiſting in an inflation of this lax and celluloſe viſcus, owing its origin to a reſtriction of the blood toward the *ſplenic* branch, in which nature ſeems to have intended the relieving herſelf from the load of a plethora, by the diſcharging a part of the maſs through the vaſa brevia. *Junker*'s Conſp. Med. p. 194.

The *infarctus lienis* differs from an obſtruction of the *ſpleen*, in that this laſt is a total ſuppreſſion of the blood in it, this only a partial one. It is too often confounded with nephritic complaints, and is indeed, in general, of the claſs of hypocondriac maladies, but only ariſes from a ſpecial and peculiar derivation of the blood to that one viſcus, not to any other of the circumjacent parts.

Signs of it. An *infarction of the ſpleen* is diſcovered by an inflation of the left ſide, a little below the ſpurious ribs, attended with permanent pains, but theſe not very acute, or violent: theſe complaints have frequent remiſſions, ſeldom continuing above a day or two in the ſame ſtate. During the time of the ſymptoms being worſt, there is a difficulty of breathing, and an anxiety of the præcordia, and generally a lowneſs of ſpirits: to theſe it may be added, that there is uſually a dry cough, and frequent belchings.

Perſons ſubject to it. Men are in general much more ſubject to this diſeaſe than women, unleſs at the middle and more advanced periods of life, when they are more ſubject to it than the men. People of a melancholic habit alſo are moſt afflicted with it, and ſuch as have before had hypocondriac complaints, and have been injudiciouſly treated with aſtringents; and all perſons of a ſedentary and ſtudious life, or who employ much time in thinking.

Cauſes of it. Theſe are a ſedentary life, and a diet of too heavy and thick a kind; an omiſſion of habitual bleedings, or other evacuations, or a ſuppreſſion of the menſtrual or hæmorrhoidal diſcharges; an injudicious treatment of intermittent fevers with aſtringents, or of acute ones with too cooling medicines, and an habitual coſtiveneſs: and to theſe may be added an hereditary diſpoſition.

Prognoſtics in it. This is a diſeaſe of no immediate danger to the patient, and the more recent it is when taken in hand, the eaſier it is cured; if left to itſelf it becomes habitual, and brings no danger of death with it, but if improperly treated, it frequently becomes the baſis of the moſt obſtinate kind of quartans, or degenerates into a ſcirrhus, which may be a long time ſuffered without any danger of life; but finally, the whole too often ends in ſlow hectic fevers, and œdematous and aſcitic ſwellings. In women it often terminates in a vomiting of blood; and ſometimes, but very rarely, an inflammatory and ſuppurating ſtaſis ſupervenes, and a black, fetid, and purulent matter is voided by ſtool or by vomiting.

Method of cure. The plethoric habit, which gives riſe to this complaint, is to be taken down by copious bleedings in the right foot, and then ſhould be repeated every ſpring and autumn; and the menſes muſt be brought to a proper regularity in the uſual way, as muſt alſo the hæmorrhoids in the other ſex, by the application of leeches to the part. The ſpiſſitude of the blood is to be amended by decoctions of elecampane, hyſſop, and the like; and by moderate and repeated doſes of tartarum vitriolatum, gum ammoniacum, &c. and gentle doſes of rhubarb and ſena in infuſion muſt be taken at times. To theſe may be added the external uſe of reſolvents and ſtrengthners, ſuch as ointment of marſhmallows, the plaiſter of gum ammoniacum, and the like; and finally, the preparations of ſteel are to be given: to theſe ſome add a number of things eſteemed ſpecifics, ſuch are madder and caper roots, dodder, yarrow, white maidenhair, and ſpleenwort, and the bark of the aſh-tree, and wood of the tamariſk. *Junker*'s Conſp. Med. p. 197.

Scirrhus of the SPLEEN. This is an indurated tumor of the *ſpleen*, cauſed by a ſtagnation and inſpiſſation of the humors from the exhalation of their thinner parts. This complaint is ſometimes compleat, and ſometimes incompleat; but in the moſt favourable caſes it is a greatly more dangerous complaint than an infarction of the *ſpleen*, and more difficult of cure. *Junker*'s Conſp. Med. p. 201.

Signs of it. Theſe are a ſenſible and palpable hardneſs under the ribs on the left ſide, extending toward the loins, with a ſenſe of a weight, as it were, hanging in this part; and hence the lying on the right ſide is always very painful and uneaſy. The face has dull deadneſs in the look, which ſometimes is communicated alſo to the ſkin of the whole body, and there is uſually a blackneſs about the orbits of the eyes; there is alſo a ſenſation of a narrowneſs in the breaſt, with ſome difficulty of breathing, and a dry cough. The appetite is uſually voracious, but ſometimes it is affected with nauſeas, without any apparent cauſe. The bowels are uſually ſomewhat coſtive, but irregularly ſo. The mind alſo ſeems affected, and a gloomy moroſeneſs, ſilence, and anxiety, oppreſs the perſon, without any viſible cauſe. Finally, there uſually is a ſwelling in the right foot, which by degrees extends itſelf farther, and is ſeldom regarded at firſt.

Perſons of both ſexes are equally ſubject to this diſorder, but it is not, however, very common. Men who have long been ſubject to hypocondriac diſorders, and women ſubject to hyſteric complaints, are moſt ſubject to it; and to theſe may be added, perſons of an indolent, ſpeculative, and ſedentary life, and thoſe who have been imprudently treated with aſtringents in intermittent caſes.

Cauſes of it. Beſide thoſe before mentioned, a ſcirrhus is ſometimes brought on in the *ſpleen* by a violent blow, or other external injury; a too thick diet may alſo be very inſtrumental in laying the foundation for it; and not a little may be added to all theſe caſes, by violent paſſions of the mind.

Prognoſtics in it. In recent *ſcirrhuſes*, and ſuch as are yet incompleat, there is ſome hope of ſucceeding in the attempt of a cure; and on the contrary, in old caſes and compleat *ſcirrhuſes*, there is indeed very little hope: but there is this comfort for the patient, that even ſuch a one, when wholly left to itſelf, will remain many years without endangering life.

There is in a *ſcirrhus* an eternal tendency to corruption, but this is rather to be expected from ſphacelation, than from an inflammatory ſuppuration; but when emollients are uſed, there is great and imminent danger: for as theſe are nearly allied to the maturating remedies, they may produce their effect; and it is certain, that no laudable ſuppuration is ever to be expected in this caſe.

Method of treatment. This caſe is to be treated in the ſame general manner with the infarctions of the *ſpleen*, already mentioned; but the more powerful reſolvents are to be uſed in this, as the more ſtubborn caſe. Gentian, bryony, and arum root, with the fine aperient roots, and the capillary herbs, with the powerful gums, as galbanum, ſagapenum, ammoniacum, and the reſt. Bleeding muſt alſo be ordered, as ſoon as the primæ viæ have been cleanſed; and externally the plaiſter of cicuta, with ammoniacum, may be applied: but if the caſe is fixed and obſtinate, it is better to let all applications alone, and leave nature to do the beſt for herſelf. *Junker*'s Conſp. Med. p. 202.

SPLEEN, in ichthyology. The *ſpleen* in fiſhes is uſually ſituated near the ſtomach, in the left ſide of the abdomen. Its figure is generally triangular, ſometimes oblong. Its colour is always more duſky and obſcure than that of the liver.

SPLEEN-*wort*. See the article LONCHITES.

SPLENECTOMIA, the name given to the chirurgical operation of cutting out the ſpleen. Many have thought that the ſpleen was an uſeleſs part of the human body, and even noxious; but this ſeems to be a very raſh opinion.

SPLENIA, a word uſed by ſurgeons to expreſs compreſſes, or rags ſeveral times doubled, applied to wounds over the plaiſters, or other dreſſings.

SPLENII *inferior*, in anatomy, a name given by Cowper to a muſcle, called by Albinus *ſplenicus colli*, and by Winſlow, and others, *maſtoidæus poſterior*, and *portio inferior ſplenii*. See the article SPLENIUS.

SPLENITIS, in medicine, the name of a ſpecies of fever, in which the blood is powerfully directed toward the ſpleen by nature, in order to break and diſſolve congeſtions formed there. The *ſplenitis* differs from what authors call an *infarctus lienis* in degree, as in this the blood only ſtagnates in ſome degree, and is not wholly obſtructed; and as there is no acute inflammatory fever here, as there is in the *ſplenitis*.

The *ſplenitis* is very various in degree; in ſome caſes the whole parenchymatous ſubſtance of the ſpleen being affected, in others only its membranaceous and ſuperficial parts. It is eaſy to conceive that the former caſe is greatly the more dangerous of the two.

Signs of it. This diſeaſe always firſt attacks people with a very remarkable ſhivering and coldneſs; this is ſucceeded by a very terrible heat, and intolerable thirſt; and there is a preſſive pain, and a ſenſible ſwelling in the left hypocondrium. If the patients expoſe themſelves a little to the open air, the extremities grow cold almoſt immediately; if a hæmorrhage happens, it is always from the left noſtril: and finally, the urine is reddiſh and turbid, and after the fourth day depoſits a roſe-coloured ſediment, which has ſomewhat of the appearance of matter. Plethoric perſons are more than all others ſubject to this diſeaſe.

Cauſes of it. The general cauſe is a plethora joined with a thickneſs of the blood, which forms ſtaſes, and fixed coagulations in the ſpleen; and the fever itſelf is no other, than the attempt of nature to break through thoſe ſtaſes, by the additional velocity of the motion of the blood. The uſual accidents that bring on this bad ſtate of the blood,

are the omiſſion of habitual bleedings, or the ſuppreſſion of the natural diſcharges of the menſes or hæmorrhoids; and the occaſional accidents that immediately bring on the diſeaſe in this ſtate of the blood are, violent commotions of the mind, ſudden chilling of the body when very hot, as by drinking cold water immediately after violent exerciſe, the taking violently aſtringent medicines in fevers, and an improper uſe of cooling external remedies in diſorders of the ſpleen, as the infarctions of it, and the like. *Junker*'s Conſp. Med. p. 292.

Prognoſtics in it. It is always a very dangerous diſeaſe, though not ſo fatal as the hepatitis, or a like inflammatory ſtate of the liver; but it is remarkable, that as the vomiting a black matter in the hepatitis is always a fatal ſymptom, ſo in this diſeaſe the ſame matter is frequently voided, but it is here ſalutary, and frequently carries off the diſeaſe. The appearance of the hæmorrhoids has alſo been frequently obſerved to have the ſame good effect. When the inflammation lies deep, it is moſt frequently fatal; when it is ſuperficial, it is often carried off: but when it ſeems cured, it ſometimes is found afterwards to have degenerated into an incurable ſcirrhus of the part.

Method of cure. The firſt thing to be done, is to open the bowels by a clyſter, and they are afterwards to be kept from becoming coſtive, by a repetition of the ſame means. Bleeding is uſually neceſſary, and may be performed once or more in the beginning of the diſeaſe; then gentle diaphoretics are to be given with juleps ſlightly acidulated. Theſe are the proper medicines for the morning; and in the afternoon powders of nitre, vitriolated tartar, and crabs eyes, ſated with lemon juice, are to be given with the cooling emulſions; and if the pains be very violent, they may be mitigated, by giving ſmall doſes of a gentle anodyne, ſuch as the ſtorax pill, with the beforementioned powders. If the ſuppreſſion of the habitual hæmorroidal evacuations are ſuſpected to be the cauſe of the diſeaſe, leeches muſt be applied to the parts, and no wine, or any other ſtrong liquor, muſt be allowed, till the decline of the diſeaſe. *Junker*'s Conſp. Med. p. 293.

SPLENITIS is alſo uſed by ſome authors to expreſs a tumor or inflammation of the ſpleen.

Splenitis is alſo uſed as the name of a vein in the left hand, the ſame as the *ſalvatella*. The vein of this kind in the right hand is called *jecoraria*.

SPLENIUS, called alſo *maſtoidæus poſterior*, in anatomy, a flat, broad, oblong muſcle, ſituated obliquely between the back part of the ear, and the poſterior and lower part of the neck.

It is partly ſingle, and partly made up of two portions, one ſuperior, the other inferior. Theſe two portions are cloſely united backward, making only one plain, but they are divided above.

The ſuperior portion is fixed to the extremities of the three or four loweſt ſpinal apophyſes of the neck, and of the firſt, and ſometimes the firſt and ſecond of the back. It is not fixed immediately to the apophyſes of the neck, which are above the laſt, but only by the intervention of the poſterior cervical ligament. It is likewiſe fixed to the edge of the interſpinal ligaments of the other vertebræ; from thence it runs obliquely toward the maſtoide apophyſis, and is inſerted in its upper part, and along the neighbouring curve portion of the tranſverſe ridge of the os occipitis.

The inferior portion of the *ſplenius* is fixed to three or four ſpinal apophyſes of the back, beginning by the ſecond or third, and afterwards running up till it reaches the ſuperior and lateral part of the neck. It is inſerted in the tranſverſe apophyſes of the three or four ſuperior vertebræ of the neck, by the ſame number of extremities a little tendinous; theſe, however, are ſometimes only two in number. The two *ſplenii* repreſent a great Roman V, and the *ſplenius*, and ſterno-maſtoidæus of the ſame ſide, form a figure like a Roman A, or the legs of a pair of compaſſes, the points of which are in an horizontal plane. *Winſlow*'s Anatomy, p. 239.

SPLENIUS *capitis*, in anatomy, a name given by Albinus to a muſcle, called by Winſlow, and others, the *maſtoidæus ſuperior*, or upper portion of the *ſplenius*. Riolanus, and others, call it the *triangularis ſplenii*.

SPLENIUS *colli*, in anatomy, a name given by Albinus to a muſcle, called by Winſlow, and others, *maſtoidæus poſterior*, or the lower portion of the *ſplenius*; and by Cowper the *muſculus inferior ſplenii*. See SPLENIUS, ſupra.

SPLICE (*Cycl.*)—*Cut*-SPLICE, in a ſhip, is when a rope is let into another with as much diſtance as one pleaſes, ſo as to have it undone at any time, and yet be ſtrong enough.

Round-SPLICE, is when a rope's end is ſo let into another, that they ſhall be as firm as if they were but one rope.

SPLINTERS *of bone*, in fractures. In caſes of fractures the ſurgeon is frequently troubled with *ſplinters of the bone* in the way, which vellicate and prick the neighbouring parts, and render the proper execution of his office very difficult. If theſe *ſplinters* are looſe, and have no connection with the bone, they muſt be carefully lifted out of the wound; if they hang to the bone in ſome part by the perioſteum, that muſt be cut off with the ſciſſors; but if they adhere pretty firmly to the neighbouring parts, and do not hinder the reduction of the bone, it is beſt to replace the bone, and leave them either to looſen, and come out of themſelves by the ſuppuration of the parts, or to grow again, as they ſometimes will ſafely and firmly do, to the reſt of the bone. When they adhere pretty firmly to the principal parts of the bone, they ſhould never be extracted by force, but replaced with the greateſt exactneſs: for when this is properly performed, they will frequently unite to the reſt of the bone.

When the points of *ſplinters of bone* ſtick ſo far out, that they are a great hindrance to the reduction of the bone, you are diligently to conſider whether you can, by any means, contrive their reunion to the bone, which may be determined, by obſerving at what diſtance they are from the large bone, and what quantity of fleſh there is intervening: when they cannot be reduced, or reunited to the bone, they muſt be removed with a pair of ſtrong forceps, or, if they ſtick very firmly, with a fine ſaw. If the *ſplinters* are buried under the ſkin, and cannot be got at with hands, it is proper firſt to try if they can be reduced to their natural ſituation; and if they cannot, an inciſion muſt be made through the ſkin, that they may be taken out. *Heiſter*'s Surg. p. 109.

SPLIT, in botany, a name given by ſome authors to the great *fumaria bulboſa*, or hollow root. *Rupp.* Flor. Sen. p. 216.

SPLIT, at ſea. When a ſail is blown to pieces, the ſeamen ſay it is *ſplit*.

SPLITTING. To *ſplit* a thin piece of metal, as an old ſilver groat, place the metal on the heads of three pins ſtuck up triangularly, and let a heap of flower of brimſtone burn out upon it; then throwing it hard againſt the floor, the upper part will ſeparate from the lower. *Boyle*'s Works Abr. Vol. I. p. 134.

SPOLIARIUM, among the antient Romans, the third part of the bath, uſed for undreſſing and dreſſing in. *Pitiſc.* Lex. Ant. in voc.

Spoliarium was likewiſe a part of the gladiatorial ſchools, where their cloths and ornaments were laid, and where the wounded and killed were carried. *Pitiſc.* l. c.

SPONDIAS, in botany, the name given by Linnæus to the genus of plants, called by Plumier *monbin*; the characters are theſe. The perianthium is plain and permanent, and conſiſts of one leaf, divided into five ſegments at the edge. The flower is compoſed of five oval and expanded petals. The ſtamina are nine filaments, five of which are placed in a circle, the others are of the ſame length with theſe, which is that of the cup. The antheræ are ſimple. The germen of the piſtil is oval. The ſtyle is very ſmall, and is terminated by three obtuſe and permanent ſtigmata. The fruit is an oval berry in every cell, of which there are contained four nuts. *Linnæi* Gen. Plant. p. 175. *Plumier*, Gen. 22.

SPONDYLI, Σπονδυλοι, in antiquity, pellets of braſs uſed in giving ſentence, before the κυαμοι, or beans, came into uſe. *Potter*, Archæol. Græc. Tom. I. p. 119.

SPONDYLOLITHOS, a name given by authors to a ſtone found in the country of Tyrol, and elſewhere, reſembling the vertebræ of an animal. It is in reality no other than the vertebræ of ſome ſea-fiſh petrified, as is common with us.

SPONDYLUS, in natural hiſtory, a name given by authors to a kind of oiſter of an oblong and umbonated form, of which there are ſeveral ſpecies. See OSTREA.

SPONGIA, *ſpunge*, in botany, the name of a genus of plants, the characters of which are theſe: that it is ſoft and elaſtic, naturally growing under water, and pervious by multitudes of holes.

The ſpecies of *ſpunge*, enumerated by Mr. Tournefort, are theſe. 1. The fineſt *ſpunge* with very ſmall cavities. 2. The great flatted *ſpunge*. 3. The globular, or round *ſpunge*. 4. The funnel-faſhioned *ſpunge*. 5. The cup-like *ſpunge*, divided into ſegments at the edges. 6. The branched *ſpunge*. 7. The conic-ſhaped branched *ſpunge*. 8. The ſhrubby-branched *ſpunge*. 9. The branched river-*ſpunge*. 10. The hairy *ſpunge*. 11. The ſail *ſpunge*. 12. The tubular long American *ſpunge*. 13. The very long-branched rope-like American *ſpunge*. 14. The headed and fingered American *ſpunge*. 15. The American honeycomb *ſpunge*. 16. The flatted and elegantly punctuated American *ſpunge*. *Tourn.* Inſt. p. 575.

Burnt *ſpunge* is much recommended as a ſweetner of the blood, and a diuretic. Some have pretended to cure the leproſy with it, and others extol it againſt the bite of a mad-dog; but theſe are virtues not univerſally received.

SPONGIOLI, a word uſed by ſome authors to expreſs the ſmall button muſhrooms, which are gathered before they expand or open their heads.

SPONSUS, one of the many names given by the chemiſts to mercury.

SPORADIC *diſeaſes*, diſtempers which ſeize particular perſons at any time or ſeaſon, or in any place. They are thus called, in contra-diſtinction to the epidemic diſeaſes, which are peculiar to certain times and ſeaſons, or to peculiar places.

SPORTS, in the cuſtoms of Flanders, were in great vogue through Flanders and the Low-Countries, ſome centuries ago. Every city had a ſolemnity of this kind peculiar to itſelf: thus Bruges had that called the *Foreſter*; Valenciennes the *Prince of Pleaſantry*, and the *Prince of the Horſe-comb*; Cambray the *King of Ribaldry*; and Bouchain the *Provoſt of Sots*. Liſle, one of the richeſt towns in Flanders, was not behind hand with its neighbours in celebrating *ſports*, by the magnificence and diverſions whereof, to draw together a vaſt concourſe of people from all parts. One of the chief of theſe divertiſements was called the *King of the Spinet*, *Roy d'Epinette*; which was celebrated with a great deal of pomp and ſhew. See Hiſt. Acad. Inſcript. Tom. 4. p. 452, ſeq.

SPOT (*Cycl.*)—SPOT, in ornithology, the name of a particular ſpecies of pigeon, called by Moore the *columba maculata*. It is of the ſize of a ſmall common pigeon, and was brought over to England from Holland. This ſpecies has always a *ſpot* upon its head, juſt above its beak, from whence it has its name. The feathers of the tail are always of the ſame colour with this *ſpot*, and the reſt of the body is all white. The *ſpot* and tail are black in ſome, red in others, and yellow in others. They look very beautiful when they ſpread their tails and fly, and are a diſtinct ſpecies, as they always produce young ones of their own marks. *Moore*'s Columb. p. 44.

SPRING, (*Cycl.*) in mecanics, is uſed to ſignify a body of any ſhape, perfectly elaſtic.

Length of a SPRING may, according to its etymology, ſignify the length of any elaſtic body, but it is particularly uſed by Dr. Jurin to ſignify the greateſt length to which a *ſpring* can be forced inwards, or drawn outwards, without prejudice to its elaſticity. He obſerves this would be the whole length, were the *ſpring* conſidered as a mathematical line; but in a material *ſpring*, is the difference between the whole length, when the *ſpring* is in its natural ſituation, or the ſituation it will reſt in when not diſturbed by any external force, and the length or ſpace it takes up when wholly compreſſed and cloſed, or when drawn out.

Strength, or *force of a* SPRING, is uſed for the leaſt force or weight, which, when the *ſpring* is wholly compreſſed or cloſed, will reſtrain it from unbending itſelf. Hence alſo the force of a *ſpring* bent, or partly cloſed, is uſed for the leaſt force or weight, which, when the *ſpring* is bent thro' any ſpace leſs than its whole length, will confine it to the ſtate it is then in, without ſuffering it to unbend any farther.

The theory of *ſprings* is founded on this principle, *ut tenſio, ſic vis*; that is, if a *ſpring* be forced or bent inwards, or drawn outwards, or any way removed from its natural ſituation, its reſiſtance is proportional to the ſpace by which it is removed from that ſituation.

This principle was verified by the experiments of Dr. Hook [b], and ſince him by thoſe of others, particularly by the accurate hand of Mr. George Graham.—[b Lectures *de potentia reſtitutiva*, 1678.]

For the better in elligence of this principle, on which the whole theory of *ſprings* depends, ſuppoſe a *ſpring* C L reſting with the end L againſt any immoveable ſupport, but otherwiſe lying in its natural ſituation, and at full liberty; then if this *ſpring* be preſſed inwards by any force p, or from C towards L, through the ſpace of one inch, and can be there detained by that force p, the reſiſtance of the *ſpring*, and the force p, exactly counterballancing one another; then will the force $2p$ bend the *ſpring* through the ſpace of two inches, $3p$ through three inches, $4p$ through four inches, &c. The ſpace C l (Fig. 2.) through which the *ſpring* is bent, or by which its end C is removed from its natural ſituation, being always proportional to the force which will bend it ſo far, and will detain it ſo bent.

Fig. 1.

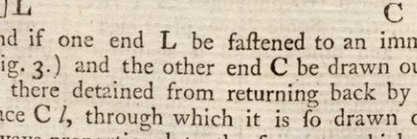


Fig. 2.

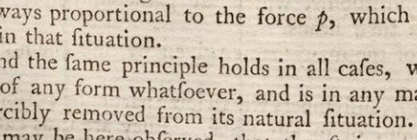
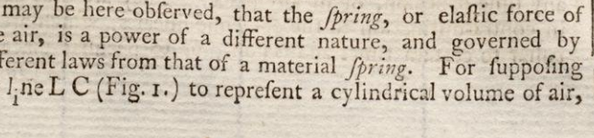


Fig. 3.

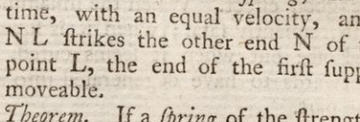


And if one end L be faſtened to an immoveable ſupport, (Fig. 3.) and the other end C be drawn outwards to l, and be there detained from returning back by any force p, the ſpace C l, through which it is ſo drawn outwards, will be always proportional to the force p, which is able to detain it in that ſituation.

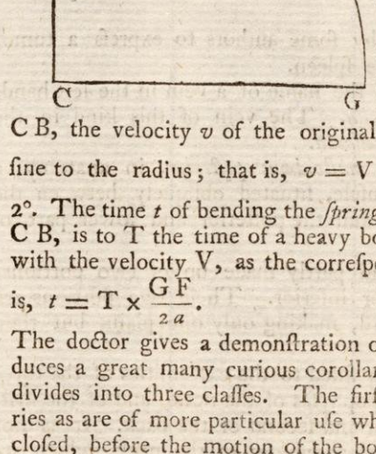
And the ſame principle holds in all caſes, where the *ſpring* is of any form whatſoever, and is in any manner whatſoever forcibly removed from its natural ſituation.

It may be here obſerved, that the *ſpring*, or elaſtic force of the air, is a power of a different nature, and governed by different laws from that of a material *ſpring*. For ſuppoſing the line L C (Fig. 1.) to repreſent a cylindrical volume of air, which by compreſſion is reduced to L l, (Fig. 2.) or by dilatation is extended to L l, (Fig. 3.) its elaſtic force will be reciprocally as L l; whereas the force, or reſiſtance of a *ſpring*, will be directly as C l.

This principle being premiſed, Dr. Jurin gives us a general theorem concerning the action of a body ſtriking on one end of a *ſpring*, while the other end is ſuppoſed to reſt againſt an immoveable ſupport. And leſt any objection ſhould be formed againſt the poſſibility of an immoveable ſupport, ſince any body, how great ſoever, may be moved out of its place by the leaſt force, he obſerves, that the objection may eaſily be removed. Thus, if the *ſpring* L M be ſuppoſed continued to N, ſo that L N = L M, if a body M, with any velocity in the direction M L, ſtrikes one end of the *ſpring*, and a body N, at the ſame time, with an equal velocity, and a contrary direction, N L ſtrikes the other end N of the continued *ſpring*, the point L, the end of the firſt ſuppoſed *ſpring* will be immoveable.



Theorem. If a *ſpring* of the ſtrength P, and the length C L, lying at full liberty upon an horizontal plane, reſt with one end L againſt an immoveable ſupport; and a body of the weight M, moving with the velocity V, in the direction of the axis of the *ſpring*, ſtrike directly on the other end C, and thereby force the *ſpring* inwards, or bend it through any ſpace C B; and a middle proportional C G be taken between the line $CL \times \frac{M}{P}$, and $2a$, a being the height to which a heavy body would aſcend in vacuo with the velocity V; and upon the radius R = C G be erected the quadrant of a circle G F A: then,



1°. When the *ſpring* is bent through any right line of that quadrant, as the body M, is to be C B, the velocity v of the original velocity V, as the coſine to the radius; that is, $v = V \times \frac{BF}{R}$.

2°. The time t of bending the *ſpring* through the ſame ſine C B, is to T the time of a heavy body's aſcending in vacuo with the velocity V, as the correſponding arch to $2a$; that is, $t = T \times \frac{GF}{2a}$.

The doctor gives a demonſtration of this theorem, and deduces a great many curious corollaries from it. Theſe he divides into three claſſes. The firſt contains ſuch corollaries as are of more particular uſe when the *ſpring* is wholly cloſed, before the motion of the body ceaſes.

The ſecond comprehends thoſe relating to the caſe, when the motion of the body ceaſes before the *ſpring* is wholly cloſed. And

The third, in caſe the motion of the body ceaſes at the inſtant that the *ſpring* is wholly cloſed.

We ſhall mention ſome of the laſt claſs, as the moſt ſimple; having firſt premiſed, that P = ſtrength of the *ſpring*, L = its length, V = the initial velocity of the body cloſing the *ſpring*, M = its maſs, t = time ſpent by the body in cloſing the *ſpring*, A = height from which a heavy body will fall in vacuo in a ſecond of time, a = the height to which a body would aſcend in vacuo with the velocity V, C = the velocity gained by the fall, m = the circumference of a circle, whoſe diameter is 1. Then,

1°. If the motion of the body ſtriking the *ſpring* ceaſe, when it is wholly cloſed, the initial velocity V is equal to $C\sqrt{\frac{PL}{2MA}}$.

2°. The initial velocity V is proportional to $\sqrt{\frac{PL}{M}}$.

3°. If P L be given, either in the ſame or in different *ſprings*, the initial velocity V is reciprocally as $\sqrt{M}$.

4°. The product of the initial velocity, and the time ſpent in cloſing the *ſpring*, or V t is equal to $1'' \times \frac{m\,CL}{4A}$; and is proportional to L the length of the *ſpring*.

5°. The initial quantity of motion, or M V, is equal to $C\sqrt{\frac{PLM}{2A}}$.

6°. M V is proportional to $\sqrt{PLM}$, or to P t. And if P L be given, either in the ſame or different *ſprings*, M V is as $\sqrt{M}$.

7°. If $\frac{P}{L}$ be given, either in the ſame or in different *ſprings*, the initial quantity of motion is as the length of the *ſpring* into the time of bending it.

8°. If a quantity of motion M V bend a *ſpring* through its whole length, and be conſumed thereby, no other

quantity of motion equal to the former, as $n\,M \times \frac{V}{n}$, will close the same *spring*, and be wholly consumed thereby.

9°. But a quantity of motion, less or greater than M V, in any given ratio, may close the same *spring*, and be wholly consumed in closing it; and the time spent in closing the *spring* will be respectively less or greater, in the same given ratio.

10°. The initial *vis viva*, or $M\,V^2$, is equal to $\frac{C^2\,P\,L}{2\,A}$; and $2\,a\,M = P\,L$.

11°. The initial *vis viva* is as the rectangle under the strength and length of the *spring*; that is M V V is as P L.

12°. If $\frac{P}{L}$ be given, the initial *vis viva* is as P^2, or as L^2.

13°. If the *vis viva* $M\,V^2$ bend a *spring* through its whole length, and be consumed in closing it; any other *vis viva*, equal to the former, as $n\,n\,M \times \frac{V^2}{n\,n}$ will close the same *spring*, and be consumed thereby.

14°. But the time of closing the *spring* by the *vis viva* $n\,n\,M \times \frac{V^2}{n\,n}$, will be to the time of closing it by the *vis viva* $M\,V^2$, as *n* to 1.

15°. If the *vis viva* $M\,V^2$ be wholly consumed in closing a *spring* of the strength P, and length L; then the *vis viva* $n\,n\,M\,V^2$ will be sufficient to close, 1°. either a *spring* of the strength $n\,n\,P$, and length L. 2°. Or a *spring* of the strength *n* P, and length *n* L. 3°. Or of the strength P, and length $n\,n\,L$. 4°. Or if *n* be a whole number, the number $n\,n$ of *springs*, each of the strength P, and length L, one after another. We may add, that it appears from hence that the number of similar and equal *springs* a given body in motion can wholly close, is always proportional to the squares of the velocity of that body. And it is from this principle that the chief argument, to prove the force of a body in motion to be as the square of its velocity, is deduced. See FORCE, *Appendix*.

The theorem abovementioned, and its corollaries, will hold equally, if the *spring* be supposed to have been at first bent through a certain space, and by unbending itself, to pass upon a body at rest, and thereby to drive that body before it, during the time of its expansion: only V, instead of being the initial velocity with which the body struck the *spring*, will now be the final velocity, with which the body parts from the *spring* when totally expanded.

It is also to be observed, that the theorem, &c. will hold equally good, if the *spring*, instead of being pressed inward, be drawn outwards by the action of the body. The like may be said, if the *spring* be supposed to have been already drawn outwards to a certain length, and in restoring itself draw the body after it. And lastly, the theorem extends to *springs* of any form whatever, provided L be the greatest length it can be extended to from its natural situation, and P the force which will confine it to the length. See Phil. Transf. N° 472. sect. 10.

SPRING, in natural history. Nothing is more certain, than that some *springs* wholly owe their origin to rains, though this is not the case with others. Those intermitting *springs*, which flow very largely after great rains, and then are gradually dried up, are owing wholly and entirely to rains; but those are not the only ones, but some of the perennial *springs*, which run in summer as well as winter, and in dry as well as wet seasons, are owing also to rains or vapours of a like kind: thus those *springs*, found at the tops of mountains, seem to be owing to the thick mists which we every day see hanging about the top of those mountains.

Though some *springs* are thus evidently owing to rain and vapours, yet others are plainly of some very different origin. The temporary *springs*, or irregular fountains we find in many parts of the world, cannot come from rains or dews, much less can those regular periodic fountains, of the nature of the Zirchnitzer sea in Carniola, and the fountain of Loire in France, and that of Lambsbourne in England: and it is yet less possible, that such vast perennial *springs*, as those of Wellowbridge in our kingdom, and of the Sorgue in France, can come from rains; for all the water that falls in the whole country about these places, in rains and dews, is not nearly so much as that which issues from them. *Plot*, de Origin. Font.

It is said [b] that in the diocese of Paderborn, in Westphalia, there is a *spring* which disappears twice in twenty four hours, and always returns at the end of six hours with a great noise, and with so much force, as to turn three mills not far from its source. It is called the *bolder-born*, or boisterous *spring*.—[b Philos. Transf. N° 7. p. 127.]

Burning, or *Boiling* SPRINGS. The *burning spring* near Grenoble in Dauphine is famous: St. Augustin speaks of it as extinguishing lamps which are lighted, and lighting those which are extinct [c]. But it is now cold like others; only near it is a spot of ground, which still emits a light flame; over which some imagine it might antiently have passed [d].

—[c *August.* de Civ. Dei, lib. 21. cap. 7. & 11. Mem. Acad. Inscipt. Tom. 9. p. 565. d Mem. Acad. Scien. An. 1699. p. 26.]

At Bosely, near Wenlock in Shropshire, there is a famous boiling well, which was discovered, in June 1711, by an uncommon noise in the night, so great, that it awakened several people, who being desirous to find what it was owing to, at length found a boggy place under a little hill, not far from the Severn; and perceiving a great shaking of the earth, and a little boiling up of water through the grass, they took a spade, and digging up some part of the earth, the water flew to a great height, and was set on fire by a candle. This water was for some time afterwards constantly found to take fire, and burn like spirit of wine; and after it was set on fire, it would boil the water in a vessel sooner than any artificial fire, and yet the *spring* itself was as cold as any whatever. Phil. Transf. N° 334.

This well was at length lost for many years, and not recovered till May 1746, when by a rumbling noise under ground, like to what the former well made, it was hit upon again, though in a lower situation, and thirty yards nearer the river.

The well is four or five feet deep, and six or seven wide; within that is another less hole of like depth, dug in the clay, in the bottom whereof is placed a cylindric earthen vessel, of about four or five inches diameter at the mouth, having the bottom taken off, and the sides well fixed in the clay, rammed close about it. Within the pot is a brown water, thick as puddle, continually forced up by a violent motion, beyond that of boiling water, and a rumbling hollow noise, rising and falling by fits five or six inches. It may be fired by a candle at a quarter of a yard distance; and it darts and flashes in a violent manner, about half a yard high. It has been left burning forty eight hours, without any sensible diminution. It may be extinguished by putting a wet mop upon it, which must be kept there a small time. On the removal of the mop there succeeds a sulphureous smoke, lasting about a minute, and yet the water is very cold to the touch. Phil. Transf. N° 482. sect. 6.

Lancarim SPRING. See the article LANCARIM.

SPRING-*arbor*, in a watch, that part in the middle of the *spring*-box, about which the *spring* is wound or turned, and to which it is hooked at one end.

SPRING-*box*, in a watch, the cylindrical case, or frame, that contains within it the *spring* of the watch.

SPRINGER, in ichthyology, a name given by authors to the grampus, or arca.

SPRINGES, (*Cycl.*) a sort of horsehair nooses, made so as to run very easy, and planted in the places where birds run in some particular path, to take them as they pass.

Those birds that frequent the waters, or love to paddle and feed in wet and plashy places, are the most easily taken by these *snares*.

The sportsmen who would use them to advantage, must first carefully search out the haunts and places where the fowls come in flocks, or in couples, and feed in the morning and evening hours. The furrows and water-tracks in these places are principally to be regarded; and wherever the several furrows, or water-courses, meet in one, and afterwards divide into several others, these places are to be remarked above the rest: the places which have most marks of the birds feet, give also the surest of all proofs, that they are well frequented. When these places are found, there should be placed a number of small and short sticks cross-wise overthwart all the other passages, one stick being placed about half an inch from another, and making together a kind of fence, guarding every way, except that one through which it is intended the fowls should pass. This being done, a good stiff stick is to be provided, cut flat on each side; both ends of this stick are to be planted under water, so that the upper part of the flat side may only be upon a level with the surface; then a bow is to be made of a hazel, or willow, in the form of a pear, broad and round at one end, and narrow at the other, and at least a foot long, and five or six inches wide; at the narrow end of this there is to be a nick or dent. Then a stiff young grown plant of hazel, elm, or withy, is to be chosen, being bushy and clear, and without knots, three or four inches about at the bottom, and about an inch at the top. Having made the bottom end of this sharp, at the top of it there must be fastened a very strong loop, made of about an hundred horsehairs, platted very fast together with strong packthread, and made to slip any way with great ease. This noose or loop should be just of the dimensions of the pear-fashioned loop before mentioned. Then hard by this loop, and within an inch of the end of the plant, there is to be fastened with strong horsehair a broad and thin trigger, made sharp at both ends. Then the bigger sharp end of the plant being made fast in the ground, just by the edge of the water; the smaller end, with the loop and the trigger, must be brought down just to the first bridge; and the pear-fashioned hoop being set upon the bridge, one end of the trigger must be set upon the nick in the hoop, and the other end on the

nick made on the ſmall end of the plate, which by the violence and bend of the plant will make them all ſtick together till the hoop be removed. This done, the loop is to be laid upon the hoop in ſuch faſhion as the hoop is proportioned: then from each ſide of the hoop little ſticks are to be pricked, as before directed, making as it were a kind of impaled path-way, widening it all the way as it goes farther from the hoop, and making it ſo conſiderably wide at the end, that any fowl that chances to come that way may be entered a conſiderable way in, before ſhe perceives the fence; by this means the bird will be enticed to go ſtrait on to the *ſpringe*, and as ſoon as ſhe touches it, either with head or feet, ſhe will be certainly caught; and thus if the plant be ſtrong enough, the largeſt bird may be caught as eaſily as the leaſt.

When the ſmaller fowls, that frequent watery places, are to be taken by this engine, it is to be made only a great deal ſlighter. When it is intended for ſnipes, woodcocks, or the like, the main plant may be of willow, hazel, or grown ozier, or any other pliant wood that will eaſily bend, and will recover its ſtraitneſs again. The uſe of this engine is limited to the winter-ſeaſon, and to times when there is much wet upon the ground. If there happen any great froſts, ſo that there is no advantage to be made of the wet places firſt deſcribed, then the ſportſman is to look for ſome place where there is a conſiderable fall, and where the current is not frozen, and in this place the *ſpringes* are to be ſet; and the greater the froſts are in this caſe, the more birds there will be taken.

There is another uſe of *ſpringes* for birds, which is the taking, by means of them, certain birds on the boughs of trees and in hedges, which is often attended with very great ſucceſs. The ſportſman, for this purpoſe, muſt firſt mark ſome tree where the birds very much reſort; then fix on ſome particular branch that is tolerably ſtrait, and cutting off all the twigs to within a foot or two of the top, he is there to bore a hole through the branch with a piercer or wimble, large enough to admit a gooſe-quill. Then another branch is to be pitched upon, at about a foot diſtance from the firſt, and all its boughs are to be pared away up to a certain height. There is to be fixed to this branch a packthread of half a foot long, and at the end of this is to be tied a nooſe of plated horſehair. The branch to which the packthread is faſtened, is then to be ſtooped ſo far, that the nooſe may be brought through the hole in the other branch, and faſtened there by means of a little ſtick four fingers long, and hooked at the end, juſt fitting the hole, and ſo brought into it, as juſt to ſtop the flying back of the other branch. Then there is to be placed beyond the nooſe ſome bait of a fruit, or inſect, as a cherry, a pear, or a worm, or any other thing which the bird, intended to be taken, is known to be fond of: this is to be ſet in ſuch a manner, that the bird can no way get at it but by ſetting its feet on the ſmall ſtick which ſupports the nooſe, and ſtops the hole. The weight of the bird will throw down the ſtick, and the bird will then be caught by the legs, and tied faſt to the branch where the hole is, by the flying back of the other branch where the packthread is faſtened.

There is yet another method in uſe for the taking many kinds of birds, from the partridge or pheaſant to the blackbird. This is made in the following manner, and is to be placed either on the ground, or on a tree, buſh, or hedge, according to the nature of the bird intended to be taken by it. A ſtrait and even piece of willow, or ſallow, is to be choſen, of about ſix feet long, and of the thickneſs of a walking cane; this is to be ſharpened at one end, and ſtuck down into the ground, and at the other end there is to be faſtened a ſmall crook; then two holes are to be made in the ſtick, the one big enough to admit a gooſe-quill, the other ſmaller; and a piece of ſtick is to be choſen, which being bent will ſpring back to its ſtraitneſs again, ſuch as holly, or the like: this ſhould be about three feet long, and the larger end of it is to be fixed in the larger hole of the firſt ſtick; the ſmaller end muſt have faſtened to it a packthread, at the end of which there is a nooſe of horſehair: this is to be brought through the ſmaller hole, and be pegged in ſo ſlightly, as juſt to prevent its flying back of itſelf. Then the *ſpringe*, or nooſe, is to be ſpread on the peg, and a bait, proper for the bird intended to be taken, is to be placed at a proper diſtance; ſo that the bird cannot come at it but by treading on the peg, which will give way under its weight, and the ſtick, to which the packthread is faſtened, will fly back, and the bird will be conſequently caught in the nooſe, and have its legs drawn cloſe to the other ſtick.

SPRINGING *a leak*, at ſea, is ſaid of a ſhip that begins to leak. See the article LEAK.

SPROD, among the fiſhermen of many parts of England, a name given to the ſalmon while in its ſecond year's growth. *Willughby*, Hiſt. Piſc. p. 189. See the article SALMON.

SPULLERS *of yarn*, in our old writers, perſons that work at the *ſpole*, or wheel. It alſo denotes triers of yarn, to ſee if it be well ſpun, and fit for the loom. *Blount*.

SPUN-*hay*, in the military art, hay twiſted in ropes, very hard, for an expedition in the winter-time; each trooper carrying as much as he can behind him.

SPUNGE, (*Cycl.*) *ſpongia*, in botany. See the article SPONGIA.

This ſpecies of ſea plant, when burnt, yields the ſame ſmell with hair or horns, or other parts of animal bodies.

A pound of *ſpunge* when weighed in a humid ſeaſon, on drying carefully in a ſtove without injuring its texture, will be reduced to eleven ounces. This quantity being diſtilled by the retort in the common way, and the principles ſeparated, and the ſalt and ſpirit rectified, there will be found an ounce and half of a reddiſh phlegm, or a ſpirit ſo weak, as ſcarce to afford any ſmell or taſte; an ounce and half of a volatile urinous ſpirit; and an ounce, four drachms and a half of a volatile urinous ſalt; half an ounce of a fetid thick oil; half an ounce of a fix'd ſalt, which, beſide the common lixivial alkali, contains ſome ſea ſalt; and five ounces of a caput mortuum, in which the magnet diſcovers ſome particles of iron.

The weight of all theſe amounts to that of the dried *ſpunge* put in, within three drachms, which is a moderate loſs from evaporation, and from ſome little remains which will always ſtick to the veſſels. By this analyſis we find, that *ſpunge* gives nearly as much volatile ſalt as raw ſilk, which yields the moſt of any known animal ſubſtance; and the difference between the quantity, yielded by that ſubſtance and this, is not more than four grains from the ounce. Mem. Acad. Par. 1706.

A wet *ſpunge* applied to bleeding-veſſels, has been found a very ſucceſsful method of ſtopping the effuſion of blood. Vid. Phil. Tranſ. N° 478. p. 33.

Cotton-SPUNGE, a name given by ſome writers to a ſpecies of ſea *ſpunge* very fine and light, and reſembling cotton in its texture. It is found at conſiderable depths, growing on the rocks in form of a coarſely-branched ſhrub; it is of a greyiſh colour, and very flexile; but it is often rendred coarſe and rigid, by being covered in certain parts with that ſort of tartarous, or cruſtaceous ſubſtance, which ſome of the antients have deſcribed under the name of an *alcyonium*, and others of an *adarce*, and which the druggiſts of the late ages have taught us to call *lapis ſpongiæ*, the *ſpunge*-ſtone. It is formed itſelf of bundles of fibres, and though it has the appearance of a very open texture, yet it admits the water but very badly, and does not imbibe it in any thing like the quantity that the common *ſpunge* does, nor is it, when imbibed, ſo eaſily preſſed out again.

When examined by the microſcope, this plant appears not at all of the ſtructure of the common *ſpunge*, but ſeems a mere aſſemblage of oblong and ſlender fibres, like thoſe of cotton or wool, not hollow, and very cloſely amaſſed together: theſe are not capable of imbibing any other moiſture than the little that can get between their interſtices in the maſs, and the yet much ſmaller quantity that can enter the ſubſtance of the filaments themſelves. Hence it is no wonder, that this plant will not imbibe water ſo readily as the common *ſpunge*, or retain it ſo well when imbibed, and yet will not yield ſo to the preſſure of a hand, as to part with it as that does.

The *ſpunge*-ſtone, or tartarous incruſtation on this plant, when examined by the microſcope, is found to be very like the incruſtations of ſtony or ſparry matter upon ſticks and ſhells, in ſome of thoſe waters which we call *petrifying ſprings*, for the whole thickneſs of it is compoſed of ſeveral thin laminæ; but then, as in thoſe incruſtations, each of theſe laminæ is of one ſimple piece, and generally of a tranſverſely ſtriated texture. In the *ſpunge*-ſtone each lamina is not thus ſtriated, nor is indeed of one piece, but is a congeries of numbers of ſimple ſmall cakes, reſembling the ſcales of fiſhes. *Marſigli*, Hiſt. Phyſ. de la Mer.

Loaf-SPUNGE, in natural hiſtory, a name given by authors to a peculiar ſpecies of *ſpunge* of the marine kind. It is called by the French *eponge en mie de pain*.

It grows at conſiderable depths to the rocks among coral, and other ſea plants. Its ſhape is uſually that of a common loaf, and its texture very much reſembles that of the crumb of bread. It is very various in colour at different times, being uſually of a fine ſcarlet; ſometimes, however, it is purple, ſometimes of a violet colour, and ſometimes ſnow white, but this more rarely than of any other colour. It is the ſofteſt and lighteſt of all the *ſpunge*-kind, being better ſuited to imbibe the water than any other. It would be greatly eſteemed for the common uſes of *ſpunge*, if it were produced in plenty enough to be had on the common occaſions, but it is ſcarce. When examined by the microſcope, it is found to be compoſed of an almoſt infinite number of cavities and protuberances, and is compoſed of an infinite ſucceſſion of ſmall fibres, which are arranged in a very beautiful manner, and ſeem held together by a ſort of glutinous matter. *Marſigli*, Hiſt. Phyſ. de la Mer.

SPUNGE, in the manege, is the extremity, or point of a horſe's ſhoe that anſwers to the heel of his foot; upon it the calkins are made. Thick *ſpunge* ruins the horſe's heels, and therefore ought never to be uſed.

SPURGE, in botany, the Engliſh name of the *tithymalus*. See the article TITHYMALUS.

This plant abounds in a thin and ſharp milky juice. On being wounded, it throws this out freely. It is clammy between the fingers, and though perfectly white when firſt let out, it turns bluiſh, on being held a while upon a knife or lancet, and has the colour and conſiſtence of blue ſkimmed milk. If it be made up into cakes with flower, it ſeems greaſy or oily, and never dries. Moſt of the milky juices of plants, as thoſe of the wild lettuce, throatwort, and the like, readily break into curds and whey on being expoſed to the air; and in the firſt of theſe, the whey is of a fine purple colour. The *ſpurge* juice requires a long time ſtanding before it breaks, but at length it ſeparates, and the curd is tough and firm, and the whey clear as rock water. The whole is very corrupt and ſtinking at this time, and if the cake of curd be dried, it ſeems a ſort of reſin, and will break and burn like reſin at a candle.

SPURGE-*laurel*. See the article LAUREOLA.

SPURGE-*root*, in the materia medica. See the article ESULÆ *radix*.

SPURKETS, in a ſhip, the ſpaces in her ſide betwixt the upper and lower futtocks, or betwixt the rungs fore and aft.

SPURRE, in zoology, a name given by many to the bird more commonly called the *ſea-ſwallow*, and by authors *ſtema*. *Ray*'s Ornitholog. p. 269. See the article STEMA.

SPURRY, in Latin *ſpergula*, is ſown in the Low-Countries twice in a ſummer. The firſt ſowing is in May; theſe plants flower in June and July, and the ſeed is ripe in Auguſt. The ſecond time of ſowing it is after the rye-harveſt; they uſually plow up the rye-grounds, and ſow them with this ſeed to ſerve the cows in winter, when the other ſorts of graſs are low or dead. The cows that feed on this plant are found to yield better milk, and finer butter is made from it, than from that of cows feeding on any other paſture. Poultry alſo are very fond of eating this plant, and the farmers in ſome places have an opinion, that it makes them lay the more eggs. *Mortimer*'s Huſbandry, p. 43.

SPYRUS, the *dung of goats*. This is uſually found in ſmall round maſſes, and is recommended by Hippocrates as a fumigation in diſeaſes of the womb.

SQUACCO, in zoology, the name of a large bird of the heron kind. Its head and neck are variegated with black, white, and yellow, and it has on the back part of its head a cruſt of the ſame colour. Its back is of a ferrugineous yellow; its breaſt and belly are white, as are alſo its wings and tail, at leaſt in great part; and its legs are green. It is a bold and fierce bird. *Aldrovand.* de Avib. p. 400.

SQUAIOTTA, in botany, the name of a bird of the heron kind. Its beak is yellow, but blackiſh at the extremity; its legs are green; its head is variegated with grey and black; and its back very elegantly with white and red. It ſeems to have had its name from its note, which it often repeats in flying. *Aldrovand.* de Avibus.

SQUALIUS, in ichthyology, a name given by Pliny to the chub. Varro, and others of the old writers, have called it *cephalus* and *ſqualus*, and the Italians at this time call it *ſquaglio*; it is wrong, however, to adapt any generical name to a fiſh, which is itſelf but a genuine ſpecies of an already eſtabliſhed genus. This is properly a ſpecies of the cyprini, and is mentioned as ſuch by Artedi.

SQUALLEY, a note of faultineſs in the making of cloth. 43 Eliz. cap. 10. *Blount*, *Cowel*. See REWEY.

SQUALUS, in the Linnæan ſyſtem of zoology, the name of a diſtinct genus of fiſhes, of the general order of the chondropterygii. The characters of this are, that the body is oblong, and the apertures of the gills are five on each ſide. Of this genus are the galeus, lamia, zygæna, *&c.* *Linnæi* Syſt. Nat. p. 52.

The characters of this genus, according to Artedi, are theſe. The foramina, or apertures of the bronchia, are five on each ſide, and they are placed longitudinally from the head to the pectoral fins; the head is depreſſed; the body oblong, and either rounded, or longiſh and angular; the ſkin is rough; the eyes are placed at the ſides of the head; and the upper part of the tail is longer than the under. The mouth in moſt of the ſpecies is placed in the under part of the head, and opens tranſverſely. The ſpecies of this genus are theſe.

Of thoſe which have granulous teeth are the following. 1. The *ſqualus* with a long-pointed and bony ſnout, flatted and denticulated at each ſide. This is the *priſtis*, or ſaw-fiſh. 2. The ſmooth *ſqualus* with granulous teeth. This is the *galeus lævis*, or ſmooth hound-fiſh.

Of thoſe which have ſharp teeth, and a prickly back, the following are the ſpecies. 1. The *ſqualus* with no pinna ani, and with a rounded body. This is the *galeus acantheus* of authors, or the prickly dog-fiſh. It has three rows of teeth on each ſide. 2. The *ſqualus* with no pinna ani, with the noſtrils placed at the extremity of the ſnout. The back of this is flat, and the belly rough and brown. 3. The *ſqualus* with no pinna ani, and with a triangulate body. This is the *centrine* of authors. This has three rows of teeth in the upper jaw, and only one row in the under. 4. The *ſqualus* with no pinna ani, and with the mouth placed at the end of the head. This is the *ſquatina* of authors, the monk-fiſh, or angel-fiſh, by ſome called the *mermaid*. It has three rows of teeth in each jaw, the whole number amounting to one hundred and eighty, or thereabout.

Of thoſe *ſquali* which want the pinna dorſi, the following are the ſpecies. 1. The *ſqualus* with a broad and tranſverſe head, ſhaped like a hammer. This is the *zygæna* of authors, the balance-fiſh, or hammer-headed ſhark. This has three or four rows of teeth in the jaws, and oblong holes near the eyes. 2. The *ſqualus* with a tail longer than the whole body. This is the fiſh called by authors the *vulpes marinus*. The tail is falcated, and reſembles a ſword in ſome degree. 3. The *ſqualus* with the noſtrils placed near the mouth, and with two ſmall foramina near the eyes. This is the *galeus canis* of authors. It is called in Cornwall a *tope*. It grows to five feet long, and weighs an hundred pounds. 4. The *ſqualus* of a reddiſh variegated colour, with the pinna ani at a middle diſtance between the anus and the fin of the tail. This is called the *catulus major*, and in England the *bounce*. 5. The *ſqualus* with the variegated back, and with the belly fins growing together. This is the *catulus minor* of authors, and is called the *rough hound*, or the *mergay*. 6. The grey *ſqualus* with the ventral fins not joined together. This is the *catulus maximus* of authors. 7. The *ſqualus* with a triangular hollow in the extremity of the back, and no foramina about the eyes. This is the *galeus glaucus* of authors, or the new ſhark. 8. The *ſqualus* with a flat back, and with numerous teeth ſerrated at the edges. This is the *canis carcharias*, or common ſhark. It is the largeſt of all the *ſquali*, often growing to ſuch a ſize, as to weigh a thouſand pounds. The ſnout is long. The teeth are for the moſt part ſerrated, and there are ſix rows of them above, and as many below, though ſometimes they are fewer. The two backfins are placed, one in the middle of the back, the other very near the tail. The ſkin is rough. *Artedi* Gen. Piſc. p. 44.

SQUALUS is alſo a name given by Varro, Columella, Salvian, and others, to a ſpecies of the cyprinus, diſtinguiſhed by Artedi by the name of the oblong *cyprinus* with long ſcales, and with the pinna ani containing eleven rays, and commonly known with us under the name of the *chub*, or *chevin*. The generality of authors call it *capito* and *cephalus*, but it is very improper to give diſtinct generical names to fiſh, which are genuine ſpecies of other genera.

The name *ſqualus* is originally Latin; it is uſed by Pliny, and many other of the old Roman authors, and is derived from the word *ſqualor*, becauſe this fiſh is found to delight in impure and dirty places.

SQUAMIS, in ichthyology, a name given by Albertus, and others, to the fiſh called by us the *monk*, or *angel-fiſh*, by the generality of authors *ſquatina*, and by the old Greek writers *rhine*.

It is a ſpecies of the ſqualus, and is diſtinguiſhed by Artedi by the name of the *ſqualus* with the mouth at the end of the ſnout. See SQUATINA.

SQUAMMOSE-*culm*. See the article STALK.

SQUAMMOSE-*root*, among botaniſts, one compoſed of, or covered with leſſer flakes. See ROOT.

SQUARE (*Cycl.*)—SQUARE, in glaſs-making, an inſtrument with which the conciator, or founder, ſtirs and mixes together the metal when in fuſion in the melting-pots. When this inſtrument is grown red-hot, it is always to be quenched in a pail of water, otherwiſe the metal will ſtick to it. *Neri*'s Art of Glaſs, p. 240.

SQUARE, in the manege, is uſed for working in a *ſquare*. The piſte or tread of a volt, inſtead of being always circular, and traced upon a circumference round a center, ought to be imagined as if it formed four ſtraight equal lines laid in a *ſquare*, and equally removed from the center, or the pillar, which repreſents it in the middle of the manege-ground; ſo that to work in a *ſquare*, is to ride along each of theſe four lines, turning the hand at every corner, and ſo paſſing from one line to another.

SQUARE, in the ſea language, is to ſet even. Thus they ſay, *ſquare the yards*; that is, ſet them right acroſs the ſhip. See the article YARD.

SQUARTIA, in ichthyology, a ſpecies of fiſh found in the Eaſt-Indies, the ſkin of which makes the ſhagreen. *Hofm.* Lex. in voc. See SHAGREEN.

SQUATAROLA, in zoology, a name given by the Venetians to the grey plover, or *pluvialis cinerea*. See the article PLUVIALIS.

SQUATINATORIA, in zoology, a name by which ſome authors have called the rhinobatus, a ſea fiſh of a ſort of middle nature between the monk-fiſh, or angel-fiſh, and the ray. *Willughby*, Hiſt. Piſc. p. 79. See the article RHINOBATUS.

SQUATINA, the *monk-fiſh*, called alſo in Italian the *peſce angelo*, and thence in Engliſh the *angel-fiſh*.

It is of a middle ſhape, between the long and flat cartilagineous fiſhes, being much broader than the galei, and rounder

rounder than the rays. It grows to a very large ſize, ſometimes to four, five, or ſix feet long. It is covered all over with a mucous ſubſtance, but under it the ſkin is harſh, and rough enough to ſerve for the poliſhing wood and ivory. It is of a browniſh grey on the back and ſides, and white under the belly. The head is flatted and roundiſh, and the mouth large, and opening at the extremity of the ſnout, not, as in other of the fiſhes of this claſs, under the head. It has three rows of teeth, eighteen in a row. Its eyes are large, and placed near its mouth, and ſeem as if meant for looking ſideway, rather than up or down. Its upper pair of fins very much reſemble wings, from whence it has its name of the *angel-fiſh*, and at the extremities of theſe are a number of ſharp hooked thorns. It has alſo a row of ſhort prickles on its back. See Tab. of Fiſhes, N° 7.

It is common in the Engliſh ſeas, and is not unfrequently caught in Cornwall. *Johnſon*, de Piſc. p. 23.

SQUATT, in mineralogy, a term given by the Engliſh miners to a peculiar ſort of bed of ore, leſs valuable than a load or vein, becauſe of its reaching but a little way.

Though the ore of the *ſquatts* is generally very rich and good, not inferior in quality to the beſt vein-ore, the miners are often terribly diſappointed, on finding theſe *ſquatts* inſtead of the right veins, after a long ſearch. In the tin countries, the way of ſearching for mines is by looking after the ſhoad-ſtones; that is, certain metalline ſtones which contain ſome ore, and which have originally made the upper part of the vein of ore, reaching up to the day, or the ſurface of the earth. See SHOAD.

In the time of the deluge theſe upper parts of the veins have been waſhed off, and carried down the ſides of the hills, in which the mines uſually lie, into the flat country, but they always lie in a regular and continued train, from the orifice of the mine to the fartheſt part of the train; ſo that when but one ſtone of this kind is found, the miners are certain of coming to the bed of metal, on tracing it up to its head by the train. This is a laborious and expenſive work, becauſe the ſtones never lie on the ſurface, but at the different depths of one to ten feet, or any depth between theſe. The *ſquatts* have their trains of ſhoad-ſtones as well as the regular veins, and when theſe are traced to the orifice, there is the appearance of a rich load, which the proprietor is not thoroughly undeceived in, till the diggers come to the end of it.

The *ſquatt* is a bed of ore from three to ten fathom long, and uſually is about half as broad as it is long; few are larger than this ſtandard, but many much leſs. This is always flat, and thence has its name; the round collections of ore of the ſame kind being called *bonnies*. The *ſquatt* communicates with no other load or vein, but is entire of itſelf, and its extremities terminate at once, without running into ſeveral little ſtrings, in the manner of thoſe of the right veins. It does not lie within walls, as the loads or veins always do, though it is always depoſited in the ſhelf, or faſt ground; that is, in ſtrata that have not been moved by the flood. Phil. Tranſ. N° 69.

SQUATUS, in ichthyology, a name uſed by Pliny, and other of the old Roman authors, to expreſs the fiſh called by the old Grecian writers *rhine*, and by the moderns *ſquatina*.

It is a ſpecies of the ſqualus, and is diſtinguiſhed by Artedi under the name of the *ſqualus* with no pinna ani, and with the mouth in the top of the ſnout. See SQUATINA.

SQUILL, SCILLA, or *ſquilla*. See SCILLA, *Cycl.*

Wagner recommends the powder of *ſquills*, given with nitre, in hydropical ſwellings, and in a nephritis, and mentions ſeveral examples of cures which he performed, by giving patients from four to ten grains with a double quantity of nitre. He ſays it almoſt always operates as a diuretic, ſometimes vomits or purges. Medic. Eſſ. Edinb.

Dr. Heſs ſays, he has made cures of the aſthma with the powder of *ſquills*. The efficacy of this powder of *ſquills*, from four to twelve grains, in curing the aſthma, is atteſted by ſeveral. Med. Eſſ. ibid. from Commerc. Norimb. 1737, & 1739.

SQUILACHI, in zoology, the name by which the modern Greeks call the *jackall*, or *lupus aureus* of authors. *Bellon.* lib. 2. cap. 107. See JACKALL.

SQUILLA *aquæ dulcis*, the *freſh-water ſhrimp*. Few people are aware of the vaſt deſtruction made by this little inſect among the ſmall fry of fiſh. This inſect is commonly very plentiful in ſtanding waters, and particularly in breeding-ponds, where they always have their prey in plenty before them; and often ſuffer none, or ſcarce any of the numerous young fry, hatched from the ſpawn of carp and tench, to live to grow up. They may be obſerved following the ſhoals of the young fry, and ſeizing multitudes one after another; and at other times lurking among the weeds, to ſeize ſuch as ſtraggle by themſelves. If one of theſe inſects be put into a baſon of water with a dozen or two of theſe young fiſh, though as big as himſelf, he will very ſoon deſtroy them all. They kill numbers that they cannot eat, but leave them to rot.

SQUIRREL, *ſciurus*, in zoology. See the article SCIURUS.

There is great diverſion in the hunting this little creature, and its fleſh is very delicate and well taſted. The only ſeaſon for hunting it is in autumn, and the beginning of winter, at which time the creature is fat; and the leaves being off the trees, it may be ſeen as it leaps from bough to bough, which when purſued it does with a ſurpriſing agility.

In the ſummer they build their neſts, which the ſportſmen call *drays*, very artificially in the tops of trees, with ſticks, moſs, and ſuch other things as the woods afford; they fill this lodging, during the ſeaſon, with nuts and other fruits, which are to ſerve them in the ſevere weather, when the trees afford nothing. They ſleep in the midſt of this proviſion a great part of the winter, and that ſo ſound, that they will not be waked by ever ſo loud a noiſe made juſt under their drays; though at other times they fly out immediately on hearing any noiſe, even at a conſiderable diſtance.

The tail of the *ſquirrel*, which is as large as the body, though compoſed almoſt entirely of hair, ſerves the creature, in ſome ſort, inſtead of wings; for by means of it the body is kept ſuſpended in the air, without any viſible ſinking, while the creature throws itſelf from the boughs of one tree to thoſe of another of equal height. But the more general leaps the *ſquirrel* takes, are from the outermoſt branches of a high tree to another ſomewhat lower at a diſtance; it is wonderful to ſee how far it will be carried in theſe leaps; and if it miſſes the tree it aims at, and by that means falls from the top of ever ſo high a tree to the ground, the tail ſupports it ſo well, that it comes ſoftly down, and receives no harm. The hunting of the *ſquirrel* is moſt agreeably performed in woods of a young growth, the trees of which may be ſhaken by the hand; and it is neceſſary to take out ſome means of diſlodging them from the clefts of trees, in which they will take refuge, and from which they will never be removed by mere noiſe.

Many people uſually go together on this expedition, and ſometimes they carry bows and arrows for the diſlodging the prey from theſe places; ſometimes bludgeons, or ſhort and thick ſtaves, loaded at one end with lead, to prevent their lodging in the trees, when they are thrown up. The *ſquirrel* which in her fright has taken refuge in any part of a tree, and is not to be diſlodged either by hollooing or ſhaking the tree, will always quit the place as ſoon as an arrow, or bludgeon, has been well aimed at her, and will give a farther chaſe.

The *ſquirrel* is always fond of a large oak in time of danger, and runs to the neareſt ſhe can find as ſoon as ſhe ſees herſelf purſued: in ſome part of the upper boughs of this tree ſhe ſits ſecure from the men and dogs, and as it is too troubleſome to the ſportſmen to climb every tree, the only method is to ſhoot arrows, and throw bludgeons at her; ſhe is very ſeldom hurt by theſe, unleſs hit juſt upon the head, for her backbone is ſo ſtrong, that ſhe will bear very nearly as hard a blow as a dog without danger of hurt. So long as the ſtrength and ſpirits of the creature laſt, ſhe always keeps in the tops of the higheſt trees, but when ſhe grows weary ſhe comes down, and takes ſhelter in the hedges; ſhe then ſoon becomes a prey to the dogs, or is very often killed upon the ground, in attempting to gain the hedge in places where there is no continued chain of trees by which ſhe can come at it.

The common *ſquirrel*, when it would croſs a water, is often ſeen to get upon ſome light piece of wood, and ſail over by means of her tail.

Flying-SQUIRREL. The *flying-ſquirrel* is a creature famous in hiſtory for being one of thoſe few animals which ſhew, that nature has given to ſome quadrupeds a power of flying.

This however is an obſervation not ſo well verified in this creature as in the bat, which is truly a quadruped, its fore feet being only expanded into wings, and webbed, and which truly flies; whereas all that is called flying in this *ſquirrel*, is only its ſuſpending itſelf in the long leaps it makes by means of a membrane on each ſide of the body, attached to the fore legs, and reaching to the hinder ones, only growing narrower all the way.

This creature is found in ſeveral parts of America, and in many places on the confines of Ruſſia toward Tartary. It lives in hollow trees, and covers itſelf carefully up with moſs. It ſeldom ſtirs abroad in the day-time, but toward evening goes out in ſearch of food. When kept within doors it ſleeps the whole winter, but revives in ſpring. The manner in which they catch them in Ruſſia is this: they tie a net over the hole in a tree where they ſuſpect any of theſe creatures to lie hid, then they kindle a fire of ſtraw, or light buſhes about the foot of the tree, and as ſoon as this begins to ſmoak pretty much, the creatures come out of the holes, and are taken in the net. Their ſkin is extremely ſoft, and the hair is ſhort, and of a blackiſh grey. Philoſ. Tranſ. N° 427. p. 37.

STABILES, in the antient muſic, was a name given to the extreme chords of a tetrachord.

They were ſo called, becauſe they remained the ſame throughout all the genera and ſpecies of muſic[c]. One of theſe chords was the hypate, and the other the nete. They are

ſometimes alſo called *ſtantes*, *immobiles*, or *quieſcentes*; and by the Greeks ἑστῶτες, ἀκίνητοι, ἠρεμοῦντες [f].—[e Vid. Philoſ. Tranſact. N° 481. f *Wallis*'s Append. ad Ptolem. Harm. p. 159.]

STABLE. Nothing conduces more to the health of a horſe, than the having a good and wholſome *ſtable*. The ſituation of a *ſtable* ſhould always be in a good air, and on a firm, dry, and hard ground, that in winter the horſe may come in and go out clean. It ſhould always be built ſomewhat on an aſcent, that the urine, and other foulneſſes, may be eaſily conveyed away by means of drains or ſinks cut for that purpoſe.

As there is no animal that delights more in cleanlineſs than the horſe, or that more abominates bad ſmells, care ſhould be taken that there be no hog-ſtie, hen-rooſt, or neceſſary-houſe near the place where the *ſtable* is to be built; for the ſwallowing of feathers, which is very apt to happen when hen-rooſts are near, often proves mortal to horſes, and the ſteams of a hog-houſe, or hog's dung, will breed many diſtempers; and particularly, they will bring on the farcy and blindneſs in many horſes. It is much better to build the walls of a *ſtable* of brick than of ſtone, for the former is always dry, the other often ſweats, and is very apt to be damp, and to cauſe rheums and catarrhs to horſes that are ſet in the *ſtable* in damp weather.

The walls ought therefore to be of brick, and to be made of a moderate thickneſs, two bricks, or a brick and half at the leaſt, both for the ſake of ſafety and warmth in winter, and to keep off the heat of the ſun in the midſt of ſummer, which would ſpoil the horſe's appetite, and ſink his ſpirits. The windows ſhould be made on the eaſt and north ſides of the building, that the north air may be let in to cool the *ſtables* in ſummer, and the riſing ſun all the year round, eſpecially in winter.

The windows ſhould either be ſaſhed, or have large caſements, for the ſake of letting in air enough; and there ſhould always be cloſe wooden ſhutters, that the light may be ſhut out at pleaſure; by which means the horſe will be brought to ſleep in the middle of the day, as well as in the night, when it is judged proper that he ſhould do ſo.

Many pave the whole *ſtable* with ſtone, but it is much better to have that part, which the horſe is to lie upon, boarded with oak planks; for it will be not only eaſier, but more warm and comfortable to the creature.

The boards muſt be laid as even as poſſible, for this is the way to make the creature lie moſt at his eaſe, and in the moſt healthful poſture. The dealers in horſes generally indeed make the boards be laid higher toward the top, and ſlanting down: this ſhews a horſe to more advantage as he lies, but it is very uncomfortable to the creature, and his hinder parts are always ſlipping down, and the hind legs are often made ſubject to ſwellings by it.

The planks ſhould be laid croſswiſe, not lengthwiſe, and there are to be ſeveral holes bored through them to receive the urine, and carry it off underneath the floor into ſome drain, or common receptacle. The ground behind ſhould be raiſed to a level with the planks, that the horſe may always ſtand even, and the floor behind ſhould be paved with ſmall pebbles, and the place where the rack ſtands ſhould be well wainſcotted. There are to be two rings placed on each ſide of the ſtall, for the horſe's halter to run through, and a logger is to be fixed to the end of this, ſufficient to poiſe it perpendicularly, but not ſo heavy as to tire the horſe, or to hinder him from eating. The beſt place for him to eat his corn in is a drawer, or locker, made in the wainſcot partition; this need not be large, and conſequently need not take up much room, ſo that it may be eaſily fixed, and taken out to clean at pleaſure: by this means, the common dirtineſs of a fixed manger is to be avoided.

Many people are againſt having a rack in their *ſtables*; they give the horſe his hay ſprinkled upon his litter, and if they think he treads it too much, or too ſoon, they only nail up three or four boards, by way of a trough, to give it to him in. The reaſon of this is, that the continual lifting up the head to feed out of the rack is an unnatural poſture for a horſe, which was intended to take his food up from the ground, and makes him, as they expreſs it, withy-cragged. In the way of ſprinkling the hay on the litter, or laying it in a trough even with the ground, he not only takes it up as if from the earth in a natural way, but can eat as he lies, which is a piece of indulgence that a horſe takes great pleaſure in.

When there is *ſtable*-room enough, partitions are to be made for ſeveral horſes to ſtand in; theſe ſhould always allow room enough for the horſe to turn about, and lie down conveniently in, and they ſhould be boarded up ſo high toward the head, that the horſes placed in ſeparate ſtalls may not be able to ſmell at one another, nor moleſt each other any way. One of theſe ſtalls ought to be covered in, and made convenient for the groom to lie in, in caſe of a great match, or the ſickneſs of a valuable horſe. Behind the horſes there ſhould be a row of pegs, to hang up ſaddles, bridles, and other neceſſary utenſils; and ſome ſhelves for the hanging up bruſhes, &c. and the ſtanding of pots of ointment and other preparations.

The *ſtables* of the nobility are often incommoded by bins for oats placed in them, which take up a great deal of room with very little advantage. Dr. Plot has given us, in his hiſtory of Oxfordſhire, a very convenient method, uſed by a gentleman of that county, to prevent this. It is done by making a conveniency to let the oats down from above, out of a veſſel like the hopper of a mill, whence they fall into a ſquare pipe of about four inches diameter, let into the wall, which comes down into a cupboard alſo let into the wall, but with its mouth ſo near the bottom, that there ſhall never be more than about a gallon in the cupboard at a time; which being taken out, and given to the horſes, another gallon immediately ſucceeds it from above, without any trouble to the groom or any body elſe. By this means there is not an inch of room loſt in the lower part of the *ſtable* where the horſes ſtand; and there is this great conveniency beſide, that the oats are always kept ſweet by it; for every gallon that is taken away puts the whole quantity above in motion, by the running down of the gallon that ſupplies its place, and no muſtineſs ever comes, where there is this continual airing and motion. There may eaſily be contrived two of theſe, the one for the oats, the other for ſplit beans; and both of theſe may be let into the range of preſſes, the oats and beans being ſeparated above by partitions. The other requiſites for a *ſtable* are a dung-yard, a pump, and a conduit; and if ſome pond or running river be near, it is greatly the better.

STACCATO, or STOCCATO, in the Italian muſic, intimates that every note ſhould be divided and ſeparated from the next in a very plain and diſtinct manner, and is much the ſame with *ſpiccato*. *Broſſard*.

STACHYS, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, and is of the labiated kind. The upper lip is ſomewhat arched, and ſtands erect, the lower is divided into three ſegments, of which the lower is conſiderably the largeſt. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower, and ſurrounded with four embryos, which afterwards become ſo many ſeeds, and ripen in the cup of the flower into a roundiſh ſhape. To theſe marks it may be added, that the leaves are hoary, as Dioſcorides deſcribes thoſe of *ſtachys* to be.

The ſpecies of *ſtachys*, enumerated by Mr. Tournefort, are theſe. 1. The great German *ſtachys*. 2. The great German *ſtachys* with paler flowers. 3. The broad-leaved Cretic *ſtachys*. 4. The narrow-leaved Cretic *ſtachys*, called *baſtard ſtachys*. 5. The leſſer Italian *ſtachys*. 6. The mullein-leaved ſhrub American *ſtachys*. *Tourn.* Inſt. p. 186.

STÆBE, in botany, a word uſed by the Greeks as the name of ſeveral plants, very different one from another.

Dioſcorides frequently calls the hippophaes by this name *ſtæbe*; Theophraſtus alſo calls his hippopheos and pheos by the ſame name; and what Hippocrates ſays of the fruit of the hippopheos, is by the modern Greeks interpreted the ſeed of the *ſtæbe*. The pheos and hippopheos were thorny plants of the ſhrub kind, growing on the ſea-coaſts of Crete and other places, and are ſtill called by the inhabitants *ſtæbis*. But beſide theſe there was a ſmall plant, called by the old Greek writers *phleos*. This was a ſmall ſoft herb, growing in damp places, and uſed to ſtuff beds with, and to other ſuch purpoſes. This alſo was called by the ſame authors *ſtæbe*. See the next article.

STÆBIS, in botany, a name given by the modern Greeks to a plant growing very plentifully in the iſland of Crete, and ſeeming to be the ſame with the *ſtæbe* of the antient Greeks, when uſed as the name of the pheos or hippopheos; for the antients uſed it alſo as the name of a low plant of the gnaphalium kind, growing in marſhy places, and uſed to ſtuff beds, &c. with.

It is evident that Dioſcorides calls the pheos and hippopheos, or, as he writes it, hippophaës, by the name *ſtæbe*; and Neophytus tells us, that the *ſtæbe* of Dioſcorides was called in his time, in the vulgar Greek, *ſtæbion*, and *ſtæbis*.

The deſcription Dioſcorides gives of this plant, is, that it had ſmall and fleſhy flowers ſtanding in cluſters ſeveral together; and Pliny tells us, that this plant grew in ſandy places near the ſea-ſhores, and had white prickles on the branches, and cluſters of berries like the ivy. In this laſt article he ſeems to go beyond his authority, all the Greek writers, from whom he tranſlates this part of his work, ſpeaking of the flowers of the *ſtæbe* growing in Corymbi like the ivy, but not giving it the fruit of that plant. Honorius Bellus ſays, that the flowers are mixed of a reddiſh and greeniſh colour; and Dioſcorides ſays, that the flowers of his hippopheos are mixed of a reddiſh and whitiſh.

The whole plant or ſhrub is alſo deſcribed, both by the antients and the moderns, under the names of *hippopheos* and *ſtæbis*, in the ſame manner: they ſay it grew to about three feet high, ſpreading its branches, ſo as to form a round buſh, and that the prickles or thorns grew under the leaves. They were both put to the ſame uſe alſo, and all the in-

terpreters of the old Greeks have agreed in looking upon them as ſynonymous terms. The fruit of the hippopheos, mentioned by Hippocrates, is rendered the ſeed of the *ſtæbis*.

STÆBIUM, in botany, a name given by the modern Greeks to the plant called *hippophaes* by Dioſcorides; that author alſo ſometimes called it *ſtæbe*. See the articles STÆBE and STÆBIS.

STÆCHAS, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, and is of the labiated kind. The upper lip is erect and bifid, and the lower divided into three ſegments, the whole ſo diſpoſed, that the flower has, at firſt ſight, no appearance of a labiated one, but appears meerly a plain flower of five ſegments. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower: this is ſurrounded by four embryos, which ripen into as many ſeeds, contained in the cup of the flower. To theſe marks it is to be added, that the flowers of the *ſtæchaſes* are diſpoſed in various ſeries in a ſort of ſcaly heads, from the ſummits of which there grow certain beautiful-coloured leaves, which Cluſius calls their membranaceous ligulæ. See Tab. 1. of Botany, Claſs 4.

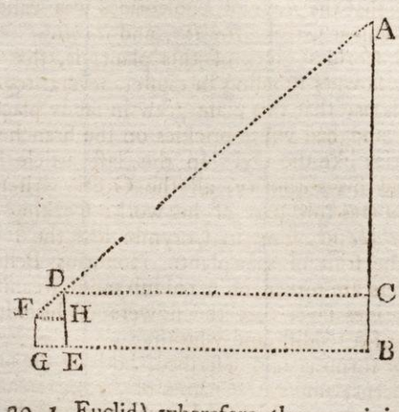
The ſpecies of *ſtæchas*, enumerated by Mr. Tournefort, are theſe. 1. The common purple *ſtæchas*, vulgarly called *Arabian ſtæchas*. 2. The naked-ſtalked *ſtæchas* with longer ligulæ. 3. The broad-leaved *ſtæchas* with white flowers. 4. The Portugal *ſtæchas* with large ligulæ, variegated with roſe colour and purple. 5. The Portugal *ſtæchas* with green hairy leaves. *Tourn.* Inſt. p. 201.

The flowers of the *ſtæchas* are much uſed in medicine, in diſeaſes of the head and nerves, eſpecially in ſuch as are ſuppoſed to ariſe from cold cauſes. They alſo promote the evacuation by urine, and by the menſes, and in ſome places are eſteemed one of the greateſt antidotes, and given in large doſes againſt the effect of poiſons, and the bites of venomous animals. Meſue, and the Arabians in general, ſpeak of it as a purge, and particularly as good in caſes where phlegm was to be evacuated; though they ſay it did this but ſlowly and weakly. At preſent we do not acknowledge any purging quality in it. There is a very fragrant oil drawn from the flowers and tops of this plant, in the ſame manner as that from lavender; but it is not much in uſe with us. The flowers are an ingredient in the Venice treacle, mithridate, and ſome other of the officinal compoſitions.

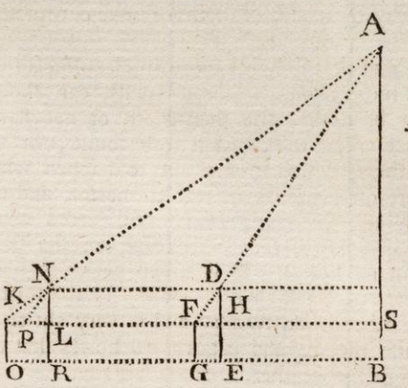
It is to be obſerved that there is another plant, called *ſtæchas*, in the ſhops; and by the writers on the materia medica, this has the epithet *citrina*, for its diſtinction from the *ſtæchas* we have been treating of, which is either called *ſtæchas* without any addition, or *ſtæchas Arabica*. The *citrine ſtæchas* has none of the virtues of this kind, nor is it of the ſame genus of plants, but of the elichryſum kind. See the article ELICHRYSUM.

The ſeveral ſpecies of *ſtæchas* are propagated by ſowing the ſeeds in March, in a bed of dry light earth; when the young plants are about three inches high, they muſt be removed into other beds, and placed at about ſix inches diſtance, watering and ſhading them till they have taken root. They muſt after this be kept clear from weeds, and ſheltered from the ſeverity of the winter by mats, or a light covering of peas, haulm, or other ſuch matter; and in March, or the beginning of April, they may be removed into the places where they are to remain. The poorer the ſoil is, in which they are planted, the better they will ſtand the winter, and the more fragant will be their flowers. They may be propagated by cuttings planted in ſpring, but the ſeeds ripening very well with us, the raiſing them from thoſe is the much better way. *Miller's* Gard. Dict.

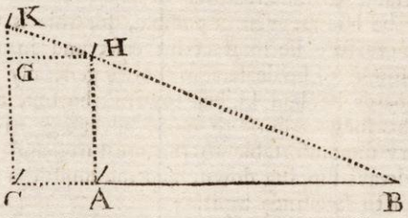
STAFF (*Cycl.*)—This is uſed as an inſtrument for taking acceſſible, or inacceſſible heights. The manner of operation, in taking the height of an acceſſible object, is as follows. Let there be placed perpendicularly in the ground a longer *ſtaff* DE, likewiſe a ſhorter one FG, ſo as the obſervator may ſee A, the top of the height to be meaſured, over the ends D, F of the two *ſtaves*; let FH and DC, parallel to the horizon, meet DE and AB in H and C, then the triangle FHD, DCA, ſhall be æquiangular; for the angles at C and H are right ones, likewiſe the angle A is equal to the angle FDH (by 29. 1. Euclid) wherefore the remaining angles DFH, and ADC, are alſo equal; and FH : HD :: DC : CA, *i. e.* as the diſtance of the ſtaves, to the exceſs of the longer *ſtaff* above the ſhorter; ſo is the diſtance of the longer *ſtaff* from the object, to the exceſs of the height of the object above the longer *ſtaff*. Hence CA may be found by the Rule of Three; to which if DE, the length of the longer *ſtaff*, be added, you will have the whole height of the object. Tr. Pract. Geom. p. 19, ſeq.



Inacceſſible heights may likewiſe be taken by means of two *ſtaves*. This muſt be done at two ſtations in a right line from the object, at each of which the *ſtaves* are to be placed in ſuch a manner, that the ſummit, or top of the height, may be ſeen along their tops in the ſame right line. Thus, ſuppoſe A the ſummit of the object whoſe height is to be meaſured, DE, FG, the two *ſtaves* at the firſt ſtation; and RN, KO, the ſame *ſtaves* at the ſecond, ſo placed, that the points FDA, KNA, are in the ſame right line. Through the point N let there be drawn the right line NP, parallel to FA: wherefore in the triangles KNP, KAF, the angles KNP, KAF, are equal; alſo the angle AKF is common to both; conſequently the remaining angles KPN, KFA, are equal. And PN : FA :: KP : KF. But the triangles PNL, FAS, are ſimilar; therefore PN : FA :: NL : SA. Thence alternately KP : NL :: KF : SA; *i. e.* as the exceſs of the diſtance of the *ſtaves* at the ſecond ſtation above their diſtance at the firſt, to the difference of their lengths; ſo the diſtance of the two ſtations of the ſhorter *ſtaff*, to the exceſs of the height ſought above the height of the ſhorter *ſtaff*. Wherefore SA may be found by the Rule of Three; to which add the height of the ſhorter *ſtaff*, and the ſum will give the whole inacceſſible height AB. Tr. Pract. Geom. p. 22. See the articles HEIGHT and ALTITUDE, *Cycl.*



Staves may be uſed for meaſuring any diſtance, ſuppoſe AB, to one of whoſe extremities we have acceſs. Let there be a *ſtaff* fixed at the point A, then going back to ſome ſenſible diſtance, in the ſame right line; let another be fixed in C, ſo that both the points A and B may be covered or hid by the *ſtaff* C. Likewiſe going off in a perpendicular, from the right line CB at the point A, let there be placed another *ſtaff* at H; and in the right line CGK, perpendicular to the ſame CB at the point C, and at ſuch a point of it K, that the points K, H and B, may be in the ſame right line, let there be fixed a fourth *ſtaff*. Let there be drawn, or ſuppoſed to be drawn a right line HG parallel to CA. The triangles KHG, HAB, will be equiangular: wherefore KG : GH (=CA) :: AH : AB; *i. e.* as the exceſs of CK above AH is to the diſtance betwixt the firſt and ſecond *ſtaff*; ſo is the diſtance betwixt the firſt and third *ſtaff* to the diſtance ſought. Tr. Pract. Geom. p. 25.



STAFF, or *Catheter*, in ſurgery. The proceſs of cutting for the ſtone, called the *high operation*, having been attended with ſome inconveniencies, which occaſioned its being haſtily left off, Mr. Cleland has attempted to remedy thoſe inconveniencies, by means of a *catheter* of a peculiar ſtructure, which he is of opinion, had it been known at that time when this operation was ſet on foot and miſcarried, would have turned the advantage of the methods to the ſide of the high operation, and made it allowed much preferable to any other method hitherto practiſed, and hopes that it will be yet brought into uſe, and revive that method.

The *catheter* is to be made either of ſilver or ſteel, and may be of different ſizes to ſuit different ages. It has the outward appearance of the common *catheter*, and will anſwer all the ſame uſes; but in reſpect of this operation it differs from the common one, in that it is compoſed of two legs with blunt points, a long tube, a ſliding bolt, and a handle, which ſerves to open and ſhut the legs. The bolt, which is fixed to the extremity of the tube, goes into two holes fixed in the plate of the handle; the one ſerves to keep the legs cloſe during the time it is to be introduced into the bladder, and the other to extend them to the diſtance of an inch or more, during the time that the operation is performing. The ſtructure of this *catheter* is well expreſſed by ſome figures given in N°401 of the Philoſophical Tranſactions, and the manner of uſing it is this: after having taken the neceſſary precautions, and filled the bladder, the *catheter* is to be introduced into the bladder with its points ſhut; then unbolt it at the handle, and by holding the tube in one hand, and the handle that moves the legs in the other, turn or open the legs till the bolt becomes oppoſite to the ſecond

hole upon the plate, into which it muſt be thruſt; then by preſſing gently downward the handle between the patient's legs, the two blunt points will be eaſily felt above the os pubis, in the protuberance made by the injection into the bladder. The advantages propoſed by uſing this *catheter* are theſe: firſt, it is a director to the operator, ſhewing the place in which the puncture is to be made into the bladder; it alſo ſerves as a ſupport to the bladder when the water is run out, and keeps it from ſubſiding during the time of the operation, or till the ſtone is extracted. It ſerves alſo to reſiſt the preſſure of the abdominal muſcles and the peritonæum, and hinders the inteſtines from being forced down upon the knife, keeping the orifice ſufficiently open, till the ſtone or ſtones are taken out. And finally, it may always be diſcovered, by the help of this inſtrument, whether the bladder be become ſcirrhous.

The method of performing the operation with this *catheter* is thus: after the *catheter* is introduced, and fixed with its legs open, the two points are to be felt for above the os pubis; when theſe are found, the finger and thumb are to be placed gently upon them, and the handle is to be held by an aſſiſtant, to keep it firmly in that poſition; then with a knife in the other hand a puncture is to be made immediately into the bladder, directly in the middle between the two points; but for the more ſecurity, it may be made ſomewhat lower, nearer the os pubis: when the knife is thus introduced, a large inciſion is to be made downward, inclining under the arch of the pubis, in proportion to the bigneſs of the ſtone, taking care not to wound the cartilage that joins the bones together when the knife is withdrawn. The bladder being thus ſupported, the ſtone may be taken out either with the fingers, or with a pair of tenets, there being little danger of breaking it in this method. When the operation is finiſhed, the handle of the *catheter* is to be raiſed; it is to be unbolted and ſhut cloſe, then fixed in this poſition and drawn out, and the patient dreſſed in the uſual way. Philoſ. Tranſ. N° 401. p. 786.

Flag-STAFF, in a ſhip, the long *ſtaff*, or piece of wood, whereto the flag is made faſt, and along which it is hoiſed up.

Station-STAFF, in ſurveying, an inſtrument conſiſting of two rulers that ſlide to ten feet, divided into feet and inches, with a moveable vane or ſight, two of which are uſed with a level; and on the edges there are the links of Gunter's chain divided. Its chief uſe is for the eaſy taking off-ſets.

STAG, *cervus*, in zoology. See CERVUS.

STAG-*evil*, in the manege. See the article HART.

STAG-*worms*, in natural hiſtory, a name given to a ſpecies of worms produced of the eggs of a fly, and lodged in a very ſtrange place behind, and under the palate of the *ſtag*, or deer's mouth.

They are always found in great numbers together, and are contained in fleſhy bags, which are placed as the almonds of the ears in the human ſpecies. The huntſmen are well acquainted with theſe *worms*, and are of opinion that they are the cauſe of the falling off of the creature's horns; they eat their way to theſe, according to their opinion, through the proper parts of the head, and then gnawing them round at the roots, they are forced to fall like a tree that is ſawed off at the bottom. This however is a vulgar error. Mr. Reaumur has abundantly proved, that theſe *worms* never attempt ſo ſtrange a paſſage; they always remain where they are firſt found till they are in a ſtate to change into the flies, to whoſe eggs they owe their origin, and whoſe forms they are at length to aſſume. *Reaumur*'s Hiſt. Inſect. Vol. 9. p. 8.

STAGGERS (*Cycl.*)—The moſt approved remedy for this diſtemper, which ſhews itſelf in horſes in a giddineſs, and reeling about, in waterineſs of the eyes, and a variety of odd motions of the head, is the following method. The creature is firſt to be blooded largely, then a glyſter is to be given him, compoſed of two quarts of emetic wine, and four ounces of the unguentum populneum. When he has repoſed an hour or two after voiding this glyſter, let another be given him, made of two ounces of the ſcoriæ of the liver of antimony finely powdered, boiled a little while in five pints of beer, and with the addition of four ounces of the ſame ointment, or of ointment of roſes. This laſt glyſter is to be frequently repeated, and his legs are to be all the while rubbed ſtrongly with whiſps of hay, wetted in warm water, to make a revulſion. His food ſhould be bran and white bread, and he ſhould be walked from time to time in ſome temperate place. If theſe methods do not ſucceed, let an ounce of Venice treacle be diſſolved in a quart of ſome cordial waters, and given him; and after this let the following glyſter be given warm: take Venice treacle and ſal polycreſtum, of each two ounces; diſſolve them in two quarts of a decoction of mallows and camomile flowers; add a quarter of a pint of oil of rue. This repeated two or three times after bleeding, and the other methods, will often cure the worſt ſtages of this diſeaſe.

Mr. Boyle mentions a cure of this diſeaſe in horſes, by rubbing their gums with the coach whip till they bleed. Works Abr. Vol. 1. p. 88.

STAGONIAS, a word uſed by the old authors to expreſs that ſort of male frankincence which is in round drops, and very clear and fine.

STAGONIUS, a name ſometimes given to ſtorax. See the article STORAX.

STAINING, or COLOURING *of porcelain*. The Chineſe, for a great many ages, uſed only white porcelain. The firſt *colour* they employed was blue, and after that they came into the uſe of all the reſt. Their antient blues was prepared by themſelves from a kind of a lapis lazuli; but we now ſupply them with the ſmalt ſo much cheaper, that it is no longer worth their while to make it themſelves. They uſed to prepare this only by giving a gentle calcination to the ſtone, and then beating it to powder, and grinding it to the utmoſt fineneſs in mortars of unglazed porcelain-ware, with peſtles of the ſame. The red, which the Chineſe uſe, is made of our green vitriol, or common copperas. They put about a pound of this into a crucible, and lute on this another crucible inverted: this laſt has a hole cut in the top, which they keep covered or open at pleaſure. They ſet this crucible in a furnace of bricks, ſo contrived, as to throw all the flame upon the lower veſſel, in the way of our chemiſts reverberatory furnaces. They make a large fire of charcoal all round it, and obſerve the hole at the top; for ſo long as there aſcend thick black fumes through that, the matter is not ſufficiently calcined. They watch the going off of this fume, and when there appears in the place of it a fine and thin cloud, they take away the crucible, the matter being then ſufficiently burnt. They try this, however, by taking a little out, and examining the colour; if it is not ſufficiently red, they let it remain longer in the fire. When they find that it is of a good colour, they take away the fire, and leave the veſſels to cool; this done, they find a cake of red matter at the bottom of the crucible, and a quantity of a finer powder about its ſides. They keep theſe ſeparate, the latter being the pureſt, the fineſt, and the brighteſt colour.

One pound of copperas affords about four ounces of this colour, and this is the red which they manage in different ſhades, and vary ſo much.

The Chineſe have alſo a white colour, which they uſe in their figures painted on the China: the ware itſelf is naturally white, and the varniſh, or oil of ſtone, is a great addition to its whiteneſs all over. But they have yet a way of making a much brighter and finer white than theſe, as may be ſeen in moſt of the fine China-ware where there is any white in the figures. This white is made in the following manner: they collect on the ſhores of their rivers a ſort of agate, which is of a whitiſh hue without veins, and tolerably tranſparent. It approaches very much to the nature of cryſtal, and probably cryſtal may be found to ſupply its place with us. They calcine this ſtone to a white powder, and to every ounce of this, when ground in their porcelain mortars to an impalpable fineneſs, they add two ounces of ceruſs in fine powder: this they mix with the varniſh, and lay on in the common way of other colours.

This white mixture ſerves not only for the colouring white, but it is the baſis of ſeveral other of thoſe beautiful colours which we ſee on the China-ware, and which our manufacturers have been often perplexed what to make of. Their green colour is made of copper ruſted with acid; and their fine deep violet colour is made of this green, by adding to it a due proportion of this white. It is not to be ſuppoſed that this effect is produced according to the common laws of mixing colours among our painters, for then the white and green would only make a paler green. But copper being a metal that as well gives a fine blue, as a fine green, according to the nature of the ſubſtances it is mixed with, the white in this caſe alters the very nature of the green, and converts it into that fine and deep violet blue, which we may draw from copper by means of any of the volatile alkalis; ſuch as ſpirit of ſal armoniac, ſpirit of hartſhorn, ſpirit of urine, or any the like liquor. The workmen know how to bring this blue to any degree, by putting in different proportions of the two colours. There is not any admixture of them, that will not produce a blue of ſome kind; but always the more of the green colour is uſed, the deeper the blue will be, and the leſs the paler. The yellow is made by an admixture of ſeven drachms of this white, and three drachms of copperas, or more, if they deſire the colour to be deeper.

Theſe colours are laid on upon the veſſels when they have been once baked, but they do not appear till the ſecond baking is over in their proper ſhades or tinges, and ſometimes ſcarce at all.

The black China is much eſteemed in the Eaſt, and particularly when it is ornamented with gold; this colour looking better with that ornament than any other. The black is always laid on when the porcelain is firſt dried, and is prepared by mixing three ounces of the fine deep blue with ſeven ounces of that fine varniſh, which they call *oil of ſtones*. This admixture gives a fine deep black. When the colour is thoroughly dry, the veſſels are baked, and when this is done the gold is laid on, and the whole is baked again in a particular furnace made for this purpoſe. If they would

have

have the black degenerate into blue, they need only add leſs of the blue, and a little of the ceruſs and agate white before deſcribed. They have two peculiar ways of applying the red, beſide the common one, both which require a nice workman, and make the ware come very dear. They call the one of theſe *oils red*, and the other *blown red*. Obſerv. ſur les Coutumes de l'Aſie. See *Blown* RED.

There are many things practiſed by the Chineſe in their *colouring* and forming the ſeveral kinds of porcelain, which may be well brought into uſe among us, and give a new value to our own wares, even though we ſhould never arrive at their art of making the thing itſelf. One kind of *colouring* eaſily introduced among us, would be what they call *hoan ton hoan*. This produces veſſels of great beauty and price, and is done in this manner. The matter, of which the veſſels are made, for this purpoſe, need not be fine; they uſually take any of the common veſſels baked, without having been varniſhed, and conſequently ſimply white, and without luſtre. When theſe are intended to be of one ſimple *colour*, they need only be plunged into a liquid varniſh or oil, as the workmen there call it, *coloured* with ſuch ingredients as will ſtrike the moſt lively tinges: but if it is to be *coloured* in compartments, as is uſually the cuſtom with this ſort of China, it is to be done by the pencil. The uſual way is to paint theſe in pannels, one green, another blue, and ſo on, and they make a very agreeable appearance. There requires no more to this, than the laying on the *colours* tolerably thick with a large pencil; but if the pictures of animals, and plants are to be given, they are to be done with the moſt permanent *colours*, and the veſſel being again well baked, becomes very beautiful. Obſerv. ſur les Coutumes de l'Aſie, p. 320.

The Chineſe, who are deceivers in every thing, find the way of cheating very much in regard to this ſort of China-ware. They paint the flowers of plants, and ſome parts of the birds, *&c.* in very bright colours, after the veſſel has been baked. Vermilion is a fine *colour*, which they often add on this occaſion; but they cannot uſe this before the baking, becauſe it would be deſtroyed by the fire. Theſe *colours* which are laid on afterwards cannot laſt, but ſoon rub off in the wiping, or uſing the things; the others laſt for ever; for they are laid on with the greateſt heat of all, the veſſels being put into the ſame furnaces to lay on theſe, as the other things are baked in for the firſt time.

Salt petre, and powder of flints, are generally the things added to the *colours* thus laid on, to make them penetrate, and run properly. Thus for the fine deep violet colour, which makes the greateſt figure of all others on this ware, they mix together equal quantities of the fine azure, the powder of flints and ſalt petre, all firſt powdered ſeparately till perfectly fine; this is tempered with water, and then laid on with the pencil, and though it looks rough at firſt, it comes out of the furnace of as beautiful a gloſſy hue as any thing can be conceived. The yellow is made by mixing together three ounces of ceruſs, and three ounces of powdered flints, and adding three, four, or more drachms of the red copperas, till the whole is of the proper degree of *colour*. The white is compoſed only of powder of flints and ceruſs, with a ſmall admixture of the ſalt petre, or it will ſucceed tolerably well without. Theſe are all the particulars neceſſary to be obſerved for the making a ſort of porcelain of great beauty, in which the nature of the ware itſelf is not concerned; ſo that it ſeems eaſy to imitate it with any of our own wares.

In the baking of this, or any other kind of *coloured* China, the ſecond time, there is, however, ſome caution to be uſed in the placing the pieces. The Chineſe are very artful in their diſpoſition of theſe, arranging them in the moſt compact manner, and putting the little ones within the great ones; but great care is alſo neceſſary, that the veſſels do not touch one another in the parts where they are painted, for the conſequence of that would be the ſpoiling of both veſſels, as the *colours* would run together. The bottom of one veſſel may generally be placed on the bottom of another, though both are painted, becauſe the rims are not painted, and they keep the painted parts from touching one another. High and narrow veſſels, ſuch as chocolate-cups, and the like, are very troubleſome on this occaſion. The method the Chineſe workmen take with them, is this: they place a range of them, ſo as to cover the whole bottom of the furnace, and they cover this with a thin bed of broken China-ware, over which they place another row of the cups, and ſo on to the top, where they lay on no covering: they never bake any thing elſe with theſe cups, when they are of this kind of twice-baked porcelain. Obſervat. ſur les Coutumes de l'Aſie, p. 321.

STAINING *of ſtones*. The art of *ſtaining* the gems and hard ſtones, could it be brought to perfection, would be a very elegant and uſeful one; but it is loaded with ſo many difficulties, that many, who have worked largely in the attempt, have given it up as impoſſible to be carried to any degree of perfection. The heat, neceſſary to be given to the ſtones in the common way of attempting this operation, ſpoils the ſtone, in order to give it the colour. It is true, that ſomething is to be done with ſolutions of ſilver, and the other metals, in acid menſtrua without fire, and ſomething may be done with a moderate heat alone, without the uſe of any thing elſe; but chance has diſcovered another way, by which, without heat, it may be done in a very eaſy manner. This was diſcovered by Mr. Muller, who grinding ſome aurum fulminans, made by diſſolving gold in aqua regia, and precipitating it with ſalt of tartar, together with ſome red glaſs powdered, and a little water added, found that this mixture ſtained the onyx, or chalcedony, of which the mortar was made. He was rubbing this mixture together to make an enamel colour, and leaving it three or four days in this little mortar, he found, that not only where it had been rubbed againſt the bottom of the mortar, but where it had accidentally ſplaſhed againſt the ſides of it, and on the ſurface of the peſtle, it had tinged them both very deeply to a fine red, leaving the intermediate parts of a true onyx, or chalcedony colour, wholly unaltered. The poliſh of the ſtone was not injured in the places where it was thus *ſtained*, nor could any art get out the colour, though it was tried with alkalis, and other ſharp liquors. This colour was not given to theſe parts of the ſtone of the mortar in ſimple blotches, but formed itſelf into regular lines, as we ſee the natural colours of ſtones do; but this not in the ſame degree of colour, but ſome of the lines were deeper, others paler.

This experiment was repeated in ſeveral other mortars of the ſame ſtone, but without ſucceſs; on which the ſtones, of which they were compoſed, were examined with the help of glaſſes, and it was found that this mortar chanced to be made of a more flaky chalcedony than any of the others, though it appeared equally ſolid and beautiful to the naked eye, and bore a poliſh no way inferior to them. It may be worth while, on this occaſion, ſtrictly to examine ſtones of this chalcedony kind, and on meeting with a plate of one of them of this flaky kind, to cover it with this mixture, and by that means give it a ſeries of lineations, which muſt make it a very beautiful and valuable ſtone. The poliſh will not be injured by this, or if it ſhould, the adding a new poliſh will not at all affect the colours. In the ſame manner the texture of ſtones, intended for any other experiments in *ſtaining*, ſhould be conſidered, and the chooſing proper ones may make this proceſs ſucceed on them. Phil. Tranſ. N° 179.

STAJOLUS, among the Romans, a meaſure of length uſed in ſurveying land; it was equal to five palms and three fourths of a palm. *Pitiſc.* in voc.

STAKE, the name of a ſmall anvil uſed by ſmiths; ſometimes it ſtands on a broad iron foot, on the work-bench, to be moved up and down occaſionally; and ſometimes it hath a ſtrong iron ſpike at the bottom, by which it is fixed to ſome place on the work-bench. Its uſe is to ſet ſmall and cold work ſtrait, by hammering it on the *ſtake*, or to cut or punch upon with the cold chiſel, or cold punch.

STAKE *of a plough*. The *ſtake* is an upright piece of wood, paſſing at its bottom through that link of the tow-chain which paſſes through the box of the plough, and at its upper end receiving the end of what is called the *bridle-chain*, which ties it to the crow-ſtaff, or if it be not long enough, a wyth, or cord, is uſed to tie it: it is alſo tied to it again, a little below the pillow of the plough, by another wyth or cord. *Tull*'s Huſbandry. See the articles PLOUGH, PILLOW, CROWSTAVES, *&c.*

STAL-*boat*, a kind of fiſhing-boat, mentioned 27 Eliz. c. 21. *Blount*.

STALACTAGNIA, in natural hiſtory, the name of a genus of ſpars. The word is derived from the Greek σταλακτὸς, ſtillatitious, or formed by dropping, and ἁγνὸς, pure.

The bodies of this genus are formed by the dropping of water from the roofs of ſubterranean caverns, and are the purer ſort of what are called by authors *ſtalactitæ*. They are cryſtalline ſparry bodies, formed into oblong conical figures, compoſed of various cruſts, and uſually found in form of icicles. Of this genus there are three known ſpecies. 1. A hard and white one. This is a very beautiful body, and is found in many parts of England, as well as other countries. 2. A white ſhattery one, found in the ſame places. And 3. a yellow ſhattery one, common with us in Yorkſhire, Devonſhire, and Derbyſhire; as alſo in many other parts of the world. *Hill*'s Hiſt. of Foſſ. p. 363.

STALACTOCIBDELA, in natural hiſtory, the name of a genus of ſpars. The word is derived from the Greek σταλακτὸς, ſtillatitious, or formed by the dropping of water, and κιβδηλος, impure.

The bodies of this genus are formed by the dropping of water from the roofs of ſubterranean caverns, and are the coarſer kinds of what authors have called *ſtalactitæ*. They are cryſtallino-terrene ſpars, formed into oblong bodies, and found hanging from the roofs of caverns and grottos.

Of this genus there are only two known ſpecies. 1. A browniſh friable one, common in our ſubterranean caverns, and even on the inſides of new-built ſtone arches, as thoſe of the New Bridge at Weſtminſter. And 2. a ſnow-white friable one, found in ſubterranean caverns in England and Germany,

Germany, and even on modern-built brick arches, as has of late been found on opening the vault under the terrace at Windſor. This, and the preceding inſtance, give us unqueſtionable evidence of the preſent, and daily formation of theſe bodies. *Hill*'s Hiſt. of Foſſ. p. 367.

STALAGMITÆ. See the article STALAGMOSCIERIA.

STALAGMODIAUGIA, in natural hiſtory, the name of a genus of ſpars. The word is derived from the Greek σταλαγμὸς, a drop, and διαυγὴς, pellucid. The bodies of this genus are the purer kinds of what authors call *ſtalagmitæ*, or drop-ſtones.

They are ſpars found in form of ſmall balls, each compoſed of numerous cruſts, and conſiderably pellucid and cryſtalline. Of this genus there are three known ſpecies. 1. A white one with numerous thin cruſts, and a ſmooth ſurface, found in many parts of Germany, and in England. 2. A greyiſh white one with thicker cruſts, and a rougher ſurface. And 3. a yellow thin-cruſted one with an echinated ſurface. Theſe are both found in the ſubterranean caverns of England, and many other places, and the former of them is the *confetti di Tivoli* of the Italians. *Hill*'s Hiſt. of Foſſ. p. 370.

STALAGMOS, a term uſed by authors to expreſs a diſtillation of rheum from the head.

STALAGMOSCIERIA, in natural hiſtory, the name of a genus of ſpars. The word is derived from the Greek σταλαγμὸς, a drop, and σκιερὸς, opake, and expreſſes an opake ſpar, which has received its form from the dropping of water.

The bodies of this genus are the coarſer kinds of what are called by authors *ſtalagmitæ*, and are ſmall round maſſes, compoſed of numerous thin cruſts, and of an opake and coarſe ſtructure.

Of this genus we have only two known ſpecies. 1. A ſmall browniſh white one with a ſmooth coat, found in Saxony, and ſome parts of England. And 2. a ſmall browniſh white one with thin cruſts, and a large nucleus. This is found in ſmall maſſes in Yorkſhire, and is the ſubſtance of which the famous Ketton-ſtone of Rutland is compoſed. *Hill*'s Hiſt. of Foſſ. p. 373.

Scotland affords a vaſt variety of the *ſtalagmitæ*. One cave, about eight miles diſtant from Aberdeen, on the ſea-ſide, has its whole roof cruſted over with *ſtalactitæ*, of a foot in length, hanging down like the fringe of a bed. The floor alſo is as deep covered with congeries of *ſtalagmitæ*. The upper coat, both of theſe and the *ſtalactites*, is of a ſea-colour, but the inner parts are as white as ſal prunellæ. The water which drops from theſe is of a very peculiar nature, for it is ſo acrimonious, that if it touch the ſkin but ever ſo ſlightly, it makes it ſmart. Near this cave there is another hollow rock, in which the *ſtalactitæ* make a very beautiful figure: they are all formed into long and thick columns, and ſtand perpendicularly, ſo that they repreſent the pipes of an organ; when broken, they are all found to be hollow within. The rock, and all the ſtone thereabouts, is of the limeſtone kind.

STALK, among botaniſts, that part of a plant which riſes immediately from the root, and which uſually ſupports the leaves, the flowers, and the fruit.

The term *ſtalk* is uſed on all occaſions; but in ſpeaking of the graſſes, and gramineous plants, where the word *culm* is uſed in its place, to diſtinguiſh that peculiar kind of *ſtalk* which is general to all theſe plants, and is not found in any others. See the article PLANT.

The terms uſed in deſcribing the *ſtalks* of plants, are; a *ſimple ſtalk*, one which runs up undivided from the root to the top.

Naked ſtalk, one that has no leaves.

Folioſe ſtalk, one with leaves on it.

Ramoſe ſtalk, that which ſends out branches.

Erect ſtalk, that which riſes ſtrait up.

Oblique ſtalk, that which is ſlanting.

Voluble ſtalk, that which twiſts round other things.

Flexuous ſtalk, that which bends.

Reclinate ſtalk, that which ſtoops towards the ground.

Procumbent ſtalk, that which lies on the ground.

Creeping, or *ſarmentous ſtalk*, that which emits roots as it runs along.

If the *ſtalk* be rounded in ſhape, it is called *round*; if it make two angles, *ancipital*; if three, *trigonal*; if four, *ſquare*; if more, *polygonal*.

If the *ſtalk* be lightly ridged and furrowed on the ſurface, it is ſaid to be *ſtriated*; if more deeply, *canaliculate*; if full of protuberances, *ſcabrous*; if lightly hairy, *villoſe*; if more roughly, *hiſpid*.

In the *branched ſtalk*, if the branches riſe erect, it is expreſſed by *aſcendant*; if they ſpread, by *diffuſe*; if they are very large, it is called *branchiated*.

If the *ſtalk* divaricate, or, inſtead of ſending out branches, it divide into them, it is called a *compoſite ſtalk*. If theſe divarications proceed by pairs, or if every branch be divided only into two others, it is called *dichotomous*; if it part into two ſeries of branches, it is expreſſed by the term *diſtichous*; if it part into a multitude of ramifications, is called *ſubdivided*.

All theſe terms are uſed alſo in expreſſing the different ſtates of the *culm*, which having no articulations, is called *equal*; when ſcaly, *ſquammoſe*.

STALK, or *ſtalking*, among the ſportſmen, a term uſed to expreſs the manner of making approaches to their game behind ſome animal, or the reſemblance of ſome animal, or other object, which may be more familiar, or leſs terrible to the creature than the body of a man would be.

The beſt, of all methods for *ſtalking*, is by means of a real living horſe, trained for the purpoſe. This horſe ſhould be choſen of the talleſt and largeſt kind; no matter how old he is, but he muſt be well trained, and ready at command. And as there is much art required to the reclaiming a horſe that is by nature wild, and apt to be frighted by noiſe and fire, as is the caſe when the gun is fired over him, the firſt attempt toward the training him muſt be the chaining up his head to a tree, and firing the gun ſeveral times very near him: at firſt he will be frighted, and kick and caper about, but after this has been practiſed many days together, he will by degrees become ſo tame, that a gun may be fired under his neck without ſtarting, or taking any notice of it.

When he is thus taught to bear the noiſe of a gun, one great matter is obtained; what remains, is the teaching him to go in a proper manner, moving gently, and feeding as he goes, and to ſtand ſtill and feed when the ſportſman would have him: this is only to be done by much practice, and by his obſerving the motions and checks given him as ſignals on this occaſion. The horſe muſt be always naked for this ſport, for the ſight of a ſaddle and bridle on a horſe give the birds an alarm, and they will riſe and take wing, when they would otherwiſe have ſtood perfectly quiet: he muſt therefore only have a little ſlip tied about his lower chap, by means of which he may be guided as the ſportſman ſees occaſion; and the perſon who uſes him, muſt always take care to go juſt upon a level with his ſhoulders, and to guide his own feet by his. Some take their aim under the *ſtalking* horſe's belly, but this expoſes them too much to the ſight of the birds, who often fly away before they can take aim; but the better way is to take the level before the creature's breaſt, where the whole body of the man remains as much concealed, as it was before the taking the aim.

The horſe being properly trained, will walk ſlowly along in any ſort of ground, as ſtubble-fields, mooriſh places, or the banks of rivers, and will always feed, or pretend to feed, as he is directed. The ſportſman is to conceal himſelf and his gun behind the horſe's fore ſhoulder, bending his body low by his ſide, and keeping the whole body of the horſe always full between the fowl and himſelf. When by this means the ſportſman is come ſo near to the birds, that the gun will reach them with ſtrength to kill, he is never to attempt advancing any nearer, that they may not be diſturbed. Some recommend the ſhooting over the horſe's buttocks, and ſome over his neck, but the beſt way is under the neck, and before the breaſt; for by this means the body of the ſportſman is covered by the ſhoulder, and his legs by the legs of the horſe. It is proper alſo to take out a ſpaniel, but he muſt be one that is well trained to the ſport, and that will lie ſtill and cloſe behind his maſter's heels, for if he is ſeen, the birds will immediately be gone. When the birds are ſhot, the dog will bring them to his maſter, and as they often fall in places where a man cannot come at them, this creature is of very neceſſary ſervice.

This is the beſt of all methods of *ſtalking*, but as ſuch a horſe is difficult to train, and chargeable to keep, and is not always to be had, there are many other contrivances introduced to ſupply the place of it; among theſe the principal are the *ſtalking* wheelbarrow, the *ſtalking* buſh, and the *ſtalking* hedge. The firſt of theſe is to be thus contrived: take a wheelbarrow, made on purpoſe of light fir, and ſet round about it boughs and buſhes in ſuch a manner, that you may ſit in it, and not be diſcovered by the fowl, and drive it along without giving them diſturbance. The ſportſman is always to take a ſpaniel well trained to the ſport along with him on this occaſion, and when he knows the haunts of the birds, he is to level through the boughs that are placed about it, and ſend out his ſpaniel for the birds he kills.

The *ſtalking* buſh is to be contrived of ſeveral buſhes well platted together, with all their leaves on; it is to be faſtened to a ſtake, which is to have an iron point at the end: the whole is to be of the height of a man, and thickſet with boughs all the way, from top to bottom. When the ſportſman ſees his game before him, he is to advance ſlowly with this artificial buſh between him and them; when he is come within a proper diſtance, he is to fix the buſh into the ground, by running in the iron ſpike, and then to ſhoot through the boughs.

The *ſtalking* hedge is generally made about nine feet long, and a yard and half high: it is to be made of ſmall wands, ſo woven together, as to give room for the placing of green boughs among them, that it may reſemble a great growing hedge. This is to be carried before the ſportſman, and, in

the manner of the buſh, it is to be faſtened down, when near enough for the gun to kill from it.

As birds however are apt to have ſome apprehenſion of terror from ſeeing a tree or hedge move, theſe machines are to be carried on very ſlowly; and the reſemblance of a real animal, as a horſe or cow, are better for the purpoſe: theſe may be made of canvas, ſupported on a ſlight frame, and with tails of hair. For pheaſants, woodcocks, and the like fooliſh birds, the common flat figure of a horſe will do; but the water fowl are generally much more ſhy, and it is neceſſary, for the getting near them, to have the body made hollow, and ſtuffed with hay, or ſome other matter, to keep it out. The proper time to uſe theſe engines is either early in the morning, or late in the evening; for the ſunſhine in the middle of the day very ſoon diſcovers to the fowl the imperfection of the engine.

STALKER, in brick-making. See the article BRICK.

STALKERS, in our old writers, a kind of fiſhing-nets. Stat. 13 Rich. II. cap. 20. *Blount.*

STALLAGE, *ſtallagium*, in our old writers, the liberty, or right of pitching and erecting *ſtalls* in fairs or markets, or the money paid for the ſame. *Kenn.* Gloſſ. Terms of Law. *Blount*, *Cowel.*

STALLION, in the manege, in French *etalon*, a ſtone-horſe kept to breed. See the articles HORSE and MARE.

STAMINA, (*Cycl.*) among botaniſts, the male organs of generation in flowers. They conſiſt of two parts, a filament and anthera; though ſometimes the latter ſtands alone. The filament is a ſlender body, ſupporting a tumid one, which is the anthera, on its head or top. The anthera is the great male organ of generation, is hollow, and contains in it a fine powder, called *farina fœcundans*. See GENERATION and FARINA.

STAMINEOUS, (*Cycl.*) in botany, a term uſed by authors for thoſe flowers of plants which have no petals, or flower-leaves, but conſiſt only of a number of *ſtamina* and piſtils placed in a cup. This cup is ſometimes miſtaken for a flower, and its leaves thought to be true petals; but they remain when the *ſtamina* are fallen, and become the capſules containing the ſeed, which is the true character of a cup, not of a flower. *Tourn.* Inſt. p. 501.

STAMNOS, an urn, or veſſel, for holding water. Some authors have made it ſignify the bucket-head, as it is called, of thoſe alembics which have no worm, but are cooled about the head by this means.

STAMPS, in metallurgy, a ſort of large peſtles lifted up by water-wheels, and ſerving to beat to powder the ores, and refuſe of ores of metals. *Ray*'s Engliſh Words, p. 116.

STANCH, or STAUNCH, a name given by the country people of Northamptonſhire, and ſome other counties, to a ſpecies of foſſil called *ſelenites*, from its ſuppoſed virtue in ſtopping fluxes of blood. *Hill*'s Hiſt. of Foſſ. p. 129. See the article PACHODECARHOMBIS.

STANCHION (*Cycl.*)—STANCHIONS, in a ſhip, thoſe pillars, which being ſet up pillarwiſe, do ſupport and ſtrengthen the waſte trees.

STAND (*Cycl.*)—STAND, in commerce, a weight from two hundred and a half to three hundred of pitch. Merch. Dict.

STANDARD (*Cycl.*)—For the Roman *ſtandards*, ſee the article SIGNA.

STANDEL, in our old writers, denotes a young ſtore oak-tree, which in time may make timber; and twelve ſuch young trees are to be left ſtanding in every acre of wood, at the felling thereof. 35 Hen. VIII. cap. 17. 13 Eliz. cap. 25. *Blount.*

STANDING-*coin*. See the article COIN.

STANDING-*marriage*, in the law of Scotland, is uſed to expreſs one actually ſubſiſting, though perhaps reducible for adultery, or liable to be declared void for impotency, or conſtingency of blood; that is, conſanguinity. *Bayne*'s Crim. Law.

STANDING *part of the ſheat*, in a ſhip, that part of it which is made faſt to a ring at the ſhip's quarter. When they ſay *overhale the ſheat*, they mean, *hale upon the ſtanding part*; but when they ſay *hale the ſheat* barely, they intend only of the running part.

STANDING *part of a tackle*, aboard a ſhip, is the end of the rope where the block is ſeized or faſtened; as the other, which is haled, is called *fall.*

STANDING-*ropes*, in a ſhip, thoſe ropes which do not run in any blocks, but are ſet taught, or let ſlack, as occaſion ſerves; as the ſheat-ſtays, back-ſtays, and the like.

STANNEL, in zoology, an Engliſh name of a ſpecies of hawk, more commonly known by the names of the *keſtrel*, or the *windhover*; and called by Latin authors *tinnunculus* and *cenchris*. *Ray*'s Ornitholog. p. 50. See the article TINNUNCULUS.

STANNUM, *tin*. See the article TIN.

STAPEDIUM, in anatomy, a name given by Albinus to the muſcle of the ſtapes in the ear, called by others *ſtapidis muſculus*, and *ſtapidanus muſculus*.

STAPES (*Cycl.*)—This bone is very well denominated from its reſemblance to a ſtirrup; it is divided by anatomiſts into its head, legs, and baſis. The head is placed upon a ſhort flatted neck, the top of it being ſometimes flat, ſometimes a little hollow. The two legs, taken together, form an arch like that of a ſtirrup, in the concave ſide of which is a groove, which runs through their whole length; one of the legs is longer, more bent, and a little broader than the other.

The baſis reſembles that of a ſtirrup, both in its oval ſhape, and union with the legs, except that it is not perforated, as the ſtirrups now are, but ſolid, like thoſe of the antients. Round its circumference, next the legs, is a little border, which makes that ſide of the baſis appear a little hollow; the other ſide is pretty ſmooth, and one half of the circumference is ſomething more curve than the other. The ſubject being in an erect poſture, the *ſtapes* is to be conſidered as lying on its ſide with the head turned downward, near the extremity of the leg of the incus; the baſis inward being fixed in the feneſtra ovalis, the longeſt leg backward, the ſhorteſt forward, and both in the ſame place. By this ſituation it is eaſy to know the *ſtapes* of each ear. *Winſlow*'s Anatomy, p. 49.

STAPHYLE, a word uſed by the old Greek writers, ſometimes to expreſs a grape; and ſometimes a diſorder of the uvula, which conſiſts in an extenuation of its ſuperior part, and a tumor of the inferior, whence it hangs down in the ſhape of a grape. The uvula, or gargareon, is alſo thus called by ſome writers.

STAPHYLEPARTES, the name of a chirurgical inſtrument, in uſe among the antients for elevating the uvula. It is mentioned by Paulus Ægineta.

STAPHYLINUS, in botany, a name given by ſome authors to the common *daucus ſylveſtris*, wild carrot, or bird's neſt. *Dillen.* Cat. Giſſ. 150.

STAPHYLIS, a name given by ſome authors to a ſort of cup or boat, made for feeding young children, and contrived with a ſpout in form of a grape or nipple.

STAPHYLODENDRON, the *bladder-nut*, in botany, the name of a genus of trees, the characters of which are theſe. The flower is of the roſaceous kind, being compoſed of a number of leaves diſpoſed in a circular form. The cup is compoſed of one leaf, divided into many ſegments at the edge; and from this ariſes the piſtil, which finally becomes a membranaceous fruit, inflated in the manner of a bladder, and containing hard ſeeds. See Tab. 1. of Botany, Claſs 21. The ſpecies of *ſtaphylodendron*, enumerated by Mr. Tournefort, are theſe. 1. The common *ſtaphylodendron*, or *bladder-nut*. 2. The trifoliate Virginian *ſtaphylodendron*, called by ſome the *wild piſtacia*, or the *trefoil Virginian piſtacia*. *Tourn.* Inſt. p. 616.

STAPHYLOMA, in ſurgery, the name of a diſtemperature of the eye, which is of two kinds: in one the cornea is more than uſually protuberant; and in the other the uvea breaks forth, and forms an unſightly tumor on the cornea, either from internal cauſes, or from ſome wounding inſtrument forced through the coat; in which laſt caſe, the ſight of the eye is uſually deſtroyed.

This is a very dangerous diſorder, as it not only deforms the face, and deſtroys the ſight of the eye, but very often it induces violent inflammations, headachs, reſtleſneſs, abſceſſes, and ſometimes a cancer in theſe parts. In the cure of this diſorder, the tumor and deformity are to be relieved by the application of compreſſes dipped in alum-water, together with a plate of lead and a bandage, or ſome proper inſtrument. If the uvea protrudes itſelf through a wound in the cornea, it ſhould be returned with a probe, and the patient muſt be ordered to lie in a ſupine poſture, and the wound muſt conſtantly be dreſſed with the white of an egg, and a mucilage of quince-ſeeds, till it is healed; and by this means the ſight is often reſtored.

If this diſorder is become inveterate and inflexible to all remedies, a needle, armed with a double thread, muſt be paſſed through the middle of the tumor, and the two ends of the thread are then to be tied on a knot, firſt on one ſide, and then on the other, by which means the tumor will gradually wither, and fall off along with the threads; but as this method occaſions a continued pain, and from thence ſometimes ariſe inflammations, it is better ſtill to cut off the tumor with a ſcalpel, or ſciſſors. *Heiſter*'s Surgery, p. 423.

STAPIDACEUS *muſculus*, in anatomy, a name given by Duverney, Douglaſs, and many others, to the muſcle of the ſtapes of the ear, called by others *ſtapedis muſculus*, and by Albinus *ſtapedium*. See the article EAR.

STAR (*Cycl.*)—Mr. Flamſtead had obſerved different diſtances of the pole-*ſtar* from the pole at different times of the year; and theſe obſervations were, through miſtake, looked upon by ſome as a proof of the annual parallax of the fixed *ſtars*. On the whole, Mr. Flamſtead concluded that the pole-*ſtar* was 35″, 40‴, or 45′ nearer the pole in December, than in May or July.

Dr. Hook had alſo communicated ſeveral obſervations on the apparent motions of the fixed *ſtars*; and as this was a matter of great importance in aſtronomy, ſeveral of the learned were deſirous of verifying and confirming his obſervations. An inſtrument was accordingly contrived by Mr. George

George Graham, and executed with ſurpriſing exactneſs. With this inſtrument the *ſtar* γ, in the conſtellation Draco, was frequently obſerved by Meſſrs. Molyneux, Bradley, and Graham, in the years 1725, 1726; and the obſervations were afterwards repeated by Mr. Bradley, with an inſtrument contrived by the ſame ingenious perſon, Mr. Graham, and ſo exact, that it might be depended on to half a ſecond. The reſult of theſe obſervations was, that the *ſtar* did not always appear in the ſame place, but that its diſtance from the zenith varied, and that the difference of the apparent places of Themis, the third ſatellite of Jupiter, amounted to 21 or 22 ſeconds. Similar obſervations were made on other *ſtars*, and a like apparent motion was found in them, proportional to the latitude of the *ſtar*. This motion was by no means ſuch as was to have been expected, as the effect of a parallax; and it was ſome time before any way could be found of accounting for this new phænomenon. At length Mr. Bradley reſolved all its variety, in a ſatisfactory manner, by the motion of light and the motion of the earth compounded together. See LIGHT.

STAR, *ſtarrum*, in our old writers. All the deeds, obligations, *&c.* of the Jews, were called *ſtars*, and writ for the moſt part in Hebrew alone, or in Hebrew and Latin; one of which yet remains in the Treaſury of the Exchequer, written in Hebrew without points, the ſubſtance whereof is expreſſed in Latin juſt under it, like an Engliſh condition under a Latin obligation: this bears date in the reign of King John; and many *ſtars*, as well of grant and releaſe, as obligatory, and by way of mortgage, are pleaded and recited at large in the Plea Rolls. Paſch. 9 Edw. I. *Blount.*

The word *ſtar* is a contraction from the Hebrew *ſchetar*, a deed or contract.

STAR *of the earth*, in botany, the name of a plant famous for its virtues in curing the bite of a mad-dog: but unhappily there has been a very great miſunderſtanding among authors about the plant properly ſignified by this name; ſome calling by it the *coronopus*, or buckſhorn-plantain, an herb common every where, and others a ſpecies of *lychnis*, or catch-fly, which is a very ſcarce plant. The original account of its nature and virtues ſeems to be this: King James ſent to the Royal Society a dried ſpecimen of a plant, which had been ſent to him as the plant with which his dogs had been cured when bitten by a mad-dog, and the name, by which this was called, was *ſtar of the earth.*

The plant was ſo ill dried, that it was not eaſily diſtinguiſhed, but at length Mr. Ray found it to be the *ſeſamoides ſalamanticum magnum.* It does not ſeem, however, clear, that this was the plant vulgarly known by that name, but rather that it was gathered by ſome ignorant perſon; neither the name *ſtar of the earth* at all agreeing with it, nor any account having been given before of its having ſuch virtues. Dr. Grey, in his Compleat Farrier, greatly recommends the *ſtar of the earth* in the cure of this bite, and the plant he means is plainly the *coronopus*, or buckſhorn-plantane: and, upon the whole, it ſeems that this laſt mentioned is the plant properly called by this name, as its virtues have always been celebrated even in this caſe, and its leaves always are diſpoſed on the earth in the form of the rays of a *ſtar*. It is to be added to this, that the Counteſs of Suffolk's powder, ſo famous in many places for this terrible diſeaſe, and by which ſeveral perſons have been known to be cured, is principally compoſed of this plant. Philoſ. Tranſ. N° 450. p. 455.

STAR-*fiſh*. There are many ſpecies of the *ſtar-fiſh*, and thoſe extremely different one from another: they have different numbers of rays, but the moſt common kind has five. Their upper ſurface, or that to which the legs are not faſtened, is covered with a firm and hard ſkin, which is full of little eminences of a harder matter, approaching to the nature of that of the ſhells of the echini marini, and the like. This ſkin is of different colours in the different ſpecies; moſt uſually it is red, ſometimes it is green, in ſome blue, and in others yellow, and of all the degrees of theſe colours, or the mixtures that may be produced from them. This colour does not extend to the under ſurface, that is covered all over with legs and with points, like the eminences of the upper ſide, only longer; theſe are all either whitiſh, or yellowiſh. In the center of the *fiſh* there may be ſeen a mouth or ſucker, by means of which the creature draws its nouriſhment from the ſhell-fiſh, on which it feeds. There are five teeth placed round this ſucker, or perhaps they may be more properly called *five bony forceps*; by means of which it ſeizes and holds faſt the creature, while the ſucker does its office, in draining out the juices; and probably it is by means of theſe that they open the bivalve ſhells, when they feed on the fiſh in them.

Every ray of the *ſtar-fiſh* is furniſhed with ſo very large a number of legs, that they cover the whole ſurface: they are diſpoſed in four ranges, each of which contains about 74; ſo that the whole ray contains 304, and conſequently the *fiſh* has, upon all five of its rays, no leſs than 1520 legs. With all this numerous train of legs, however, the animal moves but very ſlowly; and indeed they are ſo ſoft and feeble, that they ſcarce deſerve the name of legs, and, more properly ſpeaking, they are only a ſort of horns, like thoſe of our garden-ſnails, but they ſerve the animal to walk with, and are therefore called legs. It is not only in their ſoftneſs that they reſemble the horns of ſnails, but their figure is alſo perfectly like them, ſo as that the compariſon gives a ſufficient deſcription of them. They are capable of being contracted or ſhortened alſo, in the ſame manner with the horns of ſnails, and it is only in the time of the creature's moving that they are ſeen of their full length; at other times no part of them is ſeen but the extremity of each, which is formed like a ſort of button, being ſomewhat larger than the reſt of the horn. If one of the rays of this *fiſh* be turned the lower part upwards, and attentively viewed, the mechaniſm by which it extends its legs will be eaſily underſtood. If the ray be cut tranſverſely in two, it is found compoſed of two bodies, divided from one another by a cartilaginous hard ſubſtance. This body ſeems compoſed of a vaſt number of vertebræ, and along it there run a great number of ſpherical, or oblong tubercles, very bright and tranſparent. There are four ranges of theſe, on each ſide two; they are formed of a fine thin tranſparent membrane, filled with a perfectly clear and pellucid fluid, like water. It is not difficult to conceive, that theſe little bladders ſerve to the lengthening and contracting of the legs of the animal; it is ſoon perceived that they are of the ſame number with the legs, and are ranged in the ſame order, ſo that each bladder correſponds to one leg: but the whole is perfectly explained, when on preſſing one of theſe bladders the liquor is ſeen to flow out of it into the leg which it belongs to, and that the leg is extended and lengthened by this means; and that when this preſſure is taken off, the fluid runs back again of itſelf from the leg to the bladder, and that on this the leg gradually ſhortens again: there is, therefore, nothing more neceſſary for the lengthening and contracting of the legs, than that the animal ſhould have a power of preſſing theſe bladders; that would always perform the firſt motion, and the mere ceaſing to preſs them would perform the other.

When the under part of the rays is viewed, and the creature in motion, it is ſeen that the legs are elongated, and again contracted, merely by the ingreſs and egreſs of a fluid; and that the creature does not uſe all the legs of the ſame ray to walk with, but ſometimes one part of them, and ſometimes another, and this with great irregularity. They ſeize on any part of the rock, in the creature's moving, in an acute angle, and in conſequence, when they ſet themſelves ſtrait upright again the body of the fiſh, muſt be ſo far pulled forward, as is the ſpace of that angle from the perpendicular. They march with equal eaſe when thus inverted, and when in their natural poſition, and as well on ſand as ſtones, and if in the dry, or if covered with water; but in all caſes they move very ſlowly.

If a *ſtar-fiſh* is taken up when full of water, it throws it out at different parts of its body by a vaſt number of little, and almoſt imperceptible apertures, in ſo many ſmall ſtreams or threads; and when it has diſcharged thus all that it will naturally, it may be made to throw out more by preſſing or ſqueezing the rays, and by this means the pipe, by which it is thrown out, may be forced out of the body, and is then ſeen to be white, and of a triangular, not round figure. Theſe are diſpoſed in great numbers over the rays. Mem. Acad. Par. 1710.

The amazing property of reproducing the eſſential parts, when loſt, is not confined to the polype, and ſome few others of the inſect world, but is extended to the *ſtar-fiſh*, and to the urticæ marinæ of various kinds, and probably to many others, in which we at preſent have no expectation of finding it. Mr. Reaumur, on the diſcovery of this property in the polype, obſerved theſe other animals, as they lay on the ſhores of Poictou, and other places, and often found that ſpecies of *ſtar-fiſh*, which is very commonly known, and which has naturally five rays or arms, with only three or four, one or two being wanting; and on taking up and examining theſe mutilated ones, nature was always found reproducing the limb that was wanting; and on cutting and breaking other *ſtar-fiſh* into ſeveral parts, it was but a very little while before the broken parts cicatriſed, and every part remained alive; and by the appearances of things there remained no doubt, but that theſe living pieces will all, in time, reproduce their wanting parts.

Mr. Reaumur could not ſtay long enough on the ſpot to ſee this, but Mr. de Villars, on the coaſt of Rochelle, ſaw the whole proceſs very frequently in the urticæ marinæ, which he cut to pieces on purpoſe for the experiment, and which always reproduced the parts he had cut off; and the common fiſhermen of the coaſts, where Mr. Reaumur was in company with Mr. Juſſieu, ſeeing them making their experiments on the *ſtar-fiſhes*, appeared to be well acquainted with their nature, and told them that they might cut and tear them as much as they pleaſed, but they would not be able to kill them: ſo familiarly was this piece of natural hiſtory known among theſe people, though unknown to thoſe who had employed their lives in the ſearches after ſuch things.

Mr.

Mr. Reaumur was very ſenſible of the advantages that water inſects, and animals, have over others, as to the healing of their wounds, but was reſolved to try the experiment on ſome land animals. The creature he firſt choſe for theſe experiments was the earth-worm; and on cutting theſe creatures aſunder, though many of the pieces dried, yet he had the pleaſure of ſeeing ſome ſucceed ſo perfectly, that the tail part, which wanted not only the head, but alſo the organs of generation of both ſexes (which in theſe animals are always both contained in the ſame individual) has been ſeen to reproduce both theſe organs and the head, and become as perfect a worm as the whole was. Philoſ. Tranſ. N° 464. Append.

STAR-*gazer*, in ichthyology, the Engliſh name of the uranoſcopus. See the article URANOSCOPUS.

STAR-*ſhot*, the common name of a gelatinous ſubſtance often found lying on the ſurface of the earth, and called by ſome *ſtar-jelly*, and *ſtar-fallen*.

The vulgar have been always of opinion, that this was produced from that meteor which they call a *falling-ſtar*; others have imagined it a vegetable ſubſtance, and ſuppoſed it grew out of the earth: neither of theſe however appear, upon a cloſe examination, to be the caſe, but that it is really the half-digeſted food of herons, bitterns, crows, ſea-mews, and coddy-moddies, principally when they have fed upon frogs or earth-worms.

The heads of frogs have been found whole in maſſes of this matter, as have alſo parts of worms; and theſe birds, when ſhot, have been found, when dying, to diſgorge a ſubſtance of the ſame kind.

It is a gelatinous ſubſtance, reſembling a thick mucilage of gum tragacanth, and is cold to the touch. There are often yellow ſpecks, and ſmall clots, like grumous blood, in it. It ſtinks like putrid fleſh when kept, and is principally found in miſty mornings, and in wet weather in autumn, winter, and ſpring. *Moreton*'s Northampt. p. 353.

Mr. Boyle ſays, he has ſeen this jelly reſolved by digeſtion only into a permanent liquor; and that a phyſician of his acquaintance extolled it as a ſpecific, outwardly applied, to wens. Works Abr. Vol. 1. p. 310.

STAR-*ſtone*, *aſteria*, in natural hiſtory, the name of a kind of extraneous foſſil, of a very regular figure and ſtructure, and approaching very much to the nature of the entrochi, having the ſame ſubſtance and inner ſtructure, and being much of the ſame ſize, though different in form: and as thoſe foſſils have fragments of ſhelly bodies, to which they are ſometimes found affixed, and appendages like branches, or the rudiments of ſuch, growing from them, ſo theſe have both the one and the other; the firſt called *aſteropodia*, and the others the *appendiculæ*, or wires of the *aſteriæ*.

The *aſteropodia*, in ſubſtance and inner ſtructure, agree perfectly with the ſhells of the echinitæ, found in our chalk-pits, and with the *aſteriæ* and entrochi; theſe bodies being all compoſed of obliquely-arranged plates of a tabulated ſpar: they are uſually compoſed of ſeveral joints, but they are only very imperfect fragments of the body of the animal the *aſteriæ* have once been a part of; the ſeveral parts of which they are compoſed are all convex on one ſide, and concave on the other, but they are of very different ſhapes, being ſometimes roundiſh, ſometimes oblong, often quadrangular, and not unfrequently of different numbers of angles. They have frequently two, ſometimes more ridges running acroſs them, and ſometimes they have tubercles, or ſmall protuberances, ſtanding either on their upper or under ſide: they are ſometimes found ſingle, but more frequently compound, or arranged into ſmaller or larger parcels, being placed one over another in the manner of the tiles of a houſe, and ſeem truly to have been originally part of an imbricated ſhell, or cruſt of ſome yet unknown ſpecies of ſea-fiſh. They are in theſe compound maſſes even very evidently fragments, and are uſually of irregularly broken figures, though ſometimes they reſemble, in ſome degree, parts of the rays of one or other of the kinds of *ſtar*-fiſh. They are uſually found looſe from the *aſteriæ*, though lying among them; but ſometimes the *aſteriæ* are regularly fixed on them, juſt as the entrochi on the modioli, and are plainly ſeen to have originally grown out of them.

The *encrinos* of authors is one kind of *aſteropodium*, and has been affirmed by ſome perfectly to agree in figure with a ray of the magellanic *ſtar*-fiſh. This is, however, ſeldom found in ſuch a compound ſtate; it uſually is met with in ſingle joints, and then is what authors call the *aſteropodium minus*, or ſmall *aſteropodium*. *Hill*'s Hiſt. of Foſſ. p. 653.

Theſe bodies are uſually of a pale bluiſh grey, or aſh colour; ſometimes they are whitiſh, and ſometimes, though more rarely, yellowiſh, or reddiſh.

Having thus far deſcribed the *aſteropodia*, which ſeem properly the baſes of the *aſteriæ*, we ſhall be more intelligible in the account of the *aſteriæ* themſelves, which are to be treated of merely as branches of them; though, from their being much more frequent than theſe their baſes, they are much more familiarly known, and uſually more regarded.

The *aſteriæ* are ſhort, and commonly ſomewhat crooked angular columns, compoſed of ſeveral joints, each reſembling the figure of a radiated *ſtar*, with a greater or ſmaller number of rays in the different ſpecies: they are uſually found of about an inch in length, and of the thickneſs of a gooſe-quill. Some of them have five angles, or rays, and others only four, and in ſome the angles are equi-diſtant, while in others they are irregularly ſo; in ſome alſo they are ſhort and blunt, while in others they are long, narrow, and pointed; and ſome have their angles ſo very ſhort and obtuſe, that at firſt ſight they might be taken for *entrocho-aſteriæ*. The ſeveral joints in the ſame ſpecimen are uſually all of the ſame thickneſs; this however is not always the caſe, but in ſome they are larger at one end, and in others at the middle, than in any other part of the body; and ſome ſpecies have one of the rays bifid, ſo as to emulate the appearance of a ſix-rayed kind.

All the *aſteriæ* are naturally ſulcated between the angles, but this in a very different degree; ſome are very little ſo, while others are cut ſo deeply, that the ſingle joints of them reſemble the rowels of a ſpur. One end of the column is frequently found finely engraved along the edges of the angles, or rays, while the other end is ſmooth, or nearly ſo; and the ſame is often the caſe alſo in the ſingle joints. Not unfrequently, alſo, one end of a column is indented, and the other has five ſtriæ, running from a hollow center to the ſulci between the rays.

They are found of various bigneſſes and colours; the longeſt ſeldom arrive, however, at two inches, and they are found of all the intermediate bigneſs from this down to the length of a barley-corn: they are not unfrequently found, alſo, compreſſed and flatted, as is common to the foſſils that have been formed in animal moulds.

They are uſually found bedded in the ſtrata of clay, though not unfrequently in thoſe of a lax ſort of quarry-ſtone, and ſometimes in a harder, but that leſs frequently. They uſually have ſea-ſhells, and other marine remains, lying about them; and ſometimes theſe ſhells adhere to the *aſteriæ*, and when ſeparated from them do no injury to the *aſteriæ*, but themſelves ſhew a mark of the figure of the body, or part of the column, when a part has been always wanting in the ſhell. Had theſe ſhells been ſtuck into the bodies of the *aſteriæ*, it would have been a proof that theſe ſhells were the bodies firſt formed, and that the matter of the *aſteriæ* had been formed, or had gathered about them afterwards; but as it is, we have by it abundant proof on the other ſide of the queſtion, and may plainly diſcover that theſe *aſteriæ* are really of marine origin; and that however they may be altered in their matter or ſtructure, ſince they were depoſited in the earth, yet that they were really exiſting in this their proper form in thoſe ſeas, when the ſhells that are found adhering to them acquired their growth.

From the columns of the *aſteriæ* there are ſometimes propagated certain ſmall branches, like thoſe of the entrochi; theſe are called by authors *appendiculæ aſteriarum*, or the wires of the *aſteriæ*.

They are compoſed of ſeveral ſhort cylindric joints, with obliquely-truncated ends, and each hollowed to the middle, where there ſtands a ſmall tubercle. Theſe branches are ſometimes two inches long, and the largeſt or thickeſt joint always adheres to the *aſteria*, all the ſucceeding ones growing ſmaller, and the branch taperer toward the end. In their natural ſituation on the *aſteria*, they ſtand in regular circles at different diſtances, one above another: there is always one wire in each of the ſulci, or channels of the body, and theſe ſtand evenly againſt one another.

Theſe wires, or *appendiculæ*, are very ſeldom, however, found in this their native ſtate, or fixed to the bodies of the *aſteriæ*; they are commonly found broken off, and lying looſe among them, and the rudiments only of them remaining on the *aſteriæ*, and very rarely even theſe. The wires themſelves are more frequently found wholly ſeparate from them, and either in fragments of different lengths, or in ſingle joints, immerſed in ſtone, or lying among the ſtrata of clay. *Hill*'s Hiſt. of Foſſ. p. 654.

The *aſteria* is alſo denominated *aſtrites*, *aſtroites*, *aſtrobulus*, and *aſteriſcus*; by Geſner *ſphragis aſteros*, *ſigillum ſtellæ*, in Engliſh the *ſtarry-ſtone*.

The *aſteriæ* may be reduced to two kinds; the firſt, thoſe whoſe whole bodies make the form of a *ſtar*; the ſecond, thoſe which in the whole are irregular, but which are adorned, as it were, with conſtellations in the parts.

Dr. Liſter, for diſtinction's ſake, only gives the name *aſteria* to the former ſort, diſtinguiſhing the latter by the appellation of *aſtroites*; the other naturaliſts generally uſe the two indiſcriminately [b]. The *aſteria*, ſpoken of by the antients, appears to be this latter kind [g].—[b] *Plott*, Nat. Hiſt. Oxfordſh. cap. 5. ſect. 16. ſeq. [g] Mercat. Metalloth. arm. 9. cap. 10.]

Some antient writers indeed ſpeak of another more extraordinary ſpecies of *aſteria*, or *aſterites*, which the ſun's rays would ſet on fire, and which on that account came into uſe for the compoſition of philtres for kindling love. *Bail.* Dict. Crit. in voc. Eſope, n. (A).

The quality of moving in vinegar, as if animated, is ſcarce perceivable in the *aſtroites*, but is ſignal in the *aſteria*.

The former muſt be broken in ſmall pieces before it will move; but the latter will move, not only in a whole joint, but in two or three knit together. *Plott*, Nat. Hiſt. Oxfordſh. ſect. 26, ſeq.

STAR-*wort*, *after*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the radiated kind. Its diſk is compoſed of floſcules, and its border of ſemifloſcules: theſe all ſtand on the embryo ſeeds, and are contained in one common ſquammoſe cup. The embryos finally ripen into ſeeds, which are winged with down, and fixed to the thalamus of the flower.

The ſpecies of *after*, enumerated by Mr. Tournefort, are theſe. 1. The common blue Attic *ſtar-wort*. 2. The Attic *after* with white flowers. 3. The round-leaved hairy Auſtrian *ſtar-wort* with large blue flowers. 4. The long-leaved mountain *ſtar-wort* with large blue flowers. 5. The purple-flowered Alpine *after*. 6. The blue-flowered dwarf mountain *ſtar-wort*. 7. The blue-flowered Alpine Attic *ſtar-wort*. 8. The purple tripolium-flowered *after*. 9. The broader-leaved *after* with tripolium flowers. 10. The common acrid blue-flowered *after*, called the *blue fleabane*. 11. The great blue Attic *ſtar-wort*. 12. The leſſer blue Attic *ſtar-wort*, called the *blue Alpine fleabane*. 13. The blue-flowered willow-leaved ſea *ſtar-wort*, called *tripolium*. 14. The leſſer *tripolium*. 15. The ſmall white-flowered *tripolium*. 16. The early Pyrenean *after* with large blue flowers. 17. The autumnal Pyrenean *after* with ſmaller blue flowers. 18. The broad-leaved American *after* with pale blue umbellated flowers. 19. The tall hairy New England *after* with very large violet-purple flowers. 20. The late-flowering hairy willow-leaved American *after* with blue flowers. 21. The tall-branched, wild daiſy-leaved, late-flowering *after*. 22. The branched late-flowering purple *after*. 23. The broad-leaved paniculated *after* with deep violet-coloured flowers. 24. The blue-flowered hyſſop-leaved branched African *after*. 25. The white-flowered branched hyſſop-leaved African *after*. 26. The annual Canada branched *after*, called by ſome the *branched daiſy*. 27. The African *after* with helichryſum leaves. 28. The hairy yellow mountain *after atticus* with very large flowers. 29. The ſmooth mountain *after* with large yellow flowers. 30. The yellow-flowered *after* with ſweet-ſcented roots. 31. The fleabane-leaved autumnal meadow *after*, commonly called the *middle fleabane*. 32. The meadow Alpine *after* with gold-yellow flowers. 33. The yellow-flowered woolly Dutch *after*. 34. The very hairy and woolly Alpine *after*. 35. The hairy mullein-leaved *after*. 36. The rock *ſtar-wort* with viſcous, hairy, and ſtrong-ſcented leaves. 37. The long-leaved mountain yellow *after*. 38. The yellow marſh *after* with long woolly leaves. 39. The ſea *after* with a thick cylindric, and three-pointed leaf. 40. The yellow jagged-leaved marſh *after*, called the *jagged-leaved marſh fleabane*. 41. The marſh *after* with ſmall globoſe flowers. 42. The yellow-flowered tuberous-rooted ſea *after*, called *ſea-fleabane*. 43. The mountain willow-leaved *after* with yellow flowers. 44. The yellow ſweet-ſcented *fleabane* like *after*. 45. The fleabane-leaved yellow Alpine *after*. 46. The mullein-leaved *after* with yellow flowers. 47. The primroſe-leaved American *after* with yellow flowers, and a thick large cup. 48. The American primroſe-leaved *after* with a ſingle purple flower. 49. The ſhrubby yellow ſtœchas-leaved American *after* with umbellated yellow flowers. 50. The American *after* with large ragwort leaves, hairy underneath. 51. The yellow-flowered ſtœchas-leaved Æthiopian *after*. 52. The great *after*, commonly called *elecampane*. *Tourn.* Inſt. p. 481.

All the ſpecies of this plant are propagated by parting their roots early in ſpring, and they will grow in almoſt any ſoil or ſituation; and the larger ſorts encreaſe ſo faſt, that if not prevented, they will in a little time over-run a large ſpace of ground. They grow beſt in the ſhade. But the lower kinds do not run ſo much at the root, but ſhould be taken up and tranſplanted every other year, which will make them produce much fairer flowers. *Miller*'s Gard. Dict.

Golden STAR-*wort*. See the article ASTER *Atticus*.

STAR *of Bethlehem*. See the article ORNITHOGALUM.

STARAPHAXAT, a name uſed by ſome of the old writers for any medicine that reſtrains fluxions upon the eyes, noſe, or fauces.

STARTING, in the manege. A horſe is ſaid to be *ſtarting*, ſkittiſh, or timorous, that takes every object he ſees to be otherwiſe than it is; upon which he ſtops, flies out, and ſtarts ſuddenly to one ſide, inſomuch that the rider can't make him come near the place where the object is. This fault is more common to geldings than ſtone-horſes. Such horſes alſo as have bad eyes are moſt ſubject to it, as well as thoſe that have been kept a long time in a ſtable without airing; but theſe laſt are eaſily cured of it. When you have a ſkittiſh horſe, never beat him in his conſternation, but make him advance gently, and with ſoft means, to the ſcarecrow that alarms him, till he recovers it, and gains aſſurance.

STARVING *to death*, a kind of puniſhment uſed by the people of Arragon ſome ages ago; and it is reported by Tavernier, that the chief ladies in the kingdom of Tunquin are at this day ſtarved to death for adultery.

STASIS, a word uſed by phyſicians to expreſs a ſtagnation of the humors.

STATELY, in the manege. A horſe is ſaid to be *ſtately*, that goes with a proud, ſtrutting gate.

STATER, the name of a weight among the antients, equal to four drachms.

STATHEUSIS, a word uſed by the old writers to expreſs the torrefaction, or roaſting of ſome medicines before a ſlow fire, as is done frequently at preſent with rhubarb, *&c.*

STATICAL, (*Cycl.*) is ſometimes applied in a peculiar ſenſe to the experiments made as to the quantity of perſpiration, and other excretions of the human body.

We have a very particular account of ſome experiments of this kind in the Philoſophical Tranſactions, N° 470, made by Dr. John Lining of Charles-Town, in South-Carolina.

STATICAL *hygroſcope*. See the article HYGROSCOPE.

STATICE, *thrift*, in botany, the name of a genus of plants, the characters of which are theſe. The flowers are collected into a head of a ſort of globular form, which is ſurrounded by a common ſcaly cup. The head is compoſed of a number of caryophylleous flowers, compoſed of ſeveral petals, and each ariſing from its own proper tubular cup. The piſtil ariſes alſo from the ſame cup, and finally becomes an oblong fruit, covered by the cup.

The ſpecies of *ſtatice*, enumerated by Mr. Tournefort, are theſe. 1. The larger *ſtatice*, *thrift*, or *ſea July flower*. 2. The ſmaller *ſtatice*. 3. The large white-flowered Alpine *ſtatice*. 4. The ſmalleſt mountain *ſtatice*. 5. The Portugal *ſtatice* with ſcorzonera leaves. 6. The large ſhrubby Portugal ſea *ſtatice* with great flowers. 7. The great Portugal *ſtatice* with capillaceous leaves. 8. The ſmalleſt Portugal *ſtatice* with capillaceous leaves. And 9. the low ſea *ſtatice* with rigid capillaceous leaves. *Tourn.* Inſt. p. 340, ſeq.

STATICULA, among the Romans, thoſe little figures with which it was uſual to adorn their drinking-cups, called *ſcyphi*. *Pitiſc.* in voc.

STATICULI, among the Romans, a kind of dancing pantomimes. *Pitiſc.* in voc. See PANTOMIME.

STATION (*Cycl.*)—We have a method of meaſuring diſtances at one *ſtation*, in the Philoſophical Tranſactions, N° 7, by means of a teleſcope. But the practice of this method does not anſwer to the theory.

STATION, *ſtatio*, στασις, in the antient muſic, was ſometimes uſed for any fixed pitch, or degree of ſound, whether produced by intention or remiſſion. Vid. *Wallis*, Append. ad Ptolem. Harmon. p. 154.

STATION-*line*, in ſurveying. See the articles LINE and SURVEYING, *Cycl.*

STATIONARY (*Cycl.*)—STATIONARY *fevers*, a term uſed by Sydenham to expreſs a peculiar kind of fever, adapted, and owing to ſome general conſtitution of the air and ſeaſons. There are certain general conſtitutions of years, which owe their origin neither to heat, cold, dryneſs, nor moiſture, but rather depend upon a certain ſecret, and inexplicable alteration in the bowels of the earth, whence the air becomes impregnated with ſuch kinds of effluvia, as ſubject the human body to peculiar diſtempers, ſo long as that kind of conſtitution prevails, which after a certain courſe of years declines, and gives way to another. Each of theſe general conſtitutions is attended with its own proper and peculiar kind of fever, which never appears in any other; and this is thence called a *ſtationary fever*.

STATIVA, among the Romans, a ſtanding camp kept for the defence of the frontiers of the empire. Theſe camps gave riſe to a great many towns, which took their names from the legion ſtationed there. *Pitiſc.* in voc.

STATORES, among the Romans, made a part of the emperor's life-guard. *Pitiſc.* in voc.

STATUARY (*Cycl.*)—STATUARY *marble*, among our artificers, the name of the ſofter white marble uſually wrought into *ſtatues*, the ſame with the Parian marble of the antients.

STATUTE (*Cycl.*)—The king's royal aſſent to a bill by his letters patent under his great ſeal, and ſigned with his hand, and declared and notified in his abſence to the lords ſpiritual and temporal, and to the commons, aſſembled together in the high houſe, is as effectual as if the king was preſent. Stat. 33 Hen. VIII. cap. 21.

Statutes were antiently proclaimed by the ſheriff, but upon the invention of printing, this method was diſcontinued. Every body is obliged to take notice of an Act of Parliament at his peril. 4 Inſt. 26.

STATUTE-*ſeſſions*, in law, a meeting in every hundred of conſtables and houſholders, by cuſtom, for the ordering of ſervants, and the debating of differences between the maſters and the ſervants, rating of ſervants wages, *&c.* 1 Eliz. cap. 4. *Cowel.*

STATUTO *mercatorio*, a writ for the impriſoning him that has forfeited a *ſtatute merchant* bond, until the debt is ſatisfied: and of theſe writs there is one againſt lay-perſons, and another againſt perſons eccleſiaſtical. Reg. Orig. 146, 148. *Cowel.*

STATUTO *ſtapulæ*, a writ that lies to take the body to priſon, and ſeize upon the lands and goods of one who hath forfeited the bond called *ſtatute ſtaple*. Reg. Orig. 151. *Blount*, *Cowel*.

STATUTUM *de laborariis*, an antient writ for the apprehending ſuch labourers as refuſe to work according to the *ſtatute*. Reg. Judic. 27. *Blount*, *Cowel*.

STAVESACRE, *ſtaphiſagria*, in botany. See the article STAPHISAGRIA.

Staveſacre grows in Provence, Languedoc, and many other parts of Europe. The leaves are large and finger'd, the flower blue, and ſomewhat like that of the larkſpur. The ſeed, which is the only part of the plant uſed in medicine, is of a duſky brown, and very rough on the outſide, and of a pale yellow within, and of a bitter, diſagreeable, and very acrid taſte. The ſeed ſhould be choſen new, clean, and plump. Taken inwardly they are a violent purge and vomit, in a very ſmall doſe, and are never preſcribed; but outwardly they have always been famous for deſtroying lice in children's heads. Some take it into their mouths alſo for the tooth-ach, and others have ventured to uſe gargariſms of it to cure phlegm, and as an errhine, ſnuffing it up the noſtrils. It is alſo commended for the cleanſing old ulcers. *Lemery*'s Dict. de Drog.

The chief uſe of *ſtaveſacre*, as a medicine, is the deſtroying vermin in children's heads: to this end it is powdered and mixed with *cocculus indicus*, and ſeldom fails of ſucceſs. It is a violent purgative, and therefore ſeldom uſed at preſent.

STAUROPHORI, Σταυροφοροι, in church-hiſtory, certain eccleſiaſtics, whoſe buſineſs it was to carry the croſs in proceſſions. *Hofm.* Lex. in voc.

The word is compounded of σαυρος, a croſs, and φερω, I carry.

STAUROPHYLAX, Σταυροφυλαξ, in church-hiſtory, a dignified officer in the church of Conſtantinople, to whoſe care the keeping of the croſs, found by Helena, was committed. *Hofm.* Lex. univ. in voc.

The word is derived from σαυρος, a croſs, and φυλασσω, I keep.

STAXIS, a word uſed by the antient phyſicians to expreſs a diſtillation of blood in drops from the noſe.

A *ſtaxis*, in the doctrine of criſes, is juſtly condemned as indicating a weakneſs and decay of ſtrength in nature; whereas, on the contrary, free and copious diſcharges of blood from the noſe are eſteemed good indications, and often make happy criſes.

STAY (*Cycl.*)—STAY, in the manege. To *ſtay*, or ſuſtain your horſe, is to hold the bridle firm and high. We likewiſe *ſtay* or ſuſtain a horſe with the in-leg, or in-heel, when he makes his croupe go before his ſhoulders upon volts: as alſo when we hinder him to traverſe, and ride him equally, keeping him always ſubject, ſo that his croupe can't ſlip out, and he can't loſe either his cadence, or his ground, but marks all his times equal.

STEAMS. Subterranean *ſteams* often affect the ſurface of the earth in a very remarkable manner, and influence or prevent vegetation more than any thing elſe. The ſurface of ſome ground is ſo hollow and light, and ſo ſwoln by a warm and continually working ferment, that it muſt needs ſend up a warming *ſteam*; and that it does ſo, even in the coldeſt weather, is evident from the immediate melting of the ſnow that falls on it: nay, in many places, the effect of this *ſteam* is ſo great, that it melts the ſnow before it reaches the ground, ſo that it falls on it in form of rain.

Some ſtones alſo, and ſome waters, impregnate the earth by their innate warmth, ſending up a continual ſucceſſion of warm effluvia from all parts of their ſurfaces; and other ſtones have exactly a contrary effect, rendering the places where they lie barren and cold. Streams of water, which have in their ſubterranean courſe run through beds of limeſtone, marl, or chalk, are always enriched, and warmed by the *ſteams* iſſuing from thoſe ſubſtances, and mixing with them as they paſs, and conſequently theſe waters enrich the ground wherever they run; and, on the contrary, ſome waters are uliginous, or corroſive, from the *ſteams* they have received in their channels from the veins of pyrites, or beds of metalline ores. It is even reported, that the very ſubſtances of metals and minerals are thus raiſed in *ſteams*, and that the juices of plants are found loaded with them; thus we are told, that in Italy crude quickſilver is found in the juices, and at the roots of plants; and that in Moravia, Hungary, and Peru, the ſubſtances of the metals are found in the bodies of plants, particularly lead and ſilver. The Miſcellanea Curioſa of Leipſick ſpeak of wonderful appearances of gold in the form of plants, which, if true, muſt be owing to that metal's having been raiſed in *ſteams*, and carried into the veſſels of the plants in ſuch quantity, as in fine to deſtroy the vegetable appearance, and leave the figure of the plant in metal. Phil. Tranſ. N° 110.

STEATITES, in the hiſtory of foſſils, a name given by late authors to a ſubſtance called in Engliſh *ſoap-earth*, and which, though the authors on theſe ſubjects had not taken notice of that circumſtance, was the very ſubſtance called *Cimolia purpuraſcens*, or purple earth of Cimolus, by the antients. The later ages finding the purple Cimolian earth of the old writers to be wholly different from their white kind, have given that name (though it is not eaſy to gueſs why) to the common fuller's earth, which has no tinge of purple in its whole ſubſtance.

This earth however, called by us *ſoap-earth*, and *ſteatites*, is well worth enquiring after, as a ſubſtance for imitating the fine porcelain ware of China. Dr. Woodward much recommends it on this account, and repeated trials have been made of it ſince his time, and ſome of them very lately; in all which it has afforded the fineſt earthen-ware ever made with us, and promiſes fair, with good management, for the equaling any in the world.

It is dug in many parts of Devonſhire and Cornwall, and the neighbouring counties; the cliff of the Lizard point is almoſt wholly compoſed of it, and the adjacent little iſlands abound with it; and from all theſe places it might be brought, at ſmall expence, in any quantities. It is known from all other earths by theſe characters. It is compoſed of extremely fine particles, and is of a firm, equal, and regular texture, and great weight. It is very firm and hard as it lies in the earth, but when it has been ſome time expoſed to the air, it becomes almoſt of a ſtony hardneſs. It is of a perfectly fine, ſmooth, and gloſſy ſurface, ſofter to the touch than any other ſpecies of earth, and does not at all adhere to the tongue, or ſtain the fingers in handling; but drawn along a rough ſurface, as a piece of cloth, or the like, it marks it with a fine and even white line. In colour it is a clear white, veined and variegated very beautifully with purple of different degrees of deepneſs; and is of ſo fine a ſtructure of parts, that when cut into thin pieces it is in ſome degree tranſparent. It makes no efferveſcence with acids, and burns to a pure white, even in its purple parts. *Hill*'s Hiſt. of Foſſ. p. 22. See TERRA *Cimolia*.

STEATOCELE, a term uſed by the antients to expreſs a ſort of rupture, occaſioned by a large quantity of fat or ſuety matter lodged in the ſcrotum.

STEEL (*Cycl.*)—The difference between *ſteel* and iron is, that *ſteel* being much the harder, will not yield to the hammer, but is brittle, inſtead of being ductile, and reſiſts the file. Malleable iron grows rigid by being ſimply extinguiſhed in cold water, but it yet retains a conſiderable degree of ductility in the cold, and may be extended in all dimenſions with the hammer.

Steel, however, if heated again, and cooled by ſlow degrees, may be filed, and extended more or leſs by the hammer. But there are many degrees in the hardening of *ſteel*; for if it has been made extremely red-hot, and is then quenched in cold water in motion, it becomes greatly harder than if it had been but moderately red-hot, and had been quenched in warm water.

Steel is alſo of a darker colour than iron, and the ſurface of it, when broken, appears to conſiſt of ſmaller granulated, or even ſtriated particles, than the iron it was made of. This appears moſt diſtinctly, when *ſteel* is welded to the ſame iron of which it was made, and the maſs made red-hot, and well incorporated by hammering. If then you harden it again, by extinguiſhing it in cold water, and poliſh it, the veins of iron are eaſily diſtinguiſhable from thoſe of the *ſteel*; the iron ones being whitiſh, and of a ſilver-like hue, the *ſteel* ones blackiſh, or like water; and when broken, the ſize of the particles is found extremely different. *Cramer*'s Art of Aſſaying, p. 346.

The manner of making iron into *ſteel* had remained very long a ſecret, but many authors of late date have given the proceſs, though it does not appear the ſame in all, and in many is encumbered with circumſtances, intended only to diſguiſe it. Mr. Reaumur has taken greater pains, than almoſt any man, to come at the truth; but to be rightly informed of his reaſons, we ought to begin where he did, that is, at the origin of the iron in its pure metallic ſtate.

The ores of this metal are mixed bodies, compoſed of ſome particles truly metallic, and of others ſulphureous, ſaline, and terrene; this compound maſs is put in fuſion by the fire, and on this operation the metallic parts being heavieſt, ſubſide to the bottom of the veſſel, or furnace, and are then eaſily ſeparated from the lighter ſubſtances which float at the top. This ſeparation, however, is not ſuppoſed to be perfect, but the metal, after this its firſt fuſion, retains many heterogene particles, which prevent it from being malleable. It is after this to be refined, that is, to be melted again, and that ever ſo often performed, the metal becomes yet more and more pure and perfect, ſome heterogene matter being every time depoſited, or thrown off, and this is uſually much leſs after every fuſion.

The metal, when thus purified by melting, yet remains hard and brittle: theſe are two qualities which we do not want in iron, and this hardneſs and friability are no incompatible qualities, ſince their origin is this, that the iron in this ſtate is compoſed of a multitude of ſmall granules, every one of which is very firm and compact in its own texture, though they

they cohere but ſlightly one with another. The knife, or the file, cannot eaſily cut any one of theſe granules, but a blow of a hammer eaſily ſeparates large parcels of them from thoſe to which they were joined: this caſt iron is therefore uſed only for ſuch purpoſes as requires a ſubſtance poſſeſſed of theſe qualities; purpoſes where hardneſs is required, and where no blows are to be met with. Thus backs of grates, iron pots, and the like, are made of it.

One of the general properties of metals is, that they are malleable; that is, their ſeveral particles cohere ſo well together, that they are ductile and extenſible under the hammer, and will ſuffer the whole maſs to bend any way without breaking, that is, without their ſeparating from one another. In the words of the artizans, ſuch ſuppleneſs and pliability is called *body* in a metal, and the caſt iron, which wants this, is ſaid to have no body, and is what they call *no ſoft metal.* It is therefore no way fit for ſuch works as require faſhioning by the hammer or the file, nor of ſuch as are to ſtand any violent blows; but as it is eaſily fuſible, it ſerves for caſt works where there is no great delicacy in the figuring, ſince it does not run ſo thin as to adapt itſelf to every lineament of a fine figure, nor is qualified to be repaired by inſtruments.

The ill qualities of caſt iron are, in a great degree, remedied in the forged or wrought iron, taken from the ſame quantity, and the ſame fuſion. The forging of iron is only the placing it over the fire till heated to a certain degree, and then beating it out with large hammers till it becomes ſoft. When it has been ſufficiently forged, it becomes ſoft and malleable, even when cold, and when heated, is eaſily wrought into any figures, which it retains always afterwards; and it is eaſily cut by the file when cold, and is not brittle on being ſtruck, as is the caſt iron.

While it gains theſe properties by the forging, it loſes, however, another by the ſame means, which is its fuſibility. It will no longer melt in the fire, but when the workmen give it the ſtrongeſt heat they can, it is only reduced to a ſort of ſoft paſte, and *ſweats* a little, as they expreſs it; that is, ſome few drops of truly melted iron fall from it.

It is very certain, that both the caſt and the forged iron are mixtures of metalline, ſaline, and ſulphureous particles; and the different arrangement of theſe, in their mere ſimple running together in the fuſion, and their being driven intimately into, and among one another, by the hammering, makes the fuſibility different in the two ſtates.

If the forged iron differ greatly from the caſt, there is however a third ſtate into which it is reducible by art, which is yet different from both, this is what we call *ſteel*; and the quality of iron on receiving this change is not one of its leaſt valuable ones, ſince from this we have all our inſtruments for cutting, ſawing, boring, and the like purpoſes, the value of which to us is almoſt infinite. The German *ſteel* has always been in great repute, and though ſeveral other nations have made it, yet the Germans have kept their method a ſacred myſtery, to keep up their trade in it.

Steel is conſiderably harder than forged iron, and ſo it is neceſſary that it ſhould be, in order to many of the purpoſes it is employed in. Shears of *ſteel*, which are intended to cut iron, muſt be harder than iron, otherwiſe their edge will turn, and they will not cut; whereas, if the metal is too hard, then the granules will fly off, and the edge break away in ſmall fragments. This is the caſe with all edged tools; and hence it is that good *ſteel* is ſo nice and difficult a thing to make, ſince there is required ſuch a degree of hardneſs, and no more.

It is very well known, that *ſteel* acquires its hardneſs from the plunging it into water; it is to be heated to a certain degree, and then immediately plunged, while the fiery particles yet remain in it, into water perfectly cold; it is then to be ſpeedily drawn out of the water, and thus the whole operation is finiſhed. It acquires its hardneſs in degrees, proportionate to its heat when plunged into the water; and this hardneſs, or temper, remains with it only till it is heated as high again; for after that, if it is left to cool leiſurely, and not thrown into water, it is loſt. All the maſſes of *ſteel* which are ſold are thus tempered; nevertheleſs, when they are wrought into tools, their temper is loſt, and is to be renewed by plunging them again into cold water, when they have been forged into the ſhape of which they are to be.

Mr. Reaumur affirms, that *ſteel* differs in nothing from forged iron, except that it contains more ſulphurs, and more ſalts. Hence it follows, that caſt iron ſhould be *ſteel*, ſince it evidently differs from forged iron in the ſame manner, and by the ſame properties; and in effect, caſt iron is *ſteel*, ſuch as it is, eſpecially the white ſort, which is more pure, and more perfectly diveſted of its earth, than the browner ſorts; and this white kind may be accordingly brought to all the hardneſs of *ſteel*, by repeated heating and quenching in cold water. It follows alſo, that in order to convert iron into *ſteel*, we are to give it new ſalts, and new ſulphurs. It may be aſked, where is the neceſſity of giving again that, which the mere caſt iron poſſeſſes? To which the anſwer is, that *ſteel* is required to be malleable in ſome degree, which the mere caſt iron is not; and it is to be added to this, that it may be poſſible for us to give to forged iron ſuch ſalts and ſulphurs as are more proper for the *ſteel*, than thoſe which the caſt iron naturally poſſeſſes.

We have great variety of ſalts and ſulphurs, out of which to chuſe for this purpoſe, and Mr. Reaumur made many trials to find which would ſucceed beſt; and the reſult of all was, that for ſulphurs, powdered charcoal and common ſoot; and for ſalts, ſea-ſalt alone ſucceeded beſt, and that theſe were properly to be mixed with aſhes, by way of an intermediate ſubſtance. Theſe ſubſtances muſt alſo have their allotted doſe; that is, there muſt not only be a certain proportion of the ſeveral ingredients one to another, which however need not be very preciſe or exact, but there muſt alſo be a proportional quantity of the whole employed to the quantity of iron that is to be wrought upon; and in this alſo regard muſt be had to the ſeveral ſorts of ores from which the iron was obtained, ſince the iron of ſome ores is much ſooner convertible into *ſteel* than that of others, and makes alſo a better *ſteel.*

The manner of beſt introducing theſe ſalts and ſulphurs into the body of the iron, was found by this author a matter of great difficulty to determine. He ſoon perceived, that fire was the only agent that could convey theſe bodies into the metal; and in contriving how this might be done moſt eaſily, and with leaſt expence, he found out, after many trials, a new ſort of furnace, which effected this purpoſe with great eaſe, and which was not ſubject to the inconveniences of other furnaces.

As *ſteel* is iron with an admixture of heterogene particles, it follows that it muſt be leſs metallic, that is, leſs malleable, or more brittle; and it is alſo neceſſary that it muſt be, in ſome degree, malleable for the purpoſes it is required for; and it is eaſy to conceive that theſe properties cannot be given it, in a proper degree, but by means of a very accurate operation; and even when all the parts of the proceſs are the ſame, there is yet much depending on the iron itſelf, which can never be perfectly known but by trial. Something, however, may be judged of the iron by breaking bars of it: the ſeveral ſorts of iron, when broken, ſhew ſome of them only granules, others flakes, and others fibres; ſome alſo ſhew all three of theſe moleculæ at once, and others two of them; but it is eaſy, in either of theſe caſes, to ſee which ſort is in the greateſt number. The laminated and the fibrous iron are the two extremes; the firſt is very brittle, the latter very malleable. The laminated iron is ever the worſt of all kinds for making into *ſteel*; and of this kind ſuch pieces are worſt of all, the laminæ of which are very white and ſhining, and are large and irregularly diſpoſed, and arranged in different inclinations. Mr. Reaumur began to reckon from theſe an arrangement of all the kinds of iron, which coming, each by degrees, to have the laminæ ſtill ſmaller and ſmaller, and at the ſame time leſs glittering, and placed more evenly together, ſunk at laſt into the irons of the granulated kind. It is eaſy to conceive how many differences there muſt be between theſe; and from theſe the fibroſe ones may be deduced, owing their texture merely to the granulæ, which in theſe are diſpoſed into long ſtrings or ſtreaks. Tho' in this arrangement of the irons, the firſt are, of all others, the leaſt proper for making *ſteel*, it does not follow that the laſt are the moſt ſo: theſe indeed uſually make a very ſoft and pliant ſort of *ſteel*, which has what the workmen call the *greateſt body* of all the kinds of *ſteel*, and is therefore moſt proper of all for certain purpoſes, as the making watch-ſprings, and the like; but the want of hardneſs makes it very unfit for cutting tools of all kinds, from the razor to the ax. The granulated iron always makes the fineſt and hardeſt *ſteel*; and of theſe ſuch ſucceed beſt, whoſe granules are ſmalleſt.

One thing remarkable is, that all *ſteel*, though made of iron of the granulated or ſtriated kind, yet is, before it has been hammered, of a flaky, or a ſort of laminated ſtructure; but this ſeems owing to the fire's having melted ſome of the granules in the operation, and run ſeveral numbers of them together into theſe plates. The ſmallneſs of theſe flakes in *ſteel*, which has not been worked, are a proof of its being but of a bad kind.

A bar of iron, when converted into *ſteel*, is not equally ſo converted in all its parts; the fire has always acted more ſtrongly upon its ſurface than on its central parts, and it is therefore more perfect *ſteel* there than in its inner parts; but a perfection in the operation is not neceſſary to the *ſteel's* being good and uſeful, and the whole bar is often very good *ſteel*, as are alſo many bars made at the ſame time, yet all perhaps ſomewhat differently affected.

If the compoſition, which is to convert the iron into *ſteel*, be too ſtrong, or if the fire be too violent, or the matter continued too long in it, in all theſe caſes the *ſteel* will be over made; that is, there will be an over proportion of ſaline and ſulphureous parts added to the iron: theſe will therefore too far ſeparate the particles of the metal aſunder, and the conſequence will be, that the *ſteel* will be too brittle to bear hammering, and will be of great loſs to the proprietor in the great quantities that will be broken, beſide the loſs he will

will ſuſtain from the abundance of ſcales which will fly off in the working. The way to meliorate ſuch *ſteel* as this, muſt be to diveſt it of part of its ſalts and its ſulphurs, but peculiarly of the laſt; and Mr. Reaumur found, that the burying the bars of ſuch *ſteel* in lime, or any other alkaline ſubſtance that would readily abſorb the ſulphurs, and placing it for a proper time in the fire, it would be in a manner decompoſed again, and come out a very good and perfect *ſteel*; and this is no trivial proof, that the account given of the manner of iron's becoming *ſteel* is the true one.

By this management *ſteel* may again be converted, or reduced to its primitive iron, and a body of any middle degree, between *ſteel* and iron, may be produced, by ſtopping this proceſs at different points of time, or continuing it till all the adventitious ſalts and ſulphurs are drawn off or abſorbed. Hardneſs and flexibility are the two great points in this operation, and what the metal gets of the one of theſe, it aſſuredly loſes of the other. The greater hardneſs is from the greater quantity of the adventitious ſalts and ſulphurs; and the greater flexibility, or, as the workmen call it, the *greater body*, is from the greater quantity of the metallic; and he who is able to calculate properly the quantities of his ſalt, charcoal, and ſoot, and to regulate exactly the degree of fire, is capable to make *ſteel* of what degree of temper or perfection he pleaſes.

Iron, impregnated with new ſalts and new ſulphurs, is not however perfectly reduced to the ſtate of what the workman expects in *ſteel*; there wants yet the quenching it while hot in cold water, to compleat the operation. The *ſteel* penetrated every way by the particles of fire, and at that inſtant plunged into water, is by that quenching ſtopt in the very ſtate in which it was, and is not ſuffered to exhale the igneous bodies, as it would otherwiſe have done. It was, while in the fire, rarified and dilated, and this quenching continues it in that ſtate, and it is found, on meaſuring, conſiderably thicker and larger than it was while unheated. It might be ſuppoſed from hence, that the particles of fire, which were lodged in the *ſteel* while red-hot, were thus detained and impriſoned in it, and ſo wrought the change, as they are known to remain in many calcined bodies, though they have not been ſo ſuddenly quenched; but if this were the caſe, the *ſteel* muſt be encreaſed in weight as well as bigneſs, as many calcined bodies are, but this is not found to be ſo in fact.

Recourſe muſt be had therefore to ſome other operation on the *ſteel*, and this appears, in reality, to be no other than the change of its texture, or internal ſtructure. If a body be naturally compoſed of a number of particles, which are in themſelves hard and compact, but between which there are certain ſpaces; if one take from thoſe hard and compact particles ſomewhat to fill up thoſe voids, it muſt appear very evidently, that though by this the proper particles are rendered leſs hard, yet the whole body muſt be made harder than it was before.

In the converting of iron into *ſteel*, Mr. Reaumur conceives that the particles of iron, being naturally very covetous of ſalts and ſulphurs, have imbibed great quantities of theſe adventitious bodies, while the ſpaces between them have been able to retain very few. This being then the firſt ſtate of the *ſteel*, when it is afterwards heated, in order to its being tempered by quenching, the fire drives theſe ſulphureous and ſaline particles, ſo abundant in the iron, out of its granules, and diſperſes them throughout the ſpaces between theſe granules; and that it is to this equal and regular diſtribution of theſe ſalts and ſulphurs, fixed in that ſtate by the immediate quenching, that the hardneſs, and other qualities of *ſteel* are owing.

To the advantage the metal gets by this means, there is however always joined a diſadvantage, which is, that its grain naturally and neceſſarily becomes coarſer by it, and the *ſteel* has the leſs body. The hardeſt *ſteel* always muſt neceſſarily have the leaſt body; but according to the rules laid down by Mr. Reaumur, one may diſpoſe the hardneſs in what degree one pleaſes, and conſequently all the other properties are in the direction of the ſame laws.

If the oppoſition of the qualities of *ſteel* be nicely conſidered, we ſhall find, that inſtead of being hurtful, they are truly what ſhould be moſt wiſhed for, and are productive of the moſt deſirable conſequences. It may appear ſomewhat ſtrange, that hardneſs and flexibility in *ſteel* ſhould be ſuch directly oppoſite and contradictory principles, and that the quenching, which makes *ſteel* more powerful to reſiſt preſſure or rubbing, ſhould at the ſame time make it more feeble in action; but this is plainly the caſe, and a piece of *ſteel* wire, which, before it is tempered by quenching, will, when hung vertically, ſuſpend a certain weight, will not ſuſtain the ſame weight when tempered, but will be broken even by a leſs; and that if the trial be made by tempering it up to one certain part, and no farther, the wire will aſſuredly break at that very part where the tempered and untempered portions meet. The encreaſe of ſize in every grain of *ſteel*, from the quenching, gives the plain ſolution of this phænomenon. The rupture of any body whatever, that is, the ſeparation of its parts, by whatever means it is done, muſt be more difficult, the more intimately thoſe parts touch, or the more points they touch in. The granules of *ſteel* are theſe touching parts, and it is very evident that theſe granules becoming larger on the quenching, muſt after this touch in fewer points, in the whole combination of the maſs; and on the other hand, as they are larger, they alſo muſt mutually touch each other in a larger ſpace. Here are two contrary principles, which conſtitute the facility and the difficulty of the rupture by different means; and it cannot be, but that the one of theſe conſtructions muſt give the greater force to reſiſt preſſure or friction, and the other to reſiſt drawing or traction.

It has been already obſerved that *ſteel* is the harder, according as it was more or leſs hot at the time when it was plunged into the water; and it muſt be added to this, that it alſo is the more ſo, the more cold the water is into which it is plunged. The degree of heat in the *ſteel* is eaſily known by its colour, and the diſtinctions in it are familiar to the workmen. Several perſons have thought there was great virtue to be communicated to the water by means of different ingredients; this Mr. Reaumur carefully tried, and the reſult was, that he found common cold water the beſt, and moſt uſeful of all liquors: it is true, that vinegar and verjuice harden the *ſteel* ſomewhat more, and aqua fortis greatly ſo, but the latter of theſe renders it too hard for ſervice; and repeated trials have evinced, that common water alone will give *ſteel* all the hardneſs it can be wiſhed to have, provided only that it be plunged into it at a time when it is ſufficiently hot.

If *ſteel*, after the tempering, be found too hard, there is a very familiar way of bringing it back to what ſtate one pleaſes, between that and iron, which is only the heating it in the fire; for it may be kept in the fire ſo long, as to be reduced wholly to iron again. It is eaſy to infer from hence, what was before obſerved, that caſt iron is *ſteel* of a peculiar kind; its properties plainly evince, that it is *ſteel* with an over proportion of all that makes it ſo, and conſequently of all its properties. It is not malleable, is very brittle, and too hard for the file, or any other tool, to cut. Theſe are the qualities of *ſteel* which is over tempered, or, as it may be called, too much *ſteel*: it owes theſe qualities to its being overcharged with thoſe ſulphurs and ſalts, which in a due proportion makes *ſteel* of iron. The method of reducing this to the ſtate of wrought iron, is the ſame with what we have before obſerved is to be uſed to untemper too high tempered *ſteel*, that is, keeping it in the fire till part of its ſalts and ſulphurs are driven off; and if the fire alone be thought too difficult, or too tedious a method, Mr. Reaumur has found that thoſe alkaline ſubſtances, which naturally abſorb ſulphurs, will aſſiſt the reducing this to the ſtate of wrought iron, as they do to the untempering of *ſteel*, and that the very ſame ſubſtances of this kind, which have been found beſt in the untempering *ſteel*, ſucceed beſt in the rendering this malleable; ſuch are lime, chalk, and the like.

Caſt iron may be taken for theſe operations in two ſtates; the one, that of ſimply melted iron in its firſt fuſion, the other that of the iron, which has been run into the mould. When a caſt piece of iron, in a certain form, is heated again with the calx of animal bones, which is one common way, this being a ſubſtance extremely diveſted of ſalts and ſulphurs, it abſorbs thoſe of the metal too greedily, and diveſts it of too great a quantity of them; ſo that when the piece comes afterwards to be filed, the fragments fly off in large ſcales, and the beauty of the caſt figure muſt be loſt: to remedy this difficulty, ſome powdered ſulphur is to be added in the heating; for this being a ſulphureous and ſaline body, checks and moderates the effects of the calx of bone.

Chalk in the ſame manner can only be employed with certain regulations; it ſucceeds very well, if the fire be not too violent, or too long continued, but if it be exceſſive in either of theſe particulars, the chalk throws into the body of the iron ſalts and ſulphurs of its own, which lay hid in its ſtructure, and which would not have been diſlodged by a ſmaller fire; but which being diſlodged, and thrown into the iron, act upon it, and render the ſucceſs of the operation quite different from what was intended, the iron becoming more hard and more brittle by it.

One great nicety in all theſe operations, is the underſtanding the ſigns by which it is known at what time caſt iron is ſufficiently ſoftened, or over tempered *ſteel* is ſufficiently reduced toward the ſtate of iron again; but this is only to be acquired by nice obſervation, and on this depends the whole certainty of the proceſſes, ſince every minute's continuance in the fire gives the operation a different turn in degree.

Mr. Reaumur, in one of his experiments in the ſoftening a piece of caſt iron of a beautiful figure, found, on taking it out, that it had loſt prodigiouſly of its weight, and coming to a nicer examination, he found that it was hollow; its outer cruſt having been ſooner converted into malleable, that is unfuſible, iron than the reſt, and the violence of the fire afterwards having melted away the inner part, which was not yet ſo changed. This accident led him to experiments, by which he found that he could, at any time, melt out

the central part of a thick ſquare bar of caſt iron, the outer part changing firſt into the condition of malleable iron, and ſerving as a crucible for the fuſion of the yet unaltered fuſible iron within. By a proper management of this diſcovery, it will be eaſy to take off the unwieldy weight of many works of caſt iron, which do not require ſo much ſtrength as that of the ſolid contained in their circumference. Mem. Acad. Scienc. Par. 1722.

Mr. Cramer obſerves, that the method of making *ſteel* out of iron, is either by fuſion, or by cementation. That by cementation may be performed in the following manner: chooſe ſome bars of pure iron, not too thick, prepare a cement of charcoal-duſt, moderately pulverized, one part, and wood-aſhes half a part; or of charcoal-duſt two parts, bones, horns, leather, or hair of animals, burnt to a blackneſs in a cloſe veſſel, and in a gentle fire, and afterwards reduced to powder, one part, wood-aſhes half a part; mix them together. Prepare a cylindrical earthen veſſel, two or three inches higher than the bars are long; put into the bottom of this veſſel the cement, prepared as before directed, ſo that being gently preſſed down, it may cover the bottom of the veſſel an inch and half deep; place then the iron bars perpendicularly, ſo that they may be every where an inch diſtant from the ſides of the veſſel, and from each other; fill the interſtices with the cement, and cover the bars with it, that the veſſel may be quite full, cover it with a tile, and ſtop the joints with a lute; put this veſſel into a furnace, and keep it moderately, but equally red-hot, for ſix or ten hours. When this is over, take the red-hot bars out, and dip them in cold water, they will then be brittle, and turned to *ſteel*. *Cramer*'s Art of Aſſaying, p. 344.

The method of making *ſteel* by fuſion is this: take of iron ore, or of unmalleable iron of the firſt fuſion, divide it into ſmall parcels, and put them into a bed made of charcoal-duſt in a ſmith's forge; let the quantity of the iron be but ſmall for the experiment; put to it, as a defenſitive menſtruum, ſome of the vitreſcent ſcoriæ of ſand, or ſtones of the ſame nature; then put upon them a quantity of charcoal, light this, and admit only a ſmall blaſt of the bellows, that the ſcoriæ and metal may both melt regularly: when this has been ſome time kept in fuſion, take it out, divide it into two parts, which make red-hot, and hammer into long bars; finally, heat them red-hot, and plunge them into cold water, and they will then be found to be *ſteel*, ſo very hard, as not to be filable, and ſo brittle, as to break aſunder when ſtruck with conſiderable force. *Cramer*'s Art of Aſſaying, p. 348.

Mr. Lemery ſhews a ſimple method of reducing *ſteel* to a very fine powder, without ruſting it: pour water on filings of *ſteel* in an earthen veſſel, till it is four inches above the filings; ſtir it well every day, ſupplying more water, as that in the veſſel ſubſides, ſo that the *ſteel* is always covered: continue this operation till the *ſteel* falls into an impalpable black powder, then dry it for uſe. Mem. de l'Acad. des Scienc. 1736.

Mr. Boyle tells us of his having opened the body of *ſteel*, by a highly rectified ſpirit of urine made *per ſe*, and poured upon new filings of the *ſteel*. This being put into a warm place, the menſtruum diſſolved a conſiderable part of the metal. See his Works Abr. Vol. I. p. 77.

Annealing, or *nealing of* STEEL, is by ſome uſed for the ſoftening it, in order to make it work eaſier; which is uſually done by giving it a blood-red heat in the fire, and then taking it out, and letting it cool of itſelf. *Mox*. Mechan. Exerc. p. 60.

Some have pretended to ſecrets in annealing, by which they could bring down iron or *ſteel* to the temper of lead: this was to be done by often heating the metal in melting lead, and letting it cool again out of the lead. But this method is found by Moxon to have no other effect than what is had from the former. *Hought*. Collect. N° 276.

Steel may indeed be made a little ſofter than in the common way, by covering it with coarſe powder of cow-horn, or hoofs; thus incloſing it in a loam, heating the whole in a wood fire till it be red-hot, and then leaving the fire to go out of itſelf, and then the *ſteel* to cool. *Mox*. loc. cit.

STEEL *glaſſes*, a name given by ſome authors to the metalline ſpheres uſed in optics. Theſe, according to Cardan, are made of three parts of braſs, one part of tin, and one of ſilver, with an eighteenth part of antimony; but moſt either totally leave out the ſilver, or add only a twenty-fourth part, to ſave the expence. There are many other methods, directed by ſeveral authors, but moſt uſe arſenic and tartar, mixed with the metals. Theſe are afterwards to be poliſhed with emery, rotten-ſtone, putty, and the like. *Merret*'s Notes on Neri, p. 342.

STEEL-*ore*, is uſed to ſignify a particular kind of lead-ore. See LEAD-*ore*.

STEEL-*waters*. See the article *Mineral* WATERS.

STEELING, in cutlery, the laying on a piece of *ſteel* upon a larger maſs of iron, to make that part which is to receive the edge harder than the reſt. The body of an ax may very well be of iron, as it never comes into uſe to cut with, and perhaps is ſtronger, and leſs liable to break, than if of *ſteel*; but it muſt have a quantity of *ſteel* at that part where the edge is to be made.

STEELYARD (*Cycl.*)—*Chineſe* STEELYARD. The people of China carry this ſtatera about them to weigh their gems, and other things of value. The beam, or *yard*, is made of wood, and is round, and a quarter of an inch over, and about a foot in length; upon this are three rules of meaſure, made of a fine ſilver-ſtudded work, as in a watch-caſe. One of theſe rules is divided into inches, and every inch into 25 parts; the other two are divided alſo into equal parts, but not into inches. They all begin from the end of the beam, whence the firſt is extended 8 inches, the ſecond 6 and $\frac{1}{2}$, the third 8 and $\frac{1}{2}$. The firſt is the European meaſure, the other two ſeem to be China meaſure, and that of ſome other nation trading with them. At the other end of the *yard* hangs a round ſcale, marked with China characters, and at three ſeveral diſtances from this end are faſtened ſo many ſlender ſtrings; the firſt diſtance makes $\frac{3}{5}$ of an inch, the ſecond is double to the firſt, and the third 4 inches and $\frac{4}{5}$. When they weigh any thing, they hold up the *yard* by ſome of theſe ſtrings, and hang a ſealed weight, of about an ounce and $\frac{1}{4}$ troy weight, upon ſome point of the rule, as the thing requires. *Grew*'s Muſeum, p. 369.

STEELYARD-*ſwing*. In the Philoſophical Tranſactions we have an account of a *ſteelyard-ſwing*, propoſed as a mechanical method for aſſiſting children labouring under deformities, owing to the contraction of the muſcles on one ſide of the body. The crooked perſon is ſuſpended with cords under his arm, and theſe are placed at equal diſtances from the center of the beam. It is ſuppoſed that the gravity of the body will affect the contracted ſide, ſo as to put the muſcles upon the ſtretch; and hence by degrees the defect may be remedied. See N° 462. ſect. 7.

STEEVE, aboard a ſhip. The ſeamen ſay that the bow-ſprit, or the beak-head of a ſhip *ſteeves*, when it ſtands too upright, and not ſtrait enough forwards.

STEEVING, in merchant ſhips, is uſed for the ſtowing of cotton, or wool, by means of ſcrews, to force it cloſe together.

STEINBIZA, in ichthyology, a name given by Hildegard, and ſome other writers, to that ſmall ſpecies of cobitis, called by others *cobitis aculeatus*, and *tænia cornuta*. It is the *cobitis* with a forked ſpine under each eye, deſcribed by Artedi. *Hildegard*, lib. 4. p. 1. See COBITIS.

STEINHUN, *ſtone-hen*, a name given by the Germans to a bird of the lagopus kind, more commonly known by the name of *otomo*, and in ſome places by that of *colmeſtre*.

It ſeems not to differ from the lagopus in any thing but colour, and that bird being known to change its colour in the ſummer months, it is probably no other *ſpecies*. *Ray*'s Ornitholog. p. 127. See the articles LAGOPUS and OTOMO.

STELE, Στηλη, in antiquity, a kind of puniſhment, being a pillar whereon a criminal was expoſed, and on which was engraven an account of his crime.

The perſons, thus expoſed to the laughter and reproaches of the people, were called *ſtelitæ*. *Potter*, Archæol. Græc. lib. 1. cap. 25. Tom. I. p. 130.

STELECHEIA, a word uſed by ſome authors to expreſs the vena portæ.

STELECHITES, in the materia medica, a name given by Dioſcorides, and ſome other of the Greek writers, to a peculiarly fine kind of ſtorax. It was the ſame with the calamite, only that this name was given to the larger, and the name *calamite* to the ſmaller or ſlenderer pieces. Pliny, Strabo, and many others, join in telling us, that the wood of the ſtorax-tree was the moſt ſubject to be eaten by worms, of that of any tree in the world.

The ſoftneſs, and ſweet taſte it had, probably rendered it liable to theſe injuries. When the worms attacked a branch, they generally eat away all the wood, and left an empty caſe of the bark, ſo that inſtead of a ſtick, there was a hollow tube like a reed: all the while that the worms were eating, the wounded veſſels poured out their balſam, and covered at length the whole ſurface with their fine pellucid yellowiſh balſam. This was doing without, while the vermin were at work within, and in conſequence, the whole ſtick, or twig, became a hollow tube, covered over with the moſt pure and fine ſtorax. This was eſteemed beyond any other ſtorax for medicinal uſes; and when in ſmall twigs, it was called *calamites*, or *calamita*, and when on larger ſticks, it was called *ſtelechites ſtorax*. When the worms attacked the body of the tree, the duſt they made by their eroſion formed a hillock or heap round the tree, or at its foot, and the extravaſated balſam running among this duſt, made a maſs that was called the *cymatius ſtorax* at that time, and was the ſame with the common ſtorax now in uſe.

STELECHITES *ſtibii facie*, in natural hiſtory, a very uncouth name given by Aldrovandus, and ſome others, to the entrochi. He gave them this name from the reſemblance of ſome of the longeſt pieces to fragments of the trunks of trees, the arms parting out from the ſides of theſe main branches, the rudiments of which are very frequent in many of

of the entrochi, paſſing for the remains of boughs, and the hollow in the middle, for the cavity where the pith of the tree was. The addition of *ſtibii facie*, was only from the obſerving that the top and bottom were radiated, or ſtriated, from the central hole to the circumference, in the manner of antimony. Theſe are truly no vegetable remains, but parts of the arms of that ſtrange fiſh called *ſtella arboreſcens*.

They are all fragments, or ſhort pieces, broken from larger; the longeſt pieces we meet with ſeldom exceed two inches in length, and we find from theſe down to ſingle joints, as thin as a ſixpence: theſe ſingle joints are diſtinguiſhed by authors from the compound bodies, or entrochi, by the name *trochitæ*. The largeſt that we find meaſure two inches in circumference, but we have from this ſize to the thickneſs of the fineſt pin; about a quarter of an inch in diameter is, however, the moſt frequent ſize. The longeſt pieces conſiſt of from twenty to thirty joints, and are very various in their thickneſs. Theſe bodies are found ſometimes in clay, and ſometimes in marble. The Derbyſhire marble, of late come ſo much into eſteem, owes all its beauty to the great quantity of them it contains; and they in ſome places make up all the ſubſtance of the maſſes of rock, only with a very ſlender portion of ſtone to join them.

They are uſually found thrown in irregular directions, and often ſhew that they have ſuffered injuries by accident. In ſome the joints they are compoſed of are diſlocated, and thruſt out of their place; in others the whole ſubſtance is cruſhed flat, as if a hollow cane were trod upon, and ſqueezed to flatneſs; and in this caſe, the cracks occaſioned by the injury are always manifeſt. Theſe injuries muſt have happened to the entrochi, while their matter was yet ſoft; for at this time they are ſo brittle, that the force employed to diſlocate, or cruſh them, would only ſhatter them to pieces, not take that regular effect. In ſome the whole ſeries of joints are diſlocated, and the entrochus reſembles a pile of crown pieces placed on a table, and then puſhed aſide, ſo as not to break the pile, but force all the ſeveral crowns, or joints of it, to hang over one way. Some of them are found twiſted like a cord, and ſome have the taints evenly arranged, but ſtuffed full of extraneous matter, as bricks are laid in mortar. The joints of the entrochi vary in thickneſs, from the thickneſs of a ſixpence to a quarter of an inch; but this is not proportioned by their ſize, for there are ſome of them as ſmall as pins, which yet conſiſt of very thick joints.

The outermoſt joint is in ſome more deeply, and in others more ſlightly furrowed; and the outer circle of the points, though generally ſmooth, is ſometimes radiated. The rudiments of branches from the entrochi are ſmall knobs, evidently broken off: they are always placed in the middle of a thick joint, between future and future, and ſometimes are ſingle; but ſometimes there is a whole circle of them round the body of the entrochus in that joint; and ſometimes, beſide a regular circle of knots, there are other ſmaller eminences, like warts, which ſtand irregularly above and below them, and give the whole a very irregular figure. Sometimes the entrochi with thinner joints are found thus knotted, and theſe ſeem to have been all over covered with joints of ſmaller branches; and in the living ſtate of the animal, when they were perfect, muſt have made a very remarkable figure. Some joints have three regular rows of knots on them, each perfectly encompaſſing the entrochus; the middle row, or circle, conſiſts of large knots, and the upper and lower one of ſmall ones. Some of the joints, inſtead of having a circle of knots, riſe up regularly into a circular ſharp ridge between future and future; and in ſome of thoſe which have no rudiment of a knot on any part, the joints all riſe thus regularly into ſharp ridges in the middle, but that alternately, and in a very beautiful order; the one joint having a high and large ridge, and the other a ſmall and low one all the way. In others there is the ſame ſort of difference in the joints alternately, but the one ridge is blunt, and the other ſharp, and edged all the way: in theſe the joints alſo are alternately larger and ſmaller, one than another. In ſome the alternate edges are knotted, and in ſome there is a double edge in the middle of every joint: theſe have the appearance of being compoſed of a very great number of extremely thin joints, but this is not in reality the caſe. Some of theſe laſt have the double edge in the center of the joint knotted at intervals, and have the appearance of ſerrate edges.

Moſt of the entrochi have had branches, in greater or ſmaller number, iſſuing from them; in all they are inſerted deep into the ſtem, and often, when they have been diſplaced, leave deep holes in it. The ſtriature of the branches runs tranſverſely to the ſtriature of the main ſtem: theſe branches are of various thickneſſes, and ſometimes very thin ones grow upon very thick ſtems; but the more general rule is, that the thicker the ſtem, the thicker are the branches from it. Some of the branches from the largeſt ſtems are found to be branched again, but this is very rare. The pieces of entrochus which we find, however large, are uſually of a cylindric figure, as thick at one end as at the other; but there are ſome few found which ſwell out in the middle, and grow gradually taper to each end. Theſe Agricola has deſcribed, and eſteems them a diſtinct kind; but theſe never terminate regularly, in the manner of perfect bodies, at the ends, but are all fragments as the others are. Phil. Tranſ. N° 100.

STELENCHIS, a ſtrigil, or an inſtrument uſed in the baths to rub off the ſweat from the ſkin.

STELITÆ, Στηλῖται, in antiquity, perſons who had undergone the puniſhment called *ſtele*. See STELE.

STELLA (*Cycl.*)—STELLA *crinita*, in natural hiſtory, a name given by Linkius to a genus of *ſtar-fiſh*, the characters of which are theſe; that they have more than five rays, and from theſe have ſeveral other lateral proceſſes, which are covered with a fine down or hair.

STELLA *lapis*, in the materia medica, the name of a ſtone which has been very differently interpreted by different writers. Some have ſuppoſed it the *aſteria* of Pliny, and ſome the common *corolloide aſtroites*; but Meſue explains it to be the *lapis lazuli*.

This ſtone, and the ſapphire, being both blue gems, have been very ſubject to be confounded together; and the ſapphire of the antients was indeed no other than a kind of lapis lazuli; but this author has always diſtinguiſhed between the modern ſapphire and the lapis lazuli, by calling the latter *ſtella lapis*, and the former *zemphyrus*. This word has been by ſome written *zephyrus*, and its meaning much doubted of, but it is plainly the name of the ſapphire; and this word is only formed on the Arabian name of the ſame gem, which is *ſemphir*. See the articles ZEMPHYRUS and SEMPHIR.

STELLA *lumbricalis*, in natural hiſtory, a name given by Linkius, and others, to a kind of *ſtar-fiſh* with an undivided body, and with five vermiform rays.

STELLA *marina*, in natural hiſtory, a genus of animals, the characters of which are theſe. It is a ſoft animal divided into many parts, or compoſed of many ſegments, or lobes, running out from a central part, and reſembling the radii of a circle, or the rays of a *ſtar*, as it is vulgarly painted. The central part is the body, and has always a mouth in its lower ſide; and the rays, commonly called *arms*, and by ſome very improperly *legs*, all ſtand at equal diſtances from one another. The upper part of the central nucleus of this animal is called the back, and the lower the belly, but in both theſe the ſtructure is very different in the ſeveral diſtinct ſpecies of the creature.

The ſkeleton of the *ſtar-fiſh* examined, ſhews the body to be made up of joints, very different in number and figure; and in ſome, this articulated ſubſtance is made up of very ſmall, and in others of very large pieces; in ſome alſo it is covered with a very thick ſkin, and in others with a very thin one; this however, in the firmeſt ſtate, never approaches to a ſhelly hardneſs, and is rather callous than teſtaceous, or cruſtaceous, as ſome have called it. The parts, of which all theſe fiſh are invariably compoſed, are the trunk or body, and the lobes: theſe are of no determinate figure, nor have any thing certain, but that there is a mouth, or aperture, for the taking of food, in ſome part of the under plane of the trunk; and the only apparent ſenſation the animal has, is that of touch or feeling. The common poſition of the mouth is in the center of the body, and the conformation of it is this: the under part of each lobe runs toward a point with the reſt at the center of the body, and theſe ſeveral productions of the lobes make a ſort of lips, the ends of each of which are armed with a number of ſharp teeth, which ſerve to take and convey the food into the body. From this mouth there goes a ſeparate canal to all, or many of the lobes, which runs through their whole length, and becomes gradually narrower, as it approaches the extremity: theſe things are conſtant in all the ſpecies, all their other properties differ in the different ones.

Some genera of the *ſtellæ marinæ* have their body multifid, and have juſt as many canals in their belly as there are lobes or arms, one conſtantly and regularly running to each; while others have ſeveral cylindric rays or lobes, which are not perforated with any canal: hence the general number of them are divided into the whole, and the multifid kinds. In the multifid kinds the lobes, or rays, are uſually five in number, though ſometimes they are more, ſometimes fewer: hence authors have eſtabliſhed a triple diſtinction of theſe creatures. 1. Thoſe which have juſt five rays. 2. Thoſe which have more than five. And 3. thoſe which have a ſmaller number than that. The whole bodied ones are alſo arranged into their ſeveral genera in the ſame manner.

The moſt frequent kind of *ſtar-fiſh* is that which has five rays, which iſſue in the manner of ſo many vermiform, or worm-like proceſſes: theſe therefore are called *ſtellæ vermiformes*, or the worm-like *ſtar-fiſh*. Another kind, nearly approaching to the nature of theſe, has more than five rays, and from the ſides of theſe other tranſverſe proceſſes being produced, which are covered with an extremely fine kind of down, or hairyneſs: theſe are called the *hairy ſtar-fiſh*. A third kind is called the *aſtrophyta*, or plant-like *ſtar-fiſh*: this is compoſed of a body from whence there ariſe a great

number

number of branches, which divaricating more and more, are at length encreaſed, or divided into a prodigious number; and theſe being cylindric in figure, reſemble very much the branches of plants.

This general diſtinction being eſtabliſhed, the general and particular arrangements are naturally deduced from the ſubordinate diſtinctions: from the moſt remarkable differences in each ſeries of *ſtellæ* of every claſs are conſtituted the genera; from the leſs remarkable difference among each genus, the ſubordinate diſtinctions, and from the minuter diſtinctions among theſe, the ſpecies are diſtinctly ſeparated from one another. The accurate Linkius has hence eſtabliſhed a very regular method of theſe animals, calling them by names expreſſive of their differences, as *oligactis*, for ſuch of the firſt general diviſion as have leſs than five lobes, or rays, and the like. Several of the ſpecies of the *ſtar-fiſh* are eatable, and ſome of them afford a very good nouriſhment. Some are preſcribed by phyſicians as ingredients in plaiſters.

The foſſile world has been greatly enriched by the fragments and remains of the ſeveral kinds of *ſtar-fiſh* which have been converted into ſtone, and have been variouſly gueſſed at in that ſtate, as to their origin. The aſteriæ are by many affirmed to be the foſſile radii of the *ſtar-fiſh* of the decempede, or ten-rayed kind; and others have thought it evident, that ſome ſpecies of them have been the remains of the common coriaceous kinds. The encrinos, or *lilium lapideum*, ſeems to be a part of one of the ten-rayed kinds; and the trochitæ, and entrochi, are plainly owing to the fragments of ſeveral of theſe kinds. *Linkius*, de Stellis Marin.

STELLA *arboreſcens*. See ARBORESCENT and BASKET-*fiſh*.

STELLA *occidens*, a word uſed by ſome of the chemical writers to expreſs ſal armoniac.

STELLA *ſcolopendroides*, in natural hiſtory, a name given by Linkius to a kind of *ſtar-fiſh* with an undivided body, and five rays, reſembling the bodies of the ſcolopendræ, as thoſe of the more uſual kind, called *ſtella lumbricalis*, do the bodies of common earth-worms. See the article STELLA *marina*, ſupra.

STELLA *vermiformis*, in natural hiſtory, a name given by Linkius, and other authors, to a common kind of *ſtar-fiſh*, which has five rays parting from the body, each ſomewhat reſembling the body of a large worm. See the article STELLA *marina*, ſupra.

STELLARIA, in botany, a name uſed by ſome authors for the *carduus ſtellatus*, or *ſtar*-thiſtle. *Ger.* Emac. Ind. 2.

STELLARIS *lapis*, a name given by many authors to the various ſpecies of *aſtroites*. See the articles ASTROITES and STAR-*ſtone*.

The near alliance between this name and the *aſteria*, though they are the names of two foſſils of an extremely different kind, has been the occaſion of great errors. Authors, not converſant in foſſils, have too haſtily attributed to one of them the properties of the other.

Cambden tells us, that about Bevor-Caſtle there are found *aſtroitæ*, which he very well deſcribes, as conſiſting of the repreſentation of ſeveral *ſtars* fixed together by a flinty, or other extraneous matter.

STELLATE *leaf*, among botaniſts. See LEAF.

STELLIO, in zoology, the name by which authors call the ſwift, or ſpotted lizard. The ſpots which diſtinguiſh this kind are not, however, ſtellated, as might be ſuppoſed from the name, but round; ſome ſmall, and ſcattered irregularly all over the body; and others larger, and diſpoſed in thirteen zones, or ſemicircles. The ſpots are much more diſtinct and clear on the back than on the belly. It is common in Syria, and ſome other places.

STELLIO *aduſta*, an affected term uſed by ſome chemical writers for cinnabar.

STELLITES, in natural hiſtory, a name given by ſome writers on foſſils to a kind of white ſtone found on Mount Libanus, and in ſome other parts of Syria, containing the lineaments of the ſtar-fiſh compleat.

The ſame ſtones frequently contain the lineaments of other fiſhes, principally of the bones, or ſkeletons of them; and it is very certain, that the real bodies of theſe ſtar-fiſhes, and the bones of other fiſh, after the fleſh and ſkin had been corrupted and worn off, have been received into this ſtone while yet ſoft, and afterwards retained in it after its concretion: our own coal-ſlates ſhew us innumerable inſtances of leaves of plants; and the black ſlate of iſleb ſhews us, fiſhes thus preſerved.

STEM (*Cycl.*)—*Falſe* STEM, in a ſhip, that fixed before the right one. When a ſhip's *ſtem* is too flat, ſo that ſhe cannot keep a wind well, they uſe to put a *falſe ſtem* above, which makes her rid more way, and bear a better ſail.

STEMPHYLA, a word uſed by the antients to expreſs the huſks of grapes, or the remains of the preſſings of wine. The ſame word is alſo uſed by ſome to expreſs the remaining maſs of the olives, after the oil is preſſed out.

STEMPHYLITES, a name given by the antients to a ſort of wine preſſed hard from the huſks.

STEMPLES, in mining, croſs bars of wood in the ſhafts which are ſunk to mines.

In many places the way is to ſink a perpendicular hole, or ſhaft, the ſides of which they ſtrengthen from top to bottom with wood-work, to prevent the earth from falling in: the tranſverſe pieces of wood, uſed to this purpoſe, they call *ſtemples*, and by means of theſe the miners in ſome places deſcend, without uſing any rope, catching hold of theſe with their hands and feet. *Ray*'s Engl. Words, p. 118.

STENO's *duct*, a name given from its diſcoverer to the ſuperior ſalival duct. See SALIVAL, *Cycl.*

Several anatomiſts, particularly Heiſter and Palfyn, have diſputed whether *Steno's duct* is pervious in recent ſubjects, as well as in the ſkeleton. Dr. Kulm affirms, he has demonſtrated it to ſeveral to be pervious in deer, bears, wild goats, hares, calves, and in the human ſubjects; and mentions the manner of tracing it. See Med. Eſſ. Edinb. Abridg. Vol. 2. p. 421.

STENOMARGA, in natural hiſtory, a name uſed by ſome authors for a light marly earth, more uſually called *agaricus mineralis*, and *lac lunæ* by the later writers, and *terra*, or *creta Seleneuſiaca*, by Dioſcorides and Galen. *Agricola*, de re Metal. p. 378.

STENTATO, in the Italian muſic, is uſed to ſignify that the voice ſhould be forced in ſome part of a ſong, or on ſome particular ſound, to expreſs an extraordinary emotion.

STEP (*Cycl.*)—STEP, in a ſhip, that piece of timber whereon the maſts or capſtans do ſtand at bottom, is called the *ſtep* of the maſt or capſtan.

STEPHANITÆ, Στεφανῖται, in antiquity, an epithet given to games and exerciſes, where the prize was only a garland. *Potter*, Archælog. Græc. Tom. I. p. 451.

STEPHANOPHORUS, Στεφανοφόρος, in antiquity, the chief prieſt of Pallas, who preſided over the reſt. It was uſual for every God to have a chief prieſt; that of Pallas was the *ſtephanophorus*, juſt mentioned, and that of Hercules was called *dadouchus*. *Potter*, Archæol. Græc. Tom. I. p. 206. See DADOUCHUS.

STEPHANOPHORUS was alſo a prieſt that aſſiſted the women in the celebration of the feſtival Theſmophoria. Id. Tom. I. p. 403. See THESMOPHORIA.

STEPHENS's *medicine for the ſtone* (*Cycl.*)—Mrs. *Stephens* having ſold medicines for the ſtone in the bladder or kidneys, Dr. Hartley publiſhed ſeveral caſes of their ſucceſs; and ſo much was ſaid of them, that the parliament appointed truſtees to examine into the truth of what was alledged in their favour. The report of theſe truſtees being favourable, ſhe had five thouſand pounds ſterling ordered her for publiſhing the receipt. Dr. Hartley leaving out the ſuperfluous part of Mrs. *Stephens*'s preſcription, reduces her receipt to a more ſimple form; to wit, to two ounces and an half of ſoap, and ſeven ſcruples and an half of egg-ſhell powder, as the mean doſe of the medicines to be taken. Dr. Hales, after ſeveral trials on the different ingredients, found that the diſſolving power of them lay in the lime, which Dr. Rutty confirmed; and Dr. Jurin having taken ſoap-lees, the ingredients of which are pot-aſhes and lime, beginning with a few drops, and increaſing the quantity till he took an ounce, or an ounce and an half every day, in a proper vehicle, was cured of bloody urine, pain, &c. and paſſed ſeveral ſmall ſtones; after which he had no uneaſineſs.

STERA, in anatomy, a word uſed by ſome of the barbarous writers to expreſs the uterus. It ſeems to have been only a corruption of the word *hyſtera*.

STERCORARIUS *piſcis*, the *dung-fiſh*, the name of an Eaſt-Indian fiſh; ſo called, from its frequenting neceſſary-houſes which are over the water, and other places, where the like naſtineſs is to be found. It is for this reaſon ſuppoſed unwholeſome by ſome, but is really a very well-taſted fiſh, and eaten by moſt people where it is to be had. It is a broad and thin fiſh, of about ſix or ſeven inches long, and nearly as much in breadth. Its back is variegated with ſpots of deep brown; its belly is bluiſh. *Ray*'s Ichthyogr. Append. p. 2.

STERCUMEZEFF, an affected word uſed by ſome of the chemical writers for litharge.

STEREO-*ſtatics*, is uſed by ſome for the *ſtatics*, or ſcience of the equilibrium of ſolid bodies. *Curtel.* Math. Univ. p. 79.

STERN (*Cycl.*)—STERN-*faſt*, aboard a ſhip, ſome faſtenings of ropes, &c. behind the *ſtern* of a ſhip, to which a cable or hawſer may be brought, or fixed, in order to hold her *ſtern* to a wharf, &c.

STERN-*poſts*, in a ſhip, a great timber let into the keel at the *ſtern* of a ſhip, ſomewhat ſloping, into which are faſtened the after-planks; and on this poſt, by its pintle and gudgeons, hangs the rudder.

STERNA, in zoology, a name by which Turner, and ſome others, have called a bird, known among authors by the name of the *hirundo marina*, or ſea-ſwallow.

It is of the ſmaller kind of *lari*, or gulls, and has a forked tail. It is called the *ſea-ſwallow*, from its having very long wings, very ſhort legs, and a forked tail, and its being almoſt always on the wing. Its uſual weight is about five ounces. Its body is of a long and ſlender ſhape, the upper part of its head is black, but it has a white line ſurrounding it; the belly, and under part of the wings, are white, the

breaſt a little greyiſh; the rump is alſo white, but the back and wings of a blackiſh grey; its beak is ſomewhat long and ſtrait, and its legs are red. It is very common on our weſtern coaſts. It feeds on fiſh, and flies uſually in large flocks. *Ray*'s Ornitholog. p. 269.

STERNOCOSTALES, commonly called the *muſculi triangulares ſterni*, are five pairs of fleſhy planes, diſpoſed more or leſs obliquely on each ſide the ſternum, on the inſides of the cartilages of the ſecond, third, fourth, fifth, and ſixth true ribs. They are inſerted by one extremity in the edges of the inſide of all the lower half of the ſternum; from thence the firſt muſcle on each ſide runs up obliquely, and is fixed in the cartilage of the ſecond rib. The ſecond runs leſs obliquely to its inſertion in the cartilage of the third rib; and the reſt are inſerted, in the ſame manner, in the cartilages of the following ribs; their obliquity decreaſing, and their length encreaſing, in proportion as they are ſituated lower down, ſo that the loweſt of all is almoſt tranſverſe. This laſt muſcle, which is fixed by one extremity in the cartilage of the ſixth true rib near the bone, ſeems to paſs the appendix enſiformis, immediately above the inſertion of the diaphragm in that appendix, and to join the muſcle on the other ſide. *Winſlow*'s Anatomy, p. 233.

The *ſternocoſtalis* was called by ſome of the older anatomiſts *ſextus thoracis*; and by Riolanus, and ſome others of the later writers, *pectoralis internus*.

STERNODACTYLÆUS, in anatomy, a name given by Riolanus, and ſome others, to a muſcle of the foot, called by Albinus the *flexor brevis digitorum pedis*, and by others the *ſublimis flexor*, or *perforatus pedis*.

STERNOHYOIDÆUS, a long, thin, flat muſcle, called by ſome *ſterno-cleido-hyoidæus*.

It is broader at the lower than at the upper part, and is ſituated, together with its fellow, on the foreſide of the throat; from whence ſome have very improperly named it *muſculus bronchialis*. It is fixed by its lower extremity in the ſuperior and lateral part of the inner, or poſterior ſide of the ſternum, in the poſterior part of the ſternal extremity of the clavicula, in the tranſverſe ligament which connects thoſe two bones, and in the inner, or backſide of the cartilage of the firſt rib. All theſe other inſertions are more conſiderable than that in the ſternum, which is ſometimes ſcarce perceivable. From hence it runs up to the foreſide of the aſpera arteria, joined to its fellow by a membrane which forms a ſort of linea alba, and is inſerted laterally in the lower edge of the baſis of the os hyoides. There is ſometimes a tranſverſe tendinous line about the middle of the backſide of this muſcle. *Winſlow*'s Anatomy, p. 256.

STERNOMANTIS, Στερνομαντις, in antiquity, a deſignation given to the delphian prieſteſs, more uſually called *pythia*. *Potter*, Archæol. Græc. Tom. I. p. 278. See the article PYTHIA, *Cycl.*

STERNOMANTIS is alſo uſed for any one that had a propheſying demon within him. *Potter*, Archæol. Græc. Tom. I. p. 300, ſeq.

STERNOMASTOIDÆUS, a muſcle, called alſo ſimply *maſtoideus*, and *maſtoidæus anterior*, or *externus*. It is long and narrow, pretty thick, and moſtly fleſhy, and is ſituated obliquely between the back part of the ear, and the lower part of the throat. It is in a manner compoſed of two muſcles, united at the upper part through their whole breadth, and ſeparated at the lower. It has two inſertions below both of them, flat, and a little tendinous; the firſt is in the upper edge of the ſternum, near the articulation of the clavicula; and the other in the clavicula, at a ſmall diſtance from the ſternum. Theſe two portions run up obliquely, and unite together at about an inch above their lower inſertions, the triangular ſpace left between them being filled by a membrane. The ſternal portion riſes foremoſt, and covers the clavicular, both forming one body, or belly, which running in the ſame oblique direction to the apophyſis maſtoidæus, is inſerted in the upper and back part of that proceſs, over which it likewiſe ſends off a very broad aponeuroſis, which covers the ſplenius, and is inſerted in the os occipitis. The two anterior maſtoidæi repreſent a great Roman V, the angle being at the lower part of the throat, and the two crura running up behind the ears. *Winſlow*'s Anatomy, p. 234.

STERNUM (*Cycl.*)—This is a long flat bone, not all of the ſame breadth, but repreſenting a kind of dagger. It is generally made up of three principal pieces; the firſt broad and ſhort, the ſecond longer and narrower, and the third a ſort of ſmall appendix, called by the Greeks *xyphoides*, from its reſemblance to the point of a broad ſword.

The firſt, or uppermoſt piece, is broad and thick at the top, but thinner and narrower below, being nearly of the figure of a triangle with the three angles cut off, or of a very irregular ſquare. The ſecond is much longer than the firſt, and is flat on both ſides, whereas the outſide of the upper is unequally convex, and the inner a little concave. This is broader alſo toward the lower, than toward the upper part, and has ſometimes ſeveral tranſverſe lines, eſpecially on its outſide, which point out the places where the pieces, of which it is made up in children, are joined together. The two lateral edges of this bone have each one cartilaginous half notch, and five cartilaginous whole notches; the half notches are at the upper part of the lateral edges, and the five entire notches come nearer to each other, in proportion as they are lower, and part of the laſt properly belongs to the third piece.

The third piece, commonly called *cartilago enſiformis*, and *xyphoides*, is entirely cartilaginous in infants, and young ſubjects, but in an advanced age it generally oſſifies, either wholly, or in part. This piece is joined to the lower extremity of the ſecond, between the cartilages of the laſt true ribs, and is often more or leſs notched on each ſide, to form part of the articular notches of the *ſternum*. Its figure and ſize vary, and in ſome ſubjects it is forked, and in others perforated. Sometimes alſo it is very large, and at others very ſmall, hardly exceeding in ſome ſubjects the third part of an inch. The inner ſubſtance of the *ſternum* is almoſt all cellulous, and very tender; it is covered with a thin, but compact lamina. The *ſternum* compleats the fore part of the cavity of the thorax, and ſuſtains the anterior extremities of the ribs; being ſufficiently fixed to reſiſt compreſſions, and other outward accidents, and yet moveable enough, by means of its articulation with the cartilages of the ribs, not to obſtruct the motions neceſſary to reſpiration. It ſerves alſo for the inſertion of ſeveral muſcles, and to ſupport the mediaſtinum. *Winſlow*'s Anatomy, p. 67.

We owe to Mr. Hunauld a very judicious account of the perforation which is ſometimes found in the lower part of the *ſternum*.

This perforation is ſometimes larger, ſometimes ſmaller; and a certain German author has found a very ſingular uſe for it, ſuppoſing that it gives paſſage to the mamillary veins and arteries; but Mr. Hunauld, though he had often found the *ſternum* thus perforated, never could obſerve any veſſels paſſing it, but always found it filled up with a cartilaginous ſubſtance. The German author does not poſitively affirm that he ſaw the veſſels paſſing through this perforation, and Mr. Hunauld ſuppoſes it to have been but a conjecture, that this might be its uſe. Its origin and formation, however, may be more rationally accounted for on much ſounder principles.

The *ſternum* is in its firſt ſtate wholly cartilaginous, and the oſſification begins afterwards in ſeveral different parts of it: the number of theſe oſſifying ſpots is wholly uncertain, but as they encreaſe they unite, ſooner or later, into three pieces, and afterwards theſe three pieces unite themſelves, ſo as to form only one. If therefore, when theſe different oſſifications begin to unite, there be ſome place where the oſſification has been impeded, this place, or ſpot, muſt remain only of a cartilaginous ſubſtance, and in making the ſkeleton, this cartilage will be ſeparated from the bones, and will conſequently leave a perforation in the *ſternum*; and what makes this the more probable, is, that this perforation, which is ſo commonly ſeen in ſkeletons, is never found in diſſecting the recent body. It may alſo have happened, that the three pieces of bone, which conſtitute the *ſternum*, by uniting at their edges, may, in acquiring their growth and ſolidity, have naturally left a vacancy between them. We never find a perforation of this kind in the upper part of the *ſternum*, which is probably owing to that part of it being only one piece in the earlier times, and not oſſifying in different places and ſpots at the ſame time; as is always the caſe in regard to this lower part of the *ſternum*, where the perforation is always found. Mem. Acad. Par. 1740.

Cartilages of the STERNUM. The *ſternum* of an adult ſubject has commonly ſixteen cartilages; fourteen of the number are articular, the other two are ſymphyſes. Of the former, two belong to the articulations of the clavicle, and twelve to thoſe of the true ribs, from the ſecond to the ſeventh incluſively; and the two ſymphyſes are both between the *ſternum*, and the firſt rib on each ſide. There is likewiſe another ſymphyſis, by which the upper portion of the *ſternum* is connected to the lower; but the cartilage of this is often obliterated in advanced age. The apophyſis enſiformis is often long toward the *ſternum*, and more or leſs cartilaginous toward the other end. This has, in very aged perſons, been ſometimes found entirely oſſified, and ſometimes wholly cartilaginous even in adults. *Winſlow*'s Anatomy, p. 149.

Ligaments of the STERNUM. The *ſternum* has ſeveral ligaments, by which it is connected to the clavicles and ribs. It is joined to the clavicles by ſtrong ſhort ligaments, fixed by one extremity round the edges of its two ſuperior notches, and by the other in the extremity of each clavicle, and by the middle to the inter-articular cartilages, ſurrounding the particular ligaments which go between the edges of theſe cartilages and the *ſternum*. *Winſlow*'s Anatomy, p. 149.

STERNUM *fractured*. The *ſternum* is equally ſubject to depreſſions and fractures, from falls and blows, with the reſt of the bones. When either of theſe accidents happen to it, the part is not only uneven and painful, but the ſubjacent arteries and veins are alſo contuſed and ruptured; whence ariſe pains in the breaſt, difficulty of breathing, violent coughs, ſpitting of blood, or elſe extravaſations of it in the

præcordia, or between the duplicatures of the mediaſtinum, with many bad ſymptoms of the like nature. The ſigns of a *fractured ſternum* will therefore be very evident by theſe, and by its being moveable to the touch, eſpecially when one part of it grates againſt another, and when there is a cavity and inequality very remarkably viſible there.

In order to reduce a fracture of this bone, the patient muſt be laid on his back on a bed, or hard even place, as a table, putting a hard pillow, a large parcel of cloth rolled up, or ſome other ſuch body, under his back, and preſſing down his ſhoulders, by which means the *fractured ſternum* will be elevated and extended; and to facilitate the reduction, the ſurgeon muſt preſs the bones of the *ſternum* together, and ſhake them very ſtrongly. But when this method is impracticable, or not proper, the ſkin muſt be divided, and the depreſſed part of the *ſternum* lifted up into its place, by means of an elevator, or elſe of a ſcrew gently wormed into the part, and afterwards pulled upwards; and when it has regained its natural ſituation, it muſt be kept in it by the proper bandages. If after the reduction violent pains continue under the *ſternum*, and if blood ſhould gather, and ſuppurate internally, between the duplicature of the mediaſtinum, the lower part of the *ſternum* ought to be trepanned, as the cranium on the like occaſions; and when the putrid matter is diſcharged, and the wound cleanſed, it muſt be healed with vulnerary balſams; and if any blood ſhould be found diſcharged into the cavity of the thorax, the cure muſt entirely depend on the evacuating that by the paracenteſis, in the manner of wounds of the thorax. *Heiſter*, p. 122.

STHENIA, Σθενια, in antiquity, a feſtival of Argos, ſuppoſed to be kept in honour of Minerva, ſurnamed Σθενιας from σθενος, ſtrength. *Potter*, Archæol. Græc. Tom. I. p. 430.

STIÆ, a word uſed by ſome of the old authors for pebbles found on the ſea-ſhore.

STIBIALIA, a term uſed by ſome to expreſs the antimonial medicines.

STIBADIUM, among the Romans, a low kind of table-couch, or bed of a circular form, which ſucceeded to the triclinia, and was of different ſizes, according to the number of gueſts they were deſigned for. They were called *hexaclina*, *octaclina*, or *enneaclina*, according as they held ſix, eight, or nine gueſts, and ſo of any other number.

STIBINUS *color*, a term uſed by St. Jerom, and others, to expreſs the falſe black colour which the antient Jews, and other Eaſtern people, gave to their eye-brows with *ſtibium*, or antimony.

STIBIUM, *antimonium*, antimony. See ANTIMONY, *Cycl.*

This is a mineral never found native in its perfect ſtate, but always intimately mixed with, and penetrated by ſulphur, and other extraneous matter, and by it reduced to the ſtate of an ore. In this condition it is ever found in the earth, and according to the different proportions of ſulphur, or other matter, it contains, it aſſumes very different appearances.

It is moſt commonly found in form of a very hard and heavy lead-coloured ſubſtance, compoſed of a number of extremely ſmall granules, all very bright and ſparkling, and giving it the appearance of a lump of the pureſt ſteel when freſh broken. This is what is commonly underſtood by the name *antimony ore*, and is what is ſold under that title in the German ſhops.

Not unfrequently, however, it appears of a ſomewhat more lax texture, leſs heavy, but much more bright, and compoſed of ſmall, but viſibly broad and flat particles, of a very pale whitiſh lead colour, and glittering appearance, like that of many of the lead ores. This is called *broad-grained antimony ore*.

Sometimes alſo, but leſs frequently, *antimony* appears in form of bright maſſes, made up of multitudes of parallel ſlender filaments, of a bright ſteel colour, and more glittering hue than in either of the former ſtates: theſe filaments are of different breadths and thickneſſes in the ſeveral maſſes. Theſe are generally known by the name of *ſtriated*, or *plumoſe antimony ore*.

Theſe are the moſt natural and ſimple appearances of this foſſil, but beſide theſe it is liable to a multitude of other very different ones, as it ſometimes contains iron mixed among its own matter, and very frequently ſilver; theſe may naturally be ſuppoſed to give it ſome differences in its appearance: but beſide theſe it is ſubject to much greater, from its admixtures with the common marcaſites and pyritæ; theſe often tinge the whole body of the ore to a ſilvery white, or to a golden yellow.

Antimony ores are found in fiſſures and veins at different depths, and often very near the ſurface, and is variouſly accompanied with ſpars, cryſtals, ſulphurs, and other ſubſtances. Sometimes the veins of it are every way ſurrounded by a tolerably pure yellow native ſulphur; ſometimes with a more debaſed matter, made of a mixture of ſulphurs, earth and ſpar, differing according to the different diſpoſition and admixture of theſe bodies.

Antimony is found in great abundance in England and Germany; we have ſeveral mines of it in Cornwall; and Germany, Hungary, and many other parts of the world, afford it in very great abundance.

To reduce it to a ſtate fit for uſe, it is to be ſeparated from its ore by the force of fire, and by the aſſiſtance of ſuch ingredients as break the mutual connection between the ſulphureous and the reguline part, which mutually diſſolving each other, keep the concrete in the ſtate of ore. The addition of iron is able to do this; and that of ſilver, copper, and other metals, has alſo the ſame effect.

There have not been wanting perſons, who have pretended to extract a mere running mercury from *antimony*, and Mr. Boyle believed it might be done: but this is one of the many great things pretended to by chemiſtry, of which we have yet no ſufficient proof.

Antimony, when ſeparated from its ore, is very eaſily fuſible, and runs the thinneſt of all the bodies of this kind. It greatly promotes the fuſion of other foſſils, but it makes every thing brittle that it is mixed with. It is of great uſe in medicine, chemiſtry, and mechanics, and in its ſeveral preparations is diaphoretic, cathartic, and emetic. The chemiſts uſe it greatly in their operations on other metals, and it is an ingredient in pewter, bell-metal, and the mixt metal, of which types are made for printing. *Hill*'s Hiſt. of Foſſ. p. 623.

Mr. Geoffroy has been the inventor of a new method of treating this mineral, by which it yields much more regulus than according to thoſe preſcribed by Kunkel and Stahl, and is purified without the addition of ſalts, and with very little loſs.

It is generally ſuppoſed, that the vapours of *antimony* are poiſonous when raiſed by fire, but it appears otherwiſe from the operations this gentleman made on it; the ſame operator having once gone through ſixty calcinations of twelve ounces of *antimony*, without receiving any harm from it: whence it is very evident, that the common opinion of the fumes of *antimony* containing an arſenical ſulphur is an erroneous one; and it may be added, that one great mark of *antimony*'s being good, is, that it loſes a great deal of its weight in calcination. It has more ſulphur in this caſe, which the fire raiſes in a vapour, and leſs of the terreſtrial matter or ſpar, which are uſually very abundant in it. It has been proved by experiment, that the ſulphur of *antimony* is a neceſſary and eſſential part of its conſtruction, ſince without this it is no longer emetic; but this ſulphur is only neceſſary in a certain proportion; for it is found, that when it is more abundant in the *antimony*, the whole loſes in proportion of its emetic quality; and Mr. Geoffroy has found by repeated experiment, that to give this virtue in its greateſt degree, the *antimony* is firſt to be diveſted of its native ſulphur, much of which is of no uſe as to this intention, and is then to be melted with a gentle fire in a crucible with a quantity of ſoap, made from a ſtrong lixivium of pot-aſhes, quick-lime, and oil, united by boiling into a ſolid maſs.

The *antimony* melted with this, after a ſufficient previous calcination, affords a ſort of glaſſy cruſt of ſcoriæ, which covers a quantity of compact regulus lying at the bottom of the crucible. Theſe ſcoriæ are a ſort of blackiſh glaſs, which melts in the flame of a candle, but does not run on being expoſed to the air. This is plainly compoſed of the burnt oil of the ſoap, united with the acid of ſulphur of *antimony*, and a vitrification made with ſome earthy particles, and the ſalts of the ſoap; this vitrification is what preſerves the fatty matter from being liquified by the air. When theſe ſcoriæ are ſeparated from the reguline matter, if that be again melted, with an addition of an alkali ſalt and of the powder of white cryſtal glaſs, there is produced a purer regulus than can be obtained by any other known method, and in a larger quantity, by two ounces from the pound, than ever Stahl, or Kunkel, were able to procure. Mr. Geoffroy, by theſe nice obſervations and experiments, diſcovered that *antimony* contained much leſs common ſulphur than had been generally ſuppoſed, ſince it can be made to loſe, at the utmoſt, only three ounces and five drachms in the pound in calcination. The emetic quality of the regulus proves, however, that it yet contains a very large ſhare of ſulphur, though of another kind: this Mr. Geoffroy diſtinguiſhes from the common ſulphur, by the name of the *metallic ſulphur*. Mem. Acad. Scienc. Par. 1736.

Acid of ANTIMONY. Mr. Charras was the firſt author who gave the world a ſuccinct method of drawing an acid liquor from *antimony*. He did it thus: he mixed crude *antimony* ore in powder with three times its weight of ſand, this he diſtilled in a large retort into a capacious receiver, filled half full of river water, and on rectifying this, the acid liquor was to be produced. Himſelf acknowledges, however, that this, though a ſuccinct, is not always a certain method, for that ſometimes the acid liquor was produced, and ſometimes not: this, however, he attributes wholly to the management of the fire, which he ſays will always afford the acid, if conducted regularly through its ſeveral degrees. But Mr. Homberg trying this experiment ſeveral times, and finding it ſometimes ſucceed, and at other times not, though the ſame cautions were uſed, diſcovered at length that this va-

riation, in the ſucceſs of the proceſs, was not occaſioned by any difference in the fire, but by the different nature of the matter employed. The crude ore of *antimony* ſometimes being mixed with a white argillaceous earth, and ſometimes free from this admixture; he found, that when it had this white earth in any great proportion, it never failed to yield this acid liquor; and that when it had none of it, it never could be made to yield a drop of acid; and conſequently, that this was not an acid extracted from *antimony*, but merely from the earth, as common pipe-clay, or any of our argillaceous earths, will yield an acid by means of a ſtrong fire.

This liquor had therefore been very improperly called the *vinegar of antimony*; and it is evident, that whatever acid *antimony* contains, muſt be of the nature of ſpirit of ſulphur, ſince ſulphur ſo greatly abounds in the compoſition of that mineral, and its ſulphur is wholly the ſame with the common brimſtone. Whatever acid, therefore, of this kind could be produced, muſt be of the nature of that collected from the fumes of burning ſulphur; and, even though it were produced from *antimony*, could have nothing of the nature of *antimony* in it, ſince it would be wholly the produce of the common ſulphur in that mineral, and not of the reguline part, which alone is properly *antimony*. Experiment alſo proves the truth of this opinion, the *acid of antimony*, truly ſeparated from it, being no way different, in any particular, from that of crude ſulphur.

There are ſeveral ways by which it may be made, but the following ſeems the eaſieſt and moſt familiar. Powder crude *antimony* very fine, lay it in an earthen diſh not glazed, and of a conſiderable width at the top; cover this diſh with an earthen pot, with the bottom taken out, and fit to this three earthen aludels, and cover the mouth of the uppermoſt aludel with a large glaſs bell; the edges of which muſt be ſuſtained about a quarter of an inch above a veſſel of water, kept ſo hot, as to fumigate the inſide of the bell; the water that runs down from the bell, will be received again into the veſſel of water. In the middle of the earthen pot, which covers the diſh of *antimony*, there muſt be a hole, large enough to admit the handle of an iron ladle, or ſome ſuch other inſtrument, to ſtir about the *antimony*. The fire being made under the earthen diſh, and continued a proper time, there will be found the flowers of *antimony* in the aludels, a little acid liquor in the water of the veſſel kept under the bell, and the *antimony* will be found calcined in the diſh.

It is but little acid that can be obtained in this manner, but then it is aſſuredly the pure acid of the ſulphur of *antimony*. Sometimes this method furniſhes alſo little or no acid, but this depends on the care of the operator, and the temperature of the air; for the colder and moiſter the ſeaſon is, the more acid will be obtained, and the hotter and drier it is, the leſs. The operation, whenever ſo perfect, is however of little value, the acid being every way the ſame with that of common ſulphur. Mem. Acad. Par. 1700.

Infuſion of ANTIMONY. Mr. Homberg being well aſſured, that water was a menſtruum capable of diſſolving all the metals, if properly applied, uſed it, in ſeveral different manners, in his analyſis of *antimony*. He made an *infuſion of antimony* in water, putting into ſeveral glaſs veſſels crude *antimony*, coarſely powdered, five pounds into each veſſel, and to each of theſe quantities he added two pints of rain water; after the *antimony* had ſtood thus for ſix months, the ſeveral parcels were uſed on different occaſions, one only excepted, which had been forgotten, and had at length ſtood two winters and a ſummer: having at length found this veſſel, he obſerved that its inſide was every where coated over with configurations of leaves; he at firſt ſuppoſed this to be owing to ſome ſalts of the *antimony*, which had been diſſolved in the water, and had afterwards cryſtallized themſelves in this manner, as the butter of *antimony* is ſometimes known to do in ſublimation; but on rubbing the ſides of the veſſel with a finger, and afterwards ſcraping them with a knife, he found that they were covered with a yellowiſh pellicle, without the leaſt appearance of ſalt, and that the configurations of the leaves were not raiſed upon this pellicle, but ſunk, as if graved by a tool. The water taſted ſomewhat acid, and being tried on turnſol, and on different metallic ſolutions, it turned the turnſol to a light red, and turned a ſolution of ſilver white; whence it appeared to be an acid, and of the nature of that of ſea-ſalt. The ſunſhine had turned this water ſower, had made it act upon the *antimony*, and take up a part of its ſalt. This ſalt, in the winter, was probably afterwards concreted into the figures of leaves, formed upon the mud depoſited by the water on the ſides of the veſſel; and theſe ſalts being afterwards diſſolved again in ſome hotter weather, had eaten their way into this ſediment of mud, in the form of the leaves, *&c.* in which they had concreted. Mem. Acad. Par. 1693.

Texture of STIBIUM. Monſieur de Reaumur gives the following account of the contexture of *antimony*, or *ſtibium*.

Nothing is more common, than to obſerve on the ſurface of broken *antimony* long and ſhining needles, as it were; and that *antimony*, on which theſe are moſt diſtinct and viſible, is eſteemed the beſt. Sometimes theſe ſtreaks are ranged with ſo much order, and branch out ſo regularly in certain directions, that thoſe who are ever ſo converſant with it, cannot but admire its beauty. The figures of the conſtituent molecules of this mineral may poſſibly contribute ſomething to the formation of theſe needles, but the texture, and configuration of the conſtituent parts, will not alone account for the diſpoſition of theſe ſtreaks, and their arrangements, in regard to one another; ſince upon breaking different lumps of the ſame *antimony*, and thoſe of the ſame ſhape, we frequently obſerve quite different configurations of the needles. Let us take, for inſtance, equal maſſes of *antimony* of a regular conic figure, theſe being moſt frequent, from the ſhape of the veſſel they cool in, which reſembles a funnel, or inverted cone; let ſeveral of theſe conical maſſes be broken into different parts, and we ſhall ſee the needles in very different directions in theſe ſeveral parts.

In one of theſe maſſes, from a certain height, we may obſerve all theſe needles directed to the point of the cone; in a piece taken from a little higher, the needles ſhall be horizontal, or nearly perpendicular to the former; above theſe we ſhall find others, which ſometimes direct themſelves toward ſome point in the baſe of the cone, and ſometimes form themſelves into different cones with their ſeveral ſummits.

In another of theſe maſſes we ſhall not find the needles diſpoſed into a horizontal direction, but running into ſmall conical parcels, in directions quite reverſe one to another; that is, ſome of them ſhall have their ſummits toward the baſe of the cone, and others toward its apex. In ſome lumps alſo we ſhall diſcover needles every where, and in others no where at all; and often the needles are found in one part of the lump, with no appearance of them in the others. Sometimes alſo we ſhall find the inſide of a maſs regularly diſpoſed into cones, though the outſide is of no ſuch figure, for the internal cones have no dependance upon the external figure of the maſs; and ſometimes the needles are diſpoſed along the ſides of the cone, and their direction ſeems to follow the ſides of the veſſel in which they were fixed. Notwithſtanding, however, all theſe varieties in form, the cauſe of all the appearances is wholly the ſame, and is no other than that refrigeration, by which the maſs is changed from a fluid into a ſolid ſtate; and to the progreſs of this the needles plainly owe their different directions.

All melted metals cool firſt at the tops and ſides, and thence by degrees through the whole body of the maſs: the particles at the ſides and top, which firſt cool, becoming fixt to thoſe which are neareſt them, affix thoſe, and they are the next that cool, and ſo on, in ſucceſſive order; now moleculæ, of whatever ſhape, thus affixed ſucceſſively to each other, form a kind of threads or needles, the ſeveral directions of which ſhew the order in which the refrigeration has been carried on.

If the crucible, or other veſſel, in which the melted *antimony* is ſuffered to cool, were in the ſhape of a hollow bowl; if its ſides were every where equally thick, and equally warm, and acted equally upon by an air equally cold; and if the melted ſubſtance were of the ſame uniform nature, alſo, in all its parts, all the needles or fibres would be then ſo many rays, terminating in the center of the bowl; and if the ſubſtance were ſuch, that its fixed particles were naturally all of a length, we ſhould find ſo many concentrical beds of needles, formed by parcels of each ray, and lying at equal diſtances from the center.

But ſo many regular circumſtances do not concur in the cooling of melted *antimony*; and hence the beforementioned irregularities muſt neceſſarily ariſe. In melting *antimony* in conical crucibles, and ſuffering it to cool in them, the needles may be determined ſeveral ways, to any directions one may chooſe.

If, when the crucible is taken from the fire, it be ſet to cool upon ſome cold body, the conſequence is, that the bottom and top of the *antimony* muſt cool firſt, and the needles will be found diſpoſed into two cones, the one having its baſe at the apex, and the other at the baſe of the large, or general cone: but if the crucible be ſet on burning coals, and the ſurface of the *antimony* covered with more coals, then the ſides muſt cool firſt, and the needles will be found running horizontally, or forming themſelves into horizontal cones: the touching the ſides of the crucible alſo, at times, with a wet cloth, and by that means forcing the melted matter to cool firſt in ſuch particular places, will give cones of needles directed horizontally, and having their baſes at thoſe ſpots of the crucible ſo forcibly cooled.

Not unfrequently there is found a hollow in the midſt of a conical maſs of *antimony*, and in that caſe there are ever found needles proceeding in different directions from the ſides of that cavity inwards, as they, when cooled, became of the ſame nature with the ſides of the veſſel, and acted on the encloſed maſs in the very ſame manner.

To procure the needles perfect and fine, the *antimony* muſt be ſuffered to cool gradually, for if it cool too faſt, one molecula becomes fixed before it can be adapted to the end of another, and the whole is a confuſed maſs; and the ſame happens alſo if it cool too ſlowly; for then the particles of

fire get out ſo very regularly and inſenſibly, that the moleculæ cooling equally all together, form no arrangements. This is found by letting a crucible of melted *antimony* ſtand on ſome burning coals, and gradually cool as their heat burns away and decreaſes; in which caſe the maſs will have perhaps no needles at all, or if any, then but very few.

It may be objected to this, that if the refrigeration of the maſs is the only cauſe of the needles in *antimony*, all melted metals ought to afford the ſame appearance alſo, if cooled in the ſame manner: and poſſibly indeed all do ſo; we ſee them eaſily in *antimony*, becauſe it breaks with a ſlight blow, without diſordering the configuration of its parts, the combinations of its molecules into needles being more firm than that of the needles to one another; but in metals which require more force to break them, the needles may perhaps rather break than ſeparate, and by more force muſt be more diſordered; and all the parts may be as regularly arranged in a ductile maſs, as in a brittle one, though we are not able to diſcover that arrangement.

Lead, when hot to a proper degree, ceaſes to be ductile, and is brittle, and lead broken at this juncture is found to be granulated, appearing like broken ſteel; there is no reaſon to doubt but that this is alſo the caſe, when that metal is perfectly cold, but that the force required to ſeparate, or break it, deſtroys its proper ſtructure.

Mr. Reaumur melted lead in a conical crucible, and ſuffering it to cool to a certain degree only, he broke the maſs into ſeveral large lumps by a ſmart blow of a hammer, and in theſe found the ſame needles as in *antimony*, the granules having cohered in long trains, juſt as the moleculæ of the *antimony*; and the diſpoſitions of the ſeveral groupes of needles in the lead, in regard to the ſides and bottom of the crucible, were the very ſame with thoſe of *antimony*. But there is this manifeſt difference between the needles of lead, and thoſe of *antimony*, that whereas the latter are flat and extremely gloſſy, the former are viſibly round, and much leſs bright. Mem. Acad. Scienc. Par. 1724.

Ore of ANTIMONY. The way of running down *antimony* out of its ore by the aſſayers, is as follows. Take a crucible that will hold ſome pounds of *antimony* ore, broken into pieces of the ſize of a hazel-nut, and bore at the bottom of it a few ſmall holes with a common gimblet; place this bottom in the mouth of another ſmaller crucible, put in the ore, and cover the orifice with a tile; then lute all the junctures, and place this on the pavement of the hearth, making a circle of ſtones all round it, at ſix inches diſtance; fill this intermediate ſpace with aſhes, ſo high, that the lower pot may be covered up to its rim, then put freſh burning coals upon the whole, and blow the fire ſtrongly with a pair of hand-bellows, to make the upper veſſel red-hot: when it has been ſo a quarter of an hour, take away the fire, and when the veſſels are cold, open them, and the *antimony* will be found in form of a regulus in the under veſſel. *Cramer*'s Art of Aſſaying, p. 356.

The moſt ready method of fuſing *antimony*, yet known, is by means of that mineral ſubſtance called *cawk*. A lump of this, of the bigneſs of a wallnut, thrown red-hot into a pound of *antimony* in fuſion, converts almoſt the whole ſubſtance of it into glaſs, fifteen ounces of clean and fine glaſs being thus produced; and what is very remarkable, the cawk itſelf never melts in the metal.

The purification of gold, by means of *antimony*, is performed in this manner. Before you enter on the proceſs, it is neceſſary to gueſs, as nearly as may be, at the allay of the gold, by the touch-needles, or otherwiſe. If the quantity of gold in the maſs is not leſs than three quarters, that is, eighteen carats, the maſs muſt be melted in a wind-furnace, and the crucible muſt be covered, to prevent coals falling in; this done, put into it, at ſeveral times, double the quantity of crude *antimony* in fine powder, as ſoon as one portion of the *antimony* is melted, putting in another: let the whole continue in fuſion a few minutes, then pour it into a melting cone, warmed, and rubbed with tallow, and ſtrike with a hammer on the floor, near where the cone ſtands, that the heavier part may ſink to the bottom. When all is cold, invert the cone, and ſtrike it, and a maſs will fall out, having at bottom a regulus, more or leſs yellow, according to the quantity of the gold in the mixture; this may with a few blows be ſeparated from the ſulphureous cruſt, which is at top. Melt in a ſmaller fire this regulus, and when in fuſion add to it a double quantity of crude *antimony* in powder, and pour it out into the cone again a little after; ſeparate the regulus from the *antimony* at top, and then repeat this operation once more. When this is done, put the ſeparated regulus into a thick good teſt, place this in the furnace immediately before the bellows, put coals round it, and one or two pieces of wood upon them, and make a middling fire, ſuch as is ſufficient to melt the regulus, the reguline part of the *antimony* will vaniſh in a thick ſmoak; then encreaſe the fire, and keep it ſo, till the fumes are over, and the ſurface of the gold is of a fine green; and afterwards give the gold another fuſion with borax and nitre, and it will be perfectly pure.

When the gold to be purified by this proceſs is impure to an allay of eight carats, it is not proper to perform the precipitation by *antimony* alone, but there ſhould be added as many times two carats of common ſulphur, as the allay of the gold is ſo many carats leſs than eighteen. *Cramer*'s Art of Aſſaying, p. 276.

STIBIUM, in medicine, *&c.* is not only given in ſubſtance, but many preparations of it are alſo uſed; which are either emetic, cathartic, diaphoretic, or ſudorific. Crude *antimony* in powder is found good for diſſolving viſcidities, in cutaneous diſeaſes, and, as ſome very confidently aſſert, in convulſions and epilepſies. Externally, in ointments, it is commended for drying up ulcers, curing the itch, and in plaiſters for reſolving of tumors.

There appears no reaſon for people's being afraid of giving crude *antimony* internally, experience ſhews it to be a ſafe medicine, unleſs by accident the acid of the ſtomach ſhould prove ſtrong enough to be a menſtruum to it.

The preparations of *antimony* are, 1. *ſulphur præcipitatum antimonii*. 2. *Crocus antimonii*, called alſo *crocus metallorum*. 3. *Crocus antimonii lotus*. 4. *Calx antimonii*, called *antimonium diaphoreticum*. 5. *Tartarum emeticum*. 6. *Cauſticum antimoniale*. 7. *Cinnabaris antimonii*. 8. *Regulus antimonii martialis*. 9. *Tinctura antimonii*. 10. The *Kermes* mineral, or Carthuſian powder. See the articles SULPHUR, CROCUS, CALX, *&c. Cycl.* and *Suppl.*

The virtues of *antimony*, in the diſeaſes of animals, are very great, and very evident on any trial. Pigs that have the meaſles are at all times recovered by it, which proves it a great purifier of the blood. Horſes who have running heels, that cannot be cured by the common methods uſed by the farriers, will generally be cured by this medicine in a little time. The manner of uſing it is this: mix one drachm with every feeding of oats which the horſe has in a morning; it is beſt put together in one place, buried under a few oats, and the horſe's head being with-held a little, and then let go juſt againſt that place, he will take it all in at a mouthful. Some horſes do not diſlike it, others obſtinately refuſe it, but to theſe it may eaſily be given in balls. The virtues of this drug, in fattening of cattle, has by many been thought imaginary, but experiment proves it to be a real truth. A horſe that is lean and ſcabby, and not to be fatted by any other means, will become fat on taking a doſe of *antimony* every morning, for two months together. A boar fed for brawn, and having an ounce of *antimony* given him every morning, will become fat a fortnight ſooner than others put into the ſtye at the ſame time, and fed in the ſame manner, but without the *antimony*. Philoſoph. Tranſ. N° 39.

Crude *antimony* is recommended in palſies, pains, and numbneſs, which come on after a ſalivation, and is ſaid to have cured ſeveral who were paralytic from other cauſes. The method of giving it, is to begin with three grains, increaſing the doſe with three grains every day, to half a drachm; after which the doſe is diminiſhed three grains every day, till it comes down to the quantity of the firſt doſe. Commerc. Liter. Norimb. ap. Medic. Eſſ. Edinb.

Antimony, before the twelfth age, was of ſervice only in the compoſition of paint. Scripture deſcribes it to us as a ſort of paint, with which the women blackened their eyebrows. Jezabel underſtanding that Jehu was to enter Samaria, painted her eyes with *antimony*, or, according to the Hebrew, put her eyes in *antimony*.

As large black eyes were thought the fineſt, they of both ſexes, who were careful of their beauty, rubbed their eyes, eyelids, and round the eyes, with a needle dipped in a box of paint made of *antimony*, with a deſign of blackening them.

At this day the women of Syria, Arabia, and Babylonia, anoint and blacken themſelves about the eyes; and both men and women put black upon their eyes in the deſert, to preſerve them from the heat of the ſun, and the piercing of its rays. M. Darvieux tells us, that the Arabian women border their eyes with a black colour made of tutty, which the Arabians call *rehel*. They draw a line of this kind of blacking without the corner of their eyes, to make them appear larger. Iſaiah, in his enumeration of the ſeveral ornaments belonging to the daughters of Sion, has not forgot the needles which they made uſe of in painting their eyes and eyelids; nor has this practice eſcaped the laſh of Juvenal [b].

Ille ſupercilium madida fuligine tinctum
Obliqua producit acu, pingitque trementes
Attollens oculos.

Ezekiel, diſcovering the irregularities of the Jewiſh nation under the idea of a debauched woman, ſays, that ſhe bathed, perfumed herſelf, and that ſhe anointed her eyes with *antimony*. Job ſhews ſufficiently how much *antimony* was in eſteem, by calling one of his daughters a veſſel of *antimony*, or a box to put paint in, *cornu ſtibii*. Tertullian and St. Cyprian have declaimed very warmly againſt this cuſtom of painting their eyes and eyebrows [c].—[b *Juv.* Sat. 2. c *Calmet*'s Dictionary.]

STIBIUM *ceratum*. See the article VITRUM *antimonii ceratum*.

STICA, a name given by ſome authors to all external aſtringents uſed in hæmorrhages.

STICA, in our old writers, a braſs Saxon coin, of the value of half a farthing, four of them making an helfing. *Blount*.

STICHOMANTIA, Στιχομαντεια, in antiquity, a ſort of divination by verſes, (commonly thoſe of the Sibylline oracles) which being wrote on little pieces of paper, and thrown into a veſſel, the firſt drawn out was ſuppoſed to contain the will of the Gods. *Potter*, Archæol. Græc. Tom. I. p. 333. See SORTES, *Cycl.*

STICHOS, a name given by the old writers to a pectoral confection, the principal ingredient of which was the herb *marrubium*, or hore-hound.

STICKLEBACK, in ichthyology, a name given by us to that ſmall fiſh, called by authors by the ſeveral names of *ſpinachia*, *ſpinax*, and *pugnitius piſcis*; as alſo *piſciculus aſper*, *piſciculus aculeatus*, and the like; and finally, by Artedi, by the much more expreſſive name of *gaſteroſteus*, expreſſing that great ſingularity it has in the bony ſtructure of its belly. The common *ſtickleback* is diſtinguiſhed by Artedi by the name of the *gaſteroſteus* with three ſpines on the back; and by this character it differs from two other ſpecies, the one the *ſpinarella* of authors, a ſmall ſpecies with ten prickles in the back; and the other a long ſea kind with fifteen ſpines on its back, called by Willughby, and others, the *pugnitius marinus longus*. See the article GASTEROSTEUS.

As contemptible a fiſh as this may ſeem, its miſchief in eating the young fry in ponds is not greater than its value. In a ſort of manufacture carried on at Boſton, and ſome other parts of Lincolnſhire, they have fallen into a way of making oil of it, and have made annually a hundred tun, or more, to their very great advantage. All the waters thereabout ſwarm with this little fiſh, and doubtleſs a ſufficient quantity might be found in other places for the ſame ſort of uſe. They grow in the Boſton river to an inch and half in length, and about half an inch in breadth, and are taken out at a buſhel a draught. Eight chalder of them make a barrel of oil; their barrel is a hogſhead; they are obliged to uſe them very freſh, elſe the oil runs from them to waſte, and they uſually boil every night what they have caught by day. It is a wonder that this quality of this little fiſh was not found out ſooner, for in frying them in the common way for eating, they all run into an oil in the pan. Philoſ. Tranſ. N° 223.

STICKLER, in our old writers, an inferior officer, who cut wood within the king's parks of Clarendon. Rot. Parl. 1 Hen. VI. *Blount*.

STICKS *of eels*, a quantity, or meaſure of twenty five. A bind of eels contains ten *ſticks*, and each *ſtick* twenty five eels. Stat. Weights and Meaſures. *Blount*.

STIFFLE, or GREAT *muſcle*, in the manege, is the part of the hind leg of a horſe which advances towards his belly. This is a moſt dangerous part to receive a blow upon.

STIGMA, among botaniſts. See the article PISTIL.

STIGMATA, in natural hiſtory, the apertures in different parts of the bodies of inſects communicating with the tracheæ, or air veſſels, and ſerving for the office of reſpiration. *Reaumur*, Hiſt. Inſect. paſſim.

Nature has given to theſe minute animals a much larger number of tracheæ and bronchia, than to us. We have the ramifications of the trachea reaching no farther than into the breaſt, whereas, in the bodies of theſe inſects, we find them extended through the whole, and finely and admirably interlaced one with another. We have but one mouth to reſpire by; and the organization of the parts, inſervient to reſpiration, is very admirable in us; but in the inſect claſs, the mouths, or openings to breathe at, are much more numerous, and the organization much more complex.

All the two-winged and four-winged flies, which have a ſingle or undivided corcelet, to which their legs are all fixed, have alſo four *ſtigmata* in that corcelet, two on each ſide. They have them alſo on the rings of their body, but thoſe on the corcelet are the moſt conſiderable.

Of the four on the corcelet, the two anterior ones are uſually the largeſt. The beſt way to find them, in the generality of flies, is to examine them firſt in the larger ſpecies of the libellæ, where they are very diſtinct and plain, and after their ſituation is well known in that ſpecies, they will be much the more readily found in the reſt.

Theſe *ſtigmata* of the corcelet, as well the anterior as the poſterior, are oblong, and placed obliquely to the length of the body; that end of them next the head is more elevated than the other, and their ſize is ſufficiently large to render them viſible, eſpecially the firſt pair. Each of theſe ſeems not a little to reſemble a ſea-muſcle with its ſhells a little open, or is ſomewhat like the opening of an eye. It is alſo ſurrounded by two eyelids, proportionably thick; and beſide theſe, which make its outer circumference, one may diſcover two others within, which are bordered with hairs, and which, when cloſed, often quite ſhut up the opening.

The colour of the *ſtigmata* often is ſome help alſo to us for the diſcovering them; they are very frequently different in colour from the corcelet; ſome are yellowiſh, others of a coffee colour, or ſome degree of a fallow colour, in flies whoſe corcelet is brown, or black, or bluiſh.

Flies have, beſide theſe, ſeveral *ſtigmata* alſo in the rings of their bodies, perhaps in every one of them, though commonly thoſe in the two or three firſt are only to be diſtinguiſhed: theſe are not like thoſe of the corcelet, but are round, uſually a little eminent above the reſt of the ſurface, and reſembling pin's heads; they are not eaſily diſcovered, becauſe they are not only ſmall, but uſually hid by the folds, or commiſſures of the rings. They are uſually two on each ring, placed on the two oppoſite ſides, and partly under the belly. *Reaumur*, Hiſt. Inſ. Vol. 4. p. 248.

STIGMATICI, among the Romans, were ſervants marked in the face for ſome crime. *Pitiſc.* in voc.

STIGMATIZING, among the antients, was inflicted upon ſlaves as a puniſhment, but more frequently as a mark to know them by; in which caſe, it was done by applying a red-hot iron, marked with certain letters, to their foreheads, till a fair impreſſion was made, and then pouring ink into the furrows, that the inſcription might be the more conſpicuous. *Potter*, Archæol. Græc. Tom. I. p. 64.

STIGMATIZING, among ſome nations, was looked upon as a diſtinguiſhing mark of honour and nobility. *Potter*, loc. cit. p. 65.

STIL *de grain*, in the colour trade, the name of a compoſition uſed for painting in oil or water, and is made of a decoction of the lycium, or Avignon berry, in alum-water, which is mixed with whiting into a paſte, and formed into twiſted ſticks. It ought to be choſen of a fine gold yellow, very fine, tender, and friable, and free from dirt. *Pomet*'s Hiſt. of Drugs, p. 14.

STILE (*Cycl.*)—In a philoſophical *ſtile*, the only end is accurately to explain our thoughts to others; thence the particular rules to be obſerved by a philoſopher, in delivering his doctrines, naturally follow: ſuch as,

1°. Not to deviate from the received ſignifications of terms.

2°. That the ſame terms be always taken in the ſame ſenſe.

3°. To fix the meaning of ſuch words as have only a vague ſenſe.

4°. To ſignify objects, eſſentially different, by different names.

From theſe rules, the uſe and neceſſity of terms of art appear, and ſhews with how little reaſon they are vulgarly condemned.

5°. The philoſopher ought always to make uſe of proper expreſſions, and uſe no more words than what are preciſely neceſſary to eſtabliſh the truth of his doctrines. *Wolf*, Diſc. Prælim. Logic. cap. 5.

STILL-*bottoms*, in the diſtillery, a name given by the traders to what remains in the *ſtill* after the working the waſh into low wines.

Theſe *bottoms* are procured in the greateſt quantity from the malt waſh, and are of ſo much value to the diſtiller in the fattening of hogs, &c. that he often finds them one of the moſt valuable articles of the buſineſs. They might alſo be put to other uſes, ſuch as the affording a large proportion of an acid ſpirit, an oil, a fuel, and a fixed ſalt; and with ſome addreſs, and good management, a vinegar, and a tartar. Another very advantageous uſe of them, is the adding them to the next brewing of the malt for more ſpirit: the encreaſe of the produce from this, is more than could eaſily be conceived. It alſo more readily diſpoſes the new waſh to ferment, and gives the ſpirit a vinoſity that it cannot have without it; the proportion, in this caſe, muſt never exceed that of a fifth, or ſixth part of the whole quantity of liquor employed.

The liquor left behind in the *ſtill*, after the rectifying the low wines into proof ſpirit, is alſo called by ſome by the name of *ſtill-bottoms*; but this is little more than mere phlegm, or water impregnated with a few acid, and ſome oily parts, not worth ſeparating, unleſs for curioſity. The liquor left in the *ſtill*, after the rectifying the proof ſpirit into alcohol, is alſo of the ſame kind.

The *bottoms* of melaſſes ſpirits ſeem calculated for many uſes. It is very probable that the vinegar-makers would find their account in the trying them, and the ſtrong, and laſting yellow colour, with which they tinge the hands, may recommend them to the dyers. A ſmall proportion of them added to the new treacle to be fermented, greatly promotes the operation, and encreaſes the quantity of ſpirit.

The *bottoms* of the wine ſpirit, that is the remainder, after diſtilling the ſpirituous part from damaged wines, or wine lees, may be brought to afford Mr. Boyle's acid ſpirit of wine, and that ſubſtance called by Becher the *media ſubſtantia vini*. A parcel of tartar may alſo be procured in very great perfection; and the laſt remainder may be converted into excellent and genuine ſalt of tartar. The liquor may otherwiſe be ſerviceable in making vinegar and white lead. *Shaw*'s Eſſay on Diſtillery.

STILL-*houſe*. The Dutch have much the advantage of us in the ſtructure of their *ſtill-houſes*, and have every thing in

great readineſs and neatneſs. The general rules, in building theſe *houſes*, ſhould be theſe.

The firſt caution is to lay the floor aſlope, not flat, where any wet work is to be performed; it ſhould alſo be well flagged with broad ſtones, ſo that no wet be detained in the crevices, but all may run off, and be let out at the drains made at the bottom and ſides.

The *ſtills* ſhould be placed abreaſt on that ſide of the *ſtill-houſe* to which the floor has its current. The largeſt *ſtills* in Holland, for their greateſt works, are never of that monſtrous ſize that we ſee them of in England, but much more manageable and handy, as ſeldom containing more than ſix or eight hogſheads; and with ſuch *ſtills*, a ſingle hand will perform much more buſineſs than with one of a much larger ſize. Fronting the *ſtills*, and adjoining to the back wall, ſhould be a ſtage for holding the fermenting backs, and theſe being placed at a proper height, may empty themſelves, by means of a cock and a canal, into the *ſtills*, which are thus charged with very little trouble.

Near this ſet of fermenting backs ſhould be placed a pump or two, that may readily ſupply them with water by means of a trunk, or canal, leading to each back. Under the pavement, adjoining to the *ſtills*, ſhould be a kind of cellar, wherein to lodge the receivers, each of which ſhould be furniſhed with its pump, to raiſe the low wines into the *ſtill* for rectification; and through this cellar the refuſe waſh, or *ſtill*-bottoms, ſhould be diſcharged by means of a hoſe, or other contrivance. Theſe are the principal things to be regarded in the erecting a *ſtill-houſe* for the original production of ſpirits, and if theſe rules are well obſerved, malt ſpirit will be made with little more trouble than melaſſes; for by this means the buſineſs of brewing and cooling the waſh, which, according to the method generally practiſed in England, takes up ſo much time and trouble, is entirely ſaved, fermentation is carried on to a much greater advantage, and the quantity of ſpirit encreaſed. *Shaw*'s Eſſay on Diſtillery.

STINT, in zoology, the name of a ſmall bird common about the ſea ſhores in many counties of England, and ſeeming to be the ſame with the *cinclus prior* of Aldrovand, and the *ſchæniclos*, or *junco* of Bellonius, called by the French *alouette de mer*, the *ſea-lark*.

It is ſomewhat ſmaller than the common lark, and in ſhape reſembles the ſmaller ſnipe. Its beak is black, ſlender, and ſtrait; its feet of a greeniſh, or browniſh black; its back is a grey, variegated with oblong black ſpots, and its wings ſomewhat of a reddiſh brown; its neck is grey, and its head variegated with black and a reddiſh brown; its wings are long, and when folded reach beyond the end of the tail; and its rump is ſomewhat reddiſh with black ſtreaks. *Ray*'s Ornitholog. p. 226.

STIP *viſch*, in zoology, a name given by the Dutch in the Eaſt-Indies to a fiſh of the claſs of our European ones which have two back fins, the anterior of which is prickly, the hinder not ſo. Its ſkin is ſpotted, and its fleſh very delicate, and well taſted. It is generally caught by hooks. *Ray*'s Ichthyogr. Append. p. 8.

STIRRUP, (*Cycl.*) in the manege. To looſe one's *ſtirrups*, is to ſuffer them to ſlip from the foot.

The *ſtirrup-foot* is the near, or left foot before.

Stirrup-leather is a thong of leather, deſcending from the ſaddle down by the horſe's ribs, upon which the *ſtirrups* hang.

Stirrup-bearer, called in French *porte etrier*, is an end of leather made faſt to the end of the ſaddle, to truſs up the *ſtirrup* when the rider is alighted, and the horſe ſent to the ſtable.

STIRRUP *of a ſhip*, a piece of timber put upon a ſhip's keel, when ſome of her keel happens to be beaten off, and they cannot come conveniently to put, or fit in a new piece; then they patch in a piece of timber, and bind it on with an iron, which goes under the ſhip's keel, and comes up on each ſide of the ſhip, where it is nailed ſtrongly with ſpikes; and this they call a *ſtirrup*.

STOÆ, Στοαι, in antiquity, the porticos at Athens. Theſe were full of exedræ, ἐξέδραι, and ſide-buildings, furniſhed with ſeats fit for ſtudy or diſcourſe. Here it is probable philoſophers, and their ſcholars, uſed to meet. *Potter*, Archæol. Græc. lib. 1. cap. 8. Tom. I. p. 38. See the article EXEDRÆ, *Cycl.*

STOAKED, in a ſhip. When the water in the bottom cannot come to the well of the pump, they ſay, *the ſhip is a-ſtoak*, or *ſtoaked:* ſo they ſay alſo, *the limber holes are ſtoaked*, when the water cannot paſs through them; and that *the pump is ſtoaked*, when ſomething is got into it which choaks it up, ſo that it will not work.

STOAT, in zoology, the name uſed by many for the animal whoſe ſkin is the ermin. See the article ERMINEUM *animal*.

STOC *and ſtovel*, in our old writers, a forfeiture where any one is taken carrying *ſtipites* and *pabulum* out of the woods; for *ſtoc* ſignifies ſticks, and *ſtovel* pabulum. Antiq. Chart. ap. *Blount*.

STOCK *of an anchor*. See the article ANCHOR.

STOCK-*bricks*. See BRICK-*making*.

STOCK-*fiſh*, in the fiſh trade, a name given to the common cod-fiſh when cured in a particular manner, which makes it neceſſary to beat it with ſticks before it is fit for dreſſing. *Willughby*'s Hiſt. Piſc. p. 166. See COD-*fiſh*.

STOCK-*July-flower*. See the article LEUCOIUM.

STOCKER, in ichthyology, a name given by the Germans to the *ſaurus* of the antients, the *trachurus* of the later writers. It is a ſpecies of the *ſcomber*, known among us under the name of the *horſe-mackrel*; and is diſtinguiſhed from the reſt by Artedi, by the name of the *ſcomber* with the lateral line prickly, and with thirty rays in the pinna ani.

STOCKS (*Cycl.*)—STOCKS, among ſhip-carpenters, a frame of timber and great poſts, made aſhore to build pinnaces, ketches, boats, and ſuch ſmall craft, and ſometimes ſmall frigates. Hence we ſay, *a ſhip is on the ſtocks*, when ſhe is a building.

STOCKS, *cippus*, a wooden machine to put the legs of offenders in, for the ſecuring of diſorderly perſons, and by the way of puniſhment in divers caſes ordained by ſtatute, *&c.* And it is ſaid that every vill, within the precinct of a torn, is indictable for not having a pair of *ſtocks*, and ſhall forfeit 5*l.* Kitch. 13.

STOMACACE, a word uſed by ſome authors to expreſs a ſymptom of the ſcurvy, which is a fœtor of the mouth, with a ſoreneſs and bleeding of the gums.

STOMACH (*Cycl.*)—In order to underſtand the action of the *ſtomach*, in turning the aliments into chyle, we are firſt to thoroughly conſider its form. It is eaſy to obſerve, that the two orifices of the *ſtomach*, the œſophagus, and pylorus, are not ſituated exactly over-againſt one another; but that if the *ſtomach* be regularly divided longitudinally into two halves, the œſophagus will be found wholly in the anterior half, and the pylorus, in great part, in the poſterior. Near the inſertion of the œſophagus there are two planes of muſcles, the one is placed near the bottom of the *ſtomach*, and encompaſſes all that part of the œſophagus that is neareſt that part. This muſcle throws off obliquely ſeveral bundles of fibres, which run to the middle, both of the anterior and poſterior ſides of the *ſtomach*, and many of theſe extending even to the lower part of it, make what are there called *the oblique fibres of the ſtomach*. The other muſcular plane encloſes, in the ſame manner, the other part of the mouth of the œſophagus, or that which lies toward the pylorus; this terminates on each ſide near the bottom of the *ſtomach*. Theſe two planes of fibres are, as it were, two fleſhy bands about the mouth of the œſophagus, which croſs one another both on the upper and under part of the *ſtomach*.

The longitudinal fibres are very ſlender, and appear about an inch from the pylorus, extending themſelves along both the anterior and the poſterior ſides of the *ſtomach*, quite to the orifice of the œſophagus; and finally, they are inſerted round about the pylorus by two ligamentary bands, which authors have generally paſſed over without obſerving. Theſe bands are much like thoſe of the colon, and occupy all the length of the neck, and may be eaſily diſtinguiſhed by the touch, and are not difficult to be ſeen on bending the part in an inflated *ſtomach*.

The fibres of the bottom of the *ſtomach*, when nicely examined, are found to be circular, all compoſing ſeveral ſmall concentric circles, each ſeries of which is independent of all the reſt. There is one of theſe circles placed juſt in the center of the bottom of the *ſtomach*, and from this the other circles ſpread, being of ſeveral different diameters, according to the places where they ſtand, and reaching to near the orifices where the fleſhy fibres take another courſe, as before obſerved. The bodies, called *circular fibres of the ſtomach*, and ſuppoſed to part from the upper part of the *ſtomach*, cloſe to one another, and taking the round of the *ſtomach* to return thither again, are truly a number of ſmall muſcles, or bundles of fibres, placed at ſmall diſtances from one another, no one of which ever reaches perfectly round the *ſtomach:* from theſe ſeveral ſmaller fibres are propagated in an irregular manner, which fill up the interſtices of the circular directions of theſe, and form a ſort of net-like plexus, between the fibres of which the nervous membrane of the *ſtomach* is eaſily ſeen. Theſe interſtices, in general, are of a ſort of lozenge ſhape, and the whole of theſe fibres may be ſaid to conſtitute a ſort of muſcular net, enveloping the whole *ſtomach*. All thoſe bundles of fibres, or ſmall muſcles, which are ſituated below the upper orifice of the *ſtomach*, or near about it, form together a plan, or ſeries, which runs in a ſtrait line from the upper to the lower extremity of the *ſtomach*; whereas, on the contrary, thoſe which are placed about the middle of the *ſtomach* ſeem to turn about, and form parts of circles, the convex part of all which ſtands toward the bottom of the *ſtomach:* and finally, thoſe which are placed about the neck of the *ſtomach* are much bent, and their bending is always the greater, as they approach nearer to the pylorus. This appears to be the true figure and arrangement of the fibres of the *ſtomach*; and as this is very different in many particulars, from the common accounts of anatomical authors, it was neceſſary to give this at large, in order to underſtand and explain the action of this part in the

the great work of digeſtion; and according to this account, the offices of every part will be very eaſily underſtood.

The circular bands of muſcular fibres, placed round the orifice of the œſophagus, are deſigned to prevent the upper orifice of the *ſtomach* from being too much diſtended, whether by our careleſsly ſwallowing too large morſels, or by the action of vomiting. The uſe of the muſcular circles, at the bottom of the *ſtomach*, is as eaſily ſeen: the aliments received into this part of the *ſtomach*, were it not for theſe circular arrangements of fibres, would remain there, and have no tendency given them to go out of the *ſtomach*; but by this wonderful ſtructure, the whole bottom of the *ſtomach* can at once be put into a ſafe and eaſy, though a powerful contraction, by means of which the aliments are naturally ſent toward the pylorus for their diſcharge. Theſe circles give the firſt principle of the periſtaltic motion of the *ſtomach*, which is much the ſame with that of the inteſtines.

When the aliments have been thrown off from theſe circles, they are not immediately, however, diſcharged into the pylorus, but are thrown upon thoſe bundles of fibres, or ſmall muſcles, which make what has been before called the *reticular coat of the ſtomach*. That part of this coat which immediately receives them, is that compoſed of ſegments of circles, the convex parts of which are all placed toward the bottom of the *ſtomach*; and as theſe afterwards form their contractions, their middle naturally elevates, and throws off the aliment ſtill toward the pylorus, and this is done with the more force, as the action of theſe fibres is ſtrengthened by the longitudinal ones; and, in fine, thoſe longitudinal fibres, which are attached to the bands that ſurround the pylorus, when they act, contract, or pull the other parts of the *ſtomach* toward their inſertions; ſo that every thing tends to help the throwing the food upon the pylorus.

The reticular coat of the *ſtomach* has alſo other great advantages; it is eaſily capable of extenſion, and conſequently gives the *ſtomach* a capacity of enlarging, ſo as to hold a larger quantity of aliments than it otherwiſe could; and when they act, ſo as to be approaching toward their natural ſtate again after ſuch diſtention, this action, which is no other than their contraction, neceſſarily throws the aliments toward the pylorus: this contraction is always ſucceeded by a ſmall dilatation again, and that by another contraction, and theſe alternately ſucceeding one another, ſo long as any of the aliments continue in the *ſtomach*, conſtitute what authors call its periſtaltic motion. Although this motion is very ſlight, and only a kind of vermicular undulation, which is ſcarce ſenſible, yet there have not been wanting very great men, who have thought it ſufficient for the great work of digeſtion. Theſe authors ſet aſide the uſe of any liquors, or juices of the *ſtomach*, mixing themſelves with the aliments, and give the whole to this motion, which they call a kind of trituration, which they ſay breaks the aliments into ſmall and fine parts, by rubbing them againſt one another, and that theſe fine broken particles make what is called chyle; but it is ſcarce conſonant to reaſon, that ſo weak a cauſe ſhould be productive of ſuch great effects.

This motion is no ſtronger than the periſtaltic motion of the inteſtines, and that is never ſuppoſed to have any ſuch effects on their contents, but only to puſh them forward. The liquor prepared from the food is known alſo to be grey at its paſſing out of the *ſtomach*, and only to acquire its white colour in the duodenum; and how is this accountable for on the plan of trituration only? And finally, if that were all that was required to digeſtion, to what purpoſe did nature, which does nothing in vain, ordain ſuch an abundance of fluids to be preſent in all places, where the aliments were deſtined to undergo any change? To know the abundant quantity of theſe, we need only follow the courſe of the food from the time of its being taken into the mouth to that of its being changed into chyle.

All the time that the teeth are chewing the food, the parotid glands afford a prodigious quantity of ſaliva, which runs into the mouth, mixes with it, and paſſes with it into the *ſtomach*; beſide theſe, alſo, there are many other ſources of the ſaliva, which all diſcharge it at the ſame time, but the quantity from theſe alone is not eaſily conceived. A ſoldier had, by a wound in the cheek, one of the parotids cut in two, and had the wound cloſed within, but not without; it was obſerved, that whenever he uſed his jaws in chewing, this one wounded gland alone diſcharged a quantity of lymph enough to wet ſeveral napkins; what then muſt be the quantity at every meal diſcharged from both, and from all the other ſources together? Though this is all carried down into the *ſtomach*, yet there freſh juices are added to it. Wepfer diſcovered multitudes of glands in the human *ſtomach*, the orifices of which were very ſenſible; and beſide theſe, Mr. Ruyſch diſcovered ſeveral other eminences, which, by their reſemblance to thoſe in the ſecond *ſtomach* of an ox, ſeem to be only caſes encloſing cluſters of minute glands, all deſtined, with the others, to pour out their contents on the maſs of aliments. All theſe fluids, however, only change the food into a thick greyiſh liquor, which is too coarſe to be received into the lacteals, and needs a farther elaboration. This elaboration changes it into a white liquor, which we call chyle; and this is only performed in the duodenum, where there can be no trituration, but where there is a very remarkable aſſemblage of different liquors to effect it: for beſide the common ones, the liver and gall-bladder diſcharge into this inteſtine a great quantity of bile by the ductus choledocus; and the pancreas ſends thither alſo a great deal of its lympth. Brunderus has obſerved alſo, in this inteſtine, a vaſt number of glands, which, according to him, make a ſort of ſecond pancreas: theſe all furniſh, alſo, a great quantity of liquors to the duodenum, where this great change is made in the matter of the aliment; and it is very natural to conclude from the whole, that it is by means of theſe liquors that this change is effected; and if it appear, that the laſt change of the greyiſh liquor of the *ſtomach* into chyle be wrought by theſe fluids, why ſhould it be doubted but that nature, which is alike in all its works, has uſed the ſame means in the firſt change, and by the liquors, mixt with the aliments in the *ſtomach*, has wrought them into that grey liquor they are found there changed into? Trituration does not at all ſeem the buſineſs of the *ſtomach*, nature we ſee has appointed another part, the mouth, for that office, and has furniſhed that with hard bodies, capable of tearing and grinding things to pieces. The moſt natural opinion, on the whole, ſeems therefore, that the office of the mouth was thus to rend and tear in pieces the aliments before their paſſage into the *ſtomach*, that there the juices might act more ſtrongly upon them; in the ſame manner as the chemiſt beats and breaks to pieces the ſubſtances, which he is going to throw into proper liquors, to extract their tincture. Mem. Acad. Par. 1719.

The digeſtive power of the *ſtomach* of ſome fowls is vaſtly greater than that in men, or any other animals. Cryſtal bullets, ſome hollow, and others ſolid, have been crammed down the throats of hens, and have been found afterwards ſtrangely eroded, and eaten by the juices there. Hollow bullets of glaſs have been alſo crammed down by the members of the Florentine Academy, and have been found afterwards not only eroded on their ſurface, but filled within with a whitiſh liquor like cream, which ſeemed to prey upon their ſubſtance. It is probable hence, that the ſtrong digeſtion of theſe fowls may be in ſome meaſure owing to a powerful menſtruum in their *ſtomach*; glaſs and cryſtal are two things wholly indiſſoluble by any menſtruums we are acquainted with, and yet they are corroded here.

This menſtruum in the *ſtomach* of theſe animals, aſſiſted by what the gravel-ſtones, which they ſwallow, are able to do in the manner of teeth, may very well deſtroy, and reduce ſubſtances of ſuch denſe texture, as we ſcarce know how to manage. The glaſs drops with long tails, called *Prince Rupert's drops*, having been in the ſame manner forced down the throats of capons, were found entire in the *ſtomach* after many days, and burſt as uſual on breaking off the tail. Theſe loſt ſomewhat of their weight by remaining in the *ſtomach* ſome time, but the ſame ſort of drops, when untempered by heating in the fire, loſt a great deal in a very ſhort time. One of them, with which Redi made his experiments, loſt four grains of its weight in four days, and giving it to another fowl, it, in ſix days time, loſt nine grains more. This is an argument, not only of the vaſt power of digeſtion in the *ſtomach* of theſe fowls, but of the great difference of hardneſs there is between the ſame glaſs when tempered, by being dropped hot into water, and when untempered again by fire.

Experiments were alſo made, by giving diamonds, topazes, leaden bullets, jaſpers, and porphyry, to the ſame animals, and others of like kinds. The diamond loſt nothing of its weight; the topaz almoſt nothing, the loſs being ſcarce diſcernible with nice ſcales; other ſtones ſcarce loſt any thing, but the leaden bullets loſt conſiderably. Hence it is eaſy to conclude, that the ſmall gravel-ſtones, which they pick up to ſerve for grinding the food in their *ſtomachs*, do their office without parting with almoſt any thing from themſelves: theſe little ſtones, though leſs beautiful, yet approaching in their nature to the gems. There is great difference, however, between theſe and pearls; for it was found that four pearls given to a pigeon loſt one third of their weight in twenty four hours, and eight ſmall pearls given to another pigeon loſt two thirds of their weight in two days. *Redi*, Eſperienz.

STOMACH *of fiſhes*. The *ſtomach of fiſhes* is very different in the various kinds, in reſpect of ſize, thickneſs, and its ſeveral properties and qualities; but its ſituation is generally longitudinal, and it is ſingle in all the known fiſhes, except in the *ſtromateus* of Rondeletius, in which it is ſaid to be double.

The *ſtomach* in living fiſh is cold to the touch, but this is only a proof that it is leſs hot than our own fleſh. That there is heat in it, is evident enough from the digeſtion which is ſo powerful in it, the *ſtomachs* of many fiſh digeſting ſubſtances which ours could not at all effect; ſuch are the ſhells of ſhell-fiſh. It is not eaſy to ſuppoſe this could be performed without ſome degree of heat in the part, but at the ſame time we are informed by this how ſmall a

degree

degree of heat is neceſſary for working theſe effects, and how much may be done by the continual attrition of the fibres, and by a proper fluid. *Artedi*, Ichthyolog.

STOMACH *of flies*. In examining with care the bodies of theſe little animals one may perceive, that when the paſſage of the aliments is got beyond the lungs, and below the place where they form a ſort of diaphragm, one finds the canal, that ſerved for this paſſage, forming a large, though ſhort body, the diameter of which three or four times exceeds that of the canal itſelf. This body is compoſed of three fleſhy lobes, and is unqueſtionably the *ſtomach* of the animal. The inteſtine goes out of it, very nearly from the ſame part where the other paſſage is admitted into it; the inteſtine then directs itſelf toward the anus, and afterwards runs upward again toward the diaphragm, or bottom of the lungs; and thence, after many convolutions, many times running backward and forward, it terminates in the anus.

In caterpillars and butterflies, the canal from the mouth to the anus is only one ſtrait inteſtine, but it is much otherwiſe in theſe creatures, the inteſtines, both in the fly, and in the worm it is produced from, always making a number of contortions and convolutions.

STOMACH-*bruſh*. See EXCUTIA *ventriculi*.

STOMACHICA *febris*, the *ſtomachic fever*, a name given by Heiſter, and ſome others, to a ſpecies of fever, called by others a *meſenteric fever*, and by our Sydenham *nova febris* in a peculiar treatiſe. See INTESTINAL *fever*.

STOMATICA, a term uſed by ſome for all medicines uſed in diſorders of the mouth.

STONE (*Cycl.*)—Some look upon *ſtones* as unorganized vegetables, and that they grow by the accretion of ſalts, which often ſhoot into angular and regular figures. This, it is ſaid, appears in the formation of cryſtals on the Alps; and that *ſtones* are formed by the ſimple attraction and accretion of ſalts, appears by the tartar on the inſide of a claret veſſel, and eſpecially by the formation of a *ſtone* in the human body. Dr. *Berkeley*, Biſhop of Cloyne, in Philoſ. Tranſ. N° 481. p. 326.

Stones are often corroded, and conſumed by the air. Ibid.

Naturaliſts vulgarly define *ſtone* a foſſil incapable of fuſion, yet *ſtone* has been known to be melted, and when cold to become *ſtone* again. Philoſ. Tranſ. N° 481. p. 327. See the article SCIARRI.

Hence it ſhould ſeem not impoſſible for *ſtone* to be caſt, or run into the ſhape of columns, vaſes, ſtatues, or relievos; which experiment may perhaps, ſome time or other, be attempted by the curious, who following where nature has ſhewn the way, may poſſibly, by the aid of certain ſalts and minerals, arrive at a method for melting and running *ſtone*, both to their own profit, and that of the public. Phil. Tranſ. N° cit. p. 328.

Formed STONES, among naturaliſts, mineral, or *ſtony* matter, caſt in the cavities of certain ſea-ſhells, or other parts of marine animals.

Of theſe ſome are found quite naked and bare; others have the remainder of the ſhell about them: and among theſe there are alſo found many real ſhells, ſcarce at all altered from their recent ſtate, buried at great depths in the earth, far from ſeas, and even on the tops of mountains.

This is by moſt ſuppoſed an effect of the general deluge, and by many is thought a convincing proof of the truth of that hiſtory; but there have been many who have aſſerted, that theſe bodies can convey no ſuch proof, ſince, as they affirm, they are not, nor ever were marine bodies, or owed their form to ſuch, but mere *luſus naturæ*, *ſtones* formed in the places where they are found, having no relation to animals of any kind, but only accidentally reſembling them. But the aſſertors of the former opinion have plainly the better ſide of the argument. See MARINE *remains*.

It ſeems indeed contrary to the great wiſdom of nature, which is found, in all its works and productions, to deſign every thing to ſome determinate end, that theſe bodies ſhould have been ſo nicely formed by a mere plaſtic virtue in the earth, or endued with all the characters and neceſſary parts of animal coverings, &c. for no other end but merely to exhibit ſuch a form, without having any relation to the uſes theſe particulars are appropriated to in the animal. See the article FIGURED *ſtones*.

But if the origin of the *ſtones*, found in the ſhape of ſhells, be doubtful, yet the real ſhells, found in the earth, ſurely cannot be ſuppoſed to have been formed there; yet theſe are found at as great diſtances from the ſea, and that not only in the lower grounds and hillocks, but in the higheſt parts of the loftieſt mountains, and that without the leaſt particle of *ſtony* matter about them; mere ſhells, unpetrified, and uncorrupted, and of the exact figure, ſtructure, and conſiſtence with the ſea-ſhells, which are now living, of the ſame ſpecies.

Mentzel ſays that the mount near Bologna, where the Bononian *ſtone* is found, abounds with theſe *formed ſtones*: they lie in beds with ſtrata of ſand, of a yard thick, between them, and are not lodged in *ſtone*, or any cementitious matter, as we often find them in England, but are all looſe and ſeparate: and Fabius Columna tells us, that the hills about Andria, in Apulia, abound with ſea-ſhells not at all petrified, but whole and uncorrupt, and ſeeming to have undergone no change. The mountains about Genoa have alſo been found full of them; and we have in our own kingdom numerous inſtances of them in all their ſtates, ſome ſeeming mere *ſtone*, and others perfect and unaltered ſhells; ſome looſe, and others bedded in marble, in *ſtone*, or in indurated earth.

That nature ſhould form real ſhells, without ever intending them for the covering of an animal, ſeems no way probable; and indeed, were it true, would give great ſtrength to the atheiſt's opinion, that all things exiſted by mere chance, and were intended for no end or uſe. Nor are the ſhells the only inſtances of theſe foſſile bodies perfectly reſembling animal ones, but we find with them other parts of animals, as the teeth of fiſhes and land animals; which, though met with buried in earth, or on the tops of mountains, are plainly the ſame with the ſubſtances produced by the fiſhes, &c. Of this kind are the teeth of the ſeveral ſpecies of ſharks, called *gloſſopetræ*; thoſe of the wolf-fiſh, called *bufonitæ*; the vertebræ of ſeveral fiſh, and the like.

The very inſpection is abundantly ſufficient to prove, that theſe were once parts of animals; but were that inſufficient, they have not, even in this their foſſile ſtate, ſo far diveſted themſelves of their animal nature, but that they carry proofs of it; and Columna has evidently proved their true origin from theſe. He obſerves, that all animal and vegetable ſubſtances, whether of a woody, bony, or fleſhy nature, by burning, are changed firſt into a coal, before they go into a calx or aſhes; whereas *ſtony* ſubſtances, on the contrary, do not burn into a coal, but are reduced at once into their calx or lime, or elſe into glaſs. But theſe teeth, ſuppoſed by ſome mere productions of the earth, all burn firſt to a coal, while the *ſtony* matter adhering to them does not; whence alone it is ſufficiently plain, that they and that ſubſtance are of very different kinds, and that they are truly of a bony, not a *ſtony* matter. It is alſo repugnant to that great maxim, that nature does nothing in vain, to ſuppoſe theſe teeth formed in the earth where they are now found, ſince they could there have no uſe as teeth, nor the vertebræ, or other bones, as bones. It is very certain, that nature never made teeth without a jaw, nor ſhells without an animal inhabitant, nor bones without the reſt of the body they belong to; theſe things are not made in this ſeparate and uſeleſs ſtate in the element to which they naturally belong, much leſs in a foreign one.

Their very ſubſtance and place alſo evince plainly, that they were not formed where they are now depoſited; for they are uſually lodged in *ſtone*, and *ſtones* contain not the matter of which they are made; and as to their place, they muſt be ſuppoſed to have been lodged there either when formed, which proves our aſſertion, or elſe they muſt have been at ſome time either generated all of a ſudden there, or have grown from a ſmall origin, encreaſing by little and little, as the animal ſubſtances which they imitate do. Now if the *ſtone*, in which they lie, was formed before them, and they were formed all of a ſudden in it, how came the cavity there juſt correſponding to their ſize? and if they grew by little and little, how could they force a cavity in the *ſtone*, without burſting or cracking it?

Things that grow, expanding themſelves leiſurely and ſlowly, may indeed by degrees lift up great weights, and dilate the chinks or cracks of *ſtones*; but then they are ſubject to various contortions and alterations in their ſhape, as we daily ſee in the roots of trees, which make their way through the cracks of *ſtones*, and in common plants, whoſe roots meet with hard matter in their way, receding from the form they would have in a looſe open ſoil, and conforming to that of the body that ſtands in their way: thus, if foſſile ſhells and teeth were generated, and grew in *ſtone*, they muſt be liable to contortions and alterations in their ſhape and figure, from the ſhape of the cavities they found, or the hardneſs of the different matter they meet with in their progreſs; but nothing of this kind appears, and it is plain they were generated elſewhere, and then buried in the ſtrata of our fields, becauſe they are all of the ſame exact and regular ſhape, whether found looſe on the ploughed lands, buried in clay or marl, or lodged in beds of marble, or hard *ſtone*. All of the ſame ſpecies are, in theſe ſeveral matrixes, of the ſame exact form; whence it evidently appears, not only that they were not produced where they are now found, but even that the ſtrata were not hardened at the time when they received them.

It is alſo no ſmall proof of theſe teeth being of marine or animal origin; that they are not regularly ſhaped at the baſe, but are all broken, and that in various manners; which proves very plainly, that there has been no vegetation in the caſe, becauſe in all other figured foſſils it is obſerved, that they are never found mutilous, or imperfect. It cannot, with any ſhew of reaſon, be ſuppoſed, that theſe teeth were thus broken within the body of the *ſtone* where they now lie, but is plain that they were lodged in the *ſtone* at a time when it was ſoft, and were before that broken off from the jaw of the creature in this irregular manner.

It is likewiſe no weak argument, that theſe bodies are not formed at this time in the *ſtone*, that they are all found perfectly alike; for were they continually encreaſing, either in ſize or number, it is probable that the new-formed ones would be ſome way different from thoſe which were of older date; nor can any thing be more abſurd, than to think that were they mere *ſtones*, they would have been formed as we ſee they are, not only with the external ſhape and appearance, but with the whole inner ſtructure of teeth; theſe foſſile teeth being not like *ſtones*, one homogeneous body, but compounded of various parts of a different conſtitution, there muſt, in the formation of it, have been made a various election of humors; one for the root, another for the inner part, and a third for the enamel, or ſuperficial coat. The variety of ſpecies in the gloſſopetræ alone may evince, that they have belonged to the animal we attribute them to, ſince they are of extremely different kinds; ſome being ſtrait, ſome crooked, ſome bent inwards, ſome outwards, ſome to one, and others to the other ſide, ſome plain, others ſerrated at their edges, others undulated, and others beſet all about with ſmaller teeth, and ſome ſtrait and flatted, or cylindrical, others triangular, ſome plain, and others tricuſpidate, or having a ſmall point on each ſide the great one, or main body of the tooth; and all theſe varieties, and no more than theſe, are found in the teeth of ſharks of various kinds, and at various ages, and in the different parts of the mouth. The firſt row of teeth in theſe animals hanging out of the mouth, bend forward and downward, the ſecond row are ſtrait, eſpecially towards the ſides of the mouth, where they are triangular and broad, and the other rows bend downward toward the inner part of the mouth. *Columna*, de Gloſſopetra.

If the *formed ſtones* be original productions of nature, merely reſembling theſe marine bodies in form, why are we to ſuppoſe that nature ſtopt here, or confined her formations of this ſort merely to the reſemblance of fiſhes, and parts of them? why might not other natural bodies as well be imitated, and *formed ſtones* found in the ſhape of the horns and hoofs of animals? for if we deny them their origin from animals, is it yet explained how, or in what manner they are formed? They cannot ſhoot in the manner of ſalts, ſince then the ſeveral ſpecies, which are of the ſame ſubſtance, ought to be alſo of the ſame ſhape, which is not found to be the caſe; but, on the contrary, we meet with the ſame ſpecies of ſhell in ſeveral kinds of matter, and compoſed of every various ſpecies of *ſtone*; nay, and of the pyrites, a ſalino-ſulphureous matter, wholly different from common *ſtone*, and which could not, by any principle in nature, be made to ſhoot as a ſalt into the ſame form with ſo different a ſubſtance as limeſtone; whereas, if, as we obſerve, theſe bodies are really formed from ſhells, *&c.* they muſt retain the forms of thoſe bodies, of whatever foſſile matter they be compoſed; neither could it be ſuppoſed, that if a ſalt ſhould ſhoot into the figure of a ſhell, it ſhould alſo ſhoot into all the natural differences of the upper and under valve in bivalves, the one hollow, the other flat, as is neceſſary in many ſpecies, for the preſervation and well-being of the animal; and as theſe foſſile bodies are found wholly correſponding to the moſt minute particulars of the recent ſhells of the ſame ſpecies, there ſeems no reaſon to doubt their having been actually formed from them.

The perfection of the figures of theſe bodies is a farther proof of their origin from animals which they repreſent, ſince in all cryſtallizations there are many imperfect and mutilated figures, nay more than perfect ones. The hexaedral figure of common cryſtal, the cubes of marcaſites, and the cryſtals of ſalts in chemical operations, are all much more regular and ordinate in themſelves, than the figures of ſcallops, cockles, and other ſea-ſhells; yet in theſe ſimple bodies we find great defects and imperfections; often the top is cut off, and ſometimes one of the ſolid angles; and not unfrequently numbers of theſe concretions are found adhering one to another, and injuring one another's form: ſometimes, alſo, their planes greatly differ from one another in ſize and ſituation, and often they differ, or recede other ways, from their natural and perfect figure. Since this is the caſe in the cryſtallizations of bodies of ſo ſimple a figure as cubes and columns, terminated by pyramids, how much greater muſt have naturally been the varieties and imperfections, in ſuch variouſly figured bodies as the *formed ſtones*, which reſemble the ſhells of ſea-fiſhes, had they been formed like theſe by mere cryſtallization? but no ſuch defects or irregularities appear in theſe.

As there are, therefore, none of thoſe defects in theſe compound bodies, to which other much more ſimple ones are found ſubject, and that there are no irregularities obſerved in them, the like of which are not alſo found in the living animals which they repreſent; and as in whatever country they are found, and in whatever matter they are lodged, and whatever ſubſtance they are compoſed of, they are ever found alike among themſelves, and perfectly reſembling the parts of animals, it is not to be conceived that they ſhould have ſhot into theſe forms merely in the manner of ſalts, but evident that they were parts of animals; the ſimilitude of conformation in their pores, their ſtriæ, hinges, teeth, prominences, *&c.* neceſſarily inferring a ſimilitude of original, and being a ſtrong argument of the government of ſome principle ſuperior to matter figured and moved in their formations. Nor is it any ſmall argument againſt their ariſing from the ſhooting of ſalts, that in all the experiments made with the different ſalts and minerals by chemiſtry, no one ſimilar cryſtallization, no reſemblance indeed, even to the meaneſt of them, was ever produced. *Steno*, de Solido intra Solidum.

To all this it may alſo be added, as an unanſwerable proof of the foſſile ſhells having been once marine, and having lived in the ſea, that they are found with injuries which could have been no way elſe received. The purpura, and ſome other ſhell-fiſhes, have bony tongues, with which they bore regular holes through the ſhells of ſhell-fiſh of other kinds, in order to make their way in, and prey upon their fleſh. Theſe holes are always eaſily known by their regularity and ſhape; and ſhells bored through in this manner are not only frequent on our ſhores, but there are ſuch alſo found foſſile, bedded in the ſtrata of earth or *ſtone*; and ſurely, if ſalts could be allowed to have ſhot into the figures of ſea-ſhells, they could never be ſuppoſed able to ſhoot into the figures of ſuch wounds, as a few of thoſe ſhells have received in their recent ſtate from other animals.

The general opinion is, that the deluge brought all theſe ſhells into the places where we ſee them; but this ſeems not eaſily conceived; and as there is no argument ſo good, but that being carried too far it will make againſt its purpoſe, ſo the laying too much to the effects of the general deluge, has made many believe it has done nothing at all.

Theſe *formed ſtones* and real ſhells are both found in vaſt ſtrata on the tops of the higheſt mountains, the Alps, Apennines, and others in different parts of the world. The deluge laſted only ten months, and probably the tops of mountains were not covered half that time; and theſe immenſe quantities of ſhells cannot be ſuppoſed either to have bred there in that time, or to have been carried ſo high in ſuch prodigious numbers. It is more probable that theſe tops of mountains were once not ſuch, but bottoms of the ſea. The hiſtory of the marine bodies they contain is then very plain, and earthquakes may have raiſed them, or they may indeed not be ſo high above the level of the ſea, as we at firſt ſight ſuppoſe. If indeed we ſtick to the letter of the text, in the ſcripture hiſtory of the creation, we can find no account for theſe bodies from that time; for if the creation of fiſhes ſucceeded the ſeparation of the land from the water in all parts of the globe, they could not be then depoſited there; but it is poſſible, that at the creation the whole earth was not all at once uncovered, but only thoſe parts where Adam and the animals were created, and the reſt gradually afterwards, perhaps not in many years, as there ſeems no neceſſity of underſtanding the account of the creation to have been in ſix natural days. If we may thus underſtand, and conjecture in this reſpect, it is not difficult to conceive, that during the years in which the earth remained covered with ſea-water, ſhell-fiſh might breed and multiply abundantly all over its bottom; and this bottom being afterwards elevated, deſerted by the ſea, and made dry land, theſe ſhells muſt be elevated with it, and retained in thoſe ſtrata, which afterwards hardened into the various kinds of earth and *ſtone*: and ſomething of this kind ſeems to have been the caſe, much rather than, according to Dr. Woodward, that all *ſtony* matter ſhould have been diſſolved by the deluge, and afterwards have concreted again. *Ray*'s Phyſicotheological Diſcourſes.

Solution and colours of STONES. The various beauties of the form and colour of the ſeveral more precious *ſtones*, cannot but have been always the admiration of the curious part of the world, and the wits of the ableſt chemiſts have been tried, in attempting to counterfeit them; and much may be gathered even from their attempts, which have not ſucceeded, toward the learning the true nature and hiſtory of theſe beautiful bodies.

The beautiful figures of the Florentine marble, whoſe veins repreſent trees, rivers, and ruins of buildings, are well known; as are alſo the delineations of trees and ſhrubs in thoſe ſpecies of white agates, called *Mocoa ſtones*. All the *ſtones* of this kind are natural, for art has not yet been able to come up to any counterfeit of them; but it is not ſo in regard to thoſe agates which repreſent regular figures of beaſts, *&c.* theſe are all aſſiſted by art, and that by a very ſimple and eaſy proceſs; and Mr. Du Fay, in the Memoirs of the Paris Academy, has given at one view the ſeveral ways, then known, to penetrate into the ſubſtance of agate, marble, *&c.* and to lodge figures in them.

The *ſtones* ſubject to be tinged he divides into two claſſes, the harder and the ſofter. Of the harder kind are thoſe which reſiſt the force of acids, even of the moſt powerful kind; and of this claſs are agates, onyxes, and all that are vulgarly comprehended under the general name of the gems, or precious *ſtones*, with cryſtal, porphyry, granite. Theſe, and the like *ſtones*, are not ſoluble in any of the known acids, yet theſe ſame acids, impregnated with the ſolutions

of metals, are capable of penetrating very deeply into them, and tinging them with different colours. The ſimple agates and jaſpers, and other *ſtones* of the like uniform ſtructure, are eaſily coloured in an uniform manner; but thoſe which are variegated with veins are compoſed of ſeveral different ſorts of matter, and therefore are leſs eaſily, and leſs evenly ſtained. As the tinging matter does not penetrate the ſeveral beds, or veins, in the ſame manner, therefore all that can be done to theſe, is to add ſpots and veins to their natural ones, but they cannot be tinged throughout to one uniform colour, as the chalcedony, or white agate may.

If a ſmall quantity of a ſolution of ſilver, in ſpirit of nitre, be poured upon one of theſe agates, and the *ſtone* expoſed to the ſun, it will in a few hours be tinged to a reddiſh brown colour; and if more of the ſame ſolution be added, and it be again expoſed, the colour will become ſtronger, and will penetrate deeper into the body of the *ſtone*; and if the *ſtone* be not too thick, and the ſolution be rubbed on both ſides, it will tinge it throughout. Nor is this all the effect, for it will give it ſeveral veins and lineations, which were not diſtinguiſhable in it before; the reaſon of which is, that in all theſe *ſtones* there are ſome parts harder than the reſt, and conſequently more difficultly coloured, and theſe remaining, therefore, paler than the reſt of the maſs, make the lines and veins in it.

If there be added to the ſolution of ſilver, uſed for this purpoſe, a fourth part of its quantity of ſoot, and as much ſalt of tartar, the colour becomes grey; and if, inſtead of this ſoot and tartar, the ſame quantity of plumoſe alum be uſed, the *ſtone* will be tinged to a deep violet colour, tending to black.

A ſolution of gold gives agate only a pale brown colour, and that penetrates but a little way into it; and a ſolution of biſmuth gives a colour, which appears white when the light falls directly upon it, but brown when it is held againſt the ſunſhine, or a candle; and all the metallic and mineral ſolutions, employed in the ſame manner, affect the *ſtone* more or leſs in the ſame way.

The expoſing the *ſtones* to the ſun is a very neceſſary article in the proceſs, ſince without that the tinge is but very faint, and penetrates but to a very little depth. To trace in the chalcedony, or white agate, figures of any determinate kind, the uſual method is this: before the agate is poliſhed, mark out the intended figure with the point of a fine needle, and afterwards with a bruſh, or a pen, follow thoſe lines with a very ſtrong ſolution of ſilver. One would imagine that the dendritæ, or delineations of trees in Mocoa *ſtones*, might be imitated in this manner; but it is difficult to give the due blackneſs of colour, and to mark the figures with a like preciſion and exactneſs. If any *ſtone* ſhould, however, be ſuſpected to be adulterated, or counterfeited in this manner, it is eaſily brought to the trial; for if it be thus made, a ſmall heat over the fire will almoſt entirely diveſt it of its colour, and the rubbing a little ſpirit of nitre, or aqua fortis over it, will have the ſame effect. In both caſes the *ſtone* may, however, be reſtored again to its beauty; in the firſt, by tinging it afreſh with the ſame liquor, and in the laſt, by only expoſing it for ſeveral days to the ſun.

It is well known, that by means of fire alone the amethyſt, the ſapphire, and the other gems, may alſo be wholly diveſted of their beautiful colours. The method of doing this, is, to put the gems into a crucible, ſurrounding them with ſand, or with ſteel filings; then putting them into the fire, they loſe their colour as they become hot, and are taken out wholly colourleſs. If the white agate be calcined in this manner alone, it becomes of a cloudy or opake white; but if it has before been ſtained with the ſolution of ſilver, thoſe ſpots or ſtains become of a yellow colour, which aqua fortis afterwards has no power to take away. If the agate be calcined firſt, and afterwards rubbed over with the ſolution of ſilver, it receives ſome ſpots and lines of brown. The cornelian loſes a great part of its redneſs by calcination, and becomes of a duſky fleſh-coloured white; and the Mocoa *ſtone*, treated in the ſame manner, loſes all its colour, and the delineations of trees diſappear.

There are many *ſtones* on which the ſolution of ſilver has no effect; of this number are all the gems, rock cryſtal, and the like. The dendrites of Catalonia is alſo of this kind; and of this *ſtone* the artificers relate an odd phænomenon, which is, that if it be ſawn aſunder there are very few delineations obſerved in it, but if it be ſplit by a blow, it is uſually found full of them. The reaſon of this is only that theſe delineations are ſo many flaws and cracks, and the *ſtone* breaks eaſieſt in theſe places.

The effects of the ſolution of ſilver are different, as to degree of colour, on different *ſtones*. The Oriental agate receives from it a deeper and blacker tinge than the common chalcedony. Some agates, naturally diſtinguiſhed by their yellow ſpots, receive a purple colour from it. The jade *ſtone*, uſed by the Turks, takes only a faint tinge of brown. The common prime emerald, or root of the emerald, becomes blackiſh with it. The Oriental granite is tinged in many places with a violet colour by it; this is principally effected in the white parts. The ſolution does not act much on the black ones, only that it takes ſome of them away. The ſerpentine marble receives an olive colour from it; but it is remarkable that the amianthuſes, and the talcs, and other foliaceous *ſtones*, are wholly unaffected by it.

Marble being a ſubſtance greatly ſofter than agate, receives the colours with much greater eaſe, and the doing this in an accurate manner has been the ſubject of the attempts of many eminent men. Kircher has given ſome directions for the ſtaining marble, which have been tranſlated word for word into the Philoſophical Tranſactions; but they are ſo indeterminate and uncertain, that nothing can in reality be learned from them. Many others have written alſo on the ſame ſubject, but Mr. Du Fay is the only one whoſe experiments are plainly and clearly laid down, and may be followed by any body.

This gentleman choſe the common white marble without veins for making his experiments, for the ſame reaſon that he choſe the plain agates, becauſe in the veined ones there are ſeveral different ſorts of matter, all of which are not to be penetrated with equal eaſe. The ſolution of ſilver penetrates into marble to the depth of an inch, or more, and gives a tinge, reddiſh or purple, at firſt, and afterwards brown, from which colour it never varies afterwards. It always takes off the poliſh of the marble, eating away a part of its ſurface. The ſolution of gold does not penetrate ſo deep into marble as that of ſilver, but it gives a beautiful violet colour. Both theſe operations are much aſſiſted by expoſing the marble to the ſun. The liquors uſually diffuſe themſelves, and ſpread every way in the marble, ſo that it is not eaſy to make any figure with them that ſhall keep its outline tolerably regular.

The ſolution of copper gives marble a beautiful green tinge, but it does not penetrate deep, and on the application of boiling water becomes black; when the ſurface is poliſhed off afterwards, however, it becomes again of a beautiful green. Beſide the powerful acid menſtruums, there are many other liquors which have a power of penetrating deep into marble. Of this nature are all the oily fluids; but the expreſſed oils have this diſadvantage, that they leave a fattineſs in the marble which will not ſuffer it afterwards to take a good poliſh. All ſubſtances which can penetrate marble, can carry colours into it; but ſuch are moſt eligible, which having lodged the colours evaporate, and leave them there, without injuring the *ſtone*. Spirit of wine is of this number; it is excellently qualified for the extracting beautiful tinctures, and ſinks them very deep. Oil of turpentine alſo has its value, but it does not take tinges ſo well as the ſpirit. Some have recommended lixiviums of the fixt alkaline ſalts, but they very rarely produce any beautiful colour. In the uſing theſe fluids the marble is to be gently heated, and the ſpirit is by that means evaporated before it is cooled, leaving its colour always behind. White wax penetrates very deep into hot marble, and conveys colours into it in a very beautiful and determinate manner. There are however but a few bodies, which will impart their colours to wax, and therefore this valuable means is of a very limited uſe.

Several of the gums alone are alſo able to tinge marble very ſtrongly. Dragons blood, and gamboge, if rubbed on hot marble, penetrate it to the depth of about a twelfth of an inch: the gamboge requires the marble to be hotter than the other, and tinges it to a very beautiful yellow; the dragons blood tinges to a red in different degrees, according to the heat of the marble.

If theſe gums have been uſed to poliſhed marble, there is no farther caution neceſſary, than the cleaning them off from the ſurface with a little ſpirit of wine: but the way to make them ſink deeper into the *ſtone*, is to take off the poliſh by rubbing the ſurface with pumice, or the like, and then the gums ſink much farther, and the colours appear very beautiful when the marble is poliſhed again.

Though theſe gums act alone, yet they will ſucceed much better if diſſolved in ſpirit of wine, and applied with a pencil; for by this means they ſink deeper in, and the figures traced out will keep their determinate form and outlines, theſe ſolutions fixing immediately, without ſpreading any way. It is alſo remarkable, that the ſolution of dragons blood hardens the marble, and renders it leſs ſoluble in acids than before; ſo that if a piece, ſtained in part with this ſolution, be afterwards rubbed over with an acid diſſolvent, and its ſurface eaten away to ſome depth, the parts which are coloured will all ſtand out above the reſt.

A tincture of Braſil wood in ſpirit of wine tinges marble red, and if the heat given to the marble be greater, it becomes purple; but both theſe colours fade a little in keeping. A tincture of cochineal gives a purpliſh red, and the more the marble is heated, the farther the colour penetrates, and the deeper it is. In oil of turpentine the colour of cochineal penetrates much deeper into the marble, but it has a browniſh caſt. Alkanet root, by means of ſpirit of wine, gives alſo a red colour, which, if the heat be too great, changes to brown; and this, and moſt other of the like matters, tinge the marble, in tincture with ſpirit, to a ſlight depth; and in oil of turpentine they ſink much deeper, but then the oil leaves a greaſy look upon the marble.

If verdigreaſe be boiled a conſiderable time in white wax, it tinges marble, when rubbed hot upon it, to a beautiful green, little inferior to that of the coarſer emeralds, and the colour ſpreads itſelf very equally, and penetrates to a third of an inch deep; if the marble be made too hot, the colour becomes that of the jade *ſtone*. Alkanet boiled in white wax gives a fleſh colour, which penetrates very deep; and the roucou boiled in wax makes a permanent yellow, which alſo ſinks very deep. The beſt way of heating marble for this purpoſe, is to lay the piece, intended to be ſtained, upon a bed of ſand, a fifth of an inch deep, upon an iron plate; this is to be ſet over the fire, and when of a proper degree of heat, the colour is to be applied. The juſt degree can only be found by experience, and it varies indeed in almoſt every colour; but in general, the finer colours require the marble to be of ſuch a heat, that the hand can juſt bear to be laid upon it, and the others require a ſomething greater degree than this.

Black is, of all colours, the moſt difficult to give in this manner to marble; and perhaps indeed it is impoſſible to give that colour in any degree of perfection, and that for this plain reaſon, that all theſe colours only fill the interſtices between the granules of the marble, thoſe granules themſelves remaining unaltered: thus, in the other colours, the whiteneſs of the granules is only a heightning to the tinge, making it brighter, and a little paler; but the whiteneſs can never fail to appear diſtinguiſhably as ſuch in black, and by that means deſtroy that colour.

Next to black, blue ſeems the moſt difficult, of all the colours, to give to marble. Mr. Du Fay, however, having found by Mr. Geoffroy's experiments, that oil of thyme, by long ſtanding with ſpirit of ſal armoniac, acquired a blue colour, tried this mixture, and found it ſucceed very beautifully. But this is one of thoſe colours which require the marble to have but a very ſmall degree of heat, ſince a greater would evaporate them before the colour had time to penetrate. The colours of the gums may be laid on when the marble is cold, and on heating it afterwards they will ſink into it.

There is another very elegant ſort of workmanſhip to be employed on marble, that is, the tracing figures in relief in it; and this is done much more eaſily than might be imagined, there being nothing more required to it, than the ſaving the parts which are to be left in relief, by covering them with a varniſh, and eating away the reſt by means of an acid. For this purpoſe let the deſigned figures be traced in chalk upon the marble, and cover them with a bed of varniſh, made by diſſolving a piece of common red ſealing-wax in ſpirit of wine; then pour on the marble a mixture of equal parts of ſpirit of ſalt and diſtilled vinegar, and this will eat down all the ground, and leave the figures ſtanding, as if engraved with immenſe trouble. The adding the colours, before deſcribed, to theſe marbles afterward, in a regular manner, will give them a ſurpriſing beauty. Mem. Acad. Par. 1728.

Electrical attraction of STONES. Many *ſtones* have been obſerved by Dr. Liſter to have a ſort of *electrical attraction* to vegetable reſins.

This author obſerves, that having placed ſome foſſils in a cabinet made of Barbadoes cedar, and examining them at ſome diſtance of time, he found them all covered with a liquid reſin like Venice turpentine. Many of the *ſtones* were wrapt up in papers, yet theſe, as well as the reſt, were covered with this reſin; though, upon the moſt diligent ſearch, there could not be found any exſudation on any part of the cabinet. The iron ores were moſt of all covered with reſin, all the kinds of the hæmatites being thick coated with it; and among the aſtroitæ ſome were thinly covered, and others perfectly free from it.

It was not owing to the texture and denſity of the *ſtones*, that they either eſcaped this, or had it, but thoſe of the moſt open grain, and thoſe of the cloſeſt, were indifferently covered with it. It is certain from this ſingular obſervation, that the whole body of the turpentine of the cedar wood was carried up into the air, and floating in it was again condenſed, on the coming into contact with certain *ſtones*, tho' not with others.

There are ſeveral vegetable ſubſtances, which in this manner emit their whole body into the air: of the number of theſe is camphor; but the *ſtone*, that will again condenſate this into camphor, is not known. Philoſoph. Tranſact. N° 110.

Formation of STONES. See LITHOGENESIA.

Medical STONES, a term uſed by ſome to expreſs thoſe particular *ſtones*, which for their real or imaginary virtues have, at one time or other, been made ingredients in medicinal preparations.

The opinions of the antients, in regard to the virtues of gems and precious *ſtones*, were very whimſical; they ſuppoſed that they had certain ſympathetic properties, and that the wearing them on the finger, or carrying them in the pocket, would cure diſeaſes, render the Gods propitious to their prayers, or ſave them from thunder. Theſe have been deſervedly laughed out of the world in our more enlightened times; but it has remained a queſtion, and does ſo even to this time, whether or not ſome of the gems have real medical virtues, naturally reſulting from their parts, and conſtituent matter. It appears from the preſent ſtate of the gems, that they were once fluid bodies, or, at leaſt, made up in part of ſuch ſubſtances as were once fluid; and as in this ſtate they were capable of receiving metalline admixtures, it is poſſible they may derive certain virtues from thoſe admixtures; and ſome concurrent circumſtances in that mixture may have exalted the virtues of the bodies received, beyond what they could naturally and ſingly have excited.

The diaphaneiety, the external figure, and the internal ſtructure of gems, all argue ſtrongly for their having once been in a fluid ſtate; and their colours, which ſeem to be evidently adventitious, and imparted either by ſome coloured mineral juice, or ſome tinged exhalation, could have ſo deeply affected the denſe texture of theſe *ſtones*, as to paſs through all their parts in no other manner, than when that *ſtone* was in *ſolutis principiis*, or in a fluid ſtate.

There are ſometimes found extraneous matters lodged in the bodies of the gems themſelves, which could only have been enveloped in them in this manner while they were ſoft; and even in moſt of them, the art of the chemiſt is able to diſcover real particles of metals, which muſt have been mixed in their ſubſtance at ſuch a time, and to which they may very probably be indebted for real virtues.

Rubies, when too ſmall to be of value as gems, are in ſome places, where they make a ſort of ſand in the rivers, worked to ſome advantage as ores of gold. The amethyſt evidently contains iron, and the emerald copper; why ſhould it then be ſuppoſed impoſſible, that the virtues of theſe metals may be found in the gems which contain themſelves, and that in ſo pure and fine a ſtate, as no chemical proceſs can afford them in? The weight of many of the coloured gems is much greater than could be expected in *ſtones* of that hardneſs and conſiſtence, and is plainly owing to the admixtures of the metalline particles of the various ſorts they contain.

Mr. Boyle's opinion of the origin of the real virtues of the gems, is, that while the petreſcent matter was yet in a fluid ſtate, the mineral matter was received into, and intimately mixed with it, ſo as that the whole became but one *ſtone*; and that the virtues are always ſuch, as may be derived from the impregnating metal or mineral, and are various in degree, according to the various ſtates of the metal, and its quantity received into the compoſition.

If this ſyſtem holds good as to the gems, it will be much more naturally applicable to the ſemipellucid *ſtones*; many of which have gravities ſo great, as plainly to denote the metalline or mineral matter that makes a part of them. The metalline ſubſtances, that may be ſeparated out of theſe *ſtones*, give great proof of the truth of this ſyſtem: thus the hæmatites contain a very large quantity of iron, and the lapis lazuli, and turquoiſe *ſtone*, contain very large quantities of copper; and many of the jaſpers hold no inconſiderable portion of the ſame metal. *Boyle* of the Origin and Virtues of Gems.

STONE *for building*. Care muſt be taken to dig *ſtone* at the proper ſeaſon; for that *ſtone* which, taken out of the quarry at one time, would ſoon moulder away, will at another ſeaſon endure the weather for many years, if not ages. *Boyle*'s Works Abr. Vol. I. p. 111.

Bolonian STONE. See LAPIS *Bononienſis*.

Chalk STONES. See CHALK.

Chick STONE. See CICERUM *lapis*.

Copperas STONE. See LAPIS *atramentarius*.

Eft STONES. See EFT.

Figured STONES. See FIGURED *ſtones*.

Fleſh STONE. See SARCITES.

Free STONE. See FREE *ſtone*.

Gypſine STONE. See GYPSINE.

Horn STONE. See LAPIS *corneus*.

Moor STONE. See MOOR.

Oil of STONES. See OIL *of ſtones*.

Shoad STONES, among the miners of Cornwall. See the article SHOAD *ſtones*.

Staining of STONES. See STAINING.

STONE, in commerce. The *ſtone troy*, in Scotland, contains ſixteen pounds, the pound being two marks, or ſixteen ounces. Tr. Pract. Geom. p. 153. See POUND.

STONE-*braſh*, in agriculture, is a light lean ſoil, full of larger and ſmaller maſſes of rubble *ſtones*.

Theſe are to be tilled according to the condition in which they are found, for if they are graſſy they fallow them pretty late; but if they have no graſs upon them, they fold them in winter, when the ſheep's dung, with the help of ſome hay-ſeed, will furniſh them with graſs: or elſe, early in the ſpring they lay upon them old thatch or ſtraw, or the ſtrawy part of old dunghills, earth out of ditches, or the like, which will all, more or leſs, help forward a coat of graſs upon the land; for it is a rule in regard to theſe lands, that they muſt have a covering of graſs before they are fallowed, elſe they will yield but a poor crop. *Plot*'s Oxfordſhire, p. 247. See STONY *land*, infra.

STONE-*chatter*, in zoology, the name of a ſmall bird of the *œnanthe*, or fallow-finch kind, called by ſome authors *rubetra* and *muſcicapia*, and in ſome places the *ſtone-ſmich*, and the *moor-titling*.

It is about the ſize of the common linnet. Its beak is longiſh, ſtrait, and ſharp, and is black, as is alſo its mouth within. Its head is large, and in the male is black almoſt all over, as is alſo the upper part of the throat; but in the female theſe parts are variegated with black and brown. The neck is black, and marked on each ſide with a white ſpot, the two ſeen together looking ſomewhat like a white ring. The middle of its back is alſo black, but the extremities of the feathers are yellowiſh. It has a white ſpot juſt above the rump. Its breaſt is of a ſomewhat reddiſh yellow, and its belly white, with a faint caſt of red. In the female, the feathers of the back and neck are of a ſomewhat greeniſh tawny, with black middles; the upper part of the throat is grey, and the breaſt red. It is common on heaths, and makes a very loud, and often repeated noiſe. *Ray*'s Ornitholog. p. 169.

STONE-*curlew*, in zoology, the Engliſh name for the *œdicnemus*, a bird of the colour of the curlew. See the article ŒDICNEMUS.

STONE-*phoſphorus*. See LITHOPHOSPHORUS.

STONE-*plant*. See LITHOPHYTON.

STONE-*ſmich*, a common Engliſh name for that ſpecies of œnanthe, which we more frequently call the *ſtone-chatter*. See the article STONE-*chatter*.

STONE-*ſucker*, in zoology. See PETROMYZON.

STONY *land*. The farmers expreſs by this term two ſorts of land, the one full of large flints and pebbles, and the other full of fragments of free *ſtone*, or other coarſe *ſtones*.

Theſe lands in many places yield good crops, and the general rule is, that in ſtiff and cold lands the *ſtones* ſhould be as carefully picked out as may be, but in light and dry grounds they ſhould be left. In Oxfordſhire they have great quantities of a lean earth, and a ſmall rubble-*ſtone*, or a ſower ſort of land mixed with it; this is ſometimes very full of weeds, and ſometimes very clear of them: if they are weedy they fallow them late, but if they be ſeary, as they expreſs it, that is, if they have no ſwerd upon them, they either fold them in winter, and add ſome hay-ſeed to the ſheep's dung, to bring up graſs, or elſe they lay old thatch or ſtraw, and dung upon it; for they reckon, that if theſe lands have no ſwerd upon them before they are fallowed, they will by no means be brought to bear a good crop, but a great deal of May-weed, and other unprofitable herbs. In September, November, and December, they fallow as the ſwerd directs them: if this is done in either of the two laſt months, they call it a winter fallowing, and never ſtir it again till they plow it, and ſow it with barley; and theſe lands are reckoned to do better than if finely tilled. They will bear wheat and meſlin in a kindly year, and large crops of barley, if they are well managed, and kept in good heart.

They always fallow theſe lands every other year, unleſs they ſow peaſe upon them; ſometimes they ſow them with lentils; and when they are quite worn out, they lay them down for clover, or rey-graſs. *Mortimer*'s Huſbandry, p. 71.

STOOL (*Cycl.*)—STOOL, in mining, is uſed when the miners leave digging deeper, and work in the ends forward. The end before them is called the *ſtool*. *Houghton*'s Compl. Miner in the Explan. of the Terms.

Bloody STOOLS, in medicine. The ſpirit of vitriol, mixed with the patient's drink, has often been found beneficial in cures of *bloody ſtools*.

Retention of the firſt STOOLS, in infants. See INFANT.

STOP, in the manege, is a pauſe, or diſcontinuation of going. In order to *ſtop* a horſe, the rider ſhould, in the firſt place, bring to the calves of his legs, to animate the horſe, then bending his body backwards, raiſe the bridle-hand, without moving the elbow; then vigorouſly extend the hams, and reſt upon the ſtirrups, to make him form the times or motions of his *ſtop*, in falcading with his haunches three or four times. You ſhould not form the *ſtops* of your horſe ſhort and precipitate, leſt you ſpoil his hams and mouth. After *ſtopping*, a horſe ſhould be made to make two or three corvets.

The oppoſite term to *ſtop* is *parting*. In former times, the *ſtop* of a horſe was called *parade*. See the articles RAISE and NAILS.

Half a STOP, is a *ſtop* not finiſhed by a *peſate*; ſo that the horſe, after falcading three or four times upon the haunches, reſumes and continues his gallop, without making *peſates*, or *corvets*. See the articles PESATE, CORVET, &c.

STOP, at ſea, a word uſed by him that holds the half-minute glaſs, in heaving the log; for immediately when the glaſs is out, he calls *ſtop* to them that let run the line. See the article STOPPING.

STOPPAROLA, in zoology, the name of a bird of the lark kind, deſcribed by Aldrovandus, and ſuppoſed by Mr. Ray to be the ſame with the *ſpipoletta*, or the *tordino* of the Venetians. See the article SPIPOLETTA.

STOPPER, in a ſhip, a piece of rope having a wale-knot at one end, with a lannier ſpliced into it, and at the other end made faſt in the place where it is to be uſed. Its uſe is to ſtop the main-halliards, or the cable. The *ſtopper* for the halliards is faſtened at the main-knight, and it ſerves, when they are hoiſing the main-yard, to ſtop it, that it don't run out too faſt. They bind the wale-knot about the cable with the lanniers, and that ſtops it, ſo that it cannot ſlip away. This *ſtopper* is faſtened to the bottom of the bits by the deck. The word is, *lay on the ſtoppers*; and a ſhip is ſaid to ride by the *ſtoppers*, when the cable is faſtened, or tied only by them, and not bitted; but this is not ſafe riding in a ſtreſs of weather.

STOPPING (*Cycl.*)—STOPPPING *a leak*, at ſea. See LEAK.

STOPPING *a ſhip*, at ſea. When a ſhip comes to an anchor, and the cable is veered out by degrees till the ſhip is found to ride well, and then ſtopped, it is called *ſtopping the ſhip*.

STORAX (*Cycl.*)—The writers of the middle ages have greatly perplexed the hiſtory of this drug in general.

The true ſtate of the caſe is this; all authors, of all times, have deſcribed at leaſt two kinds of *ſtorax*, a dry and a liquid kind. The Arabians and Greeks have both joined to call the dry kind *calamita*; but neither the origin of that epithet, nor its true ſignification, have been conſidered as they ought.

The *ſtorax ſicca*, or *calamita* of the Arabians, was the worſt of all the kinds of *ſtorax*; it was only the refuſe, after making the artificial liquid kind.

They ſometimes boiled the fruit of this tree, and ſometimes its bark, and out of both extracted a liquid *ſtorax*; and the remainder of both was ſaved under the name of *dry*, or *calamite ſtorax*. It is no wonder, therefore, that the *calamite ſtorax* of the Arabians was the worſt of all the kinds; and as ſuch the term is always to be underſtood, when met with in the works of the Arabians.

On the other hand, when the Greeks would expreſs the very beſt and fineſt *ſtorax*, they always do it by the term *calamite ſtorax*. The two kinds of *ſtorax* they mention, are the reddiſh and the black. The latter was foul, and much leſs in eſteem. The former was the fine pure *ſtorax*, naturally exſudating from the tree. This they ſometimes called *calamite*, becauſe in the form of pieces of reed.

The common opinion, in regard to this word, is, that it was an epithet given to the fineſt *ſtorax*, from its being put into reeds to be brought over with ſafety: but this was not the caſe. The fineſt of all *ſtorax*, was that which voluntarily exſudated from the tender twigs, and young ſhoots of the tree: this ſometimes coated over the whole twigs for an inch or two in length, and reſembled a reed, or other hollow cylindric body, drawn on over the twig. This was the origin of the name *calamite*, or reed-like *ſtorax*, given to this which was of the red *ſtorax* kind, but finer than that of the trunk or larger branches, and approaching to a yellowiſh hue.

Pliny gives even a ſtricter account of the name than this: he ſays, and that from the authority of authors of repute, that the *ſtorax*-tree being very ſweet taſted, and very ſoft in the young wood, worms were very apt to get into the ſhoots; and that when they did ſo, they would eat away all the woody matter, and leave only the bark. The *ſtorax*, extravaſated by theſe punctures, uſed to coat over theſe tubes, and they then exactly reſembled pieces of reed artificially covered with ſome gum.

According to this account, the name *calamita* was extremely appoſite to that *ſtorax*, and it had as much title to the epithet, in all appearance, as the *adarce calamites*, which always gathered about reeds, and was therefore ſometimes ſimply called *calamites*. See ADARCE.

STOREA, among the Romans, a kind of baſket made of ropes or ruſhes, for gathering flowers or garden-fruits. *Pitiſc.* Lex. Ant. in voc.

STOREA was likewiſe a kind of defence, made of large cables faſhioned into a ſort of nettings; which was ſo ſtrong, that no weapon, though thrown out of an engine, could penetrate it. See *Pitiſc.* in voc. and *Cæſ.* Bell. Civ. II. 9.

STORM-*fink*, in zoology, the name of a ſmall bird deſcribed by Hoier, and ſaid to be ſeen principally at ſea, where it is looked on as a foreteller of bad weather.

It is a little larger than the common ſparrow, and is all over of a greyiſh colour. It is very remarkable for its ſkimming very ſwiftly along the ſurface of the water. When large flocks of theſe appear, the mariners know they are to expect a *ſtorm*, and prepare for it. *Ray*'s Ornithol. p. 306.

STORYNE, the name of an inſtrument uſed by the antients for drawing blood from the noſe; but we are not perfectly informed of its ſhape or ſtructure.

STOVE (*Cycl.*)—STOVES, in gardening, are buildings erected for the preſervation of tender exotic plants, which, without that aſſiſtance, will not bear the cold of our winter, becauſe they require an artificial warmth.

Stoves are of two kinds, diſtinguiſhed by the names of the *dry*, and the *bark ſtove*.

The dry *ſtove* has the flues, in which the ſmoak is carried, either laid under the pavement of the floor, or erected in the back part of the houſe over each other, and returned ſix or

eight times all along the *ſtove*. In theſe *ſtoves* the plants are placed on ſcaffolds, and benches of boards, raiſed above one another; and the plants, principally preſerved in theſe, are the aloes, cereuſes, euphorbiums, tithymals, and other ſucculent plants, which are impatient of moiſture in winter, and therefore are not to be kept among trees, or herbaceous plants, which perſpire freely.

The bark *ſtoves* are made with a large pit, nearly of the length of the houſe, which is three feet deep, and ſix or ſeven feet wide. This pit is to be filled with freſh tanner's bark to make a hot-bed, and in this the pots, containing the tender plants, are to be plunged.

This invention of tanner's bark for hot-beds has been of prodigious ſervice to the curious in gardening, as many plants are, by this means, annually preſerved and raiſed, which no other method could have made endure our climate.

The dimenſions of theſe *ſtoves* muſt be wholly directed by the number of plants intended to be preſerved; and for the dry *ſtove*, the floor muſt be raiſed above the ſurface of the earth, more or leſs, according to the dryneſs or wetneſs of the ſoil. In the front there is to be a walk about twenty inches wide, for the convenience of walking. The fire-place may be made either in the middle, or at one end, and the furnace muſt be contrived according to the nature of the fuel which is to be burnt there. The beſt firing, when it can be had, is turff, for it burns longer, and more moderately, than any other fuel, as alſo more uniformly, and therefore requires leſs attendance.

The entrance into the bark *ſtove* ſhould always be either out of a green-houſe, or the dry *ſtove*, or elſe through the ſhed where the fire is made; becauſe in cold weather the front glaſſes muſt not, by any means, be opened, and the top ſhould be covered either with tarpaulins, or ſliding ſhutters, in bad weather.

The tender ſhrubs and exotic plants muſt be plunged in their pots into the bark beds; ſuch are the caſhew, cabbage-tree, cocoa-tree, dumb-cane, fuſtick, logwood, mancinel, papaw-tree, ſour-ſop, and the like; and upon the top of the flues may be ſet the melon, thiſtle, the tender cereuſes, and the like.

The thermometer, by which the heat in the *ſtove* is regulated, muſt always be hung with its back to the ſun, and as far from the flues as may be. The proper ſtructure of theſe ſhelters, for the curious part of the vegetable creation, is to have a green-houſe in the middle, and two *ſtoves*, and a glaſs caſe, at each end. The particular rules for the ſtructure of all theſe, with plans of them, are accurately given by Mr. Miller in his Dictionary. *Miller*'s Gardner's Dictionary.

STOWS, in mining, are ſeven pieces of wood, ſet upon the ſurface of the earth, faſtened together with pins of wood.

STOWING *the hold*. See the article HOLD.

STRAIGHT, (*Cycl.*) in geography. See the article FRETUM.

STRAIGHT, in the manege. To part, or go *ſtraight*, or right out, is to go upon a tread traced in a *ſtraight* line. When you would puſh your horſe forwards, make him part *ſtraight*, without traverſing, or bearing ſidewiſe.

STRAIGHT *membered*, called in French *droit ſur les jambes*. See the article LEG.

STRAIKS, in the military art, are ſtrong plates of iron, ſix in number, fixed with large nails, called *ſtraik-nails*, on the circumference of a cannon wheel, over the joints of the fellows, both to ſtrengthen the wheel, and to ſave the fellows from wearing on hard ways or ſtreets.

STRAKE, in the ſea phraſe, a ſeam between two planks; as the *garboard-ſtrake* is the firſt ſeam next the keel. They ſay alſo a ſhip *heels a ſtrake*; that is, hangs or inclines to one ſide the quantity of a whole plank's breadth.

STRAMONIUM, *thorn-apple*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the infundibuliform kind, and conſiſting of one leaf, and divided into ſeveral ſegments at the edge. The piſtil ariſes from the cup, and is fixed, in the manner of a nail, to the hinder part of the flower. This afterwards becomes a fruit of a roundiſh figure, echinated in moſt of the ſpecies, and divided into four cells, containing ſeveral large ſeeds, uſually of a kidney ſhape. The ſeptum, which divides the head or fruit, is of a cruciform ſhape, and has four placentæ, to which the ſeeds adhere.

The ſpecies of *ſtramonium*, enumerated by Mr. Tournefort, are theſe. 1. The round thorny-fruited *ſtramonium* with ſingle white flowers. 2. The round thorny-fruited *ſtramonium* with double white flowers. 3. The round thorny-fruited *ſtramonium* with ſingle violet-coloured flowers. 4. The round thorny-fruited *ſtramonium* with double violet-coloured flowers. 5. The Ægyptian *ſtramonium* with double flowers, white within, and of a violet colour on the outſide. 6. The white-flowered *ſtramonium* with an oblong prickly fruit. 7. The purple-flowered *ſtramonium* with oblong prickly fruit. 8. The violet-flowered *ſtramonium* with oblong prickly fruit. 9. The ſharp long-thorned *ſtramonium*, called by authors *ſtramonium ferox*. 10. The ſmaller American *ſtramonium* with leaves like thoſe of alkekengi. 11. The ſmooth-fruited *ſtramonium* of Malabar with ſingle violet-coloured flowers. 12. The ſmooth-fruited *ſtramonium* of Malabar with double flowers. *Tourn.* Inſt. p. 118.

STRANGALIDES, a word uſed by authors to expreſs hard tumors in women's breaſts, ariſing from coagulations of obſtructed milk after child-birth.

STRANGLES, in the manege, is a collection of foul humors formed in the body of a young colt; which are voided by the noſtrils, or by a ſuppuration of ſome glands or knots, that lie between the bones of the lower jaw, and are crowded with impurities.

The *falſe ſtrangles* happen in old horſes, that have not well caſt the *ſtrangles*.

STRANGULATIO, a word uſed to expreſs that kind of ſuffocation which is common to women in hyſteric diſorders; and for the ſtraitning the inteſtines in hernias.

STRANGULATORIA, in the materia medica, a name by which Avicenna, and ſome other authors, have called the *doronicum*, or leopard's bane. *Ger.* Emac. Ind. 2.

STRANGURY (*Cycl.*)—The vulgar generally underſtand by this word the three ſeveral complaints, called by phyſicians *ſtrangury*, *dyſury*, and *iſchury*; the differences of which are theſe.

The *ſtrangury* is properly and diſtinctly a difficult excretion of urine, which comes away by drops, with a ſenſation of a ſpaſmodic pain about the ſphincter and neck of the bladder.

The *dyſury* is a difficulty of making water, attended with a violent attempt and preſſure of the parts. This ſometimes has its origin from the kidneys, ſometimes from the bladder.

The *iſchury* is a total ſuppreſſion of urine for ſome days, without the leaſt drop being voided, or the patient's feeling the leaſt ſtimulus toward attempting to void it.

Theſe three diſtemperatures of the urinary organs, though very properly diſtinguiſhed by their ſeveral names, are, however, in reality all the ſame in their origin, and differ only in degree.

In the *ſtrangury*, the difficulty of voiding the urine is ſomewhat tolerable, and is not attended with any ſenſation of heat, but rather with a coldneſs; and though the urine is voided only by drops, yet, as this is continual, there is more in quantity voided in this, than in the ſame time in a *dyſury*.

The *ſtrangury* ſeems a ſort of middle complaint, combined of the two others, the *diſury* and *iſchury*; and it differs in point of duration, being ſometimes only a complaint of a few hours, and ſometimes fixing itſelf upon the patient for a long time. Sometimes alſo it is idiopathic, and is properly a diſeaſe in itſelf; but ſometimes it is ſymptomatic, attending nephritic complaints of ſeveral kinds.

Phyſicians alſo diſtinguiſh the *iſchury* into the proper, and improper: the firſt is the denomination they give to this diſeaſe, when the bladder is full of urine all the time, and is ſo diſtended, that it brings on ſpaſmodic affections, which prevent the natural efforts for the excretion of it. The improper *iſchury* is that in which there is no ſuch fullneſs of urine, but this fluid is, by ſome means, prevented from flowing as it ought into this receptacle. We muſt be careful not to confound with theſe diſtempers the natural imminution of urine, which happens after copious ſweats, or diarrhœas, in which a great quantity of wet ſtools have been voided: this is diſtinguiſhed from theſe morbid affections, by its being attended with no pain, and always going off of itſelf.

Symptoms of a STRANGURY. Theſe are of frequent irritations to make water, which are ſucceeded either by a few drops, or a ſomewhat larger quantity, according to the nature and violence of the caſe; there is always a ſenſation of coldneſs while the urine is coming away, and a heat afterwards; and the whole body is very frequently affected with ſhiverings and ſudden coldneſs.

In a *dyſury*, the difficulty of voiding the urine is great, and the pain violent; but in this caſe it does not go off as ſoon as the urine is voided, but continues afterwards.

In the *iſchury*, while there is for ſeveral days together no attempt to the voiding any urine, if the complaint is in the bladder, the patient feels a weight and preſſure upon the os pubis; but when the kidneys and ureters are in fault, the pain is felt in the loins; and ſometimes this is attended with heart-burnings, iſchiatic pains, and even with diſorders of the ſtomach, and actual vomiting; and if the cauſe is ſome inflammable tumor, which is not unfrequently the caſe, then the pains are very violent, and the body is all over preternaturally hot.

The *dyſury* more frequently attacks thoſe who are ſubject to the ſtone in the kidneys or bladder, or to other nephritic complaints, and ſuch as have taken cantharides internally, and by that means brought on an eroſion of the neck of the bladder; ſometimes, alſo, this becomes a ſymptom in hyſteric complaints.

The *iſchury* principally attacks young men, and moſtly thoſe of plethoric habits; and thoſe who have been too free with hot medicines, ſtrong liquors, and powerful diuretics.

Cauſes. The cauſe of a *ſtrangury* is a ſpaſmodic contraction of the ſphincter, and neck of the bladder, attempting to throw off ſomething that is troubleſome; and the fermentative ſtate of the urine, accuſed by many as the cauſe of this diſeaſe, has indeed no ſhare in the occaſioning it. The *dyſury* ſometimes has its cauſe and origin in the kidneys, ſometimes in the bladder, and when in the laſt place, a ſpaſmodic conſtriction of the ſphincter is often the caſe, and this is not unfrequently brought on by a high diet, the feeding on very ſalt foods, or uſing too much ſpices. The *iſchury* is often occaſioned by accidents; ſuch as a ſtone, gravel, a worm, a grume of blood, or a collection of purulent matter ſtopping up the paſſage in the neck of the bladder; ſometimes it is occaſioned by a venereal caruncle, or inflammatory tumor; ſometimes by the weight of the uterus in women with child, when near the time of their delivery; ſometimes by external violence; and ſometimes by the ſitting a long time drinking, without going to make water; but this laſt more rarely happens. *Junker*'s Conſp. Med. p. 533.

Prognoſtics in theſe caſes. A ſimple and idiopathic *ſtrangury* is rather a painful, than a dangerous diſeaſe; but if it often recurs upon the perſon, it beſpeaks a calculous nephritic complaint for its cauſe: and, in general, it is a worſe complaint in old people, than in the young or middle aged. The *dyſury* is of the ſame nature with the *ſtrangury* in its event, but the longer it continues, the greater danger there is of its bringing on ſpaſms and fevers. But though theſe two caſes are not attended with any very imminent danger, the *iſchury* is, eſpecially when it is of ſome days ſtanding; for if it is not cured before the ſeventh day, an inflammatory fever comes on, which is uſually followed by a ſpeedy mortification, and by the death of the patient with hiccups and violent convulſions. People ſubject to *iſchuries* are alſo in danger of dropſies; and dropſical people are more ſubject to this complaint than any others, eſpecially when the diſeaſe is increaſed to a conſiderable height.

Method of cure. The *ſtrangury* and *dyſury* are to be treated in the ſame manner. The acrimony of the fermentitious matter in the blood, which might be apt to occaſion new congeſtions, is to be obtunded, and the ſpaſtic motions taken off: both theſe purpoſes are excellently anſwered by nitre, whether given alone, or mixed with ſome abſterſive ſalt, or with an abſorbent, mixed with a ſmall quantity of an acid to ſaturate it, and with a little cinnabar. A compound powder may be prepared of theſe ingredients, and a ſcruple of it given four times a day, will uſually ſoon take off the complaint. The cooling emulſions, made with barley-water and almonds, and with the cold ſeeds, are alſo of great ſervice; and when there is farther occaſion for medicines, gum arabic, and pills of boiled turpentine, are found very good ones; and decoctions of liquorice-root in barley-water, with ſyrup of marſh mallows, may be drank in large draughts. Many people are alſo fond of external remedies, and recommend onions, roaſted and buttered, to be applied to the pubes, and goat's ſuet to be rubbed warm about the navel.

In caſes of the *iſchury* there is occaſion for greater medicines, and the method muſt neceſſarily be varied, according to the ſtate of the patient, and the cauſe of the diſeaſe. The firſt thing to be done, is the injecting an emollient clyſter to looſen the bowels, for when theſe are emptied, the other complaint will be much more eaſily removed: after the clyſter, powders compoſed of cinnabar, nitre, and diaphoretic antimony, are to be given, to prevent an inflammation in the abdomen, and to attemperate the offending matter. When theſe things are done, the peculiar cauſes of the diſeaſe are to be examined. If a plethora and violent emotion of the blood be in fault, making a congeſtion of it at the kidneys; in this caſe, if the beforementioned methods do not take effect, bleeding in the foot will be of ſervice, and an external uſe of camphorated ointments probably will compleat the cure. When the cauſe is a ſpaſtic conſtriction of the ureters and kidneys, then the relaxing medicines are to be given, and gentle purges of ſenna, manna, and the like, will be of great uſe. Externally warm baths, oily liniments and ointments, and emollient cataplaſms, are alſo great aſſiſtants to the internal medicines.

If a ſmall ſtone, or a grume of blood, or mucous matter, or a worm, have ſtopped up the paſſage, and prevented the urine from paſſing after the clyſter, and the powders are found not to have the deſired effect, the catheter is to be introduced; or if the ſtone be lodged in the urethra, the injecting a little oil may be of uſe to lubricate the paſſage, and eaſe its way out. When a genuine nephritis is in the cauſe, this is firſt of all to be regarded, and treated in the common way. See NEPHRITIS.

If a venereal caruncle be in the way, it muſt be taken down by the ſurgeon with the ſeptics uſually employed on thoſe occaſions; and if the caſe be violent, and of this kind, the cure muſt be perfected, by treating the patient in the uſual method in venereal caſes.

If an inflammatory tumor ſtops the neck of the bladder, this is to be diſcuſſed by reſolvents internally taken, and externally applied to the pubes; and if there is an eroſion, or ulceration, balſamics are to be given, and particularly the pills of boiled turpentine. *Iſchuries* in infants are cured by giving crabs eyes, and the like powders, with the uſual catarrhal medicines to the nurſe who gives them ſuck. Finally, in caſes of grown people, as ſoon as the urine comes away at all, the common diuretics are to be given, as the daucus ſeeds, and the like, with gentle purges at the intermediate times; but it is a very dangerous practice to give diuretics, before the cauſe of the obſtruction is removed, and ſince they always add greatly to the pain and miſery of the patient.

There is no medicine ſo uſeful in theſe caſes as nitre, and it is better given in ſubſtance than any other way; for its dulcified ſpirit, though well known as a diuretic, is leſs ſafe than the ſalt itſelf. Many people have a great opinion of ſpecifics in theſe caſes, and golden-rod, and mouſe-ear, and ground ivy, are accounted of that number, as alſo violet ſeeds, and powder of egg-ſhells; but it is a very dangerous thing, in caſes of ſo great importance, to rely upon uncertain remedies. A common *ſtrangury* often is carried off by mere diluters, ſuch as tea, barley-water, or any other watery liquor, drank in large quantities till a ſweat comes on; and in the gentler caſes, where theſe alone are not quite effectual, there is no better addition to them than a little nitre. Bleeding in time often prevents great miſchiefs from theſe diſorders; and in caſes of a *dyſury*, brought on by the taking cantharides, there is no remedy ſo powerful as warm milk alone, drank in large quantities. The great Mr. Boyle has alſo ſaid much in the favour of Venice ſoap on this occaſion. *Junker*'s Conſp. Med. p. 534, 535.

STRAP (*Cycl.*)—STRAP, in a ſhip, the rope which is ſpliced about any block, and made with an eye to faſten it any where on occaſion.

STRAPS, in the manege. The *ſtraps* of a ſaddle are ſmall leather *ſtraps*, nailed to the bows of the ſaddle, with which we make the girths faſt to the ſaddle.

STRAPAZINO, in zoology, the name of a bird of the wheat-ear kind with a white rump and tail, and of a browniſh yellow on the head and back. Its wings are variegated with black and yellow, and its beak is longer, and of a browniſh colour. Its throat, breaſt and belly, of a yellowiſh white. It is common in Italy, and is frequently brought to market among the ſmall birds. *Bellonius*, de Avibus.

STRASITES, STASITES, or STAXITES, a ſtone deſcribed by the writers of the middle ages, and famed for its imaginary virtue of promoting venery, aſſiſting digeſtion, and the like, and that whether taken inwardly, or outwardly applied. It is not eaſy, from the accounts they have left us, to gueſs what ſtone they mean.

STRATA, (*Cycl.*) the beds of different kinds of matter, of which the cruſt of the earth is compoſed.

The moſt frequent opportunities we have of obſerving theſe in England, is in the coal mines in coal countries. Here we find them lying in a regular manner, on what appears to us a plane, as we ſee any ſmall part of it; but when we conſider the ſame *ſtrata*, according to the globular figure of the earth, and ſuppoſe the maſs of the earth to conſiſt of the foregoing, and perhaps in different parts, and at different depths of *ſtrata*, of ten thouſand other kinds, all originally, while in a ſoft and fluid ſtate, tending toward the center, we ſhall find that it muſt mechanically, and almoſt neceſſarily follow, by the continual revolution of the crude maſs from weſt to eaſt, like the winding up of a jack, or the rolling up of the leaves of a paper-book, that every one of theſe *ſtrata*, though they each reach the center, muſt, in ſome place or other, appear to the day, or on the ſurface. In which caſe, there needs no ſpecific gravitation to cauſe the lighteſt to be uppermoſt; and were it practicable to ſink to the center of the earth, all the *ſtrata* that are would be found in every part, and, according to the poet, *ponderibus librata ſuis*. Add to this, that, according to an obſervation of Dr. Stukely, the precipices of all hills are to the weſtward, whereas the aſcent to the eaſt is more gradual. Philoſ. Tranſ. N° 391. p. 396.

STRATEGUS (*Cycl.*)—Towards the declenſion of the Roman greatneſs, the chief magiſtrate of Athens was called by the name of Στρατηγος, *dux*. Conſtantine the great, beſides many other privileges granted to that city, honoured him with the title of Μεγας Στρατηγος, *magnus dux*. *Potter*, Archæol. Græc. lib. 1. cap. 7.

STRATOR, among the Romans, an officer who took care of the horſes, furniſhed by the provincials for the public ſervice. *Pitiſc.* in voc.

STRATOR is alſo uſed for an officer in the army, whoſe buſineſs it was to take care there was nothing in the roads to hinder or incommode the army in its march. For which purpoſe he ordered banks and ſteep eminences to be levelled; laid bridges, cut down woods, and aſſiſted the quarter-maſter to find out places proper for tranſporting the army over rivers. *Pitiſc.* in voc.

STRATOR is alſo uſed for an equerry, who held the bridle of the prince's horſe, and aſſiſted him in mounting. This officer was by the Greeks called *anaboleus*. *Pitiſc.* in voc. See the article ANABOLEUS.

STRATOR likewiſe denotes a ſurveyor of the high-ways. *Pitiſc.* loc. cit.

STRAWBERRY, *fragaria*, in botany. See FRAGARIA.

The common *ſtrawberry* is frequent in the woods of England, and is thence tranſplanted into gardens. The beſt ſeaſon for this is in September, that the plants may be rooted before the froſts. They may alſo be tranſplanted in February; but then, if the ſpring ſhould prove dry, they will require a great deal of watering to keep them alive.

The proper ſoil for *ſtrawberries* is a light hazely loam, not over rich; the ground muſt be well dug, and very carefully cleared of all noxious weeds; and when it is levelled even, it ſhould be marked out into beds about three feet and a half wide, leaving a pathway between each bed of two feet broad. In each of theſe beds ſhould be planted four rows of plants, ſo that they may ſtand about a foot diſtant from each other in the rows, and they ſhould be planted at about eight inches plant from plant in each. This is the proper diſtance for the wood *ſtrawberry*, which is of the leaſt growth of any; but the ſcarlet *ſtrawberry* muſt be planted at a foot diſtance every way, and the heautboy ſixteen inches; and finally, the large Chili *ſtrawberry*, which is the largeſt grower of all, muſt be ſet at twenty two inches diſtance plant from plant.

In the ſpring, when the *ſtrawberries* begin to flower, if the ſeaſon is dry, they muſt be very plentifully watered, and they muſt be kept very carefully cleared from weeds. At Michaelmas the beds ſhould be dreſſed, the weeds all very carefully taken up, all the ſtrings or runners muſt be taken from the roots, and the weak plants, which ſtand too cloſe, muſt be pulled up; throwing a little fine earth, at the ſame time, over the plants, alſo greatly ſtrengthens their roots. Theſe beds, however well managed, will not continue good above three years; and the beds of the firſt year bearing but few fruit, it is neceſſary to new-plant ſome freſh ground every third year, and deſtroy the old beds; but the new ones muſt be firſt of one year's growth.

Different palates prefer different ſpecies of *ſtrawberry*, but the white-fruited one is, of all others, the beſt flavoured; though it is but a very bad bearer. The great Chili *ſtrawberry* is cultivated in the fields in that country; it is a much ſtronger and larger plant than any of our kinds, and its fruit is as large as a wallnut, but not ſo well taſted as our own *ſtrawberries*. Mr. Frezier brought them ſome years ago to Paris, and ſince that they have been ſpread over the ſeveral parts of Europe. They grow beſt in a loamy ſoil, under the ſhade of trees. *Miller*'s Gard. Dict.

STRAWBERRY-*tree*. See the article ARBUTUS.

STREAK-*fallowing*, in huſbandry, a particular ſort of tillage.

The way of doing it, is to plow one furrow, and leave one, ſo that but half the land is plowed, each furrow that is ſo lying on that which is not: when this is ſtirred, it is then clean plowed, and laid ſo ſmooth, that it will come, at ſowing time, to be as plain as before. This is done, when lean and poor lands are not ſwardy enough to bear clean tillage, nor light enough to lie to get ſward. The intent of this tillage is to keep the ſun from ſcorching them too much; but in many places they think this wears their land too faſt, and therefore are not fond of having recourſe to it. *Plot*'s Oxfordſh. p. 248.

STREAMERS, in a ſhip, the ſame with *pendants*. See the article PENDANT, *Cycl.*

STRENGTH *(Cycl.)*—STRENGTH *of ſpirits*, among diſtillers, that quality by which they become inflammable, and which they have in greater or leſſer proportion, as they are more or leſs debaſed by an addition of water.

Dr. Shaw has very well recommended to the world the method of ſelling and buying ſpirits in their moſt highly-rectified ſtate, that is, when they are totally inflammable. By this means, as the burning a ſpoonful of the goods would always be a proof of their quality, there could be no room for thoſe cheats, which are now too common between the ſeller and buyer. As this, however, is not likely to be brought into practice, it may be of great uſe to thoſe, who traffic in ſpirits, to have ſome more certain way of judging of their *ſtrength* than that by the bubble proof, or crown of ſpume ariſing on ſhaking; which being wholly owing to a mixture of the eſſential oil of the ingredient from which the ſpirit is made, with the ſpirit, may be ſophiſticated by the addition of other oils, or ſaponaceous ſubſtances, or by any thing that can give a greater viſcoſity to the ſpirit than it had before.

The ſureſt method of judging of the *ſtrength of ſpirits* is by the hygrometer, water-poiſe, or balance; or 2. by diſtillation; or finally, by deflagration. The ſpecific gravity of totally inflammable ſpirit is ſo much leſs than that of phlegm, or common water, that it is eaſily ſenſible upon the balance; whence an exact hygrometer, well balanced and graduated, and furniſhed with a proper ſcale and weights, may be of great uſe to aſſign the proportions in which pure ſpirit and water are mixed in any given liquor. Though perhaps a readier way than this may be that of Mr. Homberg's, mentioned in the Memoirs of the Paris Academy 1718, for determining the different gravities of different fluids, by means of a bottle with a very long and ſlender neck; which being filled to a certain height with any mixture of ſpirit, is weighed againſt the ſame bottle filled with pure water.

The moſt exact, of all methods of determining the *ſtrength* of any ſpirit, is by diſtillation, rectifying it up to an alcohol, or totally inflammable ſpirit; but this, though liable to no error, is too tedious to come into common uſe. And, upon the whole, the beſt method, of all others, ſeems to be that of deflagration, which Mr. Geoffroy has been at much pains to adjuſt and improve. *Shaw*'s Eſſay on Diſtillery. See the article SPIRITS.

STRENGTHNERS *(Cycl.)*—An artificial method of procuring a powerful, ſafe, and innocent *ſtrengthner*, is the following. Put half a pound of fine Peruvian bark, reduced to a ſubtile powder, into a long or tall glaſs body, and pour upon it two quarts of ſpirit of wine; ſhake them well together, and ſet them in a ſand-heat two or three days, or till the ſpirit of wine is of a fine purple colour; pour off this tincture, and preſs the fæces very ſtrongly, to get it all away; then return the powder into the ſame veſſel, and pour upon it two quarts of ſtrong white wine; ſet this in ſand for two or three days, then pour off this tincture; mix it with the former, and putting the whole into a glaſs body, diſtill off a great part of the ſpirit of wine; then put the remainder into a glazed earthen pan, and evaporate it to the form of an extract, adding, toward the end, three ounces of ſyrup of orange peel.

This is the invention of Charas, and ſeems the beſt preparation of bark known. Beſide all the common caſes in which the bark is given, this preparation may be tried in other weakening diſtempers, as well as intermitting fevers, as the inconveniencies attending the taking the bark in ſubſtance are obviated by this preparation, which is equally powerful and innocent. It may be aromatized at pleaſure with any of the eſſential oils. *Shaw*'s Lectures, p. 232.

STREPITOSUS, the name of a diſtemper common to the inhabitants of ſome parts of the Alps, in which the face, neck and arms, are ſo diſtended with flatulencies, as to make a noiſe, when ſtruck, like a dry bladder half diſtended with wind.

STREPSICHEROS *ovis*, in natural hiſtory, the name of a ſpecies of ſheep deſcribed by Bellonius, and found in the iſland of Crete in great flocks. They are of the ſize of our common ſheep, but their horns are erect, and twirled into a ſpiral line, and beautifully furrowed on their outſide. *Bellon.* Obſerv. lib. 1. cap. 14.

STRETTO, in the Italian muſic, is ſometimes uſed to ſignify that the meaſure is to be ſhort and conciſe, and conſequently quick. In this ſenſe it ſtands oppoſed to *largo*. See the article LARGO.

STRETWARD, in our old writers, an officer whoſe buſineſs it was to take care of the ſtreets, like our ſurveyor of the high-ways, or rather ſcavenger. *Blount.*

STREVER, in zoology, a name given by many to the fiſh called by authors *aſper piſciculus*.

It in ſome degree reſembles in figure the *lucioperca*, or pike-pearch, but is more ſlender than that fiſh toward the tail. Its back has a hollow on its anterior part near the head, and its ſides are marked with ſeveral obliquely tranſverſe lines, like thoſe of the pearch. Its back is ſcaly, its breaſt braked. It has two back fins, a ſhort and prickly one before, and a longer behind; and the bony coverings of its gills terminate each in a ſharp ſpine. *Geſner*, de Aquat. p. 478.

Geſner, in particular, calls this fiſh *gobius aſper*. It is a genuine ſpecies of pearch, and is diſtinguiſhed by Artedi by the name of the *pearch* variegated with eight or nine tranſverſe black lines on a ſide.

STRIATA *corpora*, a term uſed by anatomiſts to expreſs two protuberances of the brain, upon the crura of the medulla oblonga. See CEREBRUM.

STRIATED *leaf*, among botaniſts. See LEAF.

STRIATED *ſtalk*. See the article STALK.

STRIATULA, in natural hiſtory, a name given by Mr. Lhuyd to a ſpecies of foſſile plants of the fern kind, remarkable for their *ſtriated* appearance. See the article *Foſſile* PLANTS

STRIBILIGO, a name given by ſome authors to any ſort of cutaneous efflorescence.

STRIGA, among the Romans, a ſpace or interval in a camp, 120 feet long, and 60 feet broad, uſed for currying and rubbing down the horſes. *Pitiſc.* in voc.

STRIGA is alſo uſed for a furrow drawn out at length, for a long row, or ſeries of any thing, and by ſurveyors for a long meaſure. *Pitiſc.* in voc.

STRIGIL, an inſtrument uſed among the antients in their baths, and at ſome of their gymnaſtic exerciſes.

It ſerved to abſterge the ſweat, or other ſordes from the body. Perſons who intended to bathe, or to uſe any of theſe exerciſes, when they entered the gymnaſium, put off their clothes in the apodyterium; after which, ſuch of them as intended to box, wreſtle, or uſe any of the more violent exerciſes, went into the alipterium, where they were anointed, and thence returning into the place where the duſt was, they were ſprinkled with this as they paſſed along, and then

entred upon their ſeveral exerciſes; after this they returned to the alipterium, where they had the ſweat and ſordes wiped off from their bodies by the alipta with an iron *ſtrigil*.

The ſordes taken off from the body, and conſiſting of oil, duſt, and ſweat, were preſerved for medicinal purpoſes, and we find them uſed among the old phyſicians.

The *ſtrigils* were of the ſhape of a gardner's knife; they were made of different materials, as ivory, horn, gold, ſilver, iron, braſs, and the like; but in ſome after times the word was only uſed to ſignify a linnen cloth, or a piece of ſpunge, which every one carried about him for his own uſe. The ſordes, ſaved for medicinal purpoſes, were called *ſtrigmenta*. See the next article.

STRIGMENTUM, the filth, dirt, or ſordes, abſterged from the ſkins of thoſe that bathed in the baths and places of public exerciſe among the antients, or from the walls of bathing places, or ſtatues ſet up in them.

Theſe were all reſerved for medicinal purpoſes, and were properly of three kinds. The firſt, or bath *ſtrigments*, conſiſted of the ſweat, oil and ſordes, collected in thoſe places. The ſecond kind was the *ſtrigments* of the palæſtra, conſiſting of the ſame things, with the addition of duſt, which was thrown upon the bodies of the perſons before they entred on thoſe exerciſes. The third kind was that collected from the walls of the gymnaſia, and from the ſtatues, of whatever materials they were made, which were placed there. Hence the nature of the firſt and ſecond kind might always be aſcertained, but that of the third was very different; for as it was often collected from braſs and copper ſtatues, it partook of the nature of the ruſt, or ærugo of thoſe metals which was collected from them with it.

Theſe *ſtrigments* were ſuppoſed to be of a heating, drying quality, and diſcutient; they were, therefore, uſed for diſcuſſing the parotides, and for condylomata of the anus. Thoſe of the palæſtræ were uſed to diſcuſs collections of matter about the joints; and applied in the manner of a cataplaſm, were ſaid to be of great uſe in the ſciatica: and thoſe collected from the walls and ſtatues were uſed to cleanſe old ulcers.

STRIGONIENSIS *terra*, earth of *Strigonium*, in the materia medica, a red earth of the bole kind, found about the gold mines at *Strigonium* in Hungary, and uſed in ſome places as an aſtringent and ſudorific.

The characters by which it is known from the other earths, are theſe. It is but of a coarſe and impure texture, and lighter than moſt of the boles; in colour it is of a ſtrong, but dull red, and is of a tolerably ſmooth ſurface. It is apt to crumble to pieces between the fingers, and ſtains the ſkin in handling. It melts freely in the mouth, and has a remarkable ſmoothneſs, but very little aſtringency in its taſte, and leaves a ſenſible grittyneſs between the teeth. It is ſometimes veined and ſpotted with ſmall moleculæ of an earth, like the whitiſh variegations of the red French bole. It makes a ſlight effervescence with aqua fortis, or any other acid menſtruum, and ſuffers no change of colour by burning. *Hill*'s Hiſt. of Foſſ. p. 11.

STRIGOSULA, in natural hiſtory, a name given by Mr. Lhuyd to a ſpecies of foſſile oiſter-ſhell. See the article *Foſſile* SHELLS.

STRIKE (*Cycl.*)—STRIKE *a nail*, in the manege, is to drive through the horſe's ſhoe, and the horn or hoof of his foot, and to rivet it for holding on the ſhoe.

STRIKE *a vein*, in the manege. See BAR, *Append.*

STRIKING (*Cycl.*)—STRIKING-*wheel*, in a clock, the ſame with that which by ſome is called the *pin-wheel*, becauſe of the pins which are placed on the round or rim (which in number are the quotient of the pinion divided by the pinion of the detent-wheel.) In ſixteen days clocks, the firſt, or great wheel, is uſually the pin-wheel; but in ſuch as go eight days, the ſecond wheel is the pin-wheel, or *ſtriking-wheel*. See PIN-*wheel*, *Cycl.*

STRILLOZZO, in zoology, a name by which ſome authors have called the emberiza alba, or bunting, or perhaps a bird ſomewhat different from our bunting, and common in Italy: for it is not yet aſcertained, whether the *ſtrillozzo* ſpecifically differs from the bunting, or only by ſome accidental variegations.

STRING (*Cycl.*)—STRINGS *of metal*, a term uſed by our miners to expreſs thoſe thin and ſmall veins of ore, into which the beds or veins degenerate toward their terminations. Theſe are from an inch to a tenth part of that in thickneſs, and run through the ſolid rocks to a great diſtance. The ore in them is uſually very pure and rich, and as they lie in the rocks, communicating with the larger veins of ore, they reſemble the ſeveral ſmall brooks and rivulets in a hilly country, which by degrees uniting all their ſtreams, form the rivers. See the articles LOAD and VEIN.

STRINSIA, in ichthyology, a name given by authors to that ſpecies of the gadus, which is called by ſome *lota*, and by others *muſtela fluviatilis*; by us in Engliſh the *eel-pout*. Olaus Magnus calls it the *borbocha*; and Artedi, who refers it to the genus of the gadi, diſtinguiſhes it by the name of the *gadus* with two fins on the back, with even jaws, and beards at the mouth. See the article GADUS.

STRIP, at ſea. A chaſe is ſaid to *ſtrip* himſelf into ſhort or fighting ſails, when he puts out his colours in the poop; his flag on the main-top; his ſtreamers or pendants at the end of his yard-arm; furls his ſprit-ſail; peeks his miſen; and ſlings his main-yard. In which caſe the chaſer muſt prepare himſelf for fight.

STRIVALE, in zoology, the name uſed by many for the fiſh more uſually known by the name of *aper*, the boar-fiſh. It is a ſmall fiſh, of the ſhape of the doree, caught in the Mediterranean. *Aldrovand.* de Piſc. p. 270. See Tab. of Fiſhes, N° 19. See the article APER.

STRIX, the *owl*. In the Linnæan ſyſtem of zoology, this makes a diſtinct genus of birds of the hawk kind, the diſtinguiſhing characters of which are, that the feet have three toes before, and only one behind, none of which are moveable backwards. *Linnæi* Syſt. Nat. p. 44.

STRIX is more particularly made the name of the common *brown owl*, or *ivy owl*. This is diſtinguiſhed from the other ſpecies of the *owl* kind by theſe characters.

Its beak is of a pale horn colour, and but ſhort, yet the opening of its mouth is very wide. Its eyes are remarkably large and protuberant, and the apertures of its ears very large, and covered with a membrane; and its eyes are nearer to its ears, than in any other animal. Its face is ſurrounded with a double circle of feathers, and its back is mottled with brown and black, and its belly of the ſame colour, but ſomething paler, as if it had a mixture of whitiſhneſs. The legs are feathered almoſt down to the toes, and the outer feather of its wing is much ſhorter than the reſt, by which it is diſtinguiſhed from the aluco without any farther mark. *Ray*'s Ornitholog. p. 66.

STROBILE, a word uſed by chirurgical writers to expreſs a pledget of a twiſted form.

STROBILUS, among botaniſts, a kind of pericarpium, formed of a number of vaginæ with contorted points applied cloſe to one another. See PERICARPIUM.

STROBULUS, among the antients, a kind of mitre, which roſe to a height by many windings and turnings, and uſed by the barbarians; inſtead of which the Romans wore the *apex*, which had a high, but ſtreight top. *Pitiſc.* in voc. See the article APEX.

STROCAL, in glaſs making, a long iron inſtrument like a fire-ſhovel, uſed to empty the metal out of a broken pot into a whole one. *Neri*'s Art of Glaſs Append.

STROMATEUS, in ichthyology, a genus of fiſhes of the malacopterygious, or ſoft-finned kind, the characters of which are theſe. The body is very much compreſſed, and very broad and thin; it has no belly fins, and has only one back fin, which is extended over the whole back. The only known ſpecies of this genus is the *callichthys* of authors, a fiſh called the *fiatola* at Rome. The tail is very forked; the mouth is very ſmall; the teeth are placed in the jaws and palate; and the tongue is ſmooth and broad. The body is ſtriped croſsways. *Artedi*, Gen. Piſc. p. 15.

The *ſtromateus* is a broad, flat, and ſhort ſea-fiſh, ſomething reſembling the turbot in figure, and thin both on the back and belly, but ſwimming erect, not flatwiſe.

Its common ſize is of about a pound and half weight; its colour on the back a pale bluiſh, and on the ſides and belly a ſilvery white; and on its back, and upper part of its ſides, it is very beautifully variegated with yellow lines and ſpots, and towards its belly with others of a paler tinge of the ſame colour. There are two longitudinal lines on the ſides, the one ſtrait, the other arched and bent. Its ſkin is extremely thin and tender, and is covered with ſcales. The tail is forked, the end of the ſnout obtuſe, and the mouth very ſmall. It has only one row of teeth in each jaw, but it has, beſide theſe, two bony ſubſtances in its mouth, all over covered with ſmall teeth. It has no belly fins, but has two ſmall ones at the gills, and one long one running down the back, and another ſingle long one anſwering it near the tail. It is caught in the Mediterranean, and brought to market at Rome under the name of the *lampuga*, and is a very delicate fiſh. *Ray*'s Ichthyography, p. 156.

STROMBUS, in conchyliology, the name of a genus of ſhells, nearly allied to the buccinums, and called by the generality of authors *turbo*. See the article TURBO.

STROMLINGUS, in ichthyology, a name given by ſome writers to the *aras* of the Greeks, which is no other than the common herring. See the article HALEC.

There is no other difference between the *ſtromling* and herring, but that the former is ſmaller.

STROPHIARIUS, among the Romans, a perſon who prepared and made the *ſtrophia*. See STROPHIUM.

STROPHIUM, among the Romans, a ſhort ſwath or band, wherewith the young women kept down the ſwelling of their breaſts. *Pitiſc.* Lex. Ant. in voc.

STROPHIUM was likewiſe a bandage for the head, made of two or three garlands of flowers tied together. *Pitiſc.* loc. cit.

STROPPUS, among the Romans, the thong with which the oars were tied to the *ſcalmus*. *Pitiſc.* Lex. Ant. in voc. See the article SCALMUS.

STRUFERTARII, among the Romans, perſons hired to perform ſome kind of ſacrifices near the trees that had been thunder-ſtruck. *Pitiſc.* in voc.

STRUMARIA, a name by which Galen has called the little burdock. *Ger.* Emac. Ind. 2.

STRUMUS, in botany, a name given by ſome of the old Roman authors to the *cucubalus*, or berry-bearing chickweed.

It had this name from its being found of ſervice in *ſtrumous* and ſcrophulous ſwellings, when externally applied. The name *cucubalus* ſeems to have been derived from the word *haliccacabum*, or the winter cherry, for the antients eſteemed both theſe plants ſpecies of nightſhade; and ſome of them have plainly deſcribed the *cucubalus* under the name of *ſolanum hortenſe*.

STRUPPI, among the Romans, garlands or wreaths of vervain, wherewith the ſtatues of the Gods were crowned. *Pitiſc.* in voc.

STRUT, a term uſed by ſome builders for that brace which is framed into the king-piece and the principal rafters. See BRACE, *Cycl.*

STRUTHIO, in zoology, the name of the oſtrich in the Linnæan ſyſtem. Others uſually call it the *ſtruthio camelus*. According to the ſyſtem of that author, this makes a diſtinct genus of birds, the characters of which are, that it has only two fore toes on each foot, and no hinder ones. See Tab. of Birds, N° 19. *Linnæi* Syſt. Nat. p. 47.

STRUTHIOMELA, a word uſed by Pliny and the antients to expreſs a ſort of quinces, which were ſmaller than the common kind, and of a ſweeter juice and leſs aſtringent.

STRUTHIOPTERI, in natural hiſtory, a name given to a ſeries of flies, of the claſs of thoſe which do not feed on fleſh: theſe have remarkable ſhort wings, and are always found on flowers and leaves of plants. There are ſeveral ſpecies of theſe. The moſt frequent among us are a white-bodied one with black wings, which cover but a very ſmall part of the back, and with feathered wings; and two others with long bodies, of a duſky grey, ſtreaked with white. Theſe are all early flies, being found in the ſpring in hedges and buſhes.

STRUTHIOPTERIS, in botany, a name by which Tragus, and ſome other authors, have called the *lonchitis*, or ſpleen-wort. *Ger.* Emac. Ind. 2.

STRUTHIUM, in natural hiſtory, a name given by the Greeks to a plant called by the Latins *lanaria herba*, from its uſe in the manufacture of their wool. Many have ſuppoſed the *chaſcuſa* of the antients to be the ſame with this plant, but that is an error, for the *chaſcuſa* of the Greeks is the *antirrhinum* of the Latins, as is plain from Pliny; and the ſame author tells us, that it has leaves like thoſe of flax, ſmall, narrow, and ſmooth. All the account we have of the *ſtruthium* is from Dioſcorides, who ſays, that it was a kind of thiſtle, ſomewhat reſembling the ſcolymus, and having a large root, long, and of the thickneſs of two or three fingers, and very ſharp prickles on the leaves. This ſhort account, though not enough perhaps certainly to inform us what the plant was, is yet abundantly ſufficient to prove, that it was not the chaſcuſa, or antirrhinum.

Many have ſuppoſed that the *candes*, or *candiſi* of the Arabian writers, is the ſame plant with the *ſtruthium* of the Greeks, and the old interpreters of the works of Avicenna and Serapion tell us that it is ſo; nay, Avicenna himſelf gives us the deſcription of the *ſtruthium*, as it ſtands in Dioſcorides, under his name *candiſi*, and Serapio under his title of *candes*: but all that we may learn from this, is, that the Arabians were as liable to errors about the Greek Phyſicians works as ourſelves, and that the *ſtruthium* of the antients was as much unknown in their days as in ours. Alphagus gives us a genuine deſcription of the candes, or candiſi, out of the writings of Ebenbita *de Simplicibus*, who ſays, that it was common in Syria; and expreſsly adds, that neither Dioſcorides, nor Galen, were at all acquainted with it, nor had any where mentioned it under any name.

It may ſeem ſtrange to ſome, that Serapio and Avicenna ſhould miſtake the plants of Dioſcorides, and their other Greek predeceſſors; but we find, by Avicenna's character of the artanita, which is not the *artanita*, but the *leontopetalon* of Dioſcorides, that the Greek phyſicians works were at that time tranſlated into the Arabic language; and theſe Arabians uſed that tranſlation in their own tongue, never troubling themſelves to refer to the original. Now though it is probable, that neither Serapio nor Avicenna would have erred about the plants of Dioſcorides, had they read the works of that author in the original, yet is very eaſy to ſuppoſe that a common tranſlator might make blunders about ſuch nice ſubjects as the ſynonyms of plants; and theſe muſt all be tranſplanted into the works of the Arabian writers, who, according to their own accounts, made uſe of theſe tranſlations, inſtead of the originals; and on this foundation we may ſafely affirm, that the *artanita* of the Arabians is the *leontopetalon*, not the *artanita* of the modern times, and that the *candes*, or *candiſi* of the Arabians, though we do not know what it is, yet evidently is not the *ſtruthium* of the Greeks.

We find the *ſtruthium* celebrated among the Romans for its virtues; but all the account we have of it from them, is, that it was a prickly plant, and was very common in the Grecian iſlands. This however is ſufficient to convince us of the great error of thoſe who make this plant, and the *oſtrucium* of the later writers, to be the ſame plant. The oſtrucium is the Smyrnium, or Alexanders, and can by no means be ſuppoſed the ſame with this prickly plant; yet Macer has made them the ſame, and has attributed to the Smyrnium, or Alexanders, the virtues which Theophraſtus gives to the ſtruthion.

STRUTHIUM, in the materia medica, is uſed by modern authors as the name of the *luteola*, or dyers weed, a common wild plant with narrow leaves and yellow flowers. *Dale's* Pharm. p. 248.

STRUTHIUM is alſo uſed by ſome for the *ſaponaria*, or ſoap-wort. *Ger.* Emac. Ind. 2.

STRYCHNUS, a name given by the antients to the plant we call *ſolanum*, or nightſhade. Some of the old authors have alſo called this *tithymal*; and in the times of Theophraſtus, we find that tithymal and nightſhade were ſynonymous terms.

The oldeſt authors [b] mention only three kinds of *ſtrychnus*, or nightſhade; the one they call the *ſleepy nightſhade*, the other the *mad nightſhade*; theſe two being poiſonous, and exerting their bad effects, by making people ſleepy or mad; and the third they called the *eſculent nightſhade*. This ſeems to have been the ſame with our *pomum amoris*, or love apples; which, though not much eſteemed in England, yet in Spain, and many other parts of the world, are univerſally eaten in ſoups, *&c.*—[b *Theophraſtus*, lib. 9. cap. 11.]

Pliny [c], in his account of the ſolanum, ſeems to intend the ſame thing as Theophraſtus; but having collected the accounts of different authors, and put them together in a confuſed manner, it is not eaſy to comprehend what he means; and to add to the perplexity, this is one of the parts of that author where the copies are very faulty.—[c Lib. 21. cap. 31.]

STUB, in the manege, is uſed for a ſplinter of freſh-cut under-wood, that goes into a horſe's foot as he runs; and piercing the ſole through to the quick, becomes more or leſs dangerous, according as it ſinks more or leſs into the foot.

STUD, in the manege. See BREED.

STUDDING-*ſail*, in a ſhip, the ſame with what is called a *gooſe-wing*. See the article GOOSE-*wing*.

Studding-ſails, are bolts of canvas, or any cloth that will hold wind, extended in a fair gale of wind along the ſide of the main-ſail, and boomed out with a boom. They are ſometimes alſo uſed to the clew of the main-ſail, fore-ſail, and ſprit-ſail, when the ſhip goes either before the wind, or quartering.

STUFFING, or CONGESTION, in medicine, the name of a diſtempered ſtate of the body, in which there is a ſpecial and peculiar direction of the blood, in larger quantities than ordinary, to ſome particular places, in order to its there making its way out by an hæmorrhage, and relieving nature from an over-abundant quantity of it, that the reſt may circulate the more freely and eaſily.

Congeſtions differ in regard to the places where they appear; ſome are made in the head, others in the breaſt; ſome in the hypocondria, and ſome in the kidneys; and others in the hæmorrhoidal veſſels. In this alſo there is ſome regularity in regard to the age and conſtitution of the patient; for in young perſons *congeſtions* are uſually made in the head, in middle-aged people in the breaſt, and in thoſe ſomewhat farther advanced in years toward the abdomen.

Medical writers diſtinguiſh *congeſtions* into two kinds, the *complete*, and the *incomplete*. The complete *congeſtions*, are thoſe in which the blood is directed to ſuch a part where it is natural and eaſy for it to be diſcharged by an hæmorrhage; ſuch are the head, the lungs, the uterus, and inteſtinum rectum; and in which it is carried in large quantities to the very parts.

The incomplete *congeſtions*, are thoſe in which the blood is indeed directed toward theſe, or the like parts, from whence it ought to be diſcharged, but never is carried to them, or indeed near them, but collecting itſelf at a diſtance from them, can never come to a diſcharge by a hæmorrhage. Something of this kind is obſerved in the rheumatiſm, gout, and what are called the *cold catarrhs*.

Congeſtions are alſo divided into two kinds, from the matter they are occaſioned by: the one are called *ſanguineous*; in theſe the blood is always ready to appear in its own form in an hæmorrhage. The other are ſtiled *bechic*; theſe extend themſelves farther than the ſanguineous, and theſe have their origin from the blood: but when a paſſage is by any means denied to the whole ſubſtance of the blood, its ſerous parts only form the *congeſtions*; and theſe, as they are become either mucidoſeroſe, or ſeroſoſaline, are the occaſion of coryzæ, gravedines, moiſt coughs and aſthmas, cold œdematous, ſcirrhous, and glandulous tumors.

Authors diſtinguiſh *congeſtions* from ſtaſes ſanguinis, by this, that in theſe the quality and progreſſive motion of the humors are greatly altered, in the others, as ſuch, they are not altered at all.

The ſigns of *congeſtions* are deduced from their effects, and are theſe. In the parts affected there is a diſtenſion of the veſſels, ſo that the very ſmall ones, which ſcarce appear at another time, are now found turgid, with heavy and tenſive pains, and often, as it were, with a ſenſation of pricking; if the *congeſtion* be carried farther, there ſucceeds to theſe redneſs, and preternatural heat in the part: when upon this there appears an hæmorrhage, all the ſymptoms vaniſh; but if this diſcharge does not happen, there are frequently formed tumors, and running ulcers, with violent pain and inflammation. Theſe are the ſymptoms in the affected parts; in the more remote ones, there is a conſtriction of the veſſels, ſo that they appear leſs than natural, and a ſenſation of coldneſs in the fleſh.

The perſons moſt ſubject to *congeſtions* are thoſe of a plethoric habit, and ſuch as live ſedentary lives, and eat and drink high; and to theſe are to be added, ſuch as have been uſed to ſome habitual diſcharge of blood, whether natural, or by regularly bleeding in the arm at ſtated times of the year, and afterwards live wholly without theſe; and ſuch as have had iſſues, bliſters, or old natural ulcers dried up, without uſing the neceſſary precautions on ſuch occaſions. *Junker*'s Conſp. Med. p. 90.

Cauſes of CONGESTIONS. Theſe are principally a plethoric habit of body, and an effort of nature to relieve herſelf from the load, by diſcharging part of it at ſome proper outlet. To theſe are to be added many external and occaſional ones; ſuch are a moiſt and cold air, and ſometimes a moiſt and hot one; a refrigeration of the remoter parts, or of thoſe oppoſite to ſuch as are proper for the *congeſtion*.

The effects of *congeſtions* are generally ſtagnations; and from theſe ſtaſes and corruptions of the blood and humors, too frequently ariſe. When *congeſtions* are become habitual to a perſon, they very rarely yield to the effects of medicines, even though the material cauſe is removed, but often after this renew their ſymptoms in ſome different way. When *congeſtions* are ill treated, eſpecially when narcotics are given, or hot medicines, or a warm diet are indulged, they always return the more frequently upon the patient, or bring on a ſeries of other diſorders; and *congeſtions* in themſelves are not without danger, when they affect perſons at a certain time of life. Finally, *congeſtions* in the breaſt are always of more unhappy conſequence than thoſe of the head and abdomen, becauſe the evacuation of the blood, which is what nature aims at in a *congeſtion*, is not to be effected any way happily in the breaſt.

Method of treating them. In the time of the paroxyſm, the bowels, which are uſually bound in this caſe, are to be looſened by a gentle emollient clyſter, or by ſome of the gentle purges; and the too great expanſion of the blood, and ſtricture of the fibres, is to be prevented by abſorbents, and nitrous medicines, with the addition of cinnabar, and of the common diaphoretics: to this purpoſe powders are to be given three or four times a day, compoſed of crabs eyes, nitre, antimonium diaphoreticum, and cinnabar, either native, or that of antimony; and if the pains are violent, a gentle opiate may be added to the powder to be taken at night. To theſe things are to be added the temperate alexipharmics, and the mild and diluent diaphoretics; ſuch as tea made of the flowers of lavender, of ſage, and the like: and when the blood begins to ſtagnate in the place of the *congeſtion*, topics may be uſed; ſuch as camphorated ſpirit of wine, or a cataplaſm of caraway ſeeds, juniper berries, ſalt, and crumb of bread: and in ſome caſes repellents may be ſafely uſed; ſuch as the vinegar of roſes, and mixtures with nitre, and with ſaccharum ſaturni. *Junker*'s Conſp. Med. p. 92.

STUFFINGS *of the breaſts*, in infants. See INFANT.

STUM, (*Cycl.*) in the wine trade, a term for the unfermented juice of the grape, when it has been ſeveral times racked off, and ſeparated from its ſediment. The caſks are for this purpoſe well matched, or fumigated with brimſtone every time, to prevent the liquor from fermenting, as it would otherwiſe readily do, and become wine.

It is this fume of the ſulphur from the match that prevents, in this caſe, all tendency to fermentation, and continues the natural juice of the grape in a ſweet ſtate, fit to be readily mixed with wines inſtead of ſugar; for which purpoſe it is very much uſed in Holland, and ſome other countries, as alſo for giving a new fret, or briſkneſs, to decayed wines. So that very large quantities of this *ſtum* are annually imported to all parts along with the foreign wines; and after the ſame manner a *ſtum* is prepared in England from the juice of apples, which ſerves the ordinary purpoſes of the wine-cooper. In the preſerving this liquor in this ſtate, we ſee the vaſt uſe of brimſtone, for it could never be done otherwiſe, than by the matching the caſks. *Shaw*'s Lectures, p. 192. See the article MATCHING.

Artificial STUM. An artificial muſt, or *ſtum*, as good as the natural, and as fit for the re-fermenting, fretting, improving, or making of wines, vinegars, and ſpirits, may be prepared in the following manner.

Take three pound of fine lump ſugar, or ſuch as has been well refined from its treacle, melt it in three quarts of water, and add in the boiling of Rheniſh tartar, finely powdered, half an ounce; this diſſolves with a remarkable ebullition, and gives a grateful acidity to the liquor; take the veſſel from the fire, and ſuffer it to cool, and you have an artificial muſt, which in all reſpects reſembles the natural taſte and ſweet juice of a white flavourleſs grape, when well purified, and racked off from its ſediment, in order to make *ſtum*. If this artifical muſt be ſtummed, that is, well fumigated with burning brimſtone, it becomes a perfect *ſtum*, and may be made of any flavour, at the diſcretion of the artiſt. *Shaw*'s Lectures, p. 202.

STUPHA, a name given by ſome writers to a balneum vaporis.

STUPIO, a name given by ſome of the writers in chemiſtry to tin. See TIN.

STURDY, in cattle, a kind of diſtemper, otherwiſe called the *turning-evil*. See TURNING-*evil*.

STURIO, the *ſturgeon*, a very well known, large, and fine-taſted fiſh, caught in many places, and ſometimes in the river Thames, being one of thoſe fiſhes called *anadromi* by authors, which ſpend a part of their time in the ſea, and a part in rivers.

It never goes into the ſea to any great diſtance, and never is caught there of any very great ſize. The ſea ſerves for its production, but it is only in large rivers that it grows to its uſual ſize. *Ray*'s Ichthyogr. p. 248.

STURNUS, the *ſtarling*, a bird very well known, and of the thruſh, or turdus kind.

There is, beſide the common ſpecies, a very beautiful one, deſcribed by Bontius under the name of the *Indian ſtarling*, or *ſturnus Indicus*. This is of the ſize and ſhape of our common *ſtarling*, but is variegated with a deep blue, a lead colour, and a pale grey, and has on its head a very beautiful yellow creſt. It learns to imitate the human voice, and talks much better than the parrot, but is troubleſome in being over noiſy. *Ray*'s Ornitholog. p. 145.

Linnæus makes the *ſturnus* a diſtinct genus of birds, of the order of the *paſſeres*; the diſtinguiſhing characters of which are, that the tongue is membranaceous, ſharp, and edged with a rim, or margin; the beak is of a ſomewhat cylindric form, and is pointed and crooked. *Linnæi* Syſtem. Naturæ, p. 49.

STYE, or STITHE, the Engliſh name for a diſorder on the eyelids, called by the phyſicians *hordeolum*, and by ſome *crithe*, *chalazium*, or *grando*.

It is a ſmall encyſted tumor, uſually of about the bigneſs of a barley-corn, which ſometimes degenerates into matter, and occaſions great pain and uneaſineſs.

The tenderneſs of the organ of ſight makes it neceſſary to be careful about theſe tumors, which, if ſituated in any other part of the body, would hardly deſerve much attention. Some authors commend cataplaſms, and the like applications, to theſe, but the eye is often hurt by thoſe applications; and it is obſerved beſides, that theſe tubercles ſeldom give way to topical applications of any kind.

When they are ſmall, it is beſt to let them take their own courſe; but if ſo large as to occaſion deformity, or danger of hurting the ſight, the way to extirpate them, is to make a longitudinal inciſion on the part, and carefully take them out whole; or if it cannot be thus got out clean, it muſt be cut out, as far as may be, with ſciſſors, and dreſſed with Ægyptian ointment, and a little red precipitate, or touched at times with the common cauſtic, till eaten thoroughly away, and then the wound dreſſed and healed in the common manner.

This is the method by which the flat and broad-bottomed tumors of this kind are to be extirpated; and in this great care muſt be taken that none of the ſharp applications touch the eye, as they might injure the ſight. It is common, however, with theſe tumors to hang by a ſort of ſmall root, and then they are much more eaſily managed, there being no more neceſſary than the cutting them cloſe off with a pair of ſciſſors, or the tying them firmly round with a piece of ſilk, or horſe-hair. They are ſometimes, if taken in time, diſperſed by rubbing them with faſting ſpittle, or with applying the pulp of a roaſted apple mixed with ſome ſaffron and camphor. *Heiſter*'s Surgery, p. 365.

STYGIA *aqua*, a term uſed ſometimes to expreſs aqua regia; ſometimes for the other ſtrong acid ſpirits.

STYLE, among botaniſts. See PISTIL.

STYLOBATON, or STYLOBATA, in architecture, the ſame with the pedeſtal of a column. It is ſometimes taken for the trunk of the pedeſtal, between the cornice and the baſe, and then called *truncus*. It is alſo called by the name of *abacus*.

STYLOCERATOIDES, in anatomy, a name given by Riolanus, and ſome others, to a muſcle, more generally known by the name of *ſtylohyoidæus*. See the next article.

STYLOHYOIDÆUS, a ſmall fleſhy muſcle, lying obliquely between the apophyſis ſtyloides, and os hyoides.

It is fixed laterally by one extremity to the root, or baſis of the apophyſis ſtyloides, and by the other to the os hyoides, at the place where the baſis and cornu unite, and likewiſe to the cornu itſelf, from whence it has been called *ſtylo-cerato-hyoidæus*. The fleſhy fibres of this extremity are often parted, and incloſe the middle tendon of the digaſtricus. *Winſlow*'s Anatomy, p. 255.

STYLOHYOIDÆUS *novus*, a name given by Santorini to a ſmall muſcle of the os hyoides, called by Albinus *ſtylohyoidæus alter*, and by Douglaſs *ſtylochondrohyoidæus*. See the articles MOUTH and Os *hyoides*.

STYMMATA, a word uſed by ſome authors to expreſs the ſtiff ointments. The antients uſed the word both for their more ſolid and ſtiff ointments, and for the ingredients which gave thoſe ointments that conſiſtence: they alſo called by the ſame name the ſeveral ſweet ingredients which they put into their ointments, to give them a fragrancy, and preſerve them from corruption; ſuch were the powders of ſpikenard, mint, amomum, and the ſeveral ſpices.

STYMPHALIA, Στυμφαλια, in antiquity, a feſtival at Stymphalus in Arcadia, in honour of Diana, called from that place *Stymphalia*. *Potter*, Archæol. Græc. Tom. I. p. 431.

STYMPHALIDES *aves*, in fabulous antiquity, birds of an extraordinary ſize, which in their flight are ſaid to obſcure the ſun. They fed only on human fleſh; but Hercules, by the help of Minerva, drove them out of Arcadia by the noiſe of cymbals. *Danet*. in voc.

STYPTIC (*Cycl.*)—STYPTIC *powder of Helvetius*, in pharmacy, a compoſition of alum and dragon's blood. In the Edinburgh diſpenſatory, two parts of alum are directed to be made into powder with one of the dragon's blood: others uſe equal parts of both. See Med. Eſſ. Edinb. Vol. 4. Art. 7.

This medicine is ſaid to be extremely ſerviceable in uterine hæmorrhages, either to correct the too frequent return of the menſes, or their too great abundance; alſo to ſtop the flooding, to which women with child are ſubject, and to moderate the flow of the lochia. It has alſo been found to have ſurpriſing good effects in the fluor albus.

In violent bleedings it may be given in the quantity of half a drachm every half hour, and it ſeldom fails of ſtopping the bleeding before three drachms, or half an ounce has been taken. See Medic. Eſſ. ibid.

Heiſter alſo, in his Compendium Medicinæ Practicæ, p. 143, recommends this powder, or alum alone, with a decoction of lin-ſeed, from Helvetius Traitè des pertes de ſang.

Eaton's STYPTIC, a medicine famous for curing freſh wounds in a very ſmall time, and immediately ſtopping their bleeding.

The method of curing freſh wounds in a few days without ſuppuration, where neither nerves, large veſſels, bones, nor any of the viſcera are concerned, has been a practice long ago uſed.

Purman, a famous ſurgeon of Breſlaw, in his Chirurgia Curioſa, tells us of a mountebank who gave himſelf thirteen wounds by inciſion in the upper part of his left arm, and applying his noſtrum with a common roller, the wounds were all well in two days: and both this author, and Blegny, mention what they call a *martial ſtyptic*, which cures wounds in two days, eſpecially if the patient take alſo a few drops of it inwardly.

The French were a long time very fond of a *ſtyptic* ball made of filings of iron and tartar, mixed to a conſiſtence with French brandy, which was afterwards publiſhed by Helvetius, and from him has been generally known by the name of *Helvetius*'s *ſtyptic*. This was extolled with us as one of the greateſt medicines in the world for the cure of wounds, bruiſes, and external injuries of all ſorts: but the author never ſaid ſo much about it; he only modeſtly introduced it into the world as an uſeful thing for a firſt dreſſing of freſh wounds with people who lived too far off for the immediate aſſiſtance of a ſurgeon: and he mentions ſeveral caſes, in which it ought not to be uſed. In fine, he publiſhed it as a good medicine under proper reſtrictions; but we made it an univerſal one. The only univerſal remedy of this kind, that we have had recommended by the author as ſuch, is the famous *ſtyptic* of Dr. Eaton, which the inventor ſays is good to ſtop all manner of bleeding both without and within, without any manner of exception.

Sir Richard Blackmore, ſoon after the publication of this great ſecret, wrote a treatiſe on conſumptions, in which he highly extols this *ſtyptic* of Dr. Eaton, declaring poſitively, that it will be of more ſervice to the world than all the diſcoveries that had been made before it. On this Dr. Sprengel, who had before examined *Eaton*'s *ſtyptic*, and judged it to be no other than that of Helvetius; which, after having been tried and diſcarded in France, Germany, and Holland, had been ſet on foot as an univerſal medicine here, thought it worthy a more ſtrict and public examination, and ordering an apothecary of credit to prepare him ſome of Helvetius's *ſtyptic* in the common way, he produced before a judicious audience a bottle of that, and another of *Eaton*'s *ſtyptic*; and giving them both the ſame trial, they both anſwered in the ſame manner, and proved, beyond all poſſibility of doubt, that they were in effect the ſame medicine.

The ſame trials were made by ſeveral other chemiſts, phyſicians, and apothecaries; and the event proving the ſame in all, it appeared wonderful that a man, who had a mind to ſell a known medicine under the notion of a ſecret, ſhould not have had the caution to alter or diſguiſe it either in taſte, ſmell, or colour; which he might very eaſily have done, without at all impairing its virtues as a medicine.

The uſual method of trying a *ſtyptic* is upon the crural artery of a dog cut open for that purpoſe. In this manner the *ſtyptic* of Helvetius and Eaton were both tried, and both anſwered very well; and plain French brandy being alſo tried, had the ſame ſucceſs; whence it appeared, that there was no very great virtue in either, more than the heat of the ſpirit, which forcibly conſtringed the fibres: and when we conſider the ſmallneſs of the crural artery in a dog, we ſhall not wonder that a trifle ſtops the bleeding of it, ſince, with a bit of dry lint, or even with no application at all, the bleeding will ſtop of itſelf, without any hurt to the animal. By this, and by the common experiments made upon this *ſtyptic* on other occaſions, its external virtues appear to be very trifling. Internally, however, it is a much worſe medicine. It is too often given in natural hæmorrhages; and in all theſe caſes, as there is a ſtimulation and feveriſh diſpoſition, which gives occaſion to the bleeding, it is certain that any thing, of the nature of brandy and a chalybeate, muſt add to it, inſtead of curing it. Upon the whole, the virtues of theſe *ſtyptics* externally are too trifling to be truſted to; and internally too precarious to meddle with, without the greateſt caution. Philoſ. Tranſ. N° 383. p. 110.

STYRAX (*Cycl.*)—STYRAX, the *ſtorax-tree*, in botany, the name of a genus of trees, the characters of which are theſe. The flower conſiſts of one leaf, and is of the funnel-faſhioned kind, and divided into many ſegments at the edges. The piſtil ariſes from the cup, and is fixed, in the manner of a nail, into the hinder part of the flower: this finally becomes a roundiſh, or fleſhy fruit, containing one or two kernels, in which are ſoft ſeeds.

There is only one known ſpecies of this tree, which is the common, or quince-leaved *ſtorax-tree*. *Tourn.* Inſt. p. 598. See the article STORAX.

SUBARMALE, among the Romans, a coarſe and thick kind of caſſock worn by the ſoldiers under their arms, in order to keep them from being hurt with their weight. *Pitiſc.* Lex. Ant. in voc.

SUBBUTEO, in zoology, the name of a bird of the hawk kind, called in Engliſh the *ringtail*; the male of which is called the *hen-harrier*. Some authors give it the name of *pygargus accipiter*. *Ray*'s Ornithol. p. 40. See the articles RINGTAIL and HEN-HARRIER.

SUBCLAVIUS, a ſmall oblong muſcle, lying between the clavicle and firſt rib. It is fixed by one end in all the middle lower portion of the clavicle, at the diſtance of about an inch from each extremity; and by the other in the cartilage, and a ſmall part of the bone of the firſt rib. It ſeems likewiſe to adhere to the extremity of the clavicle, next the ſternum, by a kind of broad thin ligament. *Winſlow*'s Anatomy, p. 177.

SUBCOSTALES. Theſe muſcles are fleſhy planes of different breadths, and very thin, ſituated more or leſs obliquely on the inſide of the ribs near their bony angles, and running in the ſame direction with the external intercoſtals. They are fixed by other extremities in the ribs, the inferior extremity being always at a greater diſtance from the vertebræ than the ſuperior, and ſeveral ribs lying between the two inſertions. Theſe muſcles are more ſenſible in the lower ribs than in the upper, and they adhere cloſely to the ribs that lie between their inſertions. *Winſlow*'s Anatomy, p. 233.

SUBDUPLICATE *ratio* of any two quantities, is the ratio of their ſquare roots. See RATIO.

SUBER, the *cork-tree*, in botany, the name of a genus of trees, the characters of which are theſe. The fruit and flowers are the ſame with thoſe of the ilex, but the bark of the tree is thick, fungous, and light.

There are two ſpecies of this tree. 1. The ever-green broad-leaved *cork-tree*. 2. The *cork-tree* with narrow, and not ſerrated leaves. *Tourn.* Inſt. p. 584.

SUBETH, the word uſed by the Arabian writers to expreſs a carus.

SUBETH *ſabala*, a term uſed by the Arabian writers to expreſs a coma vigil.

SUBFRONTALIS *futura*, a name given by ſome anatomical writers to the future, by which the os frontis is connected with the bones of the ſuperior jaw.

SUBJECT (*Cycl.*)—SUBJECT, in the manege. To keep a horſe *ſubject*, is an expreſſion relating to volts; ſignifying, to keep the croupe of the horſe in the round, ſo that it may not ſlip out; that he may not traverſe; and that he may work

work in the manege, croupe in, marking his equal times, without losing his ground.

SUBJECT, in music. See SOGGETTO.

SUBJECTION, *subjectio*, in rhetoric, is used for a brief answer to a preceding interrogation: thus Cicero, *Quid ergo? audaciſſimus ego ex omnibus? minimè. Voſſ.* Rhet. lib. 5. p. 416.

SUBINTRANTES *febres*, a term used by some medical writers to express those fevers in which one fit begins before the other is perfectly worn off.

SUBITO, in the Italian music, is used to signify that a thing is to be performed quickly and hastily: thus we meet with *volti ſubito*, turn over the leaf quickly.

SUBLIMABLE *bodies*, a term used by some of our chemical writers to express such substances as are capable of *ſublimation* in a dry form.

They say that only those things are *ſublimable*, which contain a dry exhalable matter in their original construction; and among these they find a great variety, which require various methods and means to execute that effect. Among the minerals, sulphur, antimony, and orpiment, are named as the principal among *ſublimable* bodies: these are of a very lax compage, or structure, and are easily raised by fire in small particles, which concrete again on being stopt from flying off by the cover of the vessel; while, on the contrary, iron, silver, and the other metals, being of a closer structure, remain fixed in the greatest heat, and never ascend, unless mixed with some volatile substance that is itself capable of rising, and of taking up some of them with it.

Thus copper and iron will be raised in *ſublimation* by means of sal armoniac mixed with them; and even gold itself is said to be subject to the same law, Mr. Boyle assuring us, that he had a secret method of preparing a certain saline substance, by means of a very small admixture of which, the gold would be made to rise in *ſublimation*, and form fine purple crystals.

Fire is the great agent in *ſublimation*; and according as these bodies are more or less dense and compact, this is to be made more or less strong, and continued a longer or a shorter time. Very often the internal heat alone, occasioned in vegetable or animal substances by fermentation, is sufficient to *ſublime* certain of their principles, as is evident in Wedelius's instance of a ball of woad, or glastum.

Many substances of a looser texture are to be *ſublimed* alone, and many others are to have other things mixed with them, as before observed, in order to make them subject to this operation of the fire. The admixtures, which are to make bodies *ſublimable* which are not so in themselves, are to be of various kinds, according to the nature of the body to be *ſublimed*; and the attempt of this process upon any particular body is never to be given over on the first essay, but the whole round of those things, which render *unſublimable* bodies *ſublimable*, are to be tried first, that what one does not effect, another may have its chance of doing.

Among these bodies, used as mixtures in *ſublimation*, some act by rendering the body more easily fusible, and disuniting those particles more readily which the fire is expected to carry up; others act only by preventing the cohesions of the particles of the substance to be *ſublimed*, which heat would otherwise occasion; and finally, others by entering the body of the fixed substance they are mixed with, and giving wings, as it were, to its subtle particles, so that they may ascend with its easily *ſublimable* matter, and join with it in the formation of one mixed substance in the top of the vessel, by partaking of the nature of both. Others act potentially in the same way, but by different means, themselves not being capable of *ſublimation*, but acting on the substance to be *ſublimed*, by enervating, weakening, or absorbing those substances, or parts of the mixed body, which would have otherwise prevented the ascent of the rest; and finally, some act as dissolvents only, and by that means render things easy of *ſublimation*, which would have been very difficultly so, while their parts were in a more strict continuity.

The use of this management of *ſublimable* bodies is to prepare the flowers, the sulphurs, or the volatile salts of those bodies, pure and separate from their terrestrial fæces, from phlegm, from impure oils, and from acids; and the mixing together the *ſublimable* bodies of two or more kinds into one substance, proper for the uses of medicine, painting, &c. as in the combination of mercury with sulphur into cinnabar; a noble medicine, and a very valuable paint; or with corrosive salts into the common drugs, called, by way of pre-eminence to all others, *ſublimate*. *Hoffman*'s Acta Laborat. Chem.

SUBLIMATE (*Cycl.*)—*Corroſive* SUBLIMATE. In making *ſublimate*, the quicksilver is extinguished by trituration in calcined vitriol. But Monsieur Lemery observes, that bole armeniac and potters clay are cheaper, and extinguish the mercury sooner.

It has been said, that to try whether *ſublimate* has been sophisticated with arsenic or not, it was to be rubbed with salt, or oil of tartar; and that if sophisticated, it would turn black. But Mr. Lemery agrees with Barchusen and Boulduc, that this is no trial; for the salt of tartar has the same effect on the good and the bad *ſublimate*. See Mem. de l'Acad. des Scien. 1734.

Dr. Kirsten affirms that *ſublimate*, rightly prepared, becomes first saffron coloured, and then red, when oil of tartar is dropped on it: whereas, if it is adulterated with arsenic, it becomes first near the colour of brimstone, then red, afterwards ash coloured, and lastly black. He is positive in this, notwithstanding what Barchusen and Boulduc have said to the contrary. Commerc. Norimb. 1738. Hebd. 12. §. 2.

An anonymous chemist affirms, that *ſublimate* prepared with arsenic becomes at last white, instead of black, when touched with oil of tartar. He says, that in the *ſublimation* of sweet mercury, where the *corroſive ſublimate* has been adulterated, the upper part is of an orange colour, and a white earth remains in the bottom, and the belly of the glass becomes dark coloured, or smoaky; whereas, when the corrosive mercury is genuine, the upper part is white, the powder in the bottom is red, and the middle is not smoaky coloured. But the sweet mercury, prepared with genuine or adulterated corrosive, appears on every trial the same. Dr. Kramer relates the history of a lad who swallowed half an ounce of *corroſive ſublimate*; soon after which his mouth and stomach were so eroded, that he voided large quantities of blood, both upwards and downwards, with violent gripes, coldness of the extremities, startings of the tendons, and racking pain. A vomit was soon given; notwithstanding which the symptoms continuing, Dr. Kramer ordered mild drink, with large quantities of oil of tartar *per deliquium* in it, by which the symptoms soon were mitigated, and the cure was compleated by giving theriaca andromachi, with terra sigillata, and putting him into a warm bath. Commerc. Norimb.

Blue SUBLIMATE, a preparation of mercury with some other ingredients, yielding a fine blue for painting. The method of making it is this: take quicksilver two parts, flower of brimstone three parts, sal ammoniac eight parts; grind these upon a porphyry, and with the quicksilver put them into a long-necked glass vessel luted at bottom; place it in a sand-heat, and when the moisture is ascended, you will have a fine *blue ſublimate* for painting. *Neri*'s Art of Glass, p. 164.

SUBLIMIS, in anatomy, a name given by Albinus, Hunaud, and others, to the muscle of the wrist, called by others the *perforatus*. See the article PERFORATUS.

These authors call the perforans the *profundus*. See the article PERFORANS, *Cycl.*

SUBLINGUALIA, a term used by some authors to express such medicines as were intended to be laid under the tongue, and gradually dissolving there.

These have been principally intended either to cure coughs, or give a sweet scent to the breath.

SUB-MARSHAL, an officer in the Marshalsea, who is deputy to the chief marshal of the king's house, commonly called the *knight marſhal*, and hath the custody of the prisoners there. He is otherwise termed *under marſhal*. Crompt. Jurisd. 104. *Blount*, *Cowel*.

SUBMARINE *navigation*. See the article *Submarine* NAVIGATION.

SUBMERSION, *ſubmerſio*. See DROWNING.

SUBMISSIO, a word used by medical writers to express a remission.

Sometimes it imports the same as *ſyſtole* with respect to the arteries, that is, their contraction.

SUBPRINCIPALIS, in some Latin writers of music, is used for the note or chord called by the Greeks παρυπατη, *parhypate*.

SUBPURGATION, *ſubpurgatio*, a word used by some writers to express a gentle purgation.

SUBROTUND *leaf*, among botanists. See LEAF.

SUBSCAPULARIS, (*Cycl.*) a muscle of the same breadth and length with the scapula, of which it occupies all the inner or concave side; and having its name from its situation.

It is thick, and made up of several penniform portions, nearly in the same manner with the deltoides. It is fixed in the internal labium of the whole basis, and in almost the whole internal surface of the scapula; its fleshy portions lying in the intervals between the bony lines, when these are formed. Near the neck they leave the bone, and form a very broad tendon, which is inserted in the surface of the small tuberosity of the head of the os humeri, close by the bony channel. The lower edge of this tendon probably sends off the ligamentary frænum, mentioned in the descriptions of the latissimus dorsi, teres major, and coracobrachialis. This muscle covers immediately the serratus major, being in a manner inclosed between it and the scapula: the upper edge of its tendon is joined to the lower edge of that of the supra spinatus, except at the upper part of the bony channel, where they give passage to one tendon of the biceps. It likewise adheres to the capsular ligament. The tendons of the supra spinatus, infra spinatus, teres minor, and *ſubſcapularis*, being all joined by their edges, form a sort of cap, which covers the upper part of the head of the os humeri. *Winslow*'s Anatomy, p. 184.

SUBSISTENCE, in the military art, is the money paid to the ſoldiers weekly, not amounting to their full pay, becauſe their clothes, accoutrements, tents, bread, &c. are to be paid; it is likewiſe the money paid the officers upon accompt, till their accompts be made up, which is generally once a year, and then they are paid their arrears.

SUBTERRANEAN (*Cycl.*)—SUBTERRANEAN *fires*. Among the many places where theſe *fires* are found, England is not wholly without them; though with us they appear only in the coal countries, and plainly feed on nothing but the upper ſtratum of the coal, called by the miners *day coal*, unleſs where they have by accidents been kindled by actual fires at great depths, or fired downward, by being pent in for room. See VOLCANO.

They have, in many places, been known to burſt out ſpontaneouſly from the ſurface, and make their courſe both ways from the place along the ſtratum. There is no actual native ſulphur found there, but there are plenty of the marcaſites, to which the *fire* is probably originally owing; as we know that theſe ſtones, piled up in a heap in the air, will often take fire of themſelves.

If at any time a ſmall quantity of melted ſulphur ſhould be found in the earth, it is not to be ſuppoſed to be native there; for the *fire* acting on the other marcaſites it meets with, may very well melt and ſeparate the ſulphur from them, as is done at Goſſelaer, and in ſome other places, where the ſulphur we commonly uſe is made in that manner by art.

It has been ſaid, that crude ſal armoniac is found in the earth in theſe places; but it is only met with at the mouths of the *fire*. Where the ſmoak aſcends in theſe places, there continually ariſe vaſt quanties of the vapours of ſulphur, as well as ſal armoniac; and cruſts of the flowers of ſulphur, and of ſublimed ſal armoniac, are found together around theſe openings. The brimſtone generally ariſes firſt, and forms a cruſt, under which there is a cruſt of ſal armoniac.

It is remarkable, that in the places where theſe *fires* have burnt, there are often found cavities in the rocks, containing a white milky liquor of a ſtyptic taſte: this is a ſort of liquid alum, and yields generally about one half of that ſalt.

The ſal armoniac is found in conſiderable quantities in ſome of theſe places, yet its origin is not eaſily accounted for on the common principles; for neither nitre, nor common ſalt, are found in the earth thereabouts. The ſprings alſo, which ariſe in the neighbourhood of the places where the *fire* is, have been diligently examined, and no ſuſpicion of the leaſt admixture of ſal armoniac appears in them. The water that runs through the ſtrata of coal in all theſe countries is vitriolic, and turns black with a decoction of galls. There needs no more than burning pit coal to produce ſal armoniac; for it has been found produced in brick-kilns, where nothing but coals and clay have been laid together: and here it muſt be aſcribed to the coal alone, no one ever having found it in clay. Phil. Tranſ. N° 130. See FIRE.

We have an account, in the Philoſophical Tranſactions, of a *ſubterranean* town found at Portici, near Naples, in which many antique ſtatues, paintings, and other curioſities, have been found.

This *ſubterranean* town is probably the antient city of Herculaneum, which was ſwallowed up by an earthquake. See Phil. Tranſ. N° 458. ſect. 4, 5, and 6.

It is remarkable, that ſome of the antique paintings found there are as freſh and perfect, as if lately painted. Ibid. ſect. 6.

SUBTRACTION. See the article SUBSTRACTION, *Cycl.*

SUBVERSIO *ſtomachi*, a term uſed by ſome authors to expreſs a violent vomiting, when what ſhould paſs through the inteſtines is voided conſtantly by the mouth.

SUBULARE *folium*, among botaniſts. See LEAF.

SUBULATED *leaf*, among botaniſts. See LEAF.

SUBULO, a term uſed by Pliny for deer two years old. See the article FERULÆ.

SUBULO, in natural hiſtory, a word uſed by the antients to expreſs a deer, or ſtag, at that time of its life when the horns firſt begin to appear.

Others have underſtood it as the name of the oryx, whoſe horn was narrow at the ſummit, and thence gradually larger toward the baſe, ſo that it reſembled the figure of the ſubula. This is the fabulous creature called the *unicorn*, and deſcribed as a nimble and terrible animal. But it is certain that no ſuch animal ever exiſted, as is called by this name, and thus deſcribed: the only one-horned animal in the world is the rhinoceros, and this is an unwieldy heavy animal, not at all reſembling the characters or figures we have of the *ſubulo*, or oryx.

It is to be obſerved, that the *ſubula* of the moſt antient writers was an inſtrument of iron, ſharp at the point, uſed in the ſtone-quarries to break way through large maſſes.

SUCCENTURIATI (*Cycl.*)—It is the opinion of Dr. Kerkring, and of many ſince his time, that theſe are caſes in which there is elaborated a bilious juice, which afterwards, either by the emulgent vein, or, as often is the caſe, immediately paſſes to the cava, and being thence conveyed to the heart, raiſes there that efferveſcence, which Sylvius contends to be excited in that part by the mixture of a ſaltiſh liquor with an acid: for although experience contradicts the conveyance of the juice out of the liver through the cava, yet that efferveſcence in the heart, upon which the whole ſyſtem of Sylvius is grounded, may ſtill hold, if this opinion about the uſe of the *ſuccenturiati* be true. As there needs but very little leaven to ferment a large maſs, which is in a proper ſtate and condition to be fermented, a very minute quantity of ſalt of tartar, mixed with a very large portion of oil of vitriol, will occaſion not only a very conſiderable, but a very laſting fermentation; though a very conſiderable quantity of the latter, poured on a quantity of the former, cauſes but a languid and ſhort efferveſcence. This account of an opinion, though not now received, may be worthy the conſideration of thoſe who remember how cautiouſly both ſides of a queſtion ought to be heard, before any thing is determined in regard to it. *Kerkring*, Spicileg. Anat.

SUCCIFERA *vaſa*, in natural hiſtory, a name given by thoſe who have written of the anatomy of plants, to thoſe veſſels which contain the juices, by way of diſtinction from thoſe which only give paſſage to the air, and are called *tracheæ*. Lewenhoek tells us, that the microſcope diſcovers the *ſucciferous* veſſels of plants to be, in all reſpects, analogous to thoſe of animals, and that they are of two kinds, veins and arteries: the latter receiving the juices from the root, and carrying them all over the plant; and the others receiving the juice from their extremities, and carrying it back again to the root, where it is again delivered to the arteries.

SUCCINUM, *amber* (*Cycl.*)—The origin of *amber* has been much diſputed among the naturaliſts, and many erroneous, and ſome even abſurd, conjectures made about it. There ſeems however, from experiment and a cloſer obſervation, to be no doubt but that it is wholly of mineral origin, and is a bitumen which was once liquid, and of the naphtha, or petroleum kind, hardened and brought into its preſent ſtate by a mineral acid, of the nature of ſpirit of ſulphur, or oil of vitriol; both theſe ſubſtances abounding in the earth, and an artificial mixture of them producing a body much reſembling *amber*, and affording all its principles on a chemical analyſis.

Flies, and other ſmall inſects, found bedded in *amber*, have by ſome been ſuppoſed mere *luſus naturæ*, and never to have been real animals; but this needs only the eye to diſcover its abſurdity: and with others, who allow them to be real, they are uſed as proofs that *amber* is of vegetable origin, and was once ſoft and fluid. That they do prove the laſt is certain, but by no means the firſt. To judge properly of this, we ſhould conſider the true ſtate of the caſe, which is this: that more than a thouſand pieces of *amber* are found without inſects, for one that has any; and that moſt of the pieces which have them, have not been dug out of the earth, but found on the ſea ſhores. The ſides of hills we well know are continually trickling down the liquid bitumens; and there is no abſurdity in ſuppoſing, that ſmall quantities of this might, in its paſſage, be detained in little cavities of rocks, &c. and there ſuffer leiſurely its change into *amber*, from the matter of its natural acid being near. And it can be no wonder that flies, &c. ſhould be drowned in ſuch a maſs of matter, which being afterwards hardened, might be found on the ſurface of the earth, or waſhed down to the ſea, in the form of common *amber*. Nor is there any thing impoſſible in the maſſes, thus formed on the ſurface, being afterwards buried in the earth, by the various changes we know the ſurface of the earth at times is ſubject to.

Beſide the places whence *amber* is uſually brought, which are Pruſſia, Pomerania, &c. we have it on our own ſhores, and even in our clay-pits; the pits dug for tile clay, between Tyburn and Kenſington Gravel-pits, have afforded many ſpecimens; and that behind St. George's Hoſpital, at Hyde-park Corner, has afforded fine ſpecimens, one of which has been wrought into a beautiful cane-head of three inches long. *Hill*'s Hiſt. of Foſſ. p. 409.

If the people, who collect *amber* on the ſhores of the Baltic, were more curious and particular in their obſervations of the maſſes they find, we ſhould doubtleſs have much more lights into its true hiſtory and nature. There is no queſtion, but that ſome pieces of it are toſſed up there ſo imperfectly formed, that the proceſs of nature may be ſeen in their different ſtages. Pieces have been ſometimes found ſo ſoft, as to receive the impreſſion of a ſeal: theſe are always not only perfect *amber* in other reſpects, but they are obſerved to have a ſmell ſtronger than the common *amber* has. Theſe pieces ſometimes harden immediately, on being expoſed to the air, but ſometimes they retain this ſoftneſs many months. We have an account of ſuch a piece in the Philoſophical Tranſactions, which had retained this ſoftneſs a whole year, in which time it had lain among other pieces of *amber*; and of another maſs very ſoft on one ſide, and hard on the other, and containing in the ſoft part a fly buried. Phil. Tranſ. N° 57.

This foſſil has been of great repute in the world from the very earlieſt times we have any knowledge of, many years

before Chriſt it was in eſteem as a medicine; and Plato, Ariſtotle, and Herodotus, and among the poets Æſchylus, and others, have commended its virtues. In the times of the Romans it became in high eſteem as a gem; and in the luxurious reign of Nero immenſe quantities of it were brought to Rome, and uſed for ornamenting works of various kinds. Long after this Theodoric, king of the Goths, ſhewed a high eſteem for it. However well known, and however highly eſteemed this ſubſtance was in theſe ages, its nature and origin yet remained unknown through a long ſeries of time, and various conjectures were made about it in the different places where people were poſſeſſed of it among their gems; ſome ſuppoſed it the product of Africa, others of Aſia, and others of America; and the gardens of the Heſperides, Ægypt, Æthiopia, and Numidia, were ſuppoſed, in the firſt mentioned part of the world, to give it birth. Thoſe who made it the produce of Aſia, gave Arabia, and ſome parts of the Eaſt-Indies, as the places of its production; and thoſe who ſuppoſed it brought from Europe, gave Italy, the river Eridanus, and the borders of the Adriatic, as the only parts whence it came: but the Romans, when they ſpread the terror of their arms through Germany, found it on the ſhores of the German ocean and the Baltic, and Spain, and afterwards Britain, were added to the liſt of places where it was found.

The antients, who had leſs traffic, and leſs knowledge of the world than we have, are the more pardonable in allotting ſo great a number of places, and many of them falſe ones, for the production of *amber*, and for not diſcovering the true place where it has been at all times found in the greateſt plenty, and whence moſt parts of the world have long been, and are to this day ſupplied; but the moderns are much more unpardonable, who in their accounts give us Aſia, Africa, and America, as the places where *amber* is found, as if it were to be had no where elſe; and ſome of them diſtinguiſh the finer pieces under the name of *Oriental amber*.

The generality of theſe falſe accounts of *amber*, have been owing to the ignorance of the perſons who have taken upon them to give the hiſtory of it: they have, in general, taken upon hearſay what they have related, or borrowed it from books they were not able to underſtand. Thus we find the many places in Aſia and Africa celebrated for producing large ſtores of *amber*, are taken upon credit from the old authors, who have mentioned ambra as being found there. Theſe copiers not diſtinguiſhing, that ambra in theſe places is not given as the name of *ſuccinum*, or *amber*, but as that of the rich perfume called *ambergris*, which is found there, though the real *amber* never was.

The name of *Oriental amber*, ſo common with ſome, ſeems to have been owing alſo to a miſtake, but of another kind; the gum copal, brought from the Eaſt-Indies, is very like *amber*, and ſome of the fantaſtic writers in chemiſtry have called this by the forced name of *Oriental amber*. Hence thoſe who read their works, without perfectly underſtanding them, have ſuppoſed that *amber* was common in the Eaſt-Indies; and as all the gums of that part of the world are ſuperior to thoſe of other places, they began to call all the fine pieces of this foſſil by the pompous name of *Oriental amber*.

We are not to limit the operations of nature ſo far, as to ſay that ſhe does not, or cannot produce *amber* in Aſia, Africa, or America; but it is certain, that we have no authentic account of its ever having been found in any of thoſe regions, and there is the greateſt reaſon in the world to believe that it is peculiar to Europe. This we are very well aſſured of, that the Chineſe, who are as cunning a people as any in the world, expend annually with us vaſt ſums of money in buying European *amber*, and have done ſo at all times ſince we have trafficked with them; and it is by no means to be ſuppoſed that they would purchaſe it of us, if they had it nearer home. All the intelligent perſons, who have reſided in the Eaſt-Indies, ſay, that they never ſaw or heard of *amber* being found there. And, upon the whole, it ſeems very rational to conclude, that *Oriental amber* never exiſted, otherwiſe than in the error before-mentioned, of calling copal by that name.

Europe ſeems the only region of the world where *amber* is produced: it ſeems alſo to be produced almoſt all over Europe, but not in equal plenty, nor perfection; the German dominions, and the country about the Baltic, claim the prerogative above all other places. Hartman, who has given the abovementioned account of the errors of the antients, *&c.* in regard to the places of its origin, has been too free in cenſuring the moderns for giving it to ſome parts even of Europe: he ſcruples to believe that Italy, Spain, and even England, produce *amber*; but in this he errs: he ſuppoſes that jet, which is called by ſome *black amber*, being found in theſe places, has impoſed upon the authors of theſe accounts, and made them ſay *amber* was found there; but nothing is more certain, than that *amber*, and that of the fineſt kind in the world, is found in England, at leaſt, if not in the other places where he doubts of its production. *Amber* is at this time thrown on the ſhores of Yorkſhire, and many other places, and found at great depths under the earth, in ſtrata of clay, as well about London, as in more inland places; and if we mention Dr. Woodward, and the other authors, who have themſelves taken it up, we ſhall have no room to doubt its being real *amber*, not jet, as Hartman ſuppoſes.

Poland, Sileſia, and Bohemia, are famous for the *amber* dug up there at this time. Germany affords great quantities of *amber*, as well dug up from the bowels of the earth, as toſſed about on the ſhores of the ſea and rivers there. Saxony, Miſnia, and Sweden, and many other places in this tract of Europe, abound with it. Denmark has afforded, at different times, ſeveral quantities of foſſile *amber*; and the ſhores of the Baltic abound with it. But the countries lying on the Baltic afford it in greateſt abundance of all; and of theſe the moſt plentiful country is Pruſſia, and the next is Pomerania. Pruſſia was, as early as the times of Theodoric the Goth, famous for *amber*; for this ſubſtance coming into great repute with this prince, ſome natives of Pruſſia, who were about his court, offered their ſervice to go to their own country, where that ſubſtance, they ſaid, was produced, and bring back great ſtores of it. The offer was accepted, the journey ſucceſsful, and from this time Pruſſia had the honour to be called *The Country of Amber*, inſtead of Italy, which had before undeſervedly that title.

The *amber* of Pruſſia is not only found on the ſea coaſts, but in digging; and though that of Pomerania is generally brought from the ſhores, yet people, who dig on different occaſions in the very heart of the country, at times find *amber*. Philoſ. Tranſ. N° 248. p. 5, ſeq.

In Pruſſia the cliffs are very high and abrupt, and are all of naked earth, except a few rocks; the ſhore is very even, and the ſea ſhallow for a long way; after this there is a conſiderable depth for ſome furlongs, and behind this the ſhallows riſe again, and continue a great way. The ſtormy ſeas, and high tides, waſhing againſt theſe cliffs, break down vaſt maſſes of them from time to time; in the matter of theſe maſſes of earth lie great quantities of *amber*; this mixture falling upon the flat ſhore, is daily waſhed by the waves, and the earth waſhed, and broken to pieces in a little time, and carried back by the waves into the ſea; while the lumps of *amber*, being too hard to break, and too large to be carried away ſo eaſily as the diſunited particles of earth are, remain naked on the ſhore, or in the ſhallower water. If they are any of them waſhed away, they are only carried into the firſt deep water, and by its riſe and fall in the tides they are thrown up, either on one ſide or the other, and lodged on the ſhallows, from whence the people, employed to gather them, eaſily obtain them.

The whole country about theſe cliffs abounds in *amber*, but it is impoſſible to get at it by digging, becauſe of the nature of the ſoil, which is boggy, and full of water, riſing in ſome places up into ſprings, and in others making the ground ſo ſoft, that there are a ſort of bogs and quickſands, which ſwallow up cattle, and ſometimes men and their horſes. A little higher up in the country, where digging is practicable, the earth is found of the ſame nature as in the face of the cliffs, and abounds with minerals of various kinds. The pyritæ, and vitriols of many ſorts, are found there, and ſtrata of a ſort of black earth, with white veins, in great abundance. Under theſe ſtrata there is found a great quantity of a cortical ſubſtance, reſembling the barks of trees, among, or under which the *amber* is uſually found. The whole face of the country is very barren; in this part tracks of ſand often cover vaſt ſpaces, and ſometimes a few weeds of the hardieſt kinds appear; ſometimes a buſh, but rarely, and ſcarce any ſuch thing as a tree is to be ſeen. The *amber* in theſe places, when dug up, is uſually foul, and covered with a rough opake coat, which muſt be taken off, or broke through, in order to the ſeeing its beauty; but that on the ſhores is uſually found clear and fine, this outer cruſt having been worn off by the waſhing of the waves. This *amber* on the ſhores is ſometimes found buried in the ſand, ſometimes naked on the ſurface of it, and ſometimes covered over with large bundles of the ſea-wrack, and other weeds. The vulgar have thought, from this laſt accident, that the *amber* was a gum flowing out of the leaves of thoſe plants, but that is a very abſurd opinion.

Sand, vitriol, and ochre, with a blue clay, are the ſubſtances which make up the principal part of the ſtrata in the cliffs; and the vitriol, in particular, ſeems to have ſome conſiderable ſhare in the formation of the *amber*, becauſe *amber* is ſcarce any where found foſſile, where there is not alſo vitriol: but neither of theſe ſubſtances can be properly called the matrix of the *amber*, ſince it is ſeldom found bedded in them; and when it is, only in ſmall quantities. The blue clay contains more *amber* than either of the other of theſe ſubſtances, but the true matrix of it is the wood, or cortical ſubſtance, which is found among theſe ſtrata, and of which alone there are immenſe hills in ſome places. Phil. Tranſ. N° 248. p. 12. See the article MATRIX *ſuccini*.

The bodies of inſects, found buried in *amber*, are viewed with admiration by all the world; but of the moſt remarkable of theſe, many are to be ſuſpected as counterfeit, the great price, beautiful ſpecimens of this kind ſell at, having

tempted ingenious cheats to introduce animal bodies in ſuch artful manners into ſeemingly whole pieces of *amber*, that it is not eaſy to detect the fraud. The antients have deſcribed globes of *amber* with bees immerſed in them, and the cabinets of the modern virtuoſi afford many ſuch pieces; but Sendelius, after accurately examining many of theſe ſpecimens, ſuſpects them all to be ſophiſticated. Many ſpecies of the fly kind, however, are obviouſly and indiſputably lodged by nature there: among this tribe of animals, the ſeveral ſpecies of the ichneumon fly are found the moſt numerous; the common houſe and fleſh flies are alſo frequently found thus preſerved; and it is remarkable, that of theſe ſome have preſerved, and others have wholly loſt their natural colours. Theſe are ſometimes found in cloudy pieces of *amber*, but much more frequently in the perfectly clear and fine ones; and in theſe many are ſeen plainly to be encruſted with a thin coat of the matter of the *amber*, ſeparate from the maſs. Beſide the animals already named, the cabinets of the curious afford us numerous inſtances of the ſmall ſpecies of butterflies, the cricket, the graſhopper, beetles of various kinds, but theſe only ſmall ones, the larger and ſtronger being able to force their way out of the once viſcid maſs, and therefore never remaining entangled in it. Some of theſe, which are incloſed in it, are plainly ſeen to have ſtruggled hard for their liberty, and even to have left their limbs behind them in the attempt; it being no unuſual thing to ſee, in a maſs of *amber* that contains a ſtout beetle, the animal wanting one, or perhaps two of its legs; and thoſe legs left in different places, nearer that part of the maſs from which it has travelled. This alſo may account for the common accident of finding legs, or wings of flies, without the reſt of their bodies, in pieces of *amber*; the inſects, to which theſe have belonged, having, when entangled in the yet ſoft and viſcid matter of the *amber*, eſcaped, at the expence of leaving theſe limbs behind them. Drops of clear water are ſometimes alſo preſerved in *amber*. Theſe have doubtleſs been received into it while ſoft, and preſerved by its hardening round them. They are uſually contained in cavities too large for them, though ſometimes the holes are filled up. In ſome ſpecimens, the holes alone remain without any moiſture. Naturaliſts, who have been ſo curious as to examine this liquor contained in the *amber*, have found it to be of an auſtere taſte, like that in which vitriol had been diſſolved: others mention the having met with it wholly inſipid, and ſome taſting of ſea ſalt. It is eaſy to account for a drop of water, of any of the three kinds, being found in *amber*, but the vitriolic water is the moſt natural there, as there is always great plenty of vitriol where the *amber* is found. Some people, who have been poſſeſſed of pieces of *amber* thus containing water, have thought that the quantity was continually increaſing and decreaſing, according to the increaſe and decreaſe of the moon; but this is not countenanced by any certain obſervation. *Hartman*, Hiſt. Succin.

Amber, though fuſible with a ſmall fire, and concreting again when cold, yet differs from the metals, and other fuſible bodies of that kind, in this, that as ſoon as cold they are the ſame as before melting; but *amber*, when it has once been melted, is no longer *amber*, it loſes its beauty and hardneſs: and the true reaſon of this is, that being compoſed of bitumen and ſalt, the ſalt flies off in the heating, and leaves the remainder little better than the ſimple reſiduum of an evaporated petroleum, or any other liquid bitumen. There have been people, at different times, who have pretended to have an art of melting ſmall pieces of *amber* into a maſs, and conſtituting large ones of them; but this ſeems ſuch another undertaking as the making of gold, all the trials, that have yet been made by the moſt curious experimenters, proving, that the heat which is neceſſary to melt *amber*, is ſufficient to deſtroy it. Phil. Tranſ. N° 248. p. 25.

Hartman indeed mentions an accident, which ſhews a poſſibility of many pieces of *amber* being combined into one by an operation of nature, though it never could be effected by art. A ſheep was once killed in Pruſſia, in whoſe ſtomach a large piece of *amber* was found, which was compoſed of ſeveral other ſmaller pieces, the joinings of all which might be ſeen, though as firm as the pieces themſelves. This is a proof that the creature had ſwallowed the whole in ſmall pieces with its food, and that nature, by the heat and juices of its ſtomach, had ſoftened thoſe pieces without melting them, ſo as to make them unite firmly, though not be thoroughly blended with each other. Could art arrive at this, which it is not probable it ever will, even this is far ſhort of what is pretended of melting *amber*, and caſting it into what form is deſired. The factitious curioſities in *amber*, which are pretended to be pieces of this foſſil, with inſects embedded in it, are uſually no other than a hardened varniſh, not having the hardneſs, or other qualities of *amber*. Some few of them are *amber* melted, into which the inſects have been put in that ſtate, but theſe are very coarſe and brittle. Theſe two kinds of cheat are eaſily diſcovered by their want of hardneſs, and the other by obſerving the ſides of the piece, to find the joining where it has been ſplit.

Among the numbers of inſects thus preſerved, as ſome are covered within the maſs with a thin coat, or cruſt of pure *amber*; ſo others are covered with a cruſt of a white matter of a like thickneſs, but ſeeming different from the nature of the *amber*. The true cantharides are ſometimes alſo included in *amber*, and preſerving all the beauty of their colours there, they make a very ſplendid appearance. The ant is moſt frequently met with in pieces of *amber*; and the earwig is ſometimes found very perfect and beautiful in it. The ſpider kind afford very numerous ſpecies. The millepedes are not unfrequently met with. The ſcolopendræ appear in great beauty, when their bodies are twiſted and contorted, as not unfrequently happens in the large globes of *amber* where they lie. Caterpillars are alſo ſometimes found, but the ſoftneſs of their bodies has made them ſubject to great injuries, and they are often ſqueezed, compreſſed, and injured, ſo as ſcarce to be known.

Theſe are the ſpecies of land animals moſt frequently found in *amber*; to theſe ſome add the louſe and flea: and though theſe have brought great diſcredit upon all the inſects incloſed in *amber*, in the judgment of many, as ſeeming certainly counterfeit, yet Sendelius, who had carefully examined ſeveral of the maſſes in which they were found, and could find no trace of fraud in any of them, attempts to account for ſuch animals being naturally included in the ſubſtance of the *amber*, while yet ſoft, in the manner of the other inſects.

To theſe animals thus impriſoned, many authors add accounts of ſmall fiſh, young water newts, and other aquatic animals, but theſe ſeem in general to have been ſophiſticated maſſes; and indeed it is obſerved, that even the moſt common water inſects are very rare in *amber*. The way in which all the inſects, that are truly found lodged by nature in *amber*, were placed there, is not hard to gueſs, when we are ſo far acquainted with the nature of *amber*, as to be aſſured from experience, that it is at firſt a fluid, and by degrees becomes viſcid and thick like turpentine, from which ſtate it gradually hardens into the ſolid form we find it in; and this is ſufficiently proved; ſince there have been at times found quantities of true *amber* yet in its fluid ſtate; and the ſtructure of ſome globes of *amber* abundantly ſhew, that they have hardened from a fluid ſtate, ſome being plainly compoſed of ſeveral plates, and ſome containing a maſs of *amber* in another larger maſs; the internal maſs having undoubtedly hardened firſt, and the external, while yet in a fluid ſtate, gathered and concreted round it.

This being the manner of the including of the inſect tribe in *amber*, it ſeems that inſects alone ſhould not be ſubject to that fate, but that other matters, which fall in the way of the *amber* while yet ſoft and viſcid, ſhould ſhare the ſame fate. The locomotive power of the animal kingdom gives its creatures opportunities of falling into theſe maſſes, while vegetables and minerals have not; yet as theſe cannot but ſometimes fall in the way of the hardening matter of *amber*, they are ſometimes found immerſed in it. Beautiful leaves of a pinnated ſtructure, reſembling ſome of the ferns, or maiden-hairs, have been found in ſome pieces; but theſe are rare, and the ſpecimens of great value. Other leſs beautiful vegetable ſubſtances are more frequently found than theſe, though all of this tribe are ſcarce in compariſon to the animals. Small pieces of heath, and fragments of the alga, and ſome other plants, common about the ſea ſhores, are ſometimes found; as alſo ſmall fragments of wood, the ſeeds of ſome plants, and pieces of the ſtalks of others. Theſe are ſometimes found alſo, but a little way, buried in the *amber*, and at other times are only faſtened to its ſurface; the ſmall ſpecific gravity of theſe bodies, too little to immerſe them into the fluid, and the different conſiſtence of that hardening fluid, may have been the occaſion of theſe bodies having made their way into the maſſes but to ſmall depths: and indeed, if we conſider the whole proceſs, many happy accidents muſt concur to the perfect and beautiful immerſion of a foreign body in this bitumen.

Mineral ſubſtances are alſo found at times lodged in maſſes of *amber*: ſome of the pompous collections of the German princes boaſt of ſpecimens of native gold and ſilver in maſſes of *amber*; but as there are many ſubſtances of the marcaſite, and other kinds, that have all the glittering appearance of gold and ſilver, it is not to be too haſtily concluded, that theſe metals are really lodged in theſe beds of *amber*. Iron is found in various ſhapes immerſed in *amber*, and as it is often ſeen eroded, and ſometimes in the ſtate of vitriol, it is not impoſſible but that copper, and the other metals, may be alſo ſometimes immerſed in it in the ſame ſtrata; and that the bluiſh and greeniſh colours, ſometimes found in the recent pieces of *amber*, may be owing, like the particles of the gem colours, to thoſe metals; but as the gems, by their denſe texture, always retain their colours, this lighter, and more lax bitumen uſually loſes what it gets of this kind, by keeping ſome time. Small pebbles, grains of ſand, and fragments of other ſtones, are not unfrequently alſo found immerſed in *amber*. Theſe, it is very plain, have fallen into the maſs while not yet quite hardened; though things of this ſpecific gravity, when found lodged deep in it, muſt have

fallen

fallen in when it was almoſt hard, otherwiſe they would have ſunk through. The pieces of *amber* including other pieces are alſo of this origin; and when it has happened that the included piece, and the ſurrounding maſs, have been of different degrees of colour, the inner piece is obvious, and the effect plain; but when theſe have been both of the ſame colour, which probably moſt frequently has been the caſe, we have no traces of the accident; and probably this, though by accident concealed, is a much more frequent caſe than is commonly imagined.

To all theſe accidental beauties in *amber* it is to be alſo added, that as in the Mocoa ſtones, and many other foſſils, ſo alſo in this there are ſometimes found beautiful delineations of trees, ſhrubs, and the like. The natural beauties of theſe pieces have tempted the cunning artificers ſometimes to counterfeit them; but in theſe, as well as in the ſophiſticated maſſes with inſects, the fraud may always be diſcovered by a curious and attentive inſpection. *Sendelius*'s Hiſt. of Amber.

On opening the ditches for the fortifications of Copenhagen, it is ſaid that ſeveral large maſſes of *amber* were found, all of them adhering to the ſides of large bodies of trees, which were black as ebony. The pieces are preſerved in the cabinet of the king of Denmark in that place, and ſome of them weigh forty or fifty ounces. This is an additional circumſtance to the common obſervation of ſomething, reſembling wood, being always found where *amber* is, and deſerves to be conſidered, as it tends to overthrow the preſent received ſyſtem, of *amber* being originally a mineral production.

Amber is the baſis of all varniſhes. For the method of diſſolving this ſubſtance into varniſh, ſee the article VARNISH. But if *amber* could be diſſolved without impairing its tranſparency, or one large maſs be made of it by uniting ſeveral ſmall ones, it is eaſy to ſee what would be the advantages of ſuch a proceſs. The art of embalming might poſſibly be alſo carried to a great height by this, if we could preſerve the human corps in a tranſparent caſe of *amber*, as the bodies of flies, ſpiders, graſhoppers, *&c.* are to a great perfection. Something of a ſubſtitute of this kind we have in fine roſin, boiled to a great hardneſs, and perfect tranſparence; this being diſſolved by heat, and the bodies of ſmall animals ſeveral times dipped in it, they are thus coated with colophony, that in ſome degree reſembles *amber*; but this muſt be kept from duſt. *Shaw*'s Lectures, p. 425.

Amber, in medicine, is given in its crude ſtate, only reduced to powder, as an aſtringent and balſamic. It is preſcribed in the fluor albus, in convulſions, and in all diſorders of the nerves. It is alſo given in coughs, and diſeaſes of the lungs; and is by ſome greatly recommended in inveterate head-achs. Its doſe is from one ſcruple to two.

Its preparations are, 1. *ſal ſuccini*, or ſalt of *amber*. 2. *Oleum ſuccini*, or oil of *amber*. 3. *Tinctura ſuccini*, or tincture of *amber*.

Oleum SUCCINI, or *oil of amber*. To purify the dark muddy *oil of amber* drawn *per ſe*, take two pounds of good brandy, one of ſea ſalt, half a pound of the oil; mix them, and diſtil them together, and a large proportion will come over very tranſparent, and finely coloured. *Boyle*'s Works, Vol. 1. p. 329.

Plants in SUCCINUM, or *amber*. See PLANTS.

SUCCURY, or SUCCORY, *cichorium*, in botany. See the article CICHORIUM.

The common blue-flowered *ſuccory*, or cichorium, is celebrated among ſome of the botanical writers for a property in its flowers, ſuppoſed to be peculiar to it, and eſteemed very ſingular; this is, that though naturally of a fine bright blue, they become red as blood on being a little time buried in an anthill. By what accident this property was diſcovered we do not know, but probably only by the falling of ſome of the flowers off from the plant into a neſt of theſe little animals. Langham, in his Garden of Health, has related this, but it is no diſcovery of his; for Tragus, long before his time, tells us, ſpeaking of this plant, that nature affords a miraculous phænomenon in its flowers, which is, that if put amongſt living ants in their hill, it changes from blue to red, as if bluſhing with ſhame and fear of ſuch numerous and ſmall enemies; and John Bauhine records the ſame thing from Otho Brunfelſius. It would have been well, if all who have related this wonderful change of colour, would have varied the experiment with the violet, and other blue flowers; they would then have found, that it was not the property of the plant, but of the animal, that was the true object of wonder. All blue flowers of plants will turn red on the rubbing them over with acids, and the wonder is, to find that the ants have a natural animal acid about them, capable of making ſuch a change; not that the flowers of the *ſuccory* are ſuſceptible of ſuch a change with acids. *Tragus* in Stirp. *John Bauhine*, Hiſt. Plant.

The method of making the experiment is this: lay bare the top of an anthill with a ſtick, and then throw ſome of the flowers of *ſuccory* on the place; the ants will immediately be ſeen to creep over them, and as they move along, they may be obſerved frequently to let fall a drop of clear water from the lower part of their bodies; wherever this falls upon the flower, it makes a large red ſtain; by degrees they let fall more of theſe drops, and every one making its own particular ſtain, the whole flower becomes at length coloured. Sometimes they make this change very quickly in the flower, and ſometimes they are a great while about it; but the body of the ant, bruiſed upon a leaf of the flower, will immediately ſtain the whole, ſo far as it reaches. It deſerves inquiry, whether the ants ſimply depoſit this liquor on the flower, or whether they make a wound or puncture on the ſurface of the flower firſt. The laſt is moſt probably true; becauſe this flower is covered with ſo thick an external membrane, that the acid ſpirits of vitriol, ſalt, or the like, being barely touched upon it, do not inſtantly change its colour; but if it be picked or bruiſed, ſo as to let in the liquor, the change of colour is then inſtantly produced. If the flowers of this plant be ſteeped in the ſtrongeſt vinegar for a long time together, they will not change colour while the menſtruum remains cold; but if it be heated a little, it is by that means put in motion, and rendered capable of entering the pores, and then the colour is inſtantly changed. It is not obſerved that the ant makes any puncture, and if it does not, it is evident, from the immediate change in the flower, where the ſtrong mineral has no ſuch effect, that the acid in this little animal is of a very peculiar nature.

It has been ſuppoſed by ſome, that the tingling felt in the ſkin, and the bumps raiſed on it by ants, are owing to the falling of this penetrating acid liquor, as the creature moves along. The venomous effect of the ſting of the bee and waſp, is ſaid by authors to be owing to the introducing into the wound a ſharp liquor, lodged by nature in this animal at the root of the ſting. It would deſerve a trial, whether the liquor of theſe creatures be of the ſame penetrating acid nature with that of the ant, which might be eaſily diſcovered, by forcing out the ſting of one of theſe animals by preſſure, and making it enter into the petal of the flower of a violet, bugloſs, *ſuccory*, or any other of the like plants. This liquor of the ants may eaſily be procured in ſome quantity from them. If their neſts be diſturbed with a ſtick, thruſt in among them, they will crawl about the ſtick, and leave a great number of the drops of their acid upon it, and theſe, if immediately ſmelt to, will twinge the noſe like newly diſtilled ſpirit of vitriol. The larger kind of ants, called by the country people *horſe-ants*, afford this liquor ſtronger, and in greater quantity, than the ſmaller, or common ants; and, on trials, it proves nearly allied to the mineral acids in its properties.

The ants, diſtilled either by themſelves, or with water, yield an acid ſpirit like that of vinegar, or of verdigreaſe, which is more pungent and penetrating. Lead put into this ſpirit affords a good ſaccharum ſaturni; and the ſame ſalt is produced from that metal, if only put into fair water with a large parcel of living ants in it, they ſoon parting with enough of their acid to make the water a menſtruum ſharp enough for diſſolving that metal. There is alſo ſomething very ſingular in this acid, which is, that it will preſerve itſelf, and be regained from the metalline admixture in its own nature. The common ſaccharum ſaturni being diſtilled, does not yield back the acid employed in making it, but only an inflammable oil and water; but the ſaccharum ſaturni, made by the animal acid of the ant when diſtilled, returns back that acid in the ſame quantity and ſtrength, and no way altered. The vinegar diſtilled from verdigreaſe, and called *ſpirit of verdigreaſe*, is an acid very like this, but ſtronger, and more penetrating. Phil. Tranſ. N° 68.

SUCK-*fiſh*, in ichthyology, an Engliſh name for the *remora*, or *echeneis* of Artedi. See REMORA.

SUCKING (*Cycl.*)—Though there are very few inſtances of children which are born with an inability of *ſucking*, yet the writings of phyſicians have recorded ſuch caſes; and one, which happened ſome years ago in France, gave occaſion to the members of the Academy to examine ſtrictly into the cauſe of it. Mr. Maloet, who examined the child, found that it wanted the whole palate of the mouth, and that in looking up to the top of the cavity of the mouth, the inner part of the noſe was ſeen; the child not only wanted the bony parts which form this arch, but alſo the inveſtient membrane they are naturally covered by. Mr. Maloet conceived that he had now found out the reaſon of the child's not having the power to *ſuck*, which he explained in this manner.

In the action of *ſucking*, while the infant has in its mouth the nipple of the nurſe, the air about it is diſperſed, and there is made a little void all about it in the cavity of the mouth. At this time the whole breaſt is preſſed upon as uſual by the external air, though the nipple is not, or at leaſt is much leſs ſo, and hence the mouth performing the office of a pump, the milk contained in the breaſt cannot but diſcharge itſelf by degrees through the apertures in the nipple. In order to this, however, it is evidently neceſſary that the communication between the mouth and the noſe ſhould be ſtopped by the proper organs; ſince, if this were open, the air, which continually paſſes through the noſe in reſpira-

reſpiration, getting into the child's mouth, would equally preſs the nipple with the other parts of the breaſt, and conſequently the cauſe of the iſſuing out of the milk would no longer ſubſiſt; the mouth being no longer capable of performing the office of a pump, than while it is empty. Hence, according to Mr. Maloet's account, the child born without a palate could not ſuck, becauſe the noſe and mouth had, by the abſence of this organ, a conſtant and uninterrupted communication.

This account however did not ſeem right to Mr. Petit, for theſe reaſons: a void in the mouth is not at all eſſential, or neceſſary to *ſucking*, as appears every day by women's milking their cows; when, without any ſuch void, and by the mere preſſure of their hands, they get out the milk. All the mechaniſm uſed here, is a continual ſucceſſion of ſtroaking down the teat, one hand ſupplying the place of another, and here is milk extracted without either a void, or a pump; and if the action of *ſucking* be nicely obſerved in an infant, it will be found to amount only to the ſame thing. It ſeizes the nipple, and makes with its lips a ſort of fleſhy canal, which receives, and continues gently to preſs it. The lips are found by anatomy to be compoſed of partly longitudinal, and partly tranſverſe fibres; in the action of ſeizing the nipple, the firſt of theſe are extended as far as they are capable, and afterwards their natural contraction ſqueezes the nipple, and does what the hands of the milker do on the cow's teat, preſſing out the milk in the very ſame manner. The ſhape of the nipple being larger at its origin, than at the end, makes it eaſily ſlide out of the child's mouth, and this gives the infant conſtant occaſion of laying hold of it higher up, and then if it ſlip a little, that is only a motion which, as the child's lips incloſe it round, will the more facilitate the flowing out of the milk, which is thus forced from above downwards. The lips of the infant, though they are thus aſſiſtant, are not however the only organs employed in *ſucking*, the jaws are of great uſe, by their force and power of compreſſion, and the tongue is a very ſerviceable aſſiſtant.

The tongue in infants is extremely thin, tender, and flexile: this is applied cloſely to the under part of the nipple, and when it afterwards is drawn down toward the bottom of the mouth, there is then indeed formed in that place a ſort of void, which determines the milk to flow readily in there, eſpecially as the tongue itſelf has before given the principle of ſuch a motion. Nor is this all the uſe that Mr. Petit allows the tongue in *ſucking*; he obſerves, that the root of it may be as ſerviceable to the child in the ſwallowing the milk, as the tip of it was in getting it out of the nipple; for when the milk has been conveyed along it to the lower part of the palate, in the manner of a gutter, the root at that time preſſing againſt the œſophagus, compels the milk to run down it, and then the tip is again employed to the *ſucking* out more milk; and the action of *ſucking* is thus alternately relieved by ſwallowing, and both greatly aſſiſted by the tongue. It is very poſſible, from the different ſtructure of the parts, that in the infant firſt mentioned, the root of the tongue might be incapable of its office of aſſiſting in ſwallowing, while the tip of it readily performed its office of *ſucking*; and this Mr. Petit takes to have been the occaſion of its death, for the child lived only five hours.

From this theory of *ſucking* it is plain, that a child born without a palate may yet be able to *ſuck* by means of its tongue. Mem. Acad. Scienc. Par. 1735.

We are told of a man's giving *ſuck* to a child, and thereby rearing it; but we do not find any other evidence of the truth of the ſtory, than the word of the man, or pretended man, who was a beggar. See Philoſ. Tranſact. N° 461. p. 813.

In the Philoſophical Tranſactions we have an account of a woman, of ſixty eight years of age, giving *ſuck* to her grandchildren. This woman had not borne a child for twenty years, or upwards. It would ſeem, as if the *ſucking* of the child had brought milk into the breaſts. See N° 453. ſect. 10.

SUCKING *fiſh*, in ichthyology. See the article REMORA.

SUCU, in botany, a ſpecies of apple-tree, ſaid to be frequent in the province of Canton in China. The fruit is dried like figs to be kept all the year, and is brought into Europe. It is ſomewhat larger than our apple, almoſt round, and of a reddiſh colour, or ſometimes green. When it is dry, it has a cruſt reſembling honey or ſugar. *Hoſm.* Lex. Univ. in voc.

SUDARIUM, in eccleſiaſtical writers, the ſame with *brandeum*. See the article BRANDEUM.

SUDIS, in zoology, a name uſed by moſt authors for the ſea pike, a fiſh called by others *lucius marinus*, and *ſphyræna*. See Tab. of Fiſhes, N° 44.

It in ſome degree reſembles the common river pike, but is thinner in proportion to its length, and in ſome degree approaches to the *acus*, or tobacco-pipe-fiſh, in that particular. Its ſcales are ſmall, and its noſe long, and of a conic form, the under jaw running out a good way beyond the upper, and ending in a ſharp point. Its mouth is very wide, and yellow within; its tongue large and narrow, and armed all along with ſharp and ſmall teeth. The jaws are furniſhed each with a ſingle row of large and ſharp teeth, ſet at ſome diſtance one from another; and in the middle of the lower jaw is one tooth longer than the reſt, which has a hollow in the upper jaw made to receive it. It has two fins on the back, which are both, but eſpecially the fore one, very prickly; and the tail is very deeply forked. It is caught in the Mediterranean, and uſually ſwims in ſhoals together. Its uſual length is ten or twelve inches; and it is eſteemed a very well taſted fiſh. *Ray*'s Ichthyogr. p. 273.

SUDORIFIC (*Cycl.*)—A ſafe, eaſy, and effectual *ſudorific* may be prepared in the following manner. Take an ounce of refined camphor, beat it in a marble mortar with two ounces of blanched almonds, till it be reduced to a ſmooth and even paſte. This may be formed into pills, or boluſes, and given, according to the ſtrength of the patient, and other conſiderations, from three grains to forty.

Sudorific, perſpirative, and alexipharmic medicines, make a large part of the common diſpenſatories. A few medicines, well choſen, might ſupply the place of all theſe; and of theſe one principal one would prove to be camphor, which trial will always ſhew to be greatly ſuperior to bezoar, Gaſcoign's powder, lapis contrayerva, and the like. *Shaw*'s Lectures, p. 227.

SVEGLIATO, in the Italian muſic, is uſed for a briſk, lively, gay manner of ſinging or playing. Thus they ſay *maniera ſvegliata*.

SUETA, in ichthyology, a name given by Bellonius, and ſome other writers, to the *naſus*, a ſpecies of cyprinus, according to the Artedian ſyſtem, and diſtinguiſhed by that author by the name of the *cyprinus* with the ſnout ſtanding prominent, in form of a noſe, and with forty rays in the pinna ani. See the articles CYPRINUS and NASUS.

SUFFIBULUM, among the Romans, a name given to the *prætexta* of the pontiffs, and *palla* of the Veſtal virgins. *Pitiſc.* Lex. Antiq. in voc.

SUFFIMENTA, *fumigations*, in pharmacy. The *fumigations* preſcribed by diſpenſatory writers are reduced to two kinds; the one conducive to health, the other only to pleaſure; and of each kind ſome are of moiſt, or liquid ingredients, others of dry ones.

The *fumigations* for pleaſure are compoſed of fragrant and ſweet-ſcented ſubſtances, and are uſed in form of powders, troches, or medicated candles. The firſt are uſually prepared of ſtorax, benjamin, lignum aloes, cinnamon, camphor, muſk, ambergris, and civet, mixed in due quantities, and all reduced together to a powder. The ſecond kind, or troches, are compoſed of the ſame kind of powdered ingredients, and are made into a paſte with a mucilage of gum tragacanth, and then cut into form. And the laſt kind, or candle *fumigations*, are prepared of the melted ſweet gums, with labdanum, made up into the form of large candles, with as much of the beforementioned ſweet ingredients as can be received into the maſs. Theſe, though only meant for luxury and pleaſure, yet have medicinal virtues; and as they abound in cordial ſubſtances, cannot but revive the ſpirits, and reſiſt contagion. The moiſt *fumigations* of this kind conſiſt of the powders before named, blended among a large quantity of roſe and orange-flower water, and of ſolutions of ſtorax, and other of the ſweet gums in ſpirit of wine.

The *fumigations* uſed to reſtore health are of ſeveral kinds. Some are meant only as corroboratives, and theſe are compoſed of much the ſame ingredients with thoſe uſed for pleaſure; others are uſed to dry up abundant humors, to purge the lungs, or to promote the menſes. In all diſorders of the uterus, there ſhould be added to theſe *fumigations*, galbanum, caſtor, and aſſa fœtida. A common *fumigation* is alſo uſed, by throwing tobacco on coals, and receiving the ſmoak through a funnel; and to this are ſometimes added colt's foot leaves, with other pectoral herbs, and a little ſulphur. Theſe are very uſeful for drying up ulcerations of the lungs, and other diſorders of the breaſt.

The moiſt *fumigations*, for the ſake of health, conſiſt either of ſome ſimple liquor, ſuch as vinegar, wine, aqua vitæ, or roſe water; and in ſome caſes, as for the diſcuſſing hard tumors, a red-hot brick, or ſtone, is thrown into vinegar, and the ſteam is received on the part. This is alſo a *fumigation* often uſed in times of peſtilential contagion, and that with great ſucceſs. Decoctions of uterine herbs are alſo frequently uſed for *fumigations* in ſeveral diſorders of the womb.

Olibanum, amber, ſtorax, and balſam of Tolu, make a fine dry *fumigation* for a catarrh: and in hyſteric caſes, great benefit is often found from holding the head, with the mouth open, over a hot ſolution of an ounce of aſſa fœtida in a pint of ſtrong wine vinegar.

SUFFITION, *ſuffitio*, among the Romans, a kind of luſtration, practiſed by perſons who had attended a funeral; it was performed by walking over fire, and being ſprinkled with water. *Pitiſc.* in voc.

SUFFOCATIVE *catarrh*, in medicine, the name of a diſeaſe, which conſiſts in a copious eruption of a ſerous and mucous humor into the veſicles of the lungs; which takes its origin from a ſudden congeſtion of humors about the breaſt, and a flaccid and weak ſtate of the breaſt and lungs.

This diſeaſe is not to be confounded with the ſpaſtic aſthma; nor with a moiſt cough, treated injudiciouſly with expectorants and opiates; nor with that ſudden oppreſſion of the breaſt, which is brought on by the ſtriking back of rheumatic humors, or cutaneous exanthemata; or the ſtopping the diſcharges of old ulcers: all theſe, though they have ſomething of the general appearance of the *ſuffocative catarrh*, and are therefore miſtaken for it by the leſs judicious, yet differ greatly and eſſentially from it in ſeveral points; of which hereafter.

Another diſtemper, with which it is alſo confounded, and from which it no leſs differs, is that aſthmatic anxiety which attends young and plethoric perſons, who are unhappily labouring under a latent ſcirrhus, or vomica of the lungs. The *ſuffocative catarrh* differs as widely from this, as from any of the others; but as the cauſe of this is ſeldom gueſſed at firſt, it is liable to miſconſtructions. Others have confounded this diſeaſe with a convulſive aſthma. Theſe diſtempers are in a great meaſure to be diſtinguiſhed by the habit of body of the perſons afflicted with them; plethoric perſons, who abound in rich blood, being very ſeldom ſubject to this diſeaſe, though frequently to the convulſive aſthma. They are alſo diſtinguiſhed from the abundant afflux of matter in the *ſuffocative catarrh*, and by there being none in a convulſive aſthma. In the catarrh of this kind there is a relaxation of the tone of the muſcles of the breaſt; but, on the contrary, in this kind of aſthma they are continually contracted into convulſions; and hence there is, in this caſe, rather an actual preſſure and cohibition of reſpiration, than an impotence of it, which is truly the caſe in a *ſuffocative catarrh*. In this caſe alſo there is a remarkable loſs of the ſtrength, whereas, in the convulſive aſthma, there are violent efforts, and ſtrong palpitations of the heart. Some have alſo buſied themſelves in determining the differences between a ſerous apoplexy, and a *ſuffocative catarrh*; but this is not neceſſary, ſince they very often concur, and make but one diſeaſe: but when the ſerous apoplexy comes alone, it is known by having been preſaged by diſorders of the head, redneſs and lippitude of the eyes, a dull and heavy cephalæa, and a foaming, or voiding of frothy matter by the mouth. *Junker*'s Conſp. Med. p. 507.

Signs of a ſuffocative catarrh. This diſeaſe always ſeizes the patient at once, without any previous notice; his breath becomes extremely difficult, and the fullneſs of the breaſt is eaſily diſtinguiſhed by a ſound of rattling of a frothy matter at the time of drawing in the breath. There is an immediate debility and loſs of ſtrength and ſpirits, as the patient calls it, but there is in reality a ſpaſmodic tenſion; there follows this a reſtleſsneſs, ſo that the patient cannot ſuffer his limbs to lie a minute in the ſame poſture or place; and there is always a deſpondency in the mind, and the patient thinks he is certainly going to die. There is uſually either no cough at all, or, at utmoſt, only a very ſlight and inſufficient one, and the very ſtrength to cough is wanting. The breaſt, and even the ribs, are ſenſibly affected by this diſeaſe, and the eyes always look red and tumid.

Perſons ſubject to it. Scarce any one is ever ſeized with this diſeaſe, except ſuch as are, according to the common acceptation of the word, troubled with habitual catarrhs, or have for many years been ſubject to defluxions from the head upon the fauces and lungs; and the perſons moſt of all ſubject to it, are old men of a phlegmatic and plethoric habit, and are of that kind of temperament which ſubjects people, at other times, to palſies and apoplexies. Lean perſons are ſcarce ever afflicted with this diſorder, unleſs they have long laboured under a violent cough, or have ulcerous diſorders of the lungs. Young people are alſo very little ſubject to this diſeaſe, excepting only ſuch as are very corpulent and phlegmatic, and already habituated to large defluxions of this kind. Infants alſo, which are very fat, and have had a ſudden ſuppreſſion of their natural ſweats, ſometimes fall into this diſeaſe, but with them it is not ſo violent.

Cauſes of it. The occaſional cauſes of this diſeaſe are ſeen in what has been already obſerved, but its true origin is to be ſought for in the head, not in the breaſt or lungs; yet, though it is eaſy to ſee what may occaſion a congeſtion of ſuch ſerous humors in the upper parts, it is difficult to ſay how the lungs become rendered fit to receive it all at once in this dangerous manner. It is accidentally brought on in children, as well by the repulſion of their cutaneous eruptions, as by the ſtopping their ſweats; and in grown people, from the omiſſion of habitual bleedings, from coldneſs and dampneſs in the air, from frequent drunkenneſs, and from an injudicious treatment of cutaneous humors, and particularly from drying up runnings of the eyes. *Junker*'s Conſp. Med. p. 509.

Prognoſtics in it. It is a very terrible diſeaſe, and very ſpeedily proves fatal, for the patient, if not relieved, uſually dies in twenty four hours. Sometimes it degenerates into a fever, and the patient ſeems cured by the change; but the remedy in this caſe proves as bad as the diſeaſe, for the fever proves incurable, and becomes a ſettled hectic, attended with terrible difficulty of breathing, and finally carries off the patient, after making him endure, for ſome time, a life of terrible pain. Sometimes it goes off into an aſthmatic laxity of the breaſt, attended with a cough, and a continual diſcharge of large quantities of mucous matter by ſpitting; and ſometimes into an abſolutely cachectic flaccidity of the body: and in general, if not carefully treated from the beginning, it either entails ſome of theſe diſorders upon the patient, or leaves him ſo poor and weak a conſtitution, that he becomes eaſily liable to all the diſeaſes of this kind from the ſlighteſt occaſions.

Grown perſons are ſooner taken off by this diſeaſe than young children, with whom it ſometimes continues above a week or a fortnight. In old people, the fatal event of the diſeaſe is ſo ſudden, that it is often dubious whether it were this diſorder, or an apoplexy; and in general it ſeems probable, that many of the perſons, ſaid to die of apoplexies, die, in reality, of the violent attacks of this terrible diſeaſe.

Method of cure. In the time of the fit a ſtimulating clyſter muſt be given, made of a decoction of marjoram, and other warm herbs, with colocynth, and a few grains of euphorbium, in order to abate the infarction of the breaſt, and give a new courſe to the matter that might add to it; and when there appears to be a plethora beſides, a vein muſt be immediately opened after the clyſter. After this, if the ſtomach be nauſeating and uneaſy, let a ſcruple of ſalt of vitriol be given as a vomit, with a large quantity of warm water; and if the patient is of a very phlegmatic habit, a few grains of gamboge may be added to this, to carry the humor off downward; or, if the caſe be very preſſing, a draught of a decoction of aſarum, or of tobacco, may be taken, the bad effects of which laſt are taken off by a draught of wine with the ſpices; and all this time there may be frictions and ſinapiſms applied to the lower extremities: and finally, to attenuate and diſcuſs the mucous ſtaſis, gentle alexipharmics and ſudorifics may be given, ſuch as the eſſence of amber, tincture of ſalt of tartar, and tartariſed tincture of antimony; and all nitrous medicines are alſo of the greateſt uſe, as they partly mitigate the cauſes, and partly prepare the humors for evacuation; and after all theſe, the cortex elutheriæ is of great uſe in diſcuſſing and mitigating the pain.

As ſoon as the fit is over, the corroborating medicines are to be given, and all things that can reſtore the parts to their due tone: of this number are the milder chalybeates, and the like; and with theſe analeptics are to be given, to recruit the fleſh and ſtrength, ſuch as emulſions, and a proper diet; and in ſuch as are uſed to wine, the richeſt wines, in moderate quantities, and the higheſt foods, will be of ſervice. If there be perceived a fever after the other ſymptoms are gone off, this muſt be cured by the gentle alexipharmics, and by powders of nitre, and the abſorbents; and if a chronic indiſpoſition ſeems left behind, then the gums, which act as diſcutients, are to be given for ſome time, ſuch as the ammoniacum and ſagapenum, and a warm regimen is to be recommended. And finally, to prevent a return of the diſeaſe, bleeding is very proper in the ſpring and autumn, and purging medicines taken in the intermediate time; the patient muſt alſo avoid all violent paſſions of the mind, and muſt never ſleep in a damp air. We are not to fear bleeding in the time of the fit, becauſe of the patient's complaining of want of ſtrength; for as the danger of *ſuffocation* is ſudden and imminent, it muſt be ſuddenly removed, and when that is done, the patient's ſtrength will return in good time: the ſame is alſo to be alledged in favour of the violent vomits. In people of a very phlegmatic habit, bleeding is not neceſſary nor proper; but in theſe caſes a vomit is ſafe and right, and uſually gives great relief, eſpecially if the patient have eaten heartily ſome little time before. *Junker*'s Conſp. Med. p. 513.

SUFFOLK *powder*, the name of a medicinal powder, good for the bite of a mad dog. It had its name from a Counteſs of *Suffolk*, who uſed to give it with great ſucceſs. It is ſtill kept as a ſecret in ſome private families, but ſeems to be only the ſtar of the earth, or the common buckſhorn plantain dried and powdered, or this powder with ſome very trifling addition. This plant has been famous for its virtues in this caſe a great while among us, and De Grey, in his Complete Farrier, gives the method by which he had cured dogs by it with great ſucceſs. See Phil. Tranſ. N°450. p. 455.

SUGAR (*Cycl.*)—The curious in the whole art of *ſugar*-making, or the reducing vegetable juices to what we call *ſugar*, by expreſſion, decoction, clarification, graining, claying, and cryſtallization, will find farther accounts and directions, in the ſeveral proceſſes of this art, in Piſo's Hiſt. Ind. in Angelus Sala's Saccharologia, in Dr. Slare's Treatiſe on *Sugars*, and in Sir Hans Sloane's Hiſtory of Jamaica. There are alſo ſeveral valuable papers on theſe ſubjects in the Philoſophical Tranſactions.

Sugar has been ſaid to be a ſpecific againſt the famous Indian poiſon mentioned by Mr. de la Condamine; but this ſeems a miſtake. See the article POISON.

Coarſe *ſugar*, in which there is more oil than in refined *ſugar*, is recommended as a good medicine in Collyria for diſcharging ulcers of the cornea, in which aſtringents are hurtful. *Demour*'s Diſſ. ſur les Malad. des yeux.

Labourers in *ſugar*-houſes are very ſubject to dyſenteries. The *vitrum antimonii ceratum* is an effectual remedy in theſe caſes. See VITRUM *antimonii ceratum*.

Maple SUGAR. See MAPLE.

SUGAR *of milk*. See MILK.

SUGAR *ſpirit*, a name given by our diſtillers to a ſpirit made in England, Holland, and other places, from the waſhings, ſcummings, droſs, and waſte of a *ſugar*-baker's refining-houſe. The manner of preparing it is the ſame with that uſed for the malt and melaſſes ſpirits. The refuſe of the *ſugar* is fermented with water in the uſual manner, then diſtilled into what is called *low wines*, and afterwards rectified, without any addition, into proof ſpirit.

When the operation is well performed, and no foul fœtid, or foreign matter, has got in among the waſh, this is a tolerably clean ſpirit. We uſually make it ſuch, but in Holland it is uſually made very nauſeous and diſagreeable; though capable, by an eaſy rectification familiar with us, though not much known abroad, of being brought to a fine and clean ſpirit. With us this *ſugar* ſpirit is uſed to mix with, and adulterate brandy, rum, and arrack, which will receive a large doſe of it without its being at all diſcoverable; but the Dutch, who have it very coarſe, can only adulterate rum with it, and even that will bear but a ſmall proportion, without being betrayed by its nauſeouſneſs.

This *ſugar ſpirit* reduced to alcohol makes one of the pureſt ſpirits we are acquainted with, much ſuperior to that of melaſſes, and much more to that of malt. *Shaw*'s Eſſay on Diſtillery.

We have, in the Philoſophical Tranſactions, an account of a volatile and pungent ſpirit of ſugar, which was made from what the *ſugar*-bakers call *ſugar-water*, which is no other than the water in which the aprons, moulds, and other utenſils, employed in the refining of *ſugar*, are waſhed. This was ſo extremely pungent, that a man could not ſmell to a large quantity of it without danger of ſuffocation; and ſo volatile, that no ſtopping it up could preſerve its ſpirit for any length of time. Phil. Tranſ. N° 130.

SUGGESTUS, among the Romans, a place in the *campus martius* raiſed higher than the reſt, where every magiſtrate, according to his rank, was allowed to harrangue the people; but private perſons could not, unleſs they firſt obtained leave from ſome magiſtrate to do it. *Pitiſc.* in voc.

SUGGRUNDARIUM, among the Romans, a place where infants, not exceeding forty days old, were buried; it being unlawful to burn them. *Pitiſc.* in voc. See the articles BURNING and BURIAL.

SUGITIVA, a term uſed by ſome authors to expreſs medicines, which ſuck up and abſorb the ſeroſities in dropſical perſons.

SUIT (*Cycl.*)—SUIT-*ſilver*, in our old writers, a ſmall rent, or ſum of money, paid in ſome manors to excuſe the appearance of freeholders at the courts of their lords. *Blount.*

SUKOTYRO, in natural hiſtory, the Chineſe name of a very large and remarkable horned animal, which ſeems to be the ſame with the carnivorous bull of Pliny and the antients.

It is of the ſize of a large ox; its head is ſhaped like that of a hog; its ears are long and hairy; and its tail is buſhy. On each ſide of the head, near the eyes, there ſtands a large horn, reſembling the ivory tuſk of the elephant, but not altogether ſo thick. Nieuhoff, who gives this account, adds, that it is very rarely caught, and that it feeds on graſs; but this laſt obſervation may poſſibly have been ſpoken of courſe, without any one's having certainly known it. All that we have ever ſeen of this animal, is a pair of horns of an enormous ſize, now in the poſſeſſion of Sir Hans Sloane, and of which he has given an account to the Academy of Sciences at Paris.

Theſe were found in ſome part of Wapping, by Mr. Doyly, the inventor of the Engliſh ſtuff of that name, in a cellar he had hired; they were much injured by time, and in many places rotten, and worm eaten. No one could remember any account of the place whence they came, or how they were brought to that place.

They are ſtrait for ſome diſtance from the baſe, but higher up they begin to bend, and go on crooked to a point. They have much more of the external appearance of the horns of the goat, than the ox kind, being not round, but flatted, and variouſly undulated with high tranſverſe ridges and furrows. They are not both exact in length, but the longeſt meaſures ſix feet, ſix inches and a half in length. The diameter at the baſe is ſeven inches, and the circumference there a foot and a half. The weight of the largeſt is nearly two and twenty pounds, and it will hold in its cavity a gallon and a pint of water; and would hold much more, were it not for the worm-holes near the baſe.

The captain of an Eaſt-Indian ſhip, on ſeeing theſe horns, aſſured Sir Hans that they belonged to a large ſpecies of bull in the Eaſt, which he had ſeen, and which, by his account, ſeemed to be the ſame with the creature before mentioned, as deſcribed by the antients; though none of the modern naturaliſts having ſeen it, it has been left out of their accounts. Agatharcides, who lived about a hundred and twenty four years before Chriſt, has well deſcribed this animal; and whatever has been occaſionally ſpoken of it by any others, is all tranſcribed from his writings. The creature ſeems to be a native only of Ethiopia, ſome few parts of the Eaſt-Indies, and ſome inland countries in Africa, never viſited by our travellers. From all the accounts we have, its ſize appears to be, at leaſt, twice that of our ordinary oxen, and with horns proportionably large. The pair here mentioned ſeem not to be the only ones preſerved in Europe, for Geſner tells us of one of an enormous ſize, which is ſtill hung up in the cathedral church of Straſburg. Mem. Acad. Par. 1727.

SULA, in zoology, a name given by Hoier, and ſome others, to a bird, deſcribed as a diſtinct ſpecies of the webfooted water-fowl, but ſeeming to be no other than the *anſer baſſanus*, or ſoland gooſe. *Ray*'s Ornitholog. p. 249.

SULCATED *leaf*, among botaniſts. See LEAF.

SULMO, in ichthyology, a name given by Bellonius, and ſome others, to the ſalmon.

SULPHUR, (*Cycl.*) in natural hiſtory. *Sulphurs* are defined to be dry, ſolid, but friable foſſile bodies, melting with a ſmall heat, when fired in the open air, burning almoſt wholly away with a blue flame and noxious vapour, indued with an electric power, and not diſſoluble in acids.

Some have uſed the word *ſulphur* as a name for the whole ſeries of inflammable bodies, but as we have alſo been uſed to diſtinguiſh thoſe of a particular kind by the ſame name, it ſeems much more eligible to reſtrain that name to thoſe bodies, and to give ſome other for the more general claſſes.

The word *ſulphur*, in this acceptation, becomes the name of a regular genus of foſſils, of which there are four known ſpecies. 1. The yellow native *ſulphur*, which in its pureſt ſtate is of a pale ſtraw colour, and as pellucid as the fineſt amber; but is more frequently found coarſer, and more opake. It is found in the gold mines of Peru, in Hungary, and in ſome other places. 2. The green native *ſulphur*. This is harder than the other, and is uſually found in ſmall maſſes compoſed of ſeveral cruſts. It is found, ſo far as is yet known, only about mount Veſuvius. 3. The grey native *ſulphur*, which is common in Iceland, and many other places, and is the coarſeſt and worſt of all the kinds. And 4. the moſt rare and beautiful of all the kinds, the red native *ſulphur*. This is of a fine glowing red, like cinnabar, and very bright and tranſparent, and is found, ſo far as is yet known, only in the gold mines of Peru. *Hill*'s Hiſt. of Foſſ. p. 402.

Mr. Homberg having given the original compoſition of *ſulphur*, in his accurate analyſis of that mineral, Mr. Geoffroy attempted to bring that analyſis to the niceſt teſt, by compoſing *ſulphur* out of ſuch ſubſtances as appeared to be its conſtituent principles.

It appeared from Mr. Homberg's analyſis, that what paſſed in the earth for the production of *ſulphur*, was, that the vitriolic acid, and the common mineral bitumen; both which are always found in great abundance in all places where native *ſulphur* is produced, being joined by a long digeſtion under ground, and mixt with ſome of the native alkalis of the earth, by an intimate union of all three together, formed one mineral *ſulphur*. The beſt way of trying the juſtneſs of this hypotheſis, was by attempting to make *ſulphur* with the ſame ſubſtances by a chemical digeſtion. With this view Mr. Geoffroy mixed the perfectly deflegmated ſpirit of *ſulphur* with an equal quantity of Mr. Homberg's balſam of *ſulphur*, carefully prepared; after digeſting theſe alone for ſome time, he added ſome oil of tartar by way of alkali, and then gave the whole a new digeſtion. After this the whole being diſtilled by the retort with a briſk fire, there came over into the receiver ſome phlegm, and a little oil; and when the veſſels were cooled, there was found in the retort a ſaline matter, yellow in ſome parts, and red in others, and every where ſmelling very ſtrongly of *ſulphur*. He made a lixivium of this ſubſtance, filtered the clear liquor, and adding diſtilled vinegar to it, the liquor became turbid, and ſmelt ſtrongly of *ſulphur*, and, in fine, precipitated a white powder, which was true *ſulphur*, and would burn wholly away.

This was the firſt experiment: the next was to try whether other ſubſtances, of the nature of thoſe ſeparated from *ſulphur*, would produce a true *ſulphur* in the ſame manner. For this purpoſe the ſubſtances fixed upon were oil of vitriol for the acid, and oil of turpentine for the bitumen; equal quantities of theſe being mixed together, the whole became very hot, and after ſtanding ſome time it became red, and had an agreeable ſmell, like the citron: this however, in longer ſtanding, became ſtronger, and leſs agreeable. The mixture having ſtood till it was conſiderably thick, there was added to it a quantity of oil of tartar; the whole then fermented together for a long time, but not with any great

violence, after which it became a thick ſoapy liquor. Part of this was diſtilled, and yielded by the retort a yellow tranſparent oil, of a ſtrong ſmell, and an acrid taſte, and a phlegm of a like acrid taſte: after theſe there came over a thick brown oil, ſweet to the taſte, and ſmelling like the oil of wax; and after this there followed a ſubſtance, wholly reſembling the butter of wax. At the bottom of the retort there remained a ſaline matter of a very ſtrong *ſulphureous* ſmell, reſembling alſo the ſtink of rotten eggs: this matter being diſſolved in water, and diſtilled vinegar poured on the ſolution, the whole became turbid, and, in fine, precipitated a grey powder, which proved true ſulphur.

Thus was the proceſs of nature fairly imitated, and a mineral ſubſtance produced by a mixture of bodies not drawn from that mineral. The author, after this, was deſirous to ſhorten the operation, dried the remainder of the firſt mixture over an open fire; then putting it into a red-hot crucible it flamed, and emitted a ſmell wholly reſembling that of olibanum when burnt; and after that a very penetrating ſmell of *ſulphur* iſſued from it. The whole being then taken from the fire, part of it was yellow, and part red, but all had the ſmell of *ſulphur* very ſtrong.

The vitriolic acid is not peculiarly neceſſary in the making of *ſulphur*, for the ſpirit of alum was found to finiſh the proceſs in the ſame manner.

As it appeared, that in the courſe of this proceſs there had been made a tartarum vitriolatum, by the mixture of the oil of tartar with the acid ſpirits, Mr. Geoffroy was induced to try whether the common tartar vitriolate would not anſwer the purpoſe, and the event proved, that this ſalt, mixt with any of the inflammable oils, would yield a burning and true *ſulphur*; and not only this ſalt, but many others of a like kind, anſwered the ſame purpoſe. The ſalt, produced by mixing oil of tartar and ſpirit of *ſulphur*; colcothar, or fixed ſalt of vitriol; Glauber's ſalt, which is a compoſition of the acid of vitriol, fixed by the alkali of ſea ſalt; and burnt alum, which is the vitriolic acid, mixed with a large portion of earth, all made genuine *ſulphur*, on being properly mixed with the inflammable oils. Another way of making this mineral is thus.

Mix together one ounce of the ſalt of colcothar with two drachms of ſalt of tartar; melt them together over a fierce fire, and as they begin to fuſe, throw in, at ſeveral times, an ounce of rectified ſpirit of wine. When the whole ceaſes to fume, it will yield a very penetrating ſmell of *ſulphur*; take it from the fire, and the flame will appear bluiſh. When it is cold, the matter will appear yellow in ſome places, and red in others, as in the former proceſſes, and will ſmell very ſtrongly of *ſulphur*, or of rotten eggs. Make a lixivium of this matter, and pour diſtilled vinegar into it, and a true inflammable *ſulphur* will be produced, in form of a precipitate, at the bottom of the veſſel.

The ſalt of tartar, in this mixture, ſerves only to aſſiſt the fuſion of the colcothar, and to render the mixture of the ſpirit with it more exact; but it appears very wonderful, that ſo volatile a *ſulphur*, as that of ſpirit of wine, ſhould be able at once to unite and fix itſelf in mixture with a fixed ſalt in fuſion. Nor is ſpirit of wine any more eſſential in this proceſs, than any peculiar acid in the former, ſince petroleum, oil of amber, oil of turpentine, or any of the fetid oils of animals, in the ſame manner produce *ſulphur* with theſe ſalts. Nay, any inflammable matter mixt with theſe ſalts, whether charcoal, common pit coal, or whatever elſe of the ſame kind, will produce *ſulphur* in the ſame manner, though in different proportions.

Decrepitated ſea ſalt and fixt nitre were tried in the manner of the former ſalts, but they would not yield any *ſulphur* on a like proceſs. Theſe ſeveral experiments all join in proving the truth of Mr. Homberg's obſervation, that *ſulphur* is compoſed in the earth by a mixture of an acid ſpirit, a bituminous oil, and an alkaline earth; and do great honour to that elaborate analyſis by which he diſcovered it.

Mr. Geoffroy, though he carried the art of making artificial *ſulphur* to theſe great lengths, is not however the firſt author who attempted it, Mr. Boyle and Glauber both did it before him, but on different plans; Mr. Boyle by a mixture of oil of vitriol and oil of turpentine, and Glauber by a mixture of his own ſalt and powder of charcoal; but though both ſucceeded in ſome degree, neither proceſs could be compared with theſe, nor the *ſulphur* be made near ſo pure. Mem. Acad. Par. 1704.

Stahl's method of producing *ſulphur* is very eaſy, and is thus performed. Mix with tartar vitriolate, in order to facilitate the melting of that refractory ſalt, an equal quantity of potaſh, and add to this an eighth part of ſoft powdered charcoal; put this mixture, at ſeveral times, into a red-hot crucible, and cover it with a tile, leſt a great quantity of the phlogiſton ſhould be diſſipated by the fire; the mixture will ſoon melt, and there will be produced a true *hepar ſulphuris*, or liver of *ſulphur*. When this is diſſolved in cold water, true *lac ſulphuris* may be precipitated from it; and this may be ſublimed into true and perfect flower of brimſtone. *Cramer*'s Art of Aſſaying, p. 390.

The pureſt gold, when melted with common *ſulphur*, remains perfectly the ſame as before; it lets the *ſulphur* burn freely away, remaining itſelf entire, and in a maſs. Silver, when it begins to grow red-hot in a crucible, melts immediately on adding common *ſulphur*; and when poured out, it proves a maſs that cuts very eaſily, is very malleable, and is of the colour and conſiſtence of lead: this maſs, however, being a ſecond time expoſed to a very ſtrong fire for a conſiderable time, is freed from its *ſulphur*, which becomes diſſipated, and the ſilver germinates into a kind of woolly ſubſtance, if the fire be ſlackened toward the end of the operation.

Tin, granulated and ſtratified with an equal, or double quantity of *ſulphur*, deflagrates in the fire as if nitre had been added, and leaves the fluid, which becomes ſolid and conſiſtent while it is yet red in the fire; whence it is plain, that the fuſion of tin is retarded by *ſulphur*. The remaining regulus is very brittle under the hammer, much like a ſemi-metal, and is of the colour of lead; but the part of the tin, thus turned into ſcoriæ, looks like aſhes and duſt upon the ſurface, but is darker coloured, and cleaner within. The whole quantity of the tin will be converted into theſe ſcoriæ, by repeating the burning with freſh quantities of brimſtone.

Lead melted with brimſtone, after the deflagration, is reduced to a maſs which is hardly fuſible by a great fire, but forms a friable maſs, conſiſting of very bright and glittering particles.

Copper ſtratified with *ſulphur* melts immediately in the fire, and turns to a black brittle maſs. The ſame thing alſo happens, if *ſulphur* be put upon copper when red-hot. Iron being taken red-hot out of the fire, and rubbed with *ſulphur*, melts into a ſpungy droſs; it afterwards quits this *ſulphur* with difficulty, but melts very eaſily with it. There is no metal, or ſemi-metal, that ſeems ſo nearly allied to iron, as *ſulphur*, or that melts ſo eaſily, and remains ſo intimately mixed with it. Regulus of antimony being well powdered, and mixed with *ſulphur*, and ſtirred with an iron while in fuſion, returns into crude antimony again. The fuſion of crude antimony is alſo greatly promoted and aſſiſted by common *ſulphur*; but it does not mix ſo readily with the *ſulphur* as the regulus.

Biſmuth melted with common *ſulphur* runs into a maſs reſembling antimony, of a faint grey colour, conſiſting of minute and very bright needles, each cutting the others acroſs: this maſs is extremely brittle.

Zink melted with *ſulphur* does not readily mix with it, but if it be kept a long time in a moderate fire, and *ſulphur* be many times poured over it, ſo as to cover the whole ſurface, and it be continually ſtirred together, it at laſt produces a very brittle dark-coloured ſhining ſubſtance.

From theſe experiments with *ſulphur* on the metals it appears, 1. that iron being very greedy of *ſulphur*, all the other metals, and ſemi-metals, may be freed from *ſulphur*, by adding iron to them. 2. That a very ſmall quantity of iron, a greater quantity of copper, and a much larger of lead, or tin, are neceſſary to abſorb the ſame proportion of *ſulphur*. *Cramer*'s Art of Aſſaying, p. 43.

Dr. Liſter has given it as his opinion, that there is no ſuch thing as pure mineral *ſulphur* found native, or in its original ſtate, in the earth. He ſuppoſes all the pyrites to contain a vaſt quantity of *ſulphur*, as indeed experience proves; and is of opinion, that as we by art can, by means of fire, melt and ſeparate pure *ſulphur* from the pyrites, ſo nature, acting by ſubterranean fires, can do, and frequently does the ſame; and that the *ſulphur*, found pure about the burning mountains, and in mines, is all of this kind. He ſuppoſes, alſo, that thunder, lightning, and earthquakes are all owing to this matter; and that it is owing to the exhalations of the pyrites, which are in effect the pyrites itſelf. Philoſ. Tranſ. N° 156.

It is evident, from numerous experiments, that vitriol and *ſulphur* are things very nearly allied to one another. The vitriolate ſalt, in common *ſulphur*, differs ſcarce at all from common vitriol, and the acid liquors obtained from both, under the different names of *ſpirit of ſulphur*, and *oil of vitriol*, are the ſame, except in degree of ſtrength.

The effects of theſe two acids in the body, and alſo on metals, *&c.* are exactly the ſame. It is obſerved, that the *ſulphur* yields but a very ſmall quantity of this acid, in compariſon of the vitriol; but the reaſon of this is, that in the operation the rapid motion of the flame ſublimes the far greater part of the ſubſtance, unſeparated in the form of flowers.

There are ways however of remedying this, and by ſome ſuch means it was that the famous Drebbel obtained, at the rate of eight, and ſometimes ten ounces of ſpirit, from a pound of *ſulphur*; whereas, in the common proceſs, one ounce is a conſiderable quantity to obtain. Poſſibly the grand ſecret, Mr. Ward poſſeſſes at preſent, of making oil of vitriol, as he calls it, cheaper than others, may depend on this ſort of contrivance. The veſſels he uſes are vaſt ſpheres of glaſs, of three feet in dameter, which muſt ſerve as well, at leaſt, if not much better, than bells; and oil of *ſulphur*, and oil of vitriol, are ſo much the ſame, that there is no deceit in ſelling the one for the other.

In

In all the operations for the making oil of *ſulphur*, the weather is a material thing to be regarded; for when the operation is performed in moiſt weather, there is always a greater quantity of ſpirit or oil prepared, than when in dry; and Drebbel acknowledged, that he could obtain one fourth more in theſe, than in other ſeaſons. This great chemiſt tells us, that he was convinced the contrivance he uſed was capable of very great improvements, and that he made no doubt of carrying it ſo far, at length, as to obtain an equal weight of acid ſpirit to that of the *ſulphur* uſed in the experiment; the humidity of the air, at leaſt, adding as much as the quantity of the *ſulphur* loſt in the operation. There are ſeveral common menſtrua, by means of which *ſulphur* may be reduced into the form of a highly-rectified acid, and corroſive liquor; and even ſpirit of nitre, or aqua fortis, well rectified, being digeſted upon the flowers of brimſtone, and then diſtilled in aſhes, and the proceſs repeated five or ſix times after the laſt operation, there will remain with the flowers nearly an equal weight of an acid ſpirit, in all things reſembling that made by the bell, the ſpirit of nitre being ſcarce at all changed from what it was before the operation: and it ſeems, from experiment, that if the proceſs were frequently reiterated, and the ſpirit of nitre changed, the whole may be thus tranſmuted into an acid ſpirit, abating only for ſome ſmall proportion of earthy, or metalline particles. Phil. Tranſ. N° 104.

There is a preparation of common *ſulphur*, ſtrongly recommended by Mortimer for preſerving timber from being worm eaten, as it is very ſubject to be when felled before the ſap is wholly at reſt. A quantity of common yellow brimſtone is to be put into a common retort of glaſs, and covered three fingers deep with aqua fortis; this is to be diſtilled off to a dryneſs, and the ſame repeated three times. The *ſulphur* then is to be taken out, and laid on a marble, or put into an open flat glaſs veſſel, where it will ſoon run into an oil by deliquium. This oil is to be rubbed on any curious piece of wood that is in danger of worms: it will deſtroy them if they have begun to breed in it, and wholly prevent them if not yet begun. It alſo gives the wood an agreeable tinge or colour, which no art can ever rob it of afterwards. It is alſo a great preſervative of wood that is to be ſet in the earth, or under water; and may be uſed with ſucceſs to rub over the cables in ſhipping, or any other ropes that are indangered by lying much in the water. *Mortimer*'s Huſbandry, Vol. 2. p. 104.

SULPHUR, in medicine, is given in its crude ſtate with great ſucceſs in diſeaſes of the lungs: it ſtrengthens and cleanſes them, by promoting expectoration. It has always been famous for its virtues in cutaneous diſeaſes, and in hæmorrhoidal complaints. It generally proves a little looſening to the bowels, and increaſes the diſcharges by perſpiration: it even communicates its ſmell to the perſpired matter for a conſiderable time after taking it, and will often blacken gold or ſilver that is worn by people who take any conſiderable quantity of it.

The preparations of *ſulphur* are, 1. *flores ſulphuris*, flowers of *ſulphur*. 2. *Sulphur precipitatum*, commonly called *lac ſulphuris*. 3. *Balſamum ſulphuris*. 4. *Aqua ſulphurata*. 5. *Spiritus ſulphuris*, the oil, or ſpirit of *ſulphur*.

SULPHUR *of antimony*. The method of Angelus Sala for preparing the *ſulphur of antimony* ſeems, according to Dr. Plummer, preferable to the common way. The curious may find the deſcription of Sala's in the Medic. Eſſ. Edinb. Vol. 1. Art. 6. The doctor thinks, that in the common preparation much of the true *ſulphur* is conſumed by the deflagration, and the precipitated powder conſiſts of many of the groſs earthy parts of the ſalts in antimony. However, the *ſulphur of antimony*, uſed by the doctor in the preparation of his *æthiops*, was made in the common way. See PLUMMER's *æthiops*.

SULPHUR *auratum*, a name given by ſome chemiſts to a preparation of *ſulphur* and arſenic, called by others *rubinus arſenicalis*. See RUBINUS.

Balſam of SULPHUR. See BALSAM, *Cycl.*

Embryonatum SULPHUR. See EMBRYONATUM.

Fixed SULPHUR. *Fixed ſulphur* is uſed by the enamellers, and is prepared in the following manner. Boil flower of brimſtone in common oil for an hour; take the matter off the fire, and pour on it a quantity of very ſtrong vinegar, the flower of brimſtone will on this ſink to the bottom; pour off the liquors, and repeat the operation to the third time, and the powder then ſeparated is the *fixed ſulphur*. *Neri*'s Art of Glaſs, p. 188.

Spirit of SULPHUR. The uſual methods of preparing the acid *ſpirit of ſulphur*, or oil of *ſulphur*, by the bell, are ſo tedious and expenſive, that few are at the pains to make it. Both the methods, deſcribed by Mr. Charras in the Pharmacop. Royale, p. 883, are liable to many uncertainties and inconveniencies, as well as that recommended by Mr. Homberg in the Memoirs de l'Acad. des Sciences, anno 1703. In the Medical Eſſays of Edinburgh, Vol. 5. Art 14. we have an eſſay on extracting the acid of *ſulphur* in an eaſy manner, by placing a crucible with about three ounces of flower of *ſulphur* in it under a retort. The *ſulphur* being fired by throwing a lighted coal into it, the crucible is then gradually raiſed till it be juſt received within an orifice cut in the bottom of the bole of the retort, to which a large receiver with a ſpout is adapted. When the *ſulphur* is conſumed, the ſame quantity of new lighted *ſulphur* is to be put into another crucible; and thus the proceſs may be continued, till as much acid is obtained as is required. See the book loc. cit. or the Abridgment, Vol. 1. p. 160, ſeq. for the details of practice.

This method is indeed an improvement on the common one; but there are two other more elegant and eaſy ways of extracting the acid from *ſulphur*. The firſt is by Stahl, who directs woollen cloths to be moiſtened in a ſolution of fixed alkaline ſalt, and then dried. Theſe are to be ſuſpended over the fume of burning *ſulphur*, which will be imbibed and locked up in the ſalt, from whence it may be eaſily ſeparated by the addition of oil of vitriol, and the aſſiſtance of common glaſs diſtilling veſſels.

The ſecond is by Mr. Seehl, who pours oil of vitriol on a *hepar ſulphuris* placed in a glaſs retort, to which he adapts a receiver, and by a ſmall heat draws off the acid liquor. See Improvement on making Volatile *Spirit of Sulphur*, by Ephr. Rinh. Seehl, Lond. 1744. and Medic. Eſſ. Abridg. Vol. 1. p. 164. Not.

A pound of flowers of *ſulphur* may be burnt in about ſeven or eight hours, and will yield about ſeven drachms, or an ounce of pure acid. But it is obſervable, that the quantity of acid liquor varies greatly with the weather, being, as before mentioned, conſiderably more when the air is moiſt, than when it is dry.

It is ſaid that *ſulphur* may be made by contriving a fat, oily, or bituminous ſubſtance, with any mineral acid ſalt; but, in reality, the difficulty of making *ſulphur* with every acid is very great, if not impoſſible. With the vitriolic acid, indeed, the inflammable part of bodies eaſily combines into a true *ſulphur*; but it does not appear that any way has yet been found, by which the marine or nitrous acid may directly be combined into ſuch a ſubſtance. Stahl is expreſsly of this opinion in his Opuſcul. Phyſ. Medic. 4to. See Medic. Eſſ. Abrig. p. 163. Not.

Oil of SULPHUR. Some think there is an eſſential difference between the acid of *ſulphur* and its ſuccedaneum, the oil of vitriol; but a late author aſſerts, notwithſtanding the experiments brought to ſupport this opinion, that if the two acid liquors be reduced to the ſame ſtrength, and perfectly freed from all heterogeneous ſubſtances, they will be perfectly ſimilar, and not to be diſtinguiſhed. See Eſſay for Reforming of the London Pharmacopœia, London, 1744. p. 64.

SULPHUR *præcipitatum*, a name given in the London Pharmacopœia to the medicine called by other authors *lac ſulphuris*, or milk of *ſulphur*. It is by ſome directed to be made with the addition of an alkaline ſalt, but according to the method now in uſe, is thus prepared. Boil flowers of *ſulphur* in water, with three times their weight of quick lime, till they are thoroughly diſſolved; filtre the ſolution through paper, and pour on it weak ſpirit of vitriol, till a precipitation is procured; ſeparate the precipitated matter, by pouring off the water, and waſh it with freſh water, till it is become quite inſipid. *Pemberton*'s Lond. Diſp. p. 210.

Purified SULPHUR, is uſed in the making of gunpowder, and other occaſions. The method of preparing it at the powder-mills is this: they diſſolve the *ſulphur* by a very gentle heat, and then ſkum it, and paſs it through a ſtrainer. If the brimſtone ſhould happen to take fire in the melting, they have an iron cover that fits on cloſe to the melting veſſel, and damps the flame. The brimſtone is judged to be ſufficiently refined, if it will melt without yielding any fetid odour between two hot iron plates, and be changed into a kind of red ſubſtance. *Shaw*'s Lectures, p. 389.

SULPHUR *rapax*, in chemiſtry, a name given to arſenic, from its carrying off a great quantity of many metals in the fire, which it carries up with it, and ſublimes in form of flowers, called by ſome *cadmia fornacum*.

Volatile acid of SULPHUR. The *volatile acid of ſulphur*, according to ſome, contains not only the oil of *ſulphur*, but, at the ſame time, the pure native *gas*, or highly volatile ſpirit of the *ſulphur*. Mr. Seehl has given us an eaſy method of procuring this *volatile acid of ſulphur*, which he thinks of ſuperior virtue, both as a menſtruum and as a medicine, to the oil of *ſulphur* by the bell. For this purpoſe he gives us two proceſſes; one with an alkaline ſalt *per ſe*, mentioned above; and the other, which he prefers, by means of the ſame ſalt, with the addition of quick lime. See Phil. Tranſ. N° 472. The ſpirit, obtained thus by quick lime, is ſtronger, more acid, and more volatile, although ſpecifically heavier than the former.

The caput mortuum, remaining after diſtillation, makes an excellent tartar of vitriol, by ſolution, filtration, and cryſtallization. Ibid.

SULPHUR-*water*. See AQUA *ſulphurata*.

SUMA, a name given by ſome of the chemical writers to tartar.

SUMAGE, SUMAGIUM, or SUMMAGIUM, in our old writers, toll for carriage on horſeback. *Pro uno equo portante* ſummagium *per dimidium ann. obolum. Chart. de Foreſt.* cap. 14. *Crompt.* Juriſ. 191. Terms of Law. *Blount, Cowel.*

SUMEN, a word uſed by ſome anatomical writers to expreſs the hypogaſtrium.

SUMMER (*Cycl.*)—It is ſaid, that a froſty winter produces a dry *ſummer*; and a mild winter a wet *ſummer*. It often happens ſo, in fact; but why it ſhould be ſo, is perhaps a queſtion difficult to determine. The curious may, on this ſubject, conſult the Philoſophical Tranſactions, N° 458. ſect. 10.

SUMMER *teale*, in zoology, the name of a bird, the ſmalleſt of all the duck kind, called by Geſner the *anas circias*. See the article CIRCIAS.

SUMP, in metallurgy, a round pit of ſtone lined with clay within, for the receiving the metal on its firſt fuſion from the ore. *Ray*'s Words, p. 114.

SUMP, in the Engliſh ſalt works, where ſea water is boiled into ſalt, is uſed as the name of a ſort of pond, which they make at ſome ſmall diſtance from the ſaltern on the ſea ſhore, between full ſea and low water mark. From this pond they lay a pipe, through which, when the ſea is in, the water runs into a well adjoining to the ſaltern; and from this well they pump it into troughs, through which it is carried to their ciſterns, in order to be ready to ſupply the pans. See the article SALT.

SUN (*Cycl.*)—SUN-*fiſh*, *mola*, in ichthyology. See Tab. of Fiſhes, N° 27. and the article MOLA.

One of theſe fiſhes, of five hundred weight, was taken ſome years ago near Plymouth, and on boiling a piece of the fleſh, to try how it would taſte, (as ſome authors have deſcribed it as a fine fiſh for the table) it was found, inſtead of a firm maſs, to be all converted, in a few minutes, into a perfect jelly, ſo that it could not be taken out otherwiſe than with a ſpoon. In colour and conſiſtence this jelly reſembled boiled ſtarch when cold, and had little or nothing of a fiſhy flavour, but a very agreeable taſte; it ſtuck firmly to the lips, however, and to the fingers, appearing very remarkably glutinous: and as the antients had no other glue than one made of fiſh, this jelly was tried, as to its ſticking quality, on leather, and on paper, and was found to anſwer as well as common paſte; but by ſome accident it was not tried upon wood.

It will be extremely worth while, on ſome other opportunity, to try whether a true ichthyocolla may not be prepared, by boiling down this jelly. Philoſ. Tranſ. N° 456. p. 220.

SUN-*flower*, *corona ſolis*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the radiated kind; its diſk is made up of floſcules, and its outer edge of ſemifloſcules; theſe ſtand upon the embryo ſeeds, and are ſeparated from one another by little leaves of an imbricated figure, and contained in a ſcaly huſk, or cup: the embryos finally ripen into ſeeds, furniſhed with two little leaves.

The ſpecies of *ſun-flower*, enumerated by Mr. Tournefort, are theſe. 1. The common great *ſun-flower*. 2. The great branched *ſun-flower*. 3. The great *ſun-flower* with greyiſh white ſtriated ſeeds. 4. The perennial *ſun-flower* with large flowers and large ſeeds. 5. The leſſer, or female *ſun-flower*. 6. The ſmall-flowered *ſun-flower* with tuberous roots. 7. The ſmall-flowered *ſun-flower* with long roots. 8. The talleſt broad-leaved *ſun-flower*. 9. The tall *ſun-flower* with alated ſtalks. 10. The rapunculus-rooted *corona ſolis*. 11. The ſmall-flowered large-leaved *corona ſolis*. 12. The throat-wort-leaved *ſun-flower* with creeping roots. 13. The golden-rod-leaved very tall *ſun-flower*. 14. The creeping narrow-leaved *ſun-flower* with pale yellow flowers. 15. The willow-leaved *ſun-flower* with alated ſtalks. 16. The ſhrubby American *ſun-flower* with lychnis leaves, and yellow flowers. 17. The ſhrubby American *ſun-flower* with ſpurge-laurel leaves, and yellow flowers. 18. The dwarf ſea American *ſun-flower* with fleſhy three-pointed leaves, and yellow flowers. 19. The ſmall *ſun-flower* with deeply jagged leaves. 20. The *ſun-flower* with large jagged leaves. 21. The narrow-leaved *ſun-flower* with jagged leaves. 22. The New England *ſun-flower* with very large trifid leaves. *Tourn.* Inſt. p. 489.

There are ſeveral different ſpecies of this flower, all which are very beautiful in large gardens. They are moſt of them annual plants, and are to be ſown every ſpring in a bed of good light earth. When the ſhoots are about three inches high, they muſt be tranſplanted into nurſery beds, and ſet at eight inches diſtance every way; they ſhould remain here till they are a foot high, and then be carefully taken up with a ball of earth at their roots, and planted in large borders, or intermixed in the boſquets of large growing plants; they muſt be frequently watered till they have taken root, and after that will require no farther care. In July the flowers appear, and ſtand a conſiderable time: the largeſt of theſe ſhould be left to ſtand for ſeed. The birds are very apt to devour this ſeed, but it ſhould be carefully guarded from them, and the head left on the plant till October, at which time it ſhould be cut off, and hung up to dry in an airy place, and in a month more the ſeeds will be perfectly hardened.

Several ſpecies of this plant alſo are perennial, and increaſe greatly by the root. Among theſe the common ſmaller-flowered one is a very valuable plant in gardens, as it requires no culture, will grow in all ſoils and ſituations, and is a very ornamental flower, continuing in bloom from June to October. *Miller*'s Gard. Dict.

Small SUN-*flower*. See HELIANTHEMUM.

SUN-*dew*. See ROS *ſolis*.

SUN-*ſcorched*, a term uſed by our gardners in ſome parts of England to expreſs a diſtemperature of fruit trees, owing to the *ſun*'s affecting them too forcibly and too ſuddenly; the conſequence of which is the loſs and withering of the fruit. Such trees only are ſubject to this, as are planted in places ſheltered from the ſpring *ſun*, and only open to the ſummer's; and it may be always cured by proper waterings.

Mr. Merret gives us an account of three cherry-trees, of that kind we call *May-dukes*, which he cured in this manner. Theſe trees were planted in a very rich mould, which lay to a ſouth wall, ſhaded four months of the winter from the *ſun* by a high building, ſo that the *ſun* never came upon them till the latter end of March; when being high, and ſhining ſomewhat fiercely upon them, from that time the fruit had been always uſed to wither. In a very hot ſummer, when theſe trees ſeemed going into a worſe way than ordinary, the roots of one of them was bared, and a hole being made about it, a gallon of water was poured into it every morning and evening for about a fortnight before the cherries came to a redneſs.

The effect of this was, that the fruit was full and good, while the two trees that ſtood next it had their fruit withered and ſcorched up. One of theſe was taken into conſideration more late, and being watered from time to time, thoſe fruits which were moſt withered on it fell off, and the reſt grew ripe of themſelves, and proved very good ones. The third tree, which was left to itſelf, produced not one ripe good cherry. Phil. Tranſ. N° 23.

SUNCOPULLY, in natural hiſtory, a name given by the people of the Eaſt-Indies to a kind of ſparry ſubſtance of a whitiſh colour, which they calcine, and afterwards give in agues, and other intermittent caſes.

It is erroneouſly by ſome ſuppoſed to be a ſpecies of arſenic; for it has none of its qualities.

SUONATA, in muſic. See SONATA, *Cycl.*

SUONATINA, or SONATINA, in the Italian muſic, a little, ſhort, eaſy *ſonata*. See SONATA, *Cycl.*

SUPERBUS *muſculus*, a name given by ſome to the elevator oculi, or the muſcle whoſe office is to raiſe and lift up the eye; that motion giving a haughty look.

The *ſuperbus muſculus* is one of the muſcles called by Albinus the *quatuor recti oculi*. See ATOLLENS.

SUPERFICIAL (*Cycl.*)—SUPERFICIAL *fourneau*, in fortification, the ſame with *caiſſon*, which is a wooden cheſt, or box, with three, four, five, or ſix bombs in it. Sometimes it is filled only with powder, and uſed in ſieges, by being buried under ground, with a train to it, to blow up any lodgment that the enemy may make.

SUPERFICIALIS *ſphincter*, in anatomy, a name given by Riolanus, and ſome others, to the muſcle of the anus, called by Winſlow and Albinus *ſphincter internus ani*. This author, and ſome others, call it alſo *ſphincter cutaneus*.

SUPERFICIES (*Cycl.*)—*Internal* SUPERFICIES *of the earth*, a term uſed by Tull, and others, to expreſs that part of the earth which affords the pabulum, or what is called the *paſture of plants*.

Plants themſelves are the paſture of animals; but it is from this *internal ſuperficies of the earth* that vegetables firſt receive the nouriſhment which they afterwards give to animals. This inner *ſuperficies of the earth* is the *ſuperficies* of the pores, cavities, and interſtices of the divided parts of the earth; and theſe are of two kinds, natural and artificial. Tull is the firſt who has uſed this term, and he juſtifies himſelf from the imputation of having uſed an abſurd phraſe, as it might at firſt ſeem, the adjective expreſſing ſomething within, and the ſubſtantive ſomething without, by obſerving, that though the vegetable paſture is within the earth, yet it is alſo on the outſides of the divided parts of the earth.

Of the natural and artificial paſture of plants, or the natural and artificial cavities, pores, and interſtices of the earth, the natural alone will ſuffice to furniſh a country with vegetables for the maintenance of a few inhabitants: but if the artificial, that is, if agriculture, the ſole buſineſs of which is the making this artificial paſture for plants, were aboliſhed out of the world, it is much to be feared, that the people of all populous countries, eſpecially of thoſe toward the borders of the frigid zones, (for there the trees often fail of producing fruit) would be reduced to the utmoſt neceſſities for want of this proper kind of food.

The artificial paſture of plants is that inner *ſuperficies* of the earth, which is made by dividing the ſoil by art. This, on all parts of the globe where it is uſed, maintains many more people

people than the natural one; in the colder countries it maintains ten times as many as the natural one, and when the art of agriculture is more advanced to perfection, it will maintain twice as many as it does at preſent; and this improvement is eaſy, and to be done by ſimple means.

The natural paſture is not only leſs than the artificial, in an equal quantity of ground; but the little there is of it conſiſting alſo of the *ſuperficies* of pores and cavities not having a free communication with one another, they are leſs pervious to the fine roots of all vegetables, which require a greater force to break through their partitions; and by that means roots, eſpecially of weak plants, are excluded from many of thoſe cavities; ſo that the benefit of a great part of the paſture that really is there, is loſt to the huſbandman.

The artificial paſture, on the other hand, conſiſts in *ſuperficies* of cavities that are pervious to all roots, and give them free paſſage throughout the whole extent of the cultivated place; and conſequently, the fine horizontal roots of plants, which run much farther than is generally ſuppoſed, (thoſe of a turnep, for inſtance, running ſix feet diſtant from the main root every way; ſee ROOT) will find an eaſy paſſage in every part to the utmoſt extent to which nature allows them to run.

The *internal ſuperficies of the earth*, which is the paſture of plants, is not like the external ſurface, which is the paſture of animals, in that it cannot be inlarged without the addition of more ſurface taken from land adjoining to it, by inlarging its bounds or limits: but the *internal ſuperficies*, or artificial paſture of land, may be inlarged without addition, or more land, only by diviſion of the ſame earth: and this artificial paſture may be increaſed in proportion to the diviſion of the parts of the earth, whereof it is the *ſuperficies*.

A cube of earth of one foot has but ſix ſquare feet of *ſuperficies*; but divide this cube into cubical inches, and then its *ſuperficies* will be increaſed twelve times, that is, it will be ſeventy two *ſuperficial* feet. Divide theſe cubes again into ſuch others, as bear the ſame proportion to an inch that an inch does to a foot, and then the ſame quantity of earth, which had at firſt only ſix feet *ſuperficies*, will have a *ſuperficies* of eight hundred and ſixty four feet of natural paſture: and in the ſame manner is the ſoil diviſible, and conſequently this paſture increaſable *ad infinitum*.

Poor land does not afford an *internal ſuperficies* ſo well ſtocked with theſe fruitful particles as rich land does, but this we may compenſate by dividing it more, and then what it wants in quality may be made up in quantity.

The common method of dividing the ſoil is by dung, or by tillage, or by both; and none of the natural paſture is ever loſt, or injured by the uſe of the artificial means, but, on the contrary, it is mended by ſuch means, a free communication being made by them between pore and pore. *Tull*'s Horſehoeing Huſbandry, p. 18.

SUPERFLUOUS *interval*, in muſic, is one that exceeds a true diatonic interval by a ſemitone minor. Thus the

SUPERFLUOUS *ſecond*, or *tone*, contains a ſemitone minor more than a tone, or greater ſecond; and will therefore be expreſſed by $\frac{125}{108}$, or by $\frac{75}{64}$. The firſt of theſe expreſſions is a tone minor, and a ſemitone minor; ſince $\frac{10}{9} \times \frac{25}{24} = \frac{125}{108}$: and the other is a tone major, and ſemitone minor; for $\frac{9}{8} \times \frac{25}{24} = \frac{75}{64}$. This laſt occurs in practice, and is one of the intervals of the chromaticum toniæum. See the article CHROMATIC.

In temperate ſcales theſe two *ſuperfluous* tones coincide. Thus from B♭ to C ſharp, or from F to G ſharp, are *ſuperfluous* tones.

SUPERFLUOUS *third* is greater than the third major by a ſemitone minor, and will therefore be expreſſed by $\frac{125}{96} = \frac{5}{4} \times \frac{25}{24}$. It is not in uſe. It ſeems a fourth on our harpſichords. Thus from B♭ to D ſharp is, properly ſpeaking, a *ſuperfluous third*; but D ſharp and E♭ being confounded, it paſſes for a fourth.

SUPERFLUOUS *fourth*. This interval is expreſſed by $\frac{25}{16} = \frac{4}{3} \times \frac{25}{24}$. It is by practitioners, and in temperate ſcales, confounded with the tritonus. See INTERVAL.

SUPERFLUOUS *fifth* is expreſſed by $\frac{25}{16} = \frac{3}{2} \times \frac{25}{24}$. This is equal to two thirds major, for $\frac{5}{4} \times \frac{5}{4} = \frac{25}{16}$. The *ſuperfluous fifth* occurs in practice, as from C to G ſharp.

SUPERFLUOUS *ſixth*. This interval is of two kinds; being the reſpective complements of the two diminiſhed thirds to the octave. One only, ſtrictly ſpeaking, anſwers to the general definition of a *ſuperfluous* interval, which is that interval which exceeds the ſixth major by a ſemitone minor, and is therefore expreſſed by $\frac{125}{72} = \frac{5}{3} \times \frac{25}{24}$. But the other interval, which is a comma more than the former, and is two ſemitones major leſs than the octave, is chiefly uſed in harmony, as between B♭ and *a* ſharp, where it has a fine effect. It is expreſſed by $\frac{225}{128} = \frac{2}{1} : \frac{16}{15} : \frac{16}{15} = \frac{2}{1} : \frac{256}{225}$. See the articles INTERVAL and DIMINISHED *third*.

SUPERFLUOUS *ſeventh* is expreſſed by $\frac{15}{8} \times \frac{25}{24} = \frac{125}{64}$. This is a dieſis leſs than the octave. See INTERVAL.

SUPERFLUOUS *octave* is a ſemitone minor more than the octave, as from C to *c* ſharp. It ſometimes occurs in the baſſes of inſtrumental pieces.

SUPERGEMINANS, a name given by ſome anatomical writers to the epididymis.

SUPERGENUALIS, a name given by ſome authors to the patella, or knee pan. See PATELLA.

SUPERIOR (*Cycl.*)—SUPERIOR *auriculæ muſculus*, in anatomy, a name given by Santorini, and by Winſlow, to one of the muſcles of the ear, called by Albinus and Cowper the *attollens auriculam*, and by many *auriculæ primus*.

SUPERIOR *courts of record*. See the article COURT.

SUPERNUMERARII, in the later times of the Roman empire, ſoldiers added to the legion after it was completed. They were the ſame with thoſe in former times, called *accenſi*. *Pitiſc.* in voc. See ACCENSI, *Cycl.* and *Suppl.*

SUPERNUMERARY (*Cycl.*)—SUPERNUMERARY *bones of the head*. Anatomiſts diſtinguiſh by this appellation ſeveral bony pieces found in ſome ſkulls, chiefly between the parietal and occipital bones. They form breaks in the lambdoidal ſuture, and are joined by true ſutures to the bones already mentioned.

Their figure, number, and ſize vary extremely; ſometimes they are triangular, or approaching to that form, but oftener they are of no determinate figure: in ſome ſubjects they incroach on the occipital bone, and in others on the parietal bones; and ſometimes they extend themſelves every way. They are commonly indented, and broader on the outſide of the ſkull than on the inſide, in which they have no viſible indentations; and ſometimes, when they are ſmall on the outſide, are hardly at all to be ſeen within. They have by ſome been termed keys, a name uſed by joiners for the pieces which ſerve to ſtrengthen the joints of boards; but this can agree to them only in reſpect to their ſituation, not in reſpect to their uſes with regard to the other bones of the head. Some ſuch bones have alſo been found in the joints, between the bones of the head and face; and between thoſe of the bones of the face with each other. *Winſlow*'s Anatomy, p. 53.

SUPERONERATIONE *paſturæ*, a judicial writ, that lies againſt him who is impleaded in the county court for the ſurcharging, or overburthening a common with his cattle, in a caſe where he was formerly impleaded for it in the ſame court, and the cauſe is removed into one of the courts at Weſtminſter. Reg. Judic. *Blount*, *Cowel.*

SUPERPARTICULAR (*Cycl.*)—SUPERPARTICULAR *ratio*. Ptolemy, in his Harmonics, ſeems to lay a great ſtreſs on *ſuperparticular ratios* [c], beyond the ſuperpartient in muſic. He does not call the intervals which may be expreſſed by the former ratios, excepting 2 : 3 and 3 : 4, diſſonants, as the Pythagoreans did, but concinnous, as if they were of a middle nature between conſonant and diſſonant. But all this doctrine of *ſuperparticular ratios* is a precarious hypotheſis. The two thirds, major and minor, expreſſed by 5 : 4 and 6 : 5, are *ſuperparticular*, and concords. Their octaves, 5 : 2 and 12 : 5, are *ſuperparticular*, and concords alſo. Ptolemy himſelf refutes the Pythagoreans for excluding the diapaſon diateſſaron, expreſſed by 8 : 3, from the number of concords, becauſe its proportions were ſuperpartient; yet his own doctrine is equally precarious [d].—[c See RATIO, *Cycl.* d Vid. *Euler*, Tentam. Nov. Theor. Muſic. p. 63, 64.]

SUPER-PRÆROGATIVA *regis*, a writ which formerly lay againſt the king's widow for marrying without the ſucceſſor's licence. F. N. B. 173. *Blount*, *Cowel.*

SUPER-STATUTO *de articulis cleri cap.* 6. a writ lying againſt the ſheriff, or other officer, that diſtrains in the king's highway, or in the lands antiently belonging to the church. F. N. B. 173. *Blount*, *Cowel.*

SUPER-STATUTO *facto pour ſeneſchal & marſhal de roy, &c.* a writ that lies againſt the ſteward or marſhal for holding plea in his court, or for treſpaſs or contracts not made, and ariſing within the king's houſhold. F. N. B. 141. *Blount*, *Cowel.*

SUPER-STATUTO *verſus ſervantes & laboratores*, a writ which lies againſt him who keeps any ſervants departed out of the ſervice of another contrary to law. F. N. B. 167. *Blount*, *Cowel.*

SUPINATOR (*Cycl.*)—SUPINATOR *brevis*, in anatomy. This is a ſmall thin fleſhy muſcle, ſurrounding a great portion of the upper part of the radius.

It is fixed by one end to the lower part of the external condyle of the os humeri, to the external lateral ligament of the joint, to the annular ligament of the radius, and to part of the lateral eminence in the head of the ulna; from thence it paſſes obliquely over the head of the radius, covering ſome part of it, and running down upon, and in ſome meaſure ſurrounding the neck, it turns in under the occipital tuberoſity, and is inſerted by the ſide of the interoſſeous ligament, in the inſide of the ſuperior quarter of the bone, and even a little lower. In ſome ſubjects we may obſerve the marks of the paſſage of this muſcle over the outſide of the bone. It makes an angle with the pronator teres, reſembling the Roman V. *Winſlow*'s Anatomy, p. 190.

SUPINATOR *longus*, a long flat muſcle, lying on the external condyle of the os humeri, and on the convex ſide of the radius, from one end to the other.

It is fixed by fleſhy fibres to the external intermuſcular ligament, and to the criſta of the external condyle of the os humeri, for five or ſix fingers breadth above the condyle, between the brachiæus, and anconæus externus; from thence it runs along the whole convex ſide of the radius, and is inſerted by a flat narrow tendon, a little above the ſtyloide apophyſis, in the angle between the concave and flat ſides of the extremity of this bone. *Winſlow*'s Anatomy, p. 189.

SUPPLE. To *ſupple* a horſe, in the manege, is to make him bend his neck, ſhoulders, and ſides, and to render all the parts of his body more pliable.

SUPPOPLITÆUS, in anatomy, a name given by Spigelius, and ſome others, to the muſcle more generally known by the name of the *poplitæus*. See POPLITÆUS.

SUPPRESSION (*Cycl.*)—SUPPRESSION *of urine*. There are commemorated, in the Philoſophical Tranſactions, three caſes of an actual and total *ſuppreſſion of urine*, ſuppoſed to proceed from a ſtone lodged in the neck of the bladder; but in all which, on introducing the catheter, it was found that there was no ſtone there, nor any urine in the bladder. In all theſe caſes the ſame remedy was uſed; that is, a great quantity of acids diluted largely with water, and in conſequence of this the urinary ſecretion was immediately reſtored, and the patient ſoon voided it in a proper manner, and was reſtored to health without any further uſe of medicines. Philoſ. Tranſ. N° 253.

A *ſuppreſſion of urine* ſometimes happens to women with child, by the womb falling down, and preſſing on the urethra. See Act. Acad. Nat. Curioſ. Not. 4. Obſ. 113.

SUPPRESSIONIS *ignis*, a *fire of ſuppreſſion*, a term uſed in chemiſtry to expreſs ſuch an application of fire to any ſubject, that it ſhall at once act upon it above and below in the ſame manner. The uſual way of giving this heat, is by covering the veſſel, in which the ingredients are put, with ſand, and then laying hot coals upon that, ſo that they may heat through the ſand downwards.

SUPPURATION (*Cycl.*)—When in tumors and phlegmons nature ſhews a tendency to *ſuppuration*, or ripening, all the reſolving, or diſperſing medicines muſt be laid aſide, and great care muſt be taken to forward the maturity of the inflammation, that is, to convert the ſtagnating blood into laudable matter; then to give a diſcharge, or vent, to this *ſuppurated* matter, afterwards to cleanſe the part, and finally to incarn, and heal it.

The firſt of theſe intentions, the ripening the ſwelling, is to be promoted by ſuch of the emollient medicines as obſtruct the pores of the ſkin, as fats, oils, and glutinous medicines; as alſo the ſharp, pungent, and, in ſome degree, cauſtic medicines, which may be uſed in form of cataplaſms, or plaſters. Of the firſt kind are mallows, marſhmallows, figs, linſeed, honey, crumb of bread, the various animal fats, and the oils of lillies, chamæmile, *&c.* and of the latter, or the ſharp and pungent ripeners, are garlic, onions, ſaffron, turpentine, and many of the gums, as galbanum and ammoniacum; and laſtly, ſour leven of bread.

Medicines compounded of theſe are to be applied hot to the part, and the application frequently repeated, till the matter within is found to be ſufficiently ripened, by the ſoftneſs and whiteneſs of the tumor. But when the abſceſs is ſmall, it is more convenient, and ſufficient, to apply ſome of the ripening plaſters, as diachylon, with the gums, or the like, till the *ſuppuration* is perfected.

Nor are internal remedies wholly to be neglected in caſes of this kind, eſpecially where the tumors are large, or of conſequence. In theſe caſes, when the blood moves too ſlowly, which may be known by the pulſe, the patient muſt be allowed to eat meat, and muſt take ſuch medicines as are warm and ſtimulating; by means of which, and by the increaſed motion of the blood, the inſpiſſated particles contained in the ſmaller veſſels will be the more eaſily converted into matter.

Strong broths are very proper for this purpoſe, as alſo the uſe of wine, or ale, in moderation; and Venice treacle, diaſcordium, and the confection of alkermes, are to be the medicines taken three or four times a day, and medicated teas, made of ſanders-wood, ſaſſafras, or cinnamon. But, on the contrary, when the motion of the blood is too violent, and the heat too great, cooling medicines are to be given, ſuch as the thin and watery drinks, the ſubacid medicines, and nitre: bleeding, in a ſmall quantity, is alſo often neceſſary in this caſe. But when the conſtitution is ſound, and the blood's motion regular, the uſe of internal medicines, to promote *ſuppuration*, is trifling, and may be altogether rejected. When by theſe means the matter is perfectly formed, the abſceſs is to be carefully opened by the ſurgeon, and the matter diſcharged, after which the wound is to be cleanſed and healed in the common way. *Heiſter*'s Surgery, p. 183.

SUPRACOSTALES, muſcles irregularly triangular, and ſituated on the back part of the ribs, near the vertebræ, commonly called *levatores coſtarum*.

Each of theſe is fixed by one tendinous extremity in the tranſverſe apophyſis, which lies above the articulation of each rib, and to the neighbouring ligament; the firſt being inſerted in the tranſverſe apophyſis of the laſt vertebra of the neck, and the laſt in that of the eleventh vertebra of the back. From thence the fleſhy fibres run down obliquely, increaſing in breadth as they deſcend, and are inſerted in the back part of the outſide of the following rib: ſome of the fibres often paſs beyond that rib, and are fixed in one or more of the ribs below it by ſeveral digitations, which lie at a greater diſtance from the vertebræ, in proportion as they run lower. In the inferior ribs theſe digitations are more conſiderable than in the ſuperior. *Winſlow*'s Anatomy, p. 232.

SUPRACOSTALES *longi*, in anatomy, a name given by Verheyen to thoſe muſcles of the loins, which Albinus has deſcribed under the names of the *levatores longi coſtarum*. See the article LEVATORES.

SUPRASPINATUS, in anatomy, is a thick narrow muſcle, in ſome meaſure penniform, filling all the *ſupra-ſpinal* cavity of the ſcapula.

It is fixed to all the poſterior half of the *ſupra-ſpinal* foſſa, and ſometimes its inſertion reaches near the neck of the bone. Then the fibres leave the ſurface of the bone, and being, as it were, ſupported by the fat, or cellulous ſubſtance, paſs between the acromium, and neck of the ſcapula, under the arch formed by the acromium and extremity of the clavicle, and under the ligament between the acromium and apophyſis coracoides; being afterwards inſerted in the ſuperior ſurface of the great tuberoſity of the head of the os humeri, very near the bony channel. This muſcle is covered by the trapezius. *Winſlow*'s Anatomy, p. 184.

SUPREME *pear*, a name given by the gardners to a ſmall pear, called alſo by ſome the *little muſk pear*. It is of a roundiſh ſhape, and is uſually produced in cluſters. The ſtalk is ſhort, and when it is ripe, the ſkin is yellow. The juice is ſomewhat muſky. If it be not ſuffered to hang till too ripe, it is an excellent pear. It ripens in the beginning of July, and continues good but a few days. The French call it *le petit muſcat*. *Miller*'s Gard. Dict.

SURA, (*Cycl.*) the name of a drink uſed in the Eaſt-Indies, and made of the juice that flows from the cocoa-tree. *Boyle*'s Works Abr. p. 51.

This juice being evaporated, and expoſed to the ſun, forms a ſugar, but it is little eſteemed. *Boyle*, ibid. p. 53.

SUR CUI *in vita*, in law, a writ that lies for the heir of a woman, whoſe huſband aliened her land in fee, and ſhe neglected to bring the writ *cui in vita* for recovery thereof, her heir may bring this writ againſt the tenant after her deceaſe. F. N. B. 193. Terms of Law. *Blount*, *Cowel*.

SURCULUS, in the anatomy of plants, a word uſed to expreſs that part of the branching of the ribs of a leaf which is of a middle kind, between the great middle rib and the ſmalleſt reticular ramifications. The middle rib is, by the writers on theſe ſubjects, called *petiolum*.

The firſt diviſions, that go off laterally from theſe, are called *rami*, or branches; the next diviſion of theſe, into more minute ones, are called *ſurculi*; and the final divarications of theſe into the reticular work, that ſpreads itſelf over the whole leaf, are called *capillamenta*.

Many, however, confound theſe two laſt diviſions, and call all beyond the ſecond diviſion, or lateral branches of the middle rib, by this name of *ſurculi*. Act. Erudit. 1722. See PETIOLUM and RAMUS.

SURD (*Cycl.*)—Simple *ſurds* are commenſurable in power, and by being multiplied into themſelves give, at length, rational quantities. But compound *ſurds*, multiplied into themſelves, commonly give irrational products. Yet in this caſe, when any compound *ſurd* is propoſed, there is another compound *ſurd*, which multiplied into it, gives a rational product. Thus if $\sqrt[3]{a} - \sqrt[3]{b}$ were propoſed, multiplying it by $\sqrt[3]{a^2} + \sqrt[3]{ab} + \sqrt[3]{b^2}$, the product will be $a - b$.

The inveſtigation of that *ſurd*, which multiplied into the propoſed *ſurd*, gives a rational product, is made eaſy by three theorems, delivered by Mr. Maclaurin, in his Algebra, p. 109, ſeq. to which we refer the curious.

This operation is of uſe in reducing *ſurd* expreſſions to more ſimple forms. Thus ſuppoſe a binomial *ſurd* divided by another, as $\sqrt{20} + \sqrt{12}$ by $\sqrt{5} - \sqrt{3}$, the quotient might be expreſſed by $\frac{\sqrt{20} + \sqrt{12}}{\sqrt{5} - \sqrt{3}}$. But this might be expreſſed in a more ſimple form, by multiplying both numerator and denominator by that *ſurd*, which multiplied into the denominator, gives a rational product: thus,

$$\frac{\sqrt{20} + \sqrt{12}}{\sqrt{5} - \sqrt{3}} = \frac{\sqrt{20} + \sqrt{12}}{\sqrt{5} - \sqrt{3}} \times \frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} + \sqrt{3}} = \frac{\sqrt{100} + 2\sqrt{60} + 6}{5 - 3} = \frac{16 + 2\sqrt{60}}{2} = 8 + 2\sqrt{15}.$$

To do this generally, ſee Mac Laurin, lib. cit. p. 113.

When the square root of a *surd* is required, it may be found, nearly, by extracting the root of a rational quantity that approximates to its value. Thus, to find the square root of $\sqrt{3 + 2\sqrt{2}}$, first calculate $\sqrt{2} = 1{,}41421$. Hence, $3 + 2\sqrt{2} = 5{,}82842$, the root of which is found to be nearly 2,41421.

In like manner we may proceed with any other proposed root. And if the index of the root, proposed to be extracted, be great, a table of logarithms may be used. Thus $\sqrt[7]{5 + \sqrt[13]{17}}$ may be most conveniently found by logarithms.

Take the logarithm of 17, divide it by 13; find the number corresponding to the quotient; add this number to 5; find the logarithm of the sum, and divide it by 7, and the number corresponding to this quotient will be nearly equal to $\sqrt[7]{5 + \sqrt[13]{17}}$.

But it is sometimes requisite to express the roots of *surds* exactly by other *surds*. Thus, in the first example, the square root of $3 + 2\sqrt{2}$ is $1 + \sqrt{2}$: for $\sqrt{1 + \sqrt{2}} \times \sqrt{1 + \sqrt{2}} = 1 + 2\sqrt{2} + 2 = 3 + 2\sqrt{2}$.

For the method of performing this, the curious may consult Mr. Mac Laurin's Algebra, p. 115, seq. where also rules for trinomials, *&c.* may be found.

For extracting the higher roots of a binomial, whose two members being squared are commensurable numbers, we have a rule in Sir Isaac Newton's *Arithmetica Universalis*, p. 59, but without demonstration. This is supplied by Mr. Mac Laurin, in his Algebra, p. 120, seq. as also by 'sGravesande, in his *Matheseos Universalis Element.* p. 211, seq.

It sometimes happens, in the resolution of cubic equations, that binomials of this form $a \pm b\sqrt{-9}$ occur, the cube roots of which must be found. To these Sir Isaac's rule cannot always be applied, because of the imaginary, or impossible factor $\sqrt{-9}$; yet, if the root be expressible in rational numbers, the rule will often lead to it in a short way, not merely tentative, the trials being confined to known limits. See *Mac Laur.* loc. cit. p. 127, seq.

It may be farther observed, that such roots, whether expressible in rational numbers, or not, may be found by evolving the binomial $a + b\sqrt{-9}$ by the Newtonian theorem, and summing up the alternate terms. *Mac Laur.* loc. cit. p. 130.

Those who are desirous of a general and elegant solution of the problem, *to extract any root of an impossible binomial* $a + \sqrt{-b}$, *or of a possible binomial* $a + \sqrt{b}$, may have recourse to Mr. De Moivre's Letter to Dr. Saunderson, inserted by way of Appendix to his Algebra, p. 744, seq. and to the Philosophical Transactions, N° 451. or to Dr. Martyn's Abridgment, Vol. 8. p. 1, seq.

SURFACE *(Cycl.)*—A *surface* is not a body of the least sensible magnitude, as some have imagined, but it is the termination, or boundary of a body; neither is a line to be considered as a *surface* of the least sensible breadth, but as a termination, or limit of a *surface:* nor is a point to be considered as the least sensible line, but as the termination of a line; and in this sense it is plain that a point cannot be conceived to have parts, or magnitude. See MAGNITUDE. See also *Mac Laurin*'s Fluxions, Vol. 1. p. 245. and Mr. *John Bernoulli*'s Letter to Monsieur Crouzas, concerning his Comment on the Analyse des Infiniment petits. *Jo. Bernoul.* Oper. Vol. 4. p. 160, seq.

SURF *of the sea*, the great breakings, or rolling of the sea against some shores; making it dangerous to land in such places.

SURMULLET, in zoology, a name used, both by the French and English, for the *mullus major*, a fish of the cuculus kind, in many things resembling the mullus barbatus, but differing from it in that it is twice as big, being often caught of twelve or fourteen inches in length. Its fins also are yellowish, and have a slight blush of red mixed with that colour. Its scales are large and broad, and thick, and are more firmly joined to the flesh. It has also three or four strait yellow lines, running parallel with one another down its sides. It is caught in the Mediterranean, and in the British seas, especially on the coast of Cornwall, and is every where esteemed a very delicate fish. *Ray*'s Ichthyography, p. 285.

SURO, in zoology, a name given by some to a fish of the cuculus kind, much resembling the mackrel in taste and in shape, and more usually known by the name of the *trachurus*. *Willughby*'s Hist. Pisc. p. 290. See TRACHURUS.

SURRECTORIUM, the name of a chirurgical instrument, mentioned by Ambrose Parè, and intended to keep the arm in an erect situation when required.

SURVEYING *(Cycl.)*—A *surveyor* ought to be provided with an off-set staff, equal in length to ten links of the chain [b], and divided into ten equal parts. He ought likewise to have ten arrows, or small strait sticks, near two feet long, shod with iron ferrils. When the chain is first opened, it ought to be examined by the off-set staff. In measuring any line, the leader of the chain is to have ten arrows at first setting out. When the chain is stretched in the line, and the near end touches the place from which you measure, the leader sticks one of the ten arrows in the ground at the far end of the chain. Then the leader leaving the arrow, proceeds with the chain another length; and the chain being stretched in the line, so that the near end touches the first arrow, the leader sticks down another arrow at his end of the chain. The line is preserved strait, if the arrows be always set so, as to be in a right line with the place you measure from, and that to which you are going. In this manner they proceed till the leader have no more arrows. At the eleventh chain the arrows are to be carried to him again, and he is to stick one of them in the ground, at the end of the chain: and the same is to be done at the 21, 31, 41, *&c.* chains, if there are so many in the right line to be measured. In this manner an error can hardly be committed in numbring the chains, unless of ten chains at once [c].—[b See CHAIN. c Treat. Pract. Geom. p. 72, 73.]—See farther under FIELD-*book*, OFF-SETT, STAFF, and THEODOLITE.

If the lands to be plotted are hilly, and not in any one plane, the lines measured cannot be truly laid down on paper, without being reduced to one plane, which must be the horizontal, because angles are taken in that plane.

In viewing objects, if they have much altitude or depression, either write down the degree and decimal, shewn on the double sextant, or the links shewn on the back side, which last subtracted from every chain in the station line, leaves the length in the horizontal plane; but if the degree is taken, the following table will shew the quantity.

A TABLE *of the links to be subtracted out of every chain in hypothenusal lines of several degrees altitude, or depression, for reducing them to horizontal.*

degrees.	links.	degrees.	links.	degrees.	links.
4.05	$\frac{1}{4}$	14.07	3	23.074	8
5.73	$\frac{1}{2}$	16.26	4	24.495	9
7.02	$\frac{3}{4}$	18.195	5	25.84	10
8.11	1	19.95	6	27.13	11
11.48	2	21.565	7	28.36	12

Let the first station line really measure 1107 links, and the angle of altitude, or depression, be 19° 93′; looking in the table, I find 19° 95′ is 6 links; now 6 times 11 is 66, which subtracted from 1107 leaves 1041, the true length to be laid down.

It is useful in *surveying* to take the angles which the bounding lines form with the magnetic needle, in order to check the angles of the figure, and to plot them conveniently afterwards.

Large maps, representing considerable extents of ground, are subject to a good many inconveniencies, especially if carried into the fields, to be compared with them; such maps become very troublesome in the wind, and it is difficult to find out the part you want. To remedy this, a general and small map of the manor, or county, *&c.* should be first made on one sheet of paper, the several parts may be set off on other separate sheets, and the general map being divided into as many squares as there are of these particular sheets, the relation of the whole to the several parts is easily seen; and all these maps may then be bound up in a book. See Mr. *Baighton*'s Description and Use of his New Plotting Table, in Phil. Trans. N° 461. sect. 1.

SURVEYING-*scale*, the same with *reducing-scale*.

SURVEYOR *(Cycl.)*—*Surveyor* of the king's Exchange, an antient officer, mentioned in the Statute 9 Hen. V. Stat. 2. cap. 4. But what his office was is uncertain. *Cowel.*

SUS, the *hog*, in the Linnæan system of zoology, a distinct genus of animals, the characters of which are; that they have usually ten paps, situated along their belly; their dentes incisores are four each way; and in the males, the canine, or dog-teeth, are extremely long. Of this genus are the *hog* kind, the Mexican musk-boar, and the babyroussa. *Linnæi* System. Nat. p. 41.

SUS *piscis*, in ichthyology, a name given by Ovid, and some other of the antient writers, to the fish called also *us* and *mus*, and by the later writers *capriscus*. See the article CAPRISCUS.

SUS *agrestis*, the *wild boar*. This creature differs from the common domestic *hog*, in that the grown animal is not different in colour in the different individuals of the same species, but is always of a rusty iron grey. His snout is much longer also than that of the other; his ears shorter and rounder; and both these, and his tail and feet, are always black. It differs also, in that it is covered with two sorts of hairs, the one kind long, the other short: these last serve the creature to the same purposes, as the downy fur which the bever and otter have under their long hair. It is very common wild in Italy, and its flesh frequently brought to market. *Ray*'s Syn. Quad. p. 96.

SUSCEPTOR, among the Romans, a citizen chosen by the decuriones to collect the debts belonging to the public. *Pitisc.* in voc.

SUSCEPTOR is also a term used by ecclesiastical writers for *sponsor*. See SPONSOR, *Cycl.*

SUSCEPTOR *aurarius*, in middle age writers. See the article AURARIA.

SUSPENSORIUS, in anatomy, a muſcle of the eye. It is ſo called, from its uſe in ſuch animals as go much with their head hanging down. Veſalius has deſcribed it as belonging to man, in whom it is never found. Fiſhes and fowls are commonly without it, as well as man; but oxen, and, ſo far as has been obſerved, all quadrupeds, are provided therewith; though it is not of the ſame ſtructure in all. Dr. *Porterfield*, in Med. Eſſ. Edinb. Vol. 3. Art. 12.

The doctor thinks, that the uſe of this muſcle is not only to ſuſpend the eye, and preſerve the optic nerve from being too much ſtretched, but principally to aſſiſt the ſtreight muſcles in moving the eye, according as its different fibres act.

SUSSEX *marble*, a name given by many to a peculiar ſpecies of marble found in the county, the name of which it bears, and formerly much uſed in the pillars of churches, and other buildings, but now leſs regarded. The ground of this *marble* is grey, with a faint caſt of green, and it is very thick ſet in all parts with ſhells; theſe are chiefly of the turbinated kind, and they are generally filled with a white ſpar, which adds very greatly to the beauty of the ſtone.

It is plain, from conſidering the whole maſs of this *marble*, that this ſpar was received into the ſhells before they were depoſited in the *marble*. This is about the hardneſs of the common white Genoeſe marble, if any thing, ſomewhat more hard. The ſlender round ſcapi of the pillars in Weſtminſter-Abbey, and in many other of our old Gothic buildings, are made of this kind of *marble*. Some people have thought that the ſcapi of pillars of this kind, which occur in moſt of our Gothic buildings, are artificial, and that they are a kind of fuſile marble caſt in cylindric moulds. But any one who will compare the marble, of which thoſe pillars are made, with its ſhells, and the ſpar they are filled with, with the marble of the *Suſſex* quarries, will find both to be the ſame in every particular. *Woodward*'s Cat. of Foſſ. p. 20.

SUTORIUS, in anatomy, a name given by Riolanus to a muſcle of the leg, called by Cowper, Albinus, and others, the *ſartorius*. The French authors call it the *couturier*; Veſalius, and others of the more early anatomical writers, have called it the *primus tibiam moventium*.

SUTURE (*Cycl.*)—All wounds are not to be united by the needle, but thoſe only that are oblique, tranſverſe, or angular, and at the ſame time very large and deep; or in caſes where a part is very nearly cut off; or if a wound is ſo circumſtanced, that it cannot be kept in a proper ſituation by plaſters and bandages. Wounds that are to be ſtitched, ſhould be in their recent ſtate, and muſt be firſt well cleanſed from extravaſated blood, and all extraneous bodies; there ſhould alſo be no loſs of ſubſtance, except in thoſe fleſhy parts that are eaſily elongated; and no contuſion, nor any ſign of inflammation.

Dry SUTURE. This is to be uſed in ſlight wounds, and eſpecially when they happen in the face; and indeed, wherever it may appear of force enough to keep the lips of the wound together; and as it gives no freſh pain, and occaſions no ſcar, it is much fitter for wounds of the face than the needle. The plaſters, which are to form the *dry ſuture*, ſhould be of a ſufficient length, and ſhaped like the part to which they are to be applied, ſo as to ſurround the greateſt part of it, but not the whole, leſt they ſhould retard the circulation of the blood, and bring on tumors, and miſchiefs of that kind: they muſt alſo be ſuch as will ſtick very faſt, the diachylon, if good, or the common ſticking plaſter, are fitteſt for this purpoſe. The hæmorrhage being well ſtopt, and the wound well cleanſed, ſome vulnerary balſam of the gummy kind, as the balſam of Peru, or the like, is to be applied; and over all a ſticking plaſter is to be laid, adapted to the ſize of the part. Two or more of theſe may be applied, as occaſion ſhall require, leaving a ſpace between, and they are to be ſecured in their place by the application of proper bolſters and bandages.

Petit's method of making the *ſuture* of this kind, is by letting the plaſters have one, two, or more openings in the middle, through which the ſurgeon may diſcover, as by the ſpaces left between in the former method, whether the lips of the wound are properly united or not; and may alſo be able to apply proper remedies to the part, without removing the plaſters. Theſe plaſters are applied in the ſame manner as the former, and left on till the work is compleated.

But there is alſo yet another manner of performing the *dry ſuture*, to wit; ſpread two plaſters upon ſtrong cloth, anſwering in ſize to the wound; to the ſides or margins of theſe faſten three or four tape ſtrings, according to the length of the wound, and then, after warming the plaſters, apply them on each ſide of the wound, at about a finger's breadth from it; after this bring the lips of the wound together, dreſs it as in the former method, and while an aſſiſtant keeps the lips of the wound together in a proper ſituation, tie the ends of the tapes, firſt in a ſingle, and afterwards in a ſlip knot, to keep the part in contact; over each of theſe ſhould be laid an oblong compreſs, and over all a large ſquare one, and the whole kept on by a proper bandage. The day following the wound is to be again examined, and if the tapes are looſened, they muſt be drawn tighter again; but if they are not looſened, let them remain untouched, and only moiſten the parts with a few drops of balſam, and cover them up again with the compreſſes and bandages, as before. Some, inſtead of the tape, uſe claſps of braſs, or ſteel; but this method is much leſs convenient than the former, and therefore is little uſed. *Heiſter*'s Surgery, p. 37.

Bloody SUTURE. In large wounds, eſpecially tranſverſe ones, as their lips cannot be kept in their ſituation by means of the dry *ſuture*, which is frequently the caſe in wounds of the thigh, or in the abdomen, nates, or arms; or when pieces hang from the wounded part, as often happens in wounds of the forehead, cheeks, noſe, or ears; or when wounds are large, and made in an angular, or cruciform manner, the needle muſt be uſed to bring their lips together; and this is called the *bloody*, or the *true ſuture*. This operation is alſo diſtinguiſhed into two kinds, the ſimple, and compound.

The ſimple *ſuture* is that which is performed only by the aſſiſtance of the needle and thread: to this claſs belong the interrupted *ſuture*, the glover's *ſuture*, and the twiſted *ſuture*; the laſt of theſe is ſeldom uſed but in caſes of the hare-lip, and the ſecond only in wounds of the inteſtines; but the firſt is in common uſe for all wounds which require the true, or *bloody ſuture*.

The beſt method of making the common, or interrupted *ſuture*, is this. Take a double thread, well waxed, paſs it through a ſtrong crooked needle; when the lips of the wound are brought together, and held firmly in their proper ſituation by an aſſiſtant, with one ſtroke pierce through them both, paſſing the needle through the lower lip from without inwards almoſt to the bottom, and ſo on from within outwards, obſerving to make the punctures at a finger's breadth diſtance from the wound, which in this caſe we will ſuppoſe to be in length two fingers, varying this diſtance according to the ſize of the wound. After taking off the needle, tie the ends of the thread firſt in a ſingle knot, and then in a ſlip knot, covering all with the ſame dreſſings, as are uſed in the dry *ſuture*. But if the wound be ſo large, that one ſtitch will not be ſufficient, then two or more are to be made, according to the length of it, at about a finger's breadth diſtance one from the other. To prevent the knots from bringing on any miſchief, lay a ſmall linnen compreſs over the ſingle knot, and make the ſlip knot over that; which, if any pain or inflammation ſhould ſucceed, may be afterwards eaſily looſened at pleaſure.

This is the method to be obſerved in ſtrait, oblique, or tranſverſe wounds; but where there are angles, as in a triangular wound, you are to proceed in the ſame manner, but obſerve to let the *ſuture* begin at the angle, and the other ſtitches be taken about the middle, both ways; but if the wound be quadrangular, or have two angles, like the Greek letter Π, which ſometimes happens in the face, then the *ſutures* muſt be made in both the angles; and when the wound is ſo large, that theſe are not ſufficient, then as many more, as are neceſſary, muſt be made in the midway between them. When you meet with a cruciform wound, and the lips of it cannot be kept together by the uſe of plaſters, the *bloody ſuture* muſt be made, by paſſing the needle through the lips, near the end of each extremity of the wound; and when the ſtitches are all thus made, the threads muſt be tied as in the other caſes. *Heiſter*'s Surgery, p. 38.

Compound SUTURE. Some of the ſurgeons among the antients uſed a *compound ſuture* for large wounds, inſtead of the interrupted *ſuture*, now generally practiſed: they preferred this method, becauſe it prevented the lips of the wound from being lacerated, which ſometimes happened when the other method was uſed, and not only prevented the wound from uniting, but frequently brought on other grievous diſorders; and though this method has of late years been rejected, and particularly by Dionis, in his Surgery, yet many ſtill prefer it, in ſeveral caſes, to the common interrupted *ſuture*: but inſtead of the pieces of wood uſed by the antients, thoſe, who now practiſe it, uſe pieces of plaſter rolled up in a cylindrical form, of the length of the wound, and of about the ſize of a gooſe-quill, from whence it is called by ſome the *quilled ſuture*. This method prevents tumors, pain, and inflammations, which might be brought on by the hardneſs and preſſure of wood.

Palfynus performs this operation, in deep wounds of the muſcular parts, with a large and ſtrong crooked needle, furniſhed with a double thread well waxed, which has alſo a bow at one end. The needle thus fitted being paſſed thro' both lips of the wound, in the ſame manner as in the other operations of the true *ſuture*, and afterwards a ſecond, and a third, paſſed in the ſame manner, a roll of plaſter is to be introduced into the bow ends of the thread, which are left hanging out; then when the needle is taken out at the other ſide, another roll of plaſter is to be placed between the ends of the thread; and the lips of the wound being brough

brought together, these ends are to be gently tied over the roll, first in a single, and then in a slip knot. If there are three of these threads, you are to tie the middle one first, and afterwards the rest in the same manner. On the first days after the operation of the *future* is performed, in whatever method that be done, the bandage and compress are to be gently removed, and the state of the wound examined: if every thing now looks well, and there is little or no pain, or inflammation, the *futures* are to be left alone for six or seven days, or longer, and the wound dressed till there appears a strict union in the lips. If, in any of these examinations, the stitches of the *future* are seen to be too loose, they must be tightened, if too tight, loosened. When the lips of the wound appear to be inlarged, or bruised, they must be dressed with a digestive ointment, the continuance of which usually soon takes off those symptoms; but if the wound be attended with great inflammation and a fever, the stitches must be loosened, and the patient blooded, and kept on a thin diet: if this method remove the symptoms, the stitches must be tighted again, and the wound dressed and managed as before; but if this method proves fruitless, and the symptoms continue and increase, the stitches must then be cut, and the wound treated as if there were a loss of substance.

If the wound heals by the assistance of the *future*, the threads of it are to be cut with scissors, near the knots, and the lower lip of the wound to be suspended with one hand, while the threads are gently drawn out with the other. The punctures that are left from them will easily heal, by injecting the arquebusade water, or spirit of wine, or lime-water, and laying on compresses dipt in the same liquors. *Heister*'s Surgery, p. 39.

SUVERNA *guirecom*, in natural history, a name given by the people of the East-Indies to a kind of fossile, which they esteem greatly for certain imaginary virtues. It is a kind of fine and glossy foliaceous talc. Their manner of preparing it is this: they beat it to pieces in a mortar, and then boil, or rather fry it a long time in butter, and afterwards straining off the butter, they eat it to make them fat.

SWALLOW, in ornithology. See HIRUNDO.

SWALLOW-*fish*. See HIRUNDO *piscis*.

SWALLOW-*fly*, in natural history, the name of the chelidonius, a fly very remarkable for its swift and long flight. See CHELIDONIUS and the next article.

SWALLOW-*stone*, *chelidonius lapis*, in natural history, the name of a stone which Pliny, and many other authors affirm to be found in the stomachs of young *swallows*. It is always described to be small, roundish, convex on the outside, and concave on the other, and of a browniſh, yellowish, or blackish colour: this, and the figures given of it, plainly shew that it is either a small species of the lycodontes, or bufonitæ, or else a detached piece of one of the compound ichthyperia, or, as they are vulgarly called, *siliquastra*. These are the bony palates of certain species of fish, and are composed of several parts, the middle ones longish, and resembling the pods of a lupine, and those toward the edges roundish and small, convex on the outside, and concave within, but more hollowed, and consequently thinner than the lycodontes, to which otherwise they are very like in shape. The whole palates, or the long parts, when loose, are called *siliquastra* by authors; but the round pieces have been usually confounded with the bufonitæ, and mistaken for them, whenever they have been found loose. These, as they are thinner and hollower than the lycodontes, agree better than any species of those bodies with the figures and descriptions of the *chelidonii* in the more accurate writers, who make them small, thin, and tender; but the generality confound these fragments of palates, as well under the name of *chelidonii*, as of the bufonitæ, never guessing at their true origin. They are rarely larger than the eighth of an inch in diameter. The common report is, that when two of these *stones* are found in the stomach of one *swallow*, the one is more yellow, the other more red; but that when there is only one, it possesses the virtues of both. De Boot tells us, that he cut up several young *swallows*, but never found any such stones in them; and indeed it is no wonder, since they are not to be looked for there, but in the jaws of the wolf-fish, or in the palates of some of the less known kinds.

SWALLOW-*wort*. See the articles ASCLEPIUS and VINCETOXICUM.

Difficulty of SWALLOWING, in infants. See the article INFANT.

SWAN, *cygnus*, in zoology. See the article CYGNUS.

By the law of England, to take *swans* eggs is penal, in the same manner as taking hawk's eggs, that is, by fine and imprisonment. See HAWK.

SWAN-*shell*. See the article CIGNE.

SWARDY, in agriculture, a term used by the farmers for a soil well covered with grass. *Plot*'s Oxfordsh. p. 247.

SWARM. The signal of the going out of a *swarm* from a hive is sometimes only a humming noise made by one single bee, but that a very particularly acute, and clear sound: this seems to be the voice of the new queen, or female bee, calling together the *swarm* that is to follow her out, and animating them with a sort of martial music for the great adventure they are going to engage in.

Some who have pretended to be extremely well versed in the language of bees, as Butler, and others, say, that this is a voice of intreaty, by which the young queen begs permission of the old queen, or parent of the hive, to take out a *swarm* with her to some other place: they say this noise of intreaty usually lasts about two days, and that at the end of that time, if the parent grants the request, she is heard to answer with a louder and clearer voice of the same kind. These noises are not to be heard, unless the ear be applied close to the place; and they say, that when this last sound is made, the new *swarm* may be expected certainly to go out the next day, if the weather be proper.

But he seems to have taken great pains to distinguish these sounds; he gives all the modulations of the voice of the young female, and every note that she runs into; and observes, that all these are notes of supplication, and that the sounds issued by the parent, or reigning queen of the hive, have an air of majesty, and are greatly different; and adds, that if the young female attempts to make the sounds of the reigning bee, it is looked upon as a rebellion in the hive: and he pretends to be acquainted with the proceedings against her in these cases; he says she loses her head, and that several of the bees that followed her are treated in the same manner for having been seduced to a rebellion. *Reaumur*'s Hist. Insect. Vol. 10. p. 290.

All these different modulations of sounds, made by the bees, are the effect of the different vibrations of their wings in the air. It has been supposed by Swammerdam, that the air issuing from the stigmata of the body was very instrumental to the making of this sound; but this is proved to be an erroneous conjecture, by the easy experiment of cutting off a bee's wings, which always renders the creature perfectly mute; though this could not be the case, if the voice proceeded from other parts. It is evident, therefore, that all the sounds of the bee are made by the striking of its wings against the air; and it seems very easy to imagine, that when the motion of the wings can make a sound, the more quick or slow motion of them can modulate it in a different manner, and the moving them in several different directions, may also add greatly to the variety.

The hours of going out of *swarms* are always between eleven in the morning, and three in the afternoon: the air is at this time very hot, and the sun often shines brightly on the surface of the hive; the effect of this, in causing them to go out, is easily conceived. The few who are nearest the mouth of the hive, and are ready to follow their queen, soon find that this is a pleasant season for their expedition, and the numbers of others, which remained irresolute in the inner parts of the hive, now find the natural heat of the place increased to so great a degree by the action of the external warmth, that it is very natural for them to resolve at once to depart with those which are going off, in order to find a place where they may be more at ease, or less crowded and heated in their habitation. People, who have the care of bees, should attend to their *swarming*, or going out on these occasions; and if they are not at leisure to watch them in the hours before mentioned, should defend the hives, during that part of the day, from the heat of the sun, that they may not go off and be lost.

Immediately before the going out of a *swarm* there is heard a prodigious humming in the hive, much greater than what is heard at any other hive, and immediately after this, the openings of the hive are crowded with bees, in a violent hurry to get out; those which first come out immediately take flight, and if the female, or queen, be among these, vast numbers immediately follow, and the air is seen as full of them, as it is of flakes of snow in a winter storm; and, in fine, it is not a minute before all the bees, that are to make the new *swarm*, are out of the hive: when the body is thus joined, they rise and fall in the air, and seem very curious in choosing a place where to fix themselves. It does not appear that the female bee chooses the place for them, but they all seem to be assistant in it; and as soon as they have fixed upon a proper branch of a tree, or the like, they all fly towards it, and begin to form a cluster in one part of it. The female does not place herself at the head of this cluster, but sits on the branch near it, to see how she approves the management; as soon as the cluster is of a proper size, she adds herself to it, and from that instant it thickens in a surprising manner, all trying first to fix themselves to the rest, so that in a quarter of an hour they are all collected together into a vast mass, hanging to one another by the legs. In this condition they remain absolutely quiet, though exposed to the open air, and there are no more of them seen flying loose about, than there are about the hives in a summer's day. *Reaumur*'s Hist. Ins. Vol. 10. p. 293.

The hives of bees are commonly placed in gardens, that the bees may have some flowers at least in their own neighbourhood, and not be compelled to go far in search of food; and the *swarms* from these hives always succeed best, when there

there are ſome buſhes, as of filberts, barberries, or the like, in the garden, as well as high trees; for when the bees take a high flight, they often take a very long one before they ſettle, and ſometimes go ſo far, that the eye cannot trace them to the place of their ſettling; in which caſe, all attempts to ſearch for them are uſually vain, and they are loſt entirely. The low buſhes in view uſually determine them to low flights, and if they are ſeen to be aſcending too high, the cuſtom is to throw handfuls of duſt and ſand upon them; this uſually brings them down, as they probably miſtake the particles for drops of rain.

Another very antient cuſtom, and which is continued to this day, is the beating on inſtruments of braſs, and the like, to make a great noiſe, while they are gathered in the air: it is pretended, that this diſpoſes them to fix themſelves the ſooner. The origin of this cuſtom has been an obſervation, that thunder always ſends thoſe bees, which are abroad, from the flowers back to the hive, and it is ſuppoſed that this artificial noiſe may have the ſame effect; but in all probability, the bees are better acquainted with thunder than to be thus deceived: there is indeed much more probability of their miſtaking the particles of duſt, falling upon their backs, for drops of rain, than taking ſo unlike a ſound for thunder; for it is found by experience, that the making all the noiſe that can be conceived, this way, never was able to drive one bee from a flower where it was buſy, or to ſend one ſtraggler home.

When the time of a *ſwarm*'s going out of the hive is expected, the people, who have the care of them, ſhould always be prepared with a hive to receive them; and when the *ſwarm* ſettles upon ſome branch of a buſh, or low tree, the hiving of them is an eaſier matter than could be imagined. See HIVING.

The nature of the annual new *ſwarms* of bees, which we ſee depart from old hives, are not to be truly underſtood, otherwiſe than by knowing the hiſtory of the propagation of the ſpecies among theſe animals, for which ſee the articles BEE, and QUEEN *bee*.

The queen, or mother bee, which is the general parent of the hive of bees, continues laying eggs, in greater or leſſer number, during the whole ſummer months, but in the winter months ſhe deſiſts; and many bees periſh in the end of the autumn, and during the courſe of the winter, without the hive's having any ſupply from the female: by this means there are but a ſmall number of bees left, when there is but a ſmall proviſion in ſtore for them, as they are to live on their labours of the former ſummer. As ſoon as the ſpring comes on, and there appear flowers, out of which honey may be obtained, the parent bee begins to lay again; and by the vaſt number of eggs ſhe lays every day, ſoon provides a ſupply to repair the loſs. All theſe eggs are hatched, in two or three days after they are laid, into worms; and, in fine, they appear under the form of bees, and are fit for working, in about three weeks time.

All the eggs that the female lays, during the firſt week or two, are for the production of the common, or working bees, as they are the more neceſſary at that time: after this ſhe begins to lay eggs which are to produce drones, whoſe whole period of life is to be only of a few months, and who are never to work, but to feed on the labour of the others; they being the males of the hive, and all their buſineſs being to impregnate the eggs of the females for future ſupplies of young; and this office they are to perform, as well to this their parent, as to their ſiſter female, that is to be hatched from an egg laid afterwards in a peculiar cell. According to this rule we ſee, about the month of May, a great number of drones in a hive, where, before that time, there was not one, and ſoon after the appearance of theſe we find a new female, hatched out of an egg laid on purpoſe at a proper time; and ſometimes the ſame hive affords two or three of theſe females. *Reaumur*, Hiſt. Inſect. Vol. 10. p. 285.

All the time that this female, and theſe males, or drones, are hatching, the number of common, or working bees, is alſo increaſing very faſt, by a numerous progeny hatching every day from the eggs of the parent; and the conſequence of this is, that the number becomes too great to be contained in the hive. It is neceſſary then, that a certain number ſhould go off in form of a colony, and ſettle themſelves in ſome other place; this is ſoon reſolved, and the number thus detached from the reſt is what we call a *ſwarm*. This however they would never do, had they not a chief to lead them, and promiſe a future progeny for the object of their cares and labours; but as with them, when they become numerous, there is always hatched at leaſt one female, ſhe places herſelf at their head, and leads them out to ſeek a new abode. If by any accident ſhe is killed, they will never enter a hive at all, but fly ſeparate during the whole ſummer, and take no care but of the feeding themſelves. This alſo is carried ſo far among them, that if the hive be never ſo full, and there be no young female among them, none of the bees will ſtir, but they will hang in cluſters out at the mouth of the hive; and, on the contrary, if a hive be but half peopled at the time that a young female is produced, as ſoon as ſhe is able to go away, and to lay her eggs, the half, or at leaſt ſome conſiderable part of theſe few bees, will leave the hive, though they have plentiful room in it, and form a new *ſwarm*: ſo that though the overfulneſs of the hives be, in general caſes, one great reaſon of the departing of a colony, in form of a *ſwarm*, yet it is not the only reaſon.

The departure of the *ſwarm* uſually happens almoſt immediately upon the birth of the young female, or queen. This creature ſeems to be fœcundated, and ready to lay her eggs almoſt as ſoon as ſhe is out of the nymph ſtate, and very often actually places herſelf at the head of a company, and goes off within four or five days of her birth in the winged ſtate. It may happen, however, that the time of the departure of the *ſwarm* may be retarded by accidents, ſuch as very rainy, or ſtormy weather; for as ſuch a ſeaſon would render the *ſwarming* abroad very uncomfortable, they uſually ſtay in the hive till ſuch weather is over, though perfectly ready to go. It is very certain, that though the female is ready to go, ſo ſoon after her birth, to form a new *ſwarm*, that her eggs are at that time fœcundated, and ready to produce the young ones; for there often go no drones, or male bees, with the new *ſwarm*, and it ſeems accident, rather than the intent of nature, if any go out with them, as the female is plainly already impregnated, and needs no new impregnation, till ſome of her own offſpring are able to ſerve her. The time of the going out of the *ſwarm* is different in different countries, and even in the ſame country varies very much, on occaſion of the ſeaſon of the year, and the ſtate of the hive. *Reaumur*'s Hiſt. Inſect. Vol. 10. p. 288.

If a hive has been very well peopled during the winter, the young progeny go out early in the ſpring; and if it have been very thinly peopled, it is ſometimes as late as the middle of June before they go out, even without any accidental delay from the want of a queen.

The people who manage bees, are informed of the time when they are going to ſend out new *ſwarms* by ſeveral ſigns. One is, when the hive is ſo peopled, that many of the bees cannot find room within, but ſtand in cluſters on the outſide of the hive; another, is the appearance of a large number of drones, or male bees: theſe, however, are not certain ſigns, nor do they point out the very day of the *ſwarming*; but there is one which declares it very punctually, which is the obſerving, that though the hive be very full, and the day very fine, yet very few bees go out in ſearch of honey; in this caſe it is a certainty that they are aſſembling themſelves in the hive, and preparing to be gone in a very little time. If a perſon go near the hives, that are ready to ſend out *ſwarms*, in the evening, or even in the night, he will hear a ſort of humming noiſe in them, which is not to be heard at ſuch times on any other occaſion: in ſhort, the whole is in agitation on the occaſion, and the tumult never ceaſes till the new colony goes out.

SWARMS *of inſects*. We have an account[i] of an extraordinary *ſwarm of inſects* in New-England, that deſtroyed all the trees in the country for the ſpace of two hundred miles. It is ſaid there were found a great number of holes in the ground, out of which theſe creatures broke forth in the form of maggots, which became flies with a kind of tail or ſting, which they ſtuck into the tree, and thereby envenomed and killed it.—[i Philoſ. Tranſ. N° 8. p. 137.]

SWEAT (*Cycl.*)—Many diſtemperatures of the body have their riſe, as well as their cure, by means of the differences of this evacuation.

The faults of our *ſweats*, in regard to the general health of the body, are reducible principally to three kinds. 1. They are too exceſſive: theſe uſually happen early in the morning, as ſoon after three o'clock, and are in ſome degree periodical; but in others they are rather continual, or have very few intermiſſions. 2. The uſual and habitual ſecretions by *ſweat* are ſubject to be impeded, or retarded, and hence many diſtempers take their riſe. And 3. there is in ſome particular people a remarkable difficulty of being brought to *ſweat* at all.

The perſons principally ſubject to too profuſe *ſweats*, are men of a plethoric and ſanguineo-phlegmatic temperament; theſe, on the ſlighteſt motion of the body, are uſually thrown into profuſe *ſweats*; and the ſame perſons are uſually ſubject to violent nocturnal *ſweats* in the ſpring and autumn ſeaſons. Perſons in hectics alſo, when near the time of their death, uſually fall into profuſe nocturnal *ſweats*, which are always a fatal prognoſtic.

The perſons principally ſubject to a natural difficulty of *ſweating*, are thoſe who have a mucous and thick dyſcraſy of the humors; and ſometimes perſons of very tender and delicate conſtitutions, who are ſubject to emotions of the blood, and are continually thin in fleſh.

Prognoſtics in ſweats. A profuſe *ſweat*, though it conſiderably waſtes the fleſh and ſtrength, yet is leſs dangerous when left to itſelf, than when raſhly ſuppreſſed. The conſequences of habitual *ſweats* being ſuppreſſed, are uſually according to the habit and diſpoſition of the patient, either cutaneous eruptions, as the itch, and the like; or catarrhs, coryzas, and

and gravedos; and ſometimes they bring on congeſtions, inflammations, and convulſions.

Method of treatment. So long as *ſweats* bring on no bad ſymptoms in illneſſes, they are to be rather promoted than checked, even though they may ſeem profuſe in quantity; and in this caſe, the proper regimen is a moderate warmth, a quiet ſtate of the body, and frequent draughts of warm liquors; but when the ſtrength is found to be too much exhauſted by theſe *ſweats*, ſmall doſes of nitre are found of great ſervice.

When different diſorders ariſe from the ſuppreſſion of *ſweats*, nothing is of greater ſervice than the compound powder of antimonium diaphoreticum, crabs eyes, and nitre, given in ſmall doſes every three hours; and a quiet poſture of the body is to be ordered, which greatly tends to promote *ſweating*; and frequent draughts of warm and weak liquors are to be taken, and the bowels are to be relaxed with a clyſter, or a gentle purge, if there be no ſymptom neceſſarily forbidding it. In regard to thoſe perſons, who are naturally very difficult to be *ſweated*, a draught made of freſh arum-root and wine, or vinegar, uſually brings on profuſe *ſweating*, if they are put to bed, and warm liquors drank afterwards. It is a very good general caution, that profuſe *ſweats*, if they have continued ever ſo many months, are never to be repreſſed by aſtringents; for in that caſe they are uſually attended with ſymptoms much worſe than the original complaint. The common method of forcing out ſuppreſſed *ſweats* by the hot alexipharmics, and volatile ſalts, is by no means adviſeable in any caſe. Bleeding, judiciouſly timed, is often of very great ſervice in promoting *ſweats*. When the natural *ſweats* of children are repelled, they become ſuddenly feveriſh and ill, and nothing relieves them till the *ſweats* are recalled. This may be done ſimply, by keeping them warmer than before, in moſt caſes; but when that fails, the gentle abſorbents are to be preſcribed, and if they ſuck, the nurſe may take the common alexipharmic medicines: crabs eyes are as proper as any thing for the child in this caſe, and for the nurſe the lapis contrayerva. The convulſions of children very often ariſe from the ſuppreſſion of their *ſweats*, and are always then taken off by making them *ſweat* again. *Junker*'s Conſp. Med. p. 530.

SWEATING-*houſe*. The natives of North-America, when we firſt ſettled among them, had a great many houſes to *ſweat* in, it being their general remedy for diſeaſes of whatever kind; but at preſent they are leſs uſed among them.

The cave, or *ſweating-houſe*, was uſually eight feet in diameter, and four feet high, the roof being ſupported by ſticks, or boards. They uſually dug theſe caves in the ſide of a hill, and as near as could be to ſome river, or pond. The entrance into the cave was ſmall, and when any perſon was *ſweating* in it, the door was covered with a blanket, or ſkin. Near the cave they uſed to make a large fire, and heat in this a quantity of ſtones, perhaps five hundred weight; theſe they rolled into the cave, and piled up in a heap in the middle. When this is done the Indians go in naked, as many as pleaſe, and ſit around the heap of ſtones; and as ſoon as they begin to grow faint, which is uſually in a quarter of an hour, they come out, and plunge themſelves all over in the water, remaining in it a minute or two; and repeating this a ſecond time, they dreſs themſelves, and go about their buſineſs.

This has been for many ages uſed among them with ſucceſs, in caſes of colds, ſurfeits, ſciaticas, and pains fixed in their limbs, and the Engliſh have often uſed the ſame means, and found relief by it. It is practiſed equally at all times of the year, and the Indians do it not only in ſickneſſes, but by way of refreſhment after long journies, and other fatigues, and to ſtrengthen themſelves for any expeditions. Philoſ. Tranſ. N° 384. p. 131.

Turf SWEATING. See TURF-*ſweating*.

SWEATING-*iron*, in the manege, is a piece of a ſcythe about a foot long, and of the breadth of about three or four fingers, very thin, and ſuch as cuts only with one ſide. When a horſe is very hot, and the grooms have a mind to leſſen the *ſweat*, or make it glide off, they take this knife or iron in their two hands, and gently run the cutting edge along the horſe's ſkin, commonly with the grain, or as the hair lies, and but ſeldom againſt it; with intent to ſcrape off the *ſweat*, and dry the horſe.

SWEATING-*room*. See an account of the remains of a Roman *ſweating-room* in the Philoſophical Tranſactions, N° 461. ſect. 29.

SWEATING-*ſickneſs*. See SUDOR *Anglicanus*, *Cycl.* and *Suppl.*

SWEET (*Cycl.*)—By a *ſweet* is underſtood any vegetable juice, whether obtained by means of ſugar, raiſins, or other foreign or domeſtic fruit, which is added to wines, with a deſign to improve them. It is plain, from the making of artificial muſt, or ſtum, by means of fine ſugar, with a ſmall addition of tartar, that the art of *ſweet*-making might receive a high degree of improvement, by the uſing pure ſugar, as one general wholeſome *ſweet*, inſtead of thoſe infinite mixtures of honey, raiſins, ſyrups, treacle, ſtum, cyder, &c. wherewith the *ſweet*-makers ſupply the wine-coopers to lengthen out, or amend their wines: for pure ſugar being added to any poor wine, will ferment therewith, and improve it, and bring it to a proper degree of ſtrength and vinoſity. If the wine that is to be amended is tart of itſelf, no tartar ſhould be added to the ſugar, but if it be too *ſweet* or luſcious, then the addition of tartar is neceſſary. *Shaw*'s Lectures, p. 203. See the article *Artificial* STUM.

SWEET *ſublimate of mercury*. See MERCURIUS *dulcis*.

SWEET *corn*, a term uſed by the Indians to expreſs a ſort of corn they are very fond of, and generally keep in their houſes.

While the ear of the maiz, or Indian corn, is yet green, but full, they gather it, and firſt boil, and afterwards dry it, and lay it up for uſe in bags, or baſkets. When they eat it, they boil it again, either whole, or groſsly beaten in a mortar; they then mix it with fiſh, or with veniſon, or beaver fleſh, and account it a very fine diſh. The green ears, or freſh *ſweet corn*, they alſo ſometimes eat, as ſoon as it is gathered, roaſting it before the fire, and then picking out the grains. This is a new ſupply of food for them many times, when their winter, or laſt harveſt-ſtore is exhauſted. Their ſoldiers alſo commonly go out to war againſt their enemies about this time of the year, and find this ſupply in their enemies fields. See GUINEA *corn*.

SWEET-*Williams*, the Engliſh name of ſeveral ſpecies of *cariophyllus*, or pink. See the article PINK.

There is a great variety of ſpecies, and very elegant diverſities of colouring in theſe flowers; the principal difference, however, is between the ſingle and double kinds.

The ſingle kinds are to be propagated by ſowing their ſeeds in March on a bed of light earth; in May they will be ready to plant out, and muſt then be ſet at ſix inches diſtance in beds of the ſame kind of earth. In theſe beds they ſhould remain till Michaelmas, and then be tranſplanted to the places where they are to remain. They will flower the next year in May, and ripen their ſeeds in Auguſt, when that of the beſt flowers ſhould be ſaved.

The double kinds are propagated by layers in the ſame manner with the carnations, they love a middling ſoil, neither too light, nor too ſtiff; they continue flowering a long time, and are very beautiful, eſpecially the mule-kind, which produces yearly two full blooms of flowers, the one in May, the other in July. *Miller*'s Gardner's Dictionary.

SWELLING (*Cycl.*)—*Swellings* in the face and ſalivary glands, without any fever, or redneſs of the ſkin, ſometimes happen in ſummer months, and often give way to a gentle purge or two. See Medic. Eſſ. Edinb. Abridg. Vol. 1. p. 65.

Theſe *ſwellings* are ſometimes eriſipelatous, and fall chiefly on the forehead and eyelids, and yield to purges and bliſters. Ibid.

SWIFT, in zoology, a name given by many to the common newt, or eft. See the article EFT.

SWIFTERS, in a ſhip, ropes belonging to the main-maſts and fore-maſts, which help to ſuccour or ſtrengthen the ſhrowds, and to keep the maſts ſtiff: they have pendants faſtened under the ſhrowds, at the head of the maſts, with a double block, through which the *ſwifter* is reeved; which at the ſtanding part has a ſingle block with a hook, hitched into a ring at the chain-wale, and ſo the fall being haled up, helps to ſtrengthen the maſt; yet it is belayed about the timber heads of the lower rails aloft.

SWIFTING *of a boat*, is compaſſing her gun-wale round with a good rope, to ſtrengthen her in ſtreſs of weather, that ſhe be not ſhattered by the violence of the ſea.

SWIFTING *the capſtan-bars*, aboard a ſhip, is ſtraining a rope all round the outer ends of the capſtan-bars, in order to ſtrengthen them, and make them bear all alike, and together, when the men heave or work there.

SWIFTING *of a ſhip*, is either bringing her aground, or upon a careen; for then they uſe to *ſwift* the maſts, to eaſe and ſtrengthen them, that all the weight may not hang by the head; which is done by laying faſt all the pendants of the *ſwifters* and tackles with a rope cloſe to the maſt, and as near to the blocks as can be; and then to carry forward the tackles, and there to bowſe, or hale them down as hard and taught as poſſible. The word of command here, is, *Ho! bowſe men!* All this is done alſo to keep the maſt from riſing out of the ſtep.

SWIGGING, a particular way of caſtrating rams.

The operation is performed by throwing the creature on his back, in which poſture he is held; then a ſtring is drawn about his teſticles as tight as poſſible, and fixing it there, the part is anointed with freſh butter. The beaſt is then left to feed, and in two or three days the teſticles grow ſo rotten, as to fall off with the ſtring, or may be plucked away with a ſmall force. *Boyle*'s Works Abr. Vol. 1. p. 87.

SWIMMING *of fiſhes*. See NATATIO, and AIR-*bladder*.

SWINE, *ſus*. See the article SUS.

Swine are very profitable creatures to the owner, being kept at ſmall expence, feeding on things that would be otherwiſe thrown away, and producing a very large increaſe. They are apt to dig up the ground, and to break fences; but this may be prevented, by putting rings in their noſes, and yoaks about their necks. Leiceſterſhire, Northamptonſhire,

ſhire, and Hampſhire, are famous for theſe animals, which ſeems owing to their being clayey countries, and that more beans and peaſe are ſown there, than in other places. The wild kind never grow ſo large as the tame, but they are much better taſted. The keepers of hogs ſhould always chooſe ſuch boars to breed out of as are long bodied, and have deep bellies and ſides, ſhort noſes, thick thighs, ſhort legs, high claws, a thick neck, and a thick chine, well ſet with large briſtles.

It is not proper to keep too many breeding *ſows*; for they will produce ſo many young at a time, and this three times a year, that they will not find food enough. They uſually bring thirteen or fourteen young ones in a litter, ſometimes more, but they can bring up no more than they have teats to ſuckle; and they bring forth three times in a year. Young ſhoots, as they are called, that is, *ſwine* of three quarters of a year old, are beſt for pork, and thoſe of a year and half, for bacon. Moiſt and ſedgy grounds are good for *ſwine*, for they eat the roots of many of the plants that grow there; and the fruit of the beech, cheſnut, and hedge buſhes, fatten them well, and make their fleſh much better taſted, than when bred intirely in the ſtye. *Mortimer*'s Huſbandry, p. 253.

SWINE-*pipe*, in ornithology, a name uſed in many parts of England for the red-wing.

SWING-*wheel*, in a royal pendulum, that wheel which drives the pendulum. In a watch, or balance clock, it is called the *crown-wheel*.

SWINGING was preſcribed by antient phyſicians, as a good exerciſe in ſome caſes. See AGITATION.

SWINGLE, in the wire works in England, the wooden ſpoke which is fixed to the barrel that draws the wire, and which, by its being forced back by the cogs of the wheel, is the occaſion of the force with which the barrel is pulled. *Ray*'s Engliſh Words, p. 133.

SWINGLING. See the article BRAKE.

SWIT, in natural hiſtory, a name given by the people of the Philippine iſlands to a very ſmall bird of the humming bird kind, frequent in that part of the world. It is beautifully coloured, and lives on the honey of flowers.

SWORD (*Cycl.*)—SWORD-*hand*, in the manege, is the horſeman's right hand, as *bridle-hand* is uſed to denote his left hand.

Pleas of the SWORD. See PLEA, *Cycl.* and JUS *gladii*, *Suppl.*

SYCABIS, in zoology, a name by which ſome authors have called the *atricapilla*, or black-cap, a ſmall bird well known in England. See ATRICAPILLA.

SYCAMINOS, a word uſed by ſome for the mulberry fruit, and by ſome for the tree.

SYCAMORE-*tree*, a name improperly given by us to the *acer majus*. See the article MAPLE.

SYCAMORE-*moth*, in natural hiſtory, the name of a peculiarly large and beautiful moth, or night butterfly, ſo called, from its caterpillar feeding on the leaves of the *ſycamore*.

This caterpillar is remarkably large, very often growing to three inches and an half long, and three quarters of an inch in diameter. The head is ſmall, and the body conſiſts of twelve rings, each of which has five or ſix large and ſtiff hairs on it, each having at its extremity a ſmall, but hard globule of a blue colour, from which there often ariſe alſo ſeveral other hairs, ſmaller and ſhorter than the others, and having one in the middle a little longer than the reſt; on nine of the rings alſo there is above each foot a white oval mark, ſurrounded by a black line; theſe Malpighi diſcovered in the ſilkworm to be the organs of reſpiration.

This caterpillar has ſixteen feet, diſpoſed in three ſeries, or ranges; ſix are placed near the head, theſe ſtanding very cloſe together, eight more ſtand in the middle of the body, and the other two near the tail: the ſix that are placed near the head, are the only true feet, for the reſt ſerve as well to fix the creatures to any particular place, as to aſſiſt them in their motions. The ſkin is yellow and ſmooth, without a ſingle hair, except thoſe particularly before mentioned. Theſe caterpillars being put into a box, each ſpun itſelf a ſtrong and firm caſe, which it faſtened to the ſide of the box, and in it waited the time of its laſt transformation: in each of theſe ſhells there was left a ſmall aperture, by means of which the creature was to get out when in its butterfly ſtate, and the head of this animal was placed exactly againſt this aperture. In this ſtate they lie all the autumn, winter, and ſpring, and in the beginning of ſummer come out in the ſhape of a very elegant moth. The wings, when expanded, meaſure more than five inches, and each has an eye, like that on the peacock's tail, near the extremity. The horns are of the feathered kind, and are very large and elegant; and the body and origins of the wings are covered with very long hairs. Mem. Acad. Par. 1692.

SYCION, a word uſed by ſome authors to expreſs a decoction of dried figs.

SYCITES, the *fig-ſtone*, an idle name given by ſome authors to ſuch natural nodules of flint or pebbles, as happen to approach to a fig in ſhape.

SYCITES *vinum*, a term uſed by the antients to expreſs a wine impregnated with figs.

SYCOMANTIA, Συκομαντεια, in antiquity, a ſpecies of divination performed with fig-leaves; for which ſee *Potter*, Archæol. Græc. lib. 2. cap. 18. Tom. I. p. 353.

SYCOSIS, a term uſed by ſome authors to expreſs a tumor of the anus, differing only in bigneſs from the thymus. It had this name from the reſemblance of the fleſh about its edges to a ripe fig. The antients underſtood two ſorts of ulcerated tumors by this name, tho' both attending the ſame part; the one was hard and round, the other ſofter, and of an irregular figure: from the firſt there was diſcharged only a ſmall quantity of matter, from the latter a very large quantity, and that of a very ill ſmell. Some other of the antient phyſicians make the ſame word alſo expreſs two ſorts of ulcerated tumors of the head, or beard, which they diſtinguiſh by the ſame characters into a hard and a ſoft one.

SYCOTA, a word uſed by ſome of the antients to expreſs a ſort of food prepared of figs.

SYCOTON, a name given by the antients to the liver of a pig fed with figs. This was eſteemed a very elegant diſh among the old Greeks.

SYDEROPŒCILUS, in natural hiſtory, the name of a ſtone mentioned by the antients. It was found in Arabia, and ſeems to have obtained this name from its being ſpotted with a ferrugineous colour. The deſcriptions of the antients are, however, in this, as in many other inſtances, too ſhort to ſuffer us to gueſs what ſtone they meant. This might poſſibly be a granite with ſpots of this peculiar colour.

SYENITES, in the natural hiſtory of the antients, a name given by many to the granite, the ſame with the oriental granite of the moderns. It had this name from its country; but our artificers have of late learned to call a very different ſubſtance by a name that ſounds very like this, the beautiful purple and yellow marble, ſo frequent with us now in tables, *&c.* being called among them *Sienna marble*. *Hill*'s Hiſt. of Foſſ. p. 500.

SYLVA (*Cycl.*)—SYLVA, among the Romans, a ludicrous kind of hunting exhibited in the circus; ſo called, becauſe the circus was really planted with trees, which had been dug up with the roots by the ſoldiers and brought thither, and fixed to large beams, after which earth being thrown upon their roots, the circus actually reſembled a wood; then being filled with all ſorts of herbivorous animals, the people were let looſe upon them, and carried all clear off. *Pitiſc.* Lex. Ant. in voc.

SYLURUS, in ichthyology, a name given by Geſner to the *ſilurus* of Willughby, and others, which we call in Engliſh the *ſheat-fiſh*.

The names of fiſh are in general ſo arbitrary, that it is not eaſy to determine what is meant by them in the different authors who uſe them: but Artedi has very well diſtinguiſhed this by the name of the *ſilurus* with four cirri, or beards, at the mouth; by which it evidently is diſtinguiſhed from the fiſh called the *lake*, which, though a true *ſilurus*, has only one beard.

SYMBACCHI, Συμβακχοι, in antiquity, a deſignation given to the two men, who purified the city of Athens at the feſtival *Thargelia*. See THARGELIA.

SYMBOLISM, a word uſed by ſome of the chemical writers to expreſs a conſent of parts.

SYMBOLOGICE is uſed by ſome for that part of the ſcience of medicine, which treats of the ſymptoms of diſeaſes.

SYMPARATAXIS, a word uſed by Hippocrates to expreſs the conflict between nature and a diſeaſe, and the aliments or medicines given in it.

SYMPASMA, a word uſed by many authors to ſignify a cataplaſm.

SYMPATHETIC *inks*. See *Sympathetic* INKS.

SYMPATHETIC *powder*. The compoſition of the *famous ſympathetic powder*, uſed at Goſſelaer by the miners in all their wounds, is this. Take of green vitriol eight ounces, of gum tragacanth, reduced to an impalpable powder, one ounce; mix theſe together, and let a ſmall quantity of the powder be ſprinkled on the wound, and it immediately ſtops the bleeding. The vitriol is to be calcined to whiteneſs in the ſun, before it is mixed with the gum.

SYMPATHY, (*Cycl.*) in medicine. A part is ſaid to ſuffer by *ſympathy*, or conſent, when it is yet whole and ſound, and is only affected by the fault of ſome other part. Medic. Eſſ. Edinb. Abridg. Vol. 1. p. 449.

We have ſome practical remarks on the *ſympathy* of the parts of the body, in the Medical Eſſays of Edinburgh, Vol. 5. Art. 45.

SYMPESIS, a word uſed by the old Greek writers to ſignify concoction, or digeſtion.

SYMPHONIACA, in botany, a name given by ſome authors to the common *hyoſciamus*, or henbane. *Ger.* Emac. Ind. 2.

SYMPHONIALE, in the Italian muſic, is ſometimes prefixed to a canon, or fugue, to ſhew that it is at uniſon, *i. e.* that the ſecond part is to follow, or imitate the firſt in the ſame intervals, ſounds, notes, *&c.* the third to obſerve the ſame with regard to the ſecond, and ſo on.

SYMPHYTUM, *comfrey*, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe. The cup is an erect, acute, pentagonal perianthium,

divided into five ſegments at the rim, and remaining when the flower is fallen. The flower conſiſts of one petal, formed into a very ſhort tube, with a bellied tubular end, ſomewhat thicker than the tube, the extremity of which is divided into five ſegments. The opening of the flower has five tapering rays, ſhorter than the rim of the flower, and converging, ſo as to form a ſort of cone. The ſtamina are five tapering filaments, placed alternately with the rays of the mouth of the flower; the antheræ are acute, upright, and covered. The piſtillum has four germina. The ſtyle is ſlender, and of the ſame length with the flower. The ſtigma is ſimple. The cup becomes inlarged, and ſupplies the place of a fruit, containing four pointed gibbous ſeeds, with their tops converging one towards another. *Linnæi* Gen. Plant. p. 38.

The characters of *ſymphytum*, according to Tournefort, are theſe. The flower conſiſts of one leaf, and is funnel-faſhioned, but ſomewhat reſembling the bell-ſhaped ones. The cup is divided into ſegments, even to the baſe, and from this there ariſes a piſtil, which is fixed in the manner of a nail to the hinder part of the flower, and is ſurrounded with four embryos, which afterwards ripen into ſo many ſeeds: theſe are of the ſhape of a viper's head, and are contained in the cup, which becomes inlarged for their reception.

The ſpecies of *comfrey*, enumerated by Mr. Tournefort, are theſe. 1. The great purple-flowered *comfrey*. 2. The great bluiſh purple-flowered *comfrey*. 3. The white or yellowiſh-flowered great *comfrey*. 4. The deep yellow-flowered great *comfrey*. 5. The great *comfrey*, with variegated flowers. 6. The tuberoſe-rooted larger *comfrey*. 7. The ſmaller tuberoſe-rooted *comfrey*. 8. The large echium-leaved *comfrey*, with red roots, and yellow flowers. 9. The large echium-leaved *comfrey*, with red roots, and white flowers. 10. The narrow-leaved *comfrey*, with red roots, and yellow flowers.

Authors have been uſed to reckon another ſpecies of this plant, the little borage-like *comfrey*; but this is properly a ſpecies of omphaloides. *Tourn.* Inſt. p. 138.

The roots of the common *comfrey* are very powerful agglutinants. The common people uſe them with ſucceſs in freſh wounds, and a conſerve of them is found of excellent uſe in hæmorrhages of all kinds. They have been alſo recommended in the gout and ſciatica, as of great virtues in mitigating the pain, and ſhortening the paroxyſms.

Symphytum was a name given among the antients to ſeveral different plants, which had the common virtues of agglutinators. We have appropriated the word to *comfrey*; but Dioſcorides plainly uſes it ſometimes as the name of elecampane, and ſometimes as that of the common horſe-tail. He even ſeems to have led himſelf into an error in the uſe of theſe ſynonyms, in this very article, having preſcribed the horſe-tail, under the name of *ſymphytum*, for a ſhortneſs of breath. It is very evident, from the tenor of his other works, that he meant to preſcribe the helenium, or elecampane, that having the qualities neceſſary in ſuch a caſe; and neither this author, nor any other, ever having recommended the horſe-tail on any occaſion of this kind. Pliny has collected the virtues and characters of the *ſymphytum* from all the authors he had, in whom the word occurred, and therefore he has given a liſt of virtues that belong to no one plant.

SYMPLEXIUM, in natural hiſtory, the name of a genus of foſſils, of the claſs of the ſelenitæ, but not of the determinate and regular figure of moſt of the genera of thoſe bodies, but compoſed of various irregular connections of differently ſhaped, and uſually imperfect bodies.

The word is derived from the Greek, *σύμπλεκω*, to connect, or compound a mixt maſs of different things.

The bodies of this genus are of an irregular figure, and are variouſly notched, divided, and indented at their edges: they are compoſed of a number of other imperfect ſelenitæ, principally of the rhomboidal kind, though not unfrequently with the columnar, and uſually with parts of tabular maſſes among them. The different bodies that form this kind are ſeldom quite perfect, having uſually fallen together before they were wholly hardened; but generally, whether they form a larger or a ſmaller maſs, they together affect the external figure of a flat hexaedral column, though variouſly notched at the ſides, and truncated at the ends. *Hill*'s Hiſt. of Foſſ. p. 124.

SYMPLOCE, Συμπλοκή, in rhetoric, a figure, where the ſame word is repeated ſeveral times in the beginning or end of a ſentence: thus, *Quis legem tulit? Rullus. Quis majorem populi partem ſuffragiis privavit? Rullus. Quis comitiis præfuit? Idem Rullus. Voſſ.* Rhet. lib. 5. p. 289.

SYMPOSIARCH, Συμποσιαρχος, in antiquity, the director, or manager of an entertainment. This office was ſometimes performed by the perſon at whoſe charge the entertainment was provided; ſometimes by another named by him; and at other times, eſpecially in entertainments provided at the common expence, he was elected by lot, or by the ſuffrages of the gueſts. He was otherwiſe called *baſileus*, *rex*, and *modimperator*, &c. and determined the laws of good fellowſhip, obſerved whether every man drank his proportion, whence he was called *ophthalmus*, *oculus*, the *eye*. The gueſts were in all things obliged to obey his commands; on which account Cicero upbraids a certain perſon, that *qui nunquam populi Romani legibus paruiſſet, iis legibus, quæ in poculis ponebantur, obtemperabat:* he, who had never ſubmitted to the laws of the Roman people, yielded obedience to thoſe of drinking.

Arian reports, that the king being elected by lots commanded in this manner, *do you drink, do you fill the glaſs, do you go, do you come*, &c. The chief magiſtrates were not exempted from yielding obedience, if the lots gave another the preeminence. Plutarch relates, that Ageſilaus, king of Lacedæmon, being choſen *ſympoſiarch*, gave the following command to the cup-bearer, who aſked him how much wine every gueſt ſhould drink, *viz. If there is plenty of wine, let every man have what he calls for; if not, let every man have an equal ſhare.*

SYMPTOSIS, a word uſed by the antients to expreſs a contraction, or ſubſidence of the veſſels, ſuch as happens under evacuations. It alſo is ſometimes uſed to expreſs a remiſſion in a diſeaſe, and the falling away in fleſh of people in ſickneſs.

SYNAGELASTIC, an epithet uſed to expreſs the fiſhes of the gregarious kind, or which ſwim together in large ſhoals, in oppoſition to the ſolitary kinds.

SYNAGRIS, in zoology, a fiſh caught in the Archipelago, and ſome other ſeas, and much reſembling the *dentex*. Some have uſed it as a ſynonym for that fiſh, and others accounted it only a name applied to the *dentex* while young, but it is properly a diſtinct ſpecies. It is conſiderably ſhorter and thicker than the *dentex*, and much reſembles the carp in figure. Its head is yellow, and its ſides are variegated with bluiſh, and other coloured lines, laid in an oblique direction; but the longitudinal ſide lines are black. Its ſcales are remarkably round in figure, and its tail very forked. *Bellonius* de Piſc.

Ariſtotle, Athenæus, and others, apply the name *ſynagris* to the fiſh generally called the *dentex*, or *ſynodon*, the *dentale* of the Italians.

According to Artedi, it is a ſpecies of the ſparus, and is diſtinguiſhed by him by the name of the variegated *ſparus* with a ſharp back, and with four large teeth.

SYNARTHROSIS (*Cycl.*)—The articulation of bones, ſo joined together as to remain fixed in their ſituation, is of two kinds; one is made by ingrailing, and the other in the ſame manner, in which a nail, or pin, is fixed in wood. The firſt of theſe may be again ſubdivided into the deeper, and the more ſuperficial kind.

The deep kind is obſervable in the articulation of the broad bones; the antients term this a ſuture, from the reſemblance it bears to a coarſe ſeam, as is ſeen in the upper bones of the ſkull. It is made by jags, notches, and holes, in each of the articulated bones, by which they are mutually indented, much after the ſame manner as what is called *dove-tailing* among the joiners. By the antients this was called alſo *unguis*, probably becauſe the indented pieces are rounded like nails. Sutures have been divided alſo into the true and the falſe. See SKULL.

The other kind is that which is obſerved in bones joined together by more extended ſurfaces, in which no indentation appears outwardly. This kind of articulation the antients termed *harmony*; and the articulation of ſome of the bones of the upper jaw were given as examples of it. But though they deſcribe this as running in a ſingle line, they did not mean this in a ſtrict ſenſe, but only that the joint was like that of two rough boards without grooves; for they have expreſsly told us, that ſome ſmall inequalities might be obſerved in theſe joints, and ſome of them have uſed the terms *ſuture* and *harmony* indifferently. The other kind of *ſynarthroſis*, an example of which we have in the teeth, is called *gomphoſis*, a Greek term, ſtill retained. *Winſlow*'s Anatomy, p. 15.

SYNATHROISMUS, Συναθροισμος, in rhetoric, a figure which, in order to magnify a thing, whether good or bad, enumerates a great many different perſons, actions, &c. to which it relates: thus Cicero, *qui mihi fratrem optatiſſimum, me fratri amantiſſimo, liberis noſtris parentes, nobis liberos; qui dignitatem, qui ordinem, qui fortunas, qui ampliſſimam rempublicam, qui patriam, quâ nihil poteſt eſſe jucundius; qui denique noſmet ipſos nobis reddidiſtis.* See *Voſſ.* Rhet. lib. 5. p. 372.

SYNCAMPE, a word uſed by the old writers to expreſs the joint, or flexure, where the upper part of the arm is joined to the lower.

SYNCAUSIS, a word uſed by ſome medical writers to expreſs the drying, and, as it were, burning up of the excrements within the body, by a febrile heat.

SYNCHISIS, a word uſed by the old medical writers to expreſs a confuſion and perturbation of all the humors in concoction, from the imbecillity of the ſtomach. It is alſo uſed to expreſs a diſeaſe of the eye, which conſiſts in a confuſion of the humors: this generally proceeds from a violent blow; ſometimes from an inflammation of the uvea, occaſioning a rupture of the veſſels, and an effuſion of the humors.

SYNCHORESIS, Συνκωρησις, in rhethoric, the ſame with *permiſſion*. See PERMISSION.

SYNCHYSIS,

SYNCHYSIS, Συγχυσις, in rhetoric, a confuſed manner of expreſſion, where the natural order of the words is perverted. Horace affects it much: thus lib. 1. ſat. 5.

Pæne macros arſit dum turdos verſat in igne.

SYNCOMISTERIA, Συνκομιστηρια, in antiquity, the ſame with *thalyſia*. See THALYSIA.

SYNCOMISTON, a name given by Athenæus, and ſome other authors, to the coarſer ſort of bread eaten by the poor in many countries, and made of unſifted meal, the bran being mixed up among the reſt. This is a very nouriſhing food, and for laborious people, or thoſe who uſe much exerciſe, is highly preferable to all other ſorts of bread.

SYNCRISIS, a word uſed by the chemical writers to expreſs a concretion, or coagulation of any thing, effected by a ſpontaneous, or violent reduction of a liquid ſubſtance to a ſolid one, by a privation of the humid.

SYNCRISMATA, a ſort of ointment, of the nature of the acopa, in uſe among the antients.

SYNCRITICA, a name given by ſome writers to ſuch medicines as are of a coercive and aſtringent quality, whether uſed externally, or given internally.

SYNDESIS, a word uſed by the antient phyſicians to expreſs a binding, or ſtraitening.

SYNDESMOSIS, in anatomy, a connection of the bones, called alſo *ſynnexoſis*.

SYNDESMUS, in anatomy, a word uſed by ſome for a ligament. See LIGAMENT.

SYNECHES, in medicine, is the name of a fever of the next degree to the intermittent: it alſo ſeems to be ſomething of kin to thoſe, and is called the *continent*, or *remitting fever*. It is a continual fever in regard to duration, though not in degree, continuing many days together without intermiſſion: but then it has its diminutions and augmentations; ſometimes regular, ſometimes irregular, though no true intermiſſions. *Allen*'s Synopſis, p. 3.

SYNECTICON, a word uſed by the old writers to expreſs the proximate cauſe of a diſeaſe; called alſo the *cauſa continens*, and always remaining cloſely united with the diſeaſe.

SYNERGASMA, a word uſed by Libavius, and ſome other authors, to expreſs any operation in chemiſtry. The operations are by this author divided into two claſſes, the energetic, and preparatory: the firſt producing ſuch bodies as are of power to act on others as menſtruums, to cure diſeaſes, and the like; and the others producing no ſuch things, but being neceſſary preparatives to them.

SYNESTIC is ſometimes applied by phyſicians to expreſs the ſtools when firm, and of a conſiſtence; ſuch as to make them remain in their ſhape, in oppoſition to liquid ones.

SYNGENESIA, in botany, a claſs of plants with hermaphrodite flowers, whoſe ſtamina are naturally formed into a ſingle regular congeries.

The word is formed of the Greek σὺν, together, and γένεσις, formation. The plants comprehended under it are thoſe whoſe ſtamina, by the junction of their apices, are formed into a ſingle regular cylindric body; and among theſe are the lettuce, ſuccory, hawkweed, &c.

The *ſyngeneſia* expreſſes the ſame claſs of plants with the compound flowered plants of Ray, and others. The general characters of the claſs are theſe.

The cup is the crown of the ſeed, and ſtands on the ſummit of the germen. The flower conſiſts of one petal, and has a very narrow and long tube placed upon the germen: this is either tubular, ligulated, or naked.

The tubular flower of the *ſyngeneſia* has, at the ſummit of the tube, a wide campanulated mouth, divided into five ſegments, which are expanded, and ſomewhat bent backward. The ligulated flower is that which has a plain and ſtrait edge turning outwards, with a truncated apex undivided, but furniſhed with three or four teeth. The naked flowers are thoſe which have no mouth at all; and often in theſe, even the tube is alſo wanting. The ſtamina are five very ſhort and ſlender filaments, inſerted into the tube of the flower. The antheræ are of the ſame number with the ſtamina: they are ſlender, erect, and grow together at their ſides, ſo as to form a tubular cylindric body of the length of the mouth of the flower, and divided into five ſegments at the edge. The germen of the piſtil is oblong, and placed under the receptacle of the flower. The ſtyle is capillary, erect, and of the length of the ſtamina, and goes through the cylinder formed by the antheræ. The ſtigma is divided into two parts, which ſtand open, and bend backwards. Theſe plants have properly no pericarpium, though in ſome few ſpecies there is a coriaceous cruſt placed about the ſeed. The ſeed is ſingle and oblong, often of a quadrangular figure, and ſometimes narrower at the baſe than in any other part. *Linnæi* Gen. Plant. p. 370.

The ſeeds are, in the different genera of this claſs, of a very different appearance at the ends. Some are crowned with a downy matter, compoſed of a great number of ſingle ſhort filaments, placed circularly, or otherwiſe, on the head of the ſeed. In ſome the downy matter is radiated; in others it is ramoſe, or branched; and in ſome it is ſupported on a pedicle, while in others it ſtands immediately on the ſeed. In ſome genera the ſeeds have no down at all, but have a ſmall corona, formed of what was originally the cup of the flower: this is permanent, and divided uſually into five ſegments. In ſome genera the ſeed is wholly naked, having neither any down, nor this crown of a cup.

The ſexes of the plants of this claſs are very variouſly diſpoſed, and it is owing to this that there are among them ſeveral different kinds of flowers. The tubulated flower is called an hermaphrodite flower, when it contains both the ſtamina and piſtil. It is called a male flower, when it contains only ſtamina without any ſtigmata. It is called a female flower, when it contains a ſtigma and no ſtamina. And there is ſtill another ſort of flower, called neutral, among this claſs of plants; theſe have neither ſtamina, piſtil, nor ſtigma, nor indeed any other part of fructification. Theſe ſeveral kinds of flowers are, in the deſcriptions of the genera, called ligulated, campanulated, &c. from their ſhape.

A flower compoſed of a great number of theſe ſmall flowers is called floſcular, or floſculoſe flower; each of theſe, from their being ſmall, and only making up a part of a general flower, being called a floſcule. The common receptacle of the fructification in the floſculous flowers contains always ſeveral floſcules; and in the various genera the diſk, on which theſe are received, is either concave, convex, plain, globoſe, or, finally, pyramidal. This receptacle is called by ſome *thalamus*.

The ſuperficies of this receptacle is called by authors, in ſome genera, naked, in others paleaceous. In the naked kinds, it is either abſolutely bare, or elſe covered with a number of ſmall tubercles, or with ſhort and erect hairs. The paleaceous receptacles are covered on the ſurface with narrow, ſubulated, and painted paleæ, or chaffy ſubſtances. Theſe ſtand erect, and are placed between the floſcules.

The common cup, or perianthium, in theſe plants, contains, or incloſes both this receptacle, and all the floſcules: this is contracted together at the top when the plant is in flower, but it expands itſelf when the floſcules are fallen, and the ſeeds are to ripen. This general cup is, in its different appearances in the ſeveral genera, diſtinguiſhed by authors by the epithet *ſimplex*, *imbricatus*, and *auctus*. The perianthium ſimplex, or ſimple cup, is that which conſiſts of only one ſimple ſeries of leaves, which ſurround the flower. The imbricated cup is that which is compoſed of a vaſt number of ſhort ſquammæ, or ſcales, the exterior ones being gradually ſhorter than the inner ones, which they lie upon. The calyx auctus is that, in which while one ſeries of long and equal ſegments ſurrounds the floſcules, another ſmall ſeries ſurrounds only the baſe of the inner, ſimple, and larger cup. The compound flowers are very variouſly compoſed, in regard to the nature of the floſcules. *Linnæi* Gen. Plant. p. 371.

1. Some are compoſed of tubuloſe hermaphrodite flowers in the diſk, and of the ſame ſort of tubulous hermaphrodite flowers in the radius. 2. Others are compoſed of tubuloſe hermaphrodite flowers in the diſk, and of tubulous female flowers in the radius. 3. Some are compoſed of tubulous hermaphrodite flowers in the diſk, and of tubuloſe neutral flowers in the radius. 4. Some have tubuloſe hermaphrodite flowers in the diſk, and ligulated hermaphrodite flowers in the radius. 5. Some are compoſed of tubulous hermaphrodite flowers in the diſk, and of ligulated female flowers in the radius. 6. Some are compoſed of tubulous hermaphrodite flowers in the diſk, and ligulated neutral flowers in the radius. 7. Some are compoſed of tubulous hermaphrodite flowers in the diſk, and of naked and neutral flowers in the radius. 8. Some are compoſed of tubuloſe male flowers in the diſk, and of naked female flowers in the radius. And 9. ſome are compoſed of ligulated female flowers in the diſk, and ligulated hermaphrodite flowers in the radius.

The eſſential character of a floſculous flower conſiſts in its antheræ growing together into a cylindric body, and producing a ſingle ſeed, which ſtands under the receptacle of the ſeparate floſcule. Id. p. 372.

The common cup is uſual in moſt genera of this plant, but it is no univerſal character, for it is wanting in the echinopus. Nor is this the only variation they are ſubject to, for the common receptacle, which might ſeem a very eſſential part of the plant, is wanting in the milleria. It is evident from this, how very uncertain characters the common cup, and common receptacle of the ſeeds, are in this claſs of plants; for though they have been judged eſſential, and unerring marks, yet we find the two plants above named want them ſeverally; and we alſo find that ſome plants are poſſeſſed of them, which have not the other characters of the claſs. Thus ſcabious has a common cup, and dipſacus a common receptacle, yet neither ſcabious, nor dipſacus, are floſculous, or, as they may much more properly be called, *ſyngeneſious* plants.

It is very remarkable that Plumier has no genus of compound flowers. Tournefort, though he had not the aſſiſtances of the later obſervations on the ſtamina and antheræ to guide him, yet has fixed very natural genera in the claſs of the *ſyngeneſious*, or compound flowered plants.

Vaillant made more obſervations on the nature of the flowers of theſe plants, than any one who went before him, and the

only error he run into, was the making too many genera. Pontedera has rendered the method of this claſs very eaſy and clear, though he found it very confuſed. *Linnæi* Gen. Plant. p. 373.

SYNGNATHUS, in ichthyology, the name of a genus of fiſhes, the characters of which are theſe. The coverings of the gills are on each ſide compoſed of a thin and ſingle bony lamella; the head is oblong and compreſſed; the jaws are cloſed up at the ſides; and the mouth is only capable of opening at the extremity of the ſnout. The body is long and very ſlender; the ſhape is ſometimes roundiſh, but more uſually angular. The fins are in moſt ſpecies four in number, but in ſome only one.

The ſpecies of this genus, enumerated by Artedi, are four. 1. The ſquare-bodied *ſyngnathus*, having no fin at the tail. This is the creature called the *hippocampus* by authors. 2. The cylindric *ſyngnathus* without any breaſt, or tail fins. This is the *acus lumbriciformis* of Mr. Ray. 3. The *ſyngnathus* with the middle of the body heptagonal, and with a pinnated tail. This is the *acus Ariſtotelis ſpecies altera major* of Willughby. 4. The *ſyngnathus* with the middle of the body hexangular, and a pinnated tail. This is the common *acus Ariſtotelis*. In the diſtinguiſhing this genus, the number of the inciſures, in the body of the ſeveral ſpecies, is to be carefully attended to. *Artedi*, Gen. Piſc.

The name *ſyngnathus* is of Grecian origin, and is formed of the word συν, which in compoſition ſignifies the ſame as the Latin *con*, together, and γναθος, a jaw. It is given to this fiſh from that remarkable ſtructure of its mouth, by which the jaws are made to grow together, and the very end of the mouth only opens.

SYNGNOME, Συγνωμη, in rhetoric, the ſame with *conceſſion*. See CONCESSION, *Cycl.*

SYNNAS, or SYNNADIUM *marmor*, in the writings of the antients, the name of a ſpecies of marble uſed in the larger buildings of the Romans. It is by ſome confounded with the docimenum marmor, with which the temple of Jupiter, erected by Adrian, was built; but this is erroneous, ſince that elegant marble was always charactered as perfectly white, without blemiſh; and this was always ſpotted, and clouded with black, inſomuch that ſome writers have called it by an epithet, expreſſing thoſe variegations, *maculoſa ſynnas*.

SYNNEUROSIS, in anatomy, a kind of articulation of the bones, performed by the intervention of ligaments.

SYNOCHA, (*Cycl.*) in medicine, the name of a ſpecies of fever, of which authors diſtinguiſh two kinds, the ſimple, and the compound. The ſimple *ſynocha* is very rare in our parts of the world. The compound one is a mixed diſeaſe of the *ſynochal* and ordinary continued fever, and has been called by ſome the *putrid fever*, and *ſynocha putrida* by the antient medical writers.

Signs of it. The *ſynocha* always ſeizes people at once with a violent heat, without thoſe ſhiverings which frequently attend the firſt attacks of other fevers. It is attended with a violent thirſt, an univerſal languor, and laſſitude of the limbs; and often with anxieties, ſighings, and ſuffocative difficulties of breathing. Acute and violent pains are felt in the head, with a tumid redneſs of the face and eyes, noiſes in the ears, vertigos, and eternal reſtleſsneſs and toſſing about in the bed, with wildneſſes in the thoughts. The urine from the firſt is red and pellucid; it rarely admits of any breaking, or depoſits any ſediment before the fourth day, then it frequently precipitates a reddiſh matter. There is generally an obſtinate coſtiveneſs, and ſpaſmodic tenſions of the back and limbs are uſually very painfully felt during the whole time of the diſeaſe. The ſeventh day generally brings on a criſis in this diſeaſe, which in young people is uſually by an hæmorrhage of the noſe, in older by profuſe ſweats. The perſons moſt ſubject to this diſeaſe are thoſe of a plethoric habit, who eat high-ſeaſoned foods, and uſe little exerciſe; and eſpecially ſuch as have had any habitual evacuation of blood ſtopt upon them. It is more frequent in the ſpring and autumn, than at other ſeaſons. *Junker*'s Conſp. Med. p. 267.

Cauſes of it. Theſe are principally violent and unaccuſtomed exerciſe, drinking large quantities of ſpirituous liquors, long watchings, immoderate paſſions, violent ſweatings from hot medicines, and ſudden cooling the body when very hot, by drinking large draughts of cold water, or other weak liquors. All theſe occaſion the fever, by affecting the plethoric habit of the perſon; but this, which is the general and original baſis of the diſtemper, is uſually brought on by omiſſion of uſual bleedings at ſpring and autumn, and other ſeaſons, by ſuppreſſions of accuſtomed hæmorrhages by the noſe, and by ſtoppages of the menſtrual, or hæmorrhoidal evacuations.

Prognoſtics in it. The *ſynochal* fever, in itſelf, is ſeldom attended with any great danger; and when the criſis happens by profuſe ſweats, or by an hæmorrhage, on the ſeventh day, there is no fear of any ill accidents: but if this time paſs without a criſis, and the congeſtions remain, young perſons are uſually thrown into a violent phrenitis, and older ones into ſoporous affections; and even in ſome caſes, where the criſis comes regularly on by hæmorrhages, there is danger from its being too great in quantity, and too much impairing the ſtrength of the patient. There muſt be great caution, however, uſed in aſſwaging this hæmorrhage, if that be found neceſſary, ſince, when it is imprudently done, it often brings on terrible obſtructions in the viſcera, and hectics, dropſies, and cachectic complaints, that are very difficult to get rid of. The critical hæmorrhage is known to be coming on by a ſtricture and itching of the noſe, an intenſe pain in the head, a redneſs of the eyes and face, and a ringing in the ears. Very frequently, alſo, the criſis is predicted by a remarkable perturbation of mind, but this is not the peculiar ſymptom of the hæmorrhage, but happens as often, when it is by ſweat. Often there is a dripping of blood from the noſe on the fourth day; and in this caſe, if nature be not diſturbed, there will certainly be a farther bleeding on the ſeventh day. Complaints of an anxiety and uneaſineſs about the breaſt preſage an unhappy event. Other very bad ſymptoms, alſo, are involuntary tears, great reſtleſsneſs, no relief from ſleep, and the appearance of livid, or brown ſpots. The thick ſtate of the blood, in this fever, makes it very eaſily paſs into ſlow continued fevers and hectics; and ſometimes, when the criſis does not come on at the ſeventh day, and there appear clouds in the urine, it appears afterwards on the fourteenth day.

Method of cure. Bleeding is always neceſſary in the firſt ſtages of this fever, before the ſigns of coction appear in the urine; after this the violent emotions of the blood are to be quelled by nitrous and acid medicines, as the juice of lemons: to theſe muſt be added reſt, and a frequent drinking of warm and weak liquors. The bowels, if much bound, muſt be gently looſened by an emollient clyſter; and after the criſis, ſome gentle purgatives muſt be given to clear the primæ viæ. Bleeding is not to be ordered after the ſigns of coction appear in the urine, for it often prevents the critical hæmorrhage, and renders the patient ſoporous, or delirious; and in the compound, or putrid *ſynochal* fever, the patient is not to be blooded at all. Volatile ſalts are given by ſome in this caſe, but very improperly, for they always are attended with miſchief, and often occaſion cachectic tumors. Symptomatic quinſeys often attend this diſeaſe, and are to be relieved by gargariſms, rendered aſtringent by an admixture of terra Japonica, or the like medicines; and in this particular caſe, wine is to be more cautiouſly forbid than at other times. *Junker*'s Conſp. Med. p. 266.

SYNODON, in zoology, a name given by ſeveral authors to a fiſh caught in the Mediterranean, and more commonly known by the name of *dentex*. *Aldrovand.* de Piſc. lib. 1. cap. 12. See DENTEX.

SYNODONTIDES, in natural hiſtory, the name of a ſtone deſcribed by the antients, and ſaid to be taken out of the head of the fiſh, called by them *ſynodontes*, the *dentex* of the moderns. See DENTEX.

SYNONYMA. The perplexity in the writings of the antients, ariſing from the uſe of *ſynonymous*, as well as homonymous terms, is very great, when they uſe the ſame word as the name of two different things. The whole value of the accounts they have left us is loſt, by our not being able to diſtinguiſh which of the two they mean.

The great ſource of this confuſion has been in the love of ſecrets in medicine, which prevailed as ſtrongly among the antients, as it does among the moderns. In order to conceal the remedies they uſed, they often gave them new names, and often (which was worſe) uſed for them the names of other things.

Thus they called the pine-tree *itea*, the univerſally received name of the willow, and ſo in many other inſtances; from which we have, at this time, the ſame word in uſe in different authors, as the name of different things.

Galen gives a preſcription for baldneſs, in which almoſt all the ingredients are called by names wholly different from thoſe that the reſt of the world knew them by at that time, and by that means paſſed upon the vulgar for new-diſcovered medicines. The bay-tree is there called *ladonis*. The bear *amorphon brephos*, from the ſtory of its young cubs being ſhapeleſs till licked into form by the mother bear. The ladanum, or labdanum, is called *apotragopogon*, becauſe of its being gathered from the beards of goats. And the adarce is called *pericalamitis*, from its being found concreted about a reed.

The compoſition of Philo, called *cholice*, given in the ſame author, is thus given in the ænigmatical manner by the ſame means. The more learned and ingenuous people of theſe ages deteſted this idle practice, and gave all things their common names; but as the abſurdities of one man will generally find followers in others of the ſame ſtamp, though the phyſicians diſcarded the practice, the ſucceeding race of chemiſts, famous for their love of ſecrets, continued and improved it to ſo great a degree, that were there writings of any value, it would be wholly impoſſible, in many of them, ever to arrive at the author's meaning. See SYNONYMOUS, *Cycl.*

The Arabian writers have fallen more into the uſe of *ſynonyms*, and that in a more erroneous manner than any other authors. If two things have happened to be called by the

ſame

ſame name, be they ever ſo different, they always deſcribe them together, and attribute their virtues to one, as well as to the other; nay, they too often tranſcribe from other authors the virtues belonging to the one, and adding them to the account of the other, leave no room to trace out the truth, but by referring to the originals if they are in being. Thus theſe authors found the word *zarnich*, uſed by ſome as the name of orpiment, and by others as the name of the lapis armenus, a blue colour, uſed in painting. Aëtius, and ſome other authors, tell us, that the Syrians always uſed the word in this latter ſenſe, though all other people uſed it in the former. Aviſenna on this makes theſe two different ſubſtances, orpiment, and armenian zarnich, the ſame; and having ſeen no lapis armenus, but what was of a greeniſh blue, (as much of it was) he gives a chapter on zarnich, in which he tells us that it was of three kinds, yellow, red, and green: thus confounding the true ſpecies of orpiment, the red and yellow, with a blue green colour, wholly different from them in its nature and qualities. In the ſame manner the various ſubjects of the vegetable world, that happen to have been at ſome time called by the ſame name by others, are always confounded by theſe writers. The chamælea, and chamæleon, two very different plants, both in figure and qualities, and which are not indeed wholly *ſynonymous*, yet are confounded together, both by Serapio and Aviſenna; and the nature and qualities of both deſcribed ſo conjunctly in one chapter, that they muſt paſs for the ſame plant with all, but thoſe who have before made themſelves maſters of the hiſtory of the materia medica of the earlier times, and are able to diſtinguiſh which of the characters and virtues belong to the one, and which to the other. The two ephemerons are in the ſame manner confounded together by Aviſenna, and blended in one chapter: and what is ſtill more foreign than all theſe, the Ægyptian *lotus*, becauſe it happens to be called by the ſame name with the *lotus* of the Greeks, which is a trifoliate plant, is deſcribed together with it in the ſame chapter, though nature can ſcarce afford two plants more various, either in form, or qualities. And thus in numerous other inſtances.

SYNONYMISTS, among the botanical writers, ſuch as have employed their care in the collecting the different names, or *ſynonyma*, uſed by different authors, and reducing them to one another.

SYNTENOSIS, a word uſed by anatomiſts to expreſs an articulation of the bones when they are connected, as the oſſa ſeſamoidea of the toes, only by a tendon.

SYNTHENA, a term uſed by Paracelſus to expreſs an apoplectic, or epileptic diſorder, attended with violent griping pains in the bowels. This is generally mortal.

SYNTHETIC, or SYNTHETICAL, (*Cycl.*) a term given to that part of chemiſtry, which, after the analytical chemiſtry has taken bodies to pieces, or reduced them to their principles, can, from theſe ſeparated principles, either recompound the ſame body again, or, from the mixtures of the principles of one or more bodies in various manners, form a large ſet of new productions, which would have been unknown to the world but for this art: ſuch productions are brandy, ſoap, glaſs, and the like.

Synthetical chemiſtry, taken in the ſtrict ſenſe for the recompoſition of bodies from their own principles, is rather of philoſophical, than of ordinary uſe. This however is not eaſy, except in a few caſes, nor are we to imagine, becauſe it may be done in ſome, that nature has taken this way to compoſe them; her method of compoſition of bodies are a new ſubject, and worthy a diligent inquiry. *Shaw*'s Lectures, p. 169.

SYNTHETISMUS, a word uſed in chirurgical writings to expreſs the four operations neceſſary to the reſtitution of fractures, which are extenſion, coaptation, repoſition, and deligation, or the buſineſs of bandage.

SYNTONUM *diatonum*, in muſic. See GENUS.

SYNTROPHIC, an epithet uſed to certain diſeaſes, which grow up with the patient. Of this kind is the epilepſy, which often firſt ſeizes the perſon in infancy, and continues growing up with him, and increaſing in ſtrength as he does.

SYNULOTIC, a word uſed by ſome writers in the ſame ſenſe as epulotic.

SYNYMENSIS, a word uſed by ſome chirurgical writers to expreſs a conjunction of two bones by means of a membrane, as the bones of the ſinciput are connected to thoſe of the forehead in young children.

SYPHAR, a word uſed by ſome naturaliſts in the ſame ſenſe as exuviæ, to expreſs the ſkins which many reptiles caſt off at certain times. Thus the ſnake, the water newt, and all the caterpillar tribe, part with their ſkins during the time they remain in that ſtate.

SYRIACUS *lapis*, in natural hiſtory, a name given by Aëtius, and many other authors, to the petrified ſpines of the *echini ovarii*, called by us the *Jew ſtones*, and *petrified olives*, from their likeneſs to an olive in ſhape, and called by the antients *tecolithus*.

It has been a common opinion, that this *ſtone* was good againſt the gravel and ſtone; but Aëtius limits its efficacy to a particular caſe, which is that where the ſtony matter is lodged in the kidneys and ureters; but he frankly confeſſes, it is of no power to diſſolve or break the ſtone in the bladder.

This is contrary to the doctrine of Dioſcorides, and the other old Greeks; but more conſonant to reaſon and experience. Some have carried its virtue ſo far, as to pretend, that when rubbed to powder, and mixed in water, and that mixture rubbed on the groin and perinæum, it will break the ſtones concreted within, and bring them away in pieces by urine. This, though too groſs for belief, is yet given us by Pliny. In moſt of the common editions the words ſtand thus, *lingentium frangit calculos*; but all the beſt copies have it *ungentium*; and the word *lingentium* is only made by dividing the two perpendicular lines in the letter U.

SYRICON, a word uſed by ſome authors in the ſame ſenſe as ſandyx. Pliny makes it a compoſition of equal parts of ſinopis and ſandyx; and Aëtius gives it as the name of a collyrium, uſed in many diſorders of the eyes.

SYRINGA, the *pipe-tree*, in botany, the name of a genus of trees, the characters of which are theſe. The flower is of the roſaceous kind, being compoſed of ſeveral petals arranged in a circular form. The piſtil ariſes from the cup, and finally becomes a fruit adhering to the cup, of a turbinated form, and divided into four cells, which contain ſmall ſeeds.

There is no other known ſpecies of the *ſyringa* beſide the common one, and its variety, with double flowers. *Tourn.* Inſt. Bot. p. 617.

Many ſpecies of this flowering ſhrub, common in gardens, are called *lilacs*. See LILAC.

In the Linnæan ſyſtem of botany, *ſyringa* is the name of a ſeparate genus of plants, the characters of which are, that the flower cup is a perianthium formed of only one leaf, which is ſmall, tubulated, and erect, and has four notches at its extremity. The flower is a ſingle petal, formed into a very long and ſlender tube, divided at the extremity into four ſegments, which are ſpread open and bent; the ſeveral jags, or ſegments, being ſtrait, hollowed, and obtuſe. The ſtamina are two very ſhort filaments, terminated by ſmall antheræ, hid within the tube of the flower. The piſtillum is compoſed of an oblong germen, a thready ſtylus of the length of the ſtamina, and a thick and bifid ſtigma. The fruit is an oblong, compreſſed, and pointed capſule, containing two cells, and made up of two halves, containing each a ſingle, oblong, and compreſſed ſeed; pointed at each end, and ſurrounded with a membranaceous rim. *Linnæi* Gen. Plant. p. 3.

The ſeveral ſpecies of this beautiful and ſweet flowering ſhrub are eaſily propagated, by taking off their ſuckers in autumn, of which they always produce great plenty. Theſe ſhould be tranſplanted into the nurſery, where, after they have remained two years, they will be fit to be removed to the places where they are to remain. They are very hardy, and may be planted in almoſt any ſoil or ſituation; and require no farther culture, but to take away the ſuckers, and cut out the dead wood every year, and now and then to dig up the earth about their roots. They flower in May and June. *Miller*'s Gardner's Dictionary.

SYRINGITES, a ſtone mentioned by Pliny, and deſcribed as being always full of cavities. Some have ſuppoſed this author meant the oſteocolla by this name; but it is more probable, that he meant the ſtone we now call *ſyringoides*, or the pipe-ſtone.

SYRINGOIDES *lapis*, the *pipe-ſtone*, in natural hiſtory, the name of a very beautiful foſſile ſubſtance, of which there are ſeveral different kinds. The *tubuli marini*, or caſes of ſea worms, lodged in any ſolid ſubſtance of the foſſile kind, conſtitute what is called the *lapis ſyringoides*.

The moſt frequent kind is made of the common matter of the ludus helmontii, or ſeptaria, with tubuli of different kinds and dimenſions in it; but the moſt beautiful ſort is that made of the bottoms of ſhips, old boards, or piles of wood; which having been long in the ſea, have been pierced by the ſea worms, which have made their ſeveral burrows, and left their ſhells behind in them: the whole of theſe ſubſtances becoming afterwards petrified, is found in form of wood, with all the knots, veins, and other characters, but wholly of the hardneſs of ſtone. This is uſually of a blackiſh colour, and the pipes being of a pale yellow, the whole makes a very elegant appearance.

Our clay-pits about London afford alſo a *ſyringoides* of this kind, but the earth there abounding with the matter of the common vitriolic pyrites, that ſubſtance by degrees gets into the pores of the wood, and the whole ſeems a maſs of pyrites with theſe pipes lodged in it in different directions. This has been called by authors *pyrites ſyringoides*. *Hill*'s Hiſt. of Foſſ. p. 64.

SYRINGOTON, in ſurgery, an inſtrument to lay open fiſtulæ. We have a propoſal of a *ſyringoton*, of a new form, for laying open fiſtulæ in ano, by Mr. Freke. See Appendix to *Barroughby*'s Tranſlation of *Aſtruc* on the Fiſtula in ano.

SYRINGOTOMY, in ſurgery, a term uſed for the cutting for a fiſtula.

SYRITES, in natural hiſtory, a name uſed by ſome for the ſapphire, but by Pliny for a ſtone, which he ſays was generated in the bladder of a wolf.

SYRIUS, a word uſed by ſome authors for a very ſtrong purge, a preparation of ſcammony, being no other than a reſin, or magiſtery of that drug.

SYRMA, among the Romans, a long garment, common to both ſexes, that reached to the ground. It was uſed in tragedies, that the perſons of the heroes and heroines might appear the taller. *Pitiſc.* in voc.

SYRMÆA, a name given by the antients in general to a certain root, ſaid to be of the radiſh kind, and to be frequently uſed to provoke vomiting.

Some have made it alſo the name of a ſort of viand, prepared of honey, the fine fat of animals, and other ingredients, which was the prize beſtowed at one of the Spartan games: others have uſed it to expreſs a purging potion made only of ſalt and water, or plain brine. The Ægyptians frequently purged themſelves with this radiſh juice and ſalt, which operated gently both upwards and downwards, and theſe potions were called by the ſame name *ſyrmæa*.

SYRMÆA, Συρμαια, in antiquity, was uſed as a deſignation of the games at Sparta, the prize in which was συρμαια, or a mixture of fat and honey. *Potter*, Archæol. Græc. Tom. I. p. 431.

SYRMÆSMUS, a word uſed by the antient medical writers to expreſs a gentle purging of the ſtomach or bowels, either by ſtool or vomit. It had its name from *ſyrmæa*, a word expreſſing a medicine that acted in this gentle manner.

SYRTITES, in natural hiſtory, is uſed by ſome authors as the name of a gem of a very beautiful appearance, in the ſubſtance of which are interſperſed faint ſtars of a ſaffron colour. *Hofm.* Lex. Univ. in voc.

SYRUPS *(Cycl.)*—There ſeems to be no part of pharmacy, in which the writers of diſpenſatories have more erred, than in their directions about the making of *ſyrups*; which ſeems the more ſtrange, becauſe this part is particularly eaſy. The misfortune is, that great men cannot ſtoop to conſider common and ordinary things; whence, however, the credit of a phyſician may ſink in the eſteem of thoſe, who by their employments are led to a knowledge of theſe ordinary things.

The whole of the buſineſs of *ſyrup*-making may be, however, reduced to a few ſhort and eaſy rules. As firſt, it is matter of experience that aqueous infuſions, decoctions, or other aqueous liquors, require twice their own weight of dry ſugar-candy to make them into a *ſyrup* of a juſt conſiſtence, for keeping without candying or fermenting.

This rule, by directing the uſe of ſugar-candy, fixes the conſiſtence of *ſyrups* in an exacter manner than any way elſe, becauſe all ſalts require a determinate proportion of water in cryſtallizing; ſo that ſugar, in the form of candy, contains always one certain proportion of water, while different kinds of ſugar may hold more or leſs aqueous matter, according to their different manner of refining, the accidents of the weather, *&c.* Hence, therefore, all ſuch infuſions for *ſyrups* as are of a delicate, or deſtructible colour, which is impaired by boiling, ſuch as violets, clove July flowers, *&c.* and all ſuch infuſions as contain any volatile parts, which would evaporate by a boiling heat, as thoſe of cinnamon, orange peel, *&c.* ſhould have twice their own weight of ſugar added to them, and be kept cloſe covered in the gentle heat of a balneum mariæ, till the ſugar is diſſolved; which, to haſten the ſolution, ſhould be reduced to powder.

Secondly, the decoctions of all ſuch vegetable ſubſtances, as loſe no valuable parts by boiling, may be boiled down to the proper conſiſtence with their own weight of ſugar, the two being firſt clarified together with the whites of eggs in the uſual way: but if the ingredients here contain any unctuous, or balſamic parts, whereon their medicinal virtues depend, let the ſugar be added from the very firſt, and boiled along with the ingredients; afterwards ſtraining and clarifying it, before it be of near the conſiſtence of a *ſyrup*. This rule is founded on the property in ſugar of diſſolving reſins and oils, ſo as to make them intimately mix with water.

Thirdly, all vegetable juices are to be thoroughly purified, before they are boiled into *ſyrups*. Thus the juices of lemons, oranges, *&c.* are firſt to be filtered, and then made into *ſyrups* without boiling, according to the firſt rule: but the juices of mulberries, and the like, will not clarify without a beginning fermentation; wherefore they muſt firſt ſtand a day or two, and then they will paſs through a flannel; after which theſe are to be made into *ſyrup* with an eighth part leſs than twice the quantity of ſugar; that is, with one pound twelve ounces of ſugar to a pint of the juice, on account of their being ſomewhat ſaccharine themſelves. And wines, and vinegars, muſt be made into *ſyrups* with the ſame quantity. *Shaw*'s Lectures, p. 205.

Pectoral SYRUPS, *ſyrupus pectoralis*, a new form of medicine preſcribed in the late London Pharmacopœia, and intended to ſtand in the place of the *ſyrup* of maiden-hair, and ſome others of that kind. It is to be made thus: take leaves of Engliſh maiden-hair dried five ounces, liquorice four ounces, boiling water five pints; ſteep the ingredients for ſome hours, and afterwards ſtrain off the liquor; and when it is made clear by ſettling, add to it the neceſſary quantity of ſugar to make it a *ſyrup* in the common way. *Pemberton*'s Lond. Diſp. p. 299.

SYRUP *of ſaffron*. See SAFFRON.

SYRUS *lapis*, a name given by the writers of the middle ages to a foſſil, ſeeming to be the ſame with the *thyrreus* of Pliny; of which name this indeed ſeems only a corruption, according to the barbarous manners of thoſe times. There are many remarkable qualities recorded of this, one of which is, that it would ſwim on water. Hence it ſeems to have been a ſpecies of bitumen; but we want a fuller deſcription.

SYSSARCOSIS *(Cycl.)*—Beſides the uſe of this word to ſignify a kind of articulation of the bones, by means of fleſh, when the muſcles are extended from one bone to another; it is alſo uſed by ſome chirurgical writers to expreſs a method of curing wounds of the head when the cranium is laid bare, and the interſtice between the lips of the wound too wide for a contraction, by means of promoting the granulation, as it is called, or growth of new fleſh. Paulus Ægineta uſes it alſo to expreſs a preternatural generation of fleſh about the veſſels and coats of the teſtes, which is ſometimes the caſe in a ſarcocele.

SYSTASIS properly only denotes the conſiſtence of any thing, as of a ſyrup or ointment, but authors have uſed it alſo in a different ſenſe. Hippocrates underſtands by it a collection of humors about the palate; and ſometimes expreſſes by it a contraction of any part of the body from an uneaſineſs, or ſenſation of pain.

SYSTEMATICAL *qualities*, a term uſed by Mr. Boyle to expreſs ſuch qualities as are alſo called *coſmical*, and do not depend on the nature and conſtitution of the body itſelf, but on its being a member of this general ſyſtem of the univerſe, in which capacity it is acted upon by agents unperceived by us, which occaſions great changes in it.

SYSTEMATISTS, in botany, thoſe authors, whoſe works in this ſcience are principally employed about the arranging plants into certain orders, claſſes, or genera. *Linnæi* Fund. Bot. p. 2.

SYSIMBRIUM, *water-mint*, in botany, a name given by ſome to a ſpecies of mint. See MENTHA.

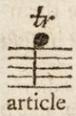
SYSTREMMA, a word uſed by Hippocrates to expreſs a collection of humors forming a hard tumor, or tubercle, in any part of the body; called alſo ſometimes *ſyſtrophe*.

SYSTYLE, in architecture, that manner of placing columns where the ſpace between the two fuſts conſiſts of two diameters, or four modules.

T.

T, In the Italian muſic, ſtands for *Tutti*, all or altogether. See the article TUTTI.

It is alſo uſed to mark the tenor, and has the words *primo*, *ſecundo*, or the figures 1°. 2°. added, to ſignify the firſt or ſecond tenor.

The letters T, *t*, or *tr*, are often uſed likewiſe to ſignify a ſhake or trillo, to be made on any ſound, and are placed over the note on which the ſhake is to be made; thus  or  being an abbreviation of the word *Trillo*. See the article TRILLO.

TABACUM, in botany, a name by which John Bauhine, and ſome others have called the tobacco-plant, more uſually known among authors by the name *nicotiana*. See the article NICOTIANA.

TABARZET, a word uſed by ſome writers to expreſs highly refined ſugar.

TABAXIR, and *Arundo* TABAXIFERA, names by which ſome authors call the Bamboo cane. *C. Bauhin.* Pin. p. 18.

TABERNA *Meritoria*, among the Romans, Mars's hoſpital, or a place where diſabled ſoldiers were maintained at the charge of the government. *Danet.* in voc.

TABES *Dorſalis* (*Cycl.*)—This diſtemper, according to a late author, is a particular ſpecies of conſumption, the proximate cauſe of which is a general debility of the nerves.

Of the ſeveral kinds of conſumptions incident to human bodies the *Tabes dorſalis* is the ſloweſt in its progreſs, but the moſt melancholy in its circumſtances; and, unleſs timely obviated, for the moſt part fatal.

This diſeaſe is incident only to young men of ſalacious diſpoſitions; and proceeds from too early venery, an immoderate uſe of it, or pollutions.

It ſeems therefore to derive its origin from too frequent venereal ſpaſms. And the immoderate loſs of the ſeminal fluid, has alſo a conſiderable ſhare in producing the effect.

The ſymptoms of the *Tabes dorſalis* are involuntary, nocturnal ſeminal emiſſions, a pain in the back, and often in the head; formication in the ſpine, an aching pain, rolling, and hanging down of the teſticles, a weakneſs of memory and ſight, and a mucous diſcharge from the urethra, eſpecially after ſtraining at the diſcharge of the excrements. The mucous diſcharge here mentioned, is called by Hippocrates *liquidum ſemen*; but it is no more than the mucus of the proſtate gland. This diſeaſe is farther attended with great melancholy and dejection of mind; and a gutta ſerena often follows. The eyes grow hollow, the viſage meagre and thin; the body emaciated and weak, a palpitation of the heart, and ſhortneſs of breath ſucceed; with a concourſe of hectical complaints, ending in death.

For the cure of this diſtemper, a regularity of the non-naturals is of the utmoſt importance. Good air, rather cool than hot, is of great uſe. As to diet, high-ſeaſon'd meats, ſpirituous and fermented liquors, ſhould be avoided. No food is ſo beneficial as milk: Chocolate alſo is eſteemed, in ſuch quantities as to ſit eaſy on the ſtomach. Animal food of eaſy digeſtion at dinner, does no harm. Suppers ſhould be avoided, at leaſt milk only ſhould be then taken, about two hours before going to bed. Sleep muſt be little, and in due ſeaſon; that is, the patient ſhould go to bed and riſe early. Indulgence in bed in a morning is hurtful. The general rule ſhould be, to riſe immediately upon waking; which, though irkſome at firſt, will by cuſtom be made familiar and agreeable. Moderate exerciſe, or ſo much as the patient's ſtrength will admit of without wearineſs, ought to be uſed. Some recommend riding, eſpecially a long journey, by ſuch daily portions as to avoid extraordinary fatigue. The ſecretions of the body, if out of order, ſhould be regulated: And the patient ſhould be entertained with chearful company. As to medicines, the claſſes of balſamics and aſtringents are chiefly uſeful. Among the latter, the Peruvian bark, either in ſubſtance, extract, or tincture, the acid elixir of vitriol, and the *tinctura ſaturnina* or *antiphthyſica*, are the moſt efficacious. Strengthening plaſters may alſo be laid on the loins; and, chief of all, the cold bath ſhould be uſed. See Pract. Eſſay on the *Tabes dorſalis*, Lond. 1748.

TABON, in natural hiſtory, a name given by the people of the Philippine iſlands to a bird called in other places *daie*, and remarkable for the largeneſs of its eggs; though ſome accounts of theſe are certainly fabulous. See the article DAIE.

TABULARIUM, among the Romans, the name of that part of the treaſury where the Elephantine books were kept. See the article ELEPHANTINE, *Cycl.*

TABUM, a word uſed by medical writers, to expreſs a thin ſanious and putrid humour, flowing from old ulcers, or from mortified parts, in caſes where the vital powers are not ſufficient for the generation of a perfect or concocted matter.

TACET, in the Italian muſic, is often uſed to denote a long reſt, or pauſe. It uſually ſignifies that a whole part is to lie ſtill: thus, *Chriſte Tacet*, *depoſuit Tacet*, intimates that while one or more parts are performing the *Chriſte*, or the verſe *depoſuit*, &c. the part marked *Tacet* ſhould be ſilent. *Broſſ.*

TAC-*Free*, in old charters, an exemption from payments. *Blount.* Law Dict. in voc.

TACHAS, in ichthyology, a name given by ſome authors to the manati, or ſea-cow. See the article MANATI.

TACIT *Decree*, in Roman antiquity, ſecret deliberations, to which none but old ſenators were ſummoned.

J. Capitolinus mentions a decree of this ſecret kind, which he calls *S. C. tacitum*, and ſays, that the uſe of them among the antients was derived from the neceſſities of the public, when upon ſome imminent danger from enemies, the ſenate was either driven to ſome low and mean expedients, or to ſuch meaſures, as were proper to be executed before they were publiſhed, or ſuch as they had a mind to keep ſecret even from friends; on which occaſions they commonly recurred to a *Tacit decree*, from which they excluded their clerks and ſervants, performing that part themſelves, leſt any thing ſhould get abroad. *Capitol.* de Gordian. c. 12.

In the early times of the republic there are ſeveral inſtances mentioned by hiſtorians, of ſuch private meetings of the ſenate, ſummoned by the conſuls to their own houſes; to which none but the old or proper ſenators were admitted, and of which the tribunes uſually complained. Vid. *Dion. Halic.* L. x. 40. L. xi. 55, 57. *Middlet.* of Rom. Sen. p. 90.

TACK, in a ſhip, a great rope having a wale-knot at one end, which is ſeized or faſtened into the clew of the ſail; ſo is reefed firſt through the cheſſe-trees, and then is brought through a hole in the ſhip's ſide. Its uſe is to carry forward the clew of the ſail, and to make it ſtand cloſe by a wind: And whenever the ſails are thus trimmed, the main-*Tack*, the fore-*Tack*, and miſen-*Tack*, are brought cloſe by the board, and haled as much forward on as they can be.

The bowlings alſo, are ſo on the weather-ſide; the lee-ſheets are haled cloſe aft, and the lee-braces of all the ſails are likewiſe braced aft. Hence they ſay, a ſhip ſails or ſtands cloſe upon a *Tack*, i. e. cloſe by the wind. The words of command are, *Hale aboard the Tacks*, i. e. bring the *Tack* down cloſe to the cheſs-trees. *Eaſe the Tack*, i. e. ſlacken it, or let it go, or run out. *Let riſe the Tack*. i. e. let all go out.

The *Tacks* of a ſhip are uſually belayed to the bitts, or elſe there is a chevil on purpoſe to faſten them.

TACKLE (*Cycl.*)—*Burton*-TACKLE, in a ſhip. See the article BURTON.

Gunners-TACKLE, in a ſhip, that which ſerves to hale the ordnance in or out.

Winding-TACKLE, in a ſhip, a *Tackle* that ſerves as a pennant, with a great double block and three ſhivers in each, ſeized faſt to the end of a ſmall cable about the head of the maſt; it has a guy brought to it from the fore-maſt. Into this block is reeved a hawſer, which is alſo reeved through another double block, having a ſtrap at its end; which being put through the eye of the ſlings, is locked into it with a fidd, in order to hoiſt in goods.

The fall of this *Tackle* is reeved into a ſnatch-block, and ſo is brought to the capſtan, whereby the goods are heaved.

TACOMAR-*Tree*, a name by which ſome authors call the ſugar-cane. *Marggrave*, p. 829.

TADPOLE. The animal called by this name is no other than the frog in its firſt ſtate from the ſpawn; and this creature furniſhes the curious in microſcopic obſervations with a beautiful view of the circulation of the blood, eſpecially when young. See Tab. of Microſcopical Objects, Claſs 1.

The method of procuring them for this purpoſe in the greateſt perfection, is this: Let a ſmall quantity of frog's ſpawn be kept for ſome days in water, and from this will be produced a vaſt number of young *Tadpoles*; theſe, while very young, are perfectly tranſparent, and when placed before the double microſcope, the heart may be eaſily ſeen, and its pulſation regularly obſerved; and the blood protruded thence may be beautifully ſeen circulating through the whole body; but particularly in the tail, where tho' ſo very minute, more than fifty veſſels may be ſeen at one view. The young brood grow more and more opake every hour, and in a day or two the circulation of the blood can only be ſeen in their tail, or in the fins near the head. *Baker*'s Microſcope, p. 126.

TADOMA, in zoology, a name given by many authors to a ſpecies of duck, called by others *vulpanſer*, and in Engliſh the *ſhell-drake*, or *burrow-duck*; and by ſome the *bergander*.

It is of a middle ſize between the duck and gooſe; its beak is broad, ſhort, and red; and at the origin of the upper chap there is a large red tubercle of fleſh. The head and upper part of the neck are of a mixed blackiſh and greeniſh colour, very gloſſy and ſhining; the reſt of the neck is white; the breaſt and ſhoulders are of an orange-colour, which makes a ſort of ring ſurrounding the whole anterior part of the body. The lower part of the breaſt and belly have a black broad line reaching to the anus; the reſt of the breaſt and belly are white; as are alſo the under ſides of the wings, but juſt below the tail there is a faint caſt of the orange colour. The middle of its back is white. The ſhoulder-feathers falling on each ſides of the back are black, and the wings are almoſt wholly white, only ſome of the longer feathers are black. The tips of moſt of the tail-feathers are alſo black. Its legs and feet are of a pale red, and their inveſtient ſkin ſo thin, that the veins may be ſeen under it. They are common on the coaſts of Lancaſhire, and build in deſerted rabbit-holes; but their fleſh is not well taſted. *Ray*'s Ornithol. p. 279.

TÆDA, in pharmacy, a term uſed by ſome authors to expreſs certain compoſitions made up in form of troches. Theſe are ſometimes meant as peſſaries to be introduced into the vagina, and therefore made into this form; ſometimes they are compoſitions of fragrant or other ingredients for fumigations.

TÆDA, in botany, a name given by ſome authors to the pinaſter or common wild pine or mountain pine. *J. Bauhin*, Vol. 1. p. 253.

TAEL, an Eaſt-Indian weight, being the ſixteenth part of a *cati*. See the article BAHAR.

TÆNARIA, Ταιναρια, in antiquity, a feſtival in honour of Neptune, ſurnamed *Tænarius*, from *Tænarus* a promontory in Laconia, where he had a temple. *Potter*, Archæol. Græc. T. 1. p. 432.

TÆNARIUM *Marmor*, the name of a marble uſed by the antient architects and ſtatuaries. There were two kinds of it, very different in colour, but perfectly agreeing in hardneſs, and in the high poliſh they were capable of. The firſt or moſt frequent kind was black, and was dug from the promontory called *Tænarus*, in the Lacedæmonian ſtate; the other, which was more ſcarce, and much more beautiful, was of a green colour with a caſt of yellow; this was dug in the Tagetan quarries, and was called by ſome *marmor herboſum*, and *xanthon*. *Strabo*.

TÆNIA, (*Cycl.*) in ichthyography, the name of a fiſh of the anguilliform, or eel-ſhaped kind, common in the Mediterranean ſea, and brought to market in Italy, and elſewhere.

It is a very remarkable little fiſh, being of a pale fleſh colour with a ſlight admixture of blue, and is free from ſcales; and its fleſh ſo tranſparent, that the vertebræ of the back may be eaſily counted through it. Its body terminates in a long and very ſlender tail. The mouth is ſmall, and has one row of ſharp teeth in each jaw, and is very ſingular in that the belly-fin is twice as wide as the back one; and runs ſo far up to the head, that the anus which is ſituated at its termination, is very near the angle of the under jaw. The inteſtines are all covered with a ſilvery peritonæum, which is ſeen alſo plainly through the fleſh. It is commonly of a foot long, and not more than a finger's breadth. *Willughby*'s Hiſt. Piſc. p. 116.

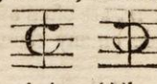
There are two other ſpecies of this fiſh. See the articles FALX, and CAVIRAGO.

TÆNIA *Cornuta*, the *horned Tænia*, in ichthyology, a name given by many authors, to the ſpecies of cobitis, named by Artedi, the cobitis with a forked prickle placed under each eye. This fiſh is properly a ſpecies of the cobitis. *Schonfeldt* Hiſt. Piſc. See the article COBITIS.

TAGETES, *African Marygold*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the radiated kind: Its diſk is compoſed of floſcules divided into ſeveral ſegments, and its outer edge of ſemifloſcules; all ſtanding on embryo ſeeds, and contained in a one-leaved cup of a tabulated form. The embryos finally become ſeeds of an angular form, furniſhed with a foliaceous head, and affixed to the thalamus of the flower. There are alſo ſome ſpecies in which the flower is wholly compoſed of ſemifloſcules.

The ſpecies of *Tagetes*, enumerated by Mr. Tournefort, are theſe: 1. The great upright *Tagetes*, with ſingle pale yellow flowers. 2. The great upright *Tagetes*, with very large double flowers. 3. The ſmaller Indian *Tagetes*, with a ſingle flower, commonly called the ſingle African, or French marygold. 4. The ſmaller Indian *Tagetes*, with double flowers. 5. The ſmall Indian *Tagetes*, with a double reddiſh yellow flower. 6. The middle-ſized Indian *Tagetes*, with a double yellow flower. 7. The Indian *Tagetes*, with a ſingle fiſtulous flower. 8. The Indian *Tagetes*, with a double fiſtulous flower. 9. The leaſt Indian *Tagetes*, with a velvety flower. 10. The *Tagetes*, with extremely finely divided leaves. *Tourn.* Inſt. p. 488.

We have a great many ſpecies of this plant annually raiſed in our gardens, for the beauty of their flowers. They are propagated by ſowing the ſeeds in ſpring, on a moderately hot bed; when the young plants come up, they muſt have air allowed them; and when three inches high, they ſhould be removed to another hot bed, which ſhould be arched over with hoops that it may be ſheltered with mats. They are to be planted here at about eight inches diſtance, and when they are grown ſtronger, as about the beginning of May, they are to be taken up with a ball of earth about their roots, and placed where they are to remain; or elſe at eighteen inches diſtance in a nurſery, where when they flower the fineſt ſorts may be marked and removed, with a large ball of earth to their roots, either into pots, or into the borders of the flower-garden. They are very beautiful; but their ſmell is very offenſive. *Miller*'s Gardener's Dict.

TAGLIATO, in the Italian muſic, is uſed for a meaſure called by the French *Barré*; that is, when the character of common time is thus marked  with a pependicular line drawn down through its middle. It ſignifies a pretty quick motion, and contains a breve, or its quantity in ſmaller notes, in each bar. Hence it is called *Alla breve*.

TAJACU, in zoology, the name of an animal common in ſome parts of America, and called by many authors *aper moſchiferus*, or the muſk-boar.

It is of the ſhape of our hog, but much ſmaller, and has no tail, and its head is broader, and the ſnout much leſs pointed than in our hog; the neck is ſhort and thick, and the whole body of a griſly colour or mixture of black and grey. Its body is covered with hairs, much thicker and ſtronger than our hogs briſtles, ſomething like the briſtles of the hedgehog, and like them alſo variegated with circles of black and white; theſe are four or five fingers breadth long on the back, and gradually diminiſh to the ſides; on the middle of its head between the ears it has a ſort of creſt, made up of black briſtles; its ears are ſmall and erect. and its eyes ſmall; its ſnout, feet and hoofs, are juſt like thoſe of the European hog; but the two poſterior or exterior hoofs are longer than in any other of the cloven-footed beaſts.

What is moſt ſingular however, in this creature, is a certain gland which he has upon the back, and which has given occaſion to ſome to ſay its navel was placed there. This gland is ſituated on the very ridge of the back near the rump, and is ſo cloſely covered with long briſtles, that till they are removed by blowing, and keeping them back with the hand, the gland is not to be ſeen; when theſe are removed there is ſeen a ſpot almoſt naked, in the middle of which the top of the gland is ſeen; the lips of this gland uſually ſtand a little way above the fleſh, and its aperture eaſily admits a large ſtylus; and this gland, when lightly preſſed, ſpews out a liquid ſubſtance of a browniſh yellow colour, and very ſweet ſcent, ſomething like that of muſk or civet. The gland itſelf is placed between the ſkin and fleſh, and is not wholly covered by its conſtringing muſcle, but only ſurrounded by it at its bottom. *Ray*'s Syn. Quad. p. 120.

TAIIBI, in zoology, the name of an American animal, deſcribed by Marggrave and other authors, and ſuppoſed by ſome to be only the male of the Opoſſum. The Portugueſe in America call it the *Cachorro de mato*, and by the Dutch it is called *Boſchratte*.

Its body is long, its head ſhaped like that of a fox, its noſe ſharp, and it has whiſkers like thoſe of a cat; its eyes are black and prominent, and its ears roundiſh, ſoft, tender, and white. The tail near its inſertion has white hairs, and toward the extremity black ones, and near the end is naked of hair, having a ſkin like that of a ſnake over it. *Ray*'s Syn. Quad. p. 183.

TAIL (*Cycl.*)—TAILS *of Fiſhes*. This part in the fiſh kind is the ſubject of very great diſtinctions, among the characters of the ſeveral genera. It differs in the ſeveral kinds of fiſh in a very obvious manner, in number, ſituation, and figure.

In regard to the firſt difference, the *acus lumbriciformis*, and one of the kinds of the *ſerpens marinus*, have no *Tail* at all; in all other fiſhes there is a *Tail*, and it is never more than one on each fiſh.

In regard to ſituation, there is this great difference, that in ſome it is placed perpendicularly, in others horizontally. In almoſt all the known fiſhes it is placed perpendicularly, except in the dolphin, the phocæna, the orea, the manati, and all the whale kinds; for in all theſe it is placed horizontally, when the body is laid in its natural poſture.

In figure it has many very remarkable differences, which are of great uſe in ichthyological diſtinctions. 1. In ſome fiſh it is rounded at the end; as in the cottus, and ſome others. 2. In ſome it is cut off even as it were at the end, ſo that the whole *Tail* is a ſort of parallelogram; as in the tench, and ſome of the ſalmons. 3. In ſome fiſhes it is cuſpidated at the end, as is the caſe in the conger, the eel, and the petromyzon. 4. In others it has as it were a ſmall ſegment of a circle cut out at the end, and ſo is ſlightly hollowed out; this is the caſe in the caraſſius, and ſome of the ſalmons. 5. In many fiſh it is forked or opened into two points, making an acute angle; this is the figure of the *Tail* in the pearches, the cyprini of many kinds, &c. 6. Finally, the *Tail* is falcated in many fiſh, that is, it is of the ſhape of a creſcent; as in the ſword-fiſh, the tunny, mackrell, and the like. *Artedi*, Ichthyolog.

TAIL, in the manege. Many affirm that the dock of a horſe's *Tail* ſerves to point out his ſixth or ſeventh year; ſaying, that about the time that the black ſpeck, or eye of the bean begins to diſappear, and the cavity to be filled, the dock of the tail becomes longer, by reaſon that the vigour of the young years begins to abate; and nature has not ſtrength enough to nouriſh and keep up the joints or knots that form the dock; ſo that when the horſe is ſix years old, one of theſe joints ſlackens, and begins to fall down; and a year after, another deſcends in like manner. But this relaxation or downfalling happens ſooner in ſome than in others, according as they have been well or ill kept, with reference to feeding, houſing, and working. Accordingly we find the marks of a horſe's age, taken from his *Tail*, are ſo erroneous, that we ſee a great many jockies maintain, that the firſt joint deſcends when he is nine, and the ſecond when he is ten years old.

TAILS *of Comets*. We have an enquiry into the cauſe of the *Tails* of comets by Mr. Euler in the Mem. de l'Acad de Berlin, Tom. 2. p. 117. ſeq. He thinks there is a great Affinity between theſe *Tails*, the zodiacal light, and the aurora borealis; and that the common cauſe of them all is the action of the ſun's light, on the atmoſpheres of the comets, of the ſun, and of the earth. He ſuppoſes that the impulſe of the rays of light on the atmoſphere of comets, may drive ſome of the finer particles of that atmoſphere far beyond its limits; and that this force of impulſe combined with that of gravity towards the comet, would produce a *Tail*, which would always be in oppoſition to the ſun, if the comet did not move. But the motion of the comet in its orbit, and about an axis, muſt vary the poſition and figure of the *Tail*, giving it a curvature, and deviation from a line drawn from the center of the ſun to that of the comet; and that this deviation will be greater, as the orbit of the comet has the greater curvature, and that the motion of the comet is more rapid. It may even happen, that the velocity of the comet, in its perihelion, may be ſo great, that the force of the ſun's rays may produce a new *Tail*, before the old one can follow; in which caſe the comet might have two or more *Tails*. The poſſibility of this is confirmed by the comet of 1744, which was obſerved to have ſeveral *Tails* while it was in its perihelion. See the article ZODIACAL *Light*, and AURORA *Borealis*.

TAIPARA, in zoology, the name of a Braſilian ſpecies of peroquette. It is of the ſize of a lark, and of a pale green colour over its whole body; its tail is ſhort, not reaching beyond the tips of the wings when cloſed. Its beak is red, and its legs are grey. Near the origin of the beak it has a ſemilunar red ſpot on the head, and a yellow ſpot in the middle of each wing. It builds in the deſerted abodes of ants on trees. *Marggrave*'s Hiſt. Braſ.

TAINHA, in zoology, a name given by ſome to a ſpecies of mullet caught in the American ſeas, and more uſually called the *curema*. *Willughby*, Hiſt. Piſc. p. 277. See the article CUREMA.

TAL, a name uſed by ſome writers on the materia medica to expreſs the dung of peacocks; and by ſome of the chemical writers, for any alkali ſalt.

TALA, in botany, a name by which ſome authors call the plant whoſe ſeed is the ſeſamum or oily purging grain of the ſhops. *Herm.* Muſ. Zeyl. p. 58.

TALABONG, in natural hiſtory, a name given by the inhabitants of the Philippine Iſlands to a ſpecies of heron, common among them; which is much ſmaller than our heron, and perfectly white all over.

TALÆDITES, Ταλαιδιτης, in antiquity, gymnical exerciſes in honour of Jupiter ταλαιος. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 432.

TALARIUS *Ludus*, among the Romans, a game ſomewhat reſembling our dice-playing, and performed with a kind of gold or ivory dice, which they ſhook as we do in a box, before they threw them. There was this difference, however, between their game and ours, that our dice have ſix ſides, becauſe they are cubical; but theirs had but four, and were conically ſhaped. They made uſe of them for divination, as well as playing; and they concluded upon a good or evil augury, according to what came up. As they uſually threw four of them at a time, the beſt chance was when four different ſides came up. The ſides were called by the name of ſome animal, as the dog, vulture, baſiliſk, *&c.* Or of ſome deity, as Venus, Hercules, *&c.* Some authors have been of opinion, that they were marked with the forms of animals, or images of Gods, and not with numbers or dots, as our dice are. *Danet.* in voc.

TALASSIO, among the Romans, an acclamation uſed at marriages; for the origin of which ſee *Pitiſc.* and *Danet* in voc. and *Livy* 1. 9.

TALC, (*Cycl.*) in natural hiſtory, the name of a large claſs of foſſile bodies. See Tab. of Foſſils, Claſſ. 1.

The *Tales* in general are defined to be foſſils, compoſed of broad, flat, and ſmooth laminæ or plates, laid evenly and regularly on one another; eaſily fiſſile, according to the ſite of theſe plates, but not all ſo in any other direction; flexile and elaſtic; bright, ſhining, and tranſparent; not giving fire with ſteel, nor fermenting with acid menſtrua, and ſuſtaining the force of a violent fire without calcining.

By theſe characters, the *Talcs* may be diſtinguiſhed from all other bodies which reſemble them; and, according to their ſeveral natural and eſſential differences among one another, they are themſelves divided into two ſeparate orders, and under thoſe into four genera.

The *Talcs* of the firſt order are thoſe compoſed of plates of great extent, each making ſingly the whole horizontal ſurface of the maſs.

Thoſe of the ſecond order are thoſe compoſed of ſmall plates, in form of ſpangles, irregularly diſpoſed, and uſually many of them concurring in different directions, to the formation of one of the ſurfaces of the maſs. *Hill*'s Hiſt. of Foſſ. p. 71.

The genera of the firſt order are two: The firſt is of thoſe compoſed of viſibly ſeparate plates of extreme thinneſs, and each fiſſile again into a number of others yet finer. The *Talcs* of this genus are called *ſpeculares*.

The ſecond genus is of thoſe which are compoſed of ſeparate plates of conſiderable thickneſs, and thoſe not fiſſile into any thinner. The *Talcs* of this genus are called *hyalinæ*.

The genera of the ſecond order are alſo two. The firſt is of thoſe compoſed of ſmall plates, in form of ſpangles, each fiſſile into many yet finer and thinner ones. The *Talcs* of this genus are called *bractearia*.

The ſecond genus is of thoſe compoſed of ſmall plates in form of ſpangles, which are moderately thick, and are either not fiſſile at all, or are only ſo to a certain degree, or into a ſmall number of others yet thick ones, and thoſe no farther fiſſile. The *Talcs* of this laſt genus are called *elaſmides*.

Authors have hitherto been uſed to call alſo another ſet of bodies by the name of *Talcs*, with the addition of the adjective *fibroſe*; but as theſe are found not at all of the nature of the true *Talcs*, they are now diſtinguiſhed by the name *fibrariæ*. See the article FIBRARIÆ.

Authors are divided as to the origin of the word *Talc*. Lemery derives it from the High-Dutch *Talch*, tallow, becauſe it feels greaſy. But this is improbable; ſince Aviſenna, who had no commerce with the Germans, uſes the word, and tell us, that the aſter of Lemnos is *Tallz*, which cannot be calcined but with the moſt intenſe fire, and which is dangerous when taken inwardly. Its origin therefore, according to Mr. Pott, ſeems rather *Arabic*. Cæſalpinus tells us, that *Talc*, among the Moors, ſignifies *ſtar*, and that they underſtand thereby the *ſtella ſamia*. Johnſon alſo ſays the word is Arabic, ſignifying ſmall ſhining ſtars. This term does not occur among the antients, as Theophraſtus, Dioſcorides, or Pliny; tho' ſome critics pretend that Dioſcorides deſigned it by *ſtella terræ*. Cæſalpinus and Salmaſius endeavour to prove that *Talc* is the *aphroſelene* or *ſelenites* of Dioſcorides. Thoſe authors alſo pretend that Pliny meant the ſame thing by *ſchiſtus*. Cæſalpinus refers *Talc* to the *galeucos argyrodamanti ſimilis*; and Bœtius to the *argyrodamas* itſelf. Some think that a paſſage in Pliny, Lib. xxxvi. c. 22. may be underſtood of *Talc*. Aviſenna call it *lapis lunæ*; and Albertus Magnus, *aphroſelene*. The moſt common ſpecies in Germany is called *katzen-ſilver*, or *katzen-glimmer*. It is alſo named from a particular place where it is found, *Kiphauſer-glantz*. When it is of a yellow colour, they call it *katzen-gold*, and in Latin, *mica*, and *chærile nitidum*. In ſome places it is alſo called *ſper-glaſs*. *Pott.* in Mem. de l'Acad. de Berlin.

Talc is often confounded with ſimilar concretions, as with the *ſchiſtus* or *lapis foſſilis*, with the *ſpathum* or *ſpatum*, and *gypſum*, Muſcovy-glaſs, or *glacies-Mariæ*, and the *lapis ſpecularis*. Boyle takes it for an alkaline ſpathum, and others for other ſubſtances, from which nevertheleſs it differs. See *Pott.* in Mem. de l'Acad. de Berlin, 1746.

The repeated experiments of the chemiſts, who expect great things from an oil of *Talc*, have abundantly proved that this ſubſtance is indiſſoluble both in acids and alkalies in a liquid, form; and the moſt violent corroſive mineral acids, ſuch as ſpirit of nitre and aqua-fortis, and the like, make no change in it. Mr. Du Hammel, in his *topiarium hermeticum*, indeed ſpeaks very largely of a ſolution of *Talc* made by means of a long trituration in water alone: This, he ſays, in ſix hours will reduce *Talc* into an unctuous or oily fluid. And in the Commercium Literarium for the year 1732, there is a paper in which it is affirmed, that *Talc* may be in part diſſolved by the mineral acids, particularly by ſpirit of ſalt; and that the diſſolved *Talc* may be afterwards precipitated from the menſtruum; but, in reality, neither the fuming ſpirit of ſalt, nor the purer acid of ſalt, dried by a repeated ſolution and ſublimation, with ſublimate Mercury, exerts the leaſt effect upon this refractory ſubſtance. It has been alſo ſaid, in the Memoirs of the Paris Academy, that *Talc* and oil of vitriol produce alum; but neither is this found true on experiment; much leſs is any ſolution of *Talc* to be expected from the volatile ſpirit of vitriol, the ſpirit of naphtha, or oil of wine, ſo much recommended by ſome of the chemiſts for this purpoſe. The greater part of theſe pretences are abſolute frauds, intended only to impoſe on credulous perſons, who expect great matters from an oil of *Talc*; the others are probably owing to the error of taking other foliated bodies for *Talc*, ſuch as the plated ſpars, which eaſily ſplit into flakes like *Talc*, and are ſoluble in any acid.

The burning *Talc* and ſulphur together does not advance any thing

thing farther toward a ſolution of the *Talc*: Even after repeated trials of this, the *Talc* is only changed to a ſort of aſh-colour, which is owing to the impurity of the earth contained in the ſulphur. This is to be underſtood of the pure and genuine *Talc*, ſuch as that of Muſcovy, commonly called iſinglaſs; for the black and yellow kinds of *Talc*, after repeated calcinations, will be finally diſſolv'd in concentrated aqua-regalis, or in very ſtrong ſpirit of ſalt, into a yellow liquor reſembling the ſolutions of gold. This colour, in the ſolution, has given ſome perſons idle notions of its containing gold or ſolar ſulphurs, as they expreſs themſelves; but an accurate examination ſhews, that this colour is only owing to ſome attenuated particles of iron; and upon evaporation of the ſolution, there remains a mere crocus martis. If freſh aqua regalis be continued to be poured on this yellow *Talc*, it will draw ſtill more of a yellow tincture from it, till the remaining matter be perfectly white, retaining no remains of its golden appearance.

Common fire has very little efficacy upon *Talc*, it neither making it crepitate, nor melt, nor reducing it to the condition of gypſum or lime: All the change it can make in it, is the rendering it in fine ſomewhat more brittle, and in part deſtroying its foliated ſtructure. It ſuffers no diminution all this time in weight, and is as bright and lucid, and as unctuous to the touch afterwards as before. Angelus Sala had *Talc* kept forty days in a glaſs-houſe fire, and at the end of that time took it out unaltered: But according to the experiments of Neuman and Hoffman, the ſolar fire, concentrated by powerful burning-glaſſes, melts this ſtubborn ſubſtance into a greyiſh kind of glaſs. Thus we may eaſily conclude, that when Morhoff and the great Boyle talk of reducing *Talc* into a kind of gypſum in a common fire, in the ſpace of an hour, they deceived themſelves, and uſed ſome other ſubſtance which had the appearance of *Talc*, but was not ſo; ſuch is the plated ſelenites, which cannot be diſtinguiſhed from the pureſt iſinglaſs, till it is tried, by bending its ſeparated plates, theſe being not at all elaſtic, as thoſe of *Talc* are.

The action of ſalts rendered fluid by fire is much more powerful upon *Talc* than any of theſe before-mentioned ſubſtances; but to this purpoſe the fire muſt be very violent, the common fire of fuſion producing nothing; hence it is, that authors in general have not found the effect of this proceſs; for they affirm that *Talc*, in a ſtrong fire, mixed with three times its own quantity of a fuſile ſalt, ſuffers nothing, but renders the ſame appearances afterwards as before. Neuman alſo affirms, that he had uſed nitre, borax, and the corroſive ſalts in the ſame manner, without the leaſt ſucceſs: But Mr. Pott gives a different account of ſuch proceſſes, which he tried not with the common fire of fuſion, but with the higheſt degree he was able to give.

In his trials with this violent heat, *Talc*, fated with a ſolution of a cauſtic alkali, run into a lax and ſpungy maſs. Mixed with half its quantity of a purified alkaline ſalt, it run into an opake and blackiſh maſs. *Talc* calcined in a common furnace, and then mixed with half its weight of an alkali, melted and run into a hard and ſtony maſs of a browniſh black, which was capable of the fine poliſh of an agate; and on repeating the ſame experiment afterwards, the maſs produced by it was of the ſame hardneſs and denſity, but perfectly white as alabaſter; the colour was in many other trials found to be in great meaſure owing to the cleanneſs of the crucible, and to its containing no ferrugineous or other metalline or mineral matter. Kunkell has before obſerved, that *Talc* mixed with ſalt of tartar, and with fritt, and put into the fire, eaſily runs into glaſs with the fritt, without any greater degree of fire than what is always uſed on this occaſion: But Mr. Pott obſerves that *Talc*, with an equal quantity of hepar ſulphuris, does not run into a compact maſs, but riſes in foam and ſpume to the top of the crucible, and acquires a yellow colour, and the mixture afterwards ſuffers the greateſt fire that common *Talc* can bear, unhurt. *Talc* does not detonate with nitre, becauſe it contains no ſulphur, but they afterwards vitrify together in a violent fire; and this has been before obſerved in the German ephemerides. *Talc*, mixed with an equal portion of fixed arſenic, runs into a white hard maſs; and with double its quantity of Glauber's ſalt, it does not diſſolve, but only becomes a white friable maſs, yellowiſh on the ſurface. *Talc*, with equal parts of borax, runs in a violent fire into a tranſparent maſs, reſembling the gem called the *aqua marina*; and melted with different mixtures of borax, nitre, and arſenic, it runs into vitreous maſſes, of many different degrees of colour.

Talc is uſed with great ſucceſs in the diſtillation of acid ſpirits; that of ſalt is always naturally impure, and can ſcarce be rendered pure but by an admixture of a *talcy* earth in the retort.

The mixture of *Talc* with different kinds and quantities of glaſs, may be ſucceſsfully performed with a violent fire, but not with a ſmaller degree: Thus three parts of *Talc* with one part of cryſtalline glaſs, make only a ſpongy and friable maſs in a common fire; but in a more violent one they become a firm and ſolid maſs of a brown colour. Minium, or glaſs of lead, mixed in equal quantities with *Talc*, and ſet in a violent fire, run into a yellowiſh glaſs reſembling the opake pieces of amber; and two parts of minium to one of *Talc*, produce a clear and tranſparent yellow glaſs, which is of a hardneſs capable of giving fire with ſteel. The alkaline earths, mixed with *Talc*, produce a maſs ſcarce vitrifiable by any fire: Hence appears the reaſon why copels made of lime and *Talc* are ſo very hard to vitrify. Minium added to theſe mixtures makes them combine into a firm maſs, but without perfect fuſion; but borax added to them melts them readily into a true glaſs. The gypſous earths mixed with *Talc*, will not unite into a maſs in any degree of fire; but if borax be added, the *Talc* readily melts. Thus two parts of *Talc*, two parts of that ſpar or gypſous matter called *glacies mariæ*, or the common plated ſpar, with one part of borax, run into a yellow maſs reſembling a topaz.

The argillaceous earths do not vitrify with *Talc*, but they run into a maſs of great hardneſs, which will give fire with ſteel, and is very ſerviceable to make crucibles of, theſe veſſels not ſuffering the glaſs of lead to run thro' them. *Talc*, joined with the vitrifiable ſtones, forms no remarkable body, but the maſs remains friable; but from theſe maſſes, by the addition of proper matters to render them fluid, great variety of elegant compounds may be made. Thus *Talc* mixed in equal quantities with powder of flints, on adding to the whole a fourth part of cryſtal glaſs, the whole unites into an opake but ſolid white maſs. Alkali ſalt added in equal quantity to *Talc* and flint, gives a tranſparent yellow glaſs; and white ſand, *Talc*, and a fixed alkali, in equal quantities, afford a green glaſs; with other mixtures of this kind, in different quantities, the reſemblances of many beautiful ſtones are produced; and what is very remarkable, ſome grains of metalline matter are often found on the ſurface of the maſſes.

Cæſalpinus, Aldrovand, and ſome others affirm, that *Talc* melted with copper, or added to copper, while in fuſion, gave it a white colour; this being taken for granted, authors have hence agreed that *Talc* contains an arſenical earth. But experiment ſhews this to have been a falſe aſſertion, in regard to *Talc*; and probably it only owes its origin to the cant language of ſome of the alchemiſts, who have called the flowers of zink, *Talc*; tho' theſe alone muſt render copper yellow, not white. Antimony and *Talc*, firſt calcined with nitre, run in a violent fire into a ſort of flint, which will give fire with ſteel. With regulus of antimony and the black flux, it runs into a black maſs; and with biſmuth it calcines into a grey powder. So little is there in the propoſals of the chemiſts for the metallization of *Talc* by antimony and biſmuth. Mem. de l'Acad. de Berlin, Ann. 1746.

In what part of Mr. Boyle's works the learned author from whom the foregoing extract was taken, has found that *Talc* may be reduced by common fire to a gypſum in an hour, we know not; but we find that Mr. Boyle ſays, that the calcination of *Talc* is ſo very difficult, that eminent chemiſts have looked upon calxes of *Talc* as counterfeits. Works abr. vol. 1. p. 160.

Mr. Boyle mentions the extracting of gold from *Talc*, as having ſometimes ſucceeded. See Works abr. vol. 1. p. 160. but *vide ſupra*.

The mountains in Hungary and Germany many of them abound in the Muſcovy *Talc*, not inferior to the *Talc* of that country from whence it has its name. The mountain of Cliſſuro, which is a part of mount Hæmus, as alſo mount Pyrlipe, ſhine like ſilver in all parts both day and night, provided there be any moon.

The *Talc* in theſe hills is the only occaſion of this. There are alſo *Talc* rocks near Spittal in Upper Carinthia; and many other hills are ſaid alſo to contain great quantities of it; but there is a ſort of ſelenites ſo very like this *Talc*, that people are eaſily deceived by its appearance. This ſelenites ſplits into flakes like the *Talc*, but they are brittle. *Brown*'s Travels.

Mexico TALC. There is a famous cave ſome leagues from Mexico, on the north-weſt ſide of the city, beyond the lake, the top and ſides of which are ſaid to be lined with leaf gold; but that of ſuch a kind, that the common methods of fluxing the ores have no effect upon it. The Spaniards, after many trials, have given it over, but are ſtill perſuaded by the Indians that it is gold, and that the famous Montezuma obtained a great part of his treaſures from this cave. The leaves, as they are called, are no more than ſpangles of the ſize of a man's nail; and the account we have of it in the Philoſophical Tranſactions, and the various methods attempted in vain to reduce it to metal, abundantly prove that it is only a yellow *Talc*. Vid. Phil. Tranſ. N°. 39.

Muſcovy TALC, a kind of foliaceous body, well known by the Engliſh name of iſinglaſs. See the article SPECULARIS *Lapis*.

Philoſophic TALC, a name given by ſome of the chemical writers to the flowers of zink.

This ſubſtance, diſſolved in vinegar, affords what they have in their unintelligible language called, oil of *Talc*, and extolled as a thing of vaſt power in the fixing of Mercury, and many other imaginary operations; and beſide this, they call it a ſovereign remedy for all diſeaſes.

The chemiſts of after ages, ſeeing ſuch prodigious effects aſcribed to oil of *Talc*, and not conceiving that *Talc* was a mere

mere cant word in this place, have been at infinite pains, by means of a thouſand differently varied menſtruums, to obtain an oil from the common Venetian *Talc*, a dry ſtone which in a very remarkable manner reſiſts the force of all menſtrua, and of fire; and from which therefore no oil can be obtained. In the various operations uſed to this purpoſe, ſome have really hit upon liquors of a conſiderable power; but that power has been wholly owing to the menſtruums they employed, not to the ſtone; and even if it were, could have none of the effects of the oil of *Talc*, mentioned by theſe dark writers, who meant by it ſo very different a ſubſtance as a ſolution of theſe flowers, which are only, that till of late little underſtood metal, zink, in another form. See *Oil of* TALC, infra.

Venetian TALC, in the materia medica, the name of a foſſile ſubſtance famous among the chemiſts for the great things they have expected from the oil of it, if that could ever have been obtained; and among the ladies of Italy, and the neighbouring nations, as a coſmetic, when reduced to an impalpable powder after repeated calcinations, by levigating on a porphiry.

It is of an extremely irregular, though in ſome degree plated or foliaceous texture, and is remarkably ſmooth and ſoft to the touch, of a lax and ſomewhat crumbly texture; the ſeveral moleculæ it is compoſed of cohering but ſlightly, either in themſelves, or with one another. It is of ſeveral ſizes, from one inch to five or ſix in diameter; and in colour, of a pale ſilvery grey, with a large admixture of green. In many of the coarſer parts of this ſubſtance, it may be obſerved to have a great analogy with the common French chalk, or morochthus. It is dug in ſeveral parts of Italy, and is brought to us principally from Venice, whence it has its name. *Hill*'s Hiſt. of Foſſ. p. 76.

Oil of TALC, the name of a ſubſtance, which has given great trouble to the chemiſts of later ages.

It had been recorded by ſome old writers, that oil of *Talc* had the power of fixing ſilver, that is, giving it the weight and tenacity of gold, ſo that it ſhould no longer be diſtinguiſhable as ſilver, nor ſoluble in aqua fortis, but only in aqua regia, as gold. This was all idle and imaginary, no known ſubſtance having any ſuch power. Our chemiſts of later times, ſuppoſing this oil was to be obtained from Venetian *Talc*, a common flaky ſtone, have tortured it a thouſand ways to extract this divine liquor from it, but in vain; for unhappily this is a ſtone remarkable beyond almoſt all other bodies, for ſuffering almoſt nothing by any menſtruum, nor even by fire itſelf. Some have however compounded liquors with the pompous names of oil of *Talc*, from their preparations of this ſtone; but theſe have owed all their qualities to the menſtruums employed in making them, not at all to the ſtone; nor indeed had they owed them to that, would they have had any relation to the oil of *Talc* they were ſeeking after. The inventors of that barbarous term having never thought of Venetian *Talc*, or any other ſtone under the name of *Talc*; but given that name to the fibroſe and cottony flowers of Zink, which in ſome degree reſemble the diſunited filaments of the fribrariæ, or, as they are called by the vulgar, fibroſe *Talc*.

When zink is diſſolved in diſtilled vinegar, and the ſolution diſtilled again in a cucurbit, there is firſt drawn over an inſipid phlegm; after this there ariſe ſome fibroſe white flowers; and finally theſe melt down into a ſulphureous liquor, which is inflammable like ſpirit of wine. This being poured into a phial of water mixes with it, only leaving a few drops of a fragrant and aromatic oil ſwimming on the ſurface; this floating liquid is the ſo famed oil of *Talc*; but this is properly no preparation of zink, or its flowers, but merely the eſſential oil of the vinegar employed in the ſolution; and it is eaſy to conclude from this, that this ſo famed liquor can poſſibly have no title to any of the wondrous qualities aſcribed to it. Mem. Acad. Scienc. Par.

TALED, in the Jewiſh antiquities, a ſort of habit that the Jews wore, chiefly when they repeated their prayers in the ſynagogue. *Numbers* xv. 38. *Deuteronomy* xxii. 12.

It ſerved inſtead of that ſquare garment they wore heretofore, to which Moſes had appointed that they ſhould faſten borders of blue to the four quarters, and fringes or ribbands all along the borders. But at preſent, that they may not be expoſed to the laughter of the people for the too great ſingularity of their dreſs, they content themſelves with wearing a ſquare piece of cloth underneath, with four tufts at the four corners, and when they meet in the ſynagogue to ſay their prayers, they cover their heads with a ſquare woollen veil, which has four tufts at its four corners. It is this they call *Thaled*, or *Taled*. *Calmet* Dict. & *Leo of Modena*, Ceremonies of the Jews, P. I. ch. 5, 11.

TALLY (*Cycl.*)—TALLY *the Sheets*, at ſea, a word of command, when the ſheets of a main-ſail, or fore-ſail are to be haled aft. See the article SHEETS.

TALPA, (*Cycl.*) the *Mole*, in the Linnæan ſyſtem of zoology, makes a diſtinct genus of animals; the characters of which are, that they have feet with five claws on each, as well on thoſe behind as on thoſe before; and have their fore-feet made like hands, and fitted for digging. *Linnæi* Syſt. Nat. p. 37.

This, though a very common animal, is very little obſerved by the generality of the world. Its fur is very ſhort, ſoft and thick. Its noſe is like that of a hog; and its teeth like thoſe of the *mus araneus*, being ſingle and eminent on the ſides of the upper jaw, and thoſe farther within the mouth armed with many points. It has ſcarce any neck, its head ſeeming ſet between its ſhoulders. Its legs are very ſhort, its claws very ſharp, and its toes five in number on each foot; the inner part or ſole of the fore-feet is very broad, and much reſembles the palm of the human hand. Its claws on theſe are more robuſt and ſtrong, than in any other animal of its ſize: The whole feet and toes are not placed downward but ſideways, for the ſake of the creature's continual employment in digging, it being properly a ſubterranean animal. Its tail is ſhort, and hairy.

It has been ſuppoſed by many, that the *Mole* had no eyes; and others have affirmed, that it had eyes, but that they were covered with a membrane; but neither of theſe aſſertions are true. The eyes are ſmall, and have apertures in the ſkin, through which they may eaſily be diſcerned by a curious obſerver; and are very black, about the ſize of a millet-ſeed, and faſtened to a nerve.

The reaſon they have not been obſerved by the common people, is, that they are hid by the fur; but, on blowing that away, they always ſhew themſelves. It has no ears.

Its ſkin is extremely firm and tough, ſo that it requires a ſharp knife to pierce it.

This ſeems the care of nature to defend the creature from the cold; and the fineneſs of the fur, that is, the ſmallneſs of every hair, ſeems proportioned to the ſmall pores they had to grow out of. *Ray*'s Syn. Quad. p. 234.

TALPA, in ſurgery, a name given by ſome authors to an encyſted tumor, ſituated under the ſcalp. *Heiſter*'s Surgery, p. 324.

TALWOOD, *Taliatura*, in our old writers, fire-wood cut and cleft into billets of a certain length: It is otherwiſe written *Talghwood*, and *Talſhide*. Stat. 34 & 35 Hen. VIII. c. 3. 7 Edw. VI. c. 7. 43 Eliz. c. 14. *Cowel*.

TAMALAPATRA, in the materia medica, a name by which ſome authors have called the *folium Indum*, or Indian leaf, uſed in medicine. *C. Bauhin*, Pinax. p. 409.

The tree which produces this leaf is one of the *Enneandria monogynia* of Linnæus; and of the *arbores fructu calyculato*, of Mr. Ray. It is a large and lofty tree, the flowers and fruit of which reſemble the cinnamon-tree. Its leaves, when full grown, are ten inches or more in length; and ſix or eight, in breadth. The flowers ſtand in cluſters, in the manner of umbels on the tops of the branches, and are of a greeniſh white colour. The fruit is of the bigneſs of our currant.

The antients recommended *Indian-leaf*, as ſtomachic, ſudorific, and cephalic. At preſent, it is utterly diſregarded, being only kept in the ſhops as an ingredient in ſeveral compoſitions. Vid. *Hill*, Hiſt. Mat. Med. p. 419. ſeq.

TAMANDUA, in natural hiſtory, a creature called in Engliſh the ant-bear; and by the Braſilians *Tamandua-guacu*.

This animal has its Engliſh name from its feeding on ants, and having its hinder feet like a bear's. It has a very long and ſharp ſnout, and its tongue is ſlender, and extenſible to a very great length; and it has a long and bruſhy tail. *De Laët*. Ind. Occ. L. 16. c. 15.

The principal food of the *Tamandua* is ants, which he catches by ſcratching open their ſubterranean hives, and thruſting his long tongue into them; when the ants are gathered in great numbers upon this, he draws it back and eats them; and this he repeats till he is ſatisfied.

His tail ſerves him for a ſort of cover; and he can, upon occaſion, ſpread it almoſt over his whole body. *Barlæus* de Reb. Braſ. p. 223.

TAMARIND, *Tamarindus*, in botany, the name of a genus of trees; the characters of which are theſe: The flower is of the roſaceous kind, and is compoſed of ſeveral petals, arranged in a circular form. The cup conſiſts of one leaf, divided into many ſegments at the edge; and from this ariſes a piſtil, which finally becomes a flat pod, containing in it another in which are ſeveral flatted and angular-ſhaped ſeeds. The interſtice between the two pods is filled up with a ſoft pulpy ſubſtance.

The only known ſpecies of this tree is that which produces the common *Tamarind*, the pulp of which is uſed in medicine. *Tourn.* Inſt. p. 660.

The characters of this genus of plants, according to Linnæus, are, that the calyx is a plain four-leaved perianthium, the leaves of an oval figure, and equal in ſize. The flower is compoſed of three petals, which are of an oval figure, ſomewhat plane and flat, but folded and gaping open; theſe are ſmaller than the leaves of the cup, and are inſerted in them, leaving a vacant ſpace at the bottom of the cup. The ſtamina are three filaments, which have their origin together in the cavity in the cup, and are pointed, and bent toward the petala of the flower. The antheræ are ſingle: The piſtil has an oval germen. The ſtyle is pointed, and bent toward the ſtamina; and its ſtigma is ſingle. The fruit is a long pod, of a compreſſed ſhape, and covered with a double ſkin

between which is the pulp; it conſiſts of only one cell. The ſeeds are angular, and of a flatted figure; and are three in each pod. *Linnæi* Gen. Plant. p. 9.

We owe the knowledge of the uſe of *Tamarinds*, in medicine, to the Arabians. The antient Greeks knew nothing of them; and Serapion, Meſue, and Avicenna, are the firſt authors who preſcribe them.

The fruit of the *Tamarind* which is what we uſe, is only the piſtil of the flower ſwelled into a pod; this is greeniſh at firſt, but grows browniſh or reddiſh, as it ripens; its common ſize is four inches in length, and one in breadth; and it is undulated on the back, and deeply notched in three or four places at the front, which is terminated by a large rib, which runs from the pedicle on which it grows, to the end of the pod, and there frequently terminates in a ſort of hook.

This fruit is, properly ſpeaking, compoſed of two pods, the one incloſed within the other; the outer pod is fleſhy, and of the twelfth of an inch in thickneſs when freſh, and the inner one is thin as a fine piece of parchment; between theſe two there is an intermediate ſpace of about a quarter of an inch all the way; and this ſpace is filled up with a very ſoft and pulpy ſubſtance, of a tart but very agreeable taſte, which is what we uſe in medicine. This is blackiſh and of a viſcous texture, and is traverſed by three large veſſels, or rather bundles of veſſels, one of which runs all along the back of the pod, and the two others are placed on the oppoſite ſide, and often there are ſeveral ramifications of veſſels, which run off different ways from theſe. Theſe veſſels carry the vinous juice, which afterwards hardens into the viſcous matter of the pulp; but this is not all their office, for they alſo convey nouriſhment to the ſeeds in the inner pod.

We uſe the *Tamarinds* only in medicine; but the Africans, and the People of many of the Oriental nations, where they are common, make them into a ſort of confect with ſugar, which they eat as a delicacy, and which cools them in the violent heats of their climates; and at the ſame time keeps their bowels in a proper ſtate of laxity. The ſour taſte of this fruit proves, that acid particles abound greatly in it, and a chemical analyſis of it gives farther proof of this. There is indeed no alkali to be obtained fom *Tamarinds*, otherwiſe than by diſtilling them in a retort with quick-lime. A ſimple analyſis of them yields no other principles but acid and ſulphur. Six pounds of *Tamarinds* mixed with ſix pints of water, will yield ſix drams of eſſential ſalt; this however requires a long time to cryſtallize, not fixing itſelf to the ſides of the veſſels under two months ſtanding; in all this time however the liquor never grows mouldy, as ſuch liquors uſually do; and it in this ſomewhat reſembles tartar, or the eſſential ſalt of grapes, which never ſeparates itſelf from their juice under a very long time. Indeed, to be aſſured of gaining all the eſſential ſalt of any plant, the liquor ought to be covered half an inch deep with oil, to prevent its ſpoiling, and ſuffered to ſtand a whole year unmoved in the ſame veſſel. The ſalt of *Tamarinds* in all things reſembles cream of tartar; it is ſharp to the taſte, and will not diſſolve in cold water. It does not detonate on the fire, nor yield any vinous ſmell, when moiſtened with oil of tartar. *Tamarinds* diſſolved alſo in common water, and ſet in digeſtion for ſeveral months, yield on diſtillation only an acid ſpirit, like that from vinegar.

It is not uncommon in thoſe places where *Tamarinds* are frequent, to find an eſſential ſalt cryſtallized on the branches of the tree, this greatly reſembles cream of tartar in all reſpects, and is no other than the genuine ſalt of the plant formed by the ſun's drying up the accidentally extravaſated juices; nor is this peculiar to this tree alone, but many others are at times found with their juices thus extravaſated, and their ſalts thus cryſtallized by the heat. The leaves of that large ſpecies of maple, which we vulgarly but improperly called the ſycamore, are often in hot ſeaſons found thus covered with cryſtals of their eſſential ſalt which is ſweet, and very much of the nature of ſugar; and the lime-trees have their leaves often covered with a like ſaccharine matter, which being waſhed off from them and the liquor given any perſon to drink, is found to have the taſte and the purgative virtue of manna. Mem. Acad. Par. 1699. See the article TAMARINDS, *Cycl.*

TAMARISCUS, the *Tamariſk-tree*, in botany, the name of a genus of trees; the characters of which are theſe. The flower is of the roſaceous kind, being compoſed of a number of petals, arranged in a circular form; the piſtil ariſes from the cup, and finally becomes a capſule, reſembling that of the willow of a long figure and membranaceous ſtructure, and containing ſeeds winged with down. *Tourn.* Inſt. p. 661.

The ſpecies of *Tamariſk*, enumerated by Mr. Tournefort, are theſe: 1. The ſhrubby thick-leaved *Tamariſk*, called the German *Tamariſk*. And, 2. The tall arboreſcent fine-leaved *Tamariſk*, called the French *Tamariſk*.

It is a very remarkable property of this tree, that its ſalt made in the way of other lixivial ſalts is no alkali, but a mere ſal ſalſus. The ſalt of guaiacum alſo approaches to the nature of this.

TAMATIA, in zoology, the name of a very ſtrange bird of the Braſils. It is of the *Gallinula*, or moor-hen kind, but very different from the European birds of that genus.

Its head is very large, its eyes large and black, its beak is two fingers breadth long, and one broad, ſhaped ſomewhat like a duck's, but pointed at the end; its upper chap is black, its under one yellow; its legs are long, and the thighs in great part naked; its toes are long; its tail is very ſhort. Its head is black, and its back and wings of a plain duſky brown. Its belly is of the ſame brown, variegated with white. See Tab. of Birds, N°. 44. *Marggrave*'s Hiſt. Braſil.

TAMBOS, in Peruvian antiquity, buildings placed at certain diſtances for the lodging of the princes of that country, in their travels through their dominions. See Mr. de la Condamine, in Mem. de l'Acad. de Berlin, Tom. 2. p. 435. who tells us (p. 438.) that he ſaw ſeveral remains of theſe *Tambos*, in his journey from Quito to Lima.

TAMNUS, in botany, the name of a genus of plants, called by the old writers *Bryonia nigra*, and from them in Engliſh black bryony.

The characters of this genus are theſe: The flower conſiſts of one leaf faſhioned like a bell, open at the mouth, and divided into ſeveral ſegments. Some of theſe are ſteril, or male flowers, having no embryo; and others fruitful or female flowers, having in their center an embryo, which afterwards becomes a berry, uſually of an oval figure, and covered with a ſort of hood of a membranaceous ſtructure; this berry is full of roundiſh ſeeds. This is a climbing plant, as well as the white bryony, but it has none of the tendrills which that has.

The ſpecies of this genus, enumerated by Mr. Tournefort, are theſe: 1. The cluſtery *black bryony*, with ſmall yellowiſh green flowers. 2. The *black bryony*, with a larger white flower. 3. The American *black bryony*, with leaves like thoſe of the citrul. *Tournefort*, Inſt. Bot. p. 102.

TAMOATA, in zoology, the name of an American freſh-water fiſh, called by the Portugueſe *Soldido*.

It is a ſmall oblong fiſh, with a flat head, ſomewhat like that of a frog. Its mouth is ſmall, and from each angle of it there hangs a long ſingle filament, by way of a beard. It has no teeth, and its eyes are extremely ſmall. It has eight fins; two at the gills of one finger in length, and hard and firm like horns; two on the belly, of a ſofter ſubſtance; and one on the middle of the back, another near the tail, and another ſmall one oppoſite to it on the belly: Its tail is the eighth. Its whole head is covered above with a hard coat like a ſhell; and its body with a ſort of coat of mail made up of oblong hard ſquammoſe bodies, dented at their edges. Its colour is a ſort of ruſty iron colour. It is accounted a very well-taſted fiſh. It lives only in freſh-water rivers; and it is ſaid, when the water where it is dries up, it will crawl out upon the land, and go in ſearch of more. See Tab. of Fiſhes, N°. 34. *Marggrave*'s Hiſt. Braſil.

TAMPOE, in natural hiſtory, the name of an Eaſt-Indian fruit, approaching to the figure of the Mangouſtan, but not near ſo agreeable to the taſte. This fruit is very much of the ſize, ſhape, and colour of ſome of our common ſummer apples; but its ſkin is very thick and tough, and it has no crown. The Indians eat it in places where better fruits are ſcarce, and in ſome places call it the Mangouſtan.

TAN (*Cycl.*)—*Flowers of* TAN. Flower of *Tan* is a name given by the people employed in the tanning-trade, to a yellow ſubſtance, often found upon old *Tan*, or oak bark broken to pieces, which has been uſed as *Tan*, and is of no farther ſervice.

The name, however, is very improper; and though every body converſant in *Tan*-yards muſt have ſeen the thing, yet it has always paſſed as an efflorescence of the bark, till the curious Mr. Marchand enquired more accurately into its nature, and found it to be a plant of itſelf, wholly different from the matter of the *Tan*; and to which the bark which had been often wetted and dried again, ſerved as a proper matrix. He found it to be more nearly allied to the ſpunge, than to any other genus of plants, and therefore named it *ſpongia fugax mollis flava & amæna in pulvere coriario naſcens*, ſoft, beautiful, yellow fading ſpunge, growing on *Tanners* bark.

It makes its appearance moſt frequently in the ſummer months, and is then ſeen in ſmall tufts of a beautiful yellow colour, on different parts of the old heaps of bark. It appears at firſt in form of a thin yellow ſcum, and is of a ſort of jelly-like ſtructure; but it every day grows larger and thicker, till it ſtands above half an inch out from the ſurface of the bark. As it grows, its ſurface becomes more and more cavernous and ſpungy, the pores or holes being of different diameters, and the interſticial matter forming a ſort of net-work more or leſs regular, and often interrupted by irregular prominences in ſeveral parts; and, in fine, when the growth is compleat, the whole more reſembles a ſpunge, than any other vegetable ſubſtance, and is of a deep yellow colour, and conſiderably thick and tough conſiſtence; there are no roots to be diſcovered iſſuing from it; its ſmell is like that of rotten wood, and its taſte is ſomewhat ſtyptic. It always appears in the warm months, and always upon ſuch old *Tan* as has begun to ferment, and is in the ſtate in which our gardeners uſe it for hot-beds. If it happens to ſtand expoſed to the ſouth ſun, it is but of ſhort duration; but if it be in a ſheltered place, it will laſt a conſiderable time, and often ſpread itſelf to a great

extent, and make a very beautiful figure for many weeks. Mem. Acad. Par. 1727.

TANACETUM, *Tanzy*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the floſculous kind, conſiſting of numerous ſmall floſcules, which are divided into many ſegments at the ends, are placed on the embryo ſeeds, and are contained in a ſort of ſcaly cup, of a ſemi-orbicular figure. The embryos ripen into ſeeds, which have no down adhering to them. To this it is to be added, that the flowers are collected into large cluſters.

The ſpecies of *Tanzy*, enumerated by Mr. Tournefort, are these: 1. The common yellow-flowered garden *Tanzy*. 2. The garden *Tanzy* with curled leaves. 3. The garden *Tanzy*, with the leaves and the ſmell of mint, called by authors, *corymbiferous mint*, and *coſtmary*. *Tourn.* Inſt. p. 461.

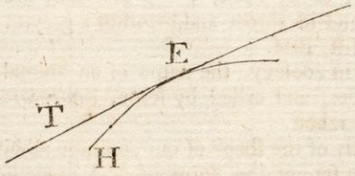
The leaves of the common *Tanzy*, either dried and given in decoction, or the expreſſed juice of them taken, are excellent in nephritic and hyſteric caſes. The good women in the country give the juice with great ſucceſs againſt worms, and in the colic. The infuſion of the dried plant is a remedy againſt flatulencies and colics, and is given in dropſies, and in ſuppreſſions of the menſes, and of the urine. It is pretended by ſome, that the diſtilled water deſtroys worms; but this is leſs probable.

TANGARA, in zoology, the name of a Braſilian Bird, of which there are two ſpecies: The firſt is of the ſize of the green-finch, and is of a fine ſhining ſea-green on its head and neck; and has a black ſpot on the front of the head, juſt above the inſertion of the beak; its ſhoulders are black, and the reſt of the back yellow. Its belly is of a very beautiful blue, and the wings variegated with blue and black. The tail is broad, and is variegated with blue and black. It feeds on vegetables, and is kept in cages for its beauty; where its only note is *zip*, *zip*.

The ſecond kind is of the ſize of the common ſparrow; its head is of a fine gay red, and its back, wings, and belly of a fine deep black; its thighs are covered with white feathers, and have each a large red ſpot, looking like a blotch of blood; the tail is ſhort, and the legs grey. *Marggrave*'s Hiſt. Braſil.

TANGARAC, a poiſonous Braſilian plant; but the root, ſays Piſo, is an antidote to the leaves, flowers, and fruit. *Boyle*, Works abr. vol. 1. p. 14.

TANGENT (*Cycl.*)—The definition of a *Tangent*, commonly given, is mentioned by Mr. Chambers; but it does not extend beyond the conic ſections; for in curves of higher orders a line may both touch and cut. A general definition is therefore neceſſary. As a right line is the *Tangent* of a circle, when it touches the circle ſo cloſely, that no right line can be



drawn through the point of contact between it and the arch, or within the angle of contact that is formed by them; ſo, in general, when a right line ET touches any arch of a curve, as EH in E, in ſuch a manner that no right line can be drawn through E, betwixt the right line ET and the arch EH, or within the angle of contact HET, that is formed by them, then is ET the tangent of the curve at E. *Maclaurin*'s Fluxions, Art. 181.

The *Tangent* of an arch is the right line that limits the poſition of all the ſecants that can paſs through the point of contact, though, ſtrictly ſpeaking, it is no ſecant. Ibid. Art. 505.

As to the methods of inveſtigating *Tangents* by Fluxions, ſee the ſaid treatiſe, book I. c. 7. where it is demonſtrated independently of infiniteſimals.

To determine the *Tangents* of curves, ſuppoſed to be deſcribed by the interſections of right lines revolving abour given poles. See Mr. *Maclaurin*'s Fluxions, Art. 210. ſeq.

In finding the tangents of curves by the method of infiniteſimal differences, it has been objected, that the concluſion is found by a double error. 1°. By taking the curve for a polygon of an infinite number of ſides. 2°. By the falſe rule for taking the differential of a power. But there is no need of ſuch ſuppoſitions in the method of fluxions, for it may be geometrically demonſtrated, that the fluxions of the baſe, ordinate, and curve, are in the ſame proportion to each other, as the ſides of a triangle reſpectively parallel to the baſe, ordinate, and *Tangent*. When the baſe is ſuppoſed to flow uniformly, if the curve be convex towards the baſe, the ordinate and curve increaſe with accelerated motions; but their fluxions at any term are the ſame as if the point which deſcribes the curve had proceeded uniformly from that term in the *Tangent*. Any farther increment which the ordinate or curve acquires, is to be imputed to the acceleration of the motions with which they flow. See *Maclaurin*'s Fluxions, Book. 1. chap. 7 and 8.

Any two arches of curve lines touch together, when the ſame right line is the *Tangent* of both at the ſame point. But when they are applied to each other in this manner, they never perfectly coincide, unleſs they be ſimilar arches of ſimilar and equal figures.

TANNERS *Bark*. This is a ſubſtance of prodigious uſe in gardening, and is the bark of the oak-tree chopped and ground into a ſort of coarſe powder, for the dreſſing of ſkins, after which uſe it becomes of ſervice to the gardener. Its fermentation is very laſting and very equal; hence it is the moſt valuable of all things for the making of hot-beds; and when it has ſerved to this uſe, and is thoroughly rotted, it makes a very valuable manure for land, one load of it doing as much ſervice as four loads of dung.

It has not been of very long uſe in England, and was brought to us from Holland in the reign of King William, and then uſed for the raiſing of orange-trees; but after this period it became diſuſed; and it is of a much later date that it has been brought into uſe again for the raiſing the pine-apple, ſince which time it is become generally uſed, wherever it is to be had, for all the purpoſes of the hot-bed, in raiſing tender plants.

There are ſeveral ſizes of this *tan*, and they heat in a different manner in proportion to their ſize, the ſmalleſt heating much quicker, and cooling again in a ſmaller time; and the largeſt acquiring its heat more gradually, but keeping it much longer. The ſkilful gardener therefore muſt uſe one or the other of theſe, or a mixture of both, according to the ſeveral occaſions he wants them for.

It ſhould always be taken within a fortnight after it comes out of the pit, and laid up in a round heap for a week, to drain out the moiſture; after which it ſhould be formed into a bed, and ſhould be laid at leaſt three feet thick. A hot-bed, properly prepared, of this ſubſtance, will retain a moderate heat ſix months. *Miller*'s Gardener's Dict.

TANNING (*Cycl.*)—The operation of *Tanning* is performed, on leather, better in the Weſt Indies than in England. They uſe three ſorts of bark, the mangrave bark, the olive bark, and another; and the whole buſineſs is ſo ſoon done, that a hide delivered to them is in ſix weeks ready to be worked into ſhoes, though they beſtow leſs labour than we do. Phil. Tranſ. N°. 36.

Every part of the oak-tree, of what age or growth ſoever, is fit for the tanners uſe, and all oaken coppice-wood, of any age or ſize, being cut and procured in barking-time, will tan all ſorts of leather, at leaſt as well as the bark alone. When this material is got at the proper ſeaſon, it muſt be very well dried in the ſun, more than the bark alone; thence it is to be cut up, and preſerved in a covered place for uſe.

When it is to be uſed, the greater wood muſt be firſt cleft ſmall, to fit it for the beating and cutting engine; and the ſmaller muſt be put into the engine as it is. Which done, it muſt be again dried upon a kiln, and after that ground in the ſame manner that the tanners grind their bark. Such wood as is to be uſed preſently after 'tis gotten, will require the better and the more drying upon the kiln; and if this is omitted, it will blacken and ſpoil all the leather it is uſed about. Where oak is ſcarce, black-thorn will tolerably well ſupply its place; and where that is not to be had in ſufficient plenty, the white thorn will do. Phil. Tranſ. N°. 108.

Birch alſo, being ordered in the ſame manner with oak, is fit for ſome uſes in *tanning*, particularly it does very well for *tanning* of ſhoe-ſoal leather. All theſe ingredients will *tan* much better than bark alone, and that with much leſs charge; ſo that this diſcovery may very well ſave the felling of trees when the bark is wanted, at a ſeaſon when the ſap is up, which, when 'tis done, cauſes the outſides of the trees to rot and grow worm-eaten; whereas if the trees had been felled in winter, when the ſap is down, they would have been almoſt all heart, as the people expreſs it, and not ſubject to worms. This manner of uſing the wood with the bark, in *tanning*, will alſo increaſe the value of underwoods very conſiderably. Phil. Tranſ. N°. 105.

The engine neceſſary for cutting the wood conſiſts of a long ſquare wooden block, and ſome pieces of iron to be faſtened on, and uſed about it, *viz.* a hammer, an anvil, an iron holding the wood to be bruiſed and cut, and a knife to cut it. The whole is a very ſimple and cheap machine, and is deſcribed at large, and figured in the above-mentioned number of the Philoſophical Tranſactions.

By Mr. de Buffon's experiments upon different ſkins, it was found that a decoction of young oak wood ſucceeded perfectly well in *tanning* ſheep and calves ſkins, but did not do equally well for ox, and the other harder ſkins. This, however, he imagines might be only for want of knowing the beſt method of uſing the wood. And certainly theſe trials deſerve to be farther proſecuted; ſince the ſmall branches of the oak, which are of little value, might be thus made to ſupply the place of a much dearer commodity, the bark; and as in many trees the bark of the young branches is found to be of greatly more virtue than that of the larger branches, or the trunk, the uſe of theſe ſmall boughs, bark and all, might very probably be found to anſwer to all the effects of the bark, of the larger kind alone. Memoirs Acad. Scien. Par. 1736. See the Phil. Tranſ. above cited.

TANT, in natural hiſtory, an Engliſh name for a ſmall ſpider of the opilio kind, having only two eyes, and eight very long legs, and commonly ſuppoſed to be very poiſonous.

It is all over of an elegant ſcarlet colour, reſembling that of the flowers of the red poppy when full blown, except that the belly has a whitiſh caſt. Four of its legs are inſerted in the upper part of the breaſt, and the other four near the belly; and near the origin of each leg there is a ſmall black ſpot. Its body is round and full, and it is all over covered with a fine ſhort velvety down. It is not unfrequent in dry paſtures in the ſpring ſeaſon. It is terribly dreaded by our farmers, who ſuppoſe that an ox will die who chances to ſwallow it. *Ray*'s Hiſt. Inſect. p. 44.

TANTALUS, one of the many names given by the chemiſts to mercury.

TANZY, *Tanacetum*, in botany, *&c.* See the article TANACETUM.

TAOS *Lapis*, the *Peacock Stone*, a name given by ſome of the antient writers to a very beautifully variegated agate, reſembling, in ſome degree, the great variety of colours in the peacock's tail.

TAP *Root*, in trees, that part of the root that deſcends ſtrait down.

In removing or tranſplanting young oaks, great care ſhould be taken not to wound this root, much leſs to cut it off; but it muſt be dug up to the bottom, and the hole prepared deep enough to ſet it; otherwiſe the tree either dies, or if not, yet it is always greatly ſtinted and impeded in its growth. *Ray*'s Engliſh Words, p. 129.

TAPAYAXIN, in zoology, the name of a very remarkable ſpecies of lizard, called by Hernandez the *lacertus orbicularis*. It is not of the long and ſlender ſhape of the common lizards, but as broad as it is long, and much reſembling the wray-fiſh in ſhape, though ſeldom exceeding four inches in length or breadth. It is a cartilaginous lizard, of a very beautiful variety of colours, always very cold to the touch, and ſo ſluggiſh a creature, that it often will not move out of its place even on touching it. Its head is extremely hard and elate, and has a ſort of crown of prickles for its defence; yet it is a perfectly harmleſs animal, and ſo far from having the fear of man, and ſhyneſs that other beaſts have, that it loves to be taken up and played with, and will ſtand perfectly ſtill, and ſeem very happy while handled. There is alſo another thing very ſingular in it, that if hurt about the head or eyes, or handled too roughly, it will throw out drops of blood from its eyes to three or four foot diſtance. *Ray's* Syn. Quad. p. 263. *Hernandez*, l. 9. c. 16.

TAPE-*Worm*, a ſpecies of worm breeding in the human bowels, and called by authors, *tænia*, and *lumbricus latus*, or the broad worm.

The Greek and Roman phyſicians, as well as thoſe of our own time, have deſcribed three ſorts of worms to which the human bowels are ſubject. The common long worms, which reſemble earth-worms; the aſcarides, or ſmall worms; and this *Tape-worm*, which they have alſo called *vermis cucurbitinus*, or the gourd worm, from its ſeveral joints reſembling, in ſome degree, the ſeeds of that fruit.

The interpreters of ſome of the Greek phyſicians have however been guilty of a great error, in confounding the gourd worms and the aſcarides together, tho' nothing can be more unlike. The antients ſeem to have had a very juſt opinion of this animal, in calling it *vermis cucurbitinus*, ſince it is plain by this, that they underſtood every joint, as we call them, of this creature, to be a diſtinct worm; and what we call the ſingle worm, to be a long ſeries of theſe worms joined together end to end.

Petrus de Abano was one of the firſt whom we find deſcribing the ſeries of theſe creatures forming a chain of this kind, and repreſenting a ſingle and very long animal. Arnoldus de Villa Nova mentions two kinds of theſe worms; but he gives no farther deſcriptions of them than ſaying, that one kind is broad and long, the other broad and ſhort. After theſe, he mentions the long and round worm, which is the common kind; and fourthly, the ſmall worm, or aſcarides. To theſe he adds a fifth, which he calls ſolium, from its being found ſingle in the bowels. This he alſo calls *cingulum*; and obſerves, that it is very long and large, and that only one can live in the bowels at the ſame time.

It has been ſuppoſed by ſome, that what this author deſcribes as a ſeparate ſpecies of worm, under the name of *ſolium*, was no other than a kind of ſacculus or bag incloſing a long ſeries of theſe *Tape-worms*.

The writers that ſucceeded ran into great errors about theſe worms: Some declared them a mere figment of the Arabian phyſicians, affirming that no ſuch animals ever exiſted in nature. Others who believed in general that there was ſuch a ſpecies of worm, yet diſcountenanced all the ſtories related concerning it; and many who wrote on theſe ſubjects, mentioned two kinds of the lumbricus latus, or broad worm, but knew nothing of what was the difference between them.

Another ſet of writers, of whom Platerus is the head, diſtinguiſh, by certain characters, two ſpecies of broad worms; the one, they ſay, is long and broad, and not jointed; the other jointed, or formed like a chain; this is the common *Tape-worm*, which they ſuppoſe to conſiſt ſingly of a number of joints, contrary to the opinion of Petrus de Abano; and they ſay, that the vermis cucurbitinus of the Arabian writers, is only one of the joints, or a fragment of the jointed tænia, ſometimes voided in this manner in ſeparate pieces. Finally, others confounding the cucurbitini with the aſcarides, if ever they chanced to ſee a real *Tape-worm*, looked on it as ſome monſtrous production; nothing that had any name. *Clerici* Hiſt. Nat. Lumbr. Lat.

In later times this animal has been better known, and Tyſon, Lewenhoek, Andry, and others, have treated very carefully of it, and all have referred it to the ſecond kind of tæniæ, mentioned by Platerus, which was of the ſhape of a chain, or compoſed of ſeveral joints, like ſo many links faſtened end by end to one another. Yet theſe have fallen into errors; and whent hey have found ſeveral of theſe tæniæ conjoined and encloſed in a ſacculus, they have taken the whole for one worm, whoſe head and tail they have deſcribed, but that in an inaccurate manner.

The true hiſtory of this animal is, that it is ſhort and broad. What is called a link of the long worm is really a diſtinct worm; and when one of theſe mutiplies in the bowels, its young adhere to it, and to each other endwiſe, ſo as to form a ſort of chain, which lengthens as they continue to increaſe, and in fine becomes immoderately long. Hence it is that the breaking, as it is called, of this worm, does not deſtroy it, and that the voiding large pieces of it is no cure, ſince it ſtill recovers that length again by new young ones. Every ſeparate link of ſuch a chain, if examined, is found to be entire, lively and briſk, and not at all injured by the ſeparation.

Authors who have treated of theſe worms as a diſeaſe, have given a canine appetite, or unnatural appetite to food, as one of the ſymptoms; but this is wrong, for it has never been found, in reality, that theſe worms, even where moſt numerous, have at all increaſed the natural appetite; and indeed it is very difficult to judge of their being in the body by ſymptoms, ſince they occaſion none which are not alſo common in many other diſeaſes. Many people have had them a long courſe of time, without being ſenſibly hurt by them; and there has never been a known inſtance of their occaſioning any one's death; or indeed any conſiderable diſorder. See the article WORMS.

TAPECON, in ichthyology, a name given by ſome to the fiſh generally called the *uranoſcopus*, or ſtar-gazer. It is properly a ſpecies of the trachinus, and is diſtinguiſhed by Artedi by the name of the *trachinus* with ſeveral beards at the lower jaw. *Aldrovand.* de Piſc. p. 258.

TAPERA, in zoology, the name of a Braſilian ſwallow, called by the Portugueſe there, *andorintra*. It is of the ſize and ſhape of our ſwallow, and it flies about in the ſame manner. The head, back, neck, wings and tail, are all of a greyiſh brown; and its throat and breaſt of a greyiſh white. *Margrave*'s Hiſt. Braſ.

TAPETI, in zoology, the name of an animal common in the Weſt Indies, and called by ſome, *cuniculus Americanus*, the American rabbit.

It is exactly of the ſhape of our common rabbit, and is of about double the ſize of the dormouſe. Its hair in length and colour is like that of the hare, and its ears long and erect, in the manner of our rabbits. It has a little reddiſhneſs on the forehead, and is ſomewhat whitiſh under the throat. It has uſually alſo a ſort of white circle or collar round the neck; but ſome of this ſpecies want that, and have their whiteneſs only under the throat, breaſt, and belly. It has no tail; its eyes are black, and its mouth bearded in the manner of our rabbits. The Indians eat the fleſh of it. *Ray*'s Syn. Quad. p. 205.

TAPHICESIUS *Lapis*, a name given by Pliny and the antients to a ſpecies of ætites, or eagle-ſtone, found in a place of that name near Leucadia.

TAPHNEUS, a word uſed by ſome writers to expreſs any thing when depurated or purified to the greateſt degree, as the ſalts by repeated ſolutions and cryſtallizations, and the like. Paracelſus uſes it for a ſpecies of earth, the things produced from which, he ſays, never alter their nature by calcination or reverberation, or the like operations.

TAPIA, in botany, a name given by Plumier to a genus of plants called afterwards by Linnæus, *crateva*. *Plum.* Gen. 21. See the article CRATEVA.

TAPIJERETE, in natural hiſtory, the name of an animal found in ſome parts of America, and called by the Portugueſe, *anta*. It is of the ſize of a young calf, and in ſhape ſomewhat approaching to the figure of the hog. Its head is thicker than a hog's, and ends in a ſharp ridge at top; and has a ſnout hanging over the opening of the mouth, in which he has a very ſtrong muſcle, ſerving to retract it at pleaſure. The dentes inciſores are ten in each jaw; from the end of theſe the jaw ſeems toothleſs for a little ſpace. The grinders are large, and are placed five on each ſide; ſo that, on the whole, the creature has twenty of each ſort of teeth. Its eyes are ſmall, and very like thoſe of the hog; its ears roundiſh; and theſe he can draw forward at pleaſure. Its legs are thick, and not longer than thoſe of our hogs. Its hoofs are divided into four portions. It has no tail; the ſkin is hard and ſolid; and the hair ſhort, and of a pale brown, variegated with white ſpots. It lives in the thick woods, and ſleeps all day; but at night, or early in the morning, goes out for its prey. It feeds on

vegetables, and is particularly fond of the ſtalks of the ſugar-cane; it often takes the water, and ſwims excellently. The natives, in places where it is common, eat its fleſh; which is but very coarſe and ill taſted. *Ray*'s Syn. Quad. p. 140.

TAPINOSIS, Ταπείνωσις, in rhetoric, the ſame with *diminution*. See the article DIMINUTION, *Cycl.*

TAPLINGS, in the Engliſh ſalt-works, the name given to certain bars of iron which ſupport the bottom of the pan in which the brine is boiled.

Theſe pans are very large, and cover a wide furnace; but as their width would make them apt to bend in the middle, which would ſpoil the working the ſalt, there is a ſort of wall of brick carried along the middle of the furnace; and on the top of this are placed theſe *Taplings*: They are about eight inches high, and from four to ſix in thickneſs, being ſmalleſt at the top. Theſe are placed at about three foot diſtance one from another, and the wall which ſupports them, and which is called the *midfeather*, is broad at the baſe, and ſo narrow at the top, as barely to give room for the baſes of the *Taplings*.

TAPPING (*Cycl.*)—In *tapping* for the dropſy, ſurgeons were formerly very careful to draw off only a ſmall quantity of water at one time, and therefore repeated it often, till the whole was evacuated. The reaſon of this was to avoid the ſyncope, which uſually attended the operation when all the water was evacuated at once. But Dr. Mead having diſcovered the true cauſe of this ſyncope to be owing to the removal of the preſſure from the deſcending aorta, it was ſoon found, that the bad conſequences might be prevented by emptying the belly at one operation, and preſerving a proper preſſure at the ſame time, which ſhould be done equally and gradually, as the water runs out. Bandages have been contrived for this purpoſe in England and in France; but, according to Mr. Monro, they are not ſufficient; and he therefore invented a belt made of fine flannel, and ſtrong linnen, which will better anſwer the purpoſe. For the draught and deſcription of this belt, we refer to the Medic. Eſſ. Edinb. vol. 1. art. 18. or its abridgment, vol. 2. p. 102. where the curious may find ſeveral practical obſervations about this operation.

Tapping has ſeldom proved more than a palliative remedy in dropſies. The chief improvements in the operation are owing to Mr. Monro, Monſieur Garengeot, and Mr. Warwick.

Mr. Monro has ſubſtituted a belt inſtead of the ordinary long bandage for compreſſing the abdomen; and has alſo aſcertained the proper place of puncture. Garengeot makes the evacuation at once, cleans the emptied cavity, to remove the feculent part of the waters which ſubſides therein, and is apt, by its acrimony, to occaſion mortifications.

Mr. Warwick tells us, however, that notwithſtanding theſe improvements, an aſcites ſhews, that the uſe of *Tapping* is but precarious, by returning as conſtantly as ever this method alone is put in practice to remove it. He has therefore endeavoured at a farther improvement, whereby the *Tapping*, inſtead of being a bare temporary relief of ſymptoms, becomes an abſolute cure. This method is, after evacuating the waters, to make an injection of equal parts of cahors, wine, or claret, and Briſtol water, blood-warm, into the emptied cavity. He mentions a cure he performed in this manner. See Phil. Tranſ. N°. 472. Sect. 3.

Dr. Hales has given us, in the ſame tranſaction, ſect. 4. a method of conveying liquors into the abdomen during the operation of *tapping*, by means of two trocars fixed at the ſame time one on each ſide of the belly, one of them having a communication with a veſſel full of the medicinal liquor, by means of a ſmall leather pipe. This veſſel might be raiſed high enough above the abdomen to force the liquor in by the laws of hydroſtatics. The advantage propoſed by this method, is to prevent a ſyncope from inanition. See a farther account of the ſucceſs of injecting medicated liquors into the abdomen, in the caſe of an aſcites, in Phil. Tranſ. N°. 473. Sect. 4.

TAR (*Cycl.*)—The antients eſteemed *Tar* good againſt poiſons, ulcers, the bites of venomous creatures; alſo for pthiſical, ſcrophulous, paralytic and aſthmatic perſons. But the method of rendering it an inoffenſive medicine, and agreeable to the ſtomach, by extracting its virtues in cold water, was unknown to them. Siris, Sect. 9. See the article TAR-*Water*, infra.

According to Pliny, liquid pitch, as he calls it, or *Tar*, was obtained by ſetting fire to billets of old fat pines or firs. The firſt running was *Tar*, the latter, or thicker running, was pitch. Theophraſtus is more particular; he tells us, that the Macedonians made huge heaps of the cloven trunks of thoſe trees, wherein the billets were placed erect beſide each other. That ſuch heaps or piles of wood were ſometimes an hundred and eighty cubits round, and ſixty, or even an hundred high; and that, having covered them with ſods of earth, to prevent the flame from burſting forth (in which caſe the *Tar* was loſt) they ſet on fire thoſe huge heaps of pine or fir, letting the *Tar* and pitch run out in a channel made for that purpoſe. Siris, Sect. 13.

Some modern writers inform us, that *Tar* flows from the trunks of pines and firs, when they are very old, through inciſions made in the bark near the root; that pitch is only *Tar* inſpiſſated, and both are the oil of the tree grown thick and black with age and the ſun. The trees, like old men, being unable to perſpire, and their ſecretory ducts obſtructed, they are, as one may ſay, choaked and ſtuffed with their own juice [a]. But the method uſed by our colonies in America for making *Tar* and pitch, is, in effect, the ſame with that of the antient Macedonians; as appears from the account given in the Philoſophical Tranſactions. And the relation of Leo Africanus, who deſcribes, as an eye-witneſs, the making of *Tar* on mount Atlas, agrees in ſubſtance with the methods uſed by the Macedonians of old, and the people of New England of this day [b].—[a Siris, Sect. 16. b Id. Sect. 17.]

According to Theophraſtus, not only the turpentine-trees, the pines, and the firs, yield reſin or *Tar*, but alſo the cedars and palm-trees; and the words *pix* and *reſin* are taken by Pliny in ſo large a ſenſe, as to include the weepings of the lentiſcus and cypreſs, and the balms of Arabia and Judæa; all which perhaps are near of kin, and in their moſt uſeful qualities concur with common tar, eſpecially the Norwegian, which is the moſt liquid and beſt for medicinal uſes. Thoſe trees that grow on mountains, expoſed to the ſun or north wind, are reckoned to produce the beſt and pureſt *Tar*; and the Idæan pines were diſtinguiſhed from thoſe growing on the plane, as yielding a thinner, ſweeter, and better ſcented *Tar*. Id. Sect. 28.

Tar in ſubſtance, mixed with honey, has been found an excellent medicine for coughs. Id. Sect. 21.

TAR-*Water*. As the cold infuſion of *Tar* has been lately much in vogue, and has been recommended by one of the moſt learned and ingenious writers of the age, it may not be improper to give ſome account of its virtues from the biſhop of Cloyne's *Siris*, or Chain of Reflections concerning the Virtues of *Tar-water*.

In ſome parts of America, *Tar-water* is made by putting a quart of cold water to a quart of *Tar*, and ſtirring them well together in a veſſel, which is left ſtanding till the *Tar* ſinks to the bottom. A glaſs of clear water being poured off for a draught, is replaced by the ſame quantity of freſh water, the veſſel being ſhaken, and left to ſtand as before. And this is repeated for every glaſs, ſo long as the *Tar* continues to impregnate the water ſufficiently, which will appear by the ſmell and taſte.

But as this method produces *Tar-water* of different degrees of ſtrength, the author ſays, he chuſes to make it in the following manner: Pour a gallon of cold water on a quart of *Tar*, and ſtir and mix them thoroughly with a ladle or flat ſtick, for the ſpace of three or four minutes; after which the veſſel muſt ſtand eight and forty hours, that the *Tar* may have time to ſubſide; when the clear water is to be poured off, and kept for uſe, no more being made from the ſame *Tar*, which may ſtill ſerve for common purpoſes.

This cold infuſion of *Tar* hath been uſed in ſome of our colonies as a preſervative or preparative againſt the ſmall pox, which foreign practice induced the biſhop to try it in his own neighbourhood, when the ſmall pox raged with great violence. He ſays, the trial fully anſwered his expectation; all thoſe within his knowledge, who took the *Tar-water*, having either eſcaped that diſtemper, or had it very favourably. Several were preſerved from taking the ſmall-pox, by the uſe of this liquor; others had it in the mildeſt manner; and others, that they might be able to take the infection, were obliged to intermit drinking *Tar-water*. He ſays, he has found it may be drank with great ſafety and ſucceſs for any length of time, and this not only before, but alſo during the aforeſaid diſtemper.

The general rule for taking it, is about half a pint night and morning, on an empty ſtomach, which quantity may be varied according to the caſe and age of the patient, provided it be always taken on an empty ſtomach, and about two hours before or after a meal.

It has been found, that ſeveral perſons infected with cutaneous eruptions and ulcers, were immediately relieved, and ſoon after cured, by the uſe of this medicine. It is ſaid, that even in the fouleſt diſtempers, it proved much more ſucceſsful than ſalivations and wood-drinks had done. It alſo ſucceeded beyond expectation, in a tedious and painful ulceration of the bowels, in a conſumptive cough, and (as appeared by expectorated pus) an ulcer in the lungs, in a pleuriſy and peripneumony. And when a perſon who had been for ſome years ſubject to eryſipelatous fevers, perceived the uſual forerunning ſymptoms to come on, the drinking of *Tar-water* prevented the eryſipelas.

Tar-water cures indigeſtion, and gives a good appetite. It is an excellent medicine in an aſthma; it imparts a kindly warmth, and quick circulation to the juices, without heating, and is therefore uſeful, not only as a pectoral and balſamic, but alſo as a powerful and ſafe deobſtruent in cachectic and hyſteric caſes. As it is both healing and diuretic, it is very good for the gravel. The biſhop ſays, he believes it to be of great uſe in a dropſy, having known it cure a very bad anaſarca in a perſon whoſe thirſt, though very extraordinary, was in a ſhort time removed by the drinking of *Tar-water*. It may likewiſe be ſafely uſed in inflammatory caſes; and, in fact, hath been found an admirable febrifuge, at once the ſafeſt cooler and cordial.

The ſalts, and more active ſpirits of *Tar* are got by infuſion in cold water; but the reſinous part is not to be diſſolved thereby,

thereby. Hence the prejudice which ſome, perhaps, may entertain againſt *Tar-water*, the uſe whereof might inflame the blood, by its ſulphur and reſin, as a medicine, appears to be not well grounded. It is obſerved by chemiſts, that all ſorts of balſamic wood afford an acid ſpirit, which is the volatile oily ſalt of the vegetable. Herein is chiefly contained their medicinal virtues; and this author affirms, that by the trials he has made, it appears, that the acid ſpirit in *Tar-water* poſſeſſes the virtues, in an eminent degree, of that of guaiacum, and other medicinal woods.

It is certain *Tar-water* warms, and therefore ſome may perhaps ſtill think it cannot cool. The more effectually to remove this prejudice, let it be farther conſidered, that, as on one hand, oppoſite cauſes do ſometimes produce the ſame effect; for inſtance, heat by rarefaction, and cold by condenſation, do both increaſe the air's elaſticity; ſo, on the other hand, the ſame cauſe ſhall ſometimes produce oppoſite effects. Heat, for inſtance, in one degree thins, in another coagulates the blood. It is not therefore ſtrange, that *Tar-water* ſhould warm one habit, and cool another; have one good effect on a cold conſtitution, and another good effect on an inflamed one; nor, if this be ſo, that it ſhould cure oppoſite diſorders. All which juſtifies to reaſon, what has often been found true in fact. The ſalts, the ſpirits, the heat of *Tar-water*, are of a temperature congenial to the conſtitution of a man, which receives from it a kindly warmth, but no inflaming heat. It is of admirable uſe in fevers, being at the ſame time the ſureſt, ſafeſt, and moſt effectual both paregoric and cordial; for the truth of which the biſhop appeals to any man's experience, who ſhall take a large draught of it milk warm, in the paroxiſm of a fever, even when plain water and herb teas ſhall be found to have little or no effect. To him it ſeems, that its ſingular and ſurprizing uſe in fevers of all kinds, were there nothing elſe, would be alone ſufficient to recommend it to the public. As *Tar-water* poſſeſſes the virtues of fortifying the ſtomach, as well as purifying and invigorating the blood, it may be preſumed of great and general efficacy in all thoſe numerous illneſſes, which take their riſe from foul or vapid blood, or from a bad digeſtion. The animal ſpirits are elaborated from the blood; ſuch therefore as the blood is, ſuch will be the animal ſpirits, more or leſs, weaker or ſtronger. This ſhews the uſefulneſs of *Tar-water* in all hyſteric and hypochondriac caſes; which, together with the maladies from indigeſtion, comprize almoſt the whole tribe of chronical diſeaſes. In very dangerous and acute caſes, much may be taken, and often, as far as the ſtomach can bear. But in chronical caſes, about half a pint, night and morning, may ſuffice. A medicine of ſo great virtue in ſo many different diſorders, and eſpecially in that grand enemy the fever, muſt needs be a benefit to mankind in general. There are nevertheleſs three ſorts of people to whom the biſhop ſays he would peculiarly recommend it; ſea-faring perſons, ladies, and men of ſtudious and ſedentary lives.

To ſailors, and all ſea-faring perſons, who are ſubject to ſcorbutic diſorders, and putrid fevers, eſpecially in long ſouthern voyages, he is perſuaded this *Tar-water* would be very beneficial. And this may deſerve particular notice, when ſo many of our countrymen have periſhed by ſuch diſtempers, contracted at ſea, and in foreign climates, which, it is probable, might have been prevented by the copious uſe of *Tar-water*.

This ſame water will alſo give charitable relief to the ladies, who often want it more than the pariſh poor; being many of them never able to make a good meal, and ſitting pale, puny, and forbidden like ghoſts, at their own table, victims of vapours and indigeſtion. Studious perſons alſo pent up in narrow holes, breathing bad air, and ſtooping over their books, are much to be pitied; as they are debarred the free uſe of air and exerciſe; this, he ſays, he will venture to recommend as the beſt ſuccedaneum to both. Though it were to be wiſhed, that modern ſcholars would, like the antients, meditate and converſe more in walks and gardens, and open air; which, upon the whole, would perhaps be no hindrance to their ſtudies.

It has been inſinuated, that *Tar-water*, made in the common way, as here deſcribed, contains noxious oils or particles of *Tar*, which renders it dangerous to thoſe who drink it. But the biſhop ſays, this is contrary to all his experience, and that *Tar-water* is ſo far from doing hurt by any cauſtic or fiery quality, that it is, on the contrary, a moſt potent medicine for the allaying of heat, and curing of all inflammatory diſtempers.

It has alſo been publickly aſſerted, that the acid juice of *Tar*, freed from the volatile oil, is much more ſafe and efficacious than *Tar-water*. But the above-mentioned author is of opinion, that if *Tar-water* be robbed of its fine volatile oil (which neither ſinks to the bottom, nor floats at the top, but is intimately united with it, and appears to the eye only in the colour of *Tar-water*) it can be no cordial, he having obſerved, that the moſt acid water is the leaſt cordial; ſo far is he from imputing the whole virtue to the acid, as ſome have thought. See *Two Letters from the Biſhop of Cloyne*, &c. publiſhed 1747.

The ſame author obſerves, that the uſe of *Tar-water*, made a ſecond time from the ſame *Tar*, is not at all noxious, or of a fiery cauſtic nature, only it is not ſo ſtrong as that firſt made.

If it be aſked, what preciſe quantity or degree of ſtrength is requir'd in *Tar-water*? it is anſwered, that the palate, the ſtomach, the particular caſe and conſtitution of the patient, the very ſeaſon of the year will diſpoſe and require him to drink more or leſs in quantity, ſtronger or weaker in degree. Preciſely to meaſure its ſtrength by a ſcrupulous exactneſs, is by no means neceſſary.

It is to be obſerved, that *Tar-water* ſhould not be made in unglazed earthen veſſels, theſe being apt to communicate a nauſeous ſweetneſs to the water.

The ſame ingenious author recommends *Tar-water* in the plague, and for the diſtemper among the horned cattle now raging; with what ſucceſs muſt be left to experience.

TARABE, in zoology, the name of a Braſilian parrot, larger than the common green parrot. Its general colour is green; but its head, breaſt, and the origin of its wings, are red. Its beak and legs are of a duſky grey. *Marggrave*'s Hiſt. Braſ.

TARAE *Lapis*, the name given by the writers of the middle ages to a ſtone which they ſay had the power of ſtopping all ſorts of fluxes. They have left us no deſcription of it, and it ſeems to have been loſt even in their times; for they obſerve that the phyſicians uſed the ſanguis draconis, or dragon's-blood, in its place.

TARAGUICO *Aycuraba*, in zoology, the Braſilian name for a ſpecies of lizard, much approaching to the nature of the taraguira; but its tail is covered from its beginning with ſmall triangular ſcales, and very regularly marked with four brown ſpots. The back alſo, particularly that part which is next the head, is variegated with undulated brown lines. *Ray*'s Syn. Quad.. p. 266.

TARAGUIRA, in zoology, the name of an American lizard. It grows to about a foot long; its body is rounded, and every where covered with ſmall triangular duſky grey ſcales. Its back is ſmooth, and it has not that falſe gullet under the throat which the iguana has.

This is the ſpecies of lizard of which it is reported, that it will wake a ſleeping perſon, if it ſee him in danger of being bitten by a ſerpent. It is very common about houſes and gardens in South America, and runs very ſwiftly, but with a waddling motion; and when it ſees any thing at a diſtance, has an odd way of nodding its head very ſwiftly. *Ray*'s Syn. Quad. p. 266.

TARANDUS, in zoology, a name given by Agricola, and ſome other authors, to the rein deer. See the article RANGIFER.

TARANIOLO, in zoology, a name by which the whimbrel, or ſmall curlew, called the *arquata minor* by authors, is known in the markets of Italy. *Ray*'s Ornithology. p. 217.

TARANTULA, (*Cycl.*) in zoology, a name given by the Italians to a peculiar ſpecies of lizard, called by Aldrovand and ſome others, *lacertus facetanus*. See Tab. of Quadrupeds and Serpents, N°. 36.

It is of a grey colour; its ſkin is extremely rough; and it is thicker and rounder bodied than the other lizards. It is found like our common eft, under old walls, and among the ruins of buildings, particularly in the neighbourhood of Rome, in great plenty; its colour looks dead and ghaſtly, and it is as odious to the ſight among the Italians, as the toad is with us, being never ſeen without a ſort of natural horror. It is eſteemed alſo a poiſonous creature, as the toad is with us, tho' it is not eaſy to find well-atteſted ſtories of any bodies ever having been hurt either by the one or the other of theſe creatures. *Ray*'s Syn. Quad. p. 264.

TARBASON, a word uſed by ſome chemical writers as a name for antimony.

TARCONANTHUS, in botany, the name of a plant deſcribed by Vaillant, the characters of which are the ſame with thoſe of the parthenium. *Vaillant*, A. G. 1719. See the article PARTHENIUM.

TARDA *Avis*, in zoology, a name given by many to the buſtard, more commonly known among authors by the name *otis*. *Ray*'s Ornithology, p. 129. See the article OTIS.

TARDO, in the Italian muſic, is uſed to denote a ſlow movement, being much the ſame as *largo*. See the article LARGO.

TAREIBOIA, in zoology, the name of a ſpecies of ſerpent found in America, and called alſo *cacaboia*; though, according to ſome authors, the *Tareiboia* and *cacaboia* are two different ſpecies.

They are both of the amphibious kind, and live in lakes and waters, as well as on land; but they are not very poiſonous. They are ſmall ſnakes, and all over black; when offended, they will bite; but the wound is eaſily curable. Authors have written differently of theſe ſerpents, ſome making the latter very different from the former, and of a yellow colour. *Ray*'s Syn. Anim. p. 329.

TAREIRA, in ichthyology, the name of a fiſh caught in the American ſeas, and eaten; but of no fine flavour.

It is of an oblong and thick body, gradually tapering toward the tail. Its head reſembles that of a ſnake, and is raiſed into two tubercles over the eyes: Its eyes are yellow, with a black pupil; its noſe pointed, and its mouth large and yellow within. It has extremely ſharp teeth in both its jaws, and on its tongue. It has eight fins, the tail being accounted one, and this is forked; but this, as well as the reſt, is of the conſiſtence of a poppy leaf, tender, thin, and ſoft, and ſuſtained by ſoft rays. Its ſcales are ſo nicely laid on one another, that it ſeems ſmooth to the touch. Its belly is white, and its back and ſides are variegated with longitudinal green and yellow lines. *Marggrave*'s Hiſt. Braſ.

TARGAR, a name given by ſome of the chemical writers to oil of juniper.

TARIERA, in ichthyology, the name of a river-fiſh caught in many parts of America.

It is an oblong fiſh, with a ſtrait back, and a belly ſomewhat hanging down. Its under jaw is longer than its upper, and its teeth are extremely ſharp. Among theſe there are two longer than the reſt in the middle of the under jaw, and four ſuch in the upper. Its ſcales are large, and its back brown, and its belly and ſides whitiſh. It is a well taſted fiſh, but full of bones. *Marggrave*'s Hiſt. Braſ.

TARIFILON, in botany, a name by which Avicenna, and ſome other authors, have called the *trifolium bituminoſum*, or ſtinking trefoil. *Ger. Emac.* Ind. 2.

TARIN, in ornithology, a name given by the French, and from them by many others to the *Citrinella*; a bird common in Italy, and kept in cages for its beauty and fine notes. *Ray*'s Ornithol. p. 93. See the article CITRINELLA.

TARINGTING, in natural hiſtory, a name given by the people of the Philippine iſlands to a ſpecies of lapwing which is common on the ſea-ſhores, and runs remarkably ſwift.

TARITH, one of the many names given by the chemiſts to mercury. See the article MERCURY.

TARRAGON, in botany. See the article DRACUNCULUS.

TARROCK, in zoology, the name of a ſea-fowl of the larus or gull-kind, and diſtinguiſhed by authors by the name of the *larus cinereus Bellonii*.

It is of the ſize of the common pigeon, and is not much unlike it in ſhape, except that the head is larger and thicker. Its tail is not forked; and its throat, breaſt and belly, are ſnow-white. Its head and the outer part of its neck are alſo white; but there is on each ſide of the head a black ſpot. The lower part of the neck is black; and the middle of the back and the ſhoulders are grey. Its long wing feathers are black and white. Its great diſtinction, however, from all the other birds of the gull kind, is, that it has no hinder toe. It is very common on the coaſts of Cornwal, and ſome other of the Engliſh ſhores. *Ray*'s Ornithol. p. 264.

TARSI, in the materia medica, a name by which ſome authors have called the root of the *cyperus eſculentus*, or ſweet cyperus of the ſhops; and by which it is in ſome places uſually called by the druggiſts. *Dale*'s Pharm. p. 257.

TARSO, in the glaſs-trade, a ſort of white ſtone found in many rivers of Italy, and other places; and uſed inſtead of ſand for the fineſt cryſtal glaſs, being firſt burnt, and calcined with the ſalt of the polverine into frit. *Neri*'s Art of Glaſs, p. 7.

Neri calls this ſtone a kind of white marble; and adds a general rule, that all ſtones that will ſtrike fire with ſteel, are fit to vitrify; and thoſe that will not ſtrike fire with ſteel, will never vitrify.

The criteria or determinate characters of foſſils were not at all fixed in this author's time, otherwiſe he had not called this ſtone a kind of marble; ſince his own general rule of trying ſtones by ſteel, is, though liable to a few exceptions, a very good one; and, according to that, this *Tarſo* could be of no affinity to marble; for marble will not ſtrike fire with ſteel, nor ever be converted into glaſs.

The great difference of ſtones is this; ſome are compoſed of cryſtal, variouſly debaſed by adventitious matter; others of ſpar, debaſed in the ſame manner. All cryſtal will give fire with ſteel; all ſpar will refuſe this. Flints, ſand, and the harder ſtones, are compoſed of cryſtal; and will therefore give fire with ſteel, and vitrify or make glaſs with the addition of ſalts. Marble, and other ſoft ſtones, are compoſed of ſpar; and can neither give fire with ſteel, nor make glaſs, but readily calcine in the fire.

The *Tarſo* therefore, of this and other authors, could be nothing of the marble kind; but is truly a cryſtalline matter debaſed by an admixture of white earth, and found in form of ſmall pebbles of a whitiſh, yellowiſh, or pale reddiſh colour; and this is common in all the gravel-pits of England, and in the beds of ſome of our rivers; and might be uſed with great advantage by our glaſs-makers, if they knew it was ſo eaſily to be had.

On comparing theſe ſtones of ours, with the cuogolo or *Tarſo* of the foreign glaſs-makers, there is no difference diſtinguiſhable to the eye, nor will the niceſt experiments by the fire, acid menſtrua, &c. ſhew the leaſt diſtinction between them. We are not to wonder however, that the glaſs-makers did not hitherto diſtinguiſh this to be the true cuogolo or *Tarſo*, ſince the characters of foſſils have been hitherto ſo little aſcertained, that the beſt and lateſt author on theſe ſubjects, Dr. Woodward, ſo far miſtook the ſtructure of this ſtone, as to call it a ſparry pebble. It is certain that ſpar could never have any thing to do with glaſs-making; but this ſtone has no ſpar in its compoſition.

TARSUS (*Cycl.*)—*Bones of the* TARSUS *luxated.* If any of the ſmall bones in the foot, the *tarſus* or *metatarſus* happen to be luxated by ſome external violence, the ligaments with the adjacent nerves and tendons, are generally ſo affected as to excite not only the moſt acute pains, but alſo violent inflammations and convulſions; and even death itſelf has been known to be the conſequence of accidents of this kind, unleſs the bones be ſpeedily replaced. The foot is for this purpoſe to be extended on an even table, and the ſurgeon is to replace the diſlocated bones with the preſſure of the palms of his hands, adjuſting them alſo with his fingers, where need requires. Compreſſes dipped in warm ſpirit of wine are then to be laid on the part, and both theſe and the reduced bones ſecured in their places, by means of the proper bandages; the patient is then to be enjoined to remain in bed till the new ſet bones have acquired a ſufficient ſtrength. *Heiſter*'s Surg. pag. 174.

TARTAR (*Cycl.*)—The ſweet wines afford always leſs *Tartar* than the ſharp ones, and it is alſo leſs valuable. The *Tartar* of Rheniſh wine, is better than that of any other; and in general, thoſe wines which have the moſt acid in them, afford the greateſt quantity of *Tartar*, and that in the largeſt cryſtals. It is objected by ſome to this ſyſtem, that vinegar affords no *Tartar*; but this is eaſily anſwered, by obſerving, that the wine from which vinegar is made, has before depoſited its *Tartar*. This ſalt of wine may be by chemiſtry reduced to elementary water, in this manner: let it be burnt to a fixed ſalt, and let this fixed ſalt of *Tartar* be diſſolved by ſtanding in a damp place into an oil *per deliquium*; let this oil be diſtilled in an alembic, and a phlegm only comes over: by repeating this proceſs, the whole will be reduced into perfect ſimple and inſipid phlegm, excepting a ſmall remainder of equally inſipid earth. *Portzius* de Vin. Rhen.

Beſide the uſual way in which *Tartar* is produced, there is a very remarkable account in the Memoirs of the Academy of Sciences at Paris, of its having been found in a more than ordinary beautiful ſtate on a human ſkull; the diſcovery was owing to accident, and was in this manner:

Mr. Morand wanting a human ſkull cleanſed from its ſoft parts, put into a dunghill of horſe-dung a whole human head; after it had lain there eight days, the fleſhy parts eaſily ſeparated, being as it were boiled to pieces; after this the ſkull was carefully waſhed, and then laid to ſoak for ten days in a large veſſel of water; after this it was drenched three or four times in freſh water, and finally, without wiping, was ſet out in the air to dry. As it dried it became covered with little cryſtals, compoſed of ſeveral planes or traces, but moſtly of a cubic form, very bright and glittering; and when expoſed to the light, of an extremely brilliant water. There were none of them on the baſis of the cranium, which was full of irregularities; but they all arranged themſelves on the upper part above the orbitary hollows; to the jaw-bones there were alſo many faſtened, as alſo to the teeth; theſe laſt were yellow, but they were not leſs bright and brilliant than the reſt.

On examining theſe cryſtals they were found to be *Tartar*, but in a purer ſtate than *Tartar* is ever uſed to appear in; and as it was ſoon judged that though theſe cryſtals owed their preſent form and extreme beauty to the ſkull, yet they could not be wholly produced from it, the whole matter was carefully examined, and it was found that there had been lees of wine in the veſſel in which the ſkull had been laid ten days in ſoak. Mem. Acad. Par. Ann. 1737.

The formation of the cryſtals of this *Tartar* on the ſkull, while the ſides of the veſſel had none concreted on them, ſhews that the ſkull had a diſpoſition for receiving the cryſtals more than any other body; and their peculiar brightneſs proves, that it had ſome ſhare in their formation.

The uſual method of refining *Tartar* is this: Take two pounds of common white *Tartar* reduced to powder, and put it into five gallons of fair water; put it over the fire to boil, and in the mean time beat up the whites of two or three eggs, mix theſe among the liquor, and ſkim it as it heats; finally ſtrain it and ſet it in a cool place for two days, at the end of which time a quantity of whitiſh cryſtals will be found ſticking to the ſides of the veſſel.

This is a very troubleſome and inconvenient proceſs, the *Tartar* requiring ſo very large a quantity of water to diſſolve it; and the operation muſt alſo be repeated more than once, to make the cryſtals fine. Veſſels of metal cannot be employed, becauſe the *Tartar* would corrode them; and earthen ones of ſize to make large quantities, are not eaſily procured. In many arts the crude *Tartar* does as well as the refined; but in many other occaſions none but the refined can be uſed. It were therefore much to be wiſhed, that we could get into a method of refining it here, as they do in France. *Shaw*'s Lectures, p. 158.

A great aſſiſtance in the diſſolving of *Tartar* is had from adding lime-water, pot-aſhes, or ſalt of *Tartar*; and if the alkali be here too great, it may be taken off by a proper quantity of oil of vitriol. But where a very pure *Tartar* is required, the beſt method of obtaining it is to diſſolve the common cryſtals or cream of *Tartar* in water, made highly acid with oil of vitriol. For this ſolution, after a proper evaporation, will afford perfectly fine cryſtals of *Tartar*, no way participating of the oil of vitriol.

The glaſs-men are very fond of a preparation, which they call burnt *Tartar*. This is no more than the larger lumps of red *Tartar*, burnt or calcined in earthen pans in an open fire till they have done ſmoaking, and is of a blackiſh purple colour. *Neri*'s Art of Glaſs, p. 69.

Soluble

Soluble TARTAR. The proceſs for making *ſoluble Tartar*, is this: Take of an alkaline fixed ſalt a pound, of water a gallon; and having diſſolved the ſalt in this water boiling, throw in cryſtals of *Tartar* in powder as long as any fermentation is raiſed, which uſually ceaſes before thrice the weight of the alkali is thrown in. Then ſtrain the liquor through paper; and after due evaporation ſet it by for the ſalt to cryſtallize, or elſe evaporate the liquor wholly away, that the ſalt may be left dry.

This ſalt by the action of the alkali on the acid of *Tartar*, being freed from thoſe groſs terreſtrious parts, with which the cryſtals of *Tartar*, how pure ſoever, remain ſtill charged; it diſſolves readily, and keeps ſuſpended in cold water. *Pemberton*'s London Diſpenſatory, p. 181. ſeq.

The ſeveral alkaline ſalts, that of *Tartar* itſelf, the common pot-aſhes, borax, *&c.* all make a very good *ſoluble Tartar*; and not only theſe but the common terreſtrial alkali's, whether of the mineral kingdom as chalk or lime, or of the vegetable, as the aſhes of plants after elixiviation; or of the animal, as oyſter-ſhells calcined or not calcined, and hartſhorn; all theſe give a better or worſe *ſoluble Tartar*; but of theſe none ſucceeds ſo well as the oyſter-ſhell, after it has been calcined; the *ſoluble Tartar* prepared with this, coſts alſo greatly leſs, than when prepared with ſalt of *Tartar*.

In wood-aſhes there is always a part, which when mixed with water ſwims, and is ſuſpended in it a long time, and at length ſubſides into a kind of ſoft and impalpable matter; and another part, which ſubſides readily to the bottom, and feels rough and harſh. It is the firſt of theſe ſubſtances alone, which being mixed with cream of *Tartar*, renders it ſoluble: The other part will not mix with the cream of *Tartar*, or produce any ſuch effect, unleſs reduced to the nature of the firſt, by repeated and violent calcinations, and then only a part becomes ſo altered, the whole never is ſo. It appears that the firſt portion has been wholly diveſted of its acid by the fire, and thence is become ſuſceptible of the impreſſion of the weakeſt acid, ſuch as is that of the cream of *Tartar*; but in the ſecond, or coarſer part, the acid it naturally contained remains fixed and concentrated, ſo that it is not ſuſceptible of any impreſſion from the weak acid of the cream of *Tartar*. Mem. Acad. Par. 1733.

The different kinds of *ſoluble Tartar* have alſo their different degrees of ſolubility, or different readineſs to run into a liquor *per deliquium*. The moſt eaſily ſoluble of all others are thoſe made with chalk, with lime, and with wood-aſhes; and that which is moſt differently ſo, is the kind made with borax; it will at length run however, and is truly *ſoluble Tartar*.

Regenerated TARTAR. When cream of *Tartar* has been made ſoluble by any alkaline ſubſtance whatever, it may be revived or regenerated into cream of *Tartar* again; its acid in this ſtate has diſſolved the alkaline matter preſented to it, and that has been itſelf attenuated in ſuch a manner as to render it capable of inſinuating itſelf between the molecules or integrant parts of the conſtituent matter of the cream of *Tartar*; on this only depends the ſolubility of this preparation: and to render the whole of its primitive nature again, there requires no more than the addition of a new acid, which ſhall free the *Tartar* from this alkali; but this muſt neceſſarily be ſtronger than that naturally in the *Tartar*. Thus ſpirit of nitre, or oil of vitriol, regenerate the *ſoluble Tartar* in a moment, as being more powerful acids than that in the cream of *Tartar* and therefore taking from it all its alkali's.

It might be ſuppoſed alſo, that theſe being mineral acids, and that of the *Tartar* a vegetable one, they might therefore be the more proper to take up its alkali's; but this is found not to be the caſe, for the acid of diſtilled vinegar, which is not only a vegetable acid, but is alſo the very ſame acid with that of *Tartar*, is alſo able to regenerate the ſoluble *Tartars*. It might ſeem wonderful that this ſhould be able to effect this change without any ſuperiority of force; but it is to be obſerved, that in the cream of *Tartar* the acid has a terreſtrial and alkaline baſis, which is natural to it in that form; but in the ſtate of *ſoluble Tartar* it takes a new alkaline baſis, which is not natural to it, but is ſuch as the artiſt gives it; and when we view the proceſs in this light, it does not appear wonderful that an acid of its own kind ſhould be able to take away from it this artificial alkaline baſis, though it was not able to take from it the natural one. Mem. Acad. Par. 1733.

This ſecond or artificial baſis is different, according to the different alkali's which have been employed to render the *Tartar* ſoluble, and conſequently the ſame acid may attach itſelf more to one than to another of thoſe alkali's, and quit them the more or leſs eaſily. There is one kind of *ſoluble Tartar* however, which is not to be regenerated at all; this is that, which is made with borax.

Dr. Huxham ſays, he as often experienced the good effects of *regenerated Tartar* in the cure of obſtructions of the bowels, and for ſluggiſh humours. See the article OBSTRUCTIONS *of the Bowels*.

TARTARI *Lixivium*. See the article LIXIVIUM *Tartari*.

TARTARON, a ſort of fine cloth or ſilk, mentioned in the ſtat. 4 Hen. VIII. c. 6. *Blount*, *Cowel*.

TARTARUM *Tartariſatum*, *Tartaris'd Tartar*, in chemiſtry, the name of a preparation of *Tartar*; the manner of doing which is given by Boerhaave, and is as follows: Reduce ſome of the pureſt white *Tartar* to powder, and boil this powder in ten times its weight of water in a large copper veſſel, till it appears perfectly diſſolved; let it after this continue boiling till the liquor become tolerably tranſparent, and of an acid taſte; then drop into it from on high oil of *Tartar per deliquium*, the liquor being ſtill kept boiling; upon the falling in of each drop there ariſes a great ebullition, occaſioned by the meeting of the acid and alkali. Large bubbles appear on this, and in theſe the chemiſts have imagined they found the figures of cluſters of grapes.

The operation is to be patiently continued till there is no more effervеſcence made by the falling in of the drops of the oil. The acidity of the *Tartar* will be then ſo perfectly ſaturated with its own alkali, that it will appear neither acid nor alkaline, but a third ſalt; great caution however muſt be uſed in obſerving the true point of ſaturation, otherwiſe the ſalt will be when finiſhed either a little acid, or a little alkaline, as the one or the other exceeds.

The liquor is then to be ſtrained ſeveral times through a flannel, till perfectly clear; it is of a deep browniſh colour, and brackiſh ſaline taſte, but has no ſcent. If this be evaporated to a pellicle, and ſet to cryſtallize, it forms a ſalt which is a *Tartar*, eaſily ſoluble in water, even when cold; and is very properly to be called ſoluble *Tartar*. *Boerhaav.* Chem. Part 2. p. 161.

Vitriolated TARTAR, *Tartarum Vitriolatum*. The chemiſts have ſometimes boaſted of great virtues, in what they call the magiſtery of this ſalt; this is the earth precipitated in the making of it. It is the opinion of ſome ingenious authors, that all fixed ſalts are produced by a blending together of the acid and alkaline ſalts, which the plants they are obtained from originally contained, with ſome earth. The making of this preparation of *Tartar* and vitriol, gives great ſtrength to his opinion by means of this magiſtery; which ſhews, that an earth neceſſary to the cementing a mixture of an acid and an alkali into a neutral ſalt, may exiſt even in one of the principles themſelves, though unſeen by us; and that, as in the preſent inſtance, in ſo large a quantity, as not only to be ſufficient for the combining the two volatile ſubſtances into a fixed one, but even to leave a remainder of it that was not neceſſary.

While the acid of vitriol is poured upon the diſſolved ſalt of *Tartar*, or its oil *per deliquium*, for the making of this ſalt, during the great effervеſcence between the acid and the alkali, there is a precipitation made of an earth, for the ſeparation of all which great care is to be had to the degree of ſaturation of the alkali with the acid. This earth afterwards may be ſevered by filtration. This earth is precipitated not out of the ſpirit of vitriol, but out of the ſalt of *Tartar*; and this experiment ſhews, that this fixed ſalt did originally contain that earth, which, according to the ſyſtem of the formation of fixed ſalts out of volatile ones originally reſiding in plants, muſt neceſſarily be mixed with them, and which not being able to mix with the acid, is ſeparated and thrown off in the conflict, in which the acid mixes itſelf with the reſt.

This earth is what is pompouſly called the magiſtery of vitriolated *Tartar*; but it is very wrong to give that name to an earth, which has none of the properties of that or any other ſalt; and they greatly deceive themſelves and their patients, who preſcribe it inſtead of the ſalt itſelf. Its ſaline taſte probably has induced them to think, that it poſſeſſed great virtues; but this is not innate, but adventitious, and the effect only of the fluid in which it was precipitated: It cannot but have ſome of the ſalts of that fluid hanging about it, when firſt made; but theſe may, by repeated waſhings, be carried wholly off, and the magiſtery will then remain a pure ſimple earth, and ſhew itſelf to be no other than that earth which may be properly called the earth of all fixed ſalts; and which, though neceſſary to give the ſalt of *Tartar* its form as a lixivial ſalt, yet being not neceſſary to it in its new form of a neutral ſalt, is depoſited in the making it into that form. It yet remains to be proved by more numerous experiments, that the fixed ſalts of plants owe that form only to a fixing earth, combining their two original volatile principles into a fixed maſs; for if this be truly the caſe, there then needs no more to the volatilizing them again, but the diveſting them of this earth. Phil. Tranſ. N°. 92.

TARTARHAN, a word uſed by ſome authors to expreſs ſpirit of tartar.

TARTARUGA, in zoology, a name by which the Portugueſe in America call a ſpecies of tortoiſe, known among authors by its Braſilian name *jurucua*. See the articles JURUCUA and TESTUDO.

TARTI *Lapis*, a ſtone mentioned by Ludovicus Dulcis, and ſome other authors, and ſaid to be very beautiful, having all the colours of the tail of a peacock, and to have many medicinal virtues. It was probably ſome ſpecies of agate; but the ſhort account given of it will not enable us to gueſs what particular kind.

TARTON *Raire*, in botany, a name uſed by ſome authors for the heath ſpurge, or that ſpecies of the thymelæa which is called *ſannamunda* in the catalogues of the materia medica. *Park.* Theat. p. 199.

TARUM, in botany, a name given by Pliny to the *agallochum ſylveſtre*, a ſpecies of aromatic plants. *Hofm.* Lex. in voc. See the article AGALLOCHUM.

TASIS, Τασις, in rhetoric, is uſed for the continuation of a period longer than the breath can bear. *Voſſ.* Ret. l. 4. p. 66.

TASCHENMUL, in zoology, a name given by authors to the *anas clypeata*, a ſpecies of duck, remarkable for the breadth of the end of its beak, and called in Engliſh, the *ſhoveler*. *Aldrovand.* de Avib. T. 3. p. 224. See the article SHOVELER.

TASTATURA, in the Italian muſic, the whole range of keys of organs, harpſichords, &c. See the articles ORGAN and HARPSICHORD, *Cycl.*

TASTE (*Cycl.*)—This is one of the moſt obvious characters of bodies, and much is to be judged from it of the nature of many things. Dr. Abercromby, in a treatiſe partly written on this ſubject, has carried his obſervations ſo far, as to lay down a ſet of rules for the judging of any plant, or other body, without knowing what it is, merely from its *Taſte*, in regard to its virtues in medicine.

In order to judge of what he expreſsly means by the names of the ſeveral *Taſtes*, it is proper to add the liſt of them, with ſome of the things to which they are applied.

Plants, fruits, &c. are either ſour as the common ſorrel, harſh as the medlar, auſtere or rough as the quince, ſweet as the freſh juice of ripe grapes, fat and oily as the ſeſamum, bitter as gentian, or the wild cucumber, ſalt as common ſea-ſalt, tart as garlick, or laſtly, inſipid as the gourd, or of ſome mixed *Taſtes*, made of two or more of theſe.

The harſh or acerb things are cold, repelling and binding, hardly concocted, and they may all be known upon the tongue by their contracting or drying it. The auſtere or rough things differ from theſe only in degree, as being ſomewhat milder in *Taſte*, and weaker in virtues.

The ſour or acid things are always cooling; but this never to exceſs, by reaſon of their penetrating parts; this *Taſte* is known by a biting on the tongue, but without any heat.

Sweet things are all nutritive; and, taking the word in its proper ſenſe, it is they only that are ſo. Their ſweetneſs ariſes from their neither being too hot nor too cold upon the tongue.

Fat things are moderately hot, and, on this account they all, in ſome degree, moiſten and relax; but they alſo obſtruct: they are known from the ſweet things by filling and, as it were, anointing the tongue, without giving that ſenſe of pleaſure that the others do.

Salt things are aſtringent and deterſive; the one quality they have from their earthy part, the other from their watery.

Bitter things may be very beneficial to the ſtomach; but, in improper caſes, they may alſo do hurt. The pungent bitters, ſuch as the elaterium, or wild cucumber, are all hurtful, unleſs rendered ſafe by other means.

Tart things are hot, and often bad for the head; but good in heavy and phlegmatic conſtitutions; they are known by their heat in the mouth.

Laſtly; inſipid things in general have no peculiar quality, but are cold and watery; they are generally hurtful to the ſtomach, unleſs mixed with hotter and ſpicy things. *Abercromb.* Nov. Medic. Clavis.

It is obſerved by Sir John Floyer, that the *Taſte* is ſo good a judge for us, that all the chemical principles in plants may be diſcovered by it, before their diſtillation. All watery plants ſhew their phlegm, as well to the *Taſte*, as by diſtilling; and in all dry woods, the *Taſte* diſcovers the earth they contain, as well as a chemical analyſis; by the mucilaginous and gummy *Taſte*, and by the manifeſt oilyneſs in ſome plants, we diſtinguiſh their abounding in oil, as well as by the retort. The ſmell alſo helps us greatly in an extemporary judging of plants, and we are able to declare upon the ſpot, that all the aromatic plants, and all the fœtid ones, contain a large quantity of a volatile oil and ſalt. By the acrimony and pungency, we are well aſſured, that there is a volatile ſalt in plants; and, by the burning taſte of others, we find that there is a corroſive ſalt in them. By a crude rough acidity, we diſtinguiſh the tartar or eſſential ſalt of plants to be in large quantity; but if the acidity be of a vinous ſmell, we obſerve that it is of a middle ſtate of digeſtion, and may be called a vinous tartar, and diſtinguiſhed from the firſt; but if the tartar have a pungent ſmell, then it is evidently a volatile tartar, or an acid acrid tartar.

The ſweet *Taſtes* are more numerous in plants, and more varied among themſelves than any other kind. Theſe, in general, ſhew their oil by thin ſlimy ſmoothneſs, and their tartar is evident in their extracts, as is very plain in the common liquorice juice.

The graſs ſweets, as the common dogs graſs, and the like, have much eſſential ſalt, and a moderate portion of oil; and the ruſh, reed, horſe-tail, and cats-tail, are all ſweet and rough; ſome of theſe have more oil, and others more acid; and the moſt crude among them have more oil than tartar.

The corn ſweets, as barley, rye, wheat, oats, millet, and rice, have much oil and eſſential ſalt, and a little volatile; ſo bread, prepared of any of theſe, yields on analyſis oil, and eſſential and volatile ſalt.

It is to be obſerved here, that fermentation and fire ſeverally produce a volatile ſalt, where it was not before, by ſubtilizing and volatilizing the eſſential ſalt; and the ſlimy mealineſs in corn ſupplies the oil. The goats beard and ſcorzonera kind, have the ſame principles as the graſſes, much oil and eſſential ſalt. The ſub-acrid ſweets, as rampions, campanulas, trachelia, and the like, contain much oil and eſſential ſalt; but the acrimony in theſe plants ſhews that they have alſo a volatile ſalt, and that in no ſmall quantity; though Lemery and the other chemical writers have not obſerved this.

The ferns, polypodys, and all that claſs of plants, contain much oil and eſſential ſalt; but the chemiſts in general have omitted to mention an acrid principle in all theſe, which beſpeaks a volatile ſalt; and fragrancy is obſerved in ſome of the harts-tongues, which beſpeaks a volatile ſalt alſo, and volatile oil, though hitherto unobſerved.

All the leguminous ſlimy ſweets have more oil than tartar; but all of them have a large quantity of both. Beans, Peas, and lentils, have alſo a volatile ſalt, as has alſo that ſtrange fruit, eaten in Ruſſia, and ſome other places, and called *lenticula aquatica* by ſome; but by the botanical writers, *tribulus aquaticus*; the other name belonging to the common duck-weed. The aromatic legumens, ſuch as melilot, have an exalted oil, and volatile ſalt. The honeyſuckle is ſaid by Lemery, and the other chemiſts, only to have an eſſential ſalt and oil; but as there is a highly aromatic flavour, and great acrimony, there muſt be alſo a volatile ſalt.

Theſe are ſome few inſtances, out of a vaſt number recited by the author, for the reſt of which we refer to the paper itſelf in N°. 280 of the Tranſactions. Philoſ. Tranſ. N°. 299. p. 1160.

TASTO, in the Italian muſic, the touch or part of any inſtrument, whereon, or by means of which its notes are made to ſound, be it on the neck, as lutes, viols, &c. which are called fixed and immoveable; or the front of organs, ſpinnets, or harpſichords, where the keys are diſpoſed to raiſe the jacks, called moveable touches; and is properly no more than the finger-board of each.

Taſto Solo is often found in thorough baſſes, where it ſhews that the inſtruments accompanying, as the lute, organ, &c. are only to ſtrike a ſingle ſound, from that place, till they find cyphers, or the words *accordo* or *accompanimento* placed in their part. Theſe intimate, that the accords are to begin again in this place.

TATA-*Youba*, in botany, a name uſed by ſome for the tree which yields what the dyers call the fuſtic, or yellow wood uſed in dying. *De Laët.* Ind. Occident. p. 603.

TATU, in zoology, the Brazilian name for the armadillo, or ſhell hedge-hog. *Grew's* Muſ. Reg. Societ. p. 17. See the article ARMADILLO.

We have ſeveral ſpecies of this creature deſcribed to us; but the moſt uſual, is of the figure of a hog, and of the ſize of a large pig, and has a bony covering, which extends over the whole body, the head and the tail. This is compoſed of a number of very elegant ſcales, which have two junctures near the hinder part of the head, by means of which the creature is able to move its neck. On the back there are ſeven diviſions, with a thick membrane between; and in all other parts of the body the ſhell is whole. The legs, ſo far as they come in ſight, are in the ſame manner defended by a bony covering, in form of a ſhell, but thinner than that of the back; the belly has nothing of this covering, but is beſet with a few whitiſh hairs, which grow out of very obſervable and eminent pores. The junctures of the head and back have alſo the ſame ſort of hairs; the head is like that of a hog, the noſe ſharp, the eyes ſmall, and ſet deep; the ears ſhort, naked, and brown; the teeth are but ſmall, and are in number eighteen in each jaw. The feet are made like hands; each has five toes, and the nails are round. Its colour is a ſort of reddiſh tawny. It digs up the ground with its noſe, in the manner of a hog, but much more nimbly; the tail is thick at the inſertion, and tapers to the extremity. The creature feeds on roots and fruits, as potatoes, melons, and the like; but will eat meat alſo if it comes in its way. It is uſually found in dry places; but ſometimes in watery ones. *Ray's* Syn. Quad. p. 233.

TATU-*Apara*, in zoology, the name of a creature of the armadillo kind; but differing from the others in many particulars: Its head is oblong, and of a pyramidal figure; its ears are ſmall, ſhort, and roundiſh; and its feet, as well the fore ones as the hinder ones, have each five toes. The fore legs are about three fingers long, the hinder ones five; the tail of a pyramidal figure, and little more than two fingers breadth long. It is covered with a ſhelly coat of a foot long, and eight fingers wide; it is ſmaller at both ends than in the middle; and is convex on the outſide, and concave within. In the middle, or a little toward the fore end, it has four junctures, which are placed tranſverſely, and by means of which it can, at pleaſure, either expand its ſhell, or contract it together into a round figure. The whole cruſt is compoſed of pentangular pieces, very nicely fitted to one another, and the ſeries of theſe between the commiſſures are parallellograms. The whole is compoſed of yelloviſh ſcales joined by an extremely tough ſkin.

When the creature would ſleep, or when it is afraid of being taken up, it contracts its cruſt into a round figure; and hiding its

whole body within, it might ſooner be taken for a ſea-ſhell than a land animal. Its fleſh is eatable, like the reſt of this kind; and its food is the ſame as theirs. *Ray*'s Syn. Quad. p. 234. See Tab. of Quadrupeds, N°. 21.

TATU-*Muſtelinus*, the *weaſel-headed armadillo*, in zoology, the name of a ſmall animal of the armadillo kind; its head is about three inches and an half long; his forehead two inches and a half broad, and very flat; the end of his noſe half an inch; his eyes ſmall; his ears very diſtant from one another; his body eleven inches long, and about ſix broad; and his tail five inches long, and not tapering to ſo extreme a thinneſs at the point as that of the common armadillo, but a fifth of an inch over. His fore leg two inches and a half long, and three quarters of an inch broad, with five toes; his hinder foot ſomething larger, and with the ſame number of toes. His head, back, ſides, and tail, all covered with a ſhelly armour. His breaſt, belly, and ears, all naked. *Grew*'s Muſæum Reg. Societ. p. 19.

TATU-*Porcinus*, in zoology, the name of the pig-headed armadillo, a creature of about twelve or fourteen inches long.

Its noſe is ſhaped like that of a pig, with four toes on its fore feet, and the hinder foot thicker, and having five toes; his tail eleven inches long, and extremely ſmall at the extremity. Its head, legs, back, and tail, are all covered with a ſhelly armour. The fore part of his tail covered with eleven ſhelly rings; his thighs, breaſt, belly, and ears, all naked; his eyes black, round, and very ſmall. His teeth are twelve in each chap, and no thicker than large needles. *Grew*'s Muſæum Reg. Societ. p. 18.

TATUETE, in zoology, the name of a ſpecies of *Tatu*, or armadillo, ſmaller than the common one, and differing alſo in many other reſpects.

Its head is ſmall and ſharp; its ears long and erect; its tail about three fingers long; and its legs much longer than in the common larger kind; but its moſt ſignal difference is, that it has only four toes on the fore feet, and five on the hinder ones; the two middle ones are the longeſt on the fore feet, and the three middle ones on the hinder; its whole length is about ſeven fingers breadth; its forehead and whole body are covered with a coat of armour, which ſtands out at the ſides ſo far, that the creature can, at pleaſure, draw in its head and legs under it; the armour of the back conſiſts of nine pieces nicely joined to one another; the tail is coated in the ſame manner, and has likewiſe nine junctures, and ends in a point. It is of an iron colour on the back, and whitiſh at the ſides; its belly alſo is whitiſh and naked, except for a few hairs.

The fleſh of this is accounted more delicious than that of any other creature of this kind, though they may all be eaten. *Ray*'s Syn. Quad. p. 234.

TATULA, in botany, a name uſed by Cluſius, and ſome other authors, for the ſtramonium, or thorn-apple. *Ger.* Emac. Ind. 2.

TAVACCARÆ, in the materia medica, the name by which many authors call the *coccus maldiviæ*, or maldive nut. *Piſo*, p. 203.

TAULACUM, in natural hiſtory, a name given by the people of the Eaſt Indies to a ſpecies of orpiment which is very common with them.

It is of a dirty yellow colour, and is compoſed partly of an irregular maſs, partly of fine flakes, like ſcales of fiſhes. Theſe are of the beſt colour. The whole maſs, on being expoſed to the fire, burns, and emits copious fumes; but it does not melt readily. After it has been ſeveral times calcined, the Indians give it internally in intermittent fevers, with ſafety and ſucceſs. *Woodw.* Catal. Foſſ. vol. 1. p. 24.

TAUREA, among the Romans, a puniſhment inflicted by whipping with ſcourges made of bulls hides. *Pitiſc.* in voc.

TAURIA, Ταυρια, in antiquity, a feſtival in honour of Neptune. *Pott.* Archæol. T. 1. p. 432.

TAURILIA, among the Romans, games in honour of the infernal gods. They were otherwiſe called *ludi taurii*. See *Pitiſc.* in voc. *Ludi*.

TAUROBOLIUM, or TAUROBOLION, among the antients, ſacrifices of bulls, which were offered to Cybele, the mother of the gods, to render thanks to the goddeſs of the earth, for her teaching men the art to tame thoſe animals, and fit them for labour. See *Pitiſc.* in voc.

TAUROCOLLA, *Bull-glue*, a ſort of glue much uſed among the antients in works that required ſtrength, being accounted far ſtronger than any other kind. It was made by boiling down the ears and genital parts of a bull in water.

TAURUS, (*Cycl.*) *Bull*, in zoology, the male of the ox-kind. See the articles BULL and BOS.

TAURUS, in ornithology, a name given by the antients to the bittern, or butterbump, from its imitating the roaring of a bull in its noiſe.

TAURUS *Æthiopicus*, the *Æthiopian Bull*, an animal deſcribed in a very remarkable manner by Pliny.

He indeed calls it the Indian *Bull*, and has led Solinus into the ſame error; but all the authors whom he quotes, and from whom he has tranſcribed his account, calling it the *Æthiopian Bull*, we may be aſſured that was its proper country. Agatharcides is the oldeſt author who has deſcribed theſe animals; he ſays, they lived only in Æthiopia, and that they were greatly larger than our oxen, and of a yellowiſh or tawny colour, and were ſwifter of foot than almoſt any other animal. Strabo, and all the other authors of credit, alſo mention this animal; but the deſcriptions they give of it are, in ſome particulars, carried too far into the marvellous.

They tell us, that all its hair ſtands the wrong way, and makes it the rougheſt animal, to appearance, in the world; and that its head is, as it were, all mouth, the opening of the mouth reaching from ear to ear. The horns, they ſay alſo, were very ſtrong and ſharp, and were moveable, ſo that the creature could turn them in any direction, at pleaſure, to take aim at the proper part of the creature he would gore; but that as ſoon as he had placed them in this direction, they became firm and unalterable in it by any force, till he choſe to alter the poſition himſelf. They, add, that its back, or hide in general, was of the hardneſs of flint, and turned away all ſorts of darts. This creature hunted and fed upon all other animals, according to the accounts of the ſame authors, and could itſelf never be taken but by pitfalls; and that when it was thus trapped, and let down into a hole or pit, out of which it was impoſſible to get out, its fury generally killed it in a few minutes, without any wound. Theſe are the wonderful things related by the antients of this animal; but they are ſo contrary to the courſe of nature in the ox kind, that we may very juſtly rank them among the other miraculous animals, ſuch as the mantichora; and the vermis cæruleus, of ſixty or ſeventy foot long. See the articles MANTICHORA.

TAXUS, the *Yew*, in botany, the name of a genus of trees, the characters of which are theſe: The flower is of the amentaceous kind, and is compoſed of a number of apices, uſually ſhaped like muſhrooms; theſe are the male flowers; the embryo fruit appears in different parts of the tree, and finally becomes a red berry, of a hollowed or cup-like ſhape, juicy, and containing a ſeed. There are alſo ſometimes, on the ſame trees with theſe, dry fruits, in ſhape of acorns; the ſeed being encloſed at its bottom, not by a juicy berry, but by a dry cup.

There is no other known ſpecies of the *Yew*, beſide the common kind; but that is ſometimes found with variegated leaves. *Tourn.* Inſt. p. 589.

TAXUS, in zoology, the name of the *Badger*, called in ſome parts of England, the *brock*, the *gray*, and the *pate*. The Greeks had no name for this animal, unleſs their *hyæna* was the ſame creature. See the article HYÆNA.

Authors who have deſcribed this animal, have all made two kinds; the *Taxus-Caninus* and *Taxus-Porcinus*, the dog and the hog-*Badger*. The laſt of theſe is our common kind; and 'tis indeed doubted whether there be any ſuch animal as the authors deſcribe under the other name.

The body of the *Badger* is ſhort and thick; its neck very ſhort, and its hairs long, and very rigid, and ſtiff like hog's briſtles. Thoſe on the back are of a pale yellow near the root; brown or black in the middle, and at the extremities yellowiſh again; ſo that the creature appears, upon the whole, of a mixt colour, or what we call grey, on the back. The ſides and belly are covered with hairs, which are all over of a pale yellowiſh hue; and the legs and ſhoulders, as alſo the belly, are wholly black. It has a broad white line from the top of the head to the noſe; and on each ſide of this a very regular pyramidal black mark reaching up to the ears; and below theſe the jaws are whitiſh, that the creature's face looks very oddly variegated. Its eyes are ſmall; and its ſnout wholly like a dog's. The teeth are like thoſe of a dog alſo; and the legs ſhort; its fore feet have ſharp claws, with which it digs itſelf burrows in the earth. Its face is very like that of the fox, being broad at the top of the forehead, and ſharpening to a point at the noſe, ſo as to appear triangular in ſhape; and its cheeks are tumid, and furniſhed with ſtrong muſcles, whence it bites very hard. It feeds on inſects and ſmall animals, and on the roots of vegetables. We have them in many parts of England, particularly in the counties of Eſſex, Suſſex, and Warwickſhire. *Ray*'s Syn. Quad. p. 185.

The *Badger*'s ſkin is of ſome uſe in commerce. Their fat is ſold by the druggiſts, as a remedy againſt diſorders of the kidneys, and the ſciatica; and their hair for the making pencils for painters and gilders. *Savar.* Dict. de Comm. p. 354.

TEA (*Cycl.*)—*Tea* is extolled by the orientals as the greateſt of all medicines; moderately and properly taken, it acts as a gentle aſtringent and corroborative; it ſtrengthens the ſtomach and bowels, and is good againſt nauſeas, indigeſtions, and diarrhœas. It acts alſo as a diuretic and diaphoretic. The immoderate uſe of it, however, has been very prejudicial to many, who have been thereby thrown into the diabetes.

TEALE. *Summer* TEALE, in zoology. See the article CIRCIAS.

TEARS (*Cycl.*)—Dr. Vaterus is of opinion, that the *Tears* come from the white lines ſeen on the inſide of the palpebræ, deſcribed by Meibomius. He obſerved two ſmall ducts, beſides the common naſal duct, from the lacrymal ſac into the noſe; one of them opened into the upper part of the noſe; the other opened into the *antrum maxillare*. Miſcel. Berol. Tom. 4. par. 3. §. 5.

TEASEL, *Dipſacus*, in botany. See the article DIPSACUS. Beſide the common wild ſpecies of this plant, there is a large kind of it, the heads of which are of ſingular uſe in raiſing the nap upon woollen cloth, for which it is propagated in great quantities in many parts in the Weſt of England. It is to be ſown in March, on a dry ſoil; a peck of the ſeeds are ſufficient to ſow an acre: The plants being come up, muſt be houghed up firſt to ſix inches, and ſome time after to a foot aſunder every way; and for the firſt ſummer the ground muſt be kept carefully cleared from weeds. The ſecond year after ſowing, the plants ſhoot up to heads, which are fit to cut in Auguſt, and tied up in bundles, and dried. The common produce of an acre of land is about a hundred and ſixty bundles, which are ſold at about a ſhilling a bundle. Some people ſow carraway among their *Teaſels*, but it only damages both. *Miller*'s Gardener's Dict.

TEBET, or THEVET, the fourth month of the civil year of the Hebrews, and the tenth of their eccleſiaſtical year. It anſwered to our moon of December, and has but 29 days. The ſecond day of this Month is the laſt of the octave of the dedication of the temple, after it was purified by Judas Maccabeus. V. 1 Macc. iv. 59. John x. 22. *Calmet*, Diction. Bibl. in voc.

TECHNICAL *Chemiſtry*. See CHEMISTRY.

TECOLITTROS, in natural hiſtory, the name of a gem, otherwiſe called *Syriacus lapis*, and *Judaicus lapis*, good for diſſolving the human *calculus*. See the articles SYRIACUS and JUDAICUS.

It has this name from τηκω, I diſſolve, and λιθος, a ſtone; becauſe it diſſolves ſtones. *Hofm.* Lex. univ. in voc.

TEE, in the manege. See the article BREAST-*Plate*.

TEETH (*Cycl.*)—When the *Teeth* are ſubject to be overſpread with a black or yellow cruſt, it is a very good method to rub them well every day with a mixture of tincture of gum lac, honey of roſes, and ſpirit of vitriol, which will not only whiten the *Teeth*, but render the gums more firm.

The world is fond of tooth powders, and a moderate uſe of them may do ſervice; but the daily rubbing with them does more harm to the *Teeth* than wholly neglecting them. Powders of this kind may be prudently uſed once in ſix or ſeven days, and will render the *Teeth* white and ſplendid. The common powders, prepared for this purpoſe, are too hard, and wear away the gums; ſofter ſubſtances ſhould be employed, and when the gums are f d, a few drops of ſome acid ſpirit be added to the powder. The following is a very efficacious and ſafe powder: Take chalk in powder, myrrh, burnt hartſhorn levigated, and Florentine rice root, of each two drams. Spirit of ſalt, ſix drops; mix all into a powder. *Heiſter*'s Surgery, p. 457.

The common trick of mountebanks, and other ſuch practiſers, is to uſe various waſhes for the *Teeth*, the ſudden effects of which, in cleaning and whitening the *Teeth*, ſurprize and pleaſe people; but the effects are very pernicious. All the ſtrong acid ſpirits will do this. As good a mixture as any thing can be, on this occaſion, is the following: Take plantane water an ounce, honey of roſes two drams, ſpirit of ſalt ten drops; mix the whole together, and rub the *Teeth* with a piece of linnen rag dipped in this, every day, till they are whitened. The mouth ought to be well waſhed with cold water, after the uſe of this or any other acid liquor; and indeed the beſt of all *Teeth*-waſhes is cold water, with or without a little ſalt; the conſtant uſe of this will keep them clean and white, and prevent them from aching. *Heiſter*'s Surg. p. 457.

Animalcules in the TEETH. No animalcules are to be found in any of the juices of the body, except the ſemen of male animals; and conſequently the ſaliva affords none: yet great numbers, and thoſe of different kinds, may be diſcovered in the white matter ſticking between the *Teeth*, if it be picked out with a pin or needle, and mixed with a little rain water, or ſpittle, without bubbles, and applied before the microſcope; and ſometimes they are ſo incredibly numerous, and full of motion, that the whole maſs ſeems alive. The largeſt ſort are of an oblong oval figure, and pointed at one end; theſe move along very ſwiftly; but of theſe there are but few. There is another ſort like theſe, in figure, but much ſhorter and ſmaller; theſe have a peculiar motion, being always running in an undulated or ſpiral line. A third ſort are roundiſh, and ſo minute, that a grain of coarſe ſand is equal to a million of them in bigneſs: Theſe move ſo very nimbly, that their ſhape is not eaſily diſtinguiſhed; yet they appear like large ſwarms of gnats.

Some, or all of theſe three kinds, may be found between the *Teeth* of perſons of all ages and ſexes, eſpecially between the grinders, and that though the mouth be waſhed ever ſo conſtantly. But from the *Teeth* of people who are more careleſs, there may uſually be taken another ſort of animal, in the ſhape of an eel or worm; theſe move backwards and forwards with great agility, and force their way through the cluſters of ſmaller animalcules with great impetuoſity; they move their bodies alſo into ſeveral bendings in their progreſſions. Beſide theſe, there are alſo ſeveral other ſpecies of animalcules, whoſe motion is ſo ſlow and languid, that it requires great attention to be ſure that they have life. They all die if a little vinegar be put to them; whence it ſeems a very proper method, to waſh the mouth with vinegar, in order to deſtroy them. *Baker*'s Microſcope, p. 167.

Clenched TEETH. The *Teeth* are in ſome caſes found ſo cloſely and firmly ſhut, that they cannot be opened ſufficiently to give the perſon liberty to eat or ſpeak. This generally ariſes from a ſpaſm or cramp of the elevating muſcles of the lower jaw. The cauſe of this ſpaſm is various; ſometimes it ariſes from a wound or blow, even from injuries of the nerves and tendons in different parts of the body; as after an amputation of an arm or a leg. Sometimes alſo, it is owing to an inflammation of the fauces themſelves.

When this diſorder ariſes from a wound, the firſt thing to be done is to ſearch whether there be not ſome extraneous body left in it, which excites theſe ſpaſms; if this be found to be the caſe, they always ceaſe immediately, upon the pulling out ſuch offending matters. If there be no ſuch bodies in the wound, and medicines give no relief to the convulſions, you may be ſure that ſome nerve is wounded; and the method then is to cut the nerve in two, if that may be done, and immediately the ſpaſms will ceaſe. Sometimes however, the nerve lies inacceſſible, or cannot be divided without danger of the patient's life; which is a very deplorable caſe, and generally brings on a neceſſity of amputating the limb. Theſe ſpaſms when from amputations are leſs to be dreaded, ſince they generally go off on untying the ligatures about the veſſels, and taking away the vitriol or other cauſtic applied to reſtrain the hæmorrhage.

When an inflammation of the tonſils or jaw excites this ſpaſm, theſe are to be treated in the common method; and the cauſe being removed, as in the other caſes, the effect will ceaſe. But if this diſorder be of ſo long continuance as to threaten the patient with ſtarving, he is to be ſupplied with broths and other liquid food, which may be ſucked through the *Teeth*.

The ſurgeons have an inſtrument, which they call *ſpeculum oris*, made to force open the mouth on theſe occaſions, and ſome adviſe the breaking out a *Tooth*, to give room for food and medicines; but both theſe practices are wholly to be rejected, as making the ſpaſms more violent and obſtinate. *Heiſter*'s Surg. p. 455.

Hollow TEETH. The *Teeth* which are hollow and decayed are uſually carious, and admit ſome parts of the food into their cavities, which by degrees putrifies, becomes acrimonious, and not only farther deſtroys the *Teeth* themſelves, but irritates the internal perioſteum and nerves of the *Teeth*, ſo as often to cauſe intolerable pain. Many methods have been contrived for relief in theſe caſes: One is to clean the cavity, and then fill it up with maſtick as often as there is occaſion; and another is the filling up the cavity with a piece of lead or gold. The cavity may alſo be filled at times with oil of cloves, and the like, or cauterized with a red hot iron; this generally proves a laſting remedy, and is attended with very little additional pain, if carefully performed, and no part of the mouth burnt. If all theſe methods fail, the laſt relief is the taking out the *Tooth*, and afterwards replacing it again. *Heiſter*'s Surg. p. 458. See the article TOOTH-*Drawing*.

Supernumerary TEETH. Theſe are ſometimes the cauſe of great diſorders, and may, without careful examination, be miſtaken for exoſtoſes or ſchirruſes of the palate. See Med. Eſſ. *Edinb.* Vol. 5. art. 16.

Mark of TEETH, in the manege. See the articles MARK and EYE *of a Bean*.

TEETH *of Fiſh*, *Dentes Piſcium*. The *Teeth* in the fiſh kind are ſo very various in their ſhape, and alſo ſo variouſly diſpoſed, that they make a very notable mark of diſtinction among the ſeveral genera.

As to ſituation, they are, 1. ſometimes placed only in the fauces and orifice of the ſtomach, the reſt of the mouth being entirely ſmooth: We have examples of this in the cyprini, and the ammodytæ or ſand-eels, and many other fiſh. 2. In ſome the *Teeth* are placed only in the jaws; the tongue, the palate, and the inner part of the mouth being ſmooth. 3. In ſome they are placed in the jaws, and on the tongue, the reſt of the mouth being ſmooth. 4. In ſome the tongue, the palate, and the jaws have *Teeth*, but the back part of the mouth is ſmooth; the herring has them diſpoſed in this manner. 5. Some have the fauces, tongue, palate, and jaws all beſet with *Teeth*, as the ſalmons, &c. 6. Some have them in the fauces and jaws only, the tongue and the palate being ſmooth: This we have inſtances of in the pleuronecti. And finally, 7. Some fiſhes have *Teeth* in the jaws, fauces and palate, and the tongue only remains ſmooth: This we ſee in the mackrel, &c. And all theſe are very eſſential marks and diſtinctions never varying in the ſame fiſh, and may ſerve as characters much better than the colours and other ſuch more obvious, but leſs eſſential things, remarked by the old authors.

The differences in the ſhape of the *Teeth*, are as many as thoſe in their ſituation, and may ſerve to as much purpoſe in their diſtinctions. 1. They are in ſome acute and ſharp at the ends; this is the caſe in moſt fiſh. 2. In ſome they are obtuſe, and as it were flatted at the end, as in the cyprini. 3. In ſome fiſh they are of a conic ſhape, as thoſe in

the upper jaw of the thymallus. 4. They are in ſome compreſſed or flatted at the ſides, as in the gadi and eſoces. 5. They are ſmooth and even at the ſides, as in the greater part of fiſhes: Or, 6. They are ſerrated or notched at the ſides, as in the ſhark kind, and ſome others. 7. They are in ſome ſtrait, as in the common acus or needle-fiſh, of Oppian. And, 8. They are ſometimes crooked inwards, as in the oſmeri, &c. Finally, they are ſometimes convex on one ſide, and flat on the other, as in the capriſcus.

The *Teeth* of fiſh differ in proportion alſo. 1. In ſome they are all of the ſame ſize in the ſame fiſh, as in the cottus, &c. 2. In ſome they are of very different ſizes in the ſame mouth; we have inſtances of this in the pike, the lucioperca, and many of the gadi. 3. They differ alſo in number and arrangement, for in ſome fiſh they are placed only in ſingle rows in the jaws, and other places allotted for them; but in others they are aggregated into ſeveral rows; the firſt is the caſe in the ſalmons, &c. the other in the cotti, and other fiſh. *Artedi* Ichthyolog.

Mammoth's TEETH. See the article MAMMOTH's *Teeth*.

TEFTERDAR, the name of an office of dignity in the Eaſtern nations. In Ægypt he is the lord high-treaſurer of the tribute paid out of the lands to the Grand Seignior. He is named for a year by the Porte; but is generally continued in his office many years. This office is ſometimes given to one of the poorer Beys, to help him to ſupport his dignity; and frequently to a quiet one, who is not likely to enter into intrigues. For one party never cares that a ſtirring man of the oppoſite party ſhould be inveſted with an office of this dignity. *Pocock's* Egypt. p. 165.

TEGS, a term uſed in ſome part of the kingdom by the farmers, to expreſs lambs of a year old.

When a flock of ewes and lambs are turned into a turnep-field, the young lambs of three weeks old will immediately fall to eating the turneps, and ſcoop them very prettily; but theſe *Tegs* will not touch them for ſeveral days. They uſually ſtay till almoſt ſtarved to death before they begin, but when they have begun they ſoon grow fat.

TEGULA *Hybernica*, Iriſh *Slate*; a ſtone of the ſlate kind, ſo ſtrongly impregnated with alum, as to deſerve the name of an alum ore. It is often likewiſe found to contain a large portion of vitriol.

It is found in great abundance in many parts of Ireland, as alſo in ſeveral of our own counties. Many preſcribe it in powder as a ſtyptic, in hæmorrhages of all kinds, with ſucceſs; but, perhaps, it would be full as prudent for the perſon who knows to what ſalt or ſalts it owes this virtue, to give thoſe ſalts alone, in a doſe that he can depend upon, and without the load of earthy matter, which is always to be found in this powder. Vid. *Hill*, Hiſt. Mat. Med. p. 257. ſeq.

This ſubſtance beaten to powder and infuſed twelve hours in water, will impart ſo much of the vitriolic ſalt it contains to the water, that being mixed with an infuſion of galls the liquor will become reddiſh, in the ſame manner that the medicinal waters of many parts of this kingdom do, which not containing vitriol enough to make ink with, the infuſion of galls yet turn reddiſh with it. It is hence not improbable, that many of theſe waters owe their virtues to this very ſubſtance. This kind of ſlate being very frequent in many parts of the kingdom, at different depths under the ſurface; and it being not hard to conceive, that a bed of water paſſing through a large ſtratum of it, may acquire thoſe virtues in its paſſage that we find common water, in our own experiments, becomes poſſeſſed of by a few hours cold infuſion.

This on being calcined, in order to try whether it be an iron ore, does not after burning, anſwer to the magnet; ſo that it ſeems to contain no iron at all in the ſtate of metal. But this is obſervable, that it calcines to a ſort of ochre, becoming of a yellow colour, and marking as ochres will do. The yellow of this ſlate being burnt too far becomes of an orange-colour, exactly like the ſediment of yellow matter, which we find about the ferrugineous waters; and this ſediment is hence eſteemed by ſome to be the remains of this ſlate diſſolved by the water, rather than iron ore. It is even doubted by ſome, whether the yellow ochres are indeed iron ores, or not; for many of them will not anſwer to the magnet, even after ſeveral days and nights continued calcination. It is indeed very certain, that all the naturally red ochres do contain iron, all of them having particles that anſwer to the magnet after a much ſlighter calcination than this given in vain to the yellow kinds. Phil. Tranſ. N°. 243. p. 272.

TEICHOPŒUS, τειχοποιος, among the Athenians, an officer who had the care of the city walls; their number was the ſame with that of the tribes, every tribe having the choice of one. *Potter*, Archæol. Græc. T. 1. p. 84.

TEITEI, in zoology, the name of a Braſilian bird called alſo *guiranheemegeta*, and *guroundi*.

It is of the ſize of our red-breaſt. Its beak is black, thick, and ſhort; its head, the upper part of its neck, its wings, its back, and its tail, are of a bluiſh black, ſhining like the fineſt high-poliſhed ſteel. Its throat, the lower part of its neck, its breaſt, and its belly, are yellowiſh. Its legs and feet are brown. The female is of the ſame ſize with the male, but differs in colour, being variegated with green, yellow, and grey. It ſings very ſweetly, and is kept in cages, five or ſix together in the ſame cage. *Marggrave's* Hiſt. Braſil.

TEJUGUACU, in zoology, the name of a ſpecies of lizard, common in the Brazils, and called alſo *Temapara*.

It much reſembles the iguana, in its general figure, but differs from it in that its whole body is black, only variegated with ſome white ſpots; its tail is thicker at its origin, it has not the ſeries of ſerrated ſpines, which the iguana has running all down its back. In the hinder feet the outer toe is alſo more remote from the reſt, and ſhorter; and it has a long red bifid tongue; and the animal can vibrate it an inch or more out of its mouth, in the manner of ſnakes; but it makes no hiſſing. It lives principally on the ſucking of eggs, but it is capable of bearing hunger a long time; Marggrave having kept one alive ſeven months without eating. This ſpecies afforded alſo a certain teſtimony to that author, of the reproduction of the tail when cut off. *Ray's* Syn. Quad. p. 265.

TEIUNHANA, in zoology, the name of a ſmall American lizard. It is about the thickneſs of one's little finger, and has a ſharp noſe. Its tail is very ſlender, ſix fingers breadth long, and terminates in a point almoſt as ſharp as a needle. Its head is covered with ſcales; its back, ſides, and legs, with a tender ſkin as ſoft as ſattin to the touch; and its tail is covered with extremely minute ſcales, of a ſquare figure. The throat and belly are covered alſo with ſcales of the ſame ſhape, but larger. Its head is wholly brown; its back and ſides are variegated with ſtreaks of brown and green, and with ſeveral beautiful longitudinal ſeries of green and black ſpots. The throat and belly are white; but they are beautifully variegated with ſpots of a fine deep blood-red. The tail is of a duſky yellow or wax colour on the upper part, and of a pale and beautiful fleſh colour underneath. *Ray's* Syn. Quad. p. 267.

TELAMONES, among the Romans, figures of men ſupporting the out-jetting of corniſhes in architecture. The word, according to ſome, is derived from the Greek τελαμων, from τειλαω, or τλαω, I bear.

Among the Greeks they were called *Atlantes*, Ατλαντες, which comes from the ſame word ταλαω, or τλαω, by the figure metatheſis. *Pitiſc.* in voc.

TELAMONES, is alſo uſed by the chirurgical writers ſometimes for lint, and ſometimes for the fillets or bandages, which they apply over their dreſſings.

TELE, Τελη, among the Athenians, thoſe revenues that were brought in by lands, mines, woods, and other public poſſeſſions, ſet apart for the uſe of the common-wealth; as alſo tributes paid by ſojourners and freed-ſervants, and the cuſtoms laid upon certain trades and goods. See *Potter* Archæol. Græc. T. 1. p. 80.

TELEOLOGY, the ſcience of the final cauſes of things. This is an ample and curious field of enquiry, though pretty much neglected by philoſophers. *Wolf.* Diſc. Prælim. Logic. §. 85.

TELEPHIUM *Orpine*, in botany, the name of a genus of plants; the characters of which are theſe: The flower is of the roſaceous kind, conſiſting of ſeveral petals, arranged in a circular form, and contained in a cup, conſiſting alſo of many leaves. The piſtil ariſes from the cup, and is finally converted into a triangular ſhaped unicapſular fruit, containing a number of ſmall and roundiſh ſeeds. To theſe marks it may be added, that the leaves ſtand alternately on the ſtalks.

The ſpecies of *Telephium*, enumerated by Mr. Tournefort, are theſe: 1. The common wild *Orpine*. 2. The American *Orpine*, with purſelain leaves. 3. The red-flowered houſe-leek-leaved ſea *Orpine*. And, 4. The white-flowered houſe-leek-leaved ſea *Orpine*. *Tourn.* Inſt. p. 248.

TELESCOPE (*Cycl.*)—Mr. Caleb Smith thinks that catadioptical *Teleſcopes* might be formed with ſpeculums of glaſs, inſtead of metal; and makes ſeveral obſervations as to remedying the diſorders cauſed by the different refrangibility of the rays of light. See Phil. Tranſ. N°. 456. ſect. 8.

TELETÆ, among the antients, were ſolemn rites performed in honour of Iſis. *Pitiſc.* in voc.

TELICARDIOS, in natural hiſtory, the name given by ſome authors to a ſtone found in the ſhape of a heart. It owes this figure to its having been found in the ſhell of ſome large bivalve of the cockle kind; and is more uſually known among authors under the name of *Bucardites*. See the article BUCARDITES.

TELIPHANO, in botany, a name uſed by ſome authors for the doronicum, or leopard's bane. *Ger. Emac.* Ind. 2.

TELLA *Sagrum*, in natural hiſtory, a name given by the natives of the Eaſt-Indies, to a kind of earth which they uſe externally to dry up ulcers, and internally in caſes of coughs and colds. It is of the nature of the finer clays, and is found at the bottoms of ſome of their rivers.

TELLA *Paſhnum*, in natural hiſtory, a name given by the people of the Eaſt-Indies to a kind of white arſenic, or rats-bane, found native among them.

It is well known to be a fatal poiſon, and uſed to deſtroy vermine. It lies in the cliffs of rivers among ſtrata of ſtone

in large white irregular lumps, when held to the fire it emits copious fumes ſmelling ſtrongly of garlick and ſulphur, but it does not readily melt or run.

TELLINA, in natural hiſtory, a ſea-ſhell, by the lateſt writers on theſe ſubjects, referred to the genus of muſcles. See the article MYTULUS.

Theſe ſhell-fiſh do not naturally live on the ſurface of the bottom of the ſea, but bury themſelves in the mud or ſand, in the manner of the chamæ, keeping a communication with the water above by means of the ſame ſort of tubes or pipes as thoſe fiſh are poſſeſſed of; but as the tubes of the *Tellinæ* are very ſhort, the fiſh can only bear to be buried to a ſmall depth.

When the water covers the bottom where they lie, they remain always buried in the ſand; but when the ſea in its ebb leaves the place dry, they very often come out of their holes, and are ſeen lying flat upon their ſides on the ſand; whether this be to take in freſh air, or, which ſeems more probable, to ſeek after the water which has abandoned them. They ſeem alſo to go far in ſearch of it, for it is common to ſee them at a foot diſtance from their hole, with the furrow marked by their progreſſion all the way behind them, from the aperture of their cell to the place where they are found. They perform this motion by means of a ſort of foot, ſuch as the chamæ, the ſourdon, and many other bivalve ſhells have; but the leg to which this foot is faſtened, is in this ſpecies very ſhort, and not capable of any great extenſion. Mem. Acad. Par. 1710.

TELON, a name given by the chemiſts to fire.

TELONÆ, τελωναι, among the Athenians, farmers of the public revenues; for the ſeverity with which they were handled, in caſe they failed, ſee *Potter* Archæol. Græc. l. 1. c. 14. T. 1. p. 81.

TELINO, a name given to the *Urogallus*, or great cock of the mountain. See Tab. of Birds, N°. 25. and the article UROGALLUS.

TELONIUM, among the Romans, is uſed to denote a cuſtom-houſe, or place where the toll was collected. See *Pitiſc.* in voc. and THELONIUM, *Cyc.*

TEM, or *brown* TEM, in zoology, the name of a water-fowl of the larus or gull-kind, called by Aldrovand *Larus cinereus minor*.

It is but a ſmall ſpecies. Its back and wings are of a pale grey, with ſome faint admixture of bluiſh; and the longer feathers of the wings are black within. The beak is very ſmall, ſomewhat crooked, and black. The back part of its head alſo is black. All other parts of the body are of a fine white. The feet are webbed, and the legs are yellow. *Ray*'s Ornithol. p. 268.

TEMACHIS, in natural hiſtory, the name of a genus of foſſils, of the claſs of the gypſums; the characters of which are theſe. It is of a ſofter ſubſtance than many of the other genera, and of a very bright and glittering hue.

The name is derived from the Greek τμαχος, *fruſtulum*, a ſmall irregular fragment; the bodies of this genus being compoſed of an aſſemblage of multitudes of irregular flaky fragments, as are all the gypſums; but no genus of them ſo viſibly ſo as theſe.

There are but three known ſpecies of this genus: 1. A ſoft ſhining green one. 2. A ſoft white one, of a marbly appearance. And, 3. A pale brown gloſſy one. The firſt is found in great plenty on the ſhores of rivers in the Eaſt-Indies; and though not known as a ſubſtance that would make a plaſter by burning, is given internally in nephritic caſes, being powdered without calcination. The ſecond is found in many parts of Derbyſhire, and is uſed for burning into plaſter for ſtuccoing of rooms, and caſting ſtatues, &c. And the third is found in Germany; and, beſide its common uſes in ſtuccoing and caſting, is in great eſteem among the metallurgiſts and aſſayers, for the making either ſingly or in mixture with bone-aſhes, their teſts. See the article TEST.

We have not this ſpecies in England ſo far as is yet known. *Hill*'s Hiſt. of Foſſ. p. 113, 114, 115, 116.

TEMAPARA, in zoology, the name of a peculiar ſpecies of lizard, called alſo *Tejuguacu*.

It approaches much to the nature of the *Iguana*, but is black ſpotted with white. See the articles IGUANA, and TEJUGUACU.

TEMBUL, in botany, a name uſed by ſome authors, for the plant called *betle*, an herb the people of the Eaſt-Indies are fond of chewing. *C. Bauhin.* pin. p. 410. See the article BETLE.

TEMELO, in zoology, a name uſed by ſome for the fiſh called in Engliſh the *greyling*, and in ſome places the *umber*.

It is a truttaceous ſpecies, known among the writers in ichthyography under the name of *Thymallus*. *Willughby*'s Hiſt. Piſc. p. 187. See the article THYMALLUS.

TEMPATLAHOAC, in zoology, the name of a broad-billed bird, of the Weſt-Indies, deſcribed by Nieremberg; and by him eſteemed a ſpecies of duck.

It is of the ſize of the common duck. Its head and neck are green, black and purple, and very bright and ſhining like the neck of the peacock. The body is of a browniſh yellow, and it has two large ſpots of white on each ſide near the tail. The tail is white all round the edges, and is of the ſame marks and colours with the peacock's, but black underneath. It is common on the lakes of Mexico, and is a good eatable bird. *Ray*'s Ornithol. p. 299.

TEMPERAMENT, or TEMPERATURE, (*Cycl.*) in muſic. Mr. Chambers, under this head, informs us, that the *Temperament*, or *Temperature*, denotes a rectifying or mending falſe and imperfect concords, by transferring to them part of the beauty of the perfect ones. This he took from Mr. de Fontenelles, in the Hiſt. de l'Acad. des ſciences, 1701.

But this requires a fuller explanation; for though it be true, conſidered in one light, that a *Temperature* corrects ſome falſe concords; yet it is no leſs true, that, in other reſpects, it ſpoils and falſifies both perfect and imperfect concords, and renders diſcords more harſh than they would otherwiſe be, if the intervals were juſtly taken. To explain this, we muſt conſider that all the intervals are founded on the primary proportions ariſing from the numbers 2, 3 and 5, that is, if we do not exceed the compaſs of an octave, $\frac{5}{4}$, $\frac{3}{2}$ and $\frac{2}{1}$. See the article INTERVAL.

The nearer we come in practice to the true intervals, the more perfect the melody and harmony will be; and it is certain, that the human voice, and ſome inſtruments, as violins, &c. which have no ſtops nor frets, will execute muſic to a great degree of exactneſs; but the caſe is not the ſame with fixed or fretted inſtruments, as harpſichords, organs, lutes, viols, &c. Accuracy is here impoſſible, unleſs we would content ourſelves with always playing in the ſame key, without any tranſition or tranſpoſition whatſoever. In this caſe, indeed, the harpſichord or organ might vie with the accuracy of the voice or violin. For inſtance; if we were to compoſe or play in the key of C, then we might make the ſeveral intervals of that key, to be in the following true proportions, $1 \cdot \frac{9}{8} \cdot \frac{10}{9} \cdot \frac{16}{15} \cdot \frac{9}{8} \cdot \frac{10}{9} \cdot \frac{9}{8} \cdot \frac{16}{15}$. that is in whole numbers $\frac{\text{C. D.}}{24 \cdot 27}$ E. F. G. A. B C. $\cdot 30 \cdot 32 \cdot 36 \cdot 40 \cdot 45 \cdot 48$. and the inſtrument, tuned in this manner, would perform any piece of muſic in C, juſtly compoſed, with great beauty and exactneſs, I here take for granted, that every key, fundamental note, or ſound, ought to have its true fifth and fourth, and that theſe ought alſo to have their true fifths and thirds.

Now this being premiſed, it will preſently appear, that in making any tranſpoſition or tranſition from C, we ſhall find ſome falſe concord. Thus, for inſtance, if we proceed to G, and conſider it as a key, or fundamental ſound, we ſhall have the following ſeries of numbers for the octave of G, *viz.* G . A . B . C . D . E . F . g $36 \cdot 40 \cdot 45 \cdot 48 \cdot 54 \cdot 60 \cdot 64 \cdot 72$. But here the interval between 40 and 54 is falſe, being a comma too much, for the ſecond of a key muſt make a true fifth with the fifth of the ſame key. In like manner, if we were to proceed from C to A, as a new key, we ſhould find the following ſeries for the octave of A, $\frac{\text{A . B . C . D . E . F . G . a}}{40 \cdot 45 \cdot 48 \cdot 54 \cdot 60 \cdot 64 \cdot 72 \cdot 80}$, where the interval between A 40 and its fourth D 54 is falſe, being too great by a comma. If any other tranſition were examined, we ſhall always find ſome note falſe; as in F, the ſixth would be redundant by a comma. And in D the fifth would be deficient by a comma. All which ſhews the impoſſibility of truth and exactneſs of muſic on fixed inſtruments. Yet as theſe inſtruments have their uſe and convenience in ſome reſpects, it was proper to endeavour to find out a method of making them tolerable.

It has been obſerved under the head INTERVAL, that the tone major exceeds the tone minor by a comma. Their difference is neceſſary for the truth and perfection of muſic; but yet if theſe tones were rendered equal, the ear would not be offended. And this has ſuggeſted the means of tempering fixed inſtruments. If we were to make all tones equal to the tone major, as ſome imagine the antients did, then we ſhould find the ditonus or third, exceeding a true third major by one comma, which would be intolerable. In like manner, if all tones were to be minor, we ſhould have thirds major defective by a comma, which would alſo be intolerable, not to mention other falſe intervals that muſt neceſſarily ariſe from ſuch a ſuppoſition.

Suppoſing then one tone increaſed, and the others diminiſhed by half a comma, we ſhould have our thirds major remain perfect. But ſtill it would be neceſſary to examine what fifths this ſuppoſition would give. Now it is evident that a tone major added to an octave, makes juſt too fifths, thus $\frac{2}{1} \times \frac{9}{8} = \frac{9}{4} = \frac{3}{2} \times \frac{3}{2}$. But the tone here added is a tone major, and the tone we have aſſumed is a temperate tone, deficient from the tone major by half a comma; hence the ſum of the two fifths, on this ſuppoſition, will fall ſhort of the truth by $\frac{1}{2}$ of a comma, and conſequently one fifth will be deficient by $\frac{1}{4}$ of a comma. Which difference, although it be ſenſible, yet experience ſhews, that fifths ſo diminiſhed are tolerable.

This *Temperature* is what is called the common or vulgar *Temperature*, and conſiſts, as has been ſaid, in diminiſhing the fifth by $\frac{1}{4}$ of a comma, in preſerving the third major perfect, and dividing it into two equal tones. Which being ſuppoſed, it follows that the fourth muſt exceed the truth by $\frac{1}{4}$ of a comma;

ma; that the third minor will be deficient by the ſame quantity; that the ſixth minor will be perfect, and the ſixth major redundant by $\frac{1}{4}$ of a comma; and laſtly, that the ſemitone major will exceed the truth by $\frac{1}{4}$ of a comma. If we introduce chromatic notes, or flats and ſharps, the ſemitone minor will alſo exceed the truth by $\frac{1}{4}$ of a comma, and conſequently the difference between the two ſemitones, or the dieſis enharmonica, will be preſerved.

If then we had a harpſichord or organ, with each feint or half note divided, we ſhould have the following notes or ſounds, *viz.* C . C♯ . D♭ . D . D♯ . E♭ . E . F . F♯ . G♭ . G . G♯ . A♭ . A . A♯ . B♭ . B . c. in the compaſs of an octave. Yet this ſyſtem of notes, numerous as they ſeem, would not be ſufficient for all tranſitions and tranſpoſitions. For tho' a piece of muſic, tranſpoſed to any of the natural keys C . D . E . F . G . A . B. and to the flats, as E♭ and B♭, and ſome others, would do well; yet in tranſpoſing to ſharps, as to C♯. we ſhould not find a true third major, unleſs we introduced E♯. and even in flats, as A♭ and E♭ we ſhould not find a true third major in deſcending, or a ſixth minor in aſcending, unleſs we introduced F♭ and C♭. and in like manner tranſpoſitions to G♯ and E♭ would oblige us to introduce B♯ and C♭. Nor would even this ſuffice; for if neceſſity required a tranſpoſition from the key of C to that of D♯, we ſhould not find a true third major without introducing F♯♯ and *c.* So that at laſt we ſhould come to a temperate ſyſtem, where, in aſcending, the notes C, D, F, G, A would each have its ſharp and double ſharp, and the notes B and E each a ſingle ſharp. In deſcending, the notes E, D, B, A, G would each have their flat and double flat, and the notes F and C each a ſingle flat. And thus the octave would be divided into 31 intervals, whoſe deſignations are C . D♭♭ . C♯ . D♭ .

1 . 2 . 3 . 4

C♯♯ . D . E♭♭ . D♯ . E♭ . D♯♯ . E . F♭ . E♯ . F . G♭♭ . F♯ .

5 . 6 . 7 . 8 . 9 . 10 . 11 . 12 . 13 . 14 . 15 . 16

G♭ . F♯♯ . G . A♭♭ . G♯ . A♭ . G♯♯ . A . B♭♭ . A♯ . B♭

17 . 18 . 19 . 20 . 21 . 22 . 23 . 24 . 25 . 26 .

. A♯♯ . B . C♭ . B♯ . C. Where the letters C . D . E .

27 . 28 . 29 . 30 . 31.

F . G . A . B. ſignify the common diatonic notes; thoſe marked with a ſingle ♯ or b are the chromatic, and thoſe marked with a double ♯♯ or bb are enharmonic notes; ſo called, becauſe the interval between them and the next diatonic note is an enharmonic dieſis; for which reaſon the notes E♯ . F♭. and B♯ . C♭. are alſo enharmonic.

But even in this diviſion of the octave, all the notes would not have a third major in aſcending and deſcending; thus, for inſtance, D♯♯ has no third major; for this would be F♯♯♯, which is not in the ſcale, nor can any number of additional notes ſuffice in all caſes. But this inconvenience is eaſily remedied, and the ſyſtem conſiderably improved by making all the 31 intervals equal. We have already obſerved, that in the common temperature the ſemitones major and minor exceed the truth by $\frac{1}{4}$ of a comma, and that the enharmonic dieſis is preſerved true. Hence it follows, that the hyperoche, or difference between the chromatic and enharmonic dieſis; for example, the interval between F♭ and E♯ or D♭♭ and C♯, *&c.* will alſo exceed the truth by $\frac{1}{4}$ comma. Now the hyperoche, by our table, under INTERVAL, is equal to 1 . 37695, to which adding $\frac{1}{4}$ comma = 0 . 25000, we have 1 . 62695, which differs from the enharmonic dieſis 1 . 90917 only by 0 . 28222, or about $\frac{7}{25}$ of a comma. Neglecting this ſmall difference, let us ſuppoſe all the 31 intervals of the octave equal, it will follow that tranſpoſitions to all the notes of the ſyſtem, whether diatonic, chromatic or enharmonic, will be equally good, and differ only in pitch or tone, as they ought, but not in accuracy, which muſt next be examined.

The diviſion of the octave into 31 parts may be conveniently done by logarithms. Under the head INTERVAL I find the logarithm of the octave = 55 . 79763 commas, conſequently each dieſis, or diviſion of the octave = 1 . 79992 commas; hence the fifth, being 18 dieſis, will be 32 . 399 commas. Now the true fifth is 32 . 640, the fifth conſequently in this *Temperature* is deficient by 0 . 241 parts of a comma, which is leſs than $\frac{1}{4}$ of a comma by $\frac{1}{110}$ part; and therefore this fifth will, ſtrictly ſpeaking, be better than that of the vulgar *Temperature* by $\frac{1}{110}$ of a comma; but this is inſenſible. Next, proceeding to examine the third, we ſhall find it equal to 10 dieſis or diviſions, that is 17 . 999 commas, and the true third major being 17 . 963 commas, the difference is 0 . 036, that is about $\frac{1}{28}$ of a comma. Now as the ear can bear a fifth, altered by $\frac{1}{4}$ of a comma, it will much more eaſily bear the alteration of $\frac{1}{28}$ of a comma in a third major. Again, in this *Temperature*, the third minor is indeed, ſtrictly ſpeaking, worſe than in the vulgar, which differs from the truth but by $\frac{1}{4}$ comma, whereas here it differs by about $\frac{1}{37}$ of a comma more; but then this difference is inſenſible.

Thus we have been led from the conſideration of the vulgar *Temperature*, to the invention of the *Temperature* which divides the octave into 31 equal intervals, commonly called, *Huygens's Temperature*. This great mathematician was indeed the firſt who gave a diſtinct account of it, and ſhewed its uſe and accuracy. But here, as in many other inventions, we find the hint of the thing much older than the true knowledge of it. See *Hugenii* Opera Omnia, vol. 1. p. 748, 749. Edit. 1. Lugd. Batav. 1724.

The diviſion of the octave into 31 parts, was invented in Italy about 200 years ago, by Don Nicola Vincentino. The title of his book is *L'Antica Muſica ridotta alla moderna prattica*, &c. Roma, 1555. Fol. and an inſtrument called *archicembalo* was made upon this ſcheme, as Salinas informs us, who at the ſame time condemns it as very diſagreeable in practice. But this could be owing to nothing but its not being tuned according to the intention of the inventor. For if all the thirds major of this inſtrument were made perfect, and the fifths diminiſhed by $\frac{1}{4}$ of a comma, it is evident that the inſtrument would be equally exact with any tuned according to the vulgar *Temperature*, and would ſuffice for tranſpoſitions to any diatonic or chromatic notes, though not to all the enharmonic, as D♯♯, *&c.* becauſe we ſhould not find its third major. And if the inſtrument were tuned according to Mr. Huygens's ſcheme, of making all the diviſions equal, it would then have all the 31 keys equally good, and very near the truth. See *Salinas*, lib. 3. The title of his work is *Franciſci Salinæ Burgenſis de Muſica Libri Septem, Salmanticæ*, 1577. Folio. *Merſennus*'s Work is entitled *Harmonicorum*, Libri XII. *authore* F. M. Merſenno *Minimo*, *Lutetiæ Pariſiorum*, 1648. Fol. He publiſhed another book before this, the title of which is, *Harmonie Univerſelle, contenant la Theorie & la Pratique de la Muſique. Paris*, 1636. Fol. 2 vol.

Hence it is plain, Salinas and Merſennus had not ſufficiently examined this matter.

The uſe of this *Temperature* of Mr. Huygens deſerves to be introduced into the practice of muſic, as it will facilitate the execution of all the genera of muſic, whether diatonic, chromatic, or enharmonic; nor does the multiplicity of its parts render it impracticable, the author aſſuring us, that he had harpſichord made at Paris with ſuch diviſions, which was approved of, and imitated by ſome able muſicians. Merſennus alſo gives a ſcheme for this purpoſe; and Salinas ſays, he ſaw and played upon ſuch an inſtrument. See alſo Don *Vincentino* before cited, lib. 5. p. 99, *&c.*

Mr. Huygens, to facilitate the tuning of inſtruments with ſuch diviſions, has given us a table of the parts of an octave, according to his ſyſtem, together with their logarithms. The table is as follows:

The diviſion of the octave into 31 equal parts.					The diviſion of the octave according to the common *Temperament.*
I.	II.	III.	IV.	V.	VI.
N. 97106450					
4,6989700043	50000	Ut²	C²	50000	4,6989700043
4,7086806493	51131				
4,7183912943	52278				
4,7281019393	53469	Si	B^x	53499	4,7283474859
4,7378125843	54678				
4,7475232293	55914	Sa	B	55902	4,7474250108
4,7572338743	57179	*	*	57243	4,7577249674
4,7669445193	58471				
4,7766551643	59794	La	A	59814	4,7768024924
4,7863658093	61146				
4,7960764543	62528	*	*	62500	4,7958800173
4,8057870993	63942	Sol^x	G^x	64000	4,8061799740
4,8154977443	65388				
4,8252083893	66866	Sol	G	66874	4,8252574989
4,8349190343	68378				
4,8446296793	69924				
4,8543403243	71506	Fa^x	F^x	71554	4,8546349804
4,8640509693	73122				
4,8737616143	74776	Fa	F	74767	4,8737125054
4,8834722593	76467				
4,8931829043	78196				
4,9028935493	79964	Mi	E	80000	4,9030899870
4,9126041943	81772				
4,9223148393	83621	Ma	E♭	83592	4,9221675119
4,9320254843	85512	*	*	85599	4,9324674685
4,9417361293	87445				
4,9514467743	89422	Re	D	89443	4,9515449935
4,9611574193	91444				
4,9708680643	93512	*	*	93459	4,9706225184
4,9805787093	95627	Ut^x	C^x	95702	4,9809224750
4,9902893543	97789				
4,9999999993	100000	Ut	C	100000	5,0000000000

The ſecond column of this table contains the numbers expreſſing the lengths of chords making 31 equal diviſions, the longeſt anſwering to C, being ſuppoſed to be divided into 100,000 parts.

In the third column are the ſyllables by which the notes are uſually named in France; and the aſteriſc * ſhews ſome enharmonic notes, of which that near *Sol* is moſt neceſſary.

In the fourth column are the letters commonly uſed to denote the ſounds of the octave.

The numbers of the ſecond column were found by means of thoſe in the firſt, which are their reſpective logarithms; and theſe were found by dividing 0.30102999566 the logarithm

of 2 by 31. The quotient 97106450 is marked N. and being continually added to the logarithm of 50000 that is to 4.6989700043 gives all the logarithms of the first column to the greatest 4.9999999993, which being extremely near to 5.0000000000 the logarithm of 100000, shews the operation to have been rightly performed.

The fifth column shews the lengths of the chords in the common *Temperament*: And the sixth column contains their respective logarithms. V. *Huygenii* Opera, vol. 1. p. 752, 753. The learned author of this *Temperature* has not given the notes answering to all the divisions of the octave; but that may easily be supplied from what has been said above, when we derived this *Temperature*, from the consideration of the common.

We have already mentioned the advantages of Mr. Huygens's system; but its excellency will better appear by comparing it with the schemes of others. We may distinguish and name the different *Temperatures* by the number of equal parts, into which the octave is supposed to be divided. The *Temperatures* that occur in books, are *Temperatures* of 12, 19, 31, 43, 50, 53 and 55 parts, of which in order.

The *Temperature* of 12 parts is founded on the supposition that the semitones major and minor may be made equal. Hence the octave will be divided into 12 equal semitones, 7 of which will make the fifth, 4 the third, and 3 the third minor.

The *Temperature* of 19 parts goes upon the supposition that the semitone major is the double of the semitone minor. Hence the tone will be 3, and the third major 6. The diesis enharmonica will be 1, and consequently the octave being 3 thirds, and a diesis, will be 19. The fifth contains 11 parts. The harpsichord in this scheme will have every feint cut in two, one for the sharp of the lower note, and the other for the flat of the higher. Between B and C, and between E and F, will be interposed keys, which must serve for the sharps of B and E, and the flats of C and F respectively.

The *Temperature* of 31 parts is Mr. Huygens's already described; here the semitones are as 3 to 2. The third major is 10, and the fifth 18.

The *Temperature* of 43 is Mr. Sauveur's, and by him very fully described in the memoirs of the Royal Academy of Sciences, An. 1701, 1702. He supposes the proportion of the semitones to be as 4 to 3. Hence his tone is 7. The third major 14, the fifth is 25, and the octave 43. What musical foundation this learned gentleman went upon in the investigation of this *Temperature*, I know not: But it seems liable to insuperable difficulties; for here the diesis enharmonica is but the half of the difference between it and the chromatic diesis; whereas, in truth, this difference, instead of being double of, is really less than the enharmonic diesis, as was long ago objected to him by Mr. Henfling, and appears from the table under the head INTERVAL. Miscel. Berolin. Tom. 1. p. 285, 286.

Besides, his enharmonic diesis falls greatly short of the truth, being but 1.27 of a comma, which is an error of 0.64 or near $\frac{2}{3}$ of a comma. Whereas in Mr. Huygens's *Temperature*, the error of the diesis is almost insensible, being but $\frac{1}{16}$ of a comma. Nor are the practical advantages of Mr. Sauveur's system any way comparable to Huygen's. His fifth is indeed, strictly speaking, better; but so little, that the difference is not sensible, not being $\frac{1}{20}$ of a comma. On the other hand, his thirds are sensibly worse, the major being $\frac{1}{5}$ and the minor $\frac{2}{5}$ of a comma false. Whereas Huygens's third major does not differ sensibly from the truth, and the minor has no sensible difference from the third minor deficient by $\frac{1}{4}$ comma of the common *Temperature*, which ought to be deemed the limit of the diminution of concords. If we add to this, that the much greater number of parts in Mr. Sauveur's octave, makes it vastly more intricate than Mr. Huygens's, and that these parts would be false or useless, even supposing the enharmonic genus restored, I believe no musician will long hesitate which he ought to prefer.

The *Temperature* of 50 parts is proposed by Mr. Henfling in the Miscellan. Berolin. above cited; he takes the proportion of the semitones as 5 to 3; hence his tone is 8, the third major 16, the fifth 29, and the octave 50. The third major and fifth in this system will be worse than Huygens's, though the third minor be a little better. The third major is here less than the true, and the fifth deficient by more than $\frac{1}{4}$ comma, which is a fault, not to mention the inconveniency arising from dividing the octave into 50 parts; besides 5 : 3 the proportion of the semitones here assumed, although expressed in greater numbers, is not so near the truth as Mr. Huygens's of 3 : 2. We have given the proof of this under the head RATIO.

The *Temperature* of 53 parts is mentioned by Mersennus. Here the tones will be unequal, 9 being the tone major, and 8 the minor. Hence the third major will be 17, and the fifth 31, which last does not differ from the truth by above $\frac{1}{313}$ part of a comma. The third minor is also more perfect than in Mr. Huygen's system: But the multiplicity of parts in the octave of this system, render it too intricate; and the distinction of tones major and minor upon fixed instruments, is, I doubt, impracticable.

The last *Temperature* we have mentioned is that of 55 parts, which Mr. Sauveur calls the *Temperature* of practical musicians. Its foundation lies in assuming the proportion of the semi-tones, as 5 to 4, so the tone will be 9, the third 18, and the fifth 32. The fifth in this system, as in that which makes the semitones equal, is nearer the truth than Mr. Huygens's, but this advantage is not $\frac{1}{15}$ of a comma; and on the other hand, the thirds both major and minor are here greatly mis-tuned, as will appear by the annexed Table, exhibiting the thirds and fifths of these several *Temperatures*, as also the thirds and fifths of the common *Temperature*, and two mentioned by Salinas, marked 1st. Salin. 2d. Salin. The letter V. stands for the fifth; III. for the third major, and 3. for the third minor. The fifths are all deficient, but the thirds are sometimes greater and sometimes less than the true; the first are marked +, the others —.

Temperatures	V. Commas.	Error.	III. Commas.	Error.	3. Commas.	Error.
of 12 parts.	32.549	0.091	18.599	0.636+	13.950	0.727—
19.	32.304	0.336	17.620	0.343—	14.684	0.007+
31.	32.399	0.241	17.999	0.036+	14.400	0.277—
43.	32.440	0.200	18.167	0.204+	14.273	0.404—
50.	32.363	0.277	17.855	0.108—	14.508	0.169—
53.	32.637	0.003	17.897	0.066—	14.740	0.063+
55.	32.464	0.176	18.261	0.298+	14.203	0.474—
Com. Temp.	32.390	0.250	17.963	0.000	14.427	0.250—
1st. Salin.	32.307	0.333	17.630	0.333—	14.677	0.000
2d. Salin.	32.354	0.286	17.520	0.143—	14.434	0.143—
True Scale.	32.640	0.000	17.963	0.000	14.677	0.000

Temperatures formed by the division of the octave into equal parts, may be called geometrical *Temperatures*. The common and the two mentioned by Salinas, do not proceed upon this foundation. The intention of the first inventors not having been to make transpositions to every note of the system equally good; but only to make the most usual transitions in the course of a piece of music tolerable. Hence the parts of the octave, in their suppositions, were not all equal.

The common *Temperature*, as we have said, preserves the third major perfect. The first of Salinas, preserves the third minor perfect. In the second of Salinas, the semitone minor is perfect. The foundation of his first *Temperature* is making the temperate tone equal to the tone-minor and $\frac{1}{3}$ of a comma, or to the tone-major less $\frac{2}{3}$ of a comma. Hence his fifth and third major will be deficient by $\frac{1}{3}$ of a comma; and the third minor consequently, will be true. The ground of his second scheme is, to add $\frac{2}{7}$ of a comma to the tone-minor, or take $\frac{2}{7}$ from the tone-major, for his temperate tone. Hence the fifth will be deficient by $\frac{2}{7}$ of a comma, and the thirds major and minor each deficient by $\frac{1}{7}$ of a comma. Consequently the semi-tone, being their difference, will be preserved.

As to Mr. Salmon's scale, in the Philosophical Transactions, there is nothing true in it, but the diatonic scale of C. His scale for A is false, the fourth being erroneous by a comma; most of his semi-tones are likewise false. In short, it can neither be considered as a true scale, nor as a *Temperature*.

Before we close this article, it may be proper to add a few words about the method of invention of the foregoing geometrical *Temperatures*. Mr. Huygens having had the hint of a division of the octave into 31 parts, had nothing farther to do but to examine it by logarithms. But, supposing no such hint had been given, he might have investigated it directly by the method laid down by himself, and also by Dr. Wallis, and Mr. Cotes, for approximating to the value of given ratio's, in smaller numbers. We have given Mr. Cotes's method, under the head RATIO. The application of that method to the present purpose, is thus: The ratio of the octave to the third major is 55.79763 to 17.96282, and the approximating ratios will be

1°. greater than the true 28 : 9, 87 : 28, &c.

2°. less than the true 3 : 1, 31 : 10, 59 : 19, 205 : 66, &c.

The ratios greater than the true, must all be rejected; because they give the third major less than true, and consequently the tone, (its half) deficient by above $\frac{1}{2}$ comma; which gives the fifth deficient above $\frac{1}{4}$ of a comma; but this ought not to be. The first of the ratios less than true, is 3 : 1, or 12 : 4, which is the *Temperature* of 12 parts before described, and too inaccurate. The next is 31 : 10, or Mr. Huygens's. The rest divide the octave into too many parts.

The

The ſame may be alſo found thus; the ratio of the octave to the common temperate fifth, deficient by $\frac{1}{4}$ of a comma, is 55·79763 to 32.38952. The approximating ratios to which are,

1°. greater than the true 2 : 1, 7 : 4, 19 : 11, 50 : 29, &c.

2°. leſs than the true 1 : 1, 3 : 2, 5 : 3, 12 : 7, 31 : 18, 205 : 119. Where we have the *Temperatures* of, 12, 19, 31, and 50 parts, before examined.

And here all ratios greater than the true, ought to be rejected; becauſe they give the fifth leſs than true, that is, in this caſe deficient by more than $\frac{1}{4}$ of a comma.

If we inveſtigate the approximating ratios to the ratio of the ſemi-tones major and minor, or 5.19529 to 3.28612, we ſhall have the ratios 1 : 1, 2 : 1, 3 : 2, 5 : 3, which reſpectively give the *Temperatures* of 12, 19, 31 and 50 parts, before deſcribed.

Again, inveſtigating the approximating ratios of the fifth to the third major, we ſhall find 7 : 4, 9 : 5, 11 : 6, 29 : 16, which will alſo give the *Temperatures* 12, 19, 31, 50, as before.

Laſtly, the approximated ratios of the octave to the true fifth, are 12 : 7 and 53 : 31 greater than the true. The others being of no uſe, ſince the fifth muſt neceſſarily be diminiſhed. Here we find the *Temperature* of 53 parts. As to the *Temperatures* of 43 and 55, being deſtitute of any muſical foundation, it is no wonder they do not appear by this method of inveſtigation.

Mr. Huygens, in his Coſmotheoros, ſays, that the tone or pitch of the voice cannot be preſerved, unleſs the conſonants be tempered, ſo as to deviate a little from the higheſt perfection. For the proof of this aſſertion, he brings a melody conſiſting of the following ſounds, C, F, D, G, C; where, if the intervals were to be ſung perfect, by taking the interval from C to F a true fourth aſcending, from F to D a third minor deſcending, from D to G a true fourth aſcending, and laſtly, from G to C a true fifth deſcending; we ſhould fall a comma below the C from whence we began. Therefore, if we were to repeat this ſeries of notes nine times, we ſhould at laſt fall near a tone major below our firſt ſound.

Mr. Huygens's ſolution of this difficulty is, that we remember the note from whence we ſet out, and return to it by a ſecret *Temperature*, thereby ſinging the intervals a little imperfect; which, he ſays, will be found neceſſary in almoſt all ſongs or melodies.

A like difficulty is mentioned in the Memoirs of the Royal Academy of Sciences; and is there urged for the neceſſity of a *Temperature*, even for ſinging in the ſame key. And Mr. Huygens's ſolution of the difficulty is there approved of. An. 1707. p. 264.

But the ſolution of theſe learned gentlemen is, as yet, far from being deciſive. No experiment has yet been brought to ſhew that the human voice ſings tempered notes; not even when accompanied by tempered inſtruments. It ſeems to us, on the contrary, that an exerciſed voice guided by a good ear, ſings true, even though accompanied by a miſ-tuned inſtrument, as harpſichords moſt frequently are, eſpecially in tranſpoſed keys. And were theſe inſtruments always as well tuned as art could make them, yet their tones would be equal; and it ſeems evident to the ear, that the human voice ſinging naturally two tones in ſucceſſion, as C, D, E, never makes them equal; and cannot, without great difficulty, and by means of a variation of harmony, be brought to make them equal.

Another ſolution, therefore, of Mr. Huygens's difficulty, muſt be ſought for. The truth ſeems to be, that the ſecond of the key muſt be the true tone-major above the key, and therefore the third between the ſecond and fourth of the key muſt be ſung deficient by a comma. Thus in the key of C, from C to D will be a tone-major $= \frac{9}{8}$, and from D to F will be a deficient third $= \frac{32}{27}$. See the article INTERVAL.

Mr. Huygens's melody therefore, will ſtand thus:

C, F, D, G, C.

$\frac{4}{3} \times \frac{32}{27} \times \frac{4}{3} \times \frac{2}{3} = 1$. And the voice would ſing the interval F, D, juſt as if the note E had been interpoſed; in which caſe the notes would be C, F, E, D, G, C.

$\frac{4}{3} \times \frac{15}{16} \times \frac{9}{10} \times \frac{4}{3} \times \frac{2}{3} = 1$.

Theſe notes all come within the diatonic ſcale of C; and the voice naturally falls upon the note from whence it ſet out. The ſame anſwer will hold in the example, mentioned in the Memoirs of the Academy of Sciences; where the intervals $^{\flat}$B, G, E, C, occur. And here the interval from $^{\flat}$B to G ſhould be taken $= \frac{32}{27} = \frac{15}{16} \times \frac{9}{10}$, as in the former example; and for the ſame reaſon, the key being F.

There ſeems therefore no repugnancy between the practice and theory of muſic, while the melody is confined to one key; but it muſt be owned, that in tranſitions from key to key, eſpecially where ſeveral parts are to make harmony with each other, there ſtill remain difficulties, not mentioned by Mr. Huygens, or any other writer we know of, which might deſerve a father examination.

We muſt not omit mentioning, that the learned Dr. Smith, in his Harmonics, has not only carried the theory of *Temperaments*, or *Temperatures*, far beyond all the authors that preceded him; but has ſhewn how to tune an inſtrument, according to any propoſed *Temperament*, by the ear only, which is certainly a moſt ingenious diſcovery.

This learned author [a] prefers what he calls the *Temperament* of equal harmony, which differs inſenſibly from the diviſion of the octave into 50 parts, to all others; and inſiſts, that it labours under the leweſt defects, and is of all others the moſt agreeable in practice. In the ſyſtem of equal harmony the *Temperaments* of the fifth, third major and third minor, are reſpectively, $\frac{5}{100}$ and $\frac{7}{100}$ and $\frac{3}{100}$ of a comma leſs than the truth [b]. It would be impoſſible here to do juſtice to the learned author's reaſonings on this ſubject; we ſhall only add, that he eſtabliſhes, contrary to the common opinion, that the leſs ſimple conſonances, generally ſpeaking, will not bear ſo great *Temperaments* as the ſimpler conſonances [c].—[a *Smith*'s Harmonics, p. 172, 188. b Ibid. p. 172. c Ibid. p. 146.]

Dr. Smith mentions a *Temperament* communicated to him by the ingenious Mr. Harriſon, which conſiſts in making the proportion between the octave and third major equal to that of the circumference of a circle to its diameter. In this *Temperament* the third major is diminiſhed by $\frac{1}{5}$ of a comma, but the third minor is very near the truth, and extremely beautiful. *Smith*. pref. p. xi.

A late author [a] ſeems to think the diviſion of the octave into 31 parts, not to be of modern invention, but neceſſarily implied in the doctrine of the antients. At firſt ſight it would ſeem, as if the antients made but 24 dieſis or diviſions in the octave, *viz.* ten to each fourth, and four to the tone; which (the octave being equal to two fourths and a tone) gives twenty-four dieſes to the octave. But the author juſt quoted contends, that this diviſion is to be underſtood only in one tenſion, that is either aſcending or deſcending; but that accurately ſpeaking, if we conſider all the dieſes or diviſions of the fourth, both aſcending and deſcending, we ſhall find thirteen; five to each tone, and three to the ſemi-tone major; and conſequently thirty-one diviſions in the octave. Theſe indeed are not all naturally equal; but if we make them ſo, we ſhall have a *Temperature* known by the moderns under the name of Huygens's *Temperature* [b].— [a Dr. *Pepuſch*, in Phil. Tranſ. N°. 481. p. 273. b Phil. Tranſ. ibid.] See the article DIESIS.

TEMPERATURE, or CLIMATE for plants. The difference of *Climate*, or *Temperature* of the air has a very great effect on plants. The different degree of heat is the great cauſe of theſe changes, and the different degree of moiſture ſomewhat aſſiſts in it. The American and Aſian plants, famous in medicine when of the growth of their native ſoils, yet when removed into our *Climate*, though they grow and even produce their flowers and ripen their ſeeds, which ſeems the laſt perfection of a plant, when put to the trial, have been always found to want their proper medicinal virtues.

Many of thoſe plants and trees, which though natives of another *Climate*, will endure the open air with us, and grow in our gardens; yet loſe much of their ſtrength, and become dwarfs, in proportion to what they were when in their proper *Climate*. But much leſs violent changes than theſe are able to produce the like effects, at leaſt in ſome degree. The ſeveral parts of Europe are able to alter the quality of the ſame plant, even while it grows naturally in them. Thus the blue aconite or napellus, the root of which is a terrible poiſon in the ſouth of France; yet in Britany, a northern province of the ſame kingdom, the root of the ſame plant, though it ſeems to grow with equal vigour there, and is equally large and ſucculent, has no bad effects; but has been eaten by old people and by children, without any injury.

In general, the farther north we go the leſs and leſs hurtful this plant becomes. It is common to almoſt all Europe, and we find the inhabitants of ſome places dreading it, and that with great juſtice, as a fatal poiſon; while thoſe of others eat the leaves in their ſallads, and even eſteem them good to reſtore the appetite.

The common woad which ſucceeds well in many parts of England, is not ſo certain in France; but the different *Climates* in different parts of that great kingdom, make ſtrange alterations in its juices. In Upper Languedoc they raiſe great quantities of it, and it makes an extremely fine blue dye for ſtuffs of all kinds; but in Britany, though the plant grows as high, and ſeems to flouriſh as well, yet the leaves never are ſo ſucculent, and the colour obtained from them is not of ſo fine a blue, but is duſky and browniſh.

This effect of the different *Climates*, in changing the nature of things produced in them, is not confined to plants; but the animal kingdom ſhares in it. The whole ſerpent kind are in general larger and more venomous, as we approach the hotter *Climates*. The tarantula, ſo poiſonous in the hot countries, is found greatly leſs ſo as it is found in more cold regions; and the ſcorpion, whoſe ſting is fatal in ſome parts of Africa, is little more miſchievous than the waſp or hornet in ſome of the coldeſt places where it lives. Nay, the Philoſophical Tranſactions inform us, that the bite of the tarantula, even in thoſe very places where moſt miſchievous, does not exert its power in cold weather; but that a perſon bitten at ſuch a time feels not the effect of the bite till the next ſultry hot day, though that may not happen till after two or three weeks.

The differences made by variety of *Climates* upon plants, are not limited to diſtance of place, but even in the ſame province the *Climate* differs greatly in different years, by means of accidents, and more or leſs heat; and more or leſs moiſture will do as much violence to plants ſometimes, as change of place, which only operates by means of the ſame agents. Our farmers complain of great miſchiefs, from long droughts; and the French huſbandmen, in many of the provinces, always find, that when there has fallen very much rain, or thick fogs have been very frequent, all the bread-corn of every kind degenerates; the wheat and barley are poor and thin in the ear, and the grain ſmall; but the rye becomes ſo altered, that it is pernicious to uſe it in making of bread; and the poor, who are obliged to eat the bread made with it, are ſubjected to many diſeaſes by it. They call the rye thus vitiated *Ergot*, and *blé cornu*. *Deſland*'s Trait. Phyſ.

TEMPERING *of Bricks*. See the article BRICK-*making*.

TEMPLE (*Cycl.*)—*Temples* were originally all open, and hence received their name. See Phil. Tranſ. N°. 471. ſect. 5. where we have an account of an antient *Temple* in Ireland of the ſame ſort as our famous Stonehenge.

The word *Templum*, in its primary ſenſe among the old Romans, ſignified nothing more than a place ſet apart, and conſecrated by the Augurs; whether incloſed, or open; in the city, or in the fields. *Middlet.* of Rom. Sen. p. 135.

TEMPLUM *Soſtrati*, the name of a kind of chirurgical bandage, deſcribed by Galen. He alſo deſcribes another under the name of *Templum parvum Apollonii Tyrii*.

TEMPO *di Gavotta*, in muſic. See the article *Tempo di* GAVOTTA.

TEMPORALIS, (*Cycl.*) a broad flat muſcle, reſembling the quadrant of a circle, and occupying all the ſemi-circular or ſemi-oval plane of the lateral region of the cranium, the *Temporal* foſſæ, and part of the zygomatic. Through all the circumference of this ſemi-circular plane, the pericranium is divided into two laminæ. The internal lamina, which is ſometimes taken for a particular perioſteum, covers immediately all the bony parts of this region; the external lamina ſeparated from the other, is ſpread out like an aponeurotic, or ligamentary tent, by means of its adheſions to the external angular apophyſis of the *os frontis*, to the poſterior edge of the ſuperior apophyſis of the *os malæ*, and to the upper edge of all the zygomatic arch all the way to the root of the maſtoide apophyſis.

This muſcle is compoſed of two planes of fleſhy fibres fixed to the two ſides of a tendinous plane, nearly of the ſame breadth with them by which they are ſeparated; it being ſpread quite through the muſcle, like a concealed middle tendon; and the body of the muſcle thus formed, is incloſed between the two aponeuretic or ligamentary laminæ in the following manner:

The internal fleſhy plane is fixed by a broad radiated inſertion to all the ſemicircular plane of the cranium by the intervention of the internal lamina of the perioſteum. Thus it is fixed to the lateral and external part of the *os frontis*, and to its external angular apophyſis, to the lower part of the *os parietale* to the ſquammous portion of the *os temporis*, to the great ala or temporal apophyſis of the ſphenoidal bone by which the temporal foſſa is formed, and a little to the backſide of the internal orbitary apophyſis of the *os malæ*, which forms part of the zygomatic foſſa.

The external fleſhy plane is fixed in the ſame radiated manner to the inſide of the external lamina of the pericranium, from the great ſemi-circular circumference, all the way to a ſmall portion of this lamina, more or leſs ſemi-circular above its inſertion in the zygomatic arch; here the fleſhy fibres leave the external lamina, aud the void ſpace is commonly filled with fat. The middle tendinous plane continues to contract by degrees, and ends at length in a very conſiderable tendon, the extremity of which, which is in a manner double, encloſes the coronoide apophyſis of the lower jaw. There is another ſmall plane, reckoned by ſome to be a portion of this muſcle, but in reality is no other than the third portion of the maſſeter. *Winſlow*'s Anat. p. 251.

When the *Temporal* muſcles are wounded, at the ſame time that there is a contuſion of the cranium, which is frequently the caſe, the patient will be attended with great diſorders; not only as theſe muſcles are neceſſary for the offices of dividing the food, and for forming of ſpeech, but becauſe they are furniſhed with nerves, tendons and arteries, all very conſiderable, which will partake of the injury. Where there is no violent ſymptom attending wounds on the external parts of the head, they are eaſily cured by the common method uſed to freſh wounds, and there will be no occaſion for ſutures, for ſticking plaſters will always anſwer the purpoſe; but the dreſſings muſt always be finiſhed with all poſſible expedition; the medicines muſt be always applied warm, and the air kept in a moderate heat with hot coals.

If there be any great degree of hæmorrhage from the wounded veſſels, dry lint, or the ſtyptic powders are to be uſed, and the whole kept on by compreſſes and a proper bandage; and after the hæmorrhage is ſtopped, the wound muſt be dreſſed with *mel roſarum*, or ſome digeſtive medicines, till ſufficiently deterged, and then with a vulnerary balſam, or dry lint till it is healed. *Heiſter*'s Surg. p. 83.

TEMPOREGIATO, in the Italian muſic, ſometimes ſignifies, that the muſicians who accompany the voice, or the perſon who beats time, ſhould prolong ſome particular part thereof, to give the actor or ſinger room to expreſs the paſſion he is to repreſent, or to introduce ſome graces by way of ornament to the piece.

TEMPOREGIATO is alſo uſed in a different ſenſe, for *à Tempo*, or *à tempo giuſto*.

TEMPORUM *Oſſa*. Theſe are two in number, ſituated in the lower and lateral part of the ſkull; the figure of each is partly ſemi-circular, reſembling the ſcale of a fiſh, partly like a ſhapeleſs rock ending in ſeveral points.

Each of them is divided into two portions, one ſuperior termed ſquammous, from its figure; the other inferior, called *apophyſis petroſa*, or the rocky apophyſis; but that more from its hardneſs, than from the irregularity of its figure. This portion is eaſily ſeparable from the former in children; and ſome marks of this diviſion are uſually found ſtill remaining in adults.

They are alſo divided into two ſides, one external and convex, the other internal and concave. Their external eminences are, the maſtoide apophyſis in the lower and poſterior part of the bone; the zygomatic apophyſis in the anterior part; the ſtyloide apophyſis under the bone, which ſeems originally to have been an epiphyſis; the capſular apophyſis, in which the bony ſtilet ſeems as it were to be ſet; the articular eminence of the zygomatic apophyſis, the lambdoidal angle, and the lower ſide of the apophyſis petroſa.

Its external cavities are, the articular one immediately behind the eminence, called by the ſame name; and which, with that, ſerves for the articulation of the lower jaw. The crack in the articular cavities; the maſtoide notch, in which the digaſtric muſcle is inſerted; the opening of the external *meatus auditorius*; the anterior indented border of that opening; the ſtylomaſtoide, or anterior maſtoide hole, which is the orifice of the paſſage of the *portio dura* of the auditory nerve, called from its form the aqueduct; the orifice or inferior hole of the carotide canal in the apophyſis petroſa, which alters its direction upward and forward, and ends at the point of the rock near the *ſella ſphenoidalis*; a portion of the jugular foſſa, and a portion of the *foramen lacerum*.

Among the external cavities we are likewiſe to reckon a portion of the *ductus palatinus* of the ear, commonly called the Euſtachian tube, and by ſome the aqueduct; but by no means to be confounded with the other aqueduct, or ſtylomaſtoide; the zygomatic notch; the parietal notch; the ſpheroidal notch; one or more little tubes, which receive the ramifications of the temporal artery; the groove in the apophyſis petroſa; by which it is connected to the great apophyſis of the *os occipitis*; the poſterior maſtoide hole; but this hole is ſometimes formed between this bone and the *os occipitis*, and is ſometimes entirely wanting in one of the bones, and ſometimes in both; and there is beſide theſe, in ſome ſubjects, a ſmall maſtoide hole, which loſes itſelf in the ſubſtance of the bone.

In examining the internal eminences and cavities, we muſt diſtinguiſh the ſquammous portion from the apophyſis petroſa. In the former we ſee the radiated indentations of the ſemicircular edge, which with the parietal bone forms the ſquammous ſuture; a portion of the middle foſſa of the baſis cranii on the ſame ſide, and ſeveral inequalities on the ſame ſide.

The apophyſis petroſa, or rock, is a ſort of pyramidal body, with three ſides ſituated obliquely, ſo that its baſis is turned backward and outward, and its apex forward and inward toward the *ſella turcica*: Of the three ſides, one is ſuperior and inclined a little forwards, the ſecond poſterior, and the third inferior: This laſt belongs to the outſide of the whole bone. The upper ſide aſſiſts in forming the middle foſſa of the baſis cranii; and we obſerve here a ſmall irregular hole appearing to be double, and partly covered by a ſmall bony plate; this is a kind of break or interruption in the duct, through which the *portio dura* of the auditory nerve paſſes.

In the back ſide of the rock we ſee the internal auditory hole, and a portion of the foſſa for the cerebellum: ſmall, indeterminate, and pretty deep depreſſions are ſometimes ſeen in it in children; but theſe are gradually obliterated as they grow up. At the baſis of this apophyſis we ſee a portion of a groove in the lateral ſinus, formed partly in this baſis, partly in the lambdoidal angle; as alſo a portion of the *foramen lacerum*, and a ſmall point which as it were divides this hole in two, and diſtinguiſhes the paſſage of the jugular vein, from that of the eighth pair of nerves.

As this apophyſis has three ſides, three angles are to be obſerved in it; the firſt ſuperior between the upper and back ſides, the ſecond poſterior between the back and lower ſides, and the third anterior between the lower and fore ſide. The ſuperior angle, which is the moſt apparent, has a groove for the ſmall ſinus of the *dura mater*. The poſterior angle is in a manner interrupted near the middle by the *foramen lacerum*, and from it proceeds the little bony point, which divides this hole; at the end of it is a grove by which it is connected with

the great apophyſis of the *os occipitis*. Between the apex of the apophyſis petroſa, and the ſuperior opening of the carotid canal, we ſometimes meet with a ſmall bone alſo of the ſeſamoide kind, mentioned long ſince by Riolan. Almoſt the whole ſubſtance of the *oſſa temporum* is compact; the ſquammous portion is thin and tranſparent; the maſtoide apophyſis is hollowed by conſiderable cells; the apophyſis petroſa is very hard and ſolid, with ſeveral internal cavities for the organ of hearing contained in it. *Winſlow*'s Anatomy, p. 30. See the article TEMPORIS *Os*, *Cycl.*

TENACIOUS *Bodies*. See the article TENACITY.

TENACITY, in natural philoſophy, that quality of bodies by which they ſuſtain a conſiderable preſſure or force without breaking. Mem. Acad. Berlin. 1745. p. 47.

Tenacity is the oppoſite quality to fragility or brittleneſs. See the article BRITTLENESS.

Tenacious bodies ſupport the effort of percuſſion, or preſſure, without receiving any damage: But here, and in many other caſes, as when we uſe the words *hard*, *ſoft*, *flexible*, &c. we muſt be underſtood in a ſenſe relative to the ordinary degrees of human ſtrength; otherwiſe it would be difficult to ſay, what is *tenacious*, brittle, hard, ſoft, *&c.* Ibid.

TENCH, the Engliſh name of the *tinca* of the modern authors, the *fullo* and *gnapheus* of the antients.

It is, according to the Artedian ſyſtem, a ſpecies of the cyprinus, and is diſtinguiſhed by that author by the name of the blackiſh, mucous, or ſlimy cyprinus, with the end of the tail even. See the articles TINCA and CYPRINUS.

This is a delicately taſted fiſh, though it lives in foul water, and ſeems to feed very coarſely. It is always found in the muddieſt parts of ponds, and where there are moſt weeds.

The ſlime of the ſkin of this fiſh is ſaid to be of a healing nature, and to cure all freſh wounds; and it is pretended that the other fiſh know this property in it, and always apply to the *Tench* when wounded. Whether their opinion be true or falſe, the *Tench* has obtained by it the name of the *fiſhes phyſician*. The pike is ſaid to pay ſuch reſpect to this fiſh, on this account, that he never ſeizes him. But theſe are things eaſier to be fancied and ſaid than proved; and if it ſhould prove that the pike does not eat the *Tench*, it may be reſolved into a much more natural cauſe, by ſuppoſing the ſlime of the *Tench* too diſagreeable in his ſtomach to ſuffer it.

The ſeaſon for angling for *Tench* is in June, July, and Auguſt. The time of their biting is early in the morning, or late in the evening, and in hot weather, all night long. The favourite bait for the *Tench* is a large red worm, and they will take this much more greedily if it be dipped in tar, after it is put on the hook. There are ſeveral ſorts of paſte alſo that he bites very well at, particularly one made of brown bread and honey, with an admixture of tar. All paſtes that have any of the ſtrong-ſcented oils in them, are alſo good baits. Other baits are the cad-worm, lob-worm, flag-worm, green gentle, marſh-worm, or ſoft boiled bread corn. All theſe will do very well at a proper ſeaſon.

When a number of *Tench* are to be taken out of a muddy pond, where they will not bite freely at the hook, the method is to take a very good and large caſting-net, well leaded, and with the meſhes from the crown to a full yard and half, not too ſmall, for then, if the pond be deep, the fiſh will ſtrike away before the net gets to the bottom. The place where the net is intended to be thrown, muſt be made clean from buſhes and large weeds, with a rake. When the place is thus cleared of any obſtacles to the even deſcent of the net, a bait is to be prepared to draw the fiſh together, where the net is to be thrown. This bait is to be thus made: Put a quarter of a peck of wheat into three quarts of water, ſend it to an oven, and let it be well ſoaked, then add to it five pints of blood, and as much bran as is neceſſary to give it the conſiſtence of a paſte. Mix ſome clay with it, that it may the better hold together; and finally add a quart of lobworms chopped to pieces. Let the whole be wrought up into a ſtiff paſte, and rolled into balls of the ſize of a hen's egg; and let theſe be thrown into the pond, in the place where the net is to be thrown. At times theſe, and at times ſome grains are to be thrown in; and the place in this manner thoroughly baited for ſeveral days. When the fiſh may be ſuppoſed to be very well acquainted with the ſpot, let a very good baiting be given in the morning, and in the cloſe of the evening let the caſting-net be carefully thrown in. When the net is ſunk, the mud all about is to be ſtirred up with a long pole, with a fork at the end; the net is to lie half an hour, and the mud to be thus ſtirred all the time; by this means the *Tench* will be raiſed, and will be taken in the pulling out the net; but if the net were to be thrown in and taken out in the common way, there would hardly be one fiſh taken; for the cuſtom of both *Tench* and carp, when they are frighted, is to plunge their heads up to the eyes in the mud, and thus placed, with their tails erect, any net in the world muſt draw over them, without a poſſibility of its entangling them.

TEND, in our old writers, ſeems to ſignify as much as *Tender* or offer; as to *tend* a traverſe, an averment, *&c.* Briton, c. 76. Staundf. Prærog. 16. *Blount*, *Cowel.*

TENDO *Achillis*, in anatomy, is ſometimes more peculiarly denominated *Chorda Achillis*, and *Chorda Magna*, or the great *Tendon*.

'Tis on the diſtance of the *Chorda Achillis* from the point of ſupport, that the ſtrength of the foot depends. The further this tendon is from the articulation, the ſtronger the part is found. Hence it is obſerved, that animals which run, or leap with the greateſt eaſe, are thoſe in which this *Tendon* is fartheſt removed. And men with long heels are better able to walk than others; and ſtill the longer the foot, the more neceſſary is the length of heel. Petit. in Mem. de l'Acad. R. des Scienc. 1722. p. 75.

Anatomiſts are divided about the rupture of the *Tendon* of Achillis. Some hold this *Tendon* impoſſible to be broken by any effort whatever, and in proof hereof alledge its ſituation, which ſeems to ſecure it from ſuch an accident. Others inſiſt, that conſidering the great force which draws this *Tendon* downward, when in a leap or fall, the whole weight of the body bears on the top of the foot, or on the heel; 'tis eaſy to conceive, that a ſingle effort may break it. Accordingly Pareus affirms, he has known it broken, on a ſlight occaſion; as by a falſe ſtep, a ſlip in mounting on horſeback; and this without any viſible injury, or ſolution of continuity of the part.

M. Petit, the ſurgeon, produces two other inſtances of his own knowledge: The firſt, of a poſture-maſter named Clochoix, who, at the fair of S. Germains, endeavouring to jump, with his feet cloſe together, upon a table 3 foot high, broke both the *Tendons of Achillis*, yet without any external wound [a]: The ſecond, of a woman who broke the *Tendon of Achillis* of the right foot, by a fall in a boat, from a bench 6 foot high [b].—[[a] Mem. de l'Acad. R. des Scienc. 1722. p. 68. ſeq. [b] Traite des Malad. des Os. Jour des Scav. T. 74. p. 328.]

The phænomena enſuing on the rupture of the *Chorda Achillis*, in the firſt inſtance, were, that the patient could ſtill contract or ſtretch his feet; that he could not ſtand upright; and that he felt no pain, either at the time of the rupture, or during the cure.

Notwithſtanding this, ſeveral perſons perſiſt in the belief of the thing's being impoſſible; and conteſt both theſe inſtances, as not real ruptures of the *Tendon of Achillis*. A warm diſpute has enſued between the author and Mr. Andry, and others, the particulars whereof are related by the Paris journaliſts. V. Jour. des Scav. T. 74. p. 328. ſeq. Id. T. 75. p. 483. ſeq. Id. T. 78, p. 230.—

Mr. *Petit* obſerves, that the *Tendons* are a ſort of cords, which at one end part from a muſcle, and at the other are joined to a bone, ſo that when the muſcle contracts itſelf in its action, the *Tendon* draws toward it the bone to which it is infixed, and makes it perform ſuch motions as it is capable of. The *Tendons* are ſubſtances not capable of extenſion; ſo that when a muſcle acts, if the bone which it ſhould, by that action, draw to a certain place, does not follow, either the bone muſt break, or the *Tendon* muſt be torn aſunder; provided that the action of the muſcle be of a proper ſtrength.

We are next to conſider, that in certain motions, ſuch as that of the dancer, who is going to riſe up from the ground, all the weight of his body is ſuſtained by, and even overpowered by a certain number of muſcles, which, having been thrown into a ſtrong contraction, violently expand themſelves again in a moment, and by that means cauſe the leap. If at the inſtant, when theſe muſcles have ſtretched their *Tendons* to the utmoſt violence, there happens ſome accident by which theſe *Tendons* are again pulled downward by the whole weight of the body, it cannot be wondered at, that, ſtrong as they are, they cannot reſiſt ſo violent a force; and it was in this very manner that the dancer, cured by Mr. Petit, broke the *Tendons*. He was about to leap upon a table placed three foot above him; the *Tendon* could not but be extended to its full power in the attempt; and in trying, he ſunk directly down again; by which means the weight of his whole body was added to the former force; and that force was yet increaſed by the acceleration of a fall from the height of three foot.

The *Tendo Achillis* is formed by an intimate union of the *Tendons* of two muſcles; now if theſe two *Tendons* are both broken, the rupture of the *Tendon* is judged compleat; if one only is torn, and the ether remains whole, the caſe is then called an imperfect or incompleat rupture of that *Tendon*.

There is a great difference between the compleat and the incompleat ruptures of this *Tendon*. The pain in the incompleat rupture is exceſſively great; whereas in the perfect one there is ſcarce any pain at all. When a *Tendon* is wholly divided, the two ends draw back different ways, like the ſtring of a bow when cut, and this produces no pain, or any farther bad ſymptom, than the loſs of the *Tendon*; which is ſo true, that, in order to take off the pain and other bad ſymptoms which attend the wounding, or imperfectly dividing a *Tendon*, the beſt means is to cut it wholly aſunder.

The *Tendo Achillis* is placed in a ſort of ſocket, where it plays freely every way, and has no connection or adherence with the adjacent parts; and hence a compleat rupture of it is without pain. This, however, is not the caſe, when only one of the two *Tendons* which compoſe it is divided, for then the ſeparated ends of this retiring back as far as poſſible, cannot but violently affect the remaining entire *Tendon*, which with

them

them formed the *Tendo Achillis*; and as the union of these two is very strict, the pain succeeding the separation of one, and the retraction of its ends, cannot but be proportionably violent and great.

The pain felt in the division of one of these *Tendons*, or the imperfect rupture of the *Tendo Achillis*, is only perceived upwards or above the wound, not below it; the reason of which is, that the upper part of the divided *Tendon* is forcibly drawn up by the muscle by which it is contracted, while it is also drawn downward at the same time by the *Tendon* to which it is intimately and firmly united, and which yet remains whole; and this contrary force must produce the most exquisite pain in the fibres which resist; while the inferior portion, having no force applied to it but what tends to draw it downwards, easily yields to that, and is in no condition to suffer a like pain. This difference between the sensation of the two extremities is, however, only to be felt at first; since, after some time, the inflammation spreading, affects the neighbouring parts, and the lower extremity must feel its share; though even then the pain is much less acute in that portion than in the upper.

In case of a compleat rupture of this *Tendon*, the foot may be bent without causing any pain to the patient; the only effect is the encreasing the space which is between the divided ends of the *Tendon*: But the case is far otherwise in an imperfect rupture of this *Tendon*; the foot then cannot be bent without the utmost pain and agony, because the space between the divided ends of the *Tendon*, which must be enlarged by this bending, cannot be enlarged without a tearing, and violently forcing the imperfectly divided parts.

In the imperfect rupture of this *Tendon*, the patient may walk, though it is with very violent pain; but in the perfect rupture, the person cannot walk, though he suffers no pain at all. In walking, at every step that we take, the whole weight of the body is sustained by the hinder foot; now the *Tendo Achillis* is the only support, by means of which the foot can sustain that weight, or regulate its pressure; and therefore when that *Tendon* can no more perform its office, we can no more walk. These are the several symptoms by which the imperfect ruptures of this *Tendon* may be known from the compleat ones; a knowledge highly necessary to all who are to undertake their cure. Memoirs Acad. Par. 1728.

There have been instances of the *Tendo Achillis* having been cut through, and cured without stitching. See Commerc. Norimb. 1740. hebd. 46.

When a *Tendon* is wounded or divided, the part to which it belongs loses its motion; but if it is divided only in part, the symptoms it produces are much the same with those arising from a nerve wounded in the same manner. *Heister*'s Surg. p. 28.

TENDON, in the manege, a sort of gristle that surrounds one part of a horse's foot, and is seated between the hoof and the coffin-bone, near the cronet. When a horse has a quitter-bone, the matter that gathers between the coffin-bone and the hoof, spoils the *Tendon*, and makes it black; and the cure of such a quitter-bone consists in cutting and extirpating the *Tendon*.

TENESMUS, (*Cycl.*) a name given by medical writers to a complaint, which is a continual desire of going to stool, but usually without any stool being ready to be voided. This is usually attended with some tumour, sometimes with a very considerable one in the part. This is properly no primary disease, but merely a symptomatic one, and differs in degree according to the disease on which it is an attendant.

Signs of it. These are a titillation and itching about the anus, attended with a violent burning pain, and a desire of compressing and voiding something, and this attended usually either with no excrement, or only a pulpous and mucous matter, and very often a procidentia ani, or falling down of the rectum.

Persons subject to it. This disease very often happens to people labouring under hæmorrhoidal disorders, especially when the discharges attending them do not succeed regularly, though nature gives all the necessary motions for their excretion. It happens also to people who are subject to void an acrid and bilious matter by stool, and not unfrequently to those who have a stone in the bladder. Women in the latter part of their time, in going with child, have also very often terrible fits of it, attended with considerable swelling; this happens to them from the pressure of the uterus, with its burden, upon the rectum and hæmorrhoidal veins. The procidentia ani happens also to all these subjects, and, beside these, is very familiar to infants, from their voiding an acrid matter by stool, and to all persons who are subject to great costiveness, and void their stools with great difficulty and pain; and finally, people who have paralytic weaknesses of the sphincter of the anus, incur this troublesome disorder after a time.

Causes of it. The causes of a *Tenesmus*, beside those already mentioned, of suppressions of the hæmorrhoidal discharges, and voiding acrid matter by stool, are the ascarides, a small sort of worms which usually infest the rectum, and occasion a continual iching and tickling there; the abuse of resinous purging medicines; and, among these, the resinous parts of aloes, and black hellebore, are, above all, most subject to remain in the rectum, and bring on this complaint: Much riding will also sometimes occasion it; and many people have been thrown into it by wiping their backside with paper in which pepper, ginger, or other hot and acrid things have been kept. The procidentia ani is owing usually to the same general causes, as also to the relaxation of the nervous and glandulous coat of the rectum, occasioned by long continued diarrhœas.

Prognostics in a TENESMUS. When a hiccough comes on upon a person in a *Tenesmus*, it is usually a bad omen; a violent *Tenesmus* coming upon women with child, sometimes occasions them to miscarry. In the mildest symptoms of the falling down of the anus, which is a frequent attendant on a *Tenesmus*, it is a very troublesome and painful disorder, especially when it continues some time, as it often does: And when there happens a tumour, and coldness in the part that is fallen, it very often becomes dangerous, threatening inflammation and mortification. In common cases, and where the distemperature has not before been frequent, the reducing the intestine to its place is usually an easy thing; but when there is any thing paralytic in the origin, it is more difficult both to restore it, and to prevent relapses.

Method of Cure. As the *Tenesmus* is merely a symptomatic disease, the primary disorder is to be examined, and treated, in order to a cure. Thus, when it is occasioned by ascarides, worm-medicines are to be given, and clysters of a proper kind injected, such as decoctions of tanzy, wormwood, and myrrh: When the worms are by this means destroyed, the *Tenesmus*, which was no more than a symptom, naturally ceases. In cases where it is caused by a flux of bilious matter by stool, or by a retention of the hæmorrhoidal discharges, it will be proper to give medicines to obtund the acrimony of the humours, and take off the spastic motions occasioned by them. To this purpose powders of nitre, crabs-eyes, and cinnabar, are to be given, and jellies of hartshorn, and the like, with gum-arabic, tragacanth, and such other agglutinants. The vapours of turpentine, and of the carminative seeds, received on the part, are also of great benefit; and hot fomentations of decoctions of the herbs of marshmallows and pellitory, and chamomile flowers. These ingredients may also be applied as a cataplasm; for beyond all things, external heat is of the most immediate service. The sitting over the steam of hot water is a very good thing, and the rubbing the part with an ointment made of mucilage of quince seeds, with oil of mullin, and the yolk of an egg. In cases where there is a procidentia ani, the gut is to be replaced as soon as possible; the person is, to this end, to be laid upon his belly, and a moderate force to be used in putting it back, the fingers being first rubbed over with oil of sweet almonds, before they touch the gut. If this is not to be done at the first attempts, the patient must be suffered to lie down again in a natural posture, and spunges, wetted with astringent dedoctions, are to be applied to the part; powders of mastic, with a very small quantity of alum among it, also is useful to be sprinkled on the gut on this occasion. The sitting upon a bag of oatmeal, boiled to the consistence of pap, and sprinkled over with a small quantity of alum, is also a very good method. And so long as the intestine remains out of its place, it must be carefully kept warm, for fear of a mortification. If there is an inflammation attending it, this must be first carefully discussed by epithems of scordium, sage, chamomile, and rose and elder flowers; and, after this, the usual methods of attempting a reduction are to be employed. And finally, when the sphincter has a paralytic weakness, the ordinary methods are to be assisted by bandages, to prevent its return; but in a case of this kind, all that is to be done, is simply palliative, since the cure is not to be hoped. In cases where the *Tenesmus* is owing to bilious stools, or to the suppressions of the hæmorrhoidal discharges, the patients are carefully to abstain from all medicines in which aloes is an ingredient, as the elixir proprietatis, and the like.

In cases of the *Tenesmus* from the pressure of the womb in women with child, there is no cure but delivery; but the methods before proposed will palliate and give ease. When milk is given in clysters, in these cases there must be great care taken that it is perfectly fresh, not the least turned sour. If there be a colic attendant on the *Tenesmus*, provided that it be not a bilious one, it is always proper to inject clysters with a small quantity of common salt, to absterge the mucous humours; and when powders of the astringent kind are used, they must always be extremely fine, lest their particles, sticking to the inner coats of the intestine, should increase, instead of mitigating the disease. Alum must be added, but in very small quantities, to these powders, lest it astringe too violently, and by that means prevent instead of forwarding the reducing the part. Hartman commends the beetles found in horse-dung, dried and powdered, as a very powerful remedy in all cases of this kind. *Junk.* Consp. Med. p. 583. seq.

TENGA, in botany, a name by which some authors have called the coco-nut-tree, or *Palma Indica nucifera* of other writers. Hort. Malab. vol. 1. p. 1.

TENSION, (*Cycl.*) *Tensio*, Τασις, in the antient music, was used to signify any pitch of sound, whether produced by intention or remission. Vid. *Aristoxen.* p. 10——13. Edit. Meibom.

Ariſtoxenus obſerves, there are five things to be conſidered about ſounds, τασις, tention; ἐπιλασις, intention; ἀνεσις, remiſſion; ὀξυτης, acumen; and βαρυτης, gravitas. Ibid. See theſe Terms in their proper Places.

TENSOR (*Cycl.*) — TENSOR *Tympani*, in anatomy, a name given by Albinus to one of the muſcles of the ear, called by Cowper, *internus auris*, and by others, *internus mallei*.

TENT, (*Cycl.*) a ſmall bundle of ſcraped lint, uſed in dreſſing ſome wounds, worked into the ſhape of a nail, with a broad flat head. They differ in thickneſs and length, according to the ſize of the wound for which they are intended.

They are chiefly uſed in deep wounds and ulcers, and are of ſervice to convey medicines to the moſt inner receſſes and ſinuſes of the wound. 2. To prevent the lips of the wound from uniting before it is healed at the bottom. And 3. By their aſſiſtance grumous blood, ſordes, and other foulneſſes, are readily evacuated.

They are to be made extremely ſoft, that the cure of the wound may not be retarded, by the pain they would otherwiſe bring on; but, that the wound may not be kept open too long, it is adviſable, as ſoon as the part is ſufficiently cleanſed, and the ſinuſes are found to heal up, to leſſen the ſizes of the *Tents* by degrees, and as ſoon as ſafely and conveniently may be, to leave them entirely off.

Many ſurgeons, of great note, have entirely forbid the uſe of *Tents*, from the frequent obſervation of the ill effects ariſing from the ſurgeon's neglecting, or not knowing theſe neceſſary cautions.

There are, however, beſide theſe *Tents* of ſcraped lint, another kind, made of linnen rags not ſcraped, worked up into a conical form, to the baſis of which is faſtened a ſtrong thread; the apex of it muſt be a little unravelled, to make it ſofter, that it may not become painful. The thread is faſtened to the baſis, that it may be recovered with the greater eaſe, if by any accident it ſhould be forced into the cavity of the thorax or abdomen, for theſe ſort of *Tents* are chiefly uſed to keep open wounds that penetrate into the thorax or abdomen; in order to make way for the proper diſcharge of blood, matter, &c. by the mouth of the wounds.

A third ſort of *Tents* there remains yet to be deſcribed, whoſe office is not only to keep open, but to enlarge, by degrees, the mouth of any wound, or ulcer, which ſhall be thought too ſtrait, by which means a freer paſſage may be procured for the blood or matter that was confined; and that the proper medicines may find a more ready admittance.

Theſe *Tents* are uſually called *ſponge Tents*, and are made either of ſponge, or of the roots of gentian, calamus aromaticus, &c. for theſe kind of things imbibe the matter that flows to them, and being enlarged, by that means dilate the lips of the wound. *Heiſter*'s Surg. p. 17.

TENTHREDO, in natural hiſtory, the name of a fly of the ſtinging kind. It is of the ſize and ſhape of the bee, but of the colour of the waſp. It loves to be among meat, as in kitchens and larders; it is a very gregarious animal, but makes no honey, though whole ſwarms live together.

TENTORES, among the Romans, were perſons appointed to hold the cloaths of the charioteers that contended in the circus. *Pitiſc.* Lex. Antiq. in voc.

TENUIROSTRÆ, in zoology, the name of a genus of ſmall birds, which feed on inſects, and have ſlender and ſharp beaks; of this genus are the lark, ſwallow, red breaſt, and a number of others. *Ray*'s Ornithology, p. 148.

TEPETOTOTL, in zoology, the name of a Braſilian bird, of the gallinaceous kind, more uſually called *mituporanga*. See the article MITUPORANGA.

TEPHRIA, in the natural hiſtory of the antients, a name given to the grey ophites. See the article OPHITES.

TEPHROMANTIA, τεφρομαντεια, in antiquity, a ſpecies of divination, performed with aſhes; for which ſee *Potter*, Archæol. Græc. T. 1. p. 353.

TEPID, in natural hiſtory, a term uſed by writers on mineral waters, to expreſs ſuch of them as have a leſs ſenſible cold than common water.

They diſtinguiſh all the medicinal ſprings into three kinds; the hot, the *tepid*, and the cold; but the middle term might eaſily be miſunderſtood to mean a great deal more than they expreſs by it; all that have what can be called the leaſt ſenſible warmth, are called hot; and the *tepid* are diſtinguiſhed from the abſolutely cold, only by their being leſs cold.

Some of this claſs of mineral waters, and ſome few alſo of the cold ones, have a ſharpiſh vinous taſte, which is never obſerved in any of the hot ones. This taſte is loſt on the giving the waters the ſlighteſt heat, and is therefore very difficult to be gueſſed at as to its origin. It is not only found in the aluminous and vitriolate waters, but alſo in thoſe which are manifeſtly nitrous, and which abound in ſulphureous ſalts, quite different in their nature from acids. 'Tis therefore an additional ſomewhat, quite diſtinct from the ſaline properties of the fluid, and as eaſily connected with one kind of that as with the others.

The cauſes of heat in the mineral waters remains yet wholly unknown, notwithſtanding all that has been written concerning it. It is hard to believe, that there are continual ſubterranean fires near enough the ſurface, to give a heat that preſerves itſelf in ſo great a degree to the very place of their eruptions; and it is equally hard to conceive, that there can be beds of fermenting mineral matters, ſufficient in quantity and force to have given the ſame degree of heat to waters for ſo many ages, as ſome of our hot ſprings are known to have ſubſiſted. *Duclos*'s Exam. des Eaux. Miner.

TEPIDARIUM, among the Romans, a *Tepid*, or blood-warm bath, which was joined to the cold and hot baths, and was a medium between the two; ſo that if any perſon wanted to go from the hot to the cold bath, or *vice verſa*, he always took the *Tepid* bath in his way. *Pitiſc.* in voc.

TERBEDH, in the materia medica, a name given by Aviſenna to the *Turbith*, a purging-drug, mentioned by all the authors of his time; but in general, in a very confuſed manner.

The *Turbith* of Serapion is the *Tripolium* of the Greeks. The *Turbith* of other authors is the *pityuſa* or the *alypum*-root; all theſe are things greatly differing from one another, and from the true *Turbith* of our ſhops deſcribed by Garcias.

The greateſt critics have been perplexed what to determine as to the *Turbith* of Aviſenna; it ſeems plainly different from all theſe; and though Scaliger, and others, make it alſo different from the *Turbith* of our times, and of Garcias; yet there is ſome reaſon to ſuſpect that they err in this, and that the drug is the ſame.

This author ſays, that the *Turbith* of his time was a woody ſubſtance, brought from the Eaſt-Indies. This cannot belong to any of the other plants, as they are natives of Greece, not brought from the Indies, and as they were not woody, but herbaceous plants; but the *Turbith*, which we at this time receive from the Indies, is a woody ſtalk, and the virtues of it agree well with thoſe aſcribed by Aviſenna to his *Turbith*.

Garcias tells us, that the Indians uſe it to purge phlegm, and that they add ginger to it by way of corrective; and Aviſenna ſays the ſame thing, of its uſe in his time.

TERDINA, in the materia medica, a name by which Paracelſus, and ſome other authors, have called the great garden Valerian. *Ger. Emac.* Ind. 2.

TEREBINTHUS, the *Turpentine-tree*, in botany, the name of a genus of plants; the characters of which are theſe. The flower is of the apetalous kind, being compoſed of ſeveral ſtamina, furniſhed with their apices; theſe are however barren, and the embryo-fruits are produced on other plants of the ſame ſpecies, which produce no flowers. Theſe finally become a capſule, compoſed of one or two cells, and containing oblong ſeeds. See Tab. 1. of Botany, Claſs 18.

To this it is to be added, that the leaves are pinnated, growing ſeveral over-againſt one another on a middle rib, which is terminated by an odd leaf.

The ſpecies of *Turpentine*, enumerated by Mr. Tournefort, are theſe: 1. The common *Turpentine*-tree. 2. The *Turpentine*-tree, with a larger eatable fruit, like the piſtachia nut. 3. The *Turpentine*-tree, with ſmall blue eatable fruit. 4. The Indian *Turpentine*-tree of Theophraſtus, the piſtachia of Dioſcorides. 5. The trifoliate piſtachia, or *Turpentine*-tree. 6. The *Turpentine*-tree of Cappadocia. 7. The American *Turpentine*-tree, with fruit like the piſtachia, but not eatable. *Tourn.* Inſt. p. 579.

TEREBOTIN, a word uſed by Paracelſus, for the common turpentine.

TEREBRA, (*Cycl.*) the name of a chirurgical inſtrument, uſed for the perforation of bones, or for the extracting of bullets, or other the like extraneous bodies, out of wounds.

TEREBRATULA, in natural hiſtory, a name given by Mr. Lhuyd to ſome ſpecies of the ſmooth conchæ anomiæ, which have near the head of the ſhell a ſmall hole, which looks as if bored by art. See the article CONCHÆ *Anomiæ*.

TEREDO, a name given by naturaliſts, to a ſpecies of ſea-worm, which eats its way into the bottoms of ſhips, lining the hole it makes with a kind of ſhelly matter.

The head of this creature is well prepared by nature for the hard offices it is to undergo. being coated with a ſtrong armour, and furniſhed with a mouth like that of the leech; by which it pierces wood, as that animal does the ſkin. A little above this it has two horns which ſeem a kind of continuation of the ſhell. The neck is as ſtrongly provided for the ſervice of the creature as the head, being furniſhed with ſeveral ſtrong muſcles. The reſt of the body is only covered by a very thin and tranſparent ſkin, through which the motion of the inteſtines is plainly ſeen by the naked eye; and by means of the microſcope, ſeveral other very remarkable particulars become viſible there.

At that part where the inteſtines end, the tail begins; this is longer than all the reſt of the body; it is depreſſed in the middle, and puffed out on each ſide, and is joined to the callous part of the lower end of the body, in an irregular manner, ſo that there is an indeterminate void ſpace left between; this occupies the middle part between what the natural hiſtorians call two ſoleæ-form fins. This creature is wonderfully minute, when newly excluded from the egg, and at its utmoſt bigneſs is a foot long; three or four inches is however its more frequent length.

The ſkin of this little animal being ſtripped off, the heart, ſtomach, and inteſtines come plainly in view, as alſo the callous muſcles of the neck, and two white ovaries; the heart is compoſed of two pyramidal veſſels.

The increaſe of this pernicious inſect is by eggs, and is ſo very great, that Sellius, who has written a whole folio of its hiſtory, computes there are in one parent more young at a time, than there are men in the eight largeſt cities of Europe; ſo that it is no wonder that ſo many of theſe creatures are found in the bottom of a ſhip, when they have once ſeized upon it; the only wonder is, that there are not many more.

When the bottom of a veſſel, or any other piece of wood conſtantly under water, is inhabited and injured by ever ſo great a number of theſe worms, there is no ſign of the damage to be perceived on the ſurface, nor are the creatures viſible till the outer part of the wood is cut or broken away, then their ſhelly habitations come in ſight; theſe lie ſo near the ſurface, however, as to have an eaſy communication with the water, and there are a multitude of little perforations in the very ſurface through which the inhabitant inſects throw out the extremities of their little ſhelly horns. Theſe are of a reddiſh colour, and may be diſtinguiſhed by an accurate obſerver in form of ſo many red prominent points; they all are retracted on the leaſt touch, and are thrown out again as ſoon as all is quiet. From theſe points, or the ſmall apertures which give them a way out, are the cells of the *Teredines* to be traced. They are compoſed of a pearly or ſhelly matter, which forms a long tube with various windings and turnings, which marks the abode of the creature; but which uſually neither adheres to the body of the animal, nor to the wood. Theſe caſes or tubes are always more or leſs looſe in the wood, and there is ever a large ſpace within them, for the body of the animal to be ſurrounded every way with water. They are very ſmooth on the inner ſurface, and ſomewhat rougher without; and are much harder and firmer in the cells of the older and larger animals, than in thoſe of the young ones.

Theſe ſhelly tubes are compoſed of ſeveral rings, or annular parts; but theſe differ greatly in their length.

There is an evident care in theſe creatures, as they are a republic, never to hurt or injure one another's habitations; and by this means each tubule or caſe is preſerved entire, and in ſuch pieces of wood as have been found eaten by them into a ſort of honeycomb, there never is ſeen a paſſage or communication between any two of the tubules, though the woody matter between them often is not thicker than a piece of writing-paper.

The creature depoſits its eggs on the outſide of the bottom of a ſhip, or any other piece of wood; the young worm hatched from this egg immediately eats its way into the wood, entering thus by a very minute hole, which is the reaſon why the ſurface of wood ever ſo much infeſted with them ſhews no ſign of them; when they have made their way into the ſubſtance, they work forward in different directions, and when they find they approach one another, they turn ſhort off, and direct their future courſe another way; and to this ſeems owing the twiſted ſhape of the tubules; neither are theſe every where of the ſame dimenſions, but are always wider where the head and the ſoleæ-form fins are placed, than elſewhere; a free motion of both theſe parts being extremely neceſſary to the well being of the animal.

The kind of wood in which theſe worms are lodged, makes a great difference in the appearance of their cells, as they work much more ſpeedily and ſucceſsfully in ſome kinds, than in others. The fir and alder are the two kinds they ſeem to eat with the greateſt eaſe, and in which they grow to the greateſt ſize. In the oak they ſeem to make but a very ſlow progreſs, and uſually appear very ſmall and poorly nouriſhed. The colour of their ſhelly tubules is often brown in this wood; which ſeems plainly owing to the effect of its juices.

Although the head of this creature ſeems extremely well formed for the eating into any ſubſtance, yet the hardneſs of oak, and of ſome other ſpecies of wood in which theſe animals are found, is ſo great, that it ſeems ſcarce credible that they could fairly have eat their way into it. Reaumur has proved that ſome kinds of ſhell-fiſh have in part of their bodies a corroſive liquor; and many have ſuppoſed the *Teredo* to have ſuch a liquor, and by that means to deſtroy the wood. But there are many reaſons againſt this, as the exact and regular figure of the hole, the difficulty of corroding wood, *&c.* Sellius reſolves the whole into the mere repeated action of water. He ſuppoſes the whole body of the *Teredo* to be an hydraulic engine, which, as it is always ſurrounded with ſea-water in its cells, takes in and throws out part of this as it pleaſes; and by continually diſcharging water with ſome violence againſt that part of the wood into which it would make its way, it is ſuppoſed by degrees either wholly to wear it away, or at leaſt to ſoften it in ſuch a manner, as that it may be eaſily gnawed away.

By this means alſo the tracheæ of the wood and other veſſels, which in its growing ſtate had ſerved for its nutrition, are opened and enlarged, and make the way for wider holes much eaſier than it would appear to any one who conſidered the wood as one ſolid maſs.

When there comes an iron ſpike, or other extraneous hard body in the way of one of theſe creatures in its courſe, it firſt trys if it can eaſily go round it, but if there appears any difficulty in that, it continues its battery of water againſt it, and either by continued induſtry makes its way through it, or periſhes in the attempt. The young ones when even but juſt hatched from the egg, have this art of darting forth water, and by that means make their way, as well as by eroſion into the wood.

One thing very remarkable is, that the body of the *Teredo* when grown to a moderate ſize becomes the habitation at pleaſure of a vaſt multitude of ſmall ſea-water inſects, which enter with the water into the cavity of the tubules, and are with it received into the body of the animal, and again thrown out againſt the wood. In this, doubtleſs, many of them periſh; but millions at a time are alſo to be ſeen, living perfectly at eaſe in the belly of the creature.

The vaſt increaſe of theſe animals, and their ſhelly tubules, naturally leads to a conſideration of the manner of their generation; and when we conſider that each of theſe creatures is, from the time when it is produced from the egg, immediately lodged in a cell, in which it lives without the leaſt poſſibility of getting into that of another animal of its own kind, or receiving one of them into its own; it is not eaſy to account for the propagation of the ſpecies in the common way. This, however, is ſolved by an accurate anatomical obſervation of the animals themſelves, ſince in every individual the parts of generation of both ſexes, and both the ſemen and ovula are found. Each individual therefore evidently ſerves by itſelf for the propagation of the ſpecies; and this is probably very often the caſe in earthworms, and other of the hermaphrodite animals. All the yet known kinds of theſe being ſoft-bodied; and probably, though they often meet one another, and copulate in pairs, yet when they have not that opportunity, the parts copulate in the individual.

The eggs are found in great plenty in the bodies of theſe animals in June, and are after this diſcharged with the water into the ſea, where the far greater part of them, doubtleſs, become food for other ſmall animals; and the few that come to good affix themſelves to any piece of wood they are waſhed againſt, and there hatch and get into its ſubſtance in the manner of their parents.

Many other animals are great deſtroyers of the eggs of the *Teredo* while they are fixed to the ſurface of the wood. The ſcolopendræ marinæ eat them in great abundance; the ſhrimps alſo, and the pulmo marinus devour them.

Poiſonous ointments are alſo found to be of ſome uſe in deſtroying them, on rubbing over the wood; ſome have thought that burning the ſurface was an effectual way of preſerving them, but this has been found to be otherwiſe. The ſureſt method of avoiding them in particular works, is the uſing bitter or very ſolid woods; the firſt kind they are found never to touch, and in the other they make but ſlow progreſs. Mixtures of lime, ſulphur, and collocynth, with pitch, for covering over the ſurfaces of boards, *&c.* have been found of ſome uſe.

It ſeems very evident, that boards and other pieces of wood have been ſubject to be eaten by theſe animals, from all times that we have any knowledge of; for the ſtone called *lapis ſyringoides* is evidently no other than wood thus eaten, petrified by long lying in the earth, together with the tubules of the worms. The maſſes of this with the grain of wood yet plain in them, are common in many places among ſea-ſhells, and other marine remains at great depths, and have evidently been brought thither in very diſtant times, and before changes were made in the ſurface of the earth of which we have no accounts in our earlieſt hiſtories. *Sellii* Hiſt. Natur. Teredinis.

TERENJABIN, in the materia medica of the antient Arabians, a word uſed to expreſs a kind of manna called by ſome *manna maſtichina*, from its round globules reſembling the drops of maſtic, and by the phyſicians of many parts of the world at preſent *manna perſicum*. See the article MANNA *Perſicum*.

Geoffroy indeed makes the *Terniabin*, or *Terenjabin* to be a kind of liquid manna; but this is an error into which he has been led by Bellonius, who, though a very cautious obſerver in moſt particulars, was evidently deceived in this, by the accounts of the monks of mount Sinai. Bellonius ſays, that theſe monks collect a kind of liquid manna, which is called *Tereniabin*, and ſold in the ſhops at Cairo under that name; and adds, that this is the *mel roſcidum* of Galen, and *mel cedrinum* of Hippocrates; but it is very evident from the general conſent of authors that this was not the ſubſtance called *Tereniabin* by the Arabians, and now *manna perſicum*.

It ſeems indeed very probable, that this liquid manna collected by theſe monks, is the ſame ſubſtance called *droſomeli*, and *aëromeli* by Galen, and *mel cedrinum* by Hippocrates (if there be no error in the text) though not the *Tereniabin*.

The deſcription which Galen has left us of the *mel roſcidum*, and of the manner of collecting it on mount Sinai in his time, agrees very well with what Bellonius ſays of it; and theſe circumſtances ſeem to be agreed upon by all authors in regard to it, but it does not appear that its uſe as a medicine was known any thing near ſo early as in the days of Hippocrates and Galen; the Arabian phyſicians ſeeming to have been the firſt who brought it into general uſe as a purge. Galen takes notice of the *mel roſcidum*, or liquid manna, more

as a curioſity than as a medicine, no where mentioning its qualities as ſuch, or ſaying any thing about its uſe. He ſays, that it was rarely met with in his country, but that it was gathered annually in conſiderable quantities on mount Sinai. And indeed from the manner in which it is ſpoken of by the old Greek writer cited by Athenæus, as mentioned by Salmaſius, it ſhould ſeem that it was only uſed for pleaſure, as an agreeable ſweet. What he ſays of it, being that it was ſweeter and more agreeable to the taſte than honey itſelf. Meſue tells us, that Galen mixed manna with ſcammony.

In the ſpurious piece *de dynamiis*, aſcribed to Galen, ſcammony is indeed ordered to be mixed with honey, but he never once mentions manna in any of his writings on any ſuch occaſion. As Galen is known to be very minute and particular in his account of the materia medica at that time in uſe, his ſilence is a ſtrong argument that even the mel roſcidum was not in uſe as a medicine, much leſs any other ſpecies of manna. Phil. Tranſ. N°. 472. p. 90.

TERES (*Cycl.*)—Teres *Folium*, among botaniſts. See the article Leaf.

TERETRON, the name of a chirurgical inſtrument, more uſually called *Terebra*.

TERFEZ, in natural hiſtory, the name given by the Africans to the truffles found in the deſarts of Numidia, and other places in that part of the world in great abundance.

Theſe are much more delicately taſted than the European truffles, and are white on the outſide. They are called by ſome of the Africans *kema*, and by the Arabian writers *cantha*, and *camahe*.

TERM (*Cycl.*)—The uſe of *Terms* is neceſſary in order to render our abſtractions clear and diſtinct, as alſo to retain them.

TERMOR, *Tenens ex termino*, in law, he that holds lands or tenements for a term of years, or life. *Litt.* 100. *Blount.*

TERNA, a word uſed by ſome authors, to expreſs an impetigo. See the article Impetigo.

Terna *Folia*, among botaniſts. See the article Leaf.

TERNARY *Number*, in antiquity, was eſteemed a ſymbol of perfection, and held in great veneration among the antient mythologiſts. Whence Virgil,

——— *Numero Deus impare gaudet.* Ecl. 8. v. 75.

Servius on this place remarks, that the Pythagoræans aſcribed the *Ternary* number to the ſupreme God, as being the beginning, middle, and end of all things. All the heathen gods had a threefold power attributed to them, as the *tria virginis ora Dianæ*, the three-forked thunderbolt of Jupiter, the trident of Neptune, the three-headed dog of Pluto. Again, the parcæ were three, the furies three, Hercules was three nights in begetting, the muſes were antiently three, the graces three, &c. *Hofm.* Lex. univ. in voc.

This number was likewiſe uſed in moſt religious ceremonies, but eſpecially in luſtrations; whence Virgil, Æn. l. 11. v. 188.

Ter circum accenſos, cincti fulgentibus armis
Decurrêre rogos.———————

TERPENTARIA, in botany, a name uſed by ſome authors for the *betonica aquatica*, or great water figwort, called waterbetony. *Ger. Emac.* Ind. 2.

TERRA, *Earth*, (*Cycl.*) in natural hiſtory, &c. ſee the article Earth.

Terra *de Baira*, in natural hiſtory, the name given by ſome to an earth of a white colour, found about Baira, not far from Palermo.

It is eſteemed a very great medicine in the cure of malignant fevers, and in the ſtopping hæmorrhages of all kinds. The powder of it is commonly ſold in Italy under the name of Claremont powder; a name it obtained from a perſon who firſt found out its virtues, and communicated them to the world in a treatiſe expreſly written on the ſubject. *Boccone* Muſ. de Fiſic. See the article Claremont *Powder*.

Chia Terra, in the materia medica of the antients, an earth of the marle kind, found in the iſland of Chio, and given internally as an aſtringent; but its chief uſe among them was as a coſmetic, the ladies eſteeming it the fineſt of all things for cleanſing the ſkin, and defacing wrinkles.

What title it has to theſe qualities, the world has not of late ages inquired into; but the ſubſtance is ſtill in being, and to be had in any quantities from the ſame place. And the deſcriptions Dioſcorides and Galen have left us of it are ſo accurate, that there is not the leaſt room to doubt but that the earth now found there was the very kind they uſed. It is a denſe compacted earth, yet very ſoft and of a texture eaſily diſunited and broken by water.

While in the ſtratum it is of a duſky greyiſh or bluiſh white, very dry, and of a ſhattery ſtructure; when thrown upon the ſurface of the earth and left to the weather, it ſoon breaks into an impalpable powder, or melts into a ſubſtance like butter, and ſinks into the earth again; but if taken up and dried, it becomes of a pale greyiſh white, and is ſeen to be laminated in its ſtructure, or compoſed of a great number of plates or thin cruſts. It is remarkably fine and ſoft to the touch; it adheres firmly to the tongue, is very eaſily broken and crumbled to pieces between the fingers, and a little ſtains the hands. Thrown into water it makes a ſlight bubbling and hiſſing noiſe, and afterwards ſwells and gradually melts into a ſubſtance like a thick cream. It ferments violently with acids, and ſuffers no change in a moderate fire, except that it becomes a little whiter; and by theſe characters may be diſtinguiſhed from all the other white earths. *Hill*'s Hiſt. of Foſſ. p. 46.

Terra *cimolia purpuraſcens*. See the article Steatites.

Terra *Foliata Tartari*. This ſaponaceous ſalt, which is a fixed alkali, ſaturated with diſtilled vinegar, is an excellent alterative and diuretic, when taken in the quantity of half a dram to two drams. If taken in the doſe of three to ſix drams, it is a mild cathartic which never ſinks the ſpirits, or occaſions any violent diſorder. It has been found of ſervice in dropſies. Med. Eſſ. Edinb. abr. Vol. 1. p. 166.

Terra *Goltbergenſis*. See the article Goltbergensis *Terra*.

Terra *Hydata*, in our old writers, land ſubject to the payment of *Hydage*. *Selden. Blount.*

Terra *Lignicenſis*. See the article Lignicensis *Terra*.

Terra *Livonica*. See the article Livonica *Terra*.

Terra *Melia*. See the article Melia *Terra*.

Terra *Melitenſis*. See the article Melitensis *Terra*.

Terra *Merita*, in the materia medica, a name given by ſome authors to the curcuma or turmeric root.

It is from a falſe pronunciation of this name *Terr merit*, that the Engliſh turmeric has its origin. *J. Bauhin.* V. 2. p. 146.

Perſica Terra. See the article Persica *Terra*.

Terra *Sigillata Magni Ducis*. See the article Etrusca *Terra*.

Terra *Sigillata fuſca*, a bole of a beautiful brown colour, found in Germany, England and America.

It is of a denſe texture, makes no fermentation with the ſtrongeſt acids, and if thrown into water, it ſoon ſeparates into a number of thin flakes.

The Germans give it in fluxes and malignant fevers, being an excellent aſtringent, and worthy to be introduced into our ſhops.

Sileſiaca Terra, *Sileſian Earth*, in the materia medica, a fine aſtringent bole, called by ſome authors *axungia ſolis*.

It is very heavy, of a firm compact texture, and in colour of a browniſh yellow. It breaks eaſily between the fingers, and does not ſtain the hands, is naturally of a ſmooth ſurface, and is readily diffuſible in water, and melts freely into a butter-like ſubſtance in the mouth. It leaves no grittineſs between the teeth, and does not ferment with acid menſtrua. Theſe are the characters by which it is known from all other earths of a like colour. It is found in the perpendicular fiſſures of rocks near the gold mines at Strigonium in Hungary, and is ſuppoſed to be impregnated with the ſulphur of that metal. It is, however that be, a good aſtringent, and better than moſt of the boles in uſe. *Hill*'s Hiſt. of Foſſ. p. 9.

The *Terra Sileſiaca* is alſo called *Terra ſigillata ſtrigonienſis*. *Boyle*'s Works, Vol. 1. p. 500, 501.

Montanus gives us a high character of its virtues, and ſays, it is gold tranſmuted by nature into an admirable medicine. Sennertus commends it as excellent againſt malignant fevers, diarrhœas, &c. *Boyle*, ibid.

Agricola tells us, that the ſpirit of this earth diſſolves gold, as well as aqua regia, though more ſlowly, into a red ſolution; which, in a few days precipitates the gold in fine powder. He alſo mentions another earth found at Weſterwald, preferable to this Sileſian earth. *Boyle*, ibid. See the article Westerwald *Earth*.

Sinopica Terra. See the article Sinopica *Terra*.

Terra *Solis*, in natural hiſtory, a name given by the German naturaliſts to a kind of black ſpungy earth, ſomewhat approaching to the nature of that Engliſh black earth, which we call *kellow*, but containing gold. It is not properly an ore of gold, but is an earth into which ſome ſmall particles of gold have been waſhed from ſome other place, and there detained. A good microſcope will diſcover theſe particles in the richer pieces of the earth, and they are bright and pure, though very ſmall. The earth is found in fiſſures of the other ſtrata, not in any beds or ſtrata of itſelf. It is not to be had in any great quantity, nor does it contain any large portion of gold.

Terra *Strigonenſis*. See the article Strigonensis *Terra*.

Turcica Terra. See the article Turcica *Terra*.

Terra *Virgine aurea*, in natural hiſtory, the name of a medicinal earth, mentioned by Boccone.

It is found at a place called Sancto Paolo, in the ſtate of Modena; and is thence ſent to Venice, and many other places, where it is eſteemed a very famous medicine.

Its great uſe is in hæmorrhages of all kinds; but it is alſo given with ſucceſs in malignant fevers. *Boccone*, Muſ. de Fiſic.

TERRÆJENBIN, in the materia medica of the antient Arabians, a word uſed as the name of a kind of manna; it is evidently only a corruption of the word *Tereniabin*, which is plainly that kind of manna now known under the name of *manna perſicum*. See the articles Manna *Perſicum*, and Terenjabin.

TERRAIGNOL, in the manege, a horſe that cleaves to the ground, that cannot be made light upon the hand, that cannot be put upon his haunches, that raiſes his fore-quarters with difficulty, that is charged with ſhoulders, and, in general, one whoſe motions are all ſhort, and too near the ground.

TERRAIN, in the manege, is the manege ground, upon which the horſe makes his piſte, or tread.

TERRE *Tenant*, *Terræ Tenens*, in law, he who hath the actual poſſeſſion of the land. For example: A lord of a manor has a freeholder, who letteth out his freehold to another, to be poſſeſſed and occupied by him, this third perſon is called the *tertenant*. *Weſt*. Symb. par. 2. *Blount*, *Cowel*.

TERRE *Verte*, in the colour trade, the name of a green earth much uſed by painters, both ſingly for a good ſtanding green, and in mixture with other colours.

The name is French, and ſignifies green earth.

It is an indurated clay, of a deep bluiſh green colour, and is found in the earth not in continued ſtrata or beds, as moſt of the other earths are; but in large flat maſſes of four or five feet in diameter; theſe break irregularly in the cutting, and the earth is generally brought out of the pit in lumps of different ſizes. It is of a fine regular and even ſtructure, and very hard. It is of an even and gloſſy ſurface, very ſmooth to the touch, and in ſome degree reſembling the morochthus, or French chalk, but adhering firmly to the tongue. It does not ſtain the hands in touching it; but, being drawn along a rough ſurface, it leaves an even white line, with a greeniſh caſt. It does not ferment with acids, and it burns to a duſky brown colour.

It is dug in the iſland of Cyprus, and in many parts of France and Italy. That from the neighbourhood of Verona has been uſed to be eſteemed the beſt in the world; but of late there has been ſome dug in France that equals it. There is alſo an earth dug on Mendip Hills, in the ſinking for coal, which, tho' wholly unobſerved, is nearly, if not wholly, of equal value. *Hill*'s Hiſt. of Foſſils, p. 31, 32.

TERRIFICATIO, a word uſed by ſome chemical writers to expreſs the coalition of the earthy particles of ſome bodies after fermentation, or during the time of it.

TERROR. The effect of *Terror*, or of ſudden frights, in diſeaſes, often are very great.

It is generally obſerved, that people who are moſt afraid of the plague in times of contagion, catch the infection ſooneſt, and that thoſe who are moſt terrified and diſheartened at firſt in the diſeaſe, generally die of it. It is indeed uncertain, whether this be to be attributed to the *Terror*, or whether the *Terror* itſelf, as a conſequence of dejection of ſpirits, be not merely a ſymptom of the diſeaſe. *Kerkring*, Spicileg. Anat.

Sudden frights, in acute diſeaſes, have evidently killed many, by the agitation into which they have thrown the ſpirits, already too much diſordered. We have alſo accounts of perſons abſolutely killed by *Terrors*, when in perfect health at the time of receiving the ſhock from them: People ordered to be executed, but with private orders for a reprieve, have expired at the block, without a wound. And Kerkring gives an inſtance of a perſon, who, walking along the ſtreets, was foretold by a beggar that ſhe ſhould die on a certain day, then nearly approaching, and who really expired on that day. The world gave the beggar the credit of predicting future events; but the phyſicians rather ſuppoſed that the effects of the *Terror* killed the patient. Id. ibid.

TERSIO, the name given by Pliny, and the antients, to the *porpeſs*. It is ranked among the cetaceous kind, and is the ſmalleſt fiſh of that tribe.

The *porpeſs*, properly ſo called, ſeldom exceeding five feet in length, in which it differs from the dolphin; a fiſh very often confounded with it; but which is frequently ſeen of ten or twelve feet in length. The ſnout of the dolphin is alſo much larger than that of the *porpeſs*; which is another thing that may ſerve to determine their difference.

In the diſſection of the head of this fiſh, the *meatus auditorius* was found to be two inches diſtant from the exterior canthus of the eye, forming a very ſmall hole, which ſeems the provident care of nature, leſt the water, getting in, ſhould prove an inconvenience to it. Ariſtotle and Mr. Ray, indeed, agree in ſaying, that there are no ear-holes found in the head of this fiſh; but a careful inſpection ſhews, that they were both miſtaken.

The *porpeſs* has no gall-bladder, and thence authors have concluded that it has no gall; but this is too haſty a concluſion; for there is a duct which ariſes in the liver, and has a great many branches, and which, tending downwards, joins itſelf to the pancreatic duct; and theſe two, ſo united together, form a canal, or common duct, about four or five lines long, before they diſcharge their contents into the duodenum; from whence it appears that the *porpeſs* has always a diſcharge of bile into the duodenum, though it is thin and diluted, and ſuch as, in other animals, is uſually called *hepatic bile*. *Klein*'s Hiſt. Piſc.

TERTHRON, a word properly ſignifying the extreme part of the ſail-yard in ſhipping. Hippocrates uſes it in a metaphorical ſenſe, to expreſs the extremity of a diſeaſe.

TERTIAN (*Cycl*)—The medical writers diſtinguiſh this diſeaſe into two kinds, the ſingle and the double; and beſide theſe, into the legitimate and the ſpurious and ſub-continual. In the ſpurious *Tertian* the cold fits are ſhorter, and the chilneſs leſs intenſe, and the heat ſcarce ever goes off at all; beſide this, it is uſually attended with a cough, and with violent laſſitudes and pains in the limbs after the fits; a vertiginous diſorder in the head, reſtleſsneſs in bed, and a want of appetite.

The ſimple *Tertian* is alſo carefully to be diſtinguiſhed from thoſe acute fevers, principally of the epidemic kind, which frequently affect the appearance of it, when they happen in the ſpring ſeaſon, and the patient is ſubject to crudities in the primæ viæ. Theſe laſt, beſide the appearance of the ſimple *Tertian*, always carry with them the certain marks of malignity, and often are attended with petechial ſpots on the fourth day or later. The juſt diſtinguiſhing all theſe appearances, in diſeaſes that reſemble the ſimple *Tertian*, is extremely neceſſary, as the treatment of them, in the way of the ſimple *Tertian*, muſt be attended with very bad conſequences.

The ſigns of the ſimple Tertian are theſe: It uſually ſeizes people in the morning, frequently about 11 o'clock, and often earlier, and begins with a very remarkable horror and coldneſs, with which the patient trembles violently: This is firſt felt in the region of the loins, and thence propagates itſelf up the back, and ſo to every part of the body; this is ſucceeded by a nauſea, and a ſtraitneſs of the præcordia; and when the *Tertian* is legitimate and genuine, this nauſea proceeds to abſolute vomiting, by which there is uſually voided a thick viſcous and mucous matter; but ſometimes a bilious ſaburra; and in the firſt fits, uſually ſome of the food of the day before, indigeſted. Sometimes there are only violent reachings to vomit, without any thing coming up; and in ſome a diarrhœa comes on in the place of the vomiting. When theſe ſymptoms have continued an hour or two, the coldneſs goes off, and there ſucceeds an univerſal languor and ſoreneſs in the joints; and this is the more violent, as the nauſea has been the leſs ſo. This languor is followed by a violent heat, which ſometimes comes on at once, and ſometimes ſlowly and gradually, and is attended with pains in the head, and a violent thirſt, and bitter taſte in the mouth. *Junker*'s Conſp. Med. p. 364.

As ſoon as the violence of the heat abates a little, a ſweat comes on; but this is not great, and often does not appear at all in the firſt paroxyſms. The more ſtill and quiet the perſon is, the more quickly the heat goes off, and the ſweating comes on. The whole fit rarely continues leſs time than ſix hours; uſually it holds eight, and ſometimes eleven hours; but when it continues longer than this, it is to be ſuſpected for being of the ſpurious kind, and degenerating into a continual one. The fit returns in the ſame manner as at firſt every other day, or, as the medical writers term it, every third, including the days of both paroxyſms; and uſually, while undiſturbed, returns on the patient at the very ſame hour.

The double Tertian. The ſigns of this are, that the fits return every day; but then the ſucceeding paroxyſms do not anſwer to one another, but the alternate ones; thus the third fit anſwers to the firſt, the fourth to the ſecond, and ſo on. It is by this, that this diſeaſe is diſtinguiſhed from the quotidian, which has its fits every day coming on at the ſame hour; while in the double *Tertian*, if the firſt fit comes on in the morning, the ſecond comes in the afternoon; then the third comes on in the morning as the firſt, the fourth in the afternoon as the ſecond, and ſo on.

The anomalous *Tertian* obſerves no regular time of coming on at all, but will begin one day in the morning, another in the evening, a third at noon, and a fourth in the afternoon, and ſo on.

Perſons ſubject to TERTIANS. Young people are much more frequently ſubject to this diſeaſe than older, and men oftener than women. People of an active life are more ſubject to it than thoſe of a ſedentary one: But no people ſo eaſily fall into it as thoſe men who are apt to be ſick after dinner, and make a cuſtom of ſuppreſſing their inclination to vomit.

Cauſes of it. Theſe are the eating immoderately of foods difficult of digeſtion, and eſpecially when this is done againſt the ſtomach, or while that is afflicted with nauſeas, violent commotions of anger, or the other paſſions, immediately after a full meal; and to theſe is to be added, a coldneſs of the abdomen after meals, by which digeſtion is impeded, and the driving back any cutaneous humour.

Prognoſtics and Method of Cure. It is commonly obſerved, that *Tertians*, when not improperly treated, are rather conducive to health, than injurious to it; and that people are uſually much better after they are cured of them, than before they were attacked by them. If thoſe who have a *tertian* uſe a moderate diet and good regimen, it often goes off of itſelf, without the aſſiſtance of medicines; but when ill treated, as by giving violent ſweating medicines in the time of the hot fit, the patients are greatly weakened, and ſometimes very dangerous inflammations of the viſcera, and acute fevers are brought on; and this the more certainly, as the patient is younger, of a more plethoric habit, and uſed to a high diet, and the uſe of wine, or other ſtrong liquors.

The more the gentle ſweat, which ſucceeds the hot fit, is encouraged, the weaker the fits grow at every period, and the

diſeaſe finally goes off much more ſafely by this means, than when violently thrown off at once by aſtringents.

The *double Tertian* requires the ſame method of cure with the ſimple one; for which ſee the articles PERUVIAN *Bark*, and AGUE. *Junker*'s Conſp. Med. p. 366.

Continual TERTIAN, in medical writers, a term uſed to expreſs a kind of compound fever, which has paroxyſms ſomething like thoſe of the *Tertian*, but in which the heat never goes wholly off; but is often ſo extream, as to continue in great violence from one fit to the time of another.

There are three ſpecies of theſe compound fevers; they are all compoſed of the intermittents of the ſeveral periods, and of an acute fever: The firſt is the *continual quotidian*, the ſecond this *continual Tertian*, and the third the *continual quartan*.

The firſt of theſe is the ſame with the catarrhal fever of the benign kind. The ſecond here treated of, is what was called by the antients, the *extended Tertian*. For the *continual quartan*, ſee the article QUARTAN.

Signs of it. The paroxyſms are begun in the ſame manner as in the ſimple *Tertian*, that is, by a ſhaking coldneſs; and this is ſucceeded by a heat which is at firſt very violent, but afterwards grows more and more languid, yet never goes wholly off, but continues, in ſome degree, to the acceſs of the next paroxyſm. In this diſeaſe the appetite is loſt, and the ſtrength fails very ſenſibly, the ſleep is troubled and unſound, and there is a continual head-ach; there is a quick pulſe at all the times of the fever, and a dryneſs of the mouth and tongue, with great thirſt. *Junker*'s Conſp. Med. p. 396.

Perſons ſubject to it. This fever is very often the conſequence of a common ſimple *Tertian*, when injudiciouſly treated, eſpecially when it has been ſuppreſſed by giving hot medicines juſt before the coming on of the fit, or when the patient has been cooled in the time of the ſweat, or has been blooded during the time of the diſeaſe; it ſometimes alſo attacks perſons who have had violent cutaneous humours, as the itch, *&c.* ſtruck in; and ſometimes the air alone gives it, from be-being full of fermentative particles.

Prognoſtics in it. When the diſeaſe is of this epidemic kind, and ariſes from faults in the air, it is always attended with greater danger, and has worſe ſymptoms than when proceeding from other cauſes; in this caſe it is ſometimes attended with purple ſpots on the breaſt and other parts. When treated cautiouſly, and with a gentle regimen, it very often changes to a common intermitting *Tertian*, and is then eaſily cured; but even from this leſs dangerous ſtate, it ſometimes changes into a hectic, when it has been treated with large doſes of abſorbents under that form; and finally, when it is treated with the common hot medicines and regimen, it too often degenerates into a violent and dangerous acute, and uſually inflammatory fever.

Method of Cure. Before the coming on of every fit, the patient ſhould take a ſcruple of a powder, prepared of diaphoretic antimony, oiſter-ſhells ſated with juice of lemons, nitre, and tartarum vitriolatum, each in equal quantities; and while the heat continues violent, he muſt drink plentifully of warm and weak liquors; and when this violent heat is gone off, he muſt be kept in a gentle ſweat, by the milder alexipharmics, till the return of the paroxyſm again.

In caſes where the heat is very violent, and the temperament of the body is hot and plethoric, the acids, ſuch as lemon-juice, and the like, are of very ſingular ſervice. During the whole courſe of the diſeaſe, the bowels muſt be kept open by all means; but they muſt not be ſtimulated; and as the force of the diſtemper wears off, more powerfully laxative medicines are to be given, and that at ſuch times that their effect may not be over at the time of the acceſs of the paroxyſm.

The bark can properly have no place in the cure of this diſeaſe; and after the cure of it by the means above preſcribed, the patient muſt continue the uſe of ſome of the medicines, and muſt harden himſelf to the air by degrees, for fear of a relapſe. *Junker*'s Conſp. Med. p. 399.

TERTIANARIA, in botany, a name given by ſome authors to the *ſcutellaria*, or hooded willow herb. *J. Bauhin.* vol. 3. p. 435.

TERTIAS, a word uſed very frequently in the writings of phyſicians, with the addition of *ad*; but it is capable of a double ſignification. *Ad Tertias* is often uſed to expreſs how far the liquor is to be boiled away in medicinal decoctions; yet it may in this caſe ſignify either the boiling to two thirds, or to one third part, of the whole. The more uſual ſenſe, however, is to boil away one third part of the original liquor, and in the ſame manner to fill a veſſel *ad Tertias*, does not ſignify to fill a veſſel one third part full, but two thirds, leaving only one empty.

TERTIUM *Sal*, a *third ſalt*, a term uſed in chemiſtry to expreſs a ſalt reſulting from the mixture of an acid and an alkali, which partakes ſo of the nature of both, as to be itſelf neither acid nor alkali, but neutral.

TERTIUS *Adducens*, in anatomy, a name given by Spigelius to one of the four muſcles called the *quatuor recti oculi* by authors.

This is the muſcle called the *adductor* by Molinett; and by ſome others, the *bibitorius*.

TERTIUS *Hyoidis Muſculus*, in anatomy, a name given by Fabricius and others, to the muſcle generally known by the name of *ſtylohyoidæus*.

TERTIUS *Oculum Movens*, in anatomy, a name given by Veſalius to one of the muſcles called by Albinus, the *quatuor recti* of the eye; this is the ſame with the firſt of that author, the *atollens oculi*, the *ſuperbus* of others.

TERTIUS *Palpebrarum*, in anatomy, a name given by ſome authors to the muſcle called by Albinus and others, *obliquus ſuperior oculi*.

TERTIUS *Thoracis*, in anatomy, a name given by many of the earlier writers to a muſcle now called *ſerratus poſterior ſuperior*. See the article SERRATUS.

TERZETTO, in the Italian muſic, a little tune or air in three parts. See the article TRIO.

TERZO, in the Italian muſic, ſometimes ſignifies a compoſition conſiſting of three parts, or deſigned for three voices or inſtruments.

It is alſo uſed for a third part of any thing, as *un Terzo di battuta*, a third part of the bar. See the article TRIO.

TERZOLA, in botany, a name by which ſome authors have called the *eupatorium cannabinum*, or water hemp agrimony. *Ger.* Emac. Ind. 2.

TESSARACONTA, Τεσσαρακοντα, among the Athenians, were forty men who went their circuits round the ſeveral boroughs, and had cognizance of all controverſies about money, if not above ten drachms; as alſo of actions of aſſault and battery. *Potter*, Archæol. Græc. T. 1. p. 122.

TESSARACONTERIS, in the naval architecture of the antients, a word uſed to expreſs a ſort of galley, in which there were no leſs than forty tires of rowers one above another.

Many have doubted whether ſuch monſtrous veſſels as theſe were ever built; but we have abſolute accounts of one ſuch of Philopater's, which muſt have required above four thouſand men to manage the oars.

Ptolemy Philadelphus is ſaid to have had one with thirty tires of rowers, requiring three thouſand men; and we have accounts of another at the ſame time of twenty tires, requiring two thouſand: But tho' ſuch veſſels as theſe were really built, we are not to ſuppoſe they were common. The triremes, or thoſe gallies which had three tires of rowers were found the moſt ſerviceable of all others; and from theſe they built pretty frequently up to the enneeres, which contained nine rows or tires; and theſe were the largeſt ever brought into common uſe, as is fully proved by Meibom againſt Salmaſius, on the authority of Pliny, Plutarch, and Polybius. *Meibom.* de Trirem.

This author has alſo taken off much of the imaginary height neceſſary, according to common computation, for theſe veſſels, having found a more convenient way of placing the rowers.

TESSARACOSTON, Τεσσαρακοστον, in antiquity, a ſolemnity kept by women on the fortieth day after child-birth, when they went to the temple, and paid ſome grateful acknowledgments for their ſafe delivery. *Pott.* Archæol. Græc. T. 1. p. 432. and T. 2. p. 335.

TESSELÆ, a word uſed in pharmacy to expreſs lozenges cut into regular figures.

TESSELARII, among the Romans, artificers of chequered or moſaic work. See the article MOSAIC, *Cycl.*

TEST, (*Cycl*) in metallurgy, is a veſſel of the nature of the coppel, uſed for large quantities of metals at once. The coppels or ſmall veſſels made of aſhes, ſerve for operations of this kind, when ſmall quantities only are concerned; but when larger are worked on, veſſels of a larger ſize and coarſer texture are employed, which are diſtinguiſhed by the name of *Teſts*.

Theſe are uſually a foot and half broad, and are made of wood-aſhes, not prepared with ſo much care as for coppel-making, and mixed with finely powdered brick-duſt; theſe are made into the proper ſhape either by means of an earthen veſſel of proper dimenſions, or only an iron ring.

To make them in the firſt manner, an earthen veſſel is to be procured, not glazed within, and by its depth and breadth proportioned to the quantity of metal to be worked; the inſide of this veſſel is to be well moiſtened with fair water, that the aſhes to be put into it may adhere the better. Put into this veſſel, thus prepared, the aſhes and brickduſt before-mentioned, and firſt moiſtened either with water alone, or with water with a little white of an egg mixed in it; let the quantity of this be ſo much as will half fill the veſſel, then preſs the maſs with a wooden indented peſtle, or, if not for a very large *Teſt*, with a wooden cylinder, only of an inch thick: When thus preſſed down, add freſh aſhes, and preſs them in a ſecond time, as in the making of coppels, and repeat this addition of freſh aſhes till the earthen veſſel be nearly full; then remove the ſuperfluous aſhes with an iron ruler, and let the inequalities remaining at the border be ſmoothed with a wooden ball rolled round about. This done, you are to cut the cavity with a bowed iron, that you may have a broad ſpherical ſegment, not very deep: And laſtly, by means of a ſieve, ſtrew this cavity carefully and regularly over with dry aſhes of bones of animals, ground extremely fine, and ſqueeze theſe hard

hard in, by the rotation of the wooden ball. Thus you have a *Teſt* finiſhed, which, together with its earthen pot, muſt be ſet in a dry warm place.

To make the *Teſts* in the other manner, or by means of an iron ring, let a ring of that metal be filled with aſhes mixed with brickduſt, and moiſtened as before-mentioned, in ſuch manner that they may riſe conſiderably above the ring; then preſs them ſtrongly either with your hands, or with an indented peſtle, and afterwards, with gentle blows of a rammer, preſs the aſhes from the circumference toward the center, in a ſpiral line, and that in ſuch manner, that, after having been ſufficiently preſſed, they may be a ſmall matter higher than the brink of the ring. If there are now any vacancies in the maſs, empty the ring, and fill it again with more aſhes; for if you ſhould attempt to fill up theſe by adding, were it but ever ſo little aſhes, the ſecond, or additional quantities, will never cohere ſo firmly with the firſt, but that they may probably ſeparate in the operation.

This done, turn the ring upſide down, and on the other ſide, or bottom, take out the aſhes to the quantity of one third part of the depth of the ring, and again fill the vacuity with the ſame aſhes, in ſuch a manner that there may remain no ſenſible cavity.

When the maſs is thus prepared, cut out a cavity in the larger ſurface of the ring, with a bowed iron, as in the former method.

The Germans have, beſide theſe, another kind of *Teſts*, which they call *treibſcherben*. Theſe are a ſort of veſſels which reſiſt the moſt violent fire, and are ſo extremely compact, that they ſometimes will retain not only melted metals, but even the glaſs of lead itſelf.

The figure and ſize of theſe veſſels may be the ſame with that of the coppel, but they are uſually made larger; and the great difference of theſe *Teſts* from coppels, and from the ordinary *Teſts*, which are indeed only a kind of large and coarſe coppels, is, that the matter of theſe is more compact and coherent.

The matter for the making theſe *Teſts* is thus prepared: Take of the pureſt and fineſt clay a ſufficient quantity, make it into balls, and dry them either in the air, or in the fire; when dried, beat them to powder in a mortar, and pour on the powder a great quantity of warm water: Let this mixture reſt a while, and when the clay has ſubſided, pour off the water which ſwims at top; and let this waſhing be ſo often repeated, that all the moſt minute lumps of the clay be broken, and whatever ſalt it contains perfectly waſhed out: Then add to this fine clay, of the pureſt ſand, of powder of calcined flints, ground, and well waſhed, of faulty, but clean Heſſian crucibles, or of any incombuſtible ſtones ground very fine, ſuch a quantity as will render the maſs thick, and hardly adhering to the hands in kneading it, or pliant when rolled into a thin lamina.

This is the matter for making this ſort of *Teſts*; but before any quantity of the veſſels be made of this earth, it will be prudent firſt to finiſh a ſingle one, and try it, by putting on it a quantity of glaſs of lead, and expoſing it for an hour or more to the ſtrongeſt fire; by this trial you will be certain whether or not the maſs is capable of making veſſels that will reſiſt both the fire and the glaſs of lead; and by no other means but this trial is it poſſible to determine the due proportion of the mixture of the ingredients for this uſe, on account of the variety of the clays. Nature in ſome places affords a clay ſo well tempered, that it is extremely proper for the making of *Teſts* without any preparation, or without the admixture of any other matter. Sometimes this only requires a ſimple waſhing, but commonly it is neceſſary to make it into balls, and powder and waſh them as before directed.

On the trial of a *Teſt* made of this, or the former mixed clay, if it runs into glaſs, you muſt add to it of the powder of ſtones, eſpecially ſuch as beſt reſiſt the fire. Great care is to be taken not to add too much powdered chalk to theſe compoſitions, ſince if the matter is tempered with that alone, the *Teſts* will indeed reſiſt the fire very well, but being too porous, they will yield a paſſage to litharge, which will ſoften them to ſuch a degree, that they will either fall aſunder of themſelves, or be totally cruſhed when taken hold of with the tongs.

Theſe veſſels are to be made in the following manner: Rub over the ſides and bottom of a ſmall mortar, and alſo its peſtle, with oil, or with the fat of bacon; fill it two thirds full of prepared clay, then make a ſlight impreſſion with your fingers in the middle of the clay; then place the bottom of the peſtle there, and force it down with blows of a hammer, the ſtronger the better. When thus properly hollowed, take it out of the mortar, and pare its edges, and dry it as the coppels are dried, in the air, in a dry warm place. *Cramer*'s Art of Aſſ. p. 60, 62.

Teſts, thus prepared, may be uſed as ſoon as dry, unleſs for ſalts, or litharge; but theſe bodies, when melted in veſſels not firſt baked or hardened in the fire, always make their way thro' them.

TEST *Liquor*, a term uſed by our dealers in brandies, *&c.* for a liquor which they uſe as the *Teſt* of brandy, *&c.* to prove whether they be genuine, or mixed with home ſpirit.

The people who uſe this, place great confidence in it, but it is really a very vague and uncertain thing. They pretend, that this liquor will ſhew by the colour which it makes, on being poured into brandy, whether it be genuine and unadulterated; or if not, in what proportion the adulterating ſpirit is mixed with it.

The whole fact is this: If a little common green or white vitriol be diſſolved in ſome fair water, it makes a *Teſt* liquor; a few drops of which being let fall into a glaſs of old French brandy, will turn the whole to a purple, or fine violet-colour; and by the ſtrength or paleneſs of this colour, the dealers judge the brandy to be genuine or mixed, in different proportions, with home ſpirits.

Old French brandy, having long lain in the caſk, takes a dilute tincture of the wood of the caſk, that is, of oak; and this being of the ſame nature with a ſolution or tincture of galls, naturally turns bluiſh or blackiſh with vitriol. A new diſtilled brandy, tho' wholly foreign, would not give this *Teſt*; and a common malt ſpirit, with oak chips infuſed in it, will turn as dark as the fineſt brandy. While our diſtillers indeed had nothing in uſe for the colouring their ſpirits but burnt ſugar, it was poſſible to make ſome gueſs at an adulteration with them, becauſe the brandy, in this caſe, would not become blackiſh in proportion to its former colour, the ſugar-colour not turning to ink with the vitriol like the other: But our diſtillers have of late found a way of uſing an extract of oak for the colouring of their ſpirits, and, ſince that, this *Teſt-liquor* is of very little uſe, our common ſpirits, of any kind, turning as deep with it as the foreign brandies.

The very beſt way of making this *Teſt-liquor*, is with a calcined vitriol of iron, diſſolved in a dilute or aqueous mineral acid. The liquor, when well made in this manner, is of a fine yellow colour, and will give, for a time, the fineſt blue to any ſpirituous tincture of oak.

The Engliſh were, at one time, very fond of high-coloured brandies, and it was then that the uſe of this *Teſt-liquor* was moſt eſteemed; afterwards we, as well as other nations, finding that this colour was only owing to the caſk, began to diſlike it, and to favour the pale brandies: At length we fell into the uſe of ſuch as were wholly limpid and colourleſs, and the re-diſtilling of all the old brandies people were poſſeſſed of took place; on this, the *Teſt-liquor* was found to be of no uſe at all, and accordingly rejected; but as we are of late again come into the eſteem of coloured brandies, and that with great juſtice, as the colour, when genuine, is a certain mark of the age of the liquor, this *Teſt-liquor* is again got into more credit than it deſerves.

The famous Helvetian ſtyptic depended wholly on this accident for its colour; and it was no ſmall mortification to our chemiſts, when, ſome years ago, it was introduced into uſe among us, that they could not make it with our own ſpirits, but muſt be at the expence of true French brandy for it; our own ſpirits, though equally coloured, would never make that violet tincture, becauſe their colour was owing to burnt ſugar, not a tincture of oak. At length this myſtery was explained, and a little ſcrapings of galls made all thoſe quantities of this ſtyptic, which had been ſet by as good for nothing, perfectly fine and well coloured. *Shaw*'s Eſſay on Diſtillery.

TESTA, in antiquity, the ſame with *oſtracon*. See the article OSTRACON.

TESTES (*Cycl.*) Theſe are wanting in moſt of the fiſh kind. The ſpinoſe fiſhes in general have neither *Teſtes* nor paraſtatæ; but all the cetaceous fiſhes have them, and not a few of the cartilaginous kinds. Thoſe fiſh that have them, have always two, as in land animals; but they differ much in figure and ſituation in the ſeveral kinds, particularly in the whale and flat fiſh. *Artedi* Ichthyol.

TESTICLE (*Cycl.*) *Tumours in the* TESTICLES. Tumours and inflammations of one or both the *Teſticles* are not unfrequently the conſequence of falls, blows, and contuſions, and very often are alſo brought on by venereal diſorders.

The beſt external applications to diſperſe theſe are vinegar of litharge, lime-water, ſpirit of wine camphorated, and ceruſs, tutty, or lapis calaminaris mixed in it. But in the night-time, when the applications of fomentations are not ſo convenient, a plaſter of the mercurial kind, doubly ſated with mercury, or, in ſlight caſes, one of ſimple diachylon, may very properly be kept on. Internal medicines, ſuch as nitre, and the thin decoctions of diſcutient remedies, are to be uſed; and, if occaſion call for it, bleeding in the arm is very proper.

This may be the method with tumours of theſe parts, from external injuries; but when they are from venereal cauſes, it is always neceſſary to give briſk purges, with the addition of a proper doſe of calomel to each, and warm and weak drinks ſhould be taken frequently, and by this means theſe tumours are often diſperſed. But if either remedies are applied too late, or the inflammation is very violent, the tumour generally ends either in a ſuppuration or gangrene. In this caſe the maturating remedies are to be applied, ſuch as warm cataplaſms, and the like; and if the tumour does not break of itſelf at a proper time, from the application of theſe, it muſt be carefully opened with the knife, and the matter being diſcharged, the wound is to be cleanſed by injecting vulnerary decoctions with

a ſyringe, and afterwards healed by the balſams, as that of Peru, or the like.

The taint that occaſioned the tumour is ſometimes wholly eradicated, and the patient freed from it by a proper management of theſe abſceſſes. It not unfrequently happens indeed in them, that the ſcrotum is in part conſumed, ſo as to leave the part bare, but this loſs of ſubſtance may generally be reſtored by proper treatment, with digeſtive and balſamic remedies. *Heiſter*'s Surgery, p. 191.

TESTICULATED *Roots*, are thoſe compoſed of two tuberoſe knobs, reſembling a pair of teſticles. Of this kind are the orchiſes, *&c.*

TESTICULI *Muſculus*, in anatomy, the name given by Fallopius, and ſome others, to the muſcle now generally known by the name of the *cremaſter*.

TESTO, in the Italian muſic, is applied to thoſe words of a ſong, to which ſome air or tune is to be compoſed.

It is a matter of great importance in muſic, to underſtand well how to appropriate or adapt the muſic to the words of a ſong, to expreſs the ſenſe, and make a juſt application of the long and ſhort ſyllables to the notes and times with which they are to be connected.

But this branch of the ſcience, which depends greatly on the knowledge of poetry, has lain a long time almoſt unregarded, and even at preſent very little care is taken with reſpect to this in the modern muſic.

TESTUDO (*Cycl.*)—TESTUDO, the *Tortoiſe*, in the Linnæan ſyſtem of zoology, makes a diſtinct genus of animals; the characters of which are, that the body is defended by a thick cruſt, and is furniſhed with a tail. *Linnæi* Syſt. Nat. p. 50. See Tab. of Quadrupeds, N°. 28.

The *Tortoiſe* is a well known animal, of which there are ſeveral ſpecies. The ſhell, which covers this creature's body, is compoſed of a number of variouſly ſhaped pieces, often pentangular; theſe are affixed to a bony ſubſtance, like the ſkull of ſome animals, which ſurrounds the animal, and has two apertures; one before, which gives way to the going out of the head and the fore-legs; and the other behind, through which the hinder legs and thighs are protruded.

This bony ſubſtance is, in different parts of very different thickneſſes; in ſome places an inch and half, in others not an eighth part of an inch. It is compoſed of two pieces, the one covering the creature's back, the other its belly; theſe are joined at the ſides by very ſtrong ligaments, but not ſo rigidly cloſed but that they eaſily give way to the creature's motions. *Ray*'s Syn. Quad. p. 253.

This is the general order of nature in the ſtructure of the ſhell of this creature; of which we have ſeveral ſpecies in different parts of the world, the ſhells of which are of different value.

1. The common *Tortoiſe*. This is variegated with black and yellow ſpots and lines on the back. The upper ſhell is extremely convex, and the under one flat. Its head is ſmall, and like that of a ſnake, and it can thruſt out this, or draw it into the ſhell at pleaſure. It has no eye-lids, nor any external ears; this is a very long-liv'd creature, and paſſes the winter without food under ground.

2. The *Jaboti* of the Braſilians, called by the Portugueſe *Cagado de Terra*. This has a black ſhell with ſeveral hexagonal figures engraved on it; the head is like that of the other kinds, and is brown, as are alſo the legs, but variegated with ſpots of a duſky greeniſh hue. The liver of this ſpecies is eſteemed a very delicate diſh.

3. The *freſh-water Tortoiſe*, or the *mud-Tortoiſe*. This lives in muddy places, frequently in the ditches that ſurround the walls of towns. The ſhell of this kind is ſcarce at all convex on the back, and the creature very diſagreeable and ugly; it is alſo remarkable for the length of its tail, which is ſlender and tapering like a rat's. The ſhell is black, and is compoſed of ſeveral ſmall pieces nicely joined together: it can at pleaſure thruſt out its head, or draw it back into the ſhell; it feeds on ſnails, inſects, *&c.* and will live a long time without any food; and even when the head is cut off will retain motion and an appearance of life in the limbs and body for a long time.

4. The *common Turtle*, or *Sea-tortoiſe*. This much reſembles the common land *Tortoiſe*, but that it is larger, and its ſhell much leſs beautiful and ſofter. Its feet are made like the fins of fiſhes, and well adapted for ſwimming. They have on each jaw a continued ſeries of bone, which is received in a ſinus in the oppoſite jaw, and ſerves to chew with.

They come out of the ſea to lay their eggs, which they depoſit on the earth in prodigious numbers; one female ſometimes laying an hundred, and theſe are left to be hatched by the heat of the ſun.

5. The *Jurucua* of the Braſilians, or *Tartaruga* of the Portugueſe, called alſo the *Frank Tortoiſe*. This has a ſort of fins in the place of feet, the fore-ones ſix inches long each, the hinder ones conſiderably ſhorter; and their ſhells are very elegantly variegated with different figures. *Ray*'s Syn. Quad. p. 258. See the article JURUCUA.

6. The *Cauoanne Tortoiſe*. This is a ſea-kind, much reſembling the former in ſhape; but the ſhell is thicker, and the fleſh but ill taſted.

7. The *Carette Tortoiſe*. This is a ſmall kind, and does not depoſit its eggs in the ſand, as the others; but lays them among gravel and heaps of ſmall pebbles. The fleſh of this ſpecies is but ill taſted, but its ſhell is extremely valuable for ornamental works.

8. The *Jurura* of the Braſilians, or *Cagado d'Agoa* of the Portugueſe. This is ſmaller than the other kinds, and its ſhell is of an elliptic figure. The ſhell of this ſpecies is conſiderably convex on the back; its head is long, and its tail ſhort. Marggrave kept one of this ſpecies in his houſe one-and-twenty months without food.

9. The *ſmall Eaſt-Indian Land-Tortoiſe*. This is not above three inches long, when at its full growth; its ſhell or cruſt is compoſed of three orders of ſcales, and a general rim ſurrounding them all. Its colours are white, purple, yellow, and black, and it is a very beautiful kind; when the ſcales of this ſhell are taken off, the veſtiges of them are plain in a mottled black and white colour, with ſome yellowneſs. The lower ſhell is white, and marked with a great number of beautiful lines. The head and beak in this ſpecies, are like thoſe of the parrot; and the upper part of the head is variegated with red and yellow; the neck is ſlender, and the fore-legs are covered with ſmall ſcales. The feet are flat, and are divided into four toes. The hinder legs are much longer and ſlenderer than the fore ones, and are only covered with a tough ſkin; the feet however of theſe are ſcaly, and have four toes, as the others. The tail is ſlender and tapering, and about three inches long. *Ray*'s Syn. Quad. p. 259.

10. The *leſſer checquered Tortoiſe*, marked with ſtars. The ſhell of this is about ſeven fingers breadth long, and five wide; it is black, and marked out into rhomboidal figures; and is compoſed of three orders of prominences, beſide the general ſurrounding rim; from the middle of theſe eminences there ariſe five, and from the ſides four tubercles, from which there are a number of ſtellar figures radiated. The lower ſhell conſiſts of eight pieees, two of which are much larger than the reſt, and this is of a blackiſh and yellowiſh mottled colour.

11. The *great checquered Tortoiſe*. This ſpecies is found in the iſland of Madagaſcar, and is the moſt convex of all the *Tortoiſes*. It is a foot long, eight fingers broad, and ſix high. This is the ſize of one kept in the Muſeum of the Royal Society.

12. The *teſſelated Surinam Tortoiſe*. 13. The *teſſelated Virginian Tortoiſe*. And, 14. The *ſcaly Tortoiſe*. This is of the mud or freſh-water *Tortoiſe* kind. It is uſually about a foot long, ten inches broad, and three and a half high; and the middle of the back riſes into a very remarkable longitudinal ridge. This is ſomewhat allied alſo to the *carette Tortoiſe*. *Ray*'s Syn. Quad. p. 260.

TETARTEMORION, among the antients, denotes the fourth part of the zodiac. *Pitiſc.* in voc.

TETHALASSOMENOS, a term uſed by the old medical writers, to expreſs wine mixed with ſea-water.

TETIMIXIRA, in zoology, the name of an American fiſh, more uſually known by the name of the *Pudiano*. It is a ſmall fiſh reſembling a pearch, with a purple back, and yellow ſides and belly. *Marggrave*'s Hiſt. Braſil. See the article PUDIANO.

TETRACERA, in botany, the name of a genus of plants; the characters of which are theſe: The cup is a ſix-leaved perianthium. The leaves are roundiſh, and ſtand expanded. There are no petals ſo far as can be ſeen in the dried ſpecimens, and the growing plant has not been examined ſince the time that Houſton was deceived by its external reſemblance with the petræa, and deſcribed its fruit and the flowers of the petræa under the character of one genus, which he called petrea. The ſtamina are numerous ſimple filaments, of the length of the cup; they are permanent alſo, and the antheræ are ſimple. The germina of the piſtil are four in number; they are of an oval figure, and gape open one from another. The ſtyles are ſubulated, and very ſhort; and the ſtigmata are obtuſe. The fruit is compoſed of four capſules, which are oval and crooked; and are compoſed of one valve containing only one cell, and opening at a future near the top when ripe. The ſeeds are ſingle and roundiſh. *Linnæi* Gen. Plant. p. 249.

TETRACHORD (*Cycl.*)—The names of the ſounds of a *Tetrachord*, conſidered by itſelf, were hypate, parypate, paranete, and nete. Ariſtoxenus calls them hypate, parypate, lychanos, and nete. *Wallis*'s Append. at *Ptolem.* Harm. p. 159, 160.

When *Tetrachords* came to be joined, the parypate was ſometimes called *trite*, as being the third from the *nete*; and the paranete was ſometimes called lychanos, as in the fore-mentioned place of Ariſtoxenus. *Wallis*, ibid. See the article LYCHANOS.

The *Tetrachord of Mercury*, contained four ſtrings or chords, in the proportions of 12, 9, 8, and 6; ſo as to give the fourth, fifth, and octave of the loweſt chord. This is the opinion of Boëthius, and after him of Zarlino. Vid. *Wallis*'s Append. Ptolem. Harm. p. 178.

TETRACTIS, in natural hiſtory, a name given by Linkius, and other authors, to a kind of ſtar-fiſh, compoſed only of four rays, the more common kinds having five.

TETRA-

TETRADECARHOMBIS, in natural hiſtory, the name of a genus of foſſils, of the claſs of the ſelenitæ.

The word is derived from the Greek τετρὰς, four, δεκὰς, ten, and ῥόμβος, a rhomboidal figure, and expreſſes a rhomboidal body conſiſting of fourteen planes.

The characters of this genus are, that the bodies of it are exactly of the ſame form with the common ſelenitæ; but that in theſe each of the end planes is divided into two; and there are by this means eight of theſe planes, inſtead of four. *Hill*'s Hiſt. of Foſſ. p. 120. See the article SELENITES.

Of this genus there are only three known ſpecies. 1. A thin pellucid one, with tranſverſe filaments; which is frequent in the clay-pits of Northamptonſhire, and ſome other counties. 2. A dull thicker kind, with very ſlender tranſverſe filaments; this is a very rare ſpecies, and found as far as is yet known only in Leiceſterſhire in the yellow brick clay, and at ſmall depths. And, 3. A large ſcaly kind, conſiderably long, and of a very rough ſurface; this is found in Yorkſhire, and that ſometimes looſe on the ſides of the hills, but more frequently buried in the ſtrata of clay. *Hill*'s Hiſt. of Foſſ. p. 133, 134, 135. See Tab. of Foſſils, Claſs 2.

TETRADYNAMIA, in botany, a claſs of plants, whoſe flowers have four of their ſtamina of more efficacy than the reſt: Theſe are always known by having the four efficacious ſtamina longer than the reſt.

The word is formed of the Greek τετρὰς, four, and δυναμὶς, power. Of this claſs of plants are ſcurvy-graſs, muſtard, radiſh, &c. See Tab. 1. of Botany, Claſs 1.

The *Tetradynamia* of Linnæus include thoſe called by Tournefort *cruciformes*, and by Ray *ſiliquoſæ*, and *ſiliculoſæ*. The general characters of the claſs are theſe:

The perianthium is of an oblong figure, and is compoſed of four leaves, which are oval, oblong, hollow, obtuſe, and converging toward one another, and are gibbous at the baſe; theſe all fall off with the flower, and ſtand in pairs; the oppoſite ones being always equal in length, this cup is properly the nectarium of the plant, and it is on this occaſion that it is gibbous at the baſe. The flower is of that kind, called by Tournefort, *cruciform*; it conſiſts of four equal petals, which have ungues of the length of the cup, erect, and flat; the petals are broad at the top, and obtuſe, and ſcarce touch one another at the ſides; and the inſertion of the petals and of the ſtamina is in the ſame place.

The ſtamina are ſix ſubulated erect filaments, the two oppoſite ones are of the length of the cup, the other four are ſomething longer, and are of a leſs length however than the petals. The antheræ are oblong and pointed, thick at the baſe and erect, with apices bending ſideways. The nectariferous gland in the different genera of this claſs is differently ſituated. It uſually however is found near the ſtamina, and moſt frequently of all is affixed to ſome ſhort filaments, and ſtands near their baſe. Two of the ſtamina are often curved, that they may not preſs upon this gland; and it is often owing to this, that two are ſhorter than the reſt. The germen of the piſtil is placed above the receptacle, and is every day in its growth raiſed higher and higher. The ſtyle is ſometimes wanting, but in ſuch plants as have it, it is of the length of the longer ſtamina. The ſtigma is always obtuſe.

The fruit or capſule is always a bivalve pod, which often contains two cells; this, when ripe, opens by ſplitting from the apex to the baſe, and it has always a little membranous ſubſtance ſerving within as a ſeptem, when the pod is bilocular; this ſtands out beyond the apex, and is the rudiments of what was before the ſtyle. The ſeeds are roundiſh, and the pod uſually narrow and oblong.

This is a very natural claſs of plants, and has been received as ſuch under whatever name by all the ſyſtematical writers in botany.

The plants of this claſs are generally ſuppoſed to be all antiſcorbutics. This claſs of plants is naturally ſubdivided into two ſeries: The one containing the ſiliculoſe plants, and the other the ſiliquoſe. The firſt have a ſhort pod, the others a long and ſlender one. The firſt pods uſually have more of the remains of the ſtyle than the others. *Linnæi* Gen. Plant. p. 309.

TETRAETERIS, τετραετηρὶς, in the Athenian chronology, a cycle of four years; for which ſee *Potter*, Archæol. Græc. l. 2. c. 26. T. 1. p. 459, ſeq.

TETRAGONIA, in botany, the name given by Linnæus to a genus of plants called by others *Tetragonocarpos*. The characters are theſe: The cup is compoſed of four oval coloured leaves, curled at their edges, and remaining after the flower is fallen. There are no petals. The ſtamina are twenty capillary filaments, ſhorter than the cup. The antheræ are ſhort, and incumbent. The germen of the piſtil is roundiſh, quadrangular, and placed under the receptacle. The ſtyles are four, ſubulated, crooked, and of the length of the ſtamina. The ſtigmata are longitudinal and hoary. The fruit is a coriaceous cruſt, formed into a kind of ſquare figure, by four longitudinal alæ. The ſeed is ſingle, oſſeous, and contains four cells, with oblong nuclei. *Linnæi* Gen. Plant. p. 249.

TETRANDRIA, in botany, a claſs of plants which have hermaphrodite flowers, with four ſtamina or male parts in each. See Tab. 1. of Botany, Claſs 1.

The word is formed of the Greek τετρὰς, four times, and ἀνὴρ, male. Of this claſs of plants are the teaſel, madder, plantane, &c.

TETRANGURIA, in botany, a name uſed by ſome authors for the citrul, a plant of the gourd kind, whoſe ſeeds are uſed in medicine. *Chabræus*, 133.

TETRAO, in the Linnæan ſyſtem of zoology, the name of a genus of birds of the order of the gallinæ; the diſtinguiſhing characters of which are, that the feet have each four toes, and the eyelids are naked and full of fleſhy tubercles. Of this genus are the pheaſant, partridge, quail, &c. *Linnæi* Syſt. Nat. p. 48.

TETRAO, is alſo uſed for a large bird of the gallinaceous kind, whereof there are two ſpecies, the one larger, and the other leſſer; they are called alſo by authors, the *urogallus major*, and *minor*.

The larger is common in Italy, and on the Alps; ſee the article UROGALLUS. The leſſer is common in ſome parts of England, and is called the *black game*, or the *grouſe*. *Ray*'s Ornithol. p. 123. See the article GROUSE.

TETRAPHOE, in botany, a name given by the people of Guiney to a plant, which they give in decoction as a cure for fluxes. This plant grows alſo in Malabar, where they uſe the roots boiled in whey in the piles; and in the colic they give the root in powder, about a ſcruple for a doſe. It is called in this latter place *wellia cadavalli*, and by Petiver *xanthium malabaricum capitulis lanuginoſis*. The ſtalks of it are woody and hoary, eſpecially about the tops. Its leaves ſtand by pairs on ſhort foot-ſtalks, and while young they are hoary underneath, with a very ſoft and velvety down; the others are rough like the ſpotted lungwort, but ſeldom are ſo large. The flowers grow in ſpikes, and conſiſt each of fine green leaves filled with ſcarlet filaments: After theſe the fruit ripens, and is a ſort of woolly bur covered with ſoft and hooked prickles, very like the common Engliſh burdock, but not of a third part of the bigneſs. Phil. Tranſ. N°. 232.

TETRAPYRAMIDIA, in natural hiſtory, the name of a genus of ſpars. The word is derived from the Greek τετρὰς, four, and πυρὰμὶς, a pyramid.

The bodies of this genus are ſpars influenced in their ſhape by an admixture of particles of tin; and are found in form of broad-bottomed pyramids of four ſides.

Of this genus there is only one known ſpecies, which is uſually of a browniſh colour, and is found in Saxony; as alſo in Devonſhire, Cornwal, and other counties of England, where there is tin. *Hill*'s Hiſt. of Foſſ. p. 378.

TETRASTŒCHON, in botany, a term often uſed by the the Greek writers, and generally miſunderſtood by thoſe who copy their accounts. Pliny has made an error in the deſcription of the euonymus, which has confounded two different ſhrubs together ever ſince, by miſtaking the ſenſe of this word, uſed by Theophraſtus in his account of it. He ſays, that the fruit is divided within into four orders or ſeries of ſeeds; this he expreſſes by the word *Tetraſtœchon*, which Pliny ſuppoſing to be the ſame with the word *Tetragonon*, has tranſlated into *granum quadrangula figura*.

But this is by no means the ſenſe of the word which was uſed by the Greeks, to expreſs, that a thing had τέτραρας τάξεις, four rows, orders, or ſeries of ſeeds in it: Nor does it at all expreſs the ſeed's being ſquare, much leſs its being ſingle; for the original derivation of the word was from the term κατα στοιχον, uſed in dances. Theſe were compoſed of ſeveral ſeries of perſons, called στοιχοι, *ſtœchi*; and every ſtœchon conſiſted of ſeveral perſons, who all moved together.

It is plain from this, that *Tetraſtœchon* could not ſignify a fruit's having ſingle ſquare ſeeds, but muſt mean that it had four ſtœchi or orders of ſeeds in it; ſuch was the euonymus of the Greeks, which had a pod like that of ſeſamum to contain them; and had flowers of an offenſive ſmell, like that of corrupted blood. Theſe are all characters ſo very different from that of our euonymus or fuſanus, that it never would have been ſuppoſed by any perſon that they meant the ſame plant that we do by that name, had not Pliny led the world on to that opinion by his falſe and ſcarce intelligible tranſlation of the words of Theophraſtus.

TETRATONON, in muſic, the ſuperfluous fifth is ſometimes thus called, as containing four tones. *Broſſard.*

TETRAX, in zoology, the name of a bird of the gallinaceous kind, called by ſome authors *anas campeſtris*, or the field-duck; and by others the *canna*.

It is a very common bird in France, where it is called *canne patriere*, and ſeems indeed peculiar to that country; it is not called anas from any reſemblance it has to the duck, or any other water-fowl, in its make or ſtructure; but from its ſitting on the ground, juſt as the duck does on the water. It is of the ſize of a pheaſant, and has a beak like that of the common hen. It is taken with nets, as the partridge: It runs very ſwiftly, and, like the buſtard, has no hinder toes; and it ſeems properly a bird of that kind. Its belly is white, and its back is variegated with grey, red, and black. It feeds on vegetables, and on ſmall inſects. *Bellonius* de Avibus.

TETRASARIUS, a word uſed by ſome of the medical writers, to expreſs half an ounce.

TETREUMA, in botany, a name given by the people of Guinea to a ſpecies of ſhrub, very common among them, and uſed to cure whitlows. They dry the leaves, and reduce them to powder; and, moiſtening them with any liquor, apply them to the place. Petiver has called this *arbor guineenſis lauruſtini facie*, from its great likeneſs to the common ſhrub, which we call the lauruſtine. The leaves are opake and ſtiff, and are an inch and a quarter broad, and two inches and a half long. Theſe ſtand alternately on all ſides the ſtalk, and are fixed on ſhort pedicles. The flowers grow out of the boſoms of the leaves, and ſtand in cluſters in the manner of thoſe of the common lauruſtine. Phil. Tranſ. N°. 232.

TETTAR, in the manege, is an ulcer almoſt as broad as one's hand, that appears commonly upon a horſe's croupe, ſometimes on his head, and ſometimes on his neck. It proceeds from bilious blood, that conſumes and eats through the hide or ſkin, and cauſes ſuch a violent itching, that it is a hard matter to keep the horſe from ſcratching, and ſo enlarging and ſpreading the ulcer.

TETTIGES, τεττιγες, graſhoppers, in antiquity, a title the Athenians aſſumed to themſelves. *Pott.* Archæol. Græc. l. 1. c. 1. T. 1. p. 2. See the article GEGENES.

TETTIGOMETRA, in natural hiſtory, a name by which the antients called the nymph of the Cicada, or *Tettyx*; and they named this nymph from which they frequently ſaw that fly hatched *Tettigometra*, which ſignifies the *mother of the cicada*.

It has been a great error in our dictionary writers, to call the *cicada* a graſhopper. It is a large four-winged fly, common in Italy, and other hot countries, and its noiſe is very troubleſome there. This noiſe is made by means of certain organs placed in the belly. See HARVEST-*Fly* and CICADA.

This creature lays its eggs with a wonderful art in the dead branches of trees, and from theſe eggs are produced ſmall animals like fleas, with ſix legs and a long trunk; theſe ſoon fall off from the tree. and, burying themſelves in the earth, feed and enlarge themſelves into a ſort of hexapode worms; after this they paſs into a ſtate like that of the nymphs of our flies, or the chryſalis of butterflies; but they move and eat in this ſtate.

They live in the form of the nymph more than a whole year, after which they crawl out of the earth, and climbing up the bodies of trees, there faſten themſelves by their claws, till they are transformed into flies. In the time when they are in this nymph ſtate they are found in great abundance buried about the roots of trees, often at two or three foot deep.

The antient Greeks uſed to dig them up from theſe places, and eat them; they were accounted a very good diſh among them; and, according to Ariſtotle, were moſt valued, and eſteemed the greateſt delicacy, juſt before the time of their ſkin breaking to let out the fly. The antients alſo eat the cicada in its winged ſtate, preferring the female when full of eggs, and the male at all other times. At preſent, though this creature is very common in moſt of the hot countries, and very troubleſome by its continual noiſe; there is no account of their being eaten any where.

TETTIGONIA, in natural hiſtory, a word uſed by the antients to expreſs the ſmaller ſpecies of *cicada*, with which they were acquainted. They called the larger *acheta*.

It is generally ſuppoſed that the *Tettigonia* was the ſame with our ſmalleſt kind, called by the French *cigalon*; but Mr. Reaumur obſerves, that as the antients knew two kinds of the *cicada*, we know three; and that our middle one ſeems to have been their *Tettigonia* or ſmall *cicada*, and that they were not acquainted with our ſmalleſt kind, or cigalon, which is not larger than a hornet. See the articles HARVEST-*Fly*, and CIGALON.

TEUCHITES, in botany, a name uſed by ſome for the ſcænanth or ſchænanth, camel's hay.

It was originally uſed only as an epithet added to the name *Schænanth*, to ſignify the place from whence a peculiar kind of it was brought; but after-writers appropriated it as a name of the plant itſelf.

Dioſcorides diſtinguiſhes the Arabian *Schænanth* from the Nabatæan; but this ſeems an unaccountable error, ſince Dioſcorides one would think could not but know, that Nabatæa was only a region in Arabia. He afterwards makes the Babylonian the ſame with the Arabian, and ſays that it was called *Teuchites*. Pliny, on the other hand, gives the name *Teuchites* to the Nabatæan *Schænanth*.

Authors do not ſeem well to have explained the word. It is evidently an epithet given to the *Scænanth*, from the name of the place where it was brought, and probably it ought to be written *Teuochitis*. There is a city *Teuochis* in Ægypt near the borders of Arabia, and the geographers all mention a lake in the neighbourhood of this city; in this lake it is probable the *Scænanth* might grow; and being gathered there, and ſold in the adjoining city of *Teuochis*, the purchaſers might diſtinguiſh it with an epithet formed of the name of the place where they bought it. See the article SCHÆNANTH.

TEUCHTLACOT-*Zanhqui*, in zoology, a name by which the natives of ſome of the American nations call the rattleſnake. *Ray*'s Syn. An. p. 291. See the article RATTLE-*Snake*.

TEUCRION, according to Pliny, a name given by ſome of the antient botaniſts to the *Chamædrys*, or germander.

This author ſuppoſes that plant and the *ſerrata* or *ſerratula*, to be the ſame in the accounts of ſome of the more early authors; but it does not appear, upon a ſtrict enquiry, that they ever called any other plant than the common ſawwort by the name *ſerrata*, though they called this plant by a great many other names beſide that, as *betonica*, *ceſtrum*, &c.

TEUCRIUM, *Tree-germander*, in botany, the name of a genus of plants; the characters of which are theſe. The flower conſiſts of one leaf, and is of the labiated kind; the ſtamina ſupplying the place of the upper lip; the lower lip is divided into five ſegments, the middle one being largeſt and hollowed like a ſpoon; the others ſtanding over-againſt one another in the neck of the flower. The cup is bell-faſhioned, and from it ariſes a piſtil which is fixed in the manner of a nail to the hinder part of the flower, and is ſurrounded by four embryos, which afterwards become four roundiſh ſeeds, and ripen in the bell-ſhaped cup of the flower.

The ſpecies of *Teucrium*, enumerated by Mr. Tournefort, are theſe: 1. The ſhrubby *Teucrium*, with ſinuated leaves, the Bœtic *Teucrium* of authors. 2. The broader-leaved Spaniſh *Teucrium*. 3. The American fox tail *Teucrium*. 4. The procumbent perennial *Teucrium*, with ſpear-pointed leaves. 5. The jagged-leaved annual procumbent *Teucrium* of Portugal. *Tourn.* Inſt. p. 208.

TEUGA, in botany, the name given in the Hortus Malabaricus, to a genus of plants called by Linnæus and others, *coccus*. Hort. Mal. L. 1. 4. See the article COCCUS.

TEUTHOPHACE, a word uſed by the antients, to expreſs a ſort of food made of beet-roots and lentils, often preſcribed as a good diet for the ſick.

TEXT, TEXTURE, in chemiſtry, is uſed for any thing having a texture in a proper ſenſe, or for an aggregate formed by admotion, compoſition, co-ordination, conſtruction, whether fortuitous, or deſigned for ſome end, ſo that without ſuch a texture the end could not be obtained; of which therefore, this texture muſt be conſidered as the true inſtrument.

In this ſenſe living bodies have a texture, and may be ſtrictly named *Texts*; and the more ſo, if they be ſentient and have local motion; all which bodies, whether ſmall or great, are formed of innumerable mixt and compound individual corpuſcles. Vid. Obſervat. Halens. Tom. 4. Obſ. 14. §. 8.

TEXT differs from *Aggregate*. See the article AGGREGATE.

TFUOI, in the Chineſe manufactory of porcelaine, a word uſed to expreſs a particular ſort of varniſh for that ware with violet colour and gold. The uſual method of doing this at firſt, was by mixing gold with the common varniſh, breaking the leaves very ſmall, and then adding the common blue and the powder of calcined agate of a coarſe kind, found in great plenty on the ſhores of their rivers. But they have ſince found, that the brown varniſh called *Tſekin* ſucceeds greatly better, for when the blue is mixed with this, its brown colour is loſt, and the gold lies on much better than it would any other way.

They had once a method of a varied varniſh, which was very beautiful, but is much neglected now; this was the giving a veſſel the brown varniſh on the outſide with a large portion of gold, and the common white varniſh within. They alſo varied the degree of colour on the outſide, by laying on more or leſs of the varniſh; and gave this way a variety, even in the ſame colour. Obſerv. ſur les Coutumes de l'Aſie, p. 308.

THACAS, Θᾶκας, in antiquity, a general name given to the place or ſeat where the augurs made their obſervations. *Pott.* Archæol. Græc. T. 1. p. 322. See the article AUGUR.

THAIS, a name given by Ægineta, to a coſmetic cerate, intended to give a beautiful red to the face. Galen uſes the ſame word to expreſs a ſort of bandage.

THALAMEGUS, among the antients, a ſhip of pleaſure, or yacht uſed by princes. It was always provided with a good cabin, or bed-chamber. *Pitiſc.* in voc.

Philopater king of Egypt had a very remarkable ſhip of this kind, for ſailing in parade with his wife and children on the Nile. It is ſaid to have been half a ſtadium, or 312 feet long; its breadth more than 30 cubits, and its height, with the pavilion erected on it, about 40 cubits. Its ſtructure was likewiſe very ſingular, being broad-bottomed, and very wide above, eſpecially towards the fore-part; and accommodated both with a double prow, and a double ſtern. On its decks were two long galleries of ivory, for walking in. *Hofm.* Lex Univ. in voc.

THALAMII, among the antients, thoſe rowers who ſat in the loweſt part of the ſhip. *Pitiſc.* in voc. See THALAMITÆ.

THALAMIUM, among the antients, a port-hole, through which the oars of the rowers in the bottom of the ſhip went. *Pitiſc.* in voc.

THALAMITÆ, in the naval architecture of the antients, a term uſed to expreſs thoſe rowers in the Polyerete galleys, or thoſe which contained ſeveral ſeries of rowers, who ſat on the *Thalamus* of the veſſel, and made the loweſt row. Theſe moved their oars and hands under the ſeats of the row that ſat

ſat next above them. The word occurs chiefly in the deſcription of the *Triremes*, or three-rowed galleys, in which the ſecond row of the men were called *Zygitæ*, and the uppermoſt *Thranitæ*. *Meibom.* de Trirem.

THALAMUS, in botany, a term uſed to expreſs that part of the flower in the capitated or floſculous flowered plants, where the embryo fruits of every ſeparate floſcule are lodged, and where afterwards the ſeeds are contained. This is the bottom of the cup, in the central part of which it adheres to the ſtalk. *Tourn.* Inſt. p. 438. See Tab. 1. of Botany, Claſs 1.

THALASSOMELI, the name of a medicine uſed as a purge among the antients. It was compoſed of equal parts of honey, ſea-water, and rain-water, expoſed to the ſun in the dog days, in a veſſel pitched on the inſide. It purged in the ſame manner that ſea-water alone would do, but only in a milder way.

THALIA, in botany, the name of a genus of plants, called by Plumier *cortuſa*. The characters of which are theſe: The cup is a ſpatha of an oval figure, terminating in a point, and compoſed of only one valve. The flower is compoſed of five petals, which are of an oblong ovated figure, and are hollowed and undulated at the margin; two of theſe, which are neareſt the cup, are ſmall and convoluted; the others are nearly equal in ſize, and are ſtrait and hollowed. The germen of the piſtil is of an ovated figure, and the fruit is a berry of an oval figure, having only one cell, and within that a ſingle bony ſeed which has two cells, in each of which is a thin kernel. *Plumier* 8. *Linnæi* Gen. Plant. p. 522.

THALICTRUM, *Meadow-rue*, in botany, the name of a genus of plants. The characters of which are theſe: The flower is of the roſaceous kind, being compoſed of ſeveral petals arranged in a circular form. The piſtil ariſes from the center of the flower, and is ſurrounded by a vaſt congeries of ſtamina. This finally becomes a fruit compoſed of ſeveral capſules gathered into a ſort of head; theſe are ſometimes alated, and ſometimes plain, and each of them contains one oblong ſeed.

The ſpecies of *Thalictrum*, enumerated by Mr. Tournefort, are theſe: 1. The larger *Thalictrum*, with angular or ſtriated ſeed-veſſels. 2. The larger *Thalictrum*, with ſmooth ſeed-veſſels. 3. The great yellow-flowered *Thalictrum*, with yellow ſtamina, and bluiſh-green leaves. 4. The columbine-leaved alpine *Thalictrum*, with purple ſtamina. 5. The great columbine-leaved alpine *Thalictrum*, with white ſtamina and green ſtalks. 6. The leſſer alpine columbine-leaved *Thalictrum*, with white ſtamina and green ſtalks. 7. The purple-ſtalked columbine-leaved Canada-*Thalictrum*, with white ſtamina. 8. The ſmaller American *Thalictrum*. 9. The great yellow-flowered ſweet-ſcented *Thalictrum*. 10. The large-flowered aſphodel-rooted ſmall *Thalictrum*. 11. The early-flowering mountain-*Thalictrum*. 12. The leſſer *Thalictrum*. 13. The narrow-leaved meadow-*Thalictrum*. 14. The little French *Thalictrum*, with thick ſhining leaves. 15. The narroweſt-leaved meadow-*Thalictrum*. 16. The ſmall ſtinking *Thalictrum*. 17. The little broad-leaved mountain-*Thalictrum*. 18. The little mountain-*Thalictrum*, with deep red ſhining leaves. *Tourn.* Inſt. p. 270.

THALLOPHORI, Θαλλοφόροι, in antiquity, the old men and women, who, in the proceſſion of the feſtival *Panathenæa*, carried olive boughs in their hands. *Potter*, Archæol. Græc. T. 1. p. 421.

THALYSIA, Θαλυσια, in antiquity, a ſacrifice offered by the huſbandmen after harveſt. For the origin and ceremonies of which, ſee *Potter*, Archæol. Græc. T. 1. p. 400.

THAMAR, a word uſed by the Arabian phyſicians, to expreſs a date. Hence a pectoral decoction made with dates and other ingredients, was called *diathamyron*; and the word was afterwards corruptly written *dicameron*.

THAOCINUS *Color*, a term uſed in the Latin tranſlations of the Arabian writers to expreſs what we call a blue purple, and the Latins *pavonaceus color*, peacock colour; which is alſo the literal ſignification of the Arabian term.

The antient writers all tell us, that their *Indicum* when diluted, made the moſt beautiful colour imaginable of that kind. This is one of many reaſons for ſuppoſing the *Indicum* of the antients, and our *Indigo* to be the ſame ſubſtance, becauſe this blue purple is the very colour of that drug when diluted.

THAPSIA, in botany, the name of a genus of plants; the characters of which are theſe. The flowers are diſpoſed in umbels, and are of the roſaceous kind, being compoſed of ſeveral petals, diſpoſed in a circular order on a cup, which afterwards becomes a fruit compoſed of two long ſtriated ſeeds, ſurrounded with a foliaceous edge, and from both ſides emarginated inwards. See Tab. 1. of Botany, Claſs 7.

The ſpecies of *Thapſia*, enumerated by Mr. Tournefort, are theſe: 1. The largeſt broad-leaved *Thapſia*. 2. The large hairy broad-leaved *Thapſia*. 3. The ſtinking *Thapſia*, with libanotis-leaves. 4. The ſtinking Portugal white-flowered *Thapſia*, with parſley leaves. 5. The narrower leaved Italian *Thapſia*, called *panax aſclepium*, and Eſculapius's all-heal. 6. The broadeſt-ſeeded *Thapſia*, or giant-turbith. 7. The ſhining alpine *Thapſia*, with thalictrum-leaves and white flowers. 8. The hairy thalictrum-leaved Portugal *Thapſia*. *Tourn.* Inſt. p. 311.

The root of the *Thapſia* is uſed in medicine: There are two kinds of it, the white, and the black.

The white *Thapſia*, called alſo by ſome grey turbith, is the root of a plant ſomewhat reſembling fennel. This is full of a milk-like juice, ſo very ſharp that it will bring off the ſkin, if ſuffered to touch the face. This root is ſeldom uſed under its own name, but is ſometimes ſold for the turbith root. They may be diſtinguiſhed however, by the turbith's being of a reddiſh grey without, and of a whitiſh grey within, and heavy and hard to break; on the contrary, white *Thapſia* is light, wrinkled, and of a ſilvery grey on the outſide, and ſo hot and acrid to the taſte, that if new it will bliſter the mouth.

The black *Thapſia* is of too duſky a colour to be uſed as an adulteration of turbith, and too hot and acrid to be preſcribed internally. *Lemery*'s Dict. des Drog.

Some of our druggiſts receive the roots of this plant inſtead of turbith, and ſell it as ſuch. It is happy for us, that it is not much in uſe. It purges very violently both upwards and downwards, and ought to be baniſhed from among the number of medicinal ſimples.

Beſide the poiſonous root known by the name *Thapſia*, the antients have deſcribed three other vegetable ſubſtances under it. The Lycium-wood uſed at this time, as alſo of old in Crete, as a yellow dye: The *Scythica radix*, or liquorice; and the *luteola*, or dyers weed. The Greek *Thapſos* ſignifies a pale dead yellow colour, and is applicable either to the ſubſtance or the juice or tincture of all theſe.

Paulus Ægineta and Alexander Trallian, in their catalogues of the things uſed to dye the hair yellow, mention the plant which they call *robia*, or *herba robia*, which they ſay dyed every thing of a gold colour.

Democritus calls the ſame plant *œcomenia*, and places it alſo among the herbs, uſed in tinging the hair. And ſome of the more modern Greeks have called it *cymene*. It is ſtill frequent in many parts of Greece, and is uſed there as well as here, to dye things yellow. Some have called it *carniola*; and Macer makes it the ſame with the *iſatis* or woad; but very erroneouſly. Some have called it *rubia*; but theſe have carefully diſtinguiſhed it from the *rubiæ radix*, or madder, which dyes red. The old ſcholiaſt on Ægineta has alſo called this plant by the ſame name with woad, and plainly ſhews he thought the two names ſynonymous, by rendering the *iſatis* of his author by the word *cymene*, which is plainly the ſame plant with the carniola, that is the *luteola* of the Romans. See the article CYMENE.

THAPSOS, in the materia medica of the antients, a name given to a kind of wood of a pale yellow colour, uſed of old in dying linnen and woollen cloths.

It has by ſome been ſuppoſed, that *Thapſos* and *Thapſia* were the ſame plant; but there is no one circumſtance in any of the accounts of authors, to favour ſuch a conjecture. The *Thapſia* was always deſcribed as a plant whoſe root was poiſonous; but the *Thapſos*, as a tree, whoſe wood was not eſteemed dangerous, and was uſed by the dyers; not the root, but the wood of the trunk and large branches. The natural colour of the wood being of a livid and dull yellow, it became an emblem of death; and the word *Thapſos* is uſed by ſome of the Greek writers, as a name for the colour of dead corpſes.

The people of Crete at this time uſe the lycium-wood in dying a yellow colour, and it is probable that the *Thapſos* was this very tree. Dioſcorides tells us, that the wood of this tree was alſo uſed at his time to tinge the hair yellow, which was a favourite colour with the Greeks. The lycium is of a colour ſomewhat deeper than our box-wood, and parts with its ſtain ſo eaſily that it ſeems very proper for ſuch a purpoſe. See the article THAPSIA, *ſupra*.

THAPSUM, among the old Roman writers, a common name for the *verbaſcum*, or mullein; but as there were many other plants, very different in their nature, yet whoſe names reſembled this; ſuch as the *Thapſia*, or deadly carrot, and the *Thapſum*, or *geniſtella tinctoria*; it was ſoon found neceſſary to add ſome other name, and it was then called *Thapſum barbatum*, or *barbaſſum*.

The Greeks uſed the word *Thapſon* for a yellow colour, and called in general all yellow things by that name. Hence the great confuſion that has ariſen by calling the *Thapſia* root the liquorice root, the lycium wood, and the geniſtella flowers, all by the common name *Thapſum*. The reaſon of the geniſtella being called *Thapſum*, was, that its flowers were yellow, and were uſed to colour the ladies hair; that being the favourite colour of thoſe days. The flowers of mullein are yellow, and ſeem more fit for the colouring the hair, than thoſe of the geniſtella; their colour being more eaſily ſeparated, and continuing on ſo well that the glovers of many parts of England uſe them in the ſeaſon for colouring their yellow gloves.

It is probable, that the ladies of old uſed this, as well as the geniſtella, for this purpoſe; and it might hence obtain the common name *Thapſum*. The other part of its diſtinction,

barbatum, ſeems owing to the leaves being ſo covered with a woolly down that they look bearded. And when this word is written *barbaſſum*, it may probably be given as the name of ſome of thoſe ſpecies of mullein, which are not hairy, as our black or ſage-leaved mullein, and be a corruption of the word *verbaſcum*. This black mullein has no leſs title than the white or bearded kind, to the name *Thapſum*. Its flowers being of a yet finer yellow than thoſe of that kind, and being as fit for the uſe of ſtaining. The glovers of Hertfordſhire uſing this ſpecies for their leather gloves.

THARGELIA, Θαργηλια, in antiquity, an Athenian feſtival, in honour of the ſun, and his attendants the hours; or, as others think, of the Delian Apollo and Diana. For an account of the ceremonies of this ſolemnity, ſee *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 400. ſeq.

THARGELION, Θαργηλιων, in chronology, the eleventh month of the Athenian year. It contained thirty days, and anſwered to the latter part of our April, and the beginning of May. See the article MONTH.

It took its name from the feſtival *Thargelia*, kept in it. See the article THARGELIA, *ſupra*.

THASIUM *Marmor*, in the writings of the antients, a name given to a ſpecies of marble, uſed in building. It had its name from the iſland Thaſus, one of the Cyclades, where it was dug; it was of a duſky greyiſh white, and ſeemed to be compoſed of the ſame matter with the common white marbles with greyiſh veins; only that the matter of the veins here did not run into thoſe determinate parcels, but were blended among the whole maſs.

THAUGHTS, or THOUGHTS, in a boat, are the benches on which the rowers ſit to row.

THEATRIC *Bandages*, a term uſed by Hippocrates, to expreſs the parade of ſurgery in applying bandages for ſhew, when there was no real uſe in them. All ſuch bandages he called *Theatric*, proper only to be looked at.

THEBANUS *Ophites*, in natural hiſtory, a name given by ſome of the antients, to that ſpecies of the *Ophites*, or ſerpentine marble, more commonly called *Ophites niger*, the black ſerpentine. See the article OPHITES.

THEDO, in ichthyology, a name given by Figulus and others, to the trout. See the article TRUTTA.

THEIOCRUS, in the materia medica of the antients, a name given by ſome to the *Melanteria*, a mineral ſubſtance of a vitriolic nature, and of a yellow colour, but turning black on touching common water.

This name *Theiocrus* ſignifies only ſulphur-coloured, and was at firſt uſed with the name of vitriol, as expreſſive of the difference of this kind from others; but in time it became common to uſe it alone.

THELE, a word uſed by ſome to expreſs the nipple, and by others for the whole breaſt.

THELIGONIUM, in botany, the name of a genus of plants, called by the common authors of botany, *cynocrambe*. The characters are theſe: The male and female flowers are produced in the ſame plant. In the male flower the cup is compoſed of one leaf, of a turbinated form, lightly divided into two ſegments with the jaggs turning downward. There are no petals. The ſtamina are numerous, being uſually twelve at leaſt; they ſtand erect, and are of the length of the cup; and the antheræ are ſingle. The female flower has an extremely ſmall one-leaved cup, which is bifid, and its ſegments gape open. There are no petals. The piſtil has a globoſe germen; the ſtyle is ſhort, and the ſtigma obtuſe. The fruit is a globoſe capſule, of a coriaceous texture, having only one cell, and containing only one globoſe ſeed. *Linnæi* Gen. Plant. p. 406. *Tourn.* Inſt. p. 485.

THEMIS, in aſtronomy, a name given by ſome to the third ſatellite of Jupiter. *Lowth.* Abr. Philoſ. Tranſ. Vol. 1. p. 408.

THENAR, (*Cycl.*) a very thick and fleſhy muſcle, in ſome meaſure pyriform, lying on the firſt phalanx of the thumb toward the palm of the hand, the large eminence in which is chiefly formed by it. It is fixed to the bone which ſupports the thumb, and to the neighbouring part of the great internal annular or tranſverſe ligament of the carpus. It is in ſome meaſure bicipital; two diſtinct portions anſwering to the two inſertions. As it runs along the firſt phalanx, theſe two portions unite, and diminiſhing in thickneſs, are both inſerted by one tendon in the lateral internal part of the head of the firſt phalanx, in the lateral part of the baſis of the ſecond, and in the lateral ligament of that joint. The void ſpace between the two portions of this muſcle gives paſſage to the tendon of the *flexor pollicis longus*. That portion which lies neareſt the hollow of the hand is largeſt; and its tendinous extremity is inſerted in the firſt ſeſamoide bone, ſituated at the baſis of the ſecond phalanx. *Winſlow's* Anat. p. 196.

THENAR *Pedis*, a muſcle made up of ſeveral portions, and lying on the inner edge of the ſole of the foot. It is fixed by three or four fleſhy faſciculi to the lower and inner part of the os calcis, ſcaphoides, and cruciforme majus, and a little in the annular ligament under the inner ankle, which belongs to the tendon of the flexor longus. From all theſe inſertions the faſciculi approach each other, as they advance under the firſt bone of the metatarſus, and are fixed in the internal ſeſamoide bone, and inſide of the firſt phalanx near its baſis; and there is another faſciculus fixed by one end of the os ſcaphoides, and cuneiforme majus; and by the other to the external ſeſamoide bone, and outſide of the firſt phalanx of the great toe. *Winſlow's* Anat. p. 222.

THENSA, among the Romans, a veil or canopy, uſed in the chariots at games; and likewiſe to cover a ſeat of ſtate. *Pitiſc.* in voc.

Thenſæ could not be granted to any but by the expreſs allowance of the ſenate. Hiſt. Acad. Inſcript. Vol. 1. p. 359.

THEOBROMA, in botany, the name of a genus of vegetables, including the cacao and the guazuma of Plumier. The characters are theſe: The cup is a three-leaved perianthium reflex and open, and is compoſed of oval, concave, and deciduous leaves. The corolla is compoſed of five petals, erect, open, concavely galeated, and terminated by a bifid briſtle. The nectarium is campanulated, and conſiſts of five petals; it is ſmaller than the flower, and conſiſts of five connected parts. The ſtamina are five-pointed filaments of the length of the nectarium; each has its top divided into five ſegments, and carrying five apices or antheræ. The germen of the piſtil is oval, the ſtyle is pointed, and is of the length of the nectarium, and the ſtigma is ſimple. The fruit is a woody ſubſtance, ribbed in five places on the ſurface, and divided into five lodgments of ſeeds within. The ſeeds are numerous, fleſhy, and of an oval figure. There is ſome difference in the fruit of the ſeveral ſpecies of theſe trees; the cacao having a long fruit, tapering at each end, and the guazuma a globular one, full of tubercles, and perforated in the manner of a ſieve, but divided into five lodgments within. *Linnæi* Gen. Plant. p. 367. *Plumier*, Gen. 18. *Tourn.* Inſt. p. 444.

THEODOLITE (*Cycl.*)—This inſtrument is now commonly made uſe of by ſurveyors. One of the beſt of the kind ſeems to be Mr. Siſſon's lateſt improved *Theodolite*; a deſcription of which may be found in Mr. *Gardner's Practical Surveying improved*; from whence it has been inſerted in a late treatiſe of practical geometry, publiſhed at Edinburgh 1745, in 8°. under the care, as it is commonly thought, of the late celebrated Mr. M'Laurin.

In this inſtrument the three ſtaves, by braſs ferrils at top, ſcrew into bell metal joints, moveable between braſs pillars, fixed in a ſtrong braſs plate; in which, round the center is fixed a ſocket with a ball moveable in it, and upon which the four ſcrews preſs that ſet the limb horizontal. Next above is ſuch another plate, through which the ſaid ſcrews paſs, and on which round the center is fixed a fruſtum of a cone of bell-metal, whoſe axis, being connected with the center of the ball, is always perpendicular to the limb, by means of a conical braſs ferril fitted to it, whereon is fixed the compaſs-box, and on it the limb, which is a ſtrong bell-metal ring, whereon are moveable three braſs indexes, in whoſe plate are fixed four braſs pillars, that joining at top, hold the center-pin of the bell-metal double ſextant, whoſe double index is fixed in the center of the ſame plate. Within the double ſextant is fixed the ſpirit level, and over it the teleſcope.

The compaſs-box is graved with two diamonds for north and ſouth, and with 20 degrees on both ſides of each, that the needle may be ſet to the variation, and its error alſo known.

The limb has two flower-de-luces againſt the diamonds in the box, and is curiouſly divided into whole degrees, and numbered to the left hand at every 10° to twice 180°, having three indexes (with Nonius's diviſions on each for the decimals of a degree) that are moved by a pinion fixed below one of them without moving the limb, and in another is a ſcrew and ſpring under, to fix it to any part of the limb: It has alſo diviſions numbered for taking the quarter girt in round timber; to which a ſhorter index is uſed, having Nonius's diviſions for the decimals of an inch; but an abatement muſt be made for the bark, if not taken off.

The double ſextant is divided on one ſide from under its center (when the ſpirit-tube and teleſcope are level) to above 60 degrees each way, and numbered at 10, 20, &c. And the double index (through which it is moveable) ſhews on the ſame ſide the degree and decimal of any altitude or depreſſion to that extent, by Nonius's diviſions; on the other ſide are diviſions numbered for taking the upright height of timber, &c. in feet, when diſtant ten feet, which at 20 muſt be doubled, and at 30 trebled; and alſo the quantities for reducing hypothenuſal lines to horizontal: It is moveable by a pinion fixed in the double index. See the article SURVEYING.

The teleſcope is a little ſhorter than the diameter of the limb, that a fall may not hurt it; yet it will magnify as much, and ſhew a diſtinct object as perfect, as moſt of treble its length; in its focus are very fine croſs wires, whoſe interſection is in the plane of the double ſextant, and this was a whole circle, and turned in a lathe to a true plane, and is fixed at right angles to the limb; ſo that whenever the limb is ſet horizontal (which is readily done by making the ſpirit-tube level over two ſcrews, and the like over the other two) the double ſextant and teleſcope are moveable in a vertical plane, and then every angle taken on the limb (though the teleſcope be never ſo much elevated or depreſſed) will be an angle in the plane of the horizon, and this is abſolutely neceſſary in plot-

ting an horizontal plane. Treat. Pract. Geom. p. 75. seq.

THEOGAMIA, Θεογαμια, in antiquity, a Sicilian festival in honour of Proserpine, which seems to have been instituted in memory of her marriage with Pluto. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 402.

THEOMANTIA, Θεομαντεια, in antiquity, divination by the supposed inspiration of some deity. For a particular account of which, see *Potter*, Archæol. Græc. l. 2. c. 12. T. 1. p. 298. seq.

THEOPHANIA, Θεοφανεια, in antiquity, a festival observed by the Delphians upon the day whereon Apollo first manifested himself to them. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 402.

THEOPHRASTA, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: The cup is a small perianthium, lightly divided into five obtuse segments, and remaining when the flower is fallen. The flower consists of a single petal, in form of a bell, slightly divided into five obtuse segments. The stamina are five tapering filaments, shorter than the flower. The antheræ are simple. The germen of the pistillum is of an oval figure. The style is tapering, and shorter than the flower. The stigma is acute. The fruit is a very large globose capsule, containing only one cell. The seeds are numerous and roundish, and are affixed to every part of their receptacle, which is loose. *Linnæi* Gen. Plant. p. 66.

THEOPHRASTICS, a name given to the followers of Paracelsus, from his name Theophrastus.

THEOPNEUSTÆ, Θεοπνευστοι, an epithet given to enthusiastical diviners. *Pott.* T. 1. p. 302.

THEOPROPIA, Θεοπροπια, a delignation given to oracles. See the article ORACLE, *Cycl.*

THEORI, Θεωροι, in antiquity, an appellation given to those Athenians who performed the solemnity called *Theoria*. See the next article.

THEORIA, Θεωρια, in antiquity, a solemn annual voyage to Apollo's temple in the island Delos, performed by the Athenians always in the same ship in which Theseus went. For the particularities of this naval procession, see *Potter*, Archæol. Græc. l. 2. c. 9. T. 1 p. 284. seq.

THEORY (*Cycl.*)—THEORY *of Chemistry*. Under the *Theory* of this art are to be laid down all the general truths which the particular experiments of chemists have hitherto demonstrated. These are, on this occasion, to be taken for granted, and the whole body of such truths makes the universal *Theory* of chemistry, for chemistry is no science formed *a priori*; 'tis no production of the human mind, or raised by reasoning, but collected *a posteriori* from experiments; it took its rise from various operations casually made, and observing those that had one and the same uniform tendency, without any expectation of what followed; and was only reduced into an art, by collecting and comparing the effects of such uncertain experiments, and noting the tendency thereof: So far then as a number of experiments agree to establish any unquestionable truth; so far they may be considered as constituting the *Theory* of chemistry. Such a *Theory* is necessary to be premised to every art; and something equivalent to this is practised by every artisan, in teaching his disciple how to proceed orderly in the exercise of his art; and accordingly it would be impossible to teach the practice of chemistry to advantage, without having first given some such *Theory*. Thus it would be to little purpose, to give a novice a parcel of rosemary, for instance, and bid him, without any addition, distil a water from it, which should contain the natural taste and odour of the plant; unless he knew before-hand this general truth, that plants, exposed to a gentle heat, like that of the summer's sun, do exhale their most subtle and volatile parts, which, being collected and condensed by means of proper vessels, appear in form of water, and are the thing required. *Shaw*'s new Meth. of Chem. p. 3.

In the forming such a *Theory* of chemistry, a direct use may indeed be made of the demonstrations in physics, as particularly in mechanics, hydrostatics, and hydraulics; since the properties common to all bodies, and what farther affections certainly flow therefrom, have their place in chemistry. One cannot, however, be too reserved in this use, since those singular properties found in some bodies, will, if applied to others, falsify the mechanical demonstrations, which might hold true every where else. Thus Galilæo has fully demonstrated the law, by which an heavy body, let fall from on high, descends in a spiral or elliptic line, with a certain degree of acceleration to a point of the earth, perpendicular to the horizon of the point from whence it was first let fall; but if a loadstone be thus let fall, and in the course of its descent enter the sphere of activity of another load-stone, the demonstration will not hold. So what Archimedes has shewn, concerning bodies equiponderant in water, holds infallibly true, if considered only in common cases, but proves false in the instance of gold; which, tho' it sink in other fluids, is suspended and dissolved in light aqua regia. *Boerhaave*, Chem. p. 3.

Due regard being had to this rule, the discoveries of naturalists and mathematicians will always be advantageous, never injurious to the art of chemistry.

Chemistry, as now conceived, is an assemblage of very different parts, which antiently subsisted separate, or at least had a subsistence prior to each other, as the preparing of metals for human uses, the attempts of transmuting the baser metals into gold, the preparing of medicines, &c. If we are to trace the antiquity of chemistry, as an art that teaches to convert other metals into gold, or to procure an universal remedy for all diseases, the research will not carry us far back; but as it relates to the discovery of metals in the mine, and the digging, separating and purifying them, it challenges even the highest antiquity.

The art of metals is, no doubt, of very early standing. To find, procure, fuse, refine, and render malleable, and apply metal to use, is even of antedeluvian origin, and was attributed by the antients to their gods. Moses, the oldest author extant, in his genealogy of the patriarchs, relates that Tubal Cain, the eighth from Adam, was the instructor of every artificer in brass and iron, to prepare the instruments and utensils of life; and 'tis apparent nothing of this could be effected without the knowledge of metallurgy. This account given us by Moses, is surprisingly seconded by prophane history and fables; for Diodorus Siculus, who lived in the time of Cæsar, when Ægypt was become a Roman province, had a fair opportunity of searching into the antiquities of the Ægyptians; and he relates, as the result of his enquiry, a very antient tradition of one Hephaistos, whom that people hold the first inventor of all arts and operations about metals, and every thing else that undergoes the fire; together with their uses; which art he delivered down to posterity, so far as it might be of service to mankind. This Hephaistos of the Ægyptians and Greeks, is the same with the Mulciber and Vulcan of the Latins, to whom the same art or invention is ascribed; and the Vulcan of the Latins we generally suppose to have been the Tubal Cain of the Hebrews, here mentioned by Moses as the inventor of the said art.

It appears from Homer, Hesiod, Orpheus, and all the most antient writers, that Vulcan had the art of working brass and iron; and that, living under mount Ætna, he was employed in forging arms for the gods and heroes. As Diodorus Siculus relates the story, he was the son of Jupiter and Juno, and the first king of Ægypt, and that he was afterwards preferred to be a god, for having invented fire, and taught men the use of it. The Ægyptians, as the same Diodorus observes, adored their god Vulcan as the inventor of the whole art and application of metals; so that the account of Moses and Diodorus perfectly agree, and prove the chemistry of metals almost coæval with mankind. *Shaw*'s Chem. p. 10.

THEOXENIA, Θεοξενια, in antiquity, a festival in honour of all the gods, and celebrated in many cities of Greece, but especially at Athens. *Potter*, T. 1. p. 402.

THEOXINI *Malagma*, the name of a sort of cataplasm, good against pains of the feet.

THERAPIDION, in botany, a name given by some authors to the common oister-green, or sea-laver, a plant of the tremella kind. See the article TREMELLA.

THERMASMA, a word used by some of the antients to express any thing that warms the body, and by others particularly for a warm fomentation, prescribed by Hippocrates for removing pains in the side, and giving ease in pleurisies.

THERMOMETER (*Cycl.*)—Dr. Martin has made useful remarks on the construction and graduation of *Thermometers*, and has reduced the most remarkable of these instruments, which have been employed in different parts of Europe, for observing the changes in our atmosphere, to one general standard, so as to enable us to compare the several observations together. See his Physical and Medical Essays.

THERMOPOLIUM, a name for a sort of public houses among the antients, in which hot liquors were sold, in the manner of our coffee-houses.

THESEIA, Θησεια, in antiquity, an Athenian festival, in honour of Theseus, and celebrated on the eighth day of every month. For the ceremonies of this solemnity see *Potter*, Archæol. Græc. T. 1. p. 404.

THESIS, (*Cycl.*) in music, denotes the fall of the hand in beating time. The Latin writers call it *depressio*. *Brossard.*

THESMOPHORIA, Θεσμοφορια, in antiquity, a festival in honour of Ceres, which was celebrated by many cities of Greece; but especially the Athenians observed it with great devotion and pomp. For the ceremonies of this solemnity, see *Potter*, Archæol. Græc. T. 1. p. 403. seq.

THESMOTHETÆ, Θεσμοθεται, in antiquity, an appellation given to six of the nine Athenian *archons*; the first and chief of the nine was called, by way of eminence, *archon*; the second in dignity was called *basileus*, the third *polemarchus*, and the other six *Thesmothetæ*; for an account of whose power and jurisdiction, see *Potter*, Archæol. Græc. T. 1. p. 77.

THESPHATA, Θεσφατα, in antiquity, an appellation given to oracles. See ORACLE, *Cycl.*

THESPIANA, the name of an antidote, intended for internal abscesses.

THETA, Θ, among the antients, one of the Greek letters. It was used as a mark on the ballots of judges, by which they condemned the person to death, it being the first letter of the word Θανατος, death. Whence it had the epithet of *niger* and *infelix*, thus:

O multum ante alias infelix litera Theta.

THETES, Θῆτες, in antiquity, the loweſt claſs of people at Athens. Ariſtides repealed Solon's law, by which the *Thetes* were made incapable of bearing any office in the government. *Potter*, Archæol. l. 1. c. 4. p. 16.

THEVET, a name of one of the Hebrew months, anſwering to our December moon. See the article TEBET.

THEXIS, a word uſed by the old medical writers, ſometimes for wounds made by puncture with ſmall inſtruments, and ſometimes for the operation of the ſuture, or the ſowing together the lips of a wound, to make it heal with a leſs ſcar.

THIGH (*Cycl.*)—THIGH-*Bone*. We have an account in the Philoſophical Tranſactions of a large piece of a young man's *Thigh-bone* being taken out, and the place ſo well ſupplied by a callus, that he walked ſtrait. See N°. 461. Sect. 2.

Fractured THIGH-*Bone*. The *Thigh-bone*, though the largeſt and ſtouteſt in the whole body, is yet frequently broken, both near its middle, and towards its ends or articulations; but more particularly near that part uſually called its neck, near its articulation with the hip-bone; and when this is the caſe, it is very difficult to ſet it, and retain it in its place. When the bone is broke in two places at once, which ſometimes happens, the danger is yet much greater; and if the patient, in this caſe, eſcapes death, which he ſeldom does, he is commonly lame, ever afterwards.

Sometimes this bone is broken tranſverſely, ſometimes obliquely, and at other times the ends ſlip a great way over one another, which makes it a very bad caſe; for the muſcles of this part being very robuſt, and ſtrongly contracted, draw the lower end of the bone with a conſiderable force upwards, ſo as to make it require great ſtrength to extend and replace it.

The oblique fracture of this bone more frequently ſlips out of its place again than the tranſverſe, and generally leaves the *Thigh* ſomewhat ſhorter than the other, notwithſtanding all the caution the ſurgeon can uſe in the ſetting it. It is therefore neceſſary, in theſe caſes, beſide the means that are common to all the fractures, to uſe a more ſtrict and tight bandage in this than in the tranſverſe fracture, to prevent the bones from being eaſily removed. When a fracture of the *Thigh-bone* happens near its middle, or towards it lower head, it is to be extended and replaced with the hands like other fractures, except that the extending force required is very great; and where the hands of a ſtrong aſſiſtant are not enough, ſlings, napkins, or linnen bandages, are to be bound round each head of the *Thigh*, whereby the fractured bone may be extended both ways, by the ſtrength of three or four perſons at once, while the ſurgeon cautiouſly reduces the fracture with his hands, and ſecures it with a proper bandage and dreſſing; there are ſometimes caſes where the joint ſtrength of three or four men, applid in this manner, are not ſufficient to make the neceſſary extenſion; in which caſe the ſurgeon is obliged to have recourſe to ropes and pullies, by means of which one man will pull more forcibly and equally than ſeveral can without them. But caſes that require this treatment are not common.

When the neck of the *Thigh-bone* is fractured, to which, from its oblique or tranſverſe direction, and ſpongy or brittle ſubſtance, it is very ſubject; it makes a fracture not only very difficult to reduce, but ſuch a one alſo as can ſeldom be cured without leaving the limb ſhorter than it was before. The reaſons of which are, that the fragments cannot but with great difficulty be preſſed into their right places, by reaſon of the great thickneſs and ſtrength of the muſcles which cover them; and that it ſeldom happens that the bones can be retained in their natural poſition, after they have been ever ſo well reduced; becauſe the muſcles which paſs over and are inſerted below the neck of this bone, draw its lower part upwards; and both theſe accidents happen the more naturally and eaſily, becauſe of the oblique poſition of the neck of this bone, which is inſerted into its head in a direction not perpendicular, nor parallel, but as it were ſloping on one ſide; ſo that it is no wonder that lameneſs, and other bad accidents, are the conſequences of this ſort of fracture.

To all theſe reaſons we may alſo add, that it is very difficult to diſcover when the neck of the *Thigh-bone* is fractured, this caſe being uſually taken for the head of the bone being ſlipped out of its ſocket or acetabulum; and this indeed, till of late, has been almoſt a general error. When we can think the external force to have been ſtrong enough to have produced a fracture, when the patient cannot bear any ſtreſs upon the limb, by ſetting his foot on the ground, when very acute pains are felt about the articulation itſelf; and when we find the affected limb ſhorter than the ſound one, it being an eaſy matter to turn the foot almoſt round from one ſide to the other, and any cracking or grating of the bones be perceived in that motion, me may reaſonably ſuppoſe the neck of the *Thigh-bone* is fractured; the limb muſt then be extended very gently and gradually, till it be brought to the ſame length with the ſound one; this may be eaſily done, either by means of a napkin, or the hands of an aſſiſtant in moſt caſes, in ſuch a manner, that the ſurgeon may be able to rejoin, in ſome meaſure, if not perfectly, the neck of the *Thigh-bone* with its head, ſtill firmly remaining in its ſocket: And though a ſhortneſs of the limb, or lameneſs, is generally left behind after this fracture; yet becauſe there are ſome cured without thoſe misfortunes, it is always beſt to uſe, for that end, ſo ſtrict or tight a bandage, that it may retain the neck and head of the bone together, ſo that they may be in a way of uniting evenly. The bandage called *ſpica inguinalis* is the moſt convenient for this purpoſe, and a large and broad napkin, or other linnen cloth, is, with this, placed between the *Thighs*, to keep the body of it from ſubſiding; and laſtly, ligatures are put about the knee and ancle, by which the foot is faſtened to the lower part of the bed, to prevent the limb from being contracted upwards.

If the fracture of the *Thigh-bone* be accompanied with a wound, it makes the caſe very difficult and dangerous. And if theſe accidents happen to be inflicted on the neighbouring joint, death is generally the conſequence, more eſpecially when any of the large blood-veſſels are alſo wounded, which will be readily enough known by the hæmorrhage. In theſe fractures, with a wound, the eighteen-headed bandage is to be uſed for the dreſſing; and if the wound be much contuſed, ſo that extravaſated blood be lodged under the ſkin, and about its interſtices, it is to be carefully opened by ſeveral inciſions, of a ſufficient depth, that the extravaſated blood, which would in a ſhort time putrify, may be diſcharged. The injured parts are to be afterwards waſhed with lime-water, mixed with a fourth part of ſpirit of wine camphorated, till the contuſed parts are digeſted.

When this kind of fracture is accompanied with no very violent loſs of blood, nor the bone near, the proper dreſſing is dry lint folded up, with which the wound is to be filled. If the flux be greater, rectified ſpirit of wine, or other aſtringent liquors are to be uſed; but if the hæmorrhage be very violent, from an artery, the tournequet is to be uſed, and the veſſel ſecured by a ligature. After the blood is ſtopped, and the wound cleanſed, the fragments of the bone are to be replaced, and the limb carefully bound up with compreſſes, ſplints, and the eighteen-headed bandage, and defended by a caſe of ſtraw. But if the fracture is attended with a violent hæmorrhage, and great ſplintering of the bone, from gun-ſhot wounds, ſo as to indicate the great crural artery to be wounded, the beſt method is to amputate the *Thigh*, and tie up the artery in time; for the crural artery is ſo large, that it ſeldom grows together; and if it does, the lower parts are ſoon ſeized with a gangrene. *Heiſter*, 129.

We have the deſcription and draught of a machine for reducing fractures of the *Thigh-bone*, by Mr. Ettrick, in the Phil. Tranſ. N°. 459. Sect 4.

Luxated THIGH. It has been formerly imagined, that the head of the *Thigh-bone* being diſplaced out of its acetabulum, was a very common caſe; but more knowledge in anatomy and ſurgery have convinced us now, that this accident is very rare. The reaſon it was before ſuppoſed common, was, that a fracture of the neck of the *Thigh-bone* was generally miſtaken for this luxation.

It will eaſily be conceived, that this is the true ſtate of the caſe, and that a real diſlocation of the *Thigh-bone* is very rare, if we conſider how very deep the ſinus or acetabulum is, into which the head of this bone is received, with what a broad concave cartilage the head of this bone is covered, how extremely ſtrong the ligaments are with which it is faſtened, how greatly it is defended with thick and ſtrong muſcles, and at the ſame time reflect how very weak and brittle the neck of the *Thigh-bone* is, in compariſon of any other part thereof; and from all theſe conſiderations, how vaſtly more eaſy it muſt be for the ſame force to break the bone off juſt under its head, than to diſplace it out of its ſocket. And, indeed, when luxations of the *Thigh-bone* do happen, it is much more frequently from internal than from external cauſes. For phyſicians have obſerved, that the ligaments of the *Thigh-bone*, though naturally of extreme ſtrength, may be, by various cauſes, and particularly by a flux of humours, ſo relaxed and weakened as to let the head of that bone ſlip ſpontaneouſly out of its acetabulum or ſocket; ſo that the *Thigh*, though not eaſily luxated by external violence, may eaſily happen to be ſo without any external violence, and while the patient lies in his bed. This is an accident, however, that happens much more rarely to adults than to infants.

Whenever the head of the *Thigh-bone* is thruſt out, it is almoſt always wholly diſplaced; ſo as to make a perfect luxation; the exact roundneſs of this head, with the great ſtrength of the circumjacent muſcles, and the narrowneſs of the ſides of the acetabulum, will not admit the bone to be partially diſlocated or thruſt out of its place a little way only; for as ſoon as the head of the bone is thruſt up to the edge of the acetabulum, it muſt unavoidably either turn quite out, or fall back again into its right place.

The thigh is found to be capable of luxation four ways, upward and downward, and backward and forward; but it is moſt frequently diſlocated downward and inward, toward the large foramen in the os pubis. For beſide, that the cartilaginous defence, on the lower part of the acetabulum, is not ſo high as in the reſt, the ligamentum rotundum is ever found to give way more readily in that part than in any other; and laſtly, the adjacent muſcles are found to be weakeſt in their reſiſtance on this part. And there is, beſide all theſe, a certain eminence in this edge of the acetabulum, which prevents the head of the bone from falling back again eaſily into its right place, when

when once it is got this way out of it. But if the head of this bone be diſplaced outwards, it generally ſlips upwards at the ſame time, it being ſcarce poſſible but that the very ſtrong muſcles of the *Thigh* muſt then draw the bone upwards; and there is no eminence in this edge of the acetabulum to reſiſt the head of the bone in that paſſage.

When the *Thigh* is diſlocated forwards and downwards, which is what moſt uſually is the caſe, the leg hangs ſtradling outward, and is longer than the other; the knee and foot alſo both turn outwards, and the head of the bone itſelf will be felt near the lower part of the inguen and os pubis. Sometimes there is a ſuppreſſion of urine in this caſe, which is occaſioned by ſome nerve which communicates with the bladder being violently compreſſed; in the buttock there alſo may be perceived a cavity from the trochanter major, and the reſt of the bones being diſplaced; and if the *Thigh-bone* be not timely reduced into its acetabulum, the whole limb withers ſoon afterwards. The patient, for this reaſon, can bear little or no ſtreſs upon that limb, but muſt always incline and throw the weight of his body upon the other; when he moves forward, he muſt move that limb in form of a ſemicircle, and ſupport his body by crutches under the arms; though there are not wanting particular caſes, where the head of the luxated *Thigh-bone* has grown ſo firmly to the adjacent parts, without the acetabulum, as to become, in proceſs of time, ſo ſtrong as to ſupport the body without ſticks, though the perſon could not, in any of the caſes that have been known of this kind, walk without halting.

If the *Thigh-bone* be diſplaced backward, it is uſually drawn upward alſo, as before obſerved, at the ſame time; hence there will be perceived, in this caſe, a cavity behind the inguen, and a tumour upon the buttock, becauſe the head, and trochanter of this bone, will be placed there. The tumour on the buttock being thruſt upward, the limb will become ſhorter than before, and the foot will be inclined to turn inwards. The heel will not touch the ground, but the perſon ſeem to ſtand upon his toes; and laſtly, the luxated limb will be much more eaſily bent than extended.

It is extremely rare that the *Thigh* is luxated forward or backward, without being alſo drawn upward or downward; but if it ſhould ſo happen, it will yet evidently be diſcovered by the rules before given, and by conſidering the nature of the arti culation of the bone: As it is, however, at beſt very difficult to diſcover when the *Thigh-bone* is diſlocated, and when it is fractured, either by feeling or inſpecting, becauſe of the great thickneſs of the muſcles and integuments, it is therefore a matter of ſome conſequence to propoſe the ſigns by which one of theſe caſes may be known from the other. There is reaſon to judge the *Thigh-bone* to be luxated, when we find the ligaments of the bone have been relaxed by ſome preceding congeſtion of humours, when no external violence has been exerted upon it, when neither violent pain, tumours, nor inflammation follow; and laſtly, when the whole limb may be bent, and turned about at the acetabulum, without the ſurgeon's diſcovering any grating or cruſhing of the bones; and the contrary of theſe ſigns, which are what uſually take place, in what have been uſed to be called luxations of this bone, are very ſtrong indications of a fracture.

When the bone is found to be really diſlocated, it is to be reduced in a method agreeable to the nature and direction of the diſlocation. When it is diſplaced forward and downward, the patient is to be laid flat upon his back on a table; then a linnen napkin, or ſtrong ſling, is to be made faſt about the groin, over the part affected, ſo that one end of the ſling may come over the belly, and the other over the nates and back, to be both tied together in a knot upon the ſpine of the os ileum, and afterwards either faſtened to a hook fixed in ſome poſt, or held firm by ſome aſſiſtance: In like manner at the bottom of the *Thigh*, a little above the knee, there muſt be faſtened another napkin or ſling, or elſe the girt of Hildanus, with a compreſs between it and the *Thigh*; both theſe ſlings being drawn tight, the *Thigh* is to be extended, but that not vehemently; but only ſo much as is ſufficient to draw the bone out of its ſinus, that it may be replaced into its proper acetabulum by the ſurgeon's hands; to this purpoſe the ſurgeon is, with one hand, to preſs the head of the *Thigh-bone* outward, while the other conducts the knee inward. Or the reduction may be made by napkins faſtened about the *Thigh* near its extremities, in the manner of ſlings, and the limb extended that way, the knee being at the ſame time preſſed inward by the hands.

If theſe methods are not ſufficient, it will be neceſſary to have recourſe to the polyſpaſton or pulley, well known to the ſurgeons on theſe occaſions. This is to be the method of reduction of the *Thigh-bone* when it is diſlocated forward; but when it is found to be luxated backward, the patient is to be placed flat on a table, with his face downward; the *Thigh* is then to be extended more ſtrongly than in the former caſe, and the reduction is then to be performed by the ſurgeon's hand, an aſſiſtant all the while turning the limb ſomewhat inwards, and by this method the head of the *Thigh-bone* generally ſlips very readily from this ſort of diſlocation into its proper place. The limb is then to be ſecured with proper bandages, and the patient to be kept to his bed for three or four weeks. *Heiſter*, Surg. p. 167.

Saltzmannus relates an inſtance of a luxation of the *Thigh-bone*, without any fracture of its neck, and confirms what Ruyſch had obſerved of the epiphyſis of the os femoris, being as it were annihilated, or at leaſt changed ſo, as it could not be obſerved, when ſought after in one who had it broken.

THIGH, in the manege. The effect of the horſeman's *Thigh* is one of the aids that ſerves to make a horſe work vigorouſly. See the article AID.

Fore-thigh, or *arm* of a horſe, is that part of the fore-leg that runs between the ſhoulder and the knee: Though the *fore-Thigh* does not bend or bow, yet we commonly ſay, a horſe goes fine, that bends well the *fore-Thigh*, importing thereby, that he bends well his leg.

THILYPTERIS, in botany, a term uſed by Dillenius to expreſs the common female fern or brakes. *Dill.* Cat. 174.

THIMHIO, in the materia medica, a name uſed by ſome authors for a peculiar ſort of lignum aloes, which is blackiſh and very heavy, and extremely ſweet. *Camell.* Syll. p. 87.

THIN, in the materia medica, a name given by the Arabian writers to earth of any kind.

Thus the bole armenic of Galen is called by Aviſenna *thin armeni*; and hence the word *muthin*, an adjective ſignifying earthy, or approaching to the nature of earth; a term applied to many medicines of this kind.

THINA, in botany, a name by which ſome authors have called the larix or larch tree. *Ger.* Emac. Ind. 2.

THIRD (*Cycl.*)—THIRD *Major*. The logarithm, or meaſure [a] of the octave $\frac{2}{1}$ being 1.000000, the meaſure of the greater *Third* $\frac{5}{4}$ will be, 0.321928. [b]—[[a] See INTERVAL. [b] *Euler*. Tentam. Nov. Theor. Muſ. p. 109.]

The *third major* is by practitioners often taken for the *third* part of an octave; but this is a great error, ſince three greater *Thirds* fall ſhort of the octave by a dieſis: For $\frac{5}{4} \times \frac{5}{4} \times \frac{5}{4} \times \frac{128}{125} = \frac{2}{1}$; or by logarithms $3 \times 0.321928 +$ log. dieſis $= 0.965784 + 0.034215 = 0.999999$ or 1.000000 the logarithm of the octave. See the article DIESIS.

THIRD *Minor*. The logarithm or meaſure of the octave $\frac{2}{1}$ being 1.000000, the meaſure of the *third minor* $\frac{6}{5}$ will be 0.263034. Hence it appears that four leſſer *Thirds* exceed the octave. But practical muſicians are apt to ſuppoſe them equal to the octave, as they are apt to confound three greater *Thirds* with that interval. Three leſſer *Thirds* exceed the octave by a dieſis and a comma; as is eaſily proved by logarithms. *Euler*. Tent. Nov. Theor. Muſ. p. 109. See the article INTERVAL.

Diminiſhed THIRD, in muſic. We meet with ſeveral kinds of *Thirds* in the writings of muſicians, as greater and leſs, commonly called ſharp and flat; diminiſhed, ſuperfluous, deficient, and redundant. See the articles INTERVAL, DEFICIENT, REDUNDANT, *&c.*

THIRST (*Cycl.*)—It is ſaid, that thoſe who travel through the ſcorching deſarts of Arabia, Perſia, *&c.* find that brandy, and the ſtrongeſt wines, quench their *Thirſt* beſt. *Boyle*, Works abr. vol. 1. p. 52.

THISMA, a name uſed by ſome for any ſubterranean vein, or bed of a mineral.

THISTLE, *Carduus*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the floſculous kind, being compoſed of ſeveral floſcules, which, at the upper end, are divided into ſegments, and ſtand upon the embryo ſeed. The general cup which contains theſe floſcules is of a prickly ſtructure; and the embryos finally become ſeeds winged with down. See Tab. 1. of BOTANY, Claſs 12.

The ſpecies of *Thiſtle*, enumerated by Mr. Tournefort, are theſe: 1. The calcitrapa, or ſtarry-headed *Thiſtle*. 2. The ſtarry-headed *Thiſtle*, with deep purple flowers. 3. The ſtarry-headed *Thiſtle*, with bright red flowers. 4. The ſtarry-headed *Thiſtle* with white flowers. 5. The ſtarry-headed *Thiſtle*, with broad jagged leaves, and large flowers. 6. The ſtarry-headed *Thiſtle*, with whole leaves ſerrated at the edges. 7. The yellow-flowered ſtarry-headed *Thiſtle*, with leaves like the blue-bottle or cyanus. 8. The yellow-flowered ſtarry-headed *Thiſtle*, with leſs ſcaly or prickly heads. 9. The ſtarry-headed *Thiſtle* with undivided leaves, and purple flowers. 10. The aſſes *Thiſtle*, with ſmall heads, or the common wild *Thiſtle*. 11. The broad-leaved ſpear-*Thiſtle*. 12. The white-flowered broad-leaved ſpear-*Thiſtle*. 13. The very large and tall exotic ſpear-*Thiſtle*. 14. The very prickly *Thiſtle*, with alated and prickly ſtalks. 15. The purple-flowered *Thiſtle* with a bending head. 16. The white-flowered *Thiſtle* with a bending head. 17. The bear's-breech *Thiſtle*. 18. The common ladies *Thiſtle*, or milk *Thiſtle*. 19. The ladies *Thiſtle* with no white variegations. 20. The eryngo-like *Thiſtle* with prickly heads. 21. The great exotic milk *Thiſtle*, with brown ſeeds. 22. The galactite *Thiſtle* of John Bauhine. 23. The galactite *Thiſtle* with white flowers. 24. The common woolly *Thiſtle*, with acanthus-leaves. 25. The white-flowered woolly *Thiſtle* with acanthus-leaves. 26. The woolly acanthus-*Thiſtle* with narrower leaves. 27. The white-flowered woolly narrower-leaved acanthus-*Thiſtle*. 28. The very tall acanthus-leaved Portugal woolly *Thiſtle*. 29. The Portugal acanthus-leaved woolly *Thiſtle*. 30. The great-flowered Aleppo woolly *Thiſtle*, with acanthus-leaves. 31. The purple *Thiſtle* with round woolly heads,

32. The white-flowered *Thiſtle* with round woolly heads. 33. The Pyrenean woolly *Thiſtle*, with glomerated purple flowers. 34. The common *Carduus* or polycantha. 35. The Spaniſh polycanthus, with very ſhort leaves, armed with very long prickles. 36. The yellow centaury-like corn *Thiſtle*. This has been called by many, the yellow *knapweed* with prickly heads. 37. The hoary ſea-*Thiſtle*, with very tall ſtalks. 38. The hoary cretic *Thiſtle*, with a yellowiſh purple flower. 39. The hoary Portugal-*Thiſtle*, with alated ſtalks, and woolly heads. 40. The prickly round-headed *Thiſtle*, called by ſome the globular-headed jacea. 41. The ſuccory leaved purple Spaniſh *Thiſtle*. 42. The hairy jagged-leaved *Thiſtle*, with white flowers. 43. The powdered or duſty *Thiſtle*. 44. The knapweed-leaved *Thiſtle*, with ſmall heads and three-pointed ſcales. 45. The rockett-leaved Malteſe *Thiſtle*, with yellow flowers. 46. The Malteſe *Thiſtle*, with conglobated heads. 47. The Portugal-*Thiſtle*, with large hairy coronopus leaves, and yellow flowers. 48. The Portugal-*Thiſtle*, with hairy, rigid, coronopus-leaves, and ſaffron-coloured flowers. 49. The yellow Portugal-*Thiſtle*, with ſmooth and rigid coronopus-leaves. 50. The rape-leaved cretic *Thiſtle*, called by ſome the prickly *cyanus*, and prickly *knapweed* of Crete. *Tourn.* Inſt. p. 440. ſeq.

Gentle THISTLE, *Cirſium*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the floſculous kind, being compoſed of a number of oblong floſcules, divided into many ſegments at their edges, and placed on the embryo ſeeds. Theſe are all contained in a ſcaly but not prickly cup; and the embryos finally become ſeeds winged with down; to this it is to be added, that the leaves are ſurrounded with ſoft prickles. The diſtinguiſhing characters of the *Cirſium* and jacea are therefore theſe: The *Cirſium* has prickly leaves, and not prickly cups, and the jacea has no thorns either on the leaves or cups.

The ſpecies of *Cirſium*, enumerated by Mr. Tournefort, are theſe: 1. The great *Cirſium* with aſphodel-roots. 2. The great *Cirſium*, with a large ſingle head, and purple ſtamina. 3. The great *Cirſium*, with a large ſingle head, and white ſtamina. 4. The great *Cirſium*, with a ſingle large head, and hoary divided leaves. 5. The great *Cirſium*, with a ſingle large head, and with green ſmooth leaves much divided. 6. The hoary large *Cirſium*, with ſingle heads, with large ſcales. 7. The *Cirſium* with ſmall ſingle heads. 8. The *Cirſium* with ſmooth leaves and compact flowers. 9. The *Cirſium* with narrow and undivided leaves. 10. The common narrow-leaved *Cirſium*. 11. The broad-leaved meadow *Cirſium*, with aſphodel-roots. 12. The aſphodel-rooted meadow *Cirſium*, with finely divided leaves. 13. The purple-flowered *Cirſium*, without a ſtalk. 14. The ſilver-ſpotted *Cirſium*. 15. The purple-flowered field-*Cirſium*, with creeping roots, and ſow-thiſtle leaves. 16. The white-flowered field-*Cirſium*, with creeping roots, and ſow-thiſtle leaves. 17. The creeping-rooted ſow-thiſtle-leaved field-*Cirſium*, with tuberous ſtalks. 18. The common many-headed meadow *Cirſium*. 19. The broad-leaved *Cirſium*, with burdock heads. 20. The low narrow-leaved *Cirſium*. 21. The mercury-leaved alpine *Cirſium*. 22. The *Cirſium* with very large leaves, of the ſhape of thoſe of the ſerratula. 23. The many-headed *Cirſium*, with a winged ſtalk, and ſinuous leaves. 24. The alpine *Cirſium*, with leſs divided leaves, armed with very frequent and long prickles. 25. The three-headed alpine *Cirſium*. 26. The purple-flowered acanthoide alpine *Cirſium*. 27. The acanthoide mountain *Cirſium*, with yellow flowers. 28. The many-headed meadow alpine *Cirſium*, with aſphodel-roots. 29. The many-headed alpine *Cirſium*, with ſmall purple flowers, and prickly ſtalks. 30. The tall Pyrenean *Cirſium*. 31. The oriental *Cirſium*, with jagged leaves. *Tourn.* Inſt. p. 447.

Torch-THISTLE. See the article TORCH.

Globe-THISTLE. See the article ECHINOPUS.

THISTLE *Fly*, in natural hiſtory, a ſmall fly produced from a fly-worm, hatching in the protuberances of the carduus hæmorrhoidalis. In the protuberances of this *Thiſtle*, while they are cloſed in all parts, the worm of this fly, from whoſe injuring it, at the time of depoſiting the egg from which it was hatched, the protuberances aroſe, undergoes its laſt transformation. It here makes of its own ſkin a ſhell, in form of an egg, within which it puts on the nymph ſtate. When this nymph becomes a living fly, the leaſt part of its difficulty is the finding its way out of this ſhell; it has a much ſtronger priſon than that, and before it can obtain its liberty, muſt force its way through the much more cloſely compacted fibres of the protuberance of the vegetable. It has, however, no other means of doing this difficult work, but that of inflating its head, and throwing out the bladder or muzzle with which all theſe creatures are provided in this ſtate. See the articles NYMPH, MUSEAU, and THISTLE-*Galls*, infra.

This is a difficult operation, and many of the creatures periſh in the attempt; but what much forwards the ſucceſs of it, in many caſes, is, that the ſtalk of the *Thiſtle* often becomes naturally half rotten before the time of the fly's egreſs. *Reaumur*, Hiſt. Inſ. vol. 4. p. 338.

THISTLE-*Galls*, a name given by the more accurate authors to the protuberances on the ſtalks of a ſpecies of *Thiſtle*, called by authors, *carduus hæmorrhoidalis*, from theſe tubercles, which are ſuppoſed to reſemble thoſe of the hæmorrhoidal veins, in perſons ſubject to the piles. Theſe have been ſuppoſed a natural production of the plant; but they are far otherwiſe. The whole hiſtory of them is, that the juices of this plant, being peculiarly agreeable to the worms of a certain ſpecies of fly, that creature always depoſits its eggs on the ſtalks; and the young ones, when hatched, gnaw their way into the ſubſtance of the ſtalk, and the copious derivation of the juice, occaſioned by their ſucking, produces the turbercles which are found on it. See Tab. of Inſects, N°. 28.

Theſe tubercles are of a roundiſh or oblong figure, and are of various ſizes, from that of a pea to the bigneſs of a nutmeg; they are much harder than the reſt of the ſtalk, approaching to a woody ſtructure; when cut open, they are found to contain each ſeveral oblong and narrow cells; theſe have no communication with one another, and are each inhabited by a ſmall white worm, which has two hooks at the head; with theſe it breaks the fibres of the plant, in order to get at its juices. When it has arrived at the time of its change into the nymph ſtate, it ceaſes to eat, and drawing up its body much ſhorter than uſual, its ſkin hardens, and forms a ſhell, under which it changes into a very beautiful two-winged fly.

The wings of this animal are of a very ſingular appearance; they are whitiſh and tranſparent in the middle, but ſurrounded at the edges with a border of black in the form of a chain of figures like the letter Z. When the fly is ſeen in ſome lights, the white parts of the wing is loſt, and the whole appears a circle of theſe notched figures.

The body and breaſt of this fly are of a beautiful black, with ſome ſlight variegations of yellow; and the ſhoulders are elegantly ſtreaked with the laſt colour. The anterior part of the head is white, which gives the creature a very ſingular appearance, and its back part is edged with a fine yellow down or hairyneſs. The antennæ are reddiſh; and the legs are in part black, and in part of a fine clear brown. In obſerving the changes of the worms of theſe galls, there are often obſerved ſome which go through them in a different manner from the reſt, and finally produce a very different ſpecies of fly. Theſe are the progeny of the eggs of ſome other ſpecies of fly, whoſe worm being carnivorous, is lodged by the art of its parent, while it is yet in the egg ſtate in the ſubſtance of this gall, there to prey upon the defenceleſs inhabitants.

There are many other ſpecies of galls, the inhabitants of which are expoſed to the ſame ſort of enemies. In thoſe it is common to find the proper inhabitant and the devourer in the ſame cell; the one feeding on the juices of the plant, the other on its juices; but this is not the caſe here, theſe worms immediately deſtroying the proper inhabitants, and being found always alone in their cells. *Reaumur*, Hiſt. Inſ. vol. 6. p. 221.

THLASIAS, a term uſed by the antients to expreſs an eunuch made by a compreſſion or contuſion of the teſticles, not by the cutting them out.

THLASIS, a word uſed by the antients to expreſs either a contuſion without a wound, or a wound made by ſome blunt inſtrument, which contuſed the parts.

THLASMA, a word ſometimes uſed like *thlaſis*, to expreſs a contuſion either with or without a wound; ſometimes applied particularly to a receſs of the cranium inward without a fracture, an accident principally affecting children.

THLASPEOS *Semen*, in the materia medica, the name of a ſeed produced by the common *thlaſpi arvenſe ſiliquis latis*, or common treacle muſtard. See the article THLASPI, infr.

It is a plant of about eight inches high; the leaves are broad and oblong, and the flowers are white, and each compoſed of four leaves. The ſeed-veſſels are broad and flat, and the ſeeds ſmall and dark coloured. It grows wild in England, but is not very common.

The ſeed ſhould be choſen clean and freſh, of a reddiſh caſt, and very ſharp, and biting on the tongue. Great care ſhould be taken in the buying this ſeed, becauſe it is often adulterated, and the ſeeds of common garden creſſes are too frequently ſold in its place. It is an ingredient in ſeveral of our ſhop compoſitions, and is eſteemed attenuating, deterſive and aperient, and is ſaid to promote urine, and the menſes, and to expel the after-birth. *Lemery*, Dict. of Drugs.

THLASPI, *Treacle Muſtard*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of four leaves, and is of the cruciform kind. The piſtil ariſes from the cup, and finally becomes a roundiſh fruit, of a flatted ſhape, and uſually terminated all round with a foliaceous edge ſplit at the extremity, and divided by an intermediate membrane into two cells, which uſually contain a number of flat ſeeds. To theſe marks it is to be added, that all the *Thlaſpis* have whole, not divided leaves, in which they evidently differ from the *naſturtium*, or creſs kind.

The ſpecies of *Thlaſpi*, enumerated by Mr. Tournefort, are theſe: 1. The common *Thlaſpi*. 2. The ſmaller hoary-leaved *Thlaſpi*. 3. The field-*Thlaſpi* with broad pods. 4. The hairy podded *Thlaſpi*. 5. The *Thlaſpi* with heart-faſhioned pods. 6. The *ſecrodo-Thlaſpi*, or *Thlaſpi* ſmelling ſtrongly of garlick. 7. The larger perfoliated field-*Thlaſpi*. 8. The ſmaller perfoliated field-*Thlaſpi*. 9. The little red-flowered rock-*Thlaſpi*. 10. The purple-flowered

alpine *Thlaſpi*, with round fleſhy leaves. 11. The little Portugal ſcurvygraſs-leaved *Thlaſpi*. 12. The little alpine *Thlaſpi*, with thick narrow leaves. 13. The *Thlaſpi* called the roſe of Jericho. 14. The Virginian *Thlaſpi*, with leaves like the Iberis, but broader and ſerrated at the edges. 15. The ever-green mountain-*Thlaſpi*. 16. The candy-*Thlaſpi*, with red and white flowers. 17. The bitter umbellated field-*Thlaſpi*. 18. The leſſer umbellated candy-*Thlaſpi*, with white umbellated flowers of a ſweet ſcent. 19. The graſſy-leaved purple-flowered umbellated Portugal-*Thlaſpi*. 20. The graſſy-leaved umbellated Portugal-*Thlaſpi*, with white flowers. 21. The rock-*Thlaſpi*, with vermiculated leaves. *Tourn.* Inſt. p. 212. See the article THLASPEOS *Semen*, *ſupra*.

THLASPIDIUM, in botany, the name of a genus of plants; the characters of which are theſe. The flower conſiſts of four leaves, and is of the cruciform kind. The piſtil ariſes from the cup, and finally becomes a ſort of double fruit, flat, and compoſed of two parts ſeparated one from the other by an intermediate membrane, and each containing uſually one long-ſhaped flatted ſeed.

The ſpecies of *Thlaſpidium*, enumerated by Mr. Tournefort, are theſe: 1. The French *Thlaſpidium*, with hairy leaves like thoſe of hawkweed. 2. The hairy *Thlaſpidium*, with auriculated flower-cups. 3. The pale yellow-flowered annual *Thlaſpidium*. 4. The reddiſh-leaved *Thlaſpidium*. 5. The ever-flowering ſhrubby *Thlaſpidium*, with leucoium leaves. 6. The ever-flowering ſhrubby *Thlaſpidium*, with variegated leaves. 7. The alkanet-leaved *Thlaſpidium*. 8. The ſpiked Italian *Thlaſpidium*. 9. The narrow-leaved ſmooth mountain-*Thlaſpidium*. 10. The dwarf alpine rough *Thlaſpidium*. *Tourn.* Inſt. p. 214.

THLIBIÆ, in antiquity, a kind of eunuchs. See the article CASTRATION.

THOCOS, Θῶκος, in antiquity, the ſame with *Thacas*. See the article THACAS.

THOKES, in our old writers, fiſh with broken bellies, forbid by ſtatute to be mixed or packed with *Tale-fiſh*. 22 Ed. IV. c. 2. *Blount*, *Cowel*.

THORACIS *Primus*, in anatomy, a name given by many of the anatomical writers to the muſcle called by the French the *Souclavier*. See the article SUBCLAVIUS.

THORACIS *Quartus*, in anatomy, a name given by many of the earlier writers to a muſcle called by the modern writers *ſerratus porticus inferior*. The ſame authors gave the name of *tertius Thoracis* to the *ſerratus poſticus ſuperior*.

THORÆ *Radix*, in the materia medica, the name of a root which keeps its place in the catalogues of officinal ſimples, but is ſeldom uſed.

The plant which produces it is the *Thora valdenſis* of Gerard. It is kept in the gardens of the curious, but grows wild in the mountainous parts of Germany. The root is compoſed of a number of granules or ſmall lumps, like that of the common ranunculus; the leaves are roundiſh and ſtand on ſmall pedicles, and the ſtalks are about ſix inches high, and the flowers yellow, and like thoſe of our common wild ranunculus's.

The root is acrid and corroſive, and the juice of the leaves is ſaid to poiſon animals, and to have been uſed by the antients for that purpoſe. *Pomet*'s Hiſt. of Drugs, p. 41.

THORAX (*Cycl.*) —Dr. Hoadley thinks it proved from Mr. Hales's experiments, in his vegetable ſtatics and hæmaſtatics, that there is air in the cavity of the *Thorax*, between the lungs and the pleura. See his Lectures on Reſpiration.

Abſceſſes in the THORAX, or breaſt. One of the moſt remarkable accounts we have ever had of the effects of an abſceſs in the *breaſt*, is from Mr. Chicoyneau, of the academy of Montpelier, given in the Memoirs of the Academy of Sciences of Paris, in 1731.

The caſe was this: A young lady of about nine years old, of a thin habit, a ſprightly temper, and dry conſtitution, ſeemed to be growing crooked, both her ſhoulders but particularly the left were more raiſed than they naturally ſhould be, and her whole body became ſomewhat more bent than uſual toward the right ſide. Mr. Chicoyneau was ſent for at this time, to know whether any ſtop could be put to the progreſs of this bad arrangement of the parts. On examining the lady it was found, that though ſhe was naturally lean, yet there was a fullneſs all about her ſhoulders, and that the edges of the ſhoulder blades toward the ſpine were ſo elevated as to have between them and the ribs a ſpace of two fingers breadth wide; and the ſpine of the back, inſtead of running down in a perpendicular line was crooked, and from the fourth vertebra downwards was puſhed out of its natural ſituation; this bending continued down to the loins, and formed a ſort of arch, the convexity of which was toward the left-ſide, and was ſo ſenſible a little below the ſhoulder-blade, that it ſeemed two fingers breadth out of its place. It ſeemed from this that the conſequences muſt be very bad, and that the young lady would inevitably fall into a terrible deformity, which neither art nor nature could prevent, and that the organs of reſpiration would be greatly injured, as is commonly the caſe in theſe bad arrangements of the parts.

Mr. Chicoyneau took his leave with giving her parents ſome flattering hopes that nature might reſtore the parts in their farther growth, as children whoſe bones are diſordered by rickets often have them right again in more advanced years, and was intending to preſcribe a ſlight regimen; when, about five days afterwards he was again called in on account of a fever which attacked the young lady with great violence, and was always worſt during the night, going off by gentle ſweating toward the morning; on thoroughly enquiring into the ſymptoms this appeared to be a putrid fever, and, beſide all the other ſymptoms of that diſeaſe, the patient had a conſtant and terrible pain in her ſhoulders, and with this a very troubleſome dry cough, and a difficulty of reſpiration, whence it appeared too plainly, that either the lungs or the pleura were threatened with an inflammatory fluxion: After twenty days the fever began to abate, but ſtill did not quite leave her; and it was not long after when all the ſigns of an internal ſuppuration appeared, and Mr. Chicoyneau dreaded an incurable phthiſis. The pulſe after this grew much worſe, and was very irregular; and two other phyſicians being called in, all agreed that the child had but few days to live, ordered only ſome gentle cordials, and acquainted the parents with the danger. When all hopes were over, the nurſes acquainted the doctors on one of their viſits, that ſince their laſt the patient had diſcharged by ſtool at ſeveral times a very large quantity of a white viſcid matter, reſembling pus; and that before every one of theſe evacuations the young patient had great irritations, and violent pains in the belly.

Nature had not given the patient over, though her doctors had, and ſoon ſhewed that ſhe could do what baffled the efforts of art. The matter voided was found, on examination, to be true pus, with a very ſmall mixture of blood, the voiding it by ſtool continued many days with the ſame frequency and violence, and the fever and other ſymptoms all going off at this time by regular degrees, the diſcharge was ſoon found to be critical, and there were ſome hopes of nature's performing a cure by it.

The diſcharge continued about twelve days, and at the end of a little longer time the patient was perfectly recovered. There is no doubt, from the cough and all the ſymptoms, that this matter was contained in the breaſt, and though it has appeared incredible to many, that matter thus formed ſhould be taken up into the blood-veſſels and carried in the courſe of circulation to the inteſtines, and there diſcharged, yet this caſe ſeems an inconteſtible proof of the poſſibility of it.

There remained now no danger to the patient, but that of the increaſe of her deformity by the progreſs of the diſplacing of the ſpine, and other bones, as there was all the reaſon in the world to believe, that during the time of this long and terrible illneſs theſe parts had grown much worſe; but, on inſpection, nature was found here to have been as good a phyſician as in the other caſe; and, to the amazement of all that were preſent, the bones were all found in their natural places.

It was eaſy to ſee from this, that the diſplacing of the bones had been wholly owing to this tumor within the breaſt, the inflammation and ſuppuration of which had occaſioned all the illneſs the patient had endured. The tumor was doubtleſs formed in the poſterior region of the *Thorax*, whence it enlarged itſelf afterwards, extending to the neighbouring parts, and as to this alone was owing the cauſe of the diſplacing the bones, it is no wonder that when this cauſe no longer ſubſiſted, they again reaſſumed their places. Mem. Acad. Scienc. 1731.

Mr. le Dran remarks, that whenever any conſiderable quantity of pus is contained in either cavity of the *Thorax*, that ſide will appear larger than the other. Med. Eſſ. Edinb.

Wounds of the THORAX. The wounds of the *Thorax* or breaſt, are of three kinds; either the wound is inflicted on the external parts only, or it penetrates into the cavity of the breaſt; or thirdly, the contents of the *Thorax* partake alſo of the wound.

It may be diſcovered whether wounds do or do not penetrate into the cavity of the *Thorax*, either by the ſight or by the hearing, obſerving whether any ſound proceeds from the wound at the time of inſpiration, by feeling with the probe or a finger, and obſerving whether they paſs into the cavity, or meet with any reſiſtance, by injecting warm water, which if the wound does not penetrate will return ſtrongly upon you; and laſtly, you will be convinced that it does not by the abſence of bad ſymptoms, ſuch as difficulty of breathing, fainting and ſick fits, which always attend a wound that penetrates into this cavity. If the wound is found not to penetrate, it is to be treated as a common ſlight wound. But ſometimes an external wound of this kind runs very deep, and obliquely between the muſcles and the ribs, and is thereby rendered very difficult to be cleanſed from grumous blood and matter; and the matter in this caſe frequently deſtroys the neighbouring parts, and produces ulcers, and very dangerous or incurable fiſtulæ; nay, ſometimes it makes its way through the pleura, into the cavity of the *Thorax*, and forms an empyema, or brings on a phthiſis, and death itſelf.

The great buſineſs in this caſe is to clear the ſinuſes from the blood and matter confined in them; and this is to be done either by preſſure, or by ordering the wound to be ſucked by

a healthy perſon, or by drawing it out with a ſyphon, or making farther openings with a knife. A proper ſyringe with its mouth applied to the wound, and a ſtrong ſuction made, often will fill itſelf with the confined blood and matter, and by repeating the operation prove of very ſignal ſervice.

In wounds that penetrate into the cavity, when a large quantity of blood is ſpilt into the cavity of the *Thorax*, the expanſion of the lungs, the office of reſpiration, and the courſe of the blood through the lungs are impeded, and the blood in the lungs being inſpiſſated by frequently being retarded there, life cannot be ſupported; but where the quantity of extravaſated blood is not ſo large as to occaſion theſe accidents, there ſtill is danger that it ſhould putrify by degrees, and corrupt either the diaphragm, pleura, or lungs, which muſt occaſion very bad ſymptoms, and finally death itſelf, and that in a ſhort time. When blood is extravaſated in the *Thorax*, we muſt therefore uſe all diligence to get it away. If the wound is inflicted on the middle or lower part of the *Thorax*, and has not a very narrow opening, it will be convenient to lay the patient upon the wounded ſide, and adviſe him to fetch his breath deep, or cough; and if the diſcharge is hindered by lumps of grumous blood ſtopping up the orifice, they muſt be removed with a probe, or with the fingers, or drawn out with a ſyringe. If the blood is become too thick to flow out of the wound, an injection of barley-water with the addition of a little honey of roſes and a ſmall quantity of ſoap muſt be uſed; this is to be injected, and the patient made afterwards to lie on the wounded ſide, and to let it run out again; and this muſt be repeated, till it appears that all the grumous blood is waſhed away. But if the wound is ſo narrow and oblique that this method cannot be uſed, it muſt be enlarged with the inciſion-knife. Great caution is to be obſerved not to fatigue the patient too much, by attempting to diſcharge all the extravaſated blood at one time. It will be more ſafe to do it by intervals, at different times, eſpecially if he be ſubject to ſwoonings; but the wound muſt be kept open in the mean time, by introducing a ſilver or leaden pipe into it, or at leaſt a large tent with a ſtring faſtened to it. This method of cleanſing the cavity of the *Thorax* is to be repeated, till the diſcharge ſhall entirely ceaſe, and the external wound can be conveniently healed.

When a wound is made in the upper part of the breaſt, the patients lying on the wounded ſide cannot at all let out the matter in the cavity; but an opening muſt be made in the lower part of the *Thorax*, between the ſecond and third rib, counting upwards, if it is on the left ſide; but if it is on the the right ſide then between the third and fourth rib, about a hand's breadth from the ſpine. The place where the opening is to be made ſhould be firſt marked with ink, and the inſtrument generally uſed to make it is the *trocar*, which muſt be driven above the rib into the *Thorax* with great caution, and gentleneſs; after it has penetrated, the ſteel inſtrument is to be drawn out, and the pipe left in as a paſſage for the extravaſated blood to be let out by; and if it does not readily make its way out by this, its evacuation may be forwarded by the ſuction of a ſyringe. The trochar is in common uſe on this occaſion; but as the lungs are very liable to be wounded by the paſſing of this inſtrument forcibly into the cavity of the *Thorax*, it is better to divide the common integuments with an inciſion-knife, as alſo the muſcles and pleura, carefully avoiding the lungs, which are very apt to adhere to the pleura in this part; when this perforation is properly made, it is carefully to be kept open as long as neceſſary, and the wound above to be healed up as ſoon as poſſible.

The cavity of the *Thorax* being thus cleanſed, the wound is to be dreſſed once every day, and the dreſſing performed with all poſſible expedition; and the utmoſt diligence uſed to guard the contents of the *Thorax* from the injuries of the external air. *Heiſter*'s Surg. p. 70.

THOS, Θως, in zoology, a name given to an animal of the wolf kind, but larger than the common wolf. It never touches men or cattle, and rather provides its food by cunning than open force; preying chiefly on poultry and water-fowl. *Hofm.* Lex. univ. in voc.

THOUGHTS, in a boat, a name given by ſeamen to the benches, on which the men ſit down to row.

THOWLES, in a boat, are thoſe pins in its gunnel, between which the men put their oars when they row.

THRACIA *Gemma*, a ſtone mentioned by Pliny, and deſcribed by him to be of three kinds; the one of a plain green, but a conſiderably deep and ſtrong colour, the other of a paler green without variegation, and the third ſpotted with blood-coloured ſpots. This is a ſhort deſcription, but the ſtone ſeems to have been a jaſper, of the nature of our green oriental jaſper and heliotrope.

THRACIUS *Lapis*, in the natural hiſtory of the antients, a ſtone often mentioned, and firſt called *benæ lapis*, from the place where it was firſt found, which was in the neighbourhood of Bina, or Bena, a town in Thrace.

It has been by ſome authors allowed a place in the catalogues of the materia medica; but it is impoſſible for us to ſay with any certainty which of ſeveral ſubſtances now known (which all anſwer in ſome degree to the accounts left us of it) is the real body they meant by that name.

It was an inflammable body, found in mines, and in the beds of rivers; and, in burning, afforded a very offenſive ſmell. Some of the late authors have ſuppoſed it was our common pit-coal, the antients expreſſed by this name; others, that it was jet; and others, the common cannel coal. *Hill*'s Theophraſtus, p. 34.

THRANITÆ, in the Roman trireme gallies, or thoſe which had three rows of rowers; thoſe of the upper row were called by this name, the ſecond the *Zygitæ*, and the loweſt *Thalamitæ*.

The *Zygitæ*, or middle row of men, in theſe veſſels took up but very little room, having a conveniency of moving their hands and oars under the ſeats of thoſe who ſat next before them.

Meibom, in his diſcourſe of the naval architecture of the antients, has proved that the builders of theſe veſſels found much better places for the ſeveral tires of rowers, than the commentators on the works of the authors who mention them have done; and that hence the vaſt height ſuppoſed neceſſary in theſe veſſels is much of it imaginary, and that the teſſaraconteris of Philopater, a veſſel ſaid to have forty tire of oars, may have been built and managed, though requiring four thouſand men to row it.

This author is of opinion, that according to the plan he has given of the Roman naval architecture, we might very much improve our own gallies and galleaſſes. He acknowledges our form indeed to be preferable in general to theirs; but would have the ſame proportions kept up by us that were by them in their long veſſels. *Meibom.* de Trirem.

THRASOS, a term uſed by Hippocrates, to expreſs a wildneſs and fierceneſs in the eyes of perſons, who approach to a delirium in fevers.

THRAUPIS, in zoology, the name given by many authors to the bird more commonly called *citrinella*; a ſmall bird of the ſize of a linnet, kept in cages in Italy for its ſinging, and of a green, yellow, and grey colour. See the article CITRINELLA.

THRAUSMA, a name given by the antients to a kind of gum ammoniacum, which was drier than the common, and more eaſily crumbled to pieces.

THRAUSTOMICTHES, in natural hiſtory, the name of a genus of compound earths. The word is derived from the Greek θραυστος, brittle, and μικθεις, mixt.

The bodies of this genus are loams compoſed of ſand and a leſs viſcid clay, and are therefore of a friable or crumbly texture.

The earths of this genus are generally uſed to make bricks; and there are ſeveral ſpecies of them. 1. A whitiſh one, dug in great plenty in Staffordſhire, and ſome other counties. 2. A brownish white one very plentiful about London. 3. A pale yellow one, common in moſt parts of England at ſmall depths. 4. A ſharp rough one, of a deep yellow, dug near the town of Hedgerley near Windſor, and commonly called Windſor loame: It is not found in any other place, and is of great value; it makes the bricks uſed for the iron furnaces, and ſerves at the glaſs-houſes and among the chemiſts as a very ſtrong and valuable lute; and is not only uſed in England, but carried to Holland and Germany, and many other parts of the world. 5. A deep duſky yellow one, dug in moſt parts of England, near the ſurface. 6. A hard brown one, found at ſome depth in Buckinghamſhire, and uſually found full of ſmall ſhells: It is uſed for covering the ridges of barns, and copings of walls; and makes very firm and durable barn-floors. 7. A light pale brown one, the looſeſt and moſt friable of all the genera, uſed in many places for making the bell-founders moulds. 8. A yellowiſh brown one: This is common in moſt parts of the kingdom, and makes the fine red bricks uſed for ornamenting buildings. *Hill*'s Hiſt. of Foſſ. p. 424.

THREAD (*Cycl.*)—The *Thread* of the Laplanders is very fine, white and ſtrong, but it is of a very different nature from ours; they know nothing of flax or hemp, nor of any other plant whoſe ſtalks might ſupply the place of theſe in making *Thread*, but theirs is made of the ſinews of the rain-deer. They kill of theſe animals a very great number continually, partly for food, partly for the ſkins which they uſe in cloathing themſelves, covering their huts, and on many other occaſions; the ſinews of all that they kill are very carefully preſerved, and delivered to the women, whoſe province it is to prepare this neceſſary matter. They beat the ſinews very well, after having ſteeped them a long time in water, and then they ſpin them out.

The *Thread* they thus make is of any degree of fineneſs they pleaſe; but it never is any longer than the ſinew from which it is made. They uſe this in ſowing their cloaths, ſhoes, gloves, &c. and the trappings of their rain-deer. The *Threads* of the ſame ſinew are laid up together, and are all of a length; and as the different ſinews afford them of very different lengths, they accordingly pick out ſuch as the preſent uſe requires, both in regard to length and fineneſs. This ſort of thread is made with much more labour than ours; but it is greatly ſuperior to it on many occaſions, where ſtrength is rather required than beauty.

Theſe people have, beſides this, a way of making a ſort of yarn

yarn of ſheeps wool, which they weave into garters and a ſort of ribbands, uſed by way of ornament; but they place no value on it, becauſe of its want of ſtrength. *Scheffer*'s Hiſt. Lapland.

Air-THREADS, a term uſed by ſome to expreſs thoſe fine long white filaments or thready ſubſtances, which we meet with in vaſt numbers floating about in the air, in Auguſt and September.

The world has been much perplexed about the generation of theſe, till it was known that they were the work of ſpiders, and that they ſerved theſe creatures to move from place to place by. They are long, downy, and very ſoft, and though they hold together when untouched, they ſtick to the fingers in handling, and eaſily break with a ſlight touch.

The greater number of ſpiders have the property of ſpinning this ſort of *Thread*. The long-legged field-ſpider, called the *ſhepherd*, and ſome others, want it; theſe have nothing to do with the *Air-threads*, ſo much wondered at; but all the others, that is, all thoſe which nature has endowed with a power of ſpinning, make them.

The general method of theſe creatures ſpinning and weaving their webs, is by letting down the thread and then drawing it after them, and ſo diſpoſing it as they think proper; but in the midſt of their work of this ſort, if they are cloſely obſerved, they will be ſometimes found to deſiſt, and turning the tail to the contrary way of the wind they will emit a thread with great violence, no leſs than that with which a jet of water is diſcharged from a cock. In this manner they continue darting forth the thread, which the wind takes, and carrying it forward it ſoon becomes many yards long. Soon after this the creature will throw herſelf off from the web, and truſting herſelf to the air with this long tail, will aſcend ſwiftly, and to a great height with it. The fragments of theſe lines, or the whole lines, and the ſpiders attached to them though unobſerved, make theſe *Air-threads*, and the uſe nature deſtines them for, is evidently the wafting the creature along the air, and giving it an opportunity of preying on gnats, and many other inſects that inhabit the air, out of the reach of theſe creatures by any other means.

The young ſpiders, as well as the old ones, have this property of ſpinning *Threads*, and ſailing in the air by means of them; and it is common to ſee very minute ſpiders at the ends of very long lines. No one particular kind is famous more than the reſt for this practice, but all that can ſpin, at the proper ſeaſon of the year do it.

The threads themſelves ſhew the uſe they are of to the creature in ſeizing its prey; for they, as well as the webs below, are uſually found filled with the fragments of devoured animals, the legs of flies, and the like.

When the *Threads* are newly ſpun, they are always ſingle, and are generally ſeen aſcending up higher and higher in the air; but when they are ſeen coming down, they are found ſometimes compoſed of three or four others, and either without any ſpider at the ends, or with two or three or more. It is plain that this happens from the meeting of theſe threads one with another in the air, and their tangling together; and this incommodes the creatures, and brings them down.

The whole proceſs of the workmanſhip of theſe threads is eaſily ſeen, by obſerving ſome of the ſpiders which have not yet mounted into the air, but ſeem to be meditating their flight. It is common to ſee one of theſe creatures at ſuch a time mount the top-moſt branch of a buſh, and from thence dart out at its tail one after another ſeveral of theſe long *Threads*, by way of aſſaying what it can do, and how it ſhall like them. When the creature has darted out a thread to the length of ſeveral yards, it will of a ſudden draw it all up again, and wind it up into a link with its fore-feet; but more frequently they break it off, and let it go. One ſpider will ſometimes dart out, and break off in this manner a great number of *Threads*, before it ſpins one that it will truſt to; but at length it will pleaſe itſelf with ſome one, and commit itſelf to the air on it.

Theſe broken *Threads* are what fill the air with the looſe threads we ſee in autumn; and as theſe ſoon entangle together, and bring one another down, it is no wonder that they are more frequent in the lower regions of the air, than thoſe with the ſpiders adhering to them, which uſually riſe to great heights, and ſuſtain themſelves there. And hence the origin of the *Threads* was much perplexed among the enquirers, becauſe they were found without any mark of the animal to which they owed their exiſtence. The buſineſs of feeding is not all the uſe of theſe *Threads*, but the creatures evidently ſport and entertain themſelves by means of them, floating about in the air, and changing height and place at pleaſure.

When a ſpider has once raiſed itſelf from the earth in this manner, it does not deſcend always on the ſame *Thread* it aroſe by, but draws that up at times, and winds it up into a hank with its fore-feet, and darts out another by way of ſupport; and the new *Thread* is made more or leſs long, as it is intended for a higher or lower flight.

Theſe *Air-threads* are not only found in autumn, but even in the depth of winter. The ſerene days about Chriſtmas bring out great numbers of them; but the *Threads* are at this ſeaſon only ſhort and ſlender. They are the produce of the young ſpiders, hatched only the autumn before, and are ſeldom uſed to ſuſtain the animal, but ſeem a mere ſporting of it, being thrown out and broke off at ſmall lengths. The thicker ropes of the autumn are the only ones intended for the ſupport of the old ſpiders in the air, when there is plenty of ſmall flies that inhabit the airy region, and make it worth the creature's while to take up its habitation among them. Phil. Tranſ. N°. 50.

THREX, among the Romans, an appellation given to gladiators, either becauſe they were natives of Thrace, or wore armour after the manner of that country. *Pitiſc.* in voc.

THRIFT, *Statice*, in botany. See the article STATICE.

The ſeveral more common ſpecies of this plant have been uſed to be raiſed promiſcuouſly for making the edges of flower-beds, inſtead of box; but the neceſſity of tranſplanting them every year to keep them within due bounds, has made them of late much diſuſed.

They are all propagated by parting their roots; the beſt time for doing which is in autumn, and they will grow with very little trouble, and flower in the May following, continuing in flower about three weeks or a month, if the weather is not too dry. *Miller*'s Gardener's Dict.

THRIO, Θρίω, in antiquity, a feſtival in honour of Apollo. *Potter*, T. 1. p. 405.

THRIPS, in natural hiſtory, a name uſed among the antients, to expreſs a ſort of worm hatched from the egg of a beetle; which, while in the worm-ſtate, eats its way into wood, and forms cells and cavities in it of various ſhapes, and in various directions, often reſembling the figures of letters or other things.

The antient Greeks are ſaid to have uſed ſmall pieces of the wood thus eroded in particular forms, as ſeals before the engraving of theſe utenſils was invented, and indeed they muſt very well have ſerved this purpoſe, ſince it is ſcarce poſſible to conceive how one of theſe pieces of corroded wood ſhould be counterfeited, or the impreſſion imitated.

Lucian mentions his marking his olives with a ſignature of one of theſe pieces of wood greatly eroded, and uſes the word *Thrips*, not as the name of the animal, but of the piece of wood eroded by it. Theophraſtus, Pliny and Ariſtotle, alſo uſe the ſame expreſſion; and we find that the word *Thrips* was as frequently uſed to ſignify the pieces of wood eroded, as the animal which eroded them.

THRISSA, in ichthyology, the name given by the Greeks and by the modern Latin writers, to the fiſh which we call the *ſhad*, or the mother of the herrings.

This is called by Artedi the clupea, with the top of the upper jaw divided, and with black ſpots on each ſide. This accurate author obſerves alſo, that the *agonus* or *agone* of Salvian, the *ſarachus* of Charleton, and the *aloſa minor* and *harengus minor* of Willughby, and others, which we call the pilchard, differ only from the *Thriſſa* in ſize; all being the varieties of the ſame ſpecies of fiſh, and all characterized by this ſpecific name.

THROAT (*Cycl.*)—*Sore*-THROAT, in medicine. See the article QUINZY, *Cycl.* and *Suppl.*

THROAT-*Wort*, in botany, the name of a plant of the bell-flower kind, called in Latin *Trachelium*. Its characters and ſpecies, ſee under that head.

This plant yields, when wounded, a milky juice in great plenty, and this if received into a ſhell or other ſmall veſſel, curdles immediately, and the whey runs from the thick part; this whey is of a brown colour, whereas that of the wild lettuce is of a fine purple, and dries into a cake that may be crumbled into a purple powder. The juice of the *Throat-wort* ſmells ſour, and its curdled part being dried burns like reſin at the flame of a candle. Phil. Tranſ. N°. 224.

THROMBUS, a word uſed by ſome medical writers, to expreſs a grume or clot of blood.

THROSTLE, an Engliſh name for the common mavis, or ſong-thruſh. See TURDUS.

THROWING, among bowlers. See the article BOWLING.

THRYALLIS, in botany, a name given by Nicander, and ſome other writers, to a ſpecies of mullein uſed in the coronæ and garlands of the antients; and, as he expreſsly ſays, different from the common wild mullein.

Dioſcorides ſeems to make this his third ſpecies, and calls it *lychnitis*, from its uſe in lamps; the Greeks beating out its thready ſtalks, and uſing them for the wicks of lamps. We have a kind of *verbaſcum*, or mullein, which we call *lychnitis*, in commemoration of Dioſcorides's name; but it does not appear to be the ſame ſpecies that Nicander and the other Greeks called by that name. Some alſo called it *nekeia*, or *necuia*, from its uſe in making a kind of torch; that was the thing with which they kindled the funeral piles of the dead.

THUMB, *Pollex*, in anatomy, one of the members, or parts of the hand. See the article HAND, *Cycl.* and *Suppl.*

The firſt phalanx of the bones of the *Thumb* is not like thoſe of the other fingers. Antient authors reckon it among the bones of the metacarpus, which it reſembles very much, and by this means allow only two phalanges to the *Thumb*, and

make five metacarpal bones. The convex ſide of this phalanx is very much flatted, and is much broader toward the head, than toward the baſis. On the concave ſide is a kind of angular line, which in ſome meaſure diſtinguiſhes it into two parts. Its head is like thoſe of the metacarpal bones, only flatted at top. The articular ſide of its baſis is proportioned to the digital ſide of the *os trapezium* of the carpus, and framed in ſuch a manner as that the ſigmoide cavities and eminences in the two bones croſs one another. This articulation has ſomething very particular in it; it is a kind of double ginglymus, which readily allows of flexion and extenſion, adduction and abduction, but with difficulty permits the oblique motions, becauſe then the two ſides run counter to each other.

The ſecond phalanx of the *Thumb* is ſhorter than the firſt; its body is convex or ſemi cylindrical on one ſide, flat on the other, and contracted between the edges. The articular ſide of the baſis is gently concave, and is ſurrounded near the edges by ſmall tuberoſities; as alſo near the angle of the phalanx. The head is the regular portion of a pulley, which projects more on the concave, than on the convex ſide; and on each ſide of it there is a ſmall foſſula, and ſome inequalities in form of tubercles. On the flat or concave ſide of the phalanx are two rough lines, one near each edge; they are the impreſſions or marks of the articular vaginæ. The connection of this phalanx with the firſt, is by a kind of arthrodia, or by a flat enarthroſis, which permits a motion in ſeveral directions, though more limited than in other articulations of the ſame kind. It is articulated with the third by a very perfect ginglymus.

The third phalanx of the *Thumb* repreſents the half of a ſort of cone, cut lengthwiſe, and by joining it to the ſame bone of the other *Thumb*, an entire cone is formed; the convex ſide is more even than the flat ſide, and on each edge there is a tuberoſity near the baſis: The baſis has two hollow ſides, which form a ginglymus with the head of the ſecond phalanx. The head is flat and ſmall, ending in a rough ſemi-circular border, which on the flat ſide of the bone repreſents a horſe-ſhoe. *Winſlow*'s Anat. p. 87.

THUNDER (*Cycl.*)—The noiſe of *Thunder* and the flame of lightning are eaſily made by art. If a mixture of oil or ſpirit of vitriol be made with water, and ſome filings of ſteel added to it, there will immediately ariſe a thick ſmoak, or vapour, out of the mouth of the veſſel; and if a lighted candle be applied to this, it will take fire; the flame will immediately deſcend into the veſſel, and this will be burſt to pieces, with a noiſe like that of a cannon.

This is ſo far analogous to *Thunder* and lightning, that a great exploſion and fire are occaſioned by it; but in this they differ, that this matter when once fired is deſtroyed, and can give no more exploſions; whereas in the heavens one clap of *Thunder* uſually follows another, and there is a continued ſucceſſion of them for a long time. Mr. Homberg explained this by the lightneſs of the air above us, in compariſon of that here, which therefore would not ſuffer all the matter ſo kindled to be diſſipated at once, but kept it for ſeveral returns.

THUNDER-*Stone*, in natural hiſtory, the ſame with that called by authors *Brontia*. See the article BRONTIA.

THUNDER-*Storms*. It is frequent in the *Thunder-ſtorms* in hot climates, to ſee a bituminous matter fall with the lightening to the ground, and there continue for ſome time burning in a maſs, or elſe burſt at once into a multitude of ſparks, which burn every thing they touch, and always leave a violent ſmell of brimſtone behind them.

Something of this nature, but concreted into a ſolid form and reſembling common brimſtone, was ſome years ago obſerved in the iſle of Wight; of which Mr. Cook, an inhabitant of Newport there, has given the following account:

The month of July, in the year 1737, had been very ſultry, and the nights often ſtormy, in particular there was one evening a very violent ſtorm of *Thunder* and lightening, attended toward the end with a great deal of rain. The morning afterwards, as a countryman was walking over a meadow near the ſea-ſide, he obſerved a yellow ball of a ſhining matter, lying looſe upon the turf or graſs. When he had taken it up, he found it to be no other than a lump of ſulphur, of an uncommonly ſtrong ſmell, and covered all over with a multitude of fine ſhining cryſtals of a yellowiſh colour, which fell off on the lighteſt touch. The whole ſubſtance appeared to be ſomewhat ſpungy, and it had a large hole in one part; it was near an inch long, and ſomewhat more than half an inch in diameter, and when put to the fire proved readily inflammable, and burnt with a whiter flame than common brimſtone, and with leſs acid and ſuffocating fumes.

The author of this account ſeems to think, that there is great probability that this ball was generated, not under ground but in the air, and that it was of the nature of thoſe maſſes of bituminous matter falling ſo frequently in *Thunder-ſtorms*, in the hotter countries, but that by ſome accident it miſſed taking fire, and was therefore left perfect in its ſolid form. It ſeems not to have been generated under ground, ſince if it had, it could never have been found on the ſurface ſo perfectly clean, with its pores all empty not filled with earth, and its covering of cryſtals untouched, though they adhered ſo very lightly to it that the gentleſt touch threw them off. Phil. Tranſ. N°. 450. p. 449.

THURIBULUM, among the Romans, a cenſer or veſſel, in which incenſe was burnt at ſacrifices. *Pitiſc.* in voc.

THURIFICATI, in church hiſtory, a deſignation given to thoſe, who, to avoid the perſecution of the Roman emperors, offered frankincenſe to the heathen gods. *Hofm.* Lex. in voc. See the article PERSECUTION.

THURSIO, in ichthyology, a ſpecies of fiſh, mentioned by Pliny, l. 9. c. 9. It is thought by ſome to be the *Phocæna*, or porpoiſe; and by others the *Sturgeon*. *Hofm.* Lex. univ. in voc. See the articles PORPOISE, and STURGEON.

THURUS, in natural hiſtory, the name of a creature deſcribed by Geſner, and ſome others, as a diſtinct ſpecies of wild bull; but the accounts of it ſeem either fabulous, or miſtaken deſcriptions of the wild bull. See the article BOS.

THUYA, *Tree of life*, in botany the name of a genus of trees, the characters of which are theſe: The embryo fruits are of a ſquammoſe ſtructure, and finally become a ſort of oblong fruit, between the ſcales of which there lie a ſort of marginated ſeed. To this it is to be added, that the leaves are ſcaly.

The ſpecies of *Thuya*, are the common *arbor vitæ*, and the Chineſe kind. *Tourn.* Inſt. p. 587.

THWART *the Hawſe*, in the ſea language. See the article HAWSE.

THYIA, Θυια, in antiquity, a feſtival in honour of Bacchus, celebrated by the Eleans. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 405.

THYITES *Lapis*, in the materia medica of the antients, the name of an indurated clay, approaching to the nature of a ſtone. It was found in Egypt, and uſed in diſtemperatures of the eyes.

This ſubſtance has been very much miſunderſtood by the late writers, and by moſt of them ſuppoſed to be loſt at this time; but this was wholly owing to their miſtaking the claſs of bodies among which they were to look for it. Some imagining it to have been a ſpecies of green marble; and others the turquoiſe-ſtone, that Dioſcorides meant by this name. It is very plain however, that it was no other than an indurated clay of the morochthus kind, and no more a ſtone than that ſubſtance, that being alſo frequently called *lapis morochthus*.

It is of a ſmooth, even and regular texture, very heavy, of a ſhining ſurface, and of a pale green, without the admixture of any other colour. It does not at all adhere to the tongue, nor ſtain the fingers in handling; but drawn along a rough ſurface, leaves a ſlender white line. It melts ſlowly in the mouth, and is of a ſharp acrid and diſagreeable taſte; and when rubbed down with water on a marble, it melts into a milky liquor of a pure white, not the leaſt greenneſs being ſenſible in it. It is found at preſent in the great mine at Goſſelar in Saxony, and ſeems to owe its colour to particles of copper; to which alſo it owes the virtues attributed to it by Dioſcorides, acting as a weak kind of verdigreaſe. *Hill*'s Hiſt. of Foſſ. p. 36.

THYLACION, a word uſed by the antient medical writers, to expreſs the bag formed by the membranes of the fœtus at the orifice of the pudenda, before the birth.

THYLLA, Θυλλα, in antiquity, a feſtival in honour of Venus. *Potter*, T. 1. p. 405.

THYMALLUS, in ichthyology, the name of a fiſh of the truttaceous kind, called in Engliſh the greyling, or umber.

It is of a long and flatted body, the belly is ſomewhat broad, and the back rigid and thin. It ſeldom exceeds a pound, or at the utmoſt a pound and half weight. Its back is of a duſky browniſh green, with a ſomewhat bluiſh caſt intermixed, and its ſides of a more blue ſhining gloſs with an admixture of gold colour. The ſcales are of a ſort of rhomboidal form, and the ſide-lines are much nearer the back than the belly. The ſides are variegated with black ſpots placed irregularly; but there are none of theſe near the tail. The back has two fins, and the tail is forked. The head is ſmall, the eyes large and protuberant; the mouth is moderately large, and the upper jaw larger than the under; it has no teeth, but the whole jaws are rough like a file.

It is caught in the freſh rivers in the mountainous counties of England, and in the like ſituations in Germany, and other kingdoms, and is one of the fineſt taſted of all the freſh-water fiſh. It feeds on worms, and ſpawns in May. See Tab. of Fiſhes, N°. 31. and *Willughby*'s Hiſt. Piſc. p. 187.

THYMBRA, in botany, the name of a genus of plants; the characters of which are theſe: The flowers and ſeeds are in all reſpects like thoſe of thyme, but that they are placed verticillately round the ſtalks.

The ſpecies of *Thymbra*, enumerated by Mr. Tournefort, are theſe: 1. The *Thymbra*, ſimply ſo called, and named by others *candy ſavory*. 2. The Spaniſh *Thymbra*, with leaves like marjoram, called *marum*, and *maſtichina*; and by ſome *clinopodium*. 3. The roundiſh-leaved Spaniſh *Thymbra*. 4. The Spaniſh *Thymbra*, with leaves like the coris, called by ſome *ſerpillum*; and by others a ſpecies of thyme. And, 5. The St. Julian *Thymbra*, or true ſavory, called alſo by ſome ſpiked ſavory, and the St. Julian's Savory. *Tourn.* Inſt. p. 197.

THYME, *Thymus*, in botany, *&c.* See the article THYMUS.

THYMELÆA, in botany, the name of a genus of plants, the characters of which are these: The flower consists of one leaf, and is funnel-shaped, and cut into four segments at the edges; from the bottom of this there arises a pistil, which finally becomes an oval fruit; which in some species is succulent, and in others is dry; but in all contains oblong seeds.

The species of *Thymelæa*, enumerated by Mr. Tournefort, are these: 1. The flax-leaved *Thymelæa*. 2. The African flax-leaved *Thymelæa*, with pale-coloured, and very sweet-scented flowers. 3. The African flax-leaved *Thymelæa*, with broad, obtuse, and shining leaves. 4. The African flax-leaved *Thymelæa*, with flowers collected into clusters. 5. The dwarf alpine flax-leaved *Thymelæa*, with purple sweet-scented flowers. 6. The dwarf alpine flax-leaved *Thymelæa*, with sweet-scented white flowers. 7. The small hairy knot-grass-leaved Portugal *Thymelæa*. 8. The common toad-flax-leaved *Thymelæa*. 9. The Spanish *Thymelæa*, with toad-flax-leaves. 10. The African *Thymelæa*, with very narrow, and short rosemary-like leaves. 11. The African *Thymelæa*, with long and narrow rosemary-like leaves. 12. The rosemary-leaved African *Thymelæa*, with long flowers. 13. The white-flowered shrubby African *Thymelæa*, with rosemary leaves. 14. The Spanish *Thymelæa*, with broad olive-like leaves. 15. The Italian silvery olive-leaved *Thymelæa*. 16. The olive-leaved rock *Thymelæa*. 17. The white-flowered alpine *Thymelæa*, with leaves hoary on both sides. 18. The smooth *Thymelæa*, with leaves like the polygala. 19. The hairy *Thymelæa*, with polygala-leaves. 20. The chamelæa-leaved *Thymelæa*, with short hairy leaves. 21. The woolly kali-leaved *Thymelæa*. 22. The juniper-leaved *Thymelæa*, with procumbent branches. 23. The Pyrenean juniper-leaved Thymelæa, with erect branches. 24. The African *Thymelæa*, with narrow heath-like leaves. 25. The *Thymelæa*, with white, soft, and silky leaves. 26. The African *Thymelæa*, with tufted flowers. 27. The woolly *Thymelæa*, with small houseleek leaves. 28. The Spanish *Thymelæa*, with hoary myrtle-like leaves. 29. The African *Thymelæa*, with butcher's-broom leaves. 30. The shrubby African *Thymelæa*, with milkwort-like leaves and jasmine flowers. 31. The narrow-leaved jasmine-flowered African *Thymelæa*. 32. The nepa-leaved prickly African *Thymelæa*, with small purple flowers. 33. The ever-green bay-leaved *Thymelæa*, called the *laureola mas*, or male spurge-laurel. 34 The bay-leaved *Thymelæa*, with deciduous leaves, called the female spurge-laurel. And 35. The bay-leaved *Thymelæa*, with deciduous leaves, with white flowers and yellow fruit. *Tourn.* Inst. p. 494.

THYMELÆÆ *Radix*, in the materia medica, the dried root of the *Thymelæa foliis lini* of Tournefort and other authors.

It is a light root of different sizes, of a reddish colour without, and greyish within, woody, and full of fibres, and tastes sweet at first, but is hot as fire when it has been held a little time in the mouth. It loses however both this fiery taste, and its acrid quality, in long keeping, and with them its virtues.

It is to be chosen new, well fed, and not worm-eaten. The fruit of this plant is the *granum cnidium* of the shops. They are both of an acrid quality, and are not in use in the shops at present. *Pomet*'s Hist. of Drugs, p. 46.

THYMELÆA is also a name by which some authors have called the *laureola*, or spurge-laurel, an ever-green shrub, common in our woods: But it is more usually made the name of the *mezereon*, or spurge-olive, and, with many, is understood only as the name of the spurge-flax. *Tourn.* Inst. p. 415. *Boerhaave*'s Index, vol. 2. p. 213.

THYMELE, in the antient theatre, a kind of pulpit, where the singers called *thymelici* performed. See the articles THYMELICI and LOGEUM.

THYMELICI, among the Romans, were musicians, who sung in the interludes, or who danced and kept time with their gestures. The place where they performed was called *Thymele*, whence Juvenal. VI. 66.

Attendit thymele, thymele nunc rustica discat.

THYMIAMA, Θυμιαμα, in antiquity, an offering of incense to God. See the article INCENSE, *Cycl.*

THYMIAMA, in the materia medica, a name by which some authors have called the *cascarilla bark*; called by some *cortex thuris*, or Indian bark. *Ray*'s Hist. Pl. vol. 2. p. 1841.

THYMIAMATA, a kind of fumigations among the antients, the ingredients of which were so various, that it appears they always consulted utility as well as pleasure, in their composition of them. Many of the ingredients, named in the oldest prescriptions for the making them, being the names of things not sweet-scented, the commentators have supposed that the antients expressed other things by those words, and not those which we at present mean by them; but all this is founded on the error of supposing these things intended only as sweet-scented preparations.

We find the gum ammoniacum of the antients used in them: And Neophytus reconciles the use of it in this manner very easily, by alledging, that it had the smell of coriander-seeds, which, as he observes justly, is an agreeable scent, and might do very well in mixture with others of this kind. It is pretty certain, that the ammoniacum of the antients was not the same gum which we now know by that name; but as the account of Neophytus, as to its smell, comes from an older Greek author, Dioscorides, we are to refer to him for the certainty of the expression; and by this it appears that Neophytus errs greatly, in attributing to ammoniacum the smell of coriander-seeds; for that the word used by Dioscorides, and which he has translated coriander, is κορίου; and this, as we find by many other passages of the same author, is an abbreviation of the word *castorei*, καστορίου.

The smell of castor is also attributed to ammoniacum by Theophrastus and others; whence it is evident that the antients used salutiferous as well as sweet-scented things in these fumigations. Galbanum is a worse smell than ammoniacum, and yet this also we find, together with myrrh, and other gums, is made an ingredient in the oldest prescriptions of this kind. And Pliny mentions the ammoniacum with the schænanth, and other sweets used for this purpose.

THYMOXALME, in the materia medica of the antients, was a composition used externally in the gout, and many disorders of the limbs, and was given inwardly in distemperatures of the stomach, a quarter of a pint for a dose. It operated as a purge, and was prepared in the following manner: Take two ounces of bruised thyme, as much salt, a little meal, rue, and penny-royal. These were to be put into a pot, and three pints of water, and fourteen ounces of vinegar are to be poured upon them; after which they are to be covered with a coarse cloth, and set in the sun for some time. *Dioscorides*, l. 5. c. 24.

THYMUS, *Thyme*, in botany, the name of a genus of plants, the characters of which are these: The flower consists of one leaf, and is of the labiated kind: The upper lip is erect, and usually bifid, and the lower is divided into three segments. The pistil arises from the cup, and is fixed in the manner of a nail to the hinder part of the flower, and surrounded by four embryos, which afterwards become as many seeds, and ripen in the cup of the flower. To these marks it may be added, that the stalks are usually hard and woody, and the flowers collected into heads.

The species of *Thyme*, enumerated by Mr. Tournefort, are these: 1. The common-headed *Thyme*. 2. The common broader-leaved *Thyme*. 3. The common narrow-leaved *Thyme*. 4. The white narrow-leaved strong-scented *Thyme*. 5. The white procumbent sweet scented *Thyme*. 6. The scentless *Thyme*. 7. The small-headed *Thyme*. 8. The Portugal *Thyme*, with narrow hairy leaves, and large long purple heads. 9. The Portugal *Thyme*, with narrow hairy leaves, and round heads of purple flowers. 10. The great-headed Portugal *Thyme*. 11. The small-headed Portugal *Thyme*. 12. The headed Portugal *Thyme*, with large scales. *Tourn.* Inst. p. 196.

We have three or four species of this plant propagated in our gardens, partly for use in the kitchen, and partly for curiosity. They are propagated either by sowing, or by parting the roots, both which should be done in March.

The seeds should be sowed on a bed of light earth, and must not be buried too deep. When they come up, they must be kept clear of weeds, and watered at times; and in June they should be thinned, leaving the plants at about six inches asunder. After this they will grow very fast, and will require no farther care.

If they are to be propagated the other way, the roots should be taken up, and parted into as many slips as can be, and each planted at six or eight inches distance, on beds of light earth, watering and shading them till they have taken root.

The common garden *Thyme* is a cephalic. It also is good in all obstructions of the viscera, in the rheumatism, and in flatulencies.

The serpillum, or wild mother of *Thyme*, is one of the greatest nervous simples of our own growth. An infusion of it alone will do wonders in tremors, lowness of spirits, and headachs. It makes a very agreeable liquor, drank in the manner of tea, and this, continued for some time, has proved a remedy in many cases where every thing else has failed. It is almost infallible in the cure of that troublesome disorder the nightmare.

THYMUS, (*Cycl.*) in anatomy. Dr. Pozzi says, that the *Thymus* of a calf, softened by maceration, discovers a lobe, from which a milky liquor runs out when wounded; and if air is afterwards blown into it, the whole *Thymus* is distended, and may be dried, when it plainly appears to be composed of cells communicating with each other; upon the sides of which muscular fibres are to be seen: From which structure he concludes, that the *Thymus* in fœtuses supplies the use of the lungs, serving as a receptacle for the chyle to be prepared in. Med. Ess. Edinb.

The *Thymus* is thought by some to furnish the liquor found in the thorax of fœtuses. See Mem. de l'Acad. des Scienc. Par. 1733.

THYNNIA, Θυννια, in antiquity, a sacrifice offered to Neptune by the fishermen, after a plentiful draught.

The word comes from Θυννος, a tunny, that being the sacrifice offered.

THYNNUS, in ichthyography, the name of a fish called in English the *tunny*, or Spanish mackrel, common in the Mediterranean,

diterranean, and others ſeas, and ſometimes, though not frequently, caught on the Engliſh coaſts.

It is a very large fiſh, growing ſometimes to ſeven or eight foot long, and more than an hundred weight. It is of a rounded and thick body, growing gradually ſmaller toward the tail, till it is at length extremely ſlender. It very much reſembles the *pelamys* in its whole figure, but that it wants the oblong black ſtreaks which that fiſh has on its ſides, and is much larger. The back is black, or, if held in ſome lights, is of a ſhining bluiſh or greeniſh hue. Its belly and half its ſides are of a ſilvery whiteneſs. Its ſcales are very ſmall. Its ſnout pointed. Its jaws both of equal length, and armed each with one row of teeth. The mouth is large and black within, except that part of the palate is red. The eyes are large. The larger black fins are two in number; the foremoſt placed near the head, and riſing out of a cavity in the back, and the other at a ſmall diſtance behind that; and, in ſome fiſh of this ſpecies, of a reddiſh or yellowiſh colour; and behind this laſt, there are eight, nine, or ten ſmall fins running down the ridge of the back at equal diſtances to the tail. The tail is very forked. The fins at the gills are black, ſmall, and terminate in a point. The belly fins are placed but at a ſmall diſtance hehind theſe, and are alſo ſmall; and both theſe, and the gill-fins have ſinuſes in the body of the fiſh, into which they may be depreſſed. Behind the anus is a fin like that on the back, and behind it eight more ſmall ones, anſwering to thoſe on the back alſo; and the ſkin of the ſides, near the tail, is extended into two fins; ſo that this part of the fiſh looks in ſome ſort ſquare. It is a good fiſh for the table, and is ſalted in vaſt quantities in Spain and Italy. See Tab. of Fiſhes, N°. 29. and *Ray*'s Ichthyography, p. 176.

THYOS, ΘυΘ, in antiquity, an offering of fruits, leaves, or acorns, which were the only ſacrifices at firſt in uſe. *Potter*, Archæol. Græc. T. 1. p. 213.

THYREOSTAPHILINUS, in anatomy, a name given by Douglaſs to a muſcle, called by Albinus and others, *palatopharyngæus*. See the article PALATOPHARYNGÆUS.

THYRRÆUM *Vinum*, a ſort of wine among the antients remarkable for its thickneſs and dark colour; it was ſweet, and luſcious, and not aſtringent.

THYRREUS *Lapis*, in natural hiſtory, the name of a foſſil, which the writers of the middle ages have called *ſyrus*.

It has many virtues aſcribed to it; but all the account we have of its real properties are from Pliny, who obſerves that it ſwam upon the water while whole; but when broken into ſmall pieces, theſe ſunk to the bottem. It ſeems to have been a ſort of bitumen of a ſpongy ſtructure.

THYSSELINUM, in botany, the name of a genus of umbelliferous plants, the flowers and fruit of which are the ſame with thoſe of the *petroſelinum*, or mountain parſley; from which it differs in nothing, except that it yields a milky juice when broken or wounded.

The ſpecies of *Thyſſelinum*, enumerated by Mr. Tournefort, are theſe: 1. The *Thyſſelinum* of Pliny, or milky parſley. 2. The marſh *Thyſſelinum*, called by ſome the *milky ſeſili*. *Tourn.* Inſt. p. 319.

TIBERIADES *Water*, the water of a hot ſpring near *Tiberiades* in Egypt.

Dr. Perry, when on the ſpot, tried ſome experiments on this water, which give us a much better idea of its nature, than we have from any other accounts of it. Half a dram of oil of tartar being mixed with an ounce and half of the water, it becomes turbid and muddy; and after twelve hours, three parts of the whole appear like white wool, only leaving a ſmall portion of clear water at the top. This white woolly matter dried, produced only a ſmall quantity of yellow ochre.

Spirit of vitriol added to the water in the ſame quantity, affords a large unctuous ſediment of a white colour. A ſolution of ſublimate being mixed in the ſame quantity, it became turbid and yellowiſh, and yielded an earthy ſediment in ſmall quantity; whence it ſeems evident, that it contains a ſal murale. Saccharum ſaturni being added in the ſame quantity, the water depoſited a lateritious ſediment in a ſmall quantity. Mixt with ſpirit of ſal armoniac, it turns to a bluiſh green turbid liquor, and finally yields a woolly ſediment. Sugar of violets mixed with it, turned it to a yellowiſh colour; and the ſcrapings of galls mixed with it, turned it to a deep purple; and on ſhaking, this became as black as ink.

It appears from theſe experiments, that the water contains a good deal of a groſs fixed vitriolic ſalt, ſome alum, and a ſal murale. It is too ſalt and nauſeous for internal uſe; but it muſt be of uſe as a bath in all cutaneous foulneſſes, eſpecially in ſcorbutic and leprous caſes; for it will powerfully deterge, ſcour and cleanſe the excretory pores, and it may, by its weight and ſtimulus, reſtore them to their natural ſtate and tone, and reſtore the true ſtate of the vitiated ſolids in general. Phil. Tranſ. N°. 462. p. 52.

TIBERIANUM *Marmor*, in the natural hiſtory of the antients, the name of the green and white marble, common in tables, *&c.* at this time, and by our artificers called *Ægyptian marble*. The Romans applied this name, however, only to one appearance of this ſpecies of marble, which was, when its white part was not arranged into regular lines, or arched figures, but diffuſed irregularly through the whole maſs; for where it was thrown into theſe ſort of arches, it was called the *auguſtan* marble. Theſe were, however, very idle diſtinctions, ſince the ſame block, to this day, often affords us the white veins, in both theſe diſpoſitions, in its different parts.

The antient Romans had it from Ægypt, and we alſo have the fineſt pieces thence; though the greater part of what we uſe is not brought quite ſo far. *Hill*'s Hiſt. of Foſſ. p. 481.

TIBERIANUM *Tormentum*, in medicine, a name given by ſome to the colic. See COLIC.

TIBIA (*Cycl.*)—*Cartilages of the* TIBIA. The *Tibia* has four or five proper cartilages, and two additional ones. The two proper cartilages which cover the two ſuperior ſurfaces of the head of the *Tibia*, are the thickeſt. Theſe are both gently hollow; but the internal, or that next the other *Tibia*, is more depreſſed in the middle than the other. The third proper cartilage covers the ſmall ſurface which lies on the lower part of the external condyle. The fourth covers the lower ſurface of the baſis of the *Tibia*, being continued over the outſide of the inner ankle. There are likewiſe ſuperficial cartilaginous incruſtations on the back part of this baſis, behind the inner ankle, and likewiſe on the backſide of the outer ankle, all for the paſſage of tendons.

The additional cartilages of the *Tibia* are two in number, called ſemilunar from their figure, and intermediate or interarticular from their ſituation; each of theſe cartilages is in the ſhape of a creſcent, or Roman C. Their convexity, or greateſt curvature, is very thick; their concavity, or ſmaller curvature, very thin, and ſomething like the edge of a ſickle. They lie on the two upper ſurfaces of the head of the *Tibia*; each cartilage is broad enough to cover about two thirds of the ſurface of the *Tibia* on which it lies, leaving one third bare in the middle; their under ſides are flat, their upper ſides hollow, and, together with the middle portions of the ſurfaces of the head of the *Tibia*, they form cavities proportioned to the convexity of the condyles of the os femoris. *Winſlow*'s Anatomy, p. 128.

Ligaments of the TIBIA. This bone is connected to the os femoris by ſeveral ligaments, two lateral, one poſterior, two middle, and one capſular. The innermoſt and broadeſt of the two lateral ones is fixed pretty low down on the inner ſide of the ſuperior part of the *Tibia*. The external, which is narrower and thicker than the former, is fixed partly in the *Tibia*, immediately above the fibula, and partly in the upper extremity of the fibula; both theſe ligaments lie a little behind the middle of the articulation. The poſterior ligament is fixed by ſeveral expanſions in the poſterior part of the head of the *Tibia*. One of the crucial ones is fixed by one end to the internal ſuperficial impreſſion in the notch of the os femoris, and by the other, to the notch in the head of the *Tibia*: The other is fixed by one end to the external impreſſion in the notch of the os femoris, and by the other between the anterior portions of the ſuperior ſurfaces of the head of the *Tibia*. The cornua of the ſemilunar cartilages degenerate into ligaments, ſhort and ſtrong, by which they are faſtened, and communicate by ſome ſmall portions with the crucial ligaments: They have likewiſe a common ligament, which like an arch runs tranſverſely between their anterior convexities, to the tuberoſity or ſpine of the *Tibia*. The patella is faſtened alſo by a ſtrong ligament; this runs directly down from the apex of the patella; and, beſide this, it has ſeveral ſmall lateral ligaments fixed in the lower part of its edge on each ſide, and inſerted anteriorly and a little laterally in the edge of the head of the *Tibia*.

The capſular ligament is fixed round the edge of the head of the *Tibia*, and in the edge of the patella. The crucial ligaments, and thoſe of the ſemilunar cartilages, are incloſed in this capſule; but the lateral and poſterior ligaments, and thoſe of the patella, lie without it. The capſule is alſo joined to a conſiderable portion of the circumference of the ſemilunar cartilages, and is ſtrengthened by many ligamentary fibres. Its inſide is ſmooth, and ſhining; and where it is not covered with tendons, is very thin. There is likewiſe a very thin ligament, fixed by one end to the lower part of the cartilaginous ſide of the patella, and by the other to the anterior part of the great notch between the condyles and the os femoris. The uſe of which ſeems to be, to prevent the articular fat from being compreſſed in the motions of the knee. *Winſlow*'s Anatomy, p. 129.

TIBIÆ *Quintus*, in anatomy, a name given by the old authors to a muſcle called the *biceps cruris* by Albinus and Winſlow, and the reſt of the moderns.

TIBIALIA, among the Romans, a kind of ſwaths with which they uſed to cover their legs. *Pitiſc.* in voc.

TIBIALIS (*Cycl.*)—TIBIALIS *Gracilis*, a muſcle of the leg, called alſo *plantaris*. It is a ſmall pyriform muſcle, ſituated obliquely in the ham, below the external condyle of the os femoris, between the poplitæus, and external gaſtrocnemius; and its tendon which is long, flat, and very ſmall, runs down on the ſide of the gaſtrocnemius internus all the way to the heel. The fleſhy body, which is no more than about two inches in length and one in breadth, is fixed by a ſhort flat tendon above the outer edge of the exterior condyle of the os femoris; from thence it runs obliquely over the edge of the poplitæus, and terminates in a very ſmall, but long flat tendon. This tendon runs between the body of the gaſtrocnemius externus and ſoleus all the way to the inner edge of the upper part of the tendo achillis, and from thence continuing

its courſe downward, it joins this tendon, and is inſerted, together with it, in the outſide of the poſterior part of the os calcis, without communicating with the aponeuroſis plantaris. Sometimes this muſcle is wanting, and in ſome ſubjects it is ſituated lower down. *Winſlow*'s Anatomy, p. 220.

TIBIALIS *Anticus*, a long muſcle, fleſhy at the upper part, and tendinous at the lower, ſituated at the fore-ſide of the legs, between the *Tibia* and the extenſor digitorum pedis longus. It is fixed above by fleſhy fibres in the upper third part of the external labium of the criſta tibiæ, and of the inſide of the aponeuroſis tibialis, or of that ligamentary expanſion which goes between the criſta tibiæ, and the anterior angle of the fibula. It is likewiſe fixed obliquely in the upper two thirds of the outſide of the tibia, or that next the fibula. From thence it runs down, and ends in a tendon, which firſt paſſes through a ring of the common annular ligament, and then through another ſeparate ring, ſituated lower down; afterwards the tendon is fixed, partly in the upper and inner part of the os cuboides, and partly in the inſide of the firſt bone of the metatarſus. *Winſlow*'s Anatomy, p. 217.

TIBIALIS *Poſticus*, a long fleſhy penniform muſcle, broader above than below, ſituated between the tibia and fibula, on the backſide of the leg, and covered by the extenſor digitorum longus. It is fixed above by fleſhy fibres, immediately under the articulation of the tibia and fibula, to the neareſt part of thoſe two bones, chiefly to the tibia, reaching to the lateral parts of that bone above the interoſſeous ligament, which is here wanting. From thence its inſertion is extended below the oblique line or impreſſion in the tibia, over all the neighbouring part of the interoſſeous ligament, and through more than the upper half of the internal angle of the fibula. Thro' all this ſpace it is fleſhy and penniform, and is covered by the extenſor digitorum longus. After this, it forms a tendon which runs down below the inner malleolus through a cartilaginous groove, and an annular ligament, and is inſerted in the tuberoſity of the lower part of the os ſchaphoides. *Winſlow*'s Anatomy, p. 220.

TIBICEN, in zoology, a fiſh of the cuculus kind, called by many authors, *lyra*, or the *harp-fiſh*; and in ſome parts of England, the *piper*.

The head of this fiſh runs out into two broad horns, which are ſerrated, or beſet with a ſort of teeth, or ſmall ſpines, all along their edges, which is its principal diſtinction from the hirundo or ſwallow-fiſh. Above the gill-fins it has on each ſide a long and ſharp ſpine. The forehead is elevated into a ſort of eyebrows over the eyes; and at the angles of theſe there are ſmall and ſhort ſpines; theſe are crooked; and the ſpines on the back of this ſpecies are longer than in any other of the cuculi. The ſide lines feel but very little rough to the touch, and the forehead between the eyes is not hollowed as in the other cuculi. The whole head is covered with a bony cruſt, which runs into two horns or ſpines behind. It has three fingers or filaments on each ſide, from the roots of the gill-fins; and its jaws are rough like files, but have no diſtinct teeth. The tail-fin, and the middle of the back in this fiſh are red. It is caught in the Mediterranean, and in ſome other ſeas. In our county of Cornwal, it is not unfrequently caught about the ſhores, and from the noiſe it makes when taken out of the water, is called the *piper*. *Ray*'s Ichthyography, p. 282. *Willughby*'s Hiſt. Piſc. p. 282.

TIBURO, in zoology, a fiſh very badly and falſely deſcribed by ſeveral authors, and proving, on a ſtrict enquiry, to be no other than the lamia or white ſhark. *Willughby*'s Hiſt. Piſc. p. 49. See the article LAMIA.

TICK, in the manege, a habit that ſome horſes take of preſſing their teeth againſt the manger, or all along the halter or collar, as if they would bite it.

TICKLISH, in the manege. A horſe is ſaid to be *tickliſh* that is too tender upon the ſpur, and too ſenſible, that does not freely fly the ſpurs, but in ſome meaſure reſiſts them, throwing himſelf up, when they come near and prick his ſkin. A *tickliſh* horſe has ſomewhat of the ramingues, *i. e.* the kickers againſt the ſpurs; but with this difference, that the latter put back, leap and kick, and yerk out behind, in diſobeying the ſpurs; whereas a *tickliſh* horſe only reſiſts for ſome time, and afterwards obeys, and goes much better, through the fear of a vigorous ham, when he finds the horſeman ſtretch his leg, than he does upon being actually pricked.

TIDE (*Cycl.*)—In the Philoſophical Tranſactions, N°. 4. we have an account of an extraordinary *Tide* near the weſtern iſles of Scotland. For ſome days one flood and ebb run twelve hours eaſtward, and the other twelve hours weſtward, till four days before the new and full moon, and then they reſume their ordinary regular courſe as before, running eaſt during the ſix hours of flood, and weſt during the ſix of ebb.

There is another uncommon irregularity in theſe *Tides*. Between the vernal and autumnal equinoxes, the courſe of irregular *Tides* about the quarter moons is to run all day, that is, twelve hours eaſtward; and all night, for twelve hours more, weſtward. But during the other ſix months, from the autumnal to the vernal equinox, the current runs all day weſtward, and all night eaſtward.

TIES, aboard a ſhip, are thoſe ropes by which the yards do hang; and, when the halliards are ſtrained to hoiſe the yards, theſe *Ties* carry them up.

TIFACOUM, a word uſed by ſome of the chemical writers to expreſs quickſilver.

TIFATUM, a word uſed by ſome of the chemical writers to expreſs ſulphur.

TIFFE *de Mer*, in natural hiſtory, a name given by Count Marſigli to a ſpecies of ſea plant, commonly but erroneouſly reckoned among the ſpunges, and called by authors, a *branched ſpunge*. This author has called it by this name from its reſemblance to the heads of the *typha paluſtris*, or cat's tail, when ripe in the month of September.

The ſpunges muſt be of a lax and cavernous texture; but this plant is ſmooth and firm, and has no inequalities on its ſurface, excepting a few ſhort hairs, which give it a velvety look, when firſt taken out of the water. It is a very elegant and beautiful plant; it grows to two foot in height, and is very elegantly branched. It grows on rocks and ſtones, and, when firſt taken out of the ſea, is full of a viſcous water, as yellow as the yolk of an egg; but when this water is preſſed out, and the plant comes to dry, it loſes its yellow, and becomes of a duſky brown colour. It is very tough and firm while in the water, but when dry it uſually breaks of itſelf into little pieces, and may be crumbled to powder between the fingers. This is a very ſtrong proof, among others, of its not being of the nature of the ſpunge.

When viewed by the microſcope, the whole ſurface is found to be covered with extremely fine and ſlender hairs; and, amongſt theſe, there are an infinity of little apertures, thro' which the ſea-water makes its way, for the nouriſhment of the plant. When a branch of it is cut tranſverſely, there are ſeen a number of long and fine canals, by means of which the water, received at theſe ſuperficial apertures, is conveyed to the whole ſubſtance of the plant; for theſe plants are all root, and imbibe their nouriſhment at every pore. *Marſig.* Hiſt. de la Mer, p. 82.

TIGEGUACU, in zoology, the name of a ſmall Braſilian bird, of the ſize of a ſparrow, and with a ridged and triangular bill, in which it reſembles the moucherolle. Its eyes are of a fine blue, and its legs and feet yellow. It is all over of a deep black, but that it has a large blood-red ſpot on the top of its head. Its tail is ſhort and black. *Marggrave*'s Hiſt. Braſil.

TIGER, *Tigris*, in zoology. See the article TIGRIS.

TIGH, in our old writers, a cloſe or incloſure mentioned in antient charters, and is ſtill uſed in Kent in the ſame ſenſe. Chart. Eccleſ. Cant. *Blount*.

TIGILLUM, a word uſed by ſome chemiſts to expreſs the tile with which they cover the mouth of their crucibles; and, by others, for the crucible itſelf. See the article TILE.

TIGRIS, the *Tyger*, or *Tiger*, in the Linnæan ſyſtem of zoology, makes a diſtinct genus of the quadruped claſs; the characters of which are, that it has four paps placed near the navel, and feet adapted to climbling. The author takes in the panther to this genus, and diſtinguiſhes the *Tiger* by the name *Tigris maculis oblongis*, and the panther by that of *Tigris maculis orbiculatis*. *Linnæi* Syſtem. Naturæ, p. 35.

The *Tiger* has its name from its ſuppoſed ſwiftneſs, and has been deſcribed by almoſt all authors as one of the ſwifteſt of all the wild carnivorous animals; but this has been wholly contradicted by ſuch authors as have ſeen the creature, who all declare that it is a ſlow and ſluggiſh animal, and is unable to overtake a man, or almoſt any animal that has an opportunity of running away from it. It will give two or three large leaps; but if it do not ſeize its prey in theſe, is but ill qualified to catch it afterwards. *Ray*, Syn. Quad. p. 165.

It exceeds the lion in ſize, and is of an unconquerable fierceneſs. It agrees with the panther in the variegation of its colours, but differs in the diſpoſition of them; for in the panther the colours are diſpoſed in round ſpots or eyes, and in the *Tyger* they are diſpoſed in long ſtreaks.

Marggrave deſcribes three ſpecies of American *Tygers*, the firſt called *jaguera* by the natives, and by the Portugueſe *onça*; the ſecond diſtinguiſhed by the natives by the name *jaguarete*, but called by the Portugueſe by the ſame name with the other; the third called by the Indians *cugua-cuarana*, and by the Portugueſe, the *Tyger*. But the two firſt ſeeming to be the ſame with what we know by the name of the *ounce*, and having round, not long variegations, ſeem properly of the panther, not of the *Tyger* kind.

It were much to be wiſhed that the antients had left us more certain marks, and fuller deſcriptions of the *Tyger* than they have.

The *Tyger* is found in the Eaſt Indies, in many parts of Aſia, and in America: But there ſeems ſome difference in ſpecies between the Aſiatic and American *Tygers*, and poſſibly fuller obſervation may prove, that the Aſiatic are ſwift, as the antients have deſcribed them, and the American ones, of the ſlowneſs of which we have accounts, may be a different ſpecies.

The manner of carrying off the young brood of this animal is deſcribed by Pliny as follows. The Hircanians and Indians bring up the *Tyger*, ſays he, an animal of a dreadful ſwiftneſs,

which is moſt put to the proof when going to be taken. The whole brood, which is always very numerous, is carried off upon a horſe, as ſwift as poſſible, and often removed to a freſh one. When the mother *Tyger* finds the neſt empty, and the brood gone, for the males take no care of them, ſhe traces the ſcent with furious ſpeed; and when ſhe is arrived within hearing of the perſon who is carrying off her young, he throws down one of them; this ſhe takes up in her mouth, and, as if made more ſwift by her load, carries it back, and then returning, is treated in the ſame manner till the perſon gets on board a ſhip, and leaves her to vent her rage on the ſhore. Vid. *Pitiſc.* Lex. Ant. in voc. *Plin.* Nat. Hiſt. l. 8. c. 18.

TIHOL, in natural hiſtory, a name given by the people of the Philippine Iſlands to a ſpecies of crane very frequent among them, and remarkable for its ſize, being taller than a man, when it ſtands erect, and holds up its neck. They call it alſo ſometimes *tipul*.

TIJEGUACU-*Paroara*, in zoology, the name of a Braſilian bird, of the ſize of a lark. It has a ſhort and thick beak, brown above, and whitiſh below. Its head, throat, ſides, and the lower part of its neck, are of a fine yellow, variegated with red in the female, and all over of a perfect blood-red in the male. The upper part of the neck, and the whole back, are grey, with a mixture of brown; the wings are brown, tipped with white; the tail is of the ſame colour; and the ſides of the neck, the breaſt, belly, and thighs, are white. *Marggrave*'s Hiſt. Braſil.

TIJEPIRANGA, in zoology, the name of a Braſilian bird of the ſparrow kind. It is a little larger than the lark. Its whole body, neck, and head, are of a very fine red or blood colour, and its wings and tail black.

There is another ſpecies alſo of this bird, which is of the ſize of a ſparrow, and is of bluiſh grey on the back, white on the belly, and of a ſea-green on the wings. The legs of this are of a pale grey. *Marggrave*'s Hiſt. Braſil.

TIKE, the Zetland name for an otter, of which there are many to be found about that iſland. Phil. Tranſ. N°. 473. Sect. 8.

TILE, or TYLE, (*Cycl.*) in aſſaying, a ſmall flat piece of dried earth, uſed to cover the veſſels in which metals are in fuſion.

Theſe are made of a mixture of clay and ſand, or powder of flints, or broken crucibles, made into a paſte, and ſpread thin with a rolling-pin, on a table, or flat ſtone. From theſe cakes or plates, pieces are to be cut with a knife, to the ſhape and ſize of the mouths of the veſſels to be cloſed. It is beſt then to pare away the borders of the under ſurface of the piece thus cut off, that this ſurface may immediately touch all the way the edge of the mouth of the veſſel, leaving a prominent rim, by which means the *Tile* ſits cloſe upon the veſſel, and is not ſo eaſily diſplaced by accidents, as a touch of the poker, or of the coals put on to mend the fire, as it otherwiſe would be. Finally, put on the middle of the outer ſurface a ſmall bit of the ſame matter, which ſerves as a kind of handle, by means of which it may be conveniently managed by the tongs, and eaſily taken off and put on again at pleaſure. *Cramer*, Art. Aſſ. p. 66.

TILIA, the *Lime-Tree*, in botany, the name of a genus of trees, the characters of which are theſe: The flower is of the roſaceous kind, and is compoſed of ſeveral petals, arranged in a circular form. The piſtil ariſes from the cup, and finally becomes an unicapſular huſk, containing oblong ſeeds.

The ſpecies of *Lime*, enumerated by Mr. Tournefort, are theſe: 1. The large-leaved common *lime*. 2. The common *Lime*, with ſmaller leaves. And 3. The hairy-leaved *Lime*, with red twigs and ſquare fruit. *Tourn.* Inſt. p. 611. See the article LIME-*Tree*.

Lime-tree flowers are eſteemed cephalic and cordial; they are alſo recommended in paralytic and nervous diſorders of all kinds.

TILLS, a name given by our farmers to the lentil, a kind of pulſe propagated in ſome parts of the kingdom; they are the ſmalleſt of all pulſe. They require but an ordinary ground, but they produce a vaſt quantity, tho' they lie in a ſmall compaſs. They make a fine ſweet fodder, and are the beſt of all things of this kind for calves, or any other young cattle. They are alſo the beſt of all ſorts of food for pigeons. *Mortimer*'s Huſbandry.

TILLÆA, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, the characters of which are theſe: The calyx is a flat perianthium, divided into three large oval ſegments. The flower is compoſed of three flat, oval, pointed petals, ſmaller than the ſegments of the cup. The ſtamina are three ſimple filaments, ſhorter than the cup. The antheræ are ſmall. The piſtillum has three germina. The ſtyles are three, and ſimple. The ſtigmata are obtuſe. The fruit is three long pointed capſules, of the ſame length with the flower, bent back, and ſplitting open longitudinally in their upper part. The ſeeds are of an oval figure; and two are contained in each of theſe capſules. *Linnæi* Gen. Plant. p. 36.

TILLAGE. The term *Tillage*, in its proper ſenſe, ſignifies the opening, breaking, and dividing the ground by the ſpade, the plough, the hoe, or other inſtruments which divide it by attrition, as the addition of dung does by fermentation.

Dung is only to be had in a limited quantity, and that in moſt places, except in the neighbourhood of great towns, too ſmall a quantity for the huſbandman's occaſions; but *Tillage* is in the power of the workman in every degree; and by this the field of ſubterranean paſture for the plants may be enlarged almoſt without limitation. Though the external ſurface is always confined to the ſame narrow bounds, *Tillage* may extend the earth's internal ſuperficies, in proportion to the diviſion of its parts; and as diviſion is infinite, ſo may alſo that extenſion of the ſuperficies be, which is the conſequence and effect of it.

Every time the earth is broken by any ſort of *Tillage* or diviſion, there muſt ariſe ſome new ſuperficies of the broken parts, which never has been open before; for when the parts of the earth are once united and incorporated together, 'tis morally impoſſible that they, or any of them, ſhould be broken again only in the ſame places; for, to do that, ſuch parts muſt have again the ſame numerical figures and dimenſions they had before that breaking, which, it is eaſy to ſee, will never happen.

Although the internal ſuperficies may have been drained by a preceding crop, and the next plowing may move many of the before divided parts, without new breaking them, yet ſuch as are new broken have, at ſuch places where they are broken, a new ſuperficies, which never was, or never exiſted before.

Tillage, as well as dung, is beneficial to all ſorts of land. Light land being naturally hollow, has larger pores, which are the occaſion of its lightneſs: This, when it is by any means ſufficiently divided, the parts being brought nearer together, becomes, for a time, bulk for bulk heavier; that is, the ſame quantity of it is made to lie in leſs room, and ſo it is made to partake of the nature and benefit of a ſtrong and firm land; that is, it will keep out too much heat and cold, and retain the roots of plants much more ſteadily than it could do before that *Tillage*.

The ſtrong and tough land being naturally leſs porous than it ought to be, is made for a time lighter, as well as richer, by a good diviſion: The ſeparation of its parts makes it more porous, and cauſes it to take up more room than it does in its natural ſtate, and then it partakes of the natural advantages of a lighter land. When ſtrong land is ploughed, but not ſufficiently, ſo that its parts are left groſs, it is ſaid by the farmers to be rough; in this caſe it has not the proper benefit of *Tillage*; for its pores and interſtices are left too large, and it has all the inconveniencies of a hollow land that is untilled. When the light land is ploughed but once, that is not ſufficient to diminiſh its natural hollowneſs or pores; and, for want of more *Tillage*, the parts into which it is divided by that once ploughing, remain too large, and conſequently the artificial pores are large alſo, and, in that reſpect, they and the ill-tilled ſtrong land are alike.

Light land having naturally leſs internal ſuperficies than any other kind, ſeems to require more *Tillage* or dung to enrich it: As when the poor hollow thin downs have their upper part, which is the beſt, burnt, whereby all, except a caput mortuum, is carried away; yet the ſalts of this ſpread upon that barren land, which is unburnt, divide it into ſuch very minute parts, that their paſture will nouriſh two or three very good crops of corn. But then the plough, even with a conſiderable quantity of dung, is never able to make another diviſion equal to that which thoſe ſalts had done; and therefore, after theſe two or three crops, the land always remains barren.

Artificial pores cannot be two ſmall, becauſe the roots of plants can the more eaſily enter the ſoil that has them; quite contrary to natural pores; for theſe may be, and generally are, too ſmall and too hard for the entrance of all weak roots, and for the free entrance even of ſtrong roots. Inſufficient *Tillage* leaves ſtrong land with its natural pores too ſmall, and its artificial ones too large; and it leaves light land, with its natural and artificial pores both too large. Pores which are too ſmall, in hard ground, will not permit roots eaſily to enter them; and pores which are too large in any ſort of land, can be of little other uſe to the roots of plants, but only to give them paſſage into other pores that are more proper for them; and if in any place they lie more open than they ought to the air, they are dried up and ſpoiled before they reach them.

The fine fibrous roots are the only parts of a plant which take in the nouriſhment, the larger part of the roots ſerving only to receive it of them, and convey it to the plant; and theſe fine and ſmall fibrous roots can take in no nouriſhment from any part of the earth, unleſs they are in contact with it, and preſs againſt the ſuperficies: This is the caſe in the ſmall pores in the earth; but by no means in large ones; for a fibrous root can never be compreſſed againſt the ſides of a cavity, whoſe diameter is much greater than its own, as is the caſe in all theſe large pores. The ſurfaces of great clods form declivities, which have large cavities at the bottom; theſe ſerve to receive and convey what rain and dew bring too quickly downward below the ploughed part.

The firſt and ſecond ploughing of land with the common plough, ſcarce deſerve the name of *Tillage*; they rather pre-

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pare the land for *Tillage*; the third, fourth, and every ſubſequent ploughing, are of infinitely more advantage to the ground, and are done at a much ſmaller expence; but the laſt ploughings will be moſt advantageouſly performed in the manner of hoeings. See the article HOEING.

The finer any land is made by *Tillage*, the richer it will become, and the more plants it will maintain; and it has been frequently obſerved, that in a large field, where at ſome time one part of the ground has been better tilled than the reſt, that part of the ground has produced the beſt crops, and been eaſily diſtinguiſhed by it from the reſt of the field, even ſix or ſeven crops after the time of the particular good *Tillage*. A piece of ground being once made finer than the reſt, will a long time ſhew the advantage of it; becauſe the dews have more power to enrich it, they penetrating farther than the ſuperficies, whereto the roots are able to enter. The fine parts of the earth are impregnated throughout their whole ſubſtance with ſome of the riches carried in by the dews, and there repoſited until, by *Tillage*, the inſide of thoſe fine parts become ſuperficies; and as the corn drains them, they are again ſupplied as before; but the rough large parts cannot have that benefit, and the dews not penetrating but to their ſurface, they remain poor. The experiments mentioned by Mr. Evelyn prove this beyond conteſt. Take of the moſt barren earth you can find, powder it well, and expoſe it abroad for a year, inceſſantly agitating it, and after this, without any other management, this earth will be the moſt fertile that can be conceived, and will readily receive any plant from the fartheſt Indies: All vegetables will proſper and flouriſh in this once barren earth, and bear their fruit as kindly with us, under a due degree of artificial heat, as in their native climates.

The artificial duſt will entertain plants which refuſe dung and other violent applications, and has a more nutritive power than any artificial dung or compoſt whatſoever: And by this pulveriſing and expoſing, the very nature of a ſoil may be changed, and the tougheſt clay made as light and friable as common light earth, and as fit for the nouriſhment of the tendereſt plants as any other; though, in its natural condition, its pores were too ſmall to give way to their tender roots, and had no communication one with another.

This is a ſort of improvement of land that cannot be practiſed in the large way, in fields, *&c.* but as it only conſiſts in dividing and breaking the particles of earth, and expoſing them thus broken to the air, it is plain that common *Tillage* approaches more or leſs to it, as more or leſs labour is employed; and the experiment proves, that the farmer need never fear beſtowing too much *Tillage* on any ſort of ground.

It is without diſpute, that what was one cubical foot of the original barren earth, and had in that ſtate only ſix cubical feet in ſuperficies, has after this powdering more than a thouſand cubic feet of ſuperficies in its internal parts. The very pooreſt land, and the very richeſt, in their natural ſtate, do not differ ſo much as one, and twenty; that is, a cubic foot of the richeſt land in the world will not produce more vegetables than twenty foot of the pooreſt; and as, in this method of pulveriſing, the ground is made greatly more than twenty times richer than it was before, it is a neceſſary conſequence that any poor land may, by proper *Tillage*, be made richer than the beſt land in the world naturally is.

There is alſo another very great advantage, when a ſoil has a large internal ſuperficies in a ſmall compaſs, as is always the caſe after much *Tilling*; which is this, that the roots of plants in it are then better ſupplied with nouriſhment; their food being nearer to them on all ſides, and more within reach than it can be when the ſoil is leſs fine, as in common *Tillage*, and the roots muſt extend much farther in the one than in the other, in order to reach an equal quantity of nouriſhment: They muſt range and fill perhaps twenty times more ſpace, in order to the coming in the way of an equal quantity of food.

Hard ground makes too great a reſiſtance to the paſſage of roots, and air makes too ſmall a preſſure upon their ſuperficies; in water they have a free paſſage to the utmoſt of their extent, and have every where an equal, proper, and even preſſure; and in light and fine earths, ſuch as thoſe divided by an equal and careful *Tillage*, they have much the ſame free paſſage and even preſſure as in water.

The general cuſtom of farmers is to leave off *Tillage* juſt when they have brought their lands into ſuch a condition, that *Tillage* would be of vaſt advantage to them. They uſually ſuppoſe the ſoil to be fine enough, when, with the help of harrows, they can cover the ſeed, and afterwards with a roller they break the clods, to the end that if a crop ſucceed, they may be able to mow it, without being hindered by theſe clods. *Tull*'s Horſehoing Huſbandry, p. 24.

TILMUS, a term uſed by ſome of the medical writers to expreſs the effect of a ſort of delirium, in which people pull the bedclothes, or pick out threads from the ſheets. This is uſually eſteemed a dangerous ſymptom.

TIMBER (*Cycl.*)—The uſes of *Timber* are ſo many, and ſo great, that the procuring a ſufficient ſupply of it, extremely well deſerves the care of every ſtate; as it muſt be a great diſadvantage to it to be obliged to have recourſe to its neighbours, and purchaſe at a very conſiderable and continually renewed expence, what might, by an eaſy œconomy, be ſufficiently ſupplied at home.

This œconomy, however, muſt be applied in time; for our natural indolence, our love to reap the advantages of every thing ourſelves, and our little care for poſterity, give great room to fear ſucceeding ages will want wood both for private and public exigencies. All our arts ſhould be employed on this ſubject, with two views, the one to preſerve and cheriſh our growing wood, the other to renew the trees which have been and are continually cut down.

The quantity of acorns that the oak bears, has made many people ſuppoſe, that nature has taken care for a renewal for us, and that of this vaſt quantity of ſeeds which annually fall, there will be always an over-ſufficient ſupply of young trees, which will grow up in the place of the old ones: But experience proves, that this is by no means the caſe. The greater number of theſe fallen acorns are devoured by a number of different animals, for whoſe nouriſhment nature has provided that abundance of them: And of thoſe which eſcape this fate, we are to conſider how few can come to good, from the natural accidents they are unavoidably expoſed to; they fall on a covered ground, where dead leaves, and decayed parts of branches of trees, uſually prevent their touching the earth, into which they are to ſhoot; or, if they can ſhoot here, it is merely from the ſurface, where they are, in their ſlow growth, liable, while very tender, to all the inclemencies of froſts; and add to this, that it is very difficult for ſuch tender plants as the young ſeedlings of theſe, to find room for growth or nouriſhment among the every way ſpreading roots of other trees; and the continual ſhade and want of free air, muſt render them very weakly and irregular in their growth, even ſuppoſing them to get over all the other difficulties.

It is very certain, that *Timber-trees* of oak are frequently met with among the underwood of foreſts; but we ſhall always find this to be the caſe, not in the cloſe places, but in certain ſpots where there has been a vacancy or opening; and that uſually where there are not, nor have at any time been, oaks in the neighbourhood of the ſpot. The acorns that fall from the oaks uſually come to nothing, from the before-mentioned accidents; and theſe trees which grow at diſtances, are owing to the acorns brought thither by birds, and accidentally dropped there. This is an inſtance familiarly verified, by obſerving, that there are frequently little buſhes near woods, which, though of white-thorn or other trees, are uſually ſurrounded and ornamented with young oaks; the jays and the like granivorous birds are the authors of this crop; for, bringing the acorns from the adjoining woods, to eat under theſe buſhes, they drop many by the way, which they do not trouble themſelves to look for on the ground, and which having here a freer ground to ſtrike root into, and an open air to grow in, ſeldom fail of coming to good, unleſs deſtroyed while young.

In order to the preſerving our growing *Timber-trees*, it would be a very uſeful law, that all who cut down any number of oaks, ſhould alſo leave a given number in good condition for after-cutting; and that no *Timber* ſhould be cut down, but at a proper age, in regard to the nature of the ſoil; ſince it is certain, that trees grow to their perfection at very different periods of time, in proportion to the depth of ſoil they have to grow in; and that as it is, on the one hand, not for the intereſt of the ſtate to ſuffer trees to be cut till at their perfection for ſize and ſoundneſs, ſo, after they are arrived at that perfection, it is equally certain, that they gradually decay.

The quality of the ſoil the tree ſtands in, may be neceſſary to be obſerved to this purpoſe; but the quantity or depth of it is the great ſubject of enquiry; and a great number of obſervations have proved, that the proper ſeaſon for cutting oaks in a ſoil of two foot and a half deep, is at fifty years old; thoſe which ſtand in a ſoil of three foot and a half deep, ſhould not be cut down before ſeventy years; and thoſe which ſtand in a ſoil of four foot and a half deep, or more than that, will encreaſe in goodneſs and in ſize till they are an hundred years old: And obſervation has proved, that after theſe ſeveral periods, the trees begin to decay.

This ſeems the beſt rule to eſtabliſh, in regard to the common ſoils; but thoſe which grow in a lighter or more ſandy ſoil, may have their periods changed from theſe to forty, to ſixty, and to eighty years at the greateſt depth; and after theſe times it is always beſt to fell the wood meant for public ſervice, whether then wanted or not, ſince it is much better to keep it in public magazines, than to leave it to be daily decaying.

Heaths, and other uncultivated places, where there is no regular growth of wood; but where fern, and uſeleſs plants alone ſeem to flouriſh, uſually afford alſo ſome ſtraggling trees of the oak. Theſe probably have had their origin from acorns dropped by birds; but theſe ſeldom grow tall or regular; ſince, not having been defended from the injuries of cattle, they are uſually browſed on, and ſtunted while young, and ſo become crooked and ſhort-trunked, or pollard trees. Theſe, though not of ſuch value as the more regular oaks, yet deſerve care, both with reſpect to their preſervation and felling; ſince they afford a number of trees naturally bent, and formed for many parts of ſhip-building.

The little care uſually taken of theſe trees, though on this occaſion

caſion of great value, ſeems to threaten a general loſs of them; but as trees, thus naturally crooked and bent, are of value, it is a laudable attempt to try at the finding a regular method of producing ſuch; and this is eaſily practicable, by following the ſame methods by which theſe wild ones become ſo. They wholly owe their figure to the cattle's biting off their tops while young, and afterwards biting off again the tops of the ſhoots from the firſt wound. In this manner, if a number of young trees, ſet apart for the experiment, have their tops cut off at two, four, ſix, eight, ten, and twelve feet from the ground, and four years afterwards the ſhoots from theſe ſtunted tops are again cut in the ſame manner, the trees will be found afterwards to grow up in all the irregularly crooked figures that can be conceived, and by this means a ſupply of naturally crooked wood may be raiſed for all the occaſions of ſhip-building, with infinitely greater eaſe and more certainty than by the method propoſed by ſome, of bending them down with weights tied to their tops while young.

As to the ſupply of young wood in the place of what is cut down, there are ſome circumſtances which have not had the attention paid to them which they deſerve. The ſpring froſts, which come on at a time when the ſhoots, by which nature is to raiſe the ſupply for what is cut down, are juſt preparing to grow, are of prodigious injury, and do not leſs miſchief to theſe than to the young ſhoots of garden plants, though the diſtant hope of the ſucceſſion to the proprietor, and uſually alſo the diſtance of place, and want of repeated obſervation, occaſions its not being perceived. This, however, may, in a great meaſure, be guarded againſt. Frequent experiments, and repeated obſervations, prove, that the miſchief done by theſe froſts, affect in a much greater degree thoſe ſhoots which are expoſed to the ſouth, than thoſe which face the north; and that it is greatly more powerful againſt ſuch as are wholly expoſed to the wind, than againſt ſuch as are ſheltered. Theſe known circumſtances may give the hint to a method of ſaving, at leaſt a great part of a wood to be felled, from this deſtruction, to its renewal, by the making it a rule to begin cutting down on the north ſide; and, as the whole felling is a work of ſome years, the ſtanding wood of every ſeaſon will defend the young ſhoots of the newly cut ſtumps the following ſpring, not only from the ſouth expoſure, but will ſhelter them alſo from the wind.

Many prudent managers have made fine eſtates of their coppice-woods, by regularly felling a certain portion every year, and providing for a renewal of the firſt cutting, againſt the felling of the laſt portion, by proportioning the time of growth to the quantity to be cut every year; and there is great intereſt to be made of a true knowledge of the growth of wood in this manner. Whoever obſerves the growth of young trees, will find that the ſecond year's growth is much more conſiderable than that of the firſt; the third year is more than that of the ſecond, and ſo on for many years; the yearly growths of young wood greatly encreaſing every ſeaſon up to a certain time or age of the tree, after which the increaſe in bulk, by growth, becomes gradually leſs. The great advantage to be made of coppice-wood, would be by knowing this intereſting period, and ſeizing on it, always to cut down the trees juſt at that time when they arrived at the end of their quick growth, and ſo ſetting nature to work with new ſhoots, to employ the ſame ſpeed on enriching again the owner. Regular obſervation and experiment alone can aſcertain this happy period; but any man who has much coppice-wood upon his eſtate, may aſſure himſelf of it, by cutting a given quantity every year, for ten years ſucceſſively, and then carefully reviewing the differences of the yearly produce. Memoirs Acad. Scienc. Ann. 1739.

Strength of TIMBER. The celebrated Monſieur de Buffon has attempted a rational calculation of the ſtrength of *Timber*, uſed in building, on the principles of his excellent demonſtration of the growth of trees. See the article WOOD.

He has proved that all wood conſiſts of a ſeries of woody cones laid in woody beds, all along the tree, and connected by a ſort of reticular work of much leſs ſtrength than their own ſubſtance. He infers hence, very juſtly, that when there are, in any ſpecies of wood, more of theſe cones, which ſhew themſelves in ſo many concentric circles in a tranſverſe ſection of the wood, and conſequently more of theſe weaker reticular ſubſtances which connect them, that wood muſt neceſſarily be weaker than ſuch in which, in an equal thickneſs, there are much fewer of theſe cones, and conſequently fewer alſo of theſe weaker inter-ſpaces.

If the irregularities of the ſtructure of wood were only theſe, it would be eaſy to compute, from the ſtrength of a ſtaff of an inch diameter, of any wood, what would be that of a beam of the ſame, of any given ſize; but this is by no means the caſe; for the diſpoſition of the cones, beds, and interſticial matter, is by no means the ſame in a large beam, formed by the workman, as in a little branch in its natural ſtate of growth.

This is eaſily conceived, when we conſider that, in order to make a beam of *Timber*, they ſquare a branch or part of the tree, or cut off four cylindric pieces from it, of what is called the blea. The heart of the wood lies now in the middle of the beam; this is the firſt woody bed, which all the others ſucceſſively cover, in form of ſo many concentric circles: The larger of theſe concentric circles is of the diameter of the whole piece of *Timber* now cut, and the circles, which naturally ſurrounded this, are now no longer perfect, but form only portions of circles, diminiſhing all the way to the ribs of the beam. A beam, thus ſquared, is therefore compoſed of a cylindric compleat piece of firm and hard wood, and of four angular portions, cut out of a much leſs ſolid and firm wood. This is the condition of a beam, ſquared out of a large arm of a tree, and made nearly of the diameter of that arm; but a beam of like ſize, cut out of the trunk of a larger tree, or out of one ſide of ſuch a trunk, is a very different thing, and is compoſed only of the longitudinal ſegments of the annual woody beds; and theſe ſegments ſometimes lie parallel to one of the ſurfaces of the beam, and ſometimes more or leſs inclined to one or the other ſide; they are alſo ſometimes longer, ſometimes ſhorter; and ſometimes more, ſometimes leſs, cut into the woody beds of the trunk of the tree they were cut from, and the beam is conſequently more or leſs ſtrong accordingly.

There are alſo two poſitions in a beam, the one of which is much ſtronger than the other; for theſe ſegments of the woody beds of the tree, form ſo many parallel flats. If you place the beam in ſuch a poſition that theſe planes or flats are vertical, it will reſiſt a much greater force than if they are placed horizontally in the poſition of the beam.

From theſe obſervations, it is eaſy to ſee how very fallacious the calculations and tables of the ſtrength of different kinds of *Timber* muſt be, while the authors have formed all their ſyſtems upon experiments made on pieces of one or two inches in diameter, and have given themſelves no trouble to enquire into either the number or diſpoſition of the woody beds in thoſe pieces, nor the directions in which the ſeveral beds were found on breaking them. Theſe, however, are extremely neceſſary and eſſential circumſtances; nor are theſe the only variations which they have omitted to obſerve; there are perhaps others equally neglected in all ſuch attempts, and yet equally neceſſary to make them of any real uſe. Young wood has always much leſs ſtrength than the older, and there is a great difference between the pieces cut out of the ſoundeſt part of the body of a tree, and thoſe from the young branches of the ſame tree. A piece cut out of the outer part of the trunk of a tree, near the blea, is alſo much weaker than one of equal diameter, cut out of the center or heart of a tree. The different age, and degree of dryneſs in wood, makes alſo great differences in its ſtrength; for a green branch of a tree is always more tough, and leſs eaſily broken, than a dry one: And the time employed in putting wood to the trial, as to its ſtrength, is alſo a circumſtance very neceſſary to be conſidered; ſince a beam of *Timber*, which will ſuſtain a certain weight for a few minutes, will not ſuſtain it perhaps for as many hours; and experiment has proved, that wood will often bear, for a ſhort time, a weight it cannot bear for a longer time; a beam having been found to bear a certain weight for one day, and the ſame beam afterwards having been broken in ſix months time by only two thirds of that weight. It is eaſily ſeen, from theſe conſiderations, that all the calculations in which theſe conſiderations have been neglected, can be of very little certainty; and that to make ſuch as may be certainly depended on, is a work of great difficulty.

As the advantages reſulting from ſuch calculations are, however, yet greater than the difficulties attending the attempt, this gentleman was encouraged to purſue the enquiry to the utmoſt. He cauſed certain pieces of wood to be broken by a determinate force, and calculating, according to that, what ought to be the force to break ſuch as were much larger; he tried afterwards what was the real force that would break them, and how far his calculations approached to the truth; in this he ever found extremely great differences between calculation and reality; and after many repeated trials, was never able to bring the fact any thing near the calculations. And trying, according to the ſame rules, others of greater lengths and thickneſſes, in proportion to the ſtandard piece, he found the calculations as far faulty as before. The diſappointment in theſe attempts determined him, however, to try a compleat courſe of experiments, from which a certain table of the force required to break the different kinds of wood might be eſtabliſhed, to which both himſelf, and the reſt of the world, might refer to upon occaſion. And this he executed in the following manner.

He began by chooſing in a certain ſpot of one of his own woods an hundred oaks, which were all found and lively growing trees, and ſtood as near to one another as they conveniently could. This caution was uſed, that the wood might be all of the growth of the ſame ſoil, ſince it is well known that the growths of different ſoils are in the ſame ſpecies of wood, of very different ſtrengths, and miſtakes of this kind might have rendered the whole attempt fruitleſs. Theſe oaks were all of the ſame ſpecies, and were in ſize from two foot and a half to five foot round. They were choſen purpoſely of different growths, or ſizes, that the experiments might be the

more ſimilar to the uſual cuſtoms of the workmen. For when a carpenter has occaſion for a piece of four or five inches ſquare, he does not for this purpoſe cut a tree that might have furniſhed a piece of a foot ſquare, becauſe of the expence; and it too often is their cuſtom to uſe ſuch pieces as have a very large ſhare of the blea on them. Not unfrequently indeed they uſe alſo rafters, ſawed out of large pieces of *Timber*; but theſe are, of all others, the very worſt; and the uſe of them in building ought to be prohibited, the ſmall wood being infinitely more advantageous for theſe purpoſes.

As the degree of dryneſs of wood alters its ſtrength very much, and as it is alſo very difficult to be aſſured with any degree of certainty, of the degree of drying or ſeaſoning of *Timber*; ſince two trees cut down at the ſame time ſhall often be found to dry very differently, it appeared to this gentleman much more eligible to take wood perfectly green for his trials, than that in any degree dried or ſeaſoned.

The trees were felled one by one, and were carried into a proper place; the day after they were felled the carpenters were employed to ſquare them, and the joiners to take their exact dimenſions; and on the day afterwards, the pieces were put to the proof; and the following is the method in which moſt of the experiments were made. Two ſtrong treſſels were taken, of ſeven inches ſquare, three foot high and three foot long, and ſtrengthened in their middle by a very ſtrong piece of *Timber*. On theſe two treſſels were placed the two extremities of the piece of wood which was to be broken; there were alſo ready ſeveral ſquare iron buckles, or rings, made of round iron work, the largeſt of which was nine inches wide, and was made of iron of ſeven inches about; the next was ſeven inches wide, and the iron it was made of was five inches round, and others of different degrees below theſe.

The piece of wood deſtined for the experiment, was paſſed through theſe rings; the larger of which ſerved for the thicker pieces, the ſmaller for the thinner. Every one of theſe rings had on its upper part and on the inſide, a rib nicely filed, of two or three twelfths of an inch broad.

The intent of this was to prevent the ring from inclining one way or other, when in uſe; and on its under part it had two hooks of iron, of the ſame thickneſs with the ring itſelf; theſe were placed at ſuch a diſtance from each other, as to form another ring of about nine inches in diameter, into which there was to be put a key of wood of the ſame diameter, and of four foot long. This key carried a ſtrong table of fourteen feet long, and ſix feet broad, which was made of rafters of five inches thick, nicely fitted one to the other, and ſecured by ſtrong bars of wood. This was ſuſpended to the ring by means of the large wooden key, and ſerved to place the weights on; theſe conſiſted of three hundred quarters of ſtones, which were all numbered, and weighed from twenty-five to two hundred pounds each. Theſe ſtones were put upon the table, and a heap of ſtones were placed together as long and wide as the table, and as high as was neceſſary for the breaking of the piece.

There was always great care uſed to place the piece and the treſſels on a level; and they were then faſtened, to prevent their diſplacing themſelves. Eight men were employed continually to fill the table, and began by placing in the center weights, firſt of two hundred, then of an hundred and fifty, next of a hundred; and ſo on to twenty-five pounds. Two men placed on a ſcaffold, ſuſpended in the air by cords, placed the fifty and twenty-five pound weights, which could not have been otherwiſe done, without danger of the mens being cruſhed to death; four other men held firm the four corners of the table, that they might not ſtir; and another, with a long ruler of wood marked how much the piece bent and gave way, as they loaded it with weights; while another marked the time, and wrote down the weight, which was often, twenty, twenty-five, or twenty-ſeven thouſand pounds.

Mr. Buffon cauſed more than an hundred pieces of wood to be broken in this manner; ſome regular ſquare beams, others rafters ſawn out of large trunks, beſide three hundred bars; and this great number was but barely ſufficient to give a regular ſcale of the force and ſtrength of *Timber*, in proportion to its ſeveral lengths and thickneſſes.

This gentleman obſerved, that a large piece of wood never broke, without firſt giving ſome notice of it; that green wood broke with much more difficulty than ſuch as was dry; and in general, ſuch ſort of wood as had a ſpring, reſiſted more than ſuch as had none. The blea of the wood, the wood of the branches, that of the top of the tree, and in general all the young wood, is weaker than that which is older.

The ſtrength of wood is not at all proportioned to its ſize; and a piece which is double or quadruple the thickneſs of another of the ſame length, is much more than of twice or four times its ſtrength; as for example, there required not quite four thouſand weight to break a piece of *Timber* of ten foot long, and four inches ſquare; and yet there required ten thouſand to break a piece of double that meaſure; and to break one of four times the meaſure, it required twenty-ſix thouſand weight; that is, to break a piece of ten foot long, and eight inches ſquare.

The ſame obſervation is alſo made good, in regard to the different lengths, as well as the thickneſſes. The laws of mechanics would inform us, that a piece of *Timber* of eight foot long, ought to bear juſt twice the weight of one of ſixteen feet. But experiment ſhews us here alſo, that the piece of eight foot long carries much more than the double of the other.

The wood which grows quickeſt, ſuppoſing the land the ſame, is always the ſtrongeſt: That which has grown more ſlowly, and the annual circles of which, that is, its ſeveral woody cones, are thin and ſlender, is always weaker than the wood in which they are thick.

The ſtrength of wood is proportionable to its weight, and a piece of wood of the ſame length and thickneſs with another, but conſiderably heavier than another, is found ſtronger alſo, and that very nearly in the ſame proportion. This is a remark of no ſmall conſequence; and, as the general weight of wood is eaſily known, it may ſave the expence of too much wood in building, as well as the danger from the greater error of uſing too little.

This accurate obſerver takes notice, that ſome may imagine his experiments to be the leſs concluſive, that the *Timber* he broke was looſe at the ends; and that in a wall, or building, it is uſually fixed at both ends. But he obſerves, that the difference of this circumſtance is not worth conſidering, for that the piece fixed in a wall is liable to bend in the middle, before it breaks; and that the fixures have no power to retain the ends, when they are pulled by this force.

This gentleman took no notice of any pieces which had faults, as many of thoſe he tried had, and broke with much leſs than their proportion of weight; but confined his obſervations and reaſonings only to ſuch pieces as were perfectly ſound and firm.

It might be ſuppoſed, that ſo great a number of trials as theſe, and that on ſo eaſy a ſubject, ſhould have left nothing farther to be done in it; but the author himſelf willingly acknowledges that there is yet much to be known. The proportion of the longitudinal ſtrength of wood to its tranſverſe, is a ſubject deſerving enquiry; as wood in buildings is often uſed in very different poſitions, and where the force acts upon it, not tranſverſely, but longitudinally or obliquely in different directions. Mem. Acad. Scienc. Par. 1740.

Seaſoning of TIMBER, a term uſed by our huſbandmen, to expreſs the preparing *Timber* after it is felled, for cutting and working up for uſe.

As ſoon as felled, it ſhould be laid up in ſome dry airy place, but out of the reach of too much wind or ſun, which, when in exceſs, will ſubject it to crack and fly. It is not to be ſet upright but laid along, one tree upon another, only with ſome ſhort blocks between, to give it the better airing, and prevent its becoming mouldy, which will rot the ſurface, and produce muſhrooms on it. Some perſons daub the trees all over with cow-dung, which occaſions their drying equally, and prevents their cracking, as they are otherwiſe very apt to do.

Some recommend the burying *Timber* in the earth, as the beſt of all ways of ſeaſoning it; and others have found it a fine preſervative to bury their *Timber* under the wheat in their granaries; but this cannot be made a general practice.

In Norway, they ſeaſon their *deal* planks, by laying them in ſalt-water for three or four days, when new ſawed, and then drying them in the ſun; this is found a great advantage to them; but neither this, nor any thing elſe, can prevent their ſhrinking.

The ſeaſoning *Timber* by fire is the beſt way of all, for piles and other pieces that are to ſtand under the earth, or water. The Venetians firſt found out this method, and the way they do it in is this; they put the piece to be ſeaſoned into a ſtrong and violent flame, in this they continually turn it round by means of an engine, and take it out when it is every where covered with a black coaly cruſt; by this means the internal part of the wood is ſo hardened, that neither earth nor water can damage it of a long time afterwards. This method is practiſed in many places for ſeaſoning the poſts for paling of parks, *&c.* and has this to recommend it, that in the very oldeſt ruins we have ever been acquainted with, there have been found many times pieces of charcoal, all of which has been found uninjured, though buried in the earth for ever ſo many ages. *Mortimer*'s Huſbandry, V. 2. p. 132.

When *Timber* has been properly felled, and ſeaſoned, by being expoſed to a certain degree of air and ſun, there is yet a method of preſerving it, much better than it could otherwiſe be, by external applications. When they are wrought and fixed in their places, the rubbing them over with tar or linſeed-oil, has been found of great uſe. The antients, particularly Virgil and Heſiod, adviſe the ſmoak-drying of all inſtruments made of wood, by hanging them up in the chimnies where wood fires are uſed. The whole benefit ariſing from this, ſeems to be the oil of the wood that is burnt, entering into the pores of the other as carried up in the ſmoak. But it would be a much more cleanly and eaſy method to apply ſome oil of this kind at once, and in any quantity that ſhould be judged requiſite. *Mortimer*'s Huſbandry, V. 2. p. 104.

The Dutch, who have *Timber* about their ſluices, and other buildings upon the water, more expoſed to the injuries of wet and weather than any other that is known; have a way of preſerving it, by coating it over with a mixture of pitch and tar, which they ſmear over the whole ſurface; and immediately, while it is moiſt, they throw on it as much ſand and powder of cockle-ſhells as it will retain. Thus it is coated over with a rough cruſt which will defend it from all kinds of injuries. See the article SULPHUR.

Green *Timber* is apt to ſplit and cleave in ſeveral places, after it is wrought into form. Workmen have different methods of remedying this deformity, for which ſee the article CLEFTS.

Felling of TIMBER. See the article FELLING.

Hardening of TIMBER. See the article HARDENING *of Timber*.

TIMBER-*Lode*, in our old writers, a ſervice by which tenants were to carry *Timber* from the woods to the lord's houſe. *Blount*.

Meaſuring of TIMAER, To meaſure round *Timber* without the help of inſtruments: let the mean circumference be found in feet, and decimals of a foot; ſquare it, multiply this ſquare by the decimal 0.079577 and the product by the length. For inſtance, let the mean circumference of a tree be 10.3 feet, and the length 24 feet; then $10.3 \times 10.3 \times 0.079577 \times 24 = 202.615$ = the number of cubical feet in the tree. The foundation of this rule is, that, when the circumference of a circle is 1, the area is 0.0795774715, and that the areas of circles are as the ſquares of their circumferences. Treat. Pract. Geom. p. 150.

The common way uſed by artificers for meaſuring round *Timber*, mentioned in the Cyclopædia, differs much from this rule. One fourth part of the circumference or girt, is by them reckoned the ſide of a ſquare, whoſe area is equal to that of the ſection of the tree; they therefore ſquare the girt, and then multiply by the length of the tree. According to this method the tree of the laſt example, would only be computed at 159,13 cubical feet.

TIME *(Cycl.)*—TIME, in the manege, is ſometimes taken for the motion of a horſe, that obſerves meaſure and juſtneſs in performing a manege; and ſometimes it ſignifies the interval between two of his motions. In the manege of a ſtep and a leap, the horſe makes by turns a corvet between two caprioles; and in that caſe the corvet is one *Time* that prepares the horſe for the caprioles.

The *Times* obſerved in making a ſtop, are nothing but ſo many falcades.

TIME alſo ſignifies the effect of one of the aids, thus, we ſay, a good horſeman diſpoſes his horſe for the effects of the heel, by beginning with one *Time* of the legs, and never runs precipitately upon his *Times*.

TIMOROSO, in the Italian muſic, intimates that the ſong is to be played or ſung, in ſuch a manner as to expreſs an awe or dread, either to ſhew reſpect, or to repreſent fear.

TIMOROUS, in the manege. See the articles STARTING, SKITTISH, *&c.*

TIN *(Cycl.)*—The combinations and ſeparations of metals, are ſubjects that have employed the thoughts of the moſt accurate chemiſts in all ages; yet new diſcoveries are ſtill to be made, and in theſe experiments as well as in many others, we are by no means yet arrived at the utmoſt perfection.

Mr. Groſſe in the memoirs of the academy of ſciences of Paris, has delivered a method he had invented of ſeparating *Tin* from lead or ſilver.

The advantages ariſing from the mixtures of different metals, are very numerous and of many different kinds; to this we owe the metal uſed for bronzes, for bells, for reflecting mirrors uſed in opticks, and a multitude of the like matters; a mixture of this kind makes braſs of copper, a little copper in the ſame manner, gives ſilver a hardneſs that greatly adds to its utility, and gives hardneſs and a more pleaſing colour to gold; a little copper or antimony give *Tin* a hardneſs, and render it more ſonorous: and a multitude of advantages beſides might be enumerated. But there is no leſs neceſſity and advantage alſo in the ſeparating metals, ſometimes when they have been joined by art, or are found united by nature: in theſe caſes ſometimes both the metals are preſerved, ſometimes the baſer or leſs valuable is deſtroyed.

Of theſe ſeparations of metals ſome are very eaſy: lead and mercury are ſeparated from gold and ſilver by heat alone, and ſo are antimony from gold, or zink from copper. On the other hand there are ſome ſeparations which cannot be effected without great trouble; of this kind are the mixtures of *Tin* with lead and with ſilver. It is not common to mix ſilver and *Tin* together on any occaſion; but they are ſometimes found mixed, and give the refiners great trouble; and even the chemiſts, who have often mixt *Tin* with ſilver to increaſe it, have always found it very difficult to ſeparate it again.

Mr. Groſſe happened to be preſent at the melting ſome ſilver, which plainly indicating that it contained ſome other metal, in the refining he ordered the workman to examine the lead which he uſed, and found that there was *Tin* among it. The ſcoriæ of the metal, which contained with the *Tin* a large quantity of ſilver, had on theſe occaſions been uſed to be ſold to the bell-founders, to the great loſs of the proprietor of the metal. Some indeed had adviſed different methods of recovering the metal from them, but without ſucceſs. It was on theſe ſcoriæ that Mr. Groſſe tried his experiment; it ſeemed to him that one great ſtep toward the ſeparation of the ſilver, was the haſtening the calcination of the *Tin*, and with this view he tried a mixture of charcoal, ſalt-petre, and earth, which he put together into the copel with the ſcoriæ. It is eaſy to ſee that a detonation would happen from this, and this muſt greatly add to the force of the fire, in acting upon the ſcoriæ, while the ferrugineous matter well known to be contained in the charcoal mixed itſelf with the *Tin*, and muſt greatly accelerate its calcination, divide its parts, and give the fire a new action over it. The conſequence of this perfectly anſwered expectation, and recovered a large quantity of ſilver from the ſcoriæ, in which the *Tin* had before held it firmly imbodied; repeated experiments proved the truth of this obſervation, and it was found to be eaſy by this means at any time to ſeparate ſilver from *Tin*, or to purify ſilver without loſs, by means of lead in which *Tin* has accidentally been embodied. The common method uſed by the plumbers to ſeparate their ſolder from old leaden pipes, *&c.* might ſeem an eaſy way of ſeparating *Tin* from lead, but this is not truly the caſe; the *Tin* in this inſtance not being ſeparated from the lead, but only a mixture of *Tin* and lead, which had been employed as ſolder is ſeparated from ſimple lead, which had been ſoldered with it. The method of making this ſeparation, is only by melting the ſolder off from the ſimple lead by a fire not ſtrong enough to melt the lead itſelf.

The ſcoriæ in which *Tin* is mixed with ſilver, are compoſed of *Tin* half calcined, and run into an opake vitrified ſubſtance, which forms a ſort of net-work, in which the ſilver is confined in extremely ſmall particles. If this is thrown into aqua fortis, the whole is diſſolved: but then it requires a very ſtrong fire to make the *Tin* loſe its metallic form; finally if the whole is finely powdered and then put into this menſtruum, the ſilver only is taken up or diſſolved, the *Tin* remaining untouched at the bottom of the veſſel.

The ſame gentleman found alſo a method of ſeparating *Tin* from ſilver, by means of corroſive ſublimate of mercury. To conceive the manner in which this ſeparation is effected, a piece of fine *Tin* need only be caſt into a ſolution of ſublimate; in which caſe the acid of the ſea-ſalt is ſeen to leave the mercury in order to fix upon the *Tin*.

And, according to the ſame principle, if ſublimate corroſive be added to a mixture of *Tin* and ſilver, the ſame effect is produced, the acid affixes itſelf to the *Tin*, and makes with it a butyrum joviale or butter of *Tin*, the mercury becomes diſſipated in the mean time by the action of the fire, and the ſilver remains pure and alone; but in this experiment, if too much corroſive ſublimate be added, there is danger of loſing ſome of the ſilver; ſince the abundant acid will prey upon and carry off a part of that metal, making a ſort of luna cornea which diſſipates itſelf in the air, or if the operation be performed in a cloſe veſſel, a butyrum lunare.

Gold may alſo be purified from *Tin* in this manner, and in this there is no riſk of loſs, ſince the acid which takes up the *Tin* has not the leaſt power over that metal: In all theſe proceſſes, however, the operator muſt avoid the fumes iſſuing from the crucible, for they are very dangerous.

Theſe methods of ſeparating *Tin* from ſilver are very certain and infallible, but they are too expenſive to be employed in common, and in larger works.

The ſeparating *Tin* from lead to be employed in the refining of ſilver is a matter of great importance; and this may be done in the following manner: Melt the lead, and when in fuſion throw into it a quantity of filings of iron, then increaſe the fire to a conſiderable degree, and the ſurface of the metal will be covered with a ſort of ſcum, which is no other than the iron and *Tin*. At this time there ſhould be a little alkali ſalt thrown in, and by this means the ſcoriæ readily ſeparate themſelves, and the pure lead remains in form of a regulus at the bottom. The ſame method may be uſed to ſeparate *Tin* from ſilver in the larger way, but it will be neceſſary for this purpoſe to add ſome lead, ſince otherwiſe the fuſion will be very ſlow and difficult, and the *Tin* will calcine without ſeparating from the ſilver. This is a very eaſy and very cheap method, and will obviate moſt of the miſchiefs which happen to the refiners, of which they would have much leſs frequent reaſon to complain, if they nicely examined the lead they were to employ. But if gold or ſilver be mixed with *Tin*, the ſhorteſt method in ſmall quantities is to calcine the whole very briſkly, and in order to compleat the vitrification and ſeparation of the *Tin*, to caſt in a little glaſs of lead, which will immediately join itſelf with it and carry it off from the maſs.

It may ſeem ſingular that iron being one of the hardeſt of the metals to melt, and *Tin* being of all the eaſieſt, they ſhould ſo readily and eaſily unite in theſe experiments; but this ſeems to be the reſult of one of thoſe natural and unexpected alliances which accident frequently diſcovers to us in bodies. There is one conjecture, however, that may be worthy a place in this reſearch, which is, that all *Tin* ore contains a quantity of arſenic, and it is well known that iron very readily mixes with arſenic, and is employed to ſeparate the arſenic from other ores, and a regulus may be formed of arſenic and iron. It is eaſy to ſuppoſe that *Tin* is in its metalline form, not wholly diveſted of the arſenic it contained when in the ore, and if this be allowed,

lowed, it is no wonder that the two metals are eaſily brought together by the mediation of that principle. Memoirs Acad. Scienc. Par. 1737.

Mr. Cramer gives the practical rules of ſeparating ſilver from *Tin*, thus: Divide one centner of *Tin* into two equal parts; put each of theſe into a ſeparate teſt, and add to each ſixteen centners of granulated lead, and one of copper; put the whole under the muffle, and make a very ſtrong fire; the *Tin* will be calcined immediately, and will ſwim upon the lead. Then diminiſh the fire a little, till the aſhes of the *Tin* that ſwim upon the ſurface do no longer ſparkle; when you ſees this, add with a ladle two centners of glaſs of lead to each teſt, in ſuch manner that it may be ſpread wide over the whole ſurface of the rejected calx; the calx will then change its form of powder into that of glaſs; then increaſe the fire to its higheſt degree, ſtir up the whole with an iron rod made warm; and when the ſcorification is perfected, pour out the maſs into a mould; the ſcoriæ being ſeparated, put both the regulus's into two coppels well heated; and into a third put ſixteen centners of lead, and one of the ſame copper uſed in the proceſs; examine all theſe beads after the coppelling is over; if the two firſt weigh exactly alike, 'tis a proof the proceſs has been well performed, and ſubſtracting the weight of the bead, ſeparated from the third pan, from the joint weight of the other two, the remainder is the weight of the pure ſilver contained in the quantity of *Tin* which was examined. *Cramer*'s Art of Aſſaying, p. 228.

Tin eaſily melts with ſilver, gold, or copper; but when they are mixt with it in equal or leſs quantity, it renders them extremely brittle. Silver is peculiarly ſuſceptible of this miſchief, and becomes almoſt as brittle as glaſs, by the admixture of a very ſmall quantity of *Tin*. Much greater quantities of *Tin*, however, in ſome metallic maſſes, leaves them ſtill pliant in ſome degree. Ten parts of *Tin*, and one part of copper, melted together, make a maſs more rigid than pure *Tin*, but ſtill ſomewhat tractable; and it is by this artifice, that veſſels and utenſils are made of tin, and yet are found conſiderably hard.

If to ten parts of *Tin*, and one part of copper, a little zink or braſs be added, it makes a very ſonorous metal, but brittle. This is ſometimes the mixture uſed as bell-metal, and cannons are in ſome places caſt of it. Lead becomes ſomewhat more rigid, or leſs ductile than before, by being mixed with *Tin*; but of all the metals it ſuffers the leaſt by the mixture.

If filings, or thin plates of iron, be made red hot in a crucible, and a double quantity of *Tin* put to them in a great fire, the whole will run into a brittle white regulus, which will yield to the magnet.

The vapours of *Tin* are very noxious to ſilver, gold, and copper, rendering them all brittle; nay, if only a little *Tin* be put into the fire, in which they are to be melted, they become brittle as ſoon as red-hot, and will break like glaſs under the hammer.

This metal, expoſed to the focus of a powerful burning-glaſs, melts, and emits a thick white fume, and, if held there a long time, wholly diſſipates itſelf in that fume. If, on the contrary, this metal be fuſed in a coppel by the ſame heat, it fumes conſiderably, and its ſurface becomes covered with a white calx, which greatly rarifies and expands, and there finally appear numbers of cryſtalline and bright ſtriæ like needles in that calx. If this be continued in the focus on a piece of free-ſtone, theſe cryſtals ceaſe to fume, and remain fixed while the ſtone itſelf melts and runs. And in the coppel there is uſually a part of theſe run into a reddiſh matter, reſembling a ſort of enamel. If the calx of *Tin* (that is, *Tin* reduced to a grey powder, by being diveſted of a part of its oil in the fire) be expoſed to the focus of the burning-glaſs, it fumes more than plain *Tin*, and is very ſoon transformed into cryſtalline ſtriæ, or needles. And if theſe are again expoſed to the ſame focus, placed on a piece of charcoal, they readily melt, and again aſſume the form of common *Tin*. The charcoal, in this caſe, furniſhes to the calx of *Tin* that oily matter which the fire had diveſted it of; and it is well known, that if the calx of *Tin* be made red hot in a crucible, and any fatty or inflammable matter be added to it, it immediately reſumes the form of *Tin* again; this reduction is wholly upon the ſame principle with the other, the oil of charcoal doing in the firſt, what the fat does in the laſt.

It appears, upon the whole, that *Tin* contains an oily matter, which is eaſily driven off by fire, and very eaſily received again on the mixture of any fat ſubſtance; that the earthy matter, which is the baſis of *Tin*, is of a cryſtalline nature, and very hard to fuſe, ſince no common fire can vitrify *Tin* alone; and even the focus of the moſt powerful burning-glaſs does it but with great difficulty, and imperfectly; this ſemi-vitrification is what throws the calx into needles, whereas were it perfect, the whole would be one uniform maſs, Mem. Acad. Par. 1709.

TIN, in medicine, though greatly celebrated by the writers of many paſt ages, is not much eſteemed at preſent. It is ſaid to be good in convulſions, epilepſies, and the madneſs ariſing from the bite of a mad dog. Its preparations are theſe: 1. *Stannum pulverizatum*, or powdered *Tin*. 2. *Sal Jovis*, or ſalt of *Tin*. 3. *Diaphoreticum Joviale*, or antihectic of Poterius. 4. *Aurum muſivum*, or, as it is commonly called, *moſaicum*, moſaic gold.

The powder of *Tin* is ſaid to be a good remedy againſt worms, particularly of the flat kind, which often elude the force of other medicines. See the article WORM.

TIN is alſo a word uſed by ſome of the chemical writers to expreſs ſulphur.

TIN *Floors*, a contrivance uſed by our huſbandmen who propagate hops, to dry them after the gathering. The common way of doing this, is either on a hair-cloth on a malt-kiln, or elſe by the ooſt. See the article OOST.

In both thoſe ways, however, the hops ſuffer very much; the beſt way is by the *Tin floor*. It is thus done: Let a ſquare brick room be built, with a door on one ſide, and a long fire-place of a foot wide in the middle, reaching almoſt acroſs it; let holes be made at the ſides of this fire-place, to let out the heat into the room; and at the height of five foot above this let a floor be made of laths of an inch thick, laid lattice-wiſe. Let this be covered with great plates of double *Tin*, taking care that the joinings of the *Tin* be well ſoldered, and lie upon the laths, not over the interſtices, which may be about four inches wide. Let a row of boards be fitted round the edge of this floor, to keep the hops from falling off, then lay on a covering of hops of a foot thick; then make a ſmall fire of charcoal in the mouth of the fire-place, and the hops will dry very quick and very regularly. They may be continually ſtirred about while drying, and when enough, a part of the boarded edge of the kiln may be taken down, and the dried parcel thruſt out, and a freſh parcel laid on in their place. A very ſmall quantity of fuel is ſufficient in this way, and any fuel will do, for the ſmoke never comes at the hops. There is a very great improvement ſtill upon this method of drying hops, uſed by ſome people; this is the making a wooden cover, of the ſize of the *Tin floor*; this is covered with plates of *Tin* nailed on, and is ſuſpended over the kiln in ſuch a manner, that it may be let down at pleaſure, when the lower parts of the hops are dry. This is to be let down within ten inches of their ſurface, and there it acts as a reverberatory, and drives back the heat on the upper ones, ſo that they are dried as ſoon as the lower ones. Thus all the trouble of turning is ſaved, and the hops are much better dried than in any other way. *Mortimer*'s Huſbandry, p. 186.

TIN *Hatch*, in mining, a term uſed by the people of Cornwall, to expreſs the opening into a *Tin* mine. They alſo call it a *Tin-ſhaft*.

They make ſeveral openings in the ſides of the hills where they ſuſpect veins of ore to be. All theſe, except that which opens on the head of the mine, are called *eſſay-hatches*; but that which does ſo, is made their entrance afterwards, and changes its name to that of the *Tin-hatch*.

TIN *Ore*. The firſt proceſs toward the ſeparating the metal from this ore, is the roaſting it, which the aſſayer performs in this manner: Put ſix centners of *Tin* ore in coarſe powder in a teſt, under a muffle made thoroughly red hot, ſhutting firſt the veſſel for a few minutes, and then opening it. If the fire is pretty ſtrong, the volatile part will be ſeen expelled in a thick white ſmoak, ſmelling like garlic. When this is over, take out the teſt, and when the ore is cold, beat it to powder, and roaſt it again in a ſomewhat ſtronger fire, till it exhales no more arſenic, which may be known by putting upon the teſt, when juſt taken from the fire, a thick cold plate of iron, which will be covered on its under ſurface with a ſmall whitiſh cloud, if the ore yet exhales any arſenic. *Cramer*'s Art of Aſſaying, p. 332.

When the roaſting is thus finiſhed, the ore may be run into malleable *Tin* in the common manner, as the common lead ore is, only with this caution, that the fire in the operation be carried as ſoon as poſſible to the higheſt degree that is neceſſary here, and the veſſel taken out of the fire, as ſoon as the operation is judged to be finiſhed.

TIN *Plates*, an article of manufacture very common among us, and vulgarly called *Tin*. It is iron plated over with *Tin*. The French call it *fer blanc*, white iron, as we ſometimes do in England. It was once known under a diſtinct name, *latin*. See the article LATIN.

TINA, a name given by the old medical writers to a bath made of a ſtrong decoction of many carminative ingredients, to be uſed in the colic.

TINCA, the *Tench*. See the article TENCH.

TINCA *Marina*, the *Sea-Tench*, in zoology, a name given by ſome authors to the common *turdus*, called in Engliſh, the *wraſſe*. *Willughby*'s Hiſt. Piſc. p. 320. See the article WRASSE.

TINCTURE *(Cycl.)*—A general rule for the properly making light *Tinctures* may be taken from the following bitter. Take half an ounce of Seville orange-peel ſhaved thin, half a dram of gentian-root thin ſliced, a ſcruple of the tops of Roman wormwood, half a dram of cardamum-ſeeds, and the ſame quantity of cochineal, each of them lightly bruiſed; put theſe ingredients into a pint of French brandy, let them ſteep for one night, and filter the liquor the next morning, and thus you have a fine light bitter.

Theſe

Theſe bitters are of the number of many other ſubſtances, where the goodneſs of a *Tincture* does not more depend upon the choice of the ingredients, than upon the manner of their being infuſed; for if ſuch be ſuffered to remain too long in the menſtruum, or if heat be uſed in extracting the *Tincture*, the groſs, terreſtrial, and nauſeous parts of the ingredients will be fetched out, and the *Tincture* will thus be loaded with a heavy indolent matter of little virtue. *Shaw*'s Lectures, p. 202.

If however, a greater ſtrength be required in the *Tincture* than can be procured by ſo ſlight an infuſion, when the ingredients are of this nature the matter ſhould never be ſuffered to be heated or ſtand long on the ſame ingredients, but ſhould be when ſtrained off, poured on freſh ones, and ſo on till of any ſtrength deſired, yet perfectly free from the groſſer parts.

Apothecaries uſually commit the ſame error in their finer *Tinctures*, that they do in their cordial waters, ſaturating the liquor in both caſes with the groſſer and more uſeleſs part of the ingredients: whence the cordial waters of the ſhops too often abound with a groſs heavy oil, and the *Tinctures* with a groſs heavy earth, or kind of bituminous matter, inſtead of the briſk, lively, and invigorating ſpirit, which alone is the thing required in both caſes.

To extract the *Tinctures* of hard, reſinous, or gummy bodies, however, requires a different treatment, and muſt be effected in another manner. See the article GUM-*Lac*.

A great variety of *Tinctures* may be given to common water, and many remarkable things occur in their changes on the addition of common menſtruums. Take a large ſpoonful of the ſyrup of pomegranate-flowers, mix it with five ſpoonfuls of water; the mixture will be of a very lively and brilliant red: for a violet colour, take the ſame quantity of ſyrup of violets and the ſame of water. When theſe *Tinctures* are thus prepared have at hand a vial in which is a ſmall portion of oil of tartar, which will only look like water remaining after the waſhing of the vial. Pour the red or the violet *Tincture* into this vial, and it immediately becomes a fine graſs green. Diſſolve the quantity of a walnut of crude ſal armoniac in a glaſs of water, pour all out except three or four drops at the bottom, and pour into this glaſs the fine red liquor, and it immediately becomes black as ink. In order to change the purple liquor red, only have a ſmall quantity of ſpirit of vitriol in the bottom of a vial, and pour into this; the violet water it immediately on this becomes of a florid red.

Steep Braſil wood in common water, or in white wine twenty hours, the liquor will then look of the colour of red wine; pour this into a glaſs waſhed with vinegar and it becomes of a fine yellow, like ſack. If this experiment be made with white wine, the wood and the vinegar make ſo little alteration in it, that it may be drank afterwards, and the whole proceſs ſeems a way of turning red port into ſack. Into this liquor when yellow, drop a few drops of a *Tincture* of benjamin made in ſpirit of wine, and it immediately loſes its yellow colour and becomes white. Beat ſome galls to fine powder, and rub the powder on a towel, then put into a baſon of water, in which any perſon is going to waſh their hands and face, a ſmall piece of common green vitriol, or copperas, after the perſon has waſhed, let them have this towel to wipe on, and the hands and face will be as black as if waſhed with common writing ink. The copperas in the water and the galls on the towel making real ink where they mix. This does no laſting injury to the ſkin, but will come off again upon waſhing with ſoap. Phil. Tranſ. N°. 238. p. 88.

TINCTURE *of Ambergreaſe*. See the article AMRERGREASE.

TINCTURE *of Antimony*, *Tinctura Antimonii*, is thus made; take ſalt of tartar a pound, antimony half a pound, rectified ſpirit of wine a quart; reduce the antimony to powder, and mix it with the ſalt by fuſion over a ſtrong fire. When it is cold, powder it, and pour on the ſpirit of wine; digeſt them together three or four days in a ſand heat, and then filtre off the clear *Tincture* for uſe. The ſalt of tartar yields a *Tincture* as well as the antimony. It is a diaphoretic and attenuant.

TINCTURA *Antiphthyſica*. See TINCTURA *Saturnina*.

TINCTURA FOETIDA, the ſtinking *Tincture*, a form of medicine in the late London Diſpenſatory prepared in this manner; take aſſafœtida four ounces, rectified ſpirit of wine a quart, digeſt them together for ſome time, and then ſtrain off and filtre the *Tincture* through paper.

TINCTURA *Martis cum Spiritu Salis*, a medicine thus prepared: take filings of iron half a pound, Glauber's ſpirit of ſea-ſalt three pounds; digeſt all together without heat, as long as the ſpirit will work upon the filings; then after the fæces have ſubſided, pour off the clear liquor, evaporating it to one pound, and adding rectified ſpirit of wine three pints.

This *Tincture* is good in all the caſes, in which the *ſal martis* is ſo. See the article SAL *Martis*.

TINCTURA SACRA, a *Tincture* of aloes, called alſo *hiera picra*.

The late London diſpenſatory have ordered this to be made of only eight ounces of aloes, and two ounces of winter's bark, powdered and put into five quarts of white wine, which is to be ſhook often, and kept in fuſion a week or more without heat, and then ſtrained off for uſe. *Pemberton*'s Lond. Diſp. p. 266.

It is a very good method to mix ſome clean white ſand with this, to prevent the aloes from running together in lumps.

TINCTURE *of Saffron*. See the article SAFFRON.

TINCTURA SATURNINA, the lead *Tincture*, a name given in the late London diſpenſatory to the *Tincture* before called *Tinctura Antiphthiſica*.

It is made of ſugar of lead and green vitriol, each two ounces; of rectified ſpirit a quart. The ſalts are ſeparately to be reduced to powder and then put into the ſpirit, then the whole is to ſtand ſome days without heat to extract the *Tincture*, and afterwards filtered through paper. *Pemberton*'s Lond. Diſp. p. 277.

Many perſons have found great perplexity in making this *Tincture*, it having at firſt begun to ſhew a good colour, but afterwards loſt it; this accident is owing to heat uſually employed in making the *Tincture*.

This *Tincture* is a powerful ſtyptic, and is often uſed with good ſucceſs in hectic fevers, ſpittings of blood, heat of the kidneys, ſimple gonorrhœas, fluor albus, and tabes dorſalis.

It was firſt recommended by Etmuller; who from its effect gave it the name of *Tinctura antiphthyſica*, which our college of phyſicians have changed to that of *Tinctura Saturnina*. We alſo find it in the pharmacopœa of Edinburgh, and in the beſt of the foreign ones. Mr. Boyle recommends it, and our moſt eminent phyſicians uſe it; notwithſtanding that ſome authors conſider it as a dangerous medicine, on account of its principal ingredient, the *ſaccharum ſaturni*, which ſome call a ſlow poiſon. Whether it be ſo or not when given in ſubſtance, it is certain, that there is a great difference between a corroſive ſalt ſo given, and a *Tincture* made of the ſame, in ſpirit of wine, and given in ſmall doſes, as Dr. Mead obſerves. Who adds, that in ſlow hectic fevers attended with a looſeneſs, profuſe ſweats, and a colliquation of the humours, he reckons two or three drachms, given at different times in cooling liquors every twenty-four hours, to be a convenient doſe. But the uſual doſe is thirty drops in Briſtol water, or ſome temperate or cool julep. See *Acc. of a medical controverſ. in the City of Cork*. p. 58, 59.

TINCTURA *Sénæ*, a form of medicine preſcribed in the new London pharmacopœa, and intended to ſtand in the place of the medicine commonly called elixir ſalutis, and Daffy's elixir. It is thus made, take ſtoned raiſins ſixteen ounces, leaves of ſena a pound, carraway ſeeds an ounce and half, cardamom-ſeeds half an ounce, proof ſpirit a gallon; digeſt all together without heat, and when the *Tincture* is well extracted preſs off the ſpirit and filtre it for uſe. *Pemberton*'s Lond. Diſp. p. 278.

TINCTURA *Styptica*, a form of medicine made with very little trouble and apparatus, and ſerving to ſupply the place of that elaborate preparation the *Tincture* of Helvetius; it is preſcribed in the late London pharmacopœa, and is to be made by mixing a dram of calcined green vitriol with a quart of French brandy *Tinctured* by the caſk, this is to be ſhook together that the brandy may turn black, and then ſtrained off for uſe. *Pemberton*'s Lond. Diſp. p. 280.

TINCTURA *Thebaica*, a name now given to the *Tincture* of opium, commonly called *laudanum*.

The method of making this is alſo much altered, as well as the name in the late London diſpenſatory, where the ſaffron being looked on as an uſeleſs ingredient is wholly left out, and the medicine ordered to be prepared in the following manner: Take of opium ſtrained two ounces, of cinnamon and cloves each a dram, white wine a pint, infuſe without heat a week and then ſtrain off the wine through paper. *Pemberton*'s Lond. Diſp. p. 266.

TINCTURES, in heraldry, a word uſed to expreſs colours, red, blue, green, and the like.

The writers on heraldry have had great diſputes about which of theſe colours or *Tinctures* are the moſt honourable. All agree in giving the pre-eminence to the metals gold, and ſilver that is to the yellow and white colours; as to the others, ſome eſteem them more noble as they approach more to light, that is to whiteneſs. Upton on this account ranges them thus; azure or blue, gules or red, purpur or purple, vert or green, ſable or black; others wholly diſſent from this, and prefer thoſe colours moſt which can be ſeen at the greateſt diſtance; with theſe, ſables or black is the moſt honourable or firſt colour; and they alledge the imperial black eagle, placed in a white field as an inſtance of this. Leigh prefers the red to the blue, as the red has ſome alliance to gold, and the blue to ſilver; the ſable is generally preferred to green and purple, by thoſe who give the red and blue the firſt places: it is in this eſteem on account of its ſtrong appearance; and green is preferred to purple, becauſe the latter is but of very late uſe in heraldry, and is called a new colour.

All the precedence given to *Tinctures* muſt however be conſidered with this ſpecial proviſo, that there is no particular reaſon for bearing them otherwiſe in the arms of kingdoms and families. In all coats of arms there ſhould be two colours or *Tinctures*; and it is the general rule that the field ſhould be of a nobler colour than the figures placed upon it: thus

thus in the arms of Scotland the field is yellow, and the lion placed upon it red: and if the field conſiſts of two different colours parted by feſs or by pall, then the nobleſt colour muſt always be in the beſt place, as on the upper part, or on the right hand of the ſhield; but all theſe rules are to be underſtood with this limitation, that there are no other ſpecial reaſons in the family for the contrary. *Neſbit*'s Heraldry, p. 19.

TINEA *(Cycl.)*—TINEA *Campeſtris*, the *field moth*, in natural hiſtory, the name given by Mr. de Reaumur to a ſpecies of inſect, which in all reſpects reſembles the *moth* ſo deſtructive of cloaths, except in its food; as that feeds upon woollen, and makes its neſt or covering of that ſubſtance; this eats the leaves of trees, and in the ſame manner makes itſelf a covering from the fibres and integuments of them.

Their changes are the ſame with thoſe of the common moth, and performed in the ſame manner; they only ſeem to differ in having a more moiſt food.

Mr. Reaumur firſt obſerved theſe on the leaves of the aſh. This creature for a great part of its life wants no covering, but like the aſcarides making its way through the upper integument of the leaf, it feeds on the parenchyma and juices; at length when it has eat away all the ſubſtance of the leaf, it bites out a piece from each integument of it, over and under its body, and faſtens the edges all round with threads of its own ſpinning; thus making a compleat caſe or covering, enabling it to bear the open air. This done, it marches from its place to find another leaf fit to ſupply it with more nouriſhment: thus it changes place ſeveral times during its life, and as often changes its covering, which requires but a very little time to make a new.

This creature may eaſily be found by the curious ſearcher in the ſpring; for at that time, if the leaves of the aſh are examined, many of them will be found flaccid and as it were dry, and the creature will uſually be found buried among the parenchyma of theſe, between their two integuments. Toward the end of ſummer theſe creatures paſs into the chryſalis ſtate, and from this, after a ſhort ſtay, into a ſmall ſort of moth, which flies about the leaves of the ſame tree; and is very beautiful when examined by the microſcope, but is too ſmall for obſervation by the naked eye. Theſe of the aſh are very common, and there is alſo another kind little leſs ſo, which at length changes into a two-winged fly, very ſmall but of very great beauty; theſe feed upon the leaves of the willow, and make their caſes of the downy matter which envelops its ſeeds.

Theſe are ſmall animals of this genus; but there are others which are conſiderably larger, and which make their coverings of various matters and of different ſtructure; they are uſually very rough and rugged, and ſeem made of any matter that happens to be in the way; ſome ſpecies uſually make them of pieces of ſtraw and particles of chaff, others of ſmall twigs of buſhes, others of the dry leaves of the oak, broom, and other plants. One ſpecies there is that erodes wood; but it never pierces deep into it, but only eats off a part of the ſurface to furniſh itſelf with matter for its covering. Several ſpecies of theſe alſo are inhabitants of the water in this ſtate: theſe form their caſes of various materials, in the choice of which they do not ſeem at all nice. Some of them make them principally of ſand; others take the fragments of water-plants, and the ſhells of ſmall freſh water ſhell-fiſh into their work. This caſe makes the ſhell, under which they ſuffer their change into the nymph-ſtate; and as according to the general rule of nature, in regard to the water nymphæ of winged animals, theſe have a neceſſity of taking in water at times, one end of this ſhell or caſe is never cloſed up, but only covered with a reticular cloſe work. In this ſtate they float upon the ſurface of the water, till the time of the perfect fly's appearing. There are beſide theſe, alſo a ſpecies of wall *Tinea*, which have been ſuppoſed by ſome to eat the very ſtones and other materials of which the walls they crawl upon are built. This however is an error, for they feed only on the liverworts and other plants which grow upon them, and make their caſes out of the integuments of their leaves, and of the fibres of moſſes and other things they find there. There is yet another ſpecies of theſe moths feeding on vegetables which differs from all theſe, in that it ſpins its covering of a ſort of ſilk, which it produces out of its own entrails in the manner of the ſilk-worm. Theſe caſes are not made ſo ſpeedily as the others, but are formed of ſeveral ſcales applied at different times one over another, and reſemble a ſort of coat of armour. Under the cover of this the creature feeds at large on ſeveral ſorts of vegetables, and when it has lived the deſtined time in this ſtate, it draws its whole body under this covering, faſtens up the apertures, and thus defended from injuries paſſes into the nymph ſtate, and after a proper time is ſeen iſſuing out of that in form of an inſect of a middle nature, between the fly and butterfly, called a muſco-papilio.

There is a ſpecies of *Tinea* or moth, found in the flowers of the lillies in many gardens, which uſes its own dung as the matter to form its caſe of. This ſpecies at length becomes a beetle.

Another ſmall beetle of a purple colour, and very remarkable for its beauty, is produced from a ſmall worm of this moth kind, which is as remarkable for its uglineſs; this has three pair of cruſtaceous feet, as the other worms of the beetle kind have: both theſe kinds, while in the *Tinea* or worm ſtate, collect together all their dung as they void it, and, by a very nice ſort of workmanſhip, form themſelves very compact and firm caſes of it, which they drag about with them where-ever they go.

Finally there is another field *Tinea*, the beetle produced by which is of a purple colour on the body, and black in every other part. This, while in the worm ſtate, covers itſelf with a caſe made of its own dung, but has this ſingularity, that when the time of its change approaches, it deſcends to the ground, and buries itſelf there till the time that it comes out in form of a beetle.

All theſe animals might have been deſcribed as the dependants on the beetle and fly kinds; but as they have this remarkable quality of feeding in the ſame manner, and making themſelves caſes of different materials in the manner of the *Tinea* or cloaths moth while in the worm ſtate, and in this ſtate they are much more obvious to the eye than the flies, beetles, *&c.* produced of them, many of which are ſo ſmall as to eſcape obſervation; this accurate author has choſen to deſcribe them together, and in this their impefect ſtate. He adds an account of another ſet of animals ſomewhat allied to them, which he therefore calls the *pſeudo-Tinea*, or falſe moth. *Reaumur*, Hiſt. Inſ. Tom. I. See the article PSEUDO-*Tinea*.

TINEMAN, in our old writers, a petty-officer in the foreſt, who had the nocturnal care of vert and veniſon, and other employments in the foreſt. Leg. *Canut.* ap. *Blount.*

TINET, *Tinettum*, in our old writers, is uſed for bruſhwood and thorns to make and repair hedges. In Herefordſhire to *tine* a gap in a hedge is to fill it up with thorns, that cattle may not paſs through it. Chart. *Blount.*

TINEWALD, the parliament or annual convention of the people of the Iſle of Man, of which this account is given; the governour and officers of that iſland do uſually ſummon the twenty-four keys, being the chief commons thereof, once every year, *viz.* Upon Midſummer-day at St. John's chapel, to the court kept there, called the *Tinewald*-court; where, upon a hill near the ſaid chapel, the inhabitants of the iſland ſtand round about the plain adjoining; and here the laws and ordinances, agreed upon in the chapel of St. John, are publiſhed and declared unto them. At this ſolemnity the lord of the iſland ſits in a chair of ſtate with a royal canopy over his head, and a ſword held before him, attended by the ſeveral degrees of the people, who ſit on each ſide of him, *&c.* *King*'s Deſcipt. of the Iſle of Man.

TINGING *of Marble*. The art of doing this has in ſeveral peoples hands been a very lucrative ſecret, tho' there is ſcarce any thing in it that has not at one time or other been publiſhed.

Kircher has the honour of being one of the firſt, who publiſhed any thing practicable about it. This author meeting with ſtones in ſome cabinets ſuppoſed to be natural, but having figures too nice and particular, to be ſuppoſed of nature's making, and theſe not only on the ſurface, but ſunk through the whole body of the ſtones, was at the pains of finding out the artiſt who did the buſineſs; and on his refuſing to part with the ſecret on any terms, this author with Albert Gunter a Saxon endeavoured to find it out; in which they ſucceeded at length very well. The method is this,

Take aqua fortis and aqua regia of each two ounces, ſal armoniac one ounce, ſpirit of wine two drams, about twenty-ſix grains of gold, and two drams of pure ſilver, let the ſilver be calcined and put into a vial, and pour upon it the aqua fortis, let this ſtand ſome time, then evaporate it, and the remainder will firſt appear of a blue and afterwards of a black colour. Then put the gold into another vial, pour the aqua regia upon it, and when it is diſſolved evaporate it as the former. Then put the ſpirit of wine upon the ſal armoniac and let it be evaporated in the ſame manner. All the remainders and many others made in the ſame manner from other metals diſſolved in their proper acid menſtrua, are to be kept ſeparate and uſed with a pencil on the marble. Theſe will penetrate without the leaſt aſſiſtance of heat, and the figure being traced with a pencil on the marble, the ſeveral parts are to be touched over with the proper colours, and this renewed daily till the colours have penetrated to the deſired depth into the ſtone. After this the maſs may be cut into thin plates, and every one of them will have the figure exactly repreſented on both ſurfaces, the colours never ſpreading: The niceſt method of applying theſe, or the other *tinging* ſubſtances, to marble, that is to be wrought into any ornamental works, and where the back is not expoſed to view, is to apply the colours behind, and renew them ſo often till the figure is ſufficiently ſeen through the ſurface on the front, though it does not quite extend to it. This is the method that of all others brings the ſtone to a nearer reſemblance of natural veins of this kind. *Kircher*'s Mund. Subter.

TINNITUS *Aurium (Cycl.)*—In the *Tinnitus*, the ear uſually receives ſounds which do not exiſt, or at leaſt which are not produced by the motion of the external air; and the ear be-

ing filled with a certain ſpecies of ſound, cannot admit other ſounds, unleſs they are very violent.

The antients imagined that this ſymptom was produced by the motion and agitation of the air which was included in the ear, and ſuppoſed this agitation to be occaſioned by flatulencies and vapours being conveyed into the ear, and that thoſe flatulencies aroſe either from the whole body, as in fevers; or from any particular part, as the ſtomach, or brain; or from pituitous humours lodged in the cavities of the ear; and from the differences of theſe they attempted to account for all the various noiſes heard in this diſorder, as if they were in ſome ſort real: but when we conſider the nature of the noiſes heard in this diſtemperature of the ear, ſuch as the loud roaring, or the murmuring of waters, and the jangling of bells, we ſhall eaſily conceive theſe can be no real ſounds; and it is indeed very evident that they do not ariſe from either wind, or any other matter, ſtriking the membranes externally.

As a *Tinnitus* conſiſts in the hearing a ſound which either is not real or exiſts only within the ear, in order to conceive the meaning of this, we are to conſider that the action of hearing conſiſts in the agitation of the immediate organ appointed for that purpoſe; and it is ſufficient to produce a ſound that that organ is agitated, whether it be by the air or not. In order to determine what may be the cauſe of this agitation, we need only examine what are the diſorders in which a *Tinnitus* uſually occurs; we ſhall find theſe to be inflammations, and abſceſſes of the tympanum and labyrinth, and the diſorders of the meatus auditorius. Inflammations of the tympanum and labyrinth neceſſarily produce agitations in the ſpiral lamina and in the ſemicircular ducts, either by tenſion of the membrances, or by the vapours which tranſpire, and mix themſelves with the air in the tympanum.

Acrid ſubſtances, worms, extraneous bodies, a conſtriction of the meatus ſucceeding a diſtenſion of the glands, and in general every thing that can cauſe in the meatus auditorius, pain, and the other ſymptoms before deſcribed, agitate the membrane of the meatus, and the membrana tympani; and this agitation is able to communicate itſelf to the immediate organ of hearing.

The ſecond ſpecies of *Tinnitus* is when we perceive a real ſound which is formed within the ear itſelf: thus we hear a humming noiſe when we ſtop our ears. This noiſe is cauſed by the friction of the hand, or by the compreſſion which influences the ſkin and cartilages, whoſe parts being put into motion may produce an agitation there. The elaſticity of the air alſo and the tranſpired matter from the hand, mixing with the internal air in the meatus, may alſo ſtrike the organ, tho' not ſtrongly, yet ſufficiently to occaſion a noiſe, as the offending matter is ſo near.

Commotions of the cranium, and diſorders which contract the meatus, may alſo cauſe a *Tinnitus* in the ear. Several perſons alſo are ſubject to a peculiar noiſe in the ear, which is plainly a pulſation; this uſually affects them moſt after exerciſe, and may very often be heard by other perſons, who place their heads near the diſeaſed perſon's ear: this is unqueſtionably the true pulſation of a dilated artery, ſince it always regularly keeps time with the heart.

There ſeem alſo to be ſome ſpecies of *Tinnitus*, in which, tho' the humming noiſe is very ſtrong, yet the organ of hearing is itſelf no way diſtempered; ſuch are thoſe of perſons in deliriums in fevers, and of ſuch as are ſubject to epileptic fits; theſe laſt uſually hear a humming in their ears, before they are attacked with a fit, and this ſeems wholly produced by the agitated ſpirits, which diſturb thoſe parts of the brain where the extremities of the auditory nerve terminate.

The *Tinnitus* are therefore of two kinds; the one proceeding from a diſtemperature of the organ of hearing, the other from a diſorder of the brain; and the cure is to be attempted accordingly. In the ſharper *Tinnituſſes*, which are uſually occaſioned by inflammations and pains in the ear, where the parts are uſually very tenſe and dry, we muſt uſe the ſame means as in acute pains, and tenſions of the membrana tympani; but in dull humming heavy noiſes, which are uſually occaſioned by rheums and ſuppurations, where the membranes are relaxed, we are to uſe the ſame remedies which give relief in pains occaſioned by cold: After which it will be no difficulty to chuſe the moſt proper, while we have a due regard to the circumſtances, from which the more juſt indications may be taken. *Du Verney.*

TINNUNCULUS, in zoology, the name of one of the long-winged hawks, called by others *Cenchris*, and in Engliſh, *Keſtrel*, *Stannel*, or *Windhover*.

It is about the ſize of a common pigeon. Its bill is ſhort, crooked, and very ſharp, and covered with a yellow ſkin at the top; near this the bill is white, elſewhere it is blue. Its tongue is bifid; its mouth very wide, and its palate blue. Its head is large and flatted, and is of an aſh-colour, with longitudinal ſtreaks of black. Its back and wings are brown, variegated with black ſpots; its rump is grey, with ſome tranſverſe black ſpots; and its breaſt and belly of a pale ruſt-colour, with a few longitudinal ſtreaks of black. Its tail is long and pointed, its tip of a pale ferrugineous hue, with a broad tranſverſe ſtreak of black over it; and the reſt of the tail is a mixed grey and brown, with black ſpots and ſtreaks. Its legs and feet are of a fine yellow. It builds in hollow oaks, and lays four egs, which are white, variegated with a number of ſmall red ſpots. It feeds on partridges and other birds. *Ray*, Ornithol. p. 50.

TINTINNABULUM, among the antients. See the article BELL.

TINUS, *Lauruſtine*, in botany, the name of a genus of trees, the characters of which are theſe: The flower conſiſts of only one leaf, and is of the rotated kind, and divided into many ſegments at the edges. The center of the flower is perforated by the pointal of the cup, which finally becomes an umbilicated fruit, of the ſhape of an olive, containing a pear-faſhioned ſeed.

The ſpecies of *Tinus*, enumerated by Mr. Tournefort, are theſe: 1. The common *Lauruſtine*. 2. The *Lauruſtine* with nervous leaves. And 3. The ſmall-leaved *Lauruſtine*. *Tourn.* Inſt. p. 607.

TIPHLE, in zoology, a name by which ſome authors expreſs the acus, or tobacco-pipe fiſh. *Bellon.* de Aquat. 446.

TIPIOCA, a name given by ſome authors to a ſort of cream or flower made from the yucca or manihot-root, by maceration of it in water, after expreſſing the juice.

TIPSARIA, or TAPSARIA, a word uſed by ſome medical writers for barley-water.

TIPUL, in natural hiſtory, a name given by the people of the Philippine iſlands, to a ſpecies of crane common there, and ſo tall, that when it ſtands erect, it can look over a man's head.

TIPULA, in natural hiſtory, the name of a genus of fly, remarkable for the great length of its legs, and uſually called by us the *long-legs*.

There are a great variety of kinds of the *Tipulæ*; and the ſmaller ſpecies ſo much reſemble gnats, that the generality of authors, not excepting even Goedart and Swammerdam, have confounded the two genera, and deſcribed theſe among the gnats. The external appearance, however, is all that conveys an idea of likeneſs between them; for the gnat is furniſhed with a trunk, and other offenſive weapons, by means of which it is able to pierce our fleſh; and, on the other hand, the *Tipula* has only a mouth without teeth, and has neither inclination, nor is in a condition to do any harm. It is indeed very happy for us, that this is the caſe, ſince the *Tipulæ* are greatly more numerous than the gnats, and were thoſe vaſt clouds of ſmall *Tipulæ*, which we ſee in marſhy places and elſewhere, and uſually call clouds of gnats, in reality ſuch numbers of thoſe miſchievous animals, we ſhould not eaſily eſcape a good deal of trouble from them.

The long form of the body, the poſition of the wings, and the length and poſition of the legs, are the circumſtances that make the reſemblance between the gnats and *Tipulæ*; but the ſtructure and organs of the head are alone a very ſufficient diſtinction. All the ſpecies of gnats have their origin from water-inſects, whoſe form they never quit, till they become winged; but the *Tipulæ* are not ſo regular, in this reſpect; ſome of them being produced from water-worms, and others from inſects of the like form, that have lived on earth, and preyed upon the juices of plants.

As the *Tipulæ* differ from the gnats in the figure of the mouth, and in being without a trunk, they differ as much from the other flies of that character, by their reſembling the gnat in the ſhape of their body. They differ alſo in the conformation of the mouth, and its ſeveral parts and organs. The opening of the mouth is a ſlit extending itſelf from the fore-part of the head toward the hinder part, and its lips cannot be called upper and lower; but they are lateral ones. When the body of the creature is preſſed, this mouth opens, and ſhews what ſeem to be a ſecond pair of lips within. Theſe are more firmly cloſed than the others, and reſemble only certain duplications of the fleſh. The exterior lips are cartilaginous, and are furniſhed with ſhort hairs; the interior are perfectly ſmooth, and of a fleſhy texture. The head of the *Tipula* is of a long and ſlender figure, and is of the nature of thoſe which we call the ſemi-trunk heads, as they much approach to the figure of the trunks of ſome other inſects. The lips are articulated at the extremity of this head, and on each ſide there ſtands, on the upper part, a ſort of beard, which, when nearly examined, is found to be articulated in the manner of the antennæ of inſects. Theſe two beards, in their uſual poſition, are placed cloſe together, and bent forwards over the head: Their office ſeems to be the covering the aperture of the mouth. Theſe ſeem conſtantly to be found in all ſpecies of the *Tipulæ*, and placed exactly in the ſame manner. They may therefore be uſed as a character of the creature; and if there ſhould be found any ſpecies wholly reſembling the *Tipulæ*, but wanting theſe, it may be very properly called a *protipula*. *Reaumur*, Hiſt. Inſ. vol. 9. p. 7.

The larger ſpecies of *Tipulæ* are uſually found in our meadows, and theſe are in no danger of being confounded with the gnat kind, their ſize alone being a ſufficient obvious diſtinction. Theſe are often found of nearly an inch in length from head to tail; but their bodies are very ſlender, and are compoſed of only nine rings. The male *Tipula* is eaſily diſtinguiſhed, at ſight, from the female. It is much ſhorter in the body, and is thicker at the tail than any where elſe; this tail alſo uſually turns upwards, whereas that of the female is placed in the

ſame line with the body, and is ſlender, and compoſed of ſeveral ſcaly parts, proceeding from the laſt ring of the body. Theſe creatures are found in our meadows through the whole ſummer; but the end of September and beginning of October is the time when they are moſt of all plentiful: They are ſo common in ſome meadows, in theſe months, that there is no walking a ſtep without putting up whole flights of them. They are extremely well furniſhed by nature either for walking or flying. In the middle of a hot day they will often riſe to a great height in the air, and take long flights; but at other times they uſually only fly to one part of a field from another. They ſometimes uſe their wings alſo in the manner of the oſtrich, aſſiſting their legs with them in running; and ſometimes they make no ſmall uſe of their legs in their ſhort flights, the ſpring with which they throw themſelves off from a plant, carrying them to half the diſtance they are going to.

The legs of theſe creatures are greatly diſproportioned to the body, according to the common rules of nature, eſpecially the hinder pair, which are in the larger ſpecies uſually three times the length of the body. Theſe carry them ſafely and eaſily among the plants, and ſeem of the ſame uſe to them that ſtilts are to boys, in wading through dirt. This large ſpecies is a creature of no great beauty. Its body is of a browniſh colour, and its corcelet is ſo elevated, that the creature ſeems hump-backed. The head is ſmall, and the neck very ſhort. The reticulated eyes are ſo large, that they cover almoſt the whole ſurface of the head; theſe are of a greeniſh colour, with a caſt of purple, when viewed in ſome lights. Mr. Reaumur very carefully examined the head, to find out ſome of thoſe ſmaller ſhining eyes which other inſects of the fly kind have, and which reſemble thoſe of ſpiders: Theſe are uſually placed in a triangular figure on the head; but in this creature there are none of them in the common place; there appear indeed two lucid ſpecks, one at the origin of each of the antennæ, when the head is carefully examined with a microſcope: But Reaumur does not allow theſe to be eyes, he rather ſuppoſes that two very lucid ſpecks, on the anterior part of the breaſt, are eyes, though placed in ſo very ſingular a manner. The wings of this creature are long, but very narrow, and ſeem ſcarce well proportioned to the ſize of the animal; they are tranſparent, but have a ſlight caſt of brown; and their ribs, when viewed by the microſcope, appear beſet with ſcales, or feathers, in the manner of thoſe of the gnat kind. Some ſpecies of the *Tipulæ* have them alſo fringed, with theſe ſcales at the edges. There are no ailerons, or petty-wings, at the origin of theſe, as is the caſe in many of the other ſpecies of two-winged flies; but in the place of them there are two very fine balancers or mallets. Theſe have long pedicles, and roundiſh or oval heads. The ſtigmata of the corcelet are four; one pair are placed immediately underneath theſe balancers, and the other immediately below the firſt pair of legs. The firſt pair are very long, the others ſmall, and thoſe on the rings of the body, if there be any, are too ſmall for our ſight, even with good glaſſes. Each ring of the body is compoſed of two half cylinders, which are joined into one, by means of a membrane, which gives them room to diſtend or cloſe up at the creature's pleaſure. The large *Tipulæ* all carry two antennæ, or horns, upon their head; but theſe are of no remarkable ſtructure, they are only compoſed of a great number of joints, each covered with a fine downy hairyneſs; and at the joining of each to the next, there is a tuft of longer and more ſtiff hairs. This is the deſcription of the common large *Tipula* which we find in the meadows; and in almoſt all its parts, is applicable to the generality of the larger ſpecies of theſe inſects. *Reaumur*, Hiſt. Inſ. vol. 9. p. 13.

The ſmaller kinds are very numerous, and of great variety. Theſe are frequent in all places, and at all ſeaſons of the year: The ſpring ſhews us immenſe clouds of them, and even the coldeſt winter's day ſhews a great number of them in the ſunſhine about noon. Theſe creatures fly much better than the large *Tipulæ*; they ſeem indeed to be almoſt continually upon the wing, and their manner of flight is very ſingular; they are continually mounting and deſcending again, and that without quitting the direction of the line they go forward in; this they will often do for many hours together. In tracing theſe flies from their origin, they are all found to be produced from worms which have no legs, and have a regular ſcaly head. Thoſe from which the larger *Tipulæ* are produced, live under ground; they are moſt fond of marſhy places; but any ground will do that is not often diſturbed. They uſually are found at about an inch under the ſurface, and are ſo plentiful in ſome places, as greatly to injure the herbage. When they get into corn-fields, they cauſe whole acres of the corn to wither before it grows into the ear, and even in paſture-land the graſs is ſometimes ſo entirely deſtroyed by them, that there is no food for cattle in places where the herbage uſed to be ever ſo plentiful and ſtrong. It has been ſuppoſed from this, that they eat up the roots of the plants; but this is not the caſe; they feed only on the ſmall inſects which live under ground, and take in a large quantity of dirt with them into their ſtomachs. The miſchief they do, is by their being continually in motion, and looſening by this means the earth from about the roots, ſo that they dry up with the ſucceeding heat of the ſun.

Theſe creatures do not find it neceſſary to their living, that plants ſhould be upon the ſurface of the earth in which they live. There is frequently found in the hollows of the ſtumps of old trees, a ſort of earth which ſeldom produces any vegetables; yet the female flies of this ſpecies well know that their young will find a proper ſubſtance there; and there are uſually found great numbers of them in all theſe places. The hollow elms and willows, ſo common in our hedges, and by ditch-ſides, afford innumerable proofs of this: but it muſt be obſerved, that they are only found in ſuch earth of this kind, as is continually ſomewhat moiſt; that is, ſuch as is placed in a cavity which will retain the wet that falls into it; for when the earth lies in places where the water eaſily drains off, there never are found any of theſe inſects in it. Mr. Reaumur mentions a very ſingular ſpecies of large *Tipula*, which was produced with him from one of the worms found in the earth of an old elm; this was of the larger kind, and had ſome beautiful ſpots on the wings. It had alſo very elegant tufted antennæ; whereas, in the common large *Tipulæ*, theſe are plain and ſimply granulated ones, as well in the males as females. *Reaumur*'s Hiſt. Inſ. vol. 9. p. 17.

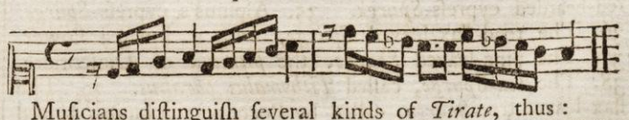
Mr. Ray, in his hiſtory of inſects, deſcribes fourteen ſpecies of this fly found in England. 1. The common *Long-legs*. This is about an inch long, and its antennæ are ſhort and ſlender, and its eyes black. The male of this ſpecies is more obtuſe at the tail than the female. 2. A very large kind, with large wings ſpotted with brown and white. 3. A large kind, with two large black ſpots on the wings. 4. A very beautiful *Tipula*, with black ſhoulders and back, a yellow belly, and ſome brown ſpots on the wings. 5. The yellow-winged *Tipula*, with ſpots on the wings, and a black and yellow body. 6. The common ſmall *Tipula*, with brown wings, ſpotted with white, and with opake dark brown ribs. 7. The middle-ſized black and yellow *Tipula*. 8. The long-legged *Tipula*, with ſhining black eyes. 9. The ſmall purple-winged *Tipula*, with a black back and yellow belly. 10. The middle-ſized green-eyed *Tipula*. 11. The browniſh-grey *Tipula*, with extremely long antennæ. 12. The elegant *Tipula*, with plumoſe antennæ. 13. The ſmall *Tipula*, with brown wings ſtreaked with black. And 14. The ſmall *Tipula*, with ſtriated wings, each having one very large black ſpot near the end. *Ray*'s Hiſt. Inſ. p. 72.

The white *Tipula* is a very beautiful little inſect; it is very common in gardens, and among buſhes in September and October; and tho' it appears all over white when ſeen at a diſtance, yet is not found to be ſo when examined more nearly. The wings, when the creature is ſitting, cover the whole body, and theſe are white; but the body itſelf is of a yellowiſh-green in that part next the head, and of a browniſh-black in the hinder part. The head of this creature is very ſmall, but the antennæ, or horns, are extremely long, and very beautifully feathered; they ſeem indeed a load to the creature to carry, and in their uſual poſition are croſſed one over the other in ſuch a manner, as to appear only one body together. *Reaumur*, Hiſt. Inſ. vol. 9. p. 20.

TIRATA, in the Italian muſic, is uſed to expreſs, in general, any quantity of notes, of whatever kind, provided they be of equal value, moving either upwards or downwards in conjoint degrees; thus they ſay, *Tirata di Semiminime*, when there are many crochets following one another in the manner above mentionod; *Tirata di Legâture*, when there are many notes of the ſame value following one another, among which the laſt of one bar, and the firſt of the next, are tied together by a ſemicircle, thus; ⌣ or ⌒.

Tirata is particularly uſed for a ſeries of quavers, or, in the modern notation, of demi-quavers or demi-ſemi-quavers, aſcending or deſcending by gradual intervals.

Theſe *Tirate* often, tho' not neceſſarily, begin with an unaccented note, and end on ſome accented one of greater duration. See the example annexed.



Muſicians diſtinguiſh ſeveral kinds of *Tirate*, thus:

1. *Tirata mezza*, or *mezza Tirata*, is that compoſed of three or four quick notes to aſcend, or deſcend to a note, a fourth, or fifth, higher or lower than the note from whence the *Tirata* begins; as in the examples before given.

2. *Tirata defectiva* is when theſe running notes go beyond the fifth, but do not reach the octave.

3. *Tirata perfecta*, is when it runs through the notes of a whole octave, aſcending or deſcending.

4. *Tirata aucta*, or *excedens* is when it goes beyond the compaſs of an octave.

The French call the *Tirata*, *Tirade*, and ſome call them *roulades*, but improperly, ſays Broſſard.

TIRSIO, in ichthyology, a name given by Gaza and ſome other authors to the phocæna of Willughby and others, the porpeſſe, or marſuin. It is a ſpecies of the delphinus, according to the Artedian ſyſtem; and is called the dolphin with a conic ſhaped body, a broad back, and a ſharp ſnout. Pliny, Bello-

Bellonius, and many others, call it *turſio*. See the articles TURSIO, PHOCÆNA, and DELPHINUS.

TIRSITES, a word uſed by ſome to expreſs foſſile coral.

TISRI, or TIZRI, the firſt hebrew month of the civil year, and the ſeventh of the eccleſiaſtical or ſacred year.

The Hebrews call it *Roſh-haſhanna*, that is, the beginning of the year. It anſwered to the moon of September. On the firſt day of this month was kept the feaſt of trumpets, becauſe the beginning of the year was then proclaimed by ſound of trumpets. On this day they refrained from all ſorts of ſervile buſineſs, and offered in ſacrifice a calf, a ram, and ſeven Lambs. Levit. xxiii. 24. Numb. xxix. 1. *Calm.* Dict. Bibl. in voc.

TITANIA, τιτανια, in antiquity, a feſtival in memory of Titanes. *Potter*, T. 1. p. 433.

TITANOS, a word uſed by ſome authors to expreſs lime, by others for the calx of burnt gypſum or plaiſter of Paris, and by others a lixivium of quicklime.

TITHENIDIA, τιθηνιδια, in antiquity, a Spartan feſtival, ſo called from τιθηναι, nurſes, who at this time carried the male infants committed to their charge to the temple of Diana Corythallia. For the ceremonies obſerved on this occaſion, ſee *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 432. ſeq.

TITHYMALOIDES, in botany, the name of a genus of plants, the characters of which are theſe: The flower compoſed of only one leaf, and in ſome degree reſembles a ſhoe; the piſtil finally becomes a fruit like that of the *Tithymal* or ſpurge.

The ſpecies of *Tithymaloides* enumerated by Mr. Tournefort are theſe: 1. The ſhrubby *Tithymaloides* with very large myrtle-like leaves. 2. The orpine-leaved ſhrubby *Tithymaloides*. 3. The nerium-leaved ſhrubby *Tithymaloides*. *Tourn.* Inſt. p. 654.

TITHYMALUS, *Spurge*, in botany, the name of a large genus of plants the characters of which are theſe: The flower conſiſts of one leaf, and is of the campaniform kind but globoſe, divided into ſeveral ſegments at the edge, and incloſed in two little leaves which ſeem to ſerve in the place of a cup to it. The piſtil ariſes from the bottom of the flower, and is uſually of a three-cornered ſhape; this ripens into a fruit of the ſame form, which contains many oblong ſeeds.

The ſpecies of *Tithymal* deſcribed by authors are theſe: 1. The myrtle-leaved tree-*Spurge*. 2. The broader-leaved tree-*Spurge*; this is evidently no other however than a variety of the firſt ſpecies, ſince, though very different in appearance, it ariſes from the ſeeds of that plant. 3. The turberoſe-rooted tree-*Spurge*, with ſmooth leaves, and a rough wart-like ſeed. 4. The leaf leſs African tree-*Spurge*. 5. The cotinus-leaved American tree-*Spurge*. 6. The cotinus-leaved tree-*Spurge*, with ſmaller leaves ſtanding in bundles about the ſtalk. 7. The blunt almond-leaved tree-*Spurge* of America. 8. The toad-flax-leaved tree-*Spurge* of America. 9. The box-leaved ſhrubby American-*Spurge*. 10. The pale flowered Æthiopian tree-*Spurge*, with leaves like thoſe of the German mezereon. 11. The red almond-leaved exotic-*Spurge*. 12. The wood-*Spurge*, with lunated flowers. 13. The hairy-leaved almond-*Spurge*. 14. The creeping-rooted almond-*Spurge*. 15. The gromwel-leaved *Spurge*. 16. The broad-leaved *Spurge*, called *lathyris* and *cataputia* by authors. 17. The broad-leaved Spaniſh *Spurge*. 18. The wild German broad-leaved *Spurge*. 19. The yellow-leaved *Spurge*, with hairy and finely indented leaves. 20. The ſoft hairy wood-*Spurge*. 21. The great broad-leaved *Spurge*. 22. The hoary meadow-*Spurge*. 23. The red-ſtalked willow-leaved and blite-leaved *Spurge* of Curaſſo. 24. The green ſtalked willow and blite-leaved *Spurge* of Curaſſo, with ſmooth leaves. 25. The little annual narrow-leaved *Spurge*, called by many authors *eſula*. 26. The little rock-*Spurge*. 27. The obtuſe-leaved little *Spurge*. 28. The annual *Spurge* with leaves like thoſe of flax. 29. The gentle mountain ſmall *Spurge*, called ſweet *Spurge*, and *eſula dulcis*. 30. The wart-*Spurge*, or rough-fruited *Spurge*. 31. The narrow-leaved wart-*Spurge*. 32. The narrow-leaved almond-*Spurge*, called *alypum* by ſome authors. 33. The cypreſs-*Spurge*, called alſo *humipinus*, and *eſula* in the ſhops. 34. The red-bearded cypreſs-*Spurge*. 35. Alpinus's cypreſs-*Spurge*. 36. The toad-flax-leaved *Spurge*, with a lunated flower. 37. The pine-leaved *Spurge*, the *pithiuſa* of Dioſcorides. 38. The ſea-*Spurge*, called *Tithymalus paralius*. 39. The flax-leaved tree-*Spurge*, called by Boccone the juniper-leaved ſea-*Spurge*. 40. The prickly ſea-*Spurge*. 41. The narrow-leaved almond-*Spurge*. 42. The jaggy-leaved almond-*Spurge*. 43. The almond-*Spurge*, with a thick pear-faſhioned root. 44. The little willow-leaved *Spurge*. 45. The tuberoſe or knotty-rooted *Spurge*, called by ſome *apios*. 46. The long-rooted tuberous *Spurge*. 47. The ſhrubby marſh-*Spurge*. 48. The broad-leaved triangular-fruited Portugal *Spurge*. 49. The olive-leaved bluiſh green *Spurge*. 50. The little ſmooth *Spurge*, with leaves like thoſe of money-wort, called *chamæſyche*. 51. The little hairy *Spurge*, with leaves like thoſe of money-wort. 52. The roundiſh-leaved not dentated *Spurge*, called by authors *peplus*, and *eſula rotunda*. 53. The common ſun-*Spurge*, or helioſcope-*Spurge*. 54. The annual *Spurge*, with oblong ſharp pointed leaves, called by Boccone the annual *peplis* with a moſſy flower. 55. The creeping annual *Spurge*, with a rounded yet pointed leaf. 56. The red ſea-*Spurge*, with obtuſe and auriculated leaves; the leaves and ſtalk of this plant are all red. 57. The green ſea-*Spurge*, with obtuſe auriculated leaves; both the leaves and ſtalk of this are green. 58. The many-fruited Sicilian *Spurge*, with leaves like thoſe of purſelain. 59. The perennial ſhort blunt-leaved kind. 60. The Spaniſh kind, with long heart-faſhioned leaves. 61. The Aleppo *Spurge*, with round hoary leaves. 62. The ſpreading American *Spurge*, with ſerrated leaves, and flowers ſtanding in cluſters in the alæ of the leaves. And, 63. The erect American *Spurge*, with ſerrated leaves, and cluſtered flowers ſtanding on long foot-ſtalks. *Tourneſ.* Inſt. p. 88.

TITILLARES *Venæ*, a name given by ſome Authors to the iliac veins.

TITILLICUM, a word uſed by ſome anatomical writers for the arm-pit.

TITMOUSE, in zoology. See the articles PARUS, and FRINGILLAGO.

TITT, in the manege. See the article NAG.

TIZRI, a Jewiſh month, anſwering to our September moon. See the article TISRI.

TIZZONAIOS, in the glaſs art, are two apertures, one on each ſide the working furnace, by which a ſervitor night and day puts in coals to maintain the fire. *Neri*'s art of Glaſs, p. 242.

TLAM, or SLAM, in the alum works, a word uſed by the workmen to expreſs a ſort of mud or foulneſs which does great hurt to the alum, rendering it foul and coarſe. The *ſlam* is a muddy ſubſtance ſettling to the bottom of the veſſels; but in the boiling the liquor it gives it a reddiſh colour, and diſorders the whole works when in any great quantity. They always paſs their liquor over four parcels of the alum rock, and the laſt if not carefully calcined generally gives it this diſadvantageous mixture. Phil. Tranſ. N°. 142.

TLAOLI, in botany, a name uſed by ſome authors for the plant called *maize*, *frumentum Indicum*, or Indian wheat. *Hernand.* p. 242. Piſo, Mant. Arom. p. 99.

TLAPALEZ-PATLI, in botany, a name uſed by ſome authors for the tree whoſe fruit is the ben-nut, and whoſe wood the Lignum Nephriticum of the ſhops. *Hernand.* p. 119.

TLAQUACUM, in zoology, the name given by the Spaniards and ſome others to a very remarkable animal in America, commonly known among us by the name of the *poſſum* or *opoſſum*. See the article OPOSSUM.

TLAQUATZIN, in zoology, a name by which the natives in ſome parts of America call the *opoſſum*. See the article OPOSSUM.

TLAQUATZIN *Spinoſum*, in zoology, the name by which Hernandez has called the cuanda, a ſort of Braſilian porcupine. See the article CUANDA.

TLATLANCUAYE, in botany, a name by which ſome authors have called the plant which produces the long pepper uſed in medicine. *Hernandez*, p. 126.

TLANHQUACHUL, in zoology, the name of a Braſilian bird, very much approaching to the nature of the European platea or ſpoonbill.

It is a very voracious bird, and feeds on live fiſh, but will not take or meddle with dead ones, and is all over of a beautiful red. It has a black ring round the upper part of its neck, and is common about the ſhores of the ſea and rivers. *Marggrave*'s Hiſt. of Braſil. See the article PLATEA.

TLAYOTIC, in natural hiſtory, the name of a ſtone found in new Spain, and uſed as a ſovereign remedy againſt the colic, and ſeveral other diſeaſes: it is a ſpecies of jaſper, approaching to the nature of the lapis nephriticus, and of a green colour. The natives cut it into ſeveral forms for uſe. See the article *Colicus* LAPIS.

TLEUQUECHOLTOTOTL, in zoology, the Mexican name of a bird of the wood-pecker kind, deſcribed by Nieremberg, under the name of the *avis ſalutiferus*; the feathers of a red creſt it carries on its head, being ſuppoſed a remedy for head-achs.

TLILZOCHITL, in botany, a name uſed by ſome authors for the plant whoſe pod is the fruit called vanilloes, and uſed in chocolate. *De Laët.* Ind. p. 230.

TMOLITES, the name of an excellent wine among the antients, like the Falernian.

TOAD, in zoology. See the article RUBETA.

TOAD-*Fiſh*, in ichthyology, an Engliſh name for the rana piſcatrix or lophius. See the article RANA.

TOAD-*Flax*. See the article LINARIA.

TOAD-*Powder*, *Pulvis Bufonum*. Dr. Kramer ſays, *pulvis bufonum*, when applied by way of pultice, with barley flour and urine, is an excellent remedy for ripening peſtilential buboes, but that it has no ſuch effect in venereal, or any other than peſtilential buboes.

TOBACCO (*Cycl.*)—In the iſland of Ceylon, there are two kinds of *Tobacco* cultivated for profit. They call both kinds *dunkol*, which ſignifies a leaf the uſe of which is to be ſmoaked. The one kind they call *hingele dunkol*, or *ſingele dunkol*; for they make no difference between the letters S and H in their pronunciation; the other they call *dunkol kappada*; *kappada* ſignifies gelding, and is a word of Portugueſe origin. This *kappada-Tobacco* is much ſtronger and more intoxicating than the other; but both kinds are the produce of the ſame plant; only the ſingle *Tobacco* has very little care

taken of it, being, after the ſowing, in a manner left to itſelf, while the other has great pains beſtowed upon it during the whole time of its growth, and till it is fit for uſe, in the following manner: They clear a little piece of ground, in which they ſow the ſeed of the *Tobacco*, and againſt the time that the young plants have got three leaves a-piece, they chooſe out another piece of ground into which to tranſplant them: This they hedge round, and turn their horned cattle into it, that their dung may fall upon it, and ſufficiently enrich it. The ground is then dug with a ſharp hoe, or ſpade, in the form of a pick-ax, and the dung, by this means, thoroughly worked into it. When the earth is thus prepared, they take up the young plants, and ſet them in this new ground, at about a foot ſquare diſtant from one another.

The manner of giving more or leſs ſtrength to this *Tobacco*, is by ſuffering the plants to grow to a greater or leſs height before they top them, or cut off the ſtalk at the ſummit. The uſual way is to cut off the top when the plant has fifteen leaves. If they intend the *Tobacco* to be a little ſtronger, they do this when it has only thirteen; and when they would have it ſtrongeſt of all, they do it when there are only eleven or twelve leaves. On the contrary, when they would have a milder *Tobacco*, they cut it not off till there be eighteen or twenty leaves; but in this way of counting the leaves, they never reckon the three or four loweſt, which do not grow ſo large and fine as the others. The cutting off the top, prevents the juices of the plant from being waſted in flowers and ſeeds, which are of no value; and, in conſequence of it, all being, after this time, employed to furniſh the growth of the leaves, they grow four times as large and thick as they otherwiſe would do.

To prevent all unneceſſary waſting of the ſap, theſe plants are tended every day; and as the young ſprouts appear in the joining of the leaves and ſtalk, they are continually cut off: This is done once in three days, till the leaves have their full bigneſs, which is about that time when the flowers would have been ripe, had the plant been ſuffered to grow in its natural way: They are immediately to be gathered when they are full grown, otherwiſe they waſte and decay. They cut down the whole plant, and bring them into their houſes, laying them on a heap. When they have lain a little time together, they begin to ſweat and grow hot: When they have been a little while fermenting, they turn them, bringing thoſe which were in the middle to the ſurface, and placing thoſe which were at the ſurface in the middle; by this means the whole quantity of leaves ferments equally. The longer they lie in this manner, the darker-coloured the *Tobacco* becomes. When they have left it thus to ſweat as long as they judge neceſſary, they hang every ſtalk ſeparately on cords; and when the whole is thoroughly dry, they carefully take off the leaves, and lay them by in bundles, till they have occaſion for them. This is the manner of their preparing the *kappada*.

The ſingle *Tobacco* is ſown in the ſame manner with this; but it is never tranſplanted nor tended, it grows as it pleaſes, and when the flowers are ripe, it is cut down, and laid careleſsly in heaps, where ſome of it ferments too much, and ſome too little. This is much weaker therefore than the *kappada*; and as both kinds are common in the place, the natives ſmoak them either ſeparately or together, mixed in different proportions, as they like. Some of the Ceiloneſe chew this ſtrong *Tobacco* with their beetle, and ſome, who ſmoke it alone, uſe no pipe, but, taking a long leaf of it, they roll it up into a long form, and cover it with the leaf of the wattukan-tree; they then light one end of it, and ſmoak by the other, till the whole is conſumed. Philoſ. Tranſ. N°. 278. p. 1145.

There are four or five kinds of *Tobacco* frequently raiſed by the curious in England. They are to be ſown in March, upon a moderate hot-bed, and when the plants are come up, they ſhould be tranſplanted to another hot-bed of moderate warmth, and ſet at four inches diſtance, watering and ſhading them till they have taken root: And as they grow ſtronger, giving them as much air as the ſeaſon will permit. In the beginning of May the plants will grow ſo large as to touch one another; and they are then to be taken up with a large ball of earth about their roots, and removed to a good ſoil, where they are to be planted at two foot aſunder every way. *Miller*'s Gardener's Dict.

Tobacco beat into a maſh with vinegar or brandy, and laid on the ſtomach, has ſometimes good effects in removing hard tumours of the hypochondria. We have the hiſtory of two cures made by ſuch applications in the Medic. Eſſ. Edinb.

The juice of this plant is ſaid to be good againſt ulcers and mortifications. *Boyle*, Works abr. Vol. 1. p. 56.

TOBACCO-*Pipe Fiſh*, the Engliſh name of the *acus*. See Tab. of Fiſhes, N°. 25. and the article ACUS.

TOBACTLI, in zoology, a name which Nieremberg ſays is often given to the American bird, more commonly called *Hoactli*. See the article HOACTLI.

TOBIANUS, in ichthyology, a name given by Schoneveldt and others, to the ammodytes, or ſand-eel.

TOBIS, in ichthyology, a name given by the Swedes to the ammodytes, or ſand-eel. The name *Tobianus*, given to this fiſh by Salvian, ſeems formed from its Swediſh name *Tobis*. Salvian is the firſt author who has deſcribed this fiſh, but his figure is not accurate, for he has given it two back fins inſtead of one.

TOCCATA, in the Italian muſic, is much the ſame as *Ricercata* or *Phantaſia*, *Taſtatura*, &c. But what diſtinguiſhes the *Toccata* from the other kinds of ſymphonies, is, firſt, its being uſually played on inſtruments that have keys, as organs, ſpinnets, &c. Secondly, that it is commonly compoſed to exerciſe both hands. Thus, ſometimes the baſs holds out a ſound, while the upper part makes diminutions, paſſages, or tiratas; and afterwards this part does the ſame, while the baſs moves in its turn. *Broſſard.*

TOCCATINA, in the Italian muſic, a ſhort reſearch, or *ricercata*. See the articles TOCCATA, *Suppl.* and RESEARCH, *Cycl.*

TOCCAVIENSIS *Bolus*, *Bole of Tokay*, in the materia medica, a fine medicinal earth, dug about Tokay in Tranſylvania, and eſteemed a powerful aſtringent. Kentman calls it the *bolus Pannonica vera*; and Crato, *bolus Hungarica*.

This laſt author eſteemed it ſuperior even to the bole armenic of Galen, and had a great opinion of it in malignant fevers. It is a fine and pure earth, and very heavy, moderately compact in its texture, but not very hard; and in colour of a conſiderably deep and ſtrong yellow. It is naturally of a ſmooth ſurface, and does not ſtain the fingers in handling. It ferments violently with acid menſtrua, and does not become red in burning. *Hill*'s Hiſt. of Foſſ. p. 7.

TOCKAY, in zoology, the name of a ſpecies of Indian lizard, diſtinguiſhed from the other kinds, by being ſpotted all over.

TOCMOL, in natural hiſtory, a name given by ſome to the common turtle.

TODDA-*Panna*, in botany, the name by which many authors call the *palma farinifera*, or ſago-tree. *Herm.* Cat. vol. 3. p. 9.

TODTENVOGEL, in zoology, a name by which Geſner and ſome other authors have called that ſpecies of œnanthe, known in England by the name of the *ſtone-chatter*, *ſtones-mich*, or *moor-titling*. *Geſner*, de Avib. See the article STONE-*Chatter*.

TOES (*Cycl.*)—*Adheſions of the* TOES. It is a frequent thing to meet with new-born infants with their fingers or *Toes* cohering or grown together, either by a ſtrict adheſion of the fleſh, or elſe by ſome looſe productions of the ſkin, as in the feet of ducks and geeſe; and a diſorder of the ſame kind is alſo ſometimes found in adults, from accidents; as when the fingers or *Toes* have been neglected, after an excoriation of them by burns or wounds. In both theſe caſes the ſurgeon's aſſiſtance is neceſſary, partly to remove the deformity, and partly to reſtore the proper uſe of the fingers.

Theſe adheſions, according to the nature of the diſorder, are to be ſeparated two ways, either by cutting out the intermediate ſkin with a pair of ſciſſars, or elſe barely by dividing them from each other with the ſame inſtruments. When this is done, to prevent their coheſions again, each finger muſt be inveſted ſeparately with a ſpiral bandage about an inch broad, dipped in lime-water and ſpirit of wine.

Sometimes the fingers, inſtead of adhering to each other, grow to the palm of the hand, from wounds or burns, ſo that they cannot be by any means extended, or drawn back to open the hand. The method of relieving this diſorder is firſt very carefully to ſeparate the fingers from their adheſions to the palm, without injuring their tendons, then dreſs them with a vulnerary balſam, and ſcraped lint, and extend them on a ferula or thick paſteboard; and let them remain in this extended poſture, ſeparately to be dreſſed till they are perfectly healed; but at every dreſſing they muſt be gently moved, to prevent a rigidity or ſtiffneſs of the joints. *Heiſter*'s Surgery. p. 330.

Bones of the TOES. Each of the *Toes*, except the greater one, conſiſts of three phalanges. The great *Toe* indeed has but two; but then there are five metatarſal bones, whereas there are but four metacarpal. The baſes of the phalanges remain for a long time epiphyſes. The firſt phalanx of the great *Toe* is very like the ſecond of the thumb; but its baſis is more hollow, anſwerably to the convexity of the firſt bone of the metatarſus, by which it is ſupported; its head is in form of a pulley, as in the thumb, but much broader: The ſecond, or laſt phalanx of the great *Toe*, is like the third of the thumb, but bigger and broader, eſpecially at its baſis. The tuberoſity, in form of a horſe-ſhoe, which terminates this bone, is alſo more unequal and more flat than in the thumb.

The firſt phalanges of the other *Toes* are the longeſt, but they are ſhorter and more convex than thoſe of the fingers. Their bodies are very narrow, and contracted in the middle, the baſes are generally excavated, and the heads made after the ſame manner as in the fingers. The ſecond phalanges are very ſhort, and almoſt without ſhape; both their baſes and heads are formed for articulations by ginglymi, but they are very imperfect. The bodies are of ſome length in the ſecond and third *Toes*; but they are very ſhort in the other two, eſpecially in the little *Toe*, in which the body is broader than it is long. The third phalanges are nearly of the ſame figure with thoſe of the fingers, but much ſhorter and thicker in proportion. In the two laſt *Toes* they are often united with

the ſecond phalanges, which is owing, perhaps, to the continual inaction and compreſſion occaſioned by ſhoes. *Winſlow*'s Anat. p. 103.

Ligaments of the TOES. The firſt phalanges of the *Toes* are tied to the heads of the metatarſal bones, by a ſort of orbicular ligament, ſet round the edges of the cartilaginous portions of the head, and thoſe of the baſes of the phalanges. In the four leſſer *Toes* of each foot, the inferior part of this ligament is very thick, and is cruſted over as it were with a cartilaginous ſubſtance, fixed to the baſes of the phalanges, and from thence continued over the head of the metatarſal bone next it. This ſubſtance grows hard with age like a ſeſamoide bone.

Of theſe ſeſamoide bones, as they are called, the great *Toe* has two belonging to the firſt phalanx, which are largeſt, ſooneſt formed, and moſt conſiderable of all. The ſecond and third phalanges of all the *Toes* being articulated by ginglymi, have lateral ligaments which go between the ſides of the baſes, and thence to the ſides of the heads: At the inferior edges of all theſe baſes there is a cartilaginous matter joined to theſe ligaments, which hardens with age in the ſame manner with thoſe of the firſt phalanges. *Winſlow*'s Anat. p. 135.

TOE, in the manege, is the ſtay of the hoof upon the fore-part of the foot, comprehended between the quarters.

We commonly ſay the *Toe* before, and the heel behind, in French, *Pince devant et Talon derriere*; implying, that in horſes, the *Toe* of the fore-feet is ſtronger than the *Toe* of the hind-feet: And, on the other hand, that the heels behind are ſtronger than thoſe before; and accordingly, in ſhoeing we drive higheſt in the *Toes* of the fore-feet and in the heels of the hinder feet. See the article DRIVE.

A horſe that does not reſt his hinder feet all equally upon the ſhoe, but raiſes his heels, and goes upon the *Toes* of his hind-feet, is called in French *Rampin*. See the article RAMPIN.

TOGA *Picta*, among the Romans, a purple gown embroidered with gold; which was worn during the ſolemnity of a triumph, by thoſe who had that honour conferred on them. It was an antient habit of the Etruſcans, and not brought to Rome till after *Tarquinius Priſcus* had ſubdued the twelve ſtates of that nation. *Hofm.* Lex. univ. in voc. *Picta*.

TOGOCH, in zoology, a name uſed by many for the umbla minor, or red charre, a fiſh caught in the lakes of Wales. The name is originally Welch. See the article CHARRE.

TOGULA, among the Romans, a narrow kind of *Toga*, uſed by the poorer ſort of people. See the article TOGA, *Cycl.* & *Suppl.*

TOKENS, in peſtilential caſes, thoſe livid ſpots which appear in the ſeveral ſtages of the diſeaſe, and are the certain forerunners of death. They generally appear only under the moſt deſperate circumſtances, and when the patient would otherwiſe be declared dying; but Hodges gives us inſtances where they appeared before any other ſymptoms of the diſeaſe, and came out without any pain or trouble; yet even in theſe caſes the perſon always died. Theſe *Tokens* are the mark by which the ſearchers conclude of the cauſe of the death of the perſon, and are the rule for ordering the houſe to be ſhut up, to prevent the ſpreading the diſeaſe. But the nurſes, and other crafty people have a way of diſguiſing this ſymptom after death, by covering the body with wet and cold ſheets. Theſe ſtrike in the ſpots, ſo that the perſon may be thought to have died by ſome other diſeaſe. *Hodges* de Peſt.

TOLCESTER, *Tolceſtrum*, in our old writers, an old exciſe or duty paid by the tenants of ſome manors to the lord, for liberty to brew and ſell ale. *Blount.*

TOLLENON, among the Romans, a warlike machine, formed in this manner: one beam was fixed very deep in the earth, and on the top of it another more than twice as long, and moveable upon a center. On one end of this croſs-beam were placed a covering of hurdles or planks, within which a few ſoldiers were put, and, by pulling down the other end with ropes, theſe were raiſed above the walls of a beſieged town. See *Pitiſc.* in voc.

TOLLENON, was alſo an engine for raiſing water out of a draw-well. *Pitiſc.* in voc.

TOLLES, or TOLÆ, names given by ſome to the tonſils, and by others to the glandular abſceſſes ſometimes affecting the limbs.

TOLSEY, in our old writers, denotes the place where merchants meet in a city or town of trade. *Blount.*

The word is compounded of the Saxon *Tol*, *tributum*, and *ſee*, *ſedes*.

TOLT, in law, a writ whereby a cauſe depending in a court-baron is removed into the *County-court*. Old. Nat. Br. 4. And as this writ removes the cauſe to the *county-court*, ſo the writ *pone* removes a cauſe from thence into the court of common-pleas, *&c.* *Terms of Law*, *Blount*, *Cowel.*

TOLTERCAIZTLI, in natural hiſtory, the American name of a ſtone, much reſembling the novacularum lapis, but variegated with red and black ſpots. They uſe the powder of this ſtone and cryſtal calcined together for diſeaſes of the eyes.

TOLUIFERA, in botany, the name of a genus of plants, ſo called from producing the balſam of Tolu. The characters are theſe: The perianthium conſiſts of one leaf, and is of a campanulated form, divided into five ſegments, and having one angle more remote than the others. The flower is compoſed of five petals, which are inſerted into the cup; four of theſe are ſtrait and equal in ſize, and are a little longer than the cup; but the fifth is twice as large as theſe, and is cordated at the end, and has an unguis of the length of the cup. The ſtamina are ten very ſhort filaments, but the antheræ are of the length of the cup, or ſomething more than that. The germen of the piſtil is oblong; there is ſcarce any ſtyle, and the ſtigma is acute. The fruit and ſeeds are yet unknown. *Linnæi* Gen. Plant. p. 182.

TOMATO, the Portugueſe name for the fruit of the lycopersicon, or love-apple; a fruit cultivated in gardens for the ſingularity of its appearance, and eaten either ſtewed or raw by the Spaniards and Italians, and by the Jew-families in England. See the article LYCOPERSICON.

TOMBAC, a name given by the French to a yellow metal, very nearly approaching to what we call prince's metal, and made by mixing and fuſing together a large quantity of zink with a ſmaller of copper.

TOMEION, a general name uſed to expreſs any ſharp or cutting inſtrument, uſed either in ſurgery, or in the mechanic arts.

TOMENTOSE-*Leaf*, among botaniſts. See the article LEAF.

TOMIAS, Τόμιας, in antiquity, an appellation given to the ſacrifice offered at the ratification of ſolemn leagues.

It was ſo called becauſe they cut out the teſticles of the victim, and took the oath ſtanding upon them. *Potter* Archæol. Græc. T. 1. p. 252.

TOMIN, in our old writers, a weight of twelve grains, uſed by goldſmiths and jewellers. *Blount.*

TOMINEIO, in zoology, a name by which ſome authors have called the guainumbi, or humming bird, the ſmalleſt of all birds. *Joſeph Acoſta*, Ind. Occ. L. 4. c. 37. See the article GUAINUMBI.

The name ſeems derived from the Spaniſh *Tomino*, a grain weight, as if they would call it a bird of a grain weight.

TOMOTOCIA, a word uſed by ſome authors, to expreſs the Cæſarean ſection.

TONE (*Cycl.*)—TONE, *in Muſic.* The word *Tone* is taken in four different ſenſes among the antients: 1°. for any ſound. 2°. For a certain interval, as when it is ſaid the difference between the diapente and diateſſaron is a *Tone*. 3°. For a certain *locus* or compaſs of the voice; in which ſenſe they ſaid the Dorian, Phrygian, Lydian *Tones*. 4°. For tenſion; as when they ſpeak of an acute, a grave, or a middle *Tone*. *Wallis*'s Append. ad Ptolem. Harm. p. 172.

In tempered ſcales of muſic, the *Tones* are made equal, but in a true and accurate practice of ſinging they are not ſo. Dr. *Pepuſch*, in Phil. Tranſ. N°. 481. p. 274.

It is uſual in the modern practice of muſic to divide the *Tone*, whether major or minor, into two *ſemi-Tones*. But a late learned muſician contends, that the diviſion of the *Tone-major* is harſh and in-elegant; ſo that, in dividing the fourth into its different ſpecies, the *Tone-major* ought either to be an individed interval, or make part of one. Phil. Tranſ. ibid See the article SPECIES.

According to Mr. Euler, the *Tone* contains two *ſemi-Tones*, taken in a large ſenſe; that is, including the greater and leſſer limma, under the term *Tone*. Thus the *Tone-major* is the ſum of the *ſemi-Tone major* and leſſer limma; as alſo the ſum of the leſſer *ſemi-Tone*, and greater limma. See the article LIMMA. And the *Tone-minor* is the ſum of the greater and leſſer *ſemi-Tones*. Laſtly, the greateſt *Tone*, *Tonus maximus*, is the ſum of two greater *ſemi-Tones*. *Euler*, Tentam. Nov. Theor. Muſ. p. 109.

But what Mr. Euler calls *Tonus maximus*, is more commonly known by muſicians under the name of a diminiſhed third. For thus they call the interval, for inſtance, between G♯ and B♭; it being compoſed of two diatonic intervals G♯ to A, and A to B♭. Vid. *Broſſard.* Dict. Muſ. p. 179.

TONE-*Major*—Six *Tones-major* exceed the octave by more than a comma. *Euler*, Tent. Nov. Theor. Muſ. p. 108.

TONGUE (*Cycl.*)—The *Tongue* is generally eſteemed a neceſſary organ in ſpeaking, ſwallowing, and taſting, yet a woman, who loſt her *Tongue* entirely by a cancer when four years old, ſpeaks diſtinctly, ſings prettily, ſwallows eaſily, and taſtes accurately. Phil. Tranſ. N°. 464. §. 11.

And this inſtance is not ſingle. Another occurs in *Lamberti*'s Memoirs; and a third, in the Memoirs of the Academy of Sciences.

TONGUE-*tied*, the popular name for a diſtemperature of the *Tongue* in children, when it is tied down too cloſe to the bottom of the mouth, by a ligament connected all along its middle, and called its frænulum, which requires to be divided, to give the *Tongue* its proper motion.

This is ſometimes the caſe in adults, but oftner in children, who cannot then exert their *Tongues* to ſuck. This is however, by no means ſo common as the women uſually imagine; not ſo much as one child in a thouſand being afflicted with it; nor is the operation in cutting it of little conſequence, ſince often bad accidents follow it, and ſometimes the loſs of a child's life. When the infant can put its *Tongue* out of its mouth, the frænulum wants no inciſion; but when the *Tongue* cannot be extended beyond the teeth, the operation is neceſſary. *Heiſter*'s Surgery, p. 466. *Heildan*, Cent. 3. Obſ. 28.

To perform this, the end of the *Tongue* ſhould be covered with a linnen rag, and held with the fingers to prevent its ſlipping, and the ligament of the *Tongue* running between the ranular veins and internal ſalival ducts, is to be divided by a pair of obtuſe pointed ſciſſars, till it give room enough for ſucking or ſpeaking, but in doing this great care muſt be taken not to wound the ſalival ducts, or the proper veins and arteries of the *Tongue*; for children have been known to periſh upon the ſpot from the cutting the ranular veins in this operation. Midwives often tear this ligament with their fingers as ſoon as a child is born; but this is a dangerous and bad practice.

TONGUE *Wounded.* The *Tongue* is frequently bit in fits of the epilepſy, and in violent falls; and is ſometimes wounded by a bullet.

If the wound is not very large, it will eaſily heal by the application of oil of almonds and ſugar-candy mixt together, or of honey of roſes and oil of myrrh made *per deliquium*; but large wounds of the *Tongue* will not unite without the aſſiſtance of the ſuture. It is therefore no wonder that wounds near the root of the *Tongue* always leave a fiſſure in the part, ſince their ſituation does not allow the uſe of the needle. To prevent the loſs of ſpeech enſuing upon large wounds on the fore part of the *Tongue*, the divided parts ſhould be brought together with the needle as ſoon and as neatly as poſſible, and afterwards anointed with oil of almonds and ſugar-candy, or honey of roſes and oil of myrrh; ſince ſticking plaſters cannot take place here. Gun-ſhot wounds on the *Tongue* can only be healed with theſe unctions, ſince the ſuture can be of no uſe in them: the patient ſhould be kept from talking, and live upon ſpoon-meats during the cure, but more particularly at the time when the wound is about to unite. *Heiſter*'s Surg. p. 81.

TONGUE *of Fiſhes.* All fiſhes have either a perfect *Tongue* or the rudiments of one in their mouths; but this organ is very different in the various ſpecies, in its figure, mobility, and other qualities and properties: as to the figure, it is in ſome pointed before, as in the clupeæ; in others it is rounded in this part, as the pearch and clariæ have it. And in others it is ſomewhat bifid, as in the pike. In ſome it is ſmooth on the upper part, as in the gadi, cyprini, and mackrel; in others it is rough and dentated in this part, as in the ſalmon, mullet, *&c.*

In many fiſh the *Tongue* is immoveable adhering firmly to the bottom of the mouth, as in the pearch, cyprinus, and indeed in the greater part of fiſhes; in others it is looſe, as in the whale.

In the cetaceous fiſhes the *Tongue* being looſe, as in quadrupeds, it is uſed by the animal in the ſame manner; but in other fiſhes it is of no uſe in the moving the food about in the mouth, nor is it the genuine organ of taſte, being in many of a cartilaginous ſubſtance, and therefore not proper for receiving the notices of that ſenſe. The principal uſe of the *Tongue* in theſe fiſh, ſeems to be in its ſerving as an aſſiſtant organ of ſwallowing, its being more elevated than the other parts of the mouth, rendering it fit for the toſſing the food down the throat. The true uſe of the *Tongue* in thoſe fiſhes which have it dentated, is that it ſerves to retain the prey from running out of the mouth, and afterwards in the ſwallowing it; what renders them the more fit for this uſe is, that, they have always the prickles turning inwards. It is the opinion of Mr. Ray, that the *Tongues* of the cartilaginous kinds have ſome ſenſe of taſte, and this is more probable, than that the more hard and rigid ones ſhould have any ſuch ſenſe. *Artedi*, de Piſcib.

It is but of late, that we have known enough of the anatomy of ſea-animals, to be able to refer to their proper origin many of the foſſile bodies which belonged once to them: an eminent inſtance we have of this in the *Tongue* of the fiſh called the *paſtinacha marina* by compariſon with which Sir Hans Sloane explained the nature of a very elegant foſſil, found ſometimes with us, but oftner in the Eaſt-Indies, ſometimes in the Weſt, and every where till then ſuppoſed to be a petrified muſhroom. The paſtinacha marina is a fiſh of a flat ſhape, and allied to the thornback kind. The *Tongue* of this fiſh is made up of many bones, all of them crooked, their two ſides making an obtuſe angle, ſuch as the ſides of the under mandible of a man do.

The uppermoſt ſides of theſe ſeveral bones, have furrows and pieces ſtanding together, after the manner of the teeth of a ſhort ſmall-toothed comb, or ſomewhat reſembling what we call the gills, on the under ſide of a common muſhroom; and to this furrowed appearance in the foſſile pieces, was owing the general error of taking them to be of the fungus kind. The extant parts of theſe toothed points in the *Tongue* anſwer to the like parts in the bones of the upper jaw of this fiſh; and between theſe and this bony *Tongue*, the food of the fiſh is cut and ground to pieces. The under ſide of the *Tongue* is, in the ſame manner as the upper, divided into ſeveral crooked pieces; but theſe have in this part no teeth or points: the whole *Tongue* of this fiſh is ſometimes found foſſile, converted into a ſort of ſtone, but this more frequently happens to the ſeveral joints or ſingle bones of which it is compoſed, and theſe are often mutilated or broken. The palate of the ſame fiſh is alſo ſometimes found either whole or in parts, and both the one and the other are of the number of thoſe things, called by Mr. Lluyd *ſiliquaſtra*, from a ſuppoſed reſemblance in them to the pods of the lupine, or ſome other ſuch plant; but he has diſtinguiſhed theſe from the reſt by calling them *ſiliquaſtra pectinata*, or the comb-like ſiliquaſtra. Phil. Tranſ. No. 230.

TONGUE *of a Muſcle.* What is vulgarly called the *Tongue* in this fiſh from its ſhape, is truly an organ by means of which it ſpins a ſort of threads in the manner of ſpiders or caterpillars; to fix itſelf to the rocks by. See the article MUSCLE.

TONGUE, in the manege. The aid of the *Tongue* or voice, is a ſort of agreeable clacking, or a certain ſound formed by the cavalier, in ſtriking his *Tongue* againſt the roof of his mouth, when he means to animate the horſe, and ſuſtain him, and make him work well in the manege. See the article AID.

To ſwallow the TONGUE, in the manege. A horſe is ſaid to draw in or ſwallow his *Tongue*, when he turns it down his throat, which makes him wheeze as if he were ſhort winded. This fault is cured by giving him a bitt with a liberty for the *Tongue*. See the article LIBERTY.

TONICUM *Diatonum.* See the article GENUS.

TONOS, a word uſed by Hippocrates to expreſs in general any nerve, whether ariſing from the brain or ſpinal marrow. It is alſo uſed to expreſs a tenſion in any part.

TONSÆ, among the Romans, the blades of oars, or that part of them which beats againſt the water. *Pitiſc.* in voc.

TONSILLS (*Cycl.*)—*Inflammation of the* TONSILLS. This is a very common complaint from taking cold, and in its different degrees requires different methods of cure: in general the ſame means are to be uſed as in quinſeys, except that ſuch copious bleedings are not neceſſary; nor indeed is there occaſion for bleeding at all unleſs the patient is of a plethoric habit, or the inflammation be very violent, for in that caſe, the taking away a moderate quantity of blood often prevents its coming to ſuppuration. The patient is firſt to be purged with an infuſion of tamarinds, ſena, and cream of tartar, and this repeated to the third or fourth doſe, if there be occaſion; in the intermediate times, the diaphoretic attemperating and nitrous medicines are to be given in powders, and a large quantity of diluting liquors allowed, which ſhould be gently acidulated, and have a ſmall quantity of nitre diſſolved in them. Gargariſms made of decoctions of biſtort root, red roſes, and other gentle aſtringents, are to be frequently uſed; and the frequent waſhing the feet in warm water often has a very remarkable good effect.

If after four or five days the diſtemper is found not to give way to theſe means, but the tumour ſtill remains; there is then but little hopes to be had of its reſolution, and a very different end is to be attempted; emollient gargariſms are now to be uſed and maturating plaſters externally applied, ſuch as diachylon with the gums, and the like; and ſuppurating cataplaſms are to be applied to the whole neck and throat: theſe methods are to be continued till the tumour either burſts of itſelf, or is ſo ripe as to be fit for opening by the hand of the ſurgeon. After this has been done, and the matter is diſcharged, gargariſms muſt be uſed of decoctions of ſome vulnerary herb, or common green tea, ſweetened with honey of roſes, may be uſed to ſerve the purpoſe. The mouth and throat are to be frequently waſhed with this till the part is healed. It is to be obſerved, however, that the reſolution of theſe tumours is never to be deſpaired of, not even during the uſe of the ſuppurating medicines, for it is often ſeen that the tumour has been wholly diſcuſſed even during the uſe of theſe means, the reſolution often being extremely ſlow.

This is a very troubleſome complaint, and with ſome perſons is apt to return very frequently; the beſt preſervative againſt it is a moderate diet and bleeding about the time of the equinoxes, either in the arm or foot. Some have found it neceſſary to open an iſſue in the arm, in this caſe, and have been by this means perfectly cured, but on its drying up have always found the diſeaſe return. *Heiſter*'s Compend. Med. p. 131.

TOOTH-*Ach* (*Cycl.*)—When this terrible pain will give way to no other remedy, it is ſaid it may be ſpeedily removed by cauterizing behind the ear underneath the protuberance termed antitragus. There are ſeveral methods of doing this: ſome uſe a cautery prepared on purpoſe, others only a common ſmall iron nail, or a piece of iron wire, and others heat a ſcalpel red hot and plunge into the part; others alſo affirm that as much ſervice is to be done by cutting there without cauterizing, ſuppoſing that the operation deſtroys a nerve going thence to the *Tooth*, which is the occaſion of the ſenſe of pain in it. But it is to be doubted whether this ſevere remedy be as certain of ſucceſs as ſome pretend. *Heiſter*'s Surgery, p. 434.

TOOTH-*drawing*. *Tooth-drawing* according to Cicero was invented by Eſculapius, in whoſe temple the antients hung up a pair of leaden pullicans, very properly ſignifying that no *Teeth* were fit to be pulled out, but ſuch as might be removed with a leaden forceps; that is ſuch as were looſe and ready to fall out of themſelves; for they very little conſult their own welfare, who pull out their *Teeth* while firm and ſound: for drawing the *Teeth* is not only a painful operation, but often brings on bad accidents, and ſometimes even hazards the patient's life.

Tooth-

Tooth-drawing, however wrong in many caſes, yet is certainly right and neceſſary in others. 1. In children for the removing their lacteal or deciduous *Teeth*, for when theſe are left too long in their ſockets, they diſplace the new ones and turn them awry. 2. In infants it is alſo neceſſary to draw ſuch *Teeth* as grow out of the palate, or out of improper parts of the mouth, and are placed ſo as to impede their ſpeaking or ſucking. 3. In the *Tooth-ach* proceeding from a *Tooth*'s being carious, and giving way to no medicines, drawing is the laſt reſort, and is abſolutely neceſſary. 4. Thoſe *Teeth* ought to be drawn which by their irregular figure and poſition lacerate the gums and lips, and cannot be brought into ſhape by the file. And laſtly, it is ſometimes neceſſary to draw a *Tooth* for the curing a fiſtula, or ulceration of the gums near the roots of the *Teeth*.

The regular method of drawing them is this: If the *Tooth* is in the lower jaw, the patient muſt be ſeated on a low ſeat, or on the floor, and if in the upper jaw, he muſt be placed on a high ſtool or table; then the proper inſtrument is to be ſelected, and the *Tooth* carefully drawn as a nail out of a piece of wood. But this muſt never be done while the gums are inflamed, ſwelled, or otherwiſe diſtempered. *Heiſter*'s Surgery, p. 456. See alſo *Fauchard*'s Chirurgien Dentiſte.

Wolf-TOOTH. See the article WOLF.

TOOTH-*Wort*, in botany. See the article PLUMBAGO.

TOP (*Cycl.*)—TOP *of a Ship*, a round frame of boards lying upon the croſs-trees near the head of the maſts, here they furl or looſe the *Top*-ſail, *&c.*

TOP-*Armours*, in a ſhip of war, are a kind of cloths hung about the round-*Tops* of the maſts for ſhow; and alſo to hide the men which are in the *Top* in a fight, who lie there to fling ſtink-pots, *&c.* or to fire ſmall ſhot down on the enemy in caſe of boarding.

TOP-*Maſts*, in a ſhip are four, which are made faſt and ſettled unto the heads of the main-maſt, foremaſt, mizzen-maſt, and bow-ſprit reſpectively.

TOP-*Gallant-Maſts*, in a ſhip are two, *viz.* *main-Top-gallant-maſt*, and *fore-Top-gallant-maſt*, which are ſmall round pieces of timber, ſet on their reſpective *Top-maſts*; on the top of which maſts are ſet the flag-ſtaffs, on which the colours, as flags, pendants, *&c.* hang.

TOP-*Ropes*, in a ſhip, are thoſe with which the *Top-maſts* are ſet or ſtruck. They are received through a great block, which is ſeized on one ſide under the cap, and then are reeved through the heel of the *Top*-maſt, where is a braſs ſhiver placed athwart ſhips; after this they are brought up and faſtened on either ſide the cap with a ring: the other part of them comes down by the ties, and ſo is reeved into the knight-head; and when it is to be heaved, it is brought to the capſtan. Theſe *Top-ropes* belong only to the main and fore-maſt.

TOP-*Sail-Lifts*, on board a ſhip. See the article LIFTS.

TOP-*Sails*, and TOP-*Gallant-Sails*, in a ſhip, are thoſe belonging to the *Top*-maſts, and *Top*-gallant-maſts.

TOP-*a-Starboard*, on board a ſhip, the word of command to hale upon the larboard liſt.

TOP *the Yard-Arms*, on board a ſhip, a word of command to make the yards hang higher or lower. See the article YARD.

TOPAN, in zoology, a name by which ſome have called the horned-beaked Indian raven, more uſually known by the name of the rhinoceros-bird, *Worm.* Muſ. p. 113. See the article RHINOCEROS-*Avis*.

TOPAZ, TOPAZIUS. The name given by the moderns to a gold-coloured gem, called by the antients the chryſolite, or gold-coloured gem.

This is a very valuable and beautiful gem, when pure and in its moſt perfect ſtate, but ſuch are very rare; and the leſs perfect ones common among our jewellers are of little beauty or price.

The *Topaz* is never found very large; the far greater number of the oriental ones are as ſmall as the head of a large pin, and it is but here and there one, which arrives at the ſixth of an inch diameter, and very few indeed exceed that ſtandard. The American ones are ſomewhat larger than theſe, and the European are the largeſt of all; but of the leaſt value. It is always found in a pebble-like form; roundiſh or oblong, and flatted on one ſide, and of an irregular and uneven ſurface, but uſually bright and of a good natural poliſh, unleſs where fouled by accidents. It is never found in a columnar or cryſtal-like form, notwithſtanding that our dealers in gems carry on a large trade with what they call *Topazes*, which are of this ſhape: but all theſe when brought to the wheel are found to be no more than common cryſtals, accidentally tinged to a yellow colour, as is very common for the cryſtals and ſpars to be, in and about mines, from an admixture of metalline particles; and almoſt all the common *Topazes* worn in rings are of this falſe kind.

The colour of the *Topaz* is ever a pure yellow; but, like the other gems, it has this in very different degrees: the fineſt *Topazes* are of a true and exact gold-colour, and are of great ſplendour; but they vary from this in degree, up to the deepeſt ſaffron-colour, and down to that of the paleſt amber.

The fineſt *Topazes* are of equal hardneſs with the ruby and ſapphire, and are ſecond only to the diamond; from this they degenerate down to the hardneſs of a garnet, and yet lower; but in all the genuine *Topazes*, even the very meaneſt are, when brought to the mill, found to be much harder than cryſtal. The fineſt *Topazes* have a luſtre at leaſt equal to any gem except the diamond; but the others are but dead and heavy: the oriental ones diveſted of their colour, by putting them in the fire, make a very cloſe counterfeit.

The *Topaz* is found in the Eaſt and Weſt-Indies, and in many parts of Europe: the oriental are greatly ſuperior to thoſe of any other part of the world; and the American are not much better than the German. The fineſt gem of this kind ever known, is in the poſſeſſion of the Great Mogul; its weight is ſaid to be 157 carrats, and its value more than twenty thouſand pounds. *Hill*'s Hiſt of Foſſ. p. 598. ſeq.

Counterfeit TOPAZ. To counterfeit the oriental *Topaz* in paſte: Take cryſtal prepared two ounces, ordinary minium or red lead ſeven ounces; put theſe into a crucible luted, and bake them twenty-four hours in a potter's kiln. If the maſs is not ſufficiently clear and fine, cover it up again and give a ſecond baking, and it will come out of a fine *Topaz*-colour. *Neri*'s Art of Glaſſ. p. 131.

TOPE, in ichthyology, an Engliſh name for a ſpecies of the ſqualus according to the Artedian ſyſtem, diſtinguiſhed from the other ſquali, by the noſtrils being placed extremely near the mouth, and by certain foramina, or apertures near the eyes. It is the fiſh called by the antients γαλέος κύων, *galeus canis* and *canicula*. See the article GALEUS *Canis*.

TOPIARIA, in botany, a name by which ſome authors have called the acanthus, or bear's breech, a plant common in the gardens of the curious. *Ger.* Emac. Ind. 2.

TOPICS (*Cycl.*)—*Topics* are ſuch medicines, as by the ſmallneſs and mobility of their particles, attended for the moſt part with a gentle acrimony, are able to make their way into the ſubſtance of the parts to which they are applied, without eroding or wounding any of the ſolids; and thence are juſtly called penetrating *Topics*.

It may be a queſtion how *Topics* in medicine act. It is commonly ſaid that this or that medicine penetrates the pores; but the ideas annexed to ſuch expreſſions do not ſeem very diſtinct. Writers on this ſubject have ſeldom been at the pains to tell us what pores they mean. We have an eſſay on this ſubject in the Medic. Eſſ. Edinb. Vol 2. Art. 4. by Dr. Armſtrong, who thinks that the effects of ſuch medicines are not owing to their particles entering the orifices of the abſorbent veins; nor to the opening of the exhalent veſſels on the ſurface of the body by theſe medicines; nor will he allow the particles of penetrating *Topics* to force their way through the coats of the veſſels; but he ſuppoſes, that ſubtile medicines are conveyed by the exhalant veſſels of the ſkin, to thoſe parts of the ſmaller arteries, where the circulation is choaked by obſtruction.

TOPIC, in rhetoric. See the article LOCUS.

TOPPING *the Lifts*, aboard a ſhip, the ſame as haling the top-ſail-*lifts*, and therefore they ſay *top-a-ſtarboard*, or *top-a-port*, that is, hale upon the ſtar-board, or larboard liſt. See the article LIFTS.

TORCH-*Thiſtle*, *Cereus*, in botany, a ſpecies of plants belonging to the *Cactus*-genus. See the article CACTUS, Append.

This plant conſiſts of a ſingle ſtem or body, twenty, thirty, or more feet high, and about five inches in diameter. It is of an angular figure, and armed with cluſters of ſharp firm ſpines, growing from tubercles placed along the ribs. The flowers, when open, are of the ſize of a large roſe, and conſiſt of forty or more petals; the outer ones purpliſh or greeniſh, the inner ones white.

It is a native of Surinam, and many parts of ſouth America. It has gotten the name *Torch-thiſtle*, from its being much uſed for *Torches*.

This plant is frequent in our ſtoves among the curious in exotic vegetables, but it ſo rarely flowers, that many who have kept ſeveral ſpecies of it in their ſtoves for their whole lives, have not happened to ſee it. Dr. Trew gives a particular account of the flowering of one of theſe plants, at Nuremberg, in the year 1730; which may be agreeable to the curious, who have not themſelves ſeen it.

The plant which flowered there was a branch ſeven years before ſeparated from another *Cereus* in the ſame garden, which had never flowered. It had in this time grown to be ſix foot high, and thirteen inches thick: it had ſeven angles near the baſe, eight in the middle, nine near the top. Its upper part appeared of a bluiſh green, from a duſty matter it was covered with; its lower part was of a fine graſs-green, and the down of the prickles was whitiſh near the top, and every where elſe brown. On the fifth of September, within an inch of its top, their appeared a round knot growing out of the trunk, this increaſed in ſize very faſt and grew out horizontally, on the fourteenth of the ſame month, it was eight inches long, and plainly ſhewed the rudiments of a flower, tho' as yet cloſed up, and ſome elegant ſtains of green, purple, and white were viſible on it.

The ſame evening the flower began to open, and at midnight was fully expanded, it was then ſix inches in diameter, and was of a ſtrong but not pleaſant ſmell. After midnight it began to contract; it grew leſs by half an inch in a few hours, and remained of this ſize till the next day at noon; it then ſoon con-

contracted to half its former diameter, and the next morning it was quite closed and withered, but it hung on the trunk till the thirtieth of September.

The beginning of the flower is a sort of tube, three inches long and about an inch diameter; of a colour between a yellow and a pale green: Its surface is channelled with several small furrows, between which there ran several blunt protuberances in a parallel order along the ridges; where the tube expanded itself, it divided into more than forty petaloide segments, ranked in six separate series; the three exterior and inferior whereof, here and there confounded their order, while the three superior and interior remained separate and unmixed. These several series differed in size and colour, the first or exterior series was of the same colour with the tube, that is of a pale yellowish green, but its upper part gradually inclining to purple. The second and third series had half their inner part greenish, and their edges of a more intense purple; the fourth was between yellow and white, terminating in purple tops; the tops of the fifth were likewise purplish. The petaloide segments of the sixth series were very tender and white, all the segments were of an oblong figure, and in the first series were terminated with blunt tops, in all the others with more and more pointed ones to the very innermost series. The innermost series, which contained thirteen of these segments, had all their edges lightly and irregularly cut and divided: the pistil was of equal height with the surface of the flower, and was a hollow tube, terminating at its upper part in a number of fine tender filaments, expanded in the form of a crown; these were as many in number as the segments of the innermost series, that is thirteen. The day before the flower dropped from the ovary, the place where it was to fall off was marked with a blackish circle, and at this the tube readily and evenly separated from the rudiments of the fruit. The pistil still firmly adhering to the ovary: the petaloide segments of the flower were found not be separated from the tube without tearing, and were really segments, not distinct petals as might have been guessed by a cursory view of the flower. The fruit did not come to its full growth, but grew so far as to shew that it would never have been prickly: upon dissection it afforded a viscous juice, and within it was a cavity, the sides of which were every where beset with small villi, except at the bottom; and at the end of each of these hairs hung a small white vesicle which was the rudiment of a future seed. The error of the common opinion of supposing the flower of the *cereus*, polypetalous, is evident from this description, and all that is observed of this strange and elegant flower, has been since verified by the flowering of the same species with us. About six years ago I was on a visit at the late Lord Petres at Therndon in Essex, when his gardener, who had been some time ordered to watch a *cereus* of this species which was about to flower, called us out at midnight to see it. It had opened three flowers at different heights upon the stalk, and they were all of the same size, something larger than the standard given by Dr. Trew, but in all other respects perfectly agreeing with his description. Philos. Trans. N°. 416.

The propagation of all the kinds of this remarkable plant is by cuttings, which must be laid in a dry place ten days or a fortnight before they are planted, or if it be three weeks, there is less danger of their miscarrying. They are to be planted in small pots, filled with a light sandy earth, with a mixture of lime rubbish, laying some stones at the bottoms of the pots to drain off the moisture. The pots are then to be placed in a gentle bed of tanner's bark, and once a week are to have a gentle watering; this is best done in June, or July: toward the middle of August, they must have air given them by degrees, and at the end of September they must be removed into the stove, where they are to remain the winter. They should always have a dry situation, and should never be exposed to the open air even in the midst of summer.

When the top of an old plant has been cut off for propagating; it always throws out several young shoots from its angles, which may all be easily propagated in the same manner, and it will continue to do this in such a manner, that there will be a continual supply even from one stock. They may be brought in small pieces from the West Indies packed up in straw, and will grow when planted here, as well as if cuttings from our own plants. *Miller*'s Gardener's Dict.

TORCHENES, in the manege, a long stick with a hole at the end of it, through which a strap of leather is run, the two ends of which being tied together, serve to straiten and closely tie up a horse's nose as long as the stick is stayed upon the halter or snaffle. This is done to keep the horse from being unruly, when he is dressed, or upon any other occasion.

TORDINO, in zoology, a name by which the Venetians call a bird of the lark kind common in their markets, and called by authors *spipolletta*. See the article SPIPOLETTA.

TORDO *Marino*, in zoology, the name of a bird of the starling-kind, called also the *codirosso maggiore*, or *ruticilla major*, and by the Austrians the *stein-reitling*. Aldrovandus has named it the *merula saxatilis*, or rock-blackbird. It is of the size of our starling, and much resembles it in figure, its breast is greyish and has a black transverse streak, and behind that the whole is of a yellowish hue. Its head and back are of a blackish hue with some slight variegations of grey, from the tip of the feathers being of that colour. The tail is long and of a reddish orange colour, and the under feathers of the wings are of the same hue; the females are of a less elegant colour than the males, viz. a mouse-colour variegated with white on the back, and ash-colour on the belly; what is yellow in the male birds is also very pale in the females. It is not uncommon in Germany, and may be taught like the starling to imitate the human voice. *Ray*'s Ornitholog. p. 145.

TORDYLIUM, in botany, the name of a genus of umbelliferous plants; the characters of which are these: The flowers are of the rosaceous kind, being composed of several heart-fashioned petals of irregular sizes disposed in a circular order on a cup which afterwards becomes a fruit nearly of an orbicular figure, being composed of two flattish seeds with a high and usually denticulated margin, which easily deposit their covering.

The species of *Tordylium* enumerated by Mr. Tournefort are these: 1. The greatest *Tordylium*, called by some the largest *caucalis*. 2. The smaller Narbone *Tordylium*, called by some the smaller Cretic *seseli*. 3. The least Apulian *Tordylium*, called the least *seseli*. 4. The small Syrian *Tordylium* with a granulated limb, called by some *gingidium*, and the great seeded *caucalis*. And, 5. The Portugal *Tordylium*, with hemlock-leaves, and striated seeds. *Tournef.* Inst. p. 320.

TORMENTILLA, *Tormentill*, in botany, the name of a genus of plants, the characters of which are these: The flower is of a rosaceous kind, consisting of four leaves disposed in a circular form: the cup is of the shape of a bason, consisting of one leaf, divided into several segments; the pistil arises from this cup, and finally becomes a globose fruit composed of several seeds closely laid together, and covered by the cup.

To these it may be added, that the leaves grow always more than three together, at the ends or summits of the stalks.

The species of *Tormentill* enumerated by Mr. Tournefort are these: 1. The common wild *Tormentill*. 2. The large Alpine *Tormentill*. 3. The creeping *Tormentill*, with gold yellow flowers. 4. The great *Tormentill*, with green deeply divided leaves. 5. The lesser *Tormentill*, with leaves deeply indented. *Tournef.* Inst. p. 298.

TORMENTILLÆ *radix*, in the materia medica, is the root of the common wild *Tormentill*, which is frequent with us in woods and on heaths, and flowers in June and July. It is a small trailing plant, and the leaves grow about seven at a joint; the flowers are small but of a lively yellow; the root is tuberous and often an inch thick, brown or reddish without, and of a flesh colour within, of a very astringent taste, and are to be chosen from the druggists large, plump, fresh dried. It is a cordial and a very valuable astringent; it makes a very good addition to the common white drink, changing it to a red colour and increasing its virtue. *Pomet*'s Hist. of Druggs, p. 48.

TORPEDO, (*Cycl.*) the *cramp*, or *numb fish*, in ichthyology, a name given to that species of ray-fish which is wholly smooth. See the article RAJA.

The phænomena of this fish are fully explained in the cyclopædia under the article TORPEDO.

TORQUATA, in zoology, a name given by many authors to the common or water-snake, from the remarkable ring it has about its neck. See the article NATRIX.

TORQUILLA, in zoology, the name of a species of woodpecker, more commonly known by the name jynx, and called in English the wry-neck, from its manner of twisting its neck about, and turning its head over its shoulders. *Ray*'s Ornitholog. p. 95. See the article JYNX.

TORTOISE (*Cycl.*)—It is said *Tortoises* will live some days after their heads are cut off, and that this is a preparation for dressing them in Pegu. *Boyle*'s Works Abridg. Vol. 1. p. 28. See the article TESTUDO.

TORTURA, a word appropriated by many medical writers, to express only the distortions of the face, and particularly of the mouth in convulsions.

TORUS, in architecture. See the article TORE, *Cycl.*

TORUSCULA, a word used by some medical writers to express a drop.

TORYNE, in pharmacy, the name of a kind of spatula intended for the stirring up the ingredients of decoctions while boiling.

TORYNETOS, a name given by some to a mixture of bread and water boiled together, whether meant as a kind of a panada, or for a pultice.

TOTANO, or TOTANUS, in zoology, the name of a bird, of the ægocephalus or godwit kind, common in the Italian markets, and more usually known by the name of vetola. See the article VETOLA.

TOTANUS, is also used by some for the limosa. See the article LIMOSA.

TOTAQUESTAC, in zoology, the name of a beautiful American bird, described by Nieremberg from Antonius Herera. It is said to be something smaller than a pigeon, and all over of a most beautiful green; its tail-feathers are of a very great length, and are greatly esteemed. The Indians value the bird so highly that it is death by their laws to kill it, so that when it is caught they only strip it and let it go again. *Ray*'s Ornithol. p. 303.

TOTTAVILLA, in zoology, a name by which ſome authors have called the *alauda arborea*, or common wood-lark. See the article ALAUDA.

TOUCAN (*Cycl.*)—TOUCAN, in zoology, the name of a very remarkable Braſilian bird, a kind of magpie, of a middle ſize between our common magpie and the thruſh, but having a beak thicker and longer than its whole body; this beak is hooked at the end, and is of a very thin ſubſtance, not exceeding the thickneſs of a membrane, and very light and hollow, yet bony in ſubſtance and very bright and ſhining. It has a ſort of toothed edge, which prevents its ſhutting cloſely, and giving paſſage for the air, enables the bird to live without noſtrils.

It is yellowiſh on the outſide and red within, and is covered with a ſort of ſcaly ſubſtance eaſily ſcraped off with a finger at the edge. Its head is large in proportion to its body, and is black on the crown, the reſt of it and the neck and back are ſlightly variegated with white; its breaſt is of a bright orange-colour, and its belly and thighs of a very fine and bright red, and the tail is black, but red at the end: it is on the whole a very ſingularly beautiful bird. It is ſaid that it feeds on pepper, and Thevet affirms that it devours it greedily and returns it again undigeſted, and that the natives gather up that pepper, and uſe it in their food, as leſs hot and acrid than the freſh pepper. See Tab. of Birds, N°. 11. and *Ray*'s Ornitholog. p. 88.

TOUCH-*Hole*, or VENT, in gunnery, is the ſmall hole at the end of the cylinder of a gun or muſquet, by which the fire is conveyed to the powder in the chamber. In a firelock, carabine, or piſtol, it is called the *Touch-hole*, but in a piece of cannon it is more properly called the vent.

TOUCH-*Needles*, ſmall maſſes of gold, ſilver, and copper, each pure, and ſimple, and in all the different combinations, proportions, and degrees of mixture, prepared for the trying gold and ſilver by the *Touch*-ſtone; by compariſon with the mark they leave on it.

The metals uſually tried by the *Touch*-ſtone, are gold, ſilver, and copper, either pure, or mixed with one another in different degrees, and proportions, by fuſion. In order to find out the purity, or quantity of baſer metal in theſe various admixtures, when they are to be examined, they are compared with theſe needles, which are mixed in a known proportion, and prepared for this uſe. The metals of theſe needles both pure and mixed, are all made into laminæ or plates, one twelfth of an inch broad, and of a fourth part of their breadth in thickneſs, and an inch and half long; theſe being thus prepared, you are to engrave on each a mark indicating its purity, or the nature and quantity of the admixture in it.

The manner of making the *Touch-needles* is by the proportions of the mark, a weight of half a pound, or eight ounces, being divided into ſixteen half ounces, the half ounces each into four drams, the dram into four penny-weight, and this into two half penny-weights.

Silver TOUCH-*Needles*, theſe muſt be only tempered with copper, and the proportion determined by the mark divided into half ounces and grains.

You muſt uſe therefore for this purpoſe one mark of ſuch a weight that it may conſtitute a ſufficient maſs of metal for the making one needle, let it weigh for inſtance one dram, then weigh ſuch a mark of the pureſt ſilver, wrap it up in a ſmall paper and upon this write ſixteen half ounces, which will ſignify that the whole mark of this metal is the pureſt ſilver, make the firſt needle of this maſs.

Next weight fifteen half ounces of pure ſilver, and one half ounce of pure copper, wrap theſe both in a paper, and write on it fifteen half ounces, which will ſignify that there are in that ſmall maſs fifteen parts of pure ſilver, and one part of pure copper; make of this the ſecond needle. In the ſame manner go on with the reſt, add two half ounces of copper to fourteen half ounces of ſilver, mark it fourteen half ounces, make the third needle of this, and in the ſame manner proportion the ſmall maſſes of ſilver and copper for making the other needles, and put inſcriptions upon every one in the following manner.

For the needle	1.— 16	half oz. of ſilver	0	halfoz. of copper.
	2.— 15		1	
	3.— 14		2	
	4.— 13		3	
	5.— 12		4	
	6.— 11		5	
	7.— 10		6	
	8.— 9		7	
	9.— 8		8	
	10.— 7		9	
	11.— 6		10	
	12.— 5		11	
	13.— 4		12	
	14.— 3		13	
	15.— 2		14	
	16.— 1		15	

When you have gone thus far, and have the metals in each of theſe proportions, wraped up in its ſeparate paper; put each ſeparately, into a new crucible never uſed for any operation, and adding a little borax melt them together in a very quick fire, which muſt be well kindled before with bellows: or what is yet better, throw them ſuddenly into a hot crucible, and as ſoon as they melt, ſtir them with a dry wooden peg, burnt at the end, and pour them immediately into an ingot. When this is done, wrap up each maſs, when cold, in its own paper again, and weight them ſingly, in a nice ballance. If they ſtill weigh a whole mark, they are good; but if there is any conſiderable deficiency in their weight, it is a ſign that your fire having been too weak, or of too long duration, has conſumed as much copper as is wanting in the weight; therefore this maſs muſt be eſteemed uſeleſs, and another made in its place in the ſame proportion.

When this is all finiſhed, make with a hammer out of each theſe ſmall maſſes, a *Needle*, making them a little hot; then engrave on each of theſe *Needles*, the number of half ounces it contains, as before marked on its paper; that is, upon the firſt 16, upon the ſecond 15, and ſo on, and then pierce them at one end, and running a ſilver wire thro' their eyes, collect them in order according to their different numbers. Theſe are the *Silver Touch-Needles*, made of the different allays of ſilver and copper.

In Holland they make uſe of the mint mark, divided into grains for the making their *Needles*. The firſt *Needle* made of pure ſilver is ſaid to be of twelve penny-weights. The ſecond is made of eleven penny-weights and eighteen grains, by the addition of ſix grains of copper. The third is made of eleven penny-weights and twelve grains, by the addition of twelve grains of copper; and ſo on, the proportion of ſilver decreaſing always ſix grains, that is, one quarter of a penny-weight at a time, and that of the copper being always increaſed in the ſame proportion, till at laſt the weight of the ſilver is reduced to one penny-weight, and that of the copper encreaſed to eleven penny-weights, which proportion conſtitutes the laſt *Needle*.

It is needleſs however, to go through the whole ſeries of the *Needles*, by ſo ſmall progreſſions to the very laſt, for very delicate proportions cannot be very accurately diſtinguiſhed in the operation.

Gold TOUCH-*Needles*. Theſe muſt be mixt either with ſilver alone, or with ſilver and copper, variouſly intermixed. This mixture is called allaying or carracting, and is determined with a mark divided into carracts, or weights of two ſixth parts of an ounce. There is nothing to be obſerved about the making of theſe *Needles*, beſide what has been already ſaid in regard to the *Silver Needles*; except that the proportions of the weights are determined in another manner. Theſe *Needles* are made according to the following diviſion and order; and they all weigh one mark.

The firſt is entirely of pure gold.

2.	23 Car. 6 Gr.	pure gold	6 Gr.	pure ſilver.
3.	23 Car.		1 Car.	
4.	22 Car. 6 Gr.		1 Car. 6 Gr.	
5.	22 Car.		2 Car.	
6.	21 Car. 6 Gr.		2 Car. 6 Gr.	
7.	21 Car.		3 Car.	
8.	20 Car. 6 Gr.		3 Car. 6 Gr.	
9.	20 Car.		4 Car.	
10.	19 Car.		5 Car.	
11.	18 Car.		6 Car.	

The decreaſe goes on thus, by whole carracts, till the weight of the gold is arrived at one carract, and that of the ſilver at twenty three; for after the ninth *Needle* you cannot make ſo exact a diſtinction of the half carracts.

This mixture of gold and ſilver is called the white allay; but when copper together with ſilver enters into the mixture of the gold, then it is called a mixt allay. The *Needles* for trial of pieces thus debaſed, are made of mixtures analogous to the former, except only that thoſe portions which in the firſt caſe were pure ſilver, here conſiſt of copper and ſilver mixt. Therefore you have here a double ſeries; for the mixture is either of two parts of ſilver, and one of copper, or of two parts of copper and one of ſilver. For inſtance,

The firſt is of pure gold.

2.	of pure gold.	23 Car. 6 Gr.	of pure ſilver.	4 Car.	of pure copper.	2 Gr.
3.		23 Car.		8 Gr.		4 Gr.
4.		22 Car. 6 Gr.		1 Car.		6 Gr.
5.		22 Car.		1 Car. 4 Gr.		8 Gr.
6.		21 Car. 6 Gr.		1 Car. 8 Gr.		10 Gr.
7.		21 Car.		2 Car.		1 Car.
8.		20 Car. 6 Gr.		2 Car. 4 Gr.		1 Car. 2 Gr.

and ſo on as in the foregoing.

If in this table you take pure copper inſtead of pure ſilver, and ſilver inſtead of copper, this gives you a third ſeries of golden *Needles*. And you may have a fourth by mixing with gold equal quantities of ſilver and copper in the ſame proportion. Theſe allays of gold are much in uſe, but workmen may eaſily employ a multitude of other variations, which compared with the already mentioned will be diſtinguiſhed in a thouſand different ways by an experienced perſon, ſo that it is neither poſſible, nor neceſſary to imitate them all.

But that theſe *golden Needles* may not be too expenſive, they

they may be made much ſhorter than thoſe of ſilver, and afterwards ſoldered to plates of copper, that may be ſufficiently long for uſe.

The uſe of theſe *Needles* is by means of the touchſtone; and ariſes hence, that every metal when pure muſt have its ſpecific colour, that diſtinguiſhes it from the reſt: but metals being the moſt opake of all known bodies, the ſpecific colour of every one appears moſt diſtinctly when you rub it againſt a very black hard ſtone; and if the colours of two or more metals are expreſſed by large lively ſpots, made near each other on the ſame plane, by rubbing them againſt the ſurface of the ſtone, you will by that means eaſily diſcern their difference, or their likeneſs.

The ſtone adapted to this uſe, and called from its office the *Touch-ſtone*, muſt have the following qualities. It muſt be of the deepeſt black, leſt the tincture of the metal ſhould be altered by ſpurious rays of light ſhining among it: it muſt be capable of being pretty well poliſhed, for when too rough, the colours of the metals rubbed againſt it cannot be neatly or regularly diſtinguiſhed; and if it is too ſmooth, the metals are but faintly, and too ſlowly abraded or ſcraped by it, eſpecially when gold is tried. It muſt alſo be neither too hard, nor too ſoft. Tripoli, coal-duſt, and tin aſhes are uſed in rubbing off the thin metalline cruſts, and in a ſhort time the ſtone when very hard is apt to acquire too ſmooth a ſurface; and when it is too ſoft it eaſily wears, throws off a duſt, and contracts furrows.

The black rough marbles, and the ſofter black pebbles from the beds of rivers, are moſt proper for this uſe, and are to be made into the form of a quadrangular priſm, about an inch thick, and two or three inches long.

The method of uſing your *Needles* and the ſtone is this: When you meet with a piece of metal to be tried; firſt wipe it very well with a clean towel, or piece of ſoft leather, that you may the better ſee its true colour; for from this alone an experienced perſon will in ſome degree judge before-hand what the principal metal is, and how, and with what debaſed. Then chuſe a convenient not over large part of the ſurface of the metal, and rub it ſeveral times very hardly and ſtrongly againſt the *Touch-ſtone*; that in caſe a deceitful coat or cruſt ſhould have been laid upon it, it may be worn off by that friction. This however is done more readily by a grindſtone or ſmall file if you have them at hand. Then wipe a flat and very clean part of the *Touch-ſtone*, and rub againſt it over and over, the juſt mentioned part of the ſurface of the piece of metal, till you have on the flat ſurface of the ſtone a thin metallic cruſt, an inch long and about an eighth of an inch broad: this done look out the *Needle* that ſeems moſt like to the metal under trial, wipe the lower part of this *Needle* very clean, and then rub it againſt the *Touch-ſtone* as you did the metal by the ſide of the other line, and in a direction parallel to it. When this is done, if you find no difference between the colours of the two marks, made by your *Needle*, and the metal under trial; you may with great probability pronounce that metal, and your *Needle*, to be of the ſame allay; which is immediately known by the mark engraved on your *Needle*. But if you find a difference between the colour of the mark given by the metal, and that by the *Needle* you have tried; chooſe out another *Needle*, either of a darker or a lighter colour than the former, as the difference of the tinge on the *Touch-ſtone* directs; and by one or more trials of this kind you will be able to determine which of your *Needles* the metal anſwers, and thence what allay it is of, by the mark of the *Needle*; or elſe you will find that the allay is extraordinary, and not to be determined by the compariſon of your *Needles*.

But if the metal under trial, has been altered by tin, arſenic, zink, or other ſuch admixtures, the workmen may be deceived by the colour, ſo as to take for pure gold, or ſilver, that which is not by any means ſuch. Deceits of this kind however are found out by the aſſiſtance of acid menſtrua. *Aqua fortis* anſwers this purpoſe, when the maſs is of the colour of gold, and *aqua regia* when it is of the colour of ſilver; for the firſt of theſe menſtrua diſſolves all metals except gold, and the latter all metals except ſilver. In this caſe then you are to pour upon your metallic ſtreak on the ſtone, one ſmall drop of either of theſe liquors, and extend it gently over it with a feather. If it is neither gold nor ſilver the whole ſtreak will be obliterated and conſumed, but if there is any gold or ſilver in it, this remains undiſſolved, and ſhews another colour, becauſe the other parts have been ſeparated from it by the ſolution. When theſe menſtrua are uſed, great care muſt be taken that there is no oil in the way; for that would ſpoil and deſtroy their effects.

Beſide theſe the following particulars are to be obſerved: Gold and ſilver when pure, whether ſeparate or both mixed together, without the addition of any other matter, when made hot in the fire, not only preſerve their colour, but if they were tarniſhed before, they recover their ſplendour there, not loſing the leaſt part of their weight: and by this quality in theſe two metals, the *caratura alba*, or white allay, made by the mixture of gold and ſilver alone, is diſtinguiſhed from all the others. If you have not liberty to try the whole maſs in the fire, you may make this experiment on a ſmall piece of it with a blow pipe.

If you find a *Needle* of the ſame allay with the metal under trial, the ſtreaks made by both upon the touch-ſtone muſt undergo exactly the ſame changes when *aqua fortis* is poured on them; and this ought always to be made a part of the trial by the *Touch-Needles*, that no fraud may be at the bottom.

All gold rendered brittle, when compared with the *Touch-Needles* by the ſtone, will appear leſs pure than it really is; and on the contrary all ſilver rendered brittle, has the whiteneſs of ſilver in a higher degree: nor is there any wonder in this, when rightly conſidered, ſince the bodies which make gold and ſilver brittle are only a few metals, and ſemi-metals, all of a very bright white colour, and neceſſarily adding to the whiteneſs of ſilver, and taking from the yellowneſs of gold, ſuch are tin, lead, regulus of antimony, biſmuth, zink, and arſenic. Theſe dilute the yellow colour of gold or copper, into a whiteneſs, ſo that the colour of copper mixed with the ſilver is hidden by admixtures of this kind, whereas gold on the contrary appears by them to have much more ſilver in it than it really has.

In a white allay, *aqua fortis* does not diſcover the preſence of ſilver from twenty-three, to ſeven carracts, becauſe *aqua fortis* does not ſeparate ſilver from gold, unleſs the maſs contains three times more ſilver than gold.

Metallic ſtreaks or cruſts which have been left ſome time upon the *Touch-ſtone*, cannot be compared with freſh ones, with any degree of uſe, becauſe their remaining long on the ſtone always alters their colour.

Silver when tempered with braſs appears whiter than it would do with a like quantity of copper, and as it may then be rendered ſufficiently ductile by a proper operation, you will hardly be able to find out the fraud with the *Touch-ſtone*, unleſs you make a ſecond time the ſame compariſon with the ſtreak of a *Needle* of the ſame colour, having previouſly poured *aqua regia* upon the metallic cruſt laid by rubbing on the touch-ſtone; nor are *Touch-Needles* tempered with braſs, of any great uſe on this occaſion, ſince this artificial metal is ſometimes more and ſometimes leſs yellow.

Laſtly, if the metal laid upon the *Touch-ſtone* by rubbing does not appear neat or diſtinct enough, lick it over with ſpittle that is not frothy; and the colours will be by that means more diſtinctly and livelily reflected. *Cramer*'s Art of Aſſaying, p. 116.

TOUCH-*Stone* (*Cycl.*) The *Iriſh* TOUCH-STONE, called *Baſanus Hibernicus*, by Molyneux and ſome others, is a black marble found in the county of Antrim in that kingdom, in angular columns, forming that amazing pile called by the vulgar, the giant's cauſeway.

This marble has the property of trying metals by the *Touch* beyond any other known ſtone; but it is not eaſily wrought into form, being ſo hard that it turns the edges of all the tools uſed to cut ſtones. Were it not for this it is admirably calculated for building, and for ornamental works; but nobody has attempted to uſe it in this manner, any where, except in the church of Ballywellan in the neighbourhood, and here the trouble of cutting is avoided, for the joints are taken as they found them, and the church is built of theſe in their natural ſhape, piled one upon another. The outer ſurface of this ſtone is of a whitiſh colour like lime-ſtone, but this is only the effect of the weather upon it; for where-ever it is broken it is found to be of a fine iron grey, and when poliſhed appears of a true and deep jetty black.

The accounts Pliny and others give of the *baſaltes* or *baſanus* found in Æthiopia and other places, agree extremely well in all reſpects with this Iriſh marble. They ſay it was always found in form of columns, and was much harder than the common marble, and of an iron colour: Kentman and other later writers, deſcribe alſo a pillared ſtone, found in Miſnia, the accounts of which agree perfectly well both with this and with the *baſaltes* of the antients: ſo that there is no great room to doubt but that both the Miſnian and the Iriſh columnar marble are the ſame with the *baſaltes* of the Greeks and Romans; and that this *baſaltes* is always found in the ſame columnar form, in whatever part of the world it is met with; and conſequently that the giant's cauſeway in Ireland, is no work of art as vulgarly thought, but only an immenſe congeries of this *baſanus* or *baſaltes* in its natural ſtate and form.

The columns of this marble are all regularly angular, but they conſiſt of a great number of ſides in ſome, and of a ſmall number in others. Some columns being octangular and others only triangular, and others of all the different numbers of angles between three and eight.

The Miſnian *baſaltes* is ſaid to have no columns of more than ſeven angles, or of leſs than four; by this account it appears that the Iriſh kind has two orders of columns which that wants, but this may be owing to want of due obſervation of the Miſnian kind: for Dr. Molyneux in his firſt account of this cauſeway, ſays, that its columns conſiſt of five angles at leaſt, or ſeven at moſt, but future obſervations alone can ſhew whether the Miſnian kind may not have other numbers of angles in ſome of its columns, from thoſe at firſt taken notice of, as well as this. Some of our Engliſh authors have been of opinion that the ſtone of the giant's cauſeway was of the *entrochus* or *aſteria* kind; but this is very abſurd, for the ſize of thoſe ſtones ſeems to be limited, as they are the remains of animals, and

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nothing of that kind can be larger than the part of the animal it had its origin from, whereas we can never ſuppoſe any animal ſo monſtrouſly large to have at all exiſted, as that theſe columns ſhould have been only a part of it.

The ſubſtance of this ſtone is alſo an unſurmountable difficulty againſt the opinion of its being of the nature of the *entrochi* and *aſteriæ*, for they are all compoſed of ſpar, and are ſoft and crumbly; whereas this is too hard even for cutting in the common way of working other ſtones.

The columns of *baſaltes* in Miſnia, either are not jointed like thoſe in Ireland, or the joints have not been obſerved; but ſuppoſing that they really are not jointed at all, they may nevertheleſs be the ſame ſtone, ſince the joints may have been obliterated by the ſtones coming together while yet ſoft, and ſubject to injury by preſſure from above given by the ſucceeding addition of new joints: and, even in the Iriſh kind, the joints, tho' ſo very regularly formed in the way of ball and ſocket, in ſome are much leſs regular than in others, and, in ſome of the inland columns, are only two flat and ſmooth ſurfaces laid one upon another. It is not difficult to conceive that if theſe ſurfaces had met together in this cloſe contact, while a little moiſt, they would have cohered together; ſo as to have left no mark of the joining.

Agricola deſcribes a kind of marble found in the diſtrict of Hildeſheim in Germany; which alſo agrees very well with our *baſanus* of the giant's-cauſeway, and with the *baſaltes* of the antients; and an author, who has wrote on the ſame ſubjects ſince his time, confirms his account: he ſays, that the marble is black, and in form of beams and columns ſtanding up above the ſurface of the earth in the hills, and that being ſtruck forcibly againſt with a bar of iron, it gives a ſtrong ſmell like that of burnt horn. This agrees very well with the marble of the giant's cauſeway, which when put to the ſame trial has evidently the ſame effect. Philoſ. Tranſ. N°. 241.

TOURNEFORTIA, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: The cup is a ſmall *perianthium* divided into five ſegments, and remains after the flower is fallen; the ſegments are of a pointed figure. The flower conſiſts of a ſingle petal in form of an oval tube, longer than the calyx, divided into five ſlight ſegments, ſomewhat broad and pointed and ſpread open. The ſtamina are five tapering filaments of the lengh of the tube of the flower. The antheræ are ſimple and ſtand in the mouth of the flower. The germen of the piſtil is globoſe, and ſituated under the cup. The ſtyle is ſimple and of the length of the ſtamina, and the ſtigma is ſimple. The fruit is a globoſe berry, containing two cells, the ſeeds are of an oval figure, two in number, and ſeparated by the pulp. *Linnæi*, Genera plantarum, p. 62.

TOURNEQUET, in ſurgery, an inſtrument made of rollers and compreſſes with the help of a ſmall ſtick, and uſed to ſtop the effuſion of blood from large arteries in amputations by forcibly tying up the limb. The things neceſſary for this are a roller of a thumb's breadth, and of an ell in length, a ſmall cylindrical ſtick, a conglomerated bandage two fingers thick and four long, ſome compreſſes of a good length, and about three or four fingers breadth, to ſurround the legs and arms, and a ſquare piece of ſtrong paper or leather about four fingers wide.

The manner of applying this inſtrument is this, the rolled bandage is to be applied to the trunk of the wounded artery length-ways, covering it in a contrary direction with compreſſes ſurrounding the leg, foot, or arm, as it were with a ring; the roller muſt be paſſed twice round theſe applications, and faſtened in a knot, but ſo looſely that you may eaſily introduce your hand between it and the part: the leather or thick paper muſt now be nicely placed under it, upon the external part of the leg, and the roller tightened by degrees by turning round the ſtick, which is to be introduced into the knot; this to be done till the hæmorrhage is entirely ſtopped: the ſtick muſt now be kept in this ſituation till the wound is properly treated, and the return of the hæmorrhage prevented. When this end is acquired, the *Tournequet* is to be looſened, or entirely taken off, as ſhall be judged moſt convenient; but where it is applied to the arm, the rolled bandage is to be placed near the *axilla* in the internal part of the *humerus*, and the ſtick in this caſe is to be faſtened on the oppoſite ſide, the ſituation of the artery there requiring this poſition; and when it is to be applied to the thighs, the bandage is to be put as the caſe ſhall require, either to the upper part of the thigh, or juſt over the knee. *Heiſter*'s Surgery, p. 47.

TOW (*Cycl.*)—Tow-*Chain*, in huſbandry, a name given by our farmers to a chain, that makes a part of the ſtructure of the plough, faſtening the plough-tail to what they call the plough-head.

This is an iron chain of few links, and very ſtrong; it is fixed at one end to a collar faſtened to the middle of the beam of the plough, and at the other end paſſes thro' that part of the plough-head called the box, which is the timber thro' which the ſpindle of the two wheels run. The ſtake of the plough, which is an upright piece running parallel with the crow-ſtaves, pins this in at the bottom, running thro' that link which comes out by the box; this ſtake is faſtened by wyths or cords in two places to the left crow-ſtaffs, and the chain is thus kept firm. *Tull*'s Huſbandry.

TOWER, in glaſs-making. See the article Leer.

TOXICODENDRON, *poiſon-wood*, in botany, the name of a genus of plants the characters of which are theſe. The flower is of the roſaceous kind, being compoſed of ſeveral leaves diſpoſed in a circular form. The piſtil ariſes from the cup, and finally becomes a fruit of a roundiſh ſhape, dry, not juicy, and uſually of a ſtriated ſtructure.

The ſpecies of *Toxicodendron* enumerated by Mr. Tournefort are theſe: 1. The ſmooth trifoliate *Toxicodendron*. 2. The trifoliate *Toxicodendron*, with hoary ſinuated leaves. *Tourn.* Inſt. p. 610.

The moſt common American kind of this tree, is the aſh-leaved one; it grows in marſhy places, and is called by the common people marſh-ſumach; its leaves reſembling thoſe of the common ſumach, which are very well known to reſemble aſh-leaves in their pinnated ſtructure. It grows to about four inches in diameter, and at the utmoſt does not exceed twenty feet in height. It ſpreads much at the root, and where one has been at any time cut down, there are always ſeen a great number of young ones growing from its ſtump. It is of very quick growth, but is not durable. The inſide of the wood is yellow, and contains a juice which is as glutinous as turpentine; the wood itſelf has a very ſtrong and diſagreeable ſmell, but the juice ſtinks like carrion.

This tree poiſons two ways; by handling of it, and by the ſmell. The ſcent of it when cut down in the woods has poiſoned many people, and many more have ſuffered by it while burning in their fires. People with only handling it have been made blind for ſeveral days, and perſons who ſit near a fire when it is burning are often ſwelled and choaked up in all parts of the body in a terrible manner. It is very remarkable that the effect of this poiſon ſeems confined to ſome few perſons, and that one may handle it ever ſo long, and even chew it without hurt, while another is poiſoned by only touching it; and a whole company ſitting by a fire where it is burning, ſhall often all eſcape except one or two, who will be ſwelled with it. The poiſon of this tree is never mortal, but goes off of itſelf in a few days; and the people who ſuffer by it generally carry its effects off the ſooner, by uſing ſallad oil and cream to the parts. The firſt notice the perſon has of being affected by it, is by feeling a violent itching in the ſkin; this provokes ſcratching and rubbing; and in conſequence of this the part inflames and ſwells. Sometimes a perſon's whole body is ſwelled and poiſoned in this manner, and ſometimes only a particular part, as the legs; and, in this caſe, they often diſcharge a conſiderable quantity of water, and then grow well.

People who have been poiſoned by handling it, affirm that it is ſo much colder to the touch than other wood, and that it may be diſtinguiſhed by this in the dark; when it is burning ſome people are ſo affected by it as to ſwoon away, others yawn and ſeem uneaſy, while the reſt feel nothing of it. The fruit of this tree is a white roundiſh dry berry, growing in cluſters. Philoſ. Tranſ. N°. 367. p. 144.

TOXICUS, in botany, a name by which ſome authors have called the *arundo farcta*, of which the walking-canes are made. *Chabræus*, p. 193.

TOXOTÆ, τοξόται, among the Athenians, bowmen, a ſort of inferior officers, or rather ſervants, who attended the lexiarchi.

They were much like the Roman lictors: there were a thouſand of them in the city of Athens, that lived in tents, erected firſt in the forum and afterwards in the areopagus. *Potter*, Archæol. Græc. T. 1. p. 79. See the article Lexiarchi.

TOZZIA, in botany, a name given by Micheli and continued by Linnæus to a genus of plants, the characters of which are theſe: The perianthium is very ſhort; it conſiſts of one leaf of a tubular figure, divided into five ſegments at the end, and remaining when the flower is fallen. The flower is one-leaved and open; the tube is cylindric, and longer than the cup. The extremity forms two lips; the upper lip is bifid and the lower trifid, and all the ſegments are nearly equal in ſize and of a roundiſh figure. The ſtamina are four filaments hid under the upper lip of the flower. The antheræ are roundiſh. The germen of the piſtil is oval; the ſtile is capillary, of the length of the ſtamina; and the ſtigma is capitated. The fruit is a globoſe univalve capſule, having only one cell, in which is contained a ſingle oval ſeed. *Linnæi* Gen. Pl. p. 302. *Michel.* p. 16.

TRACHEA (*Cycl.*)—Tracheæ, in vegetables, are certain air-veſſels evident in many plants, but in none more beautifully or diſtinctly obſervable than in the melon.

Mr. Bulfinger obſerved that in cutting the root of the common melon tranſverſely, there appeared, beſide the bark and other commonly known parts of the root, a multitude of foramina, which were larger or ſmaller as the portions of the root were cut from a thicker or a thinner part. Theſe are eaſily viſible to the naked eye, for they are arranged into a number of faſciculi, which ſurround the axis of the root: there are uſually three circles of theſe diſtinguiſhable in the ſmaller parts of the root, and four in the larger; and the matter in which they

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are placed is different from that which ſurrounds it, being much harder and more firm than that.

Moſt of theſe faſciculi or foramina finally become divided into two or three portions, and the interſtitial matter in that caſe is always the ſame with that which ſurrounds them. If any number of theſe faſciculi are examined, the order and diſpoſition of the foramina, and even their numbers, are found the ſame in all; they are ſo regularly continued along the root, that air, and light fluids, may be ſucked into the mouth thro' pieces of the root from two to nine inches long, and this even when they are contorted and crooked in their growth: the caſe is the ſame alſo, whether the piece be cut from the root or from the ſtalk of the plant, or from both; for when ſuch a piece is cut, half of which is root and half ſtalk, the continuation of theſe foramina is found to be the ſame, and the air paſſes, whether it be blown in at one end or the other: this is plainly ſeen on immerſing one end in water, and blowing in at the other; the bubbles of air ariſing readily and in great quantities. Comment. Petropolit. Vol. 4. p. 182.

In the trunk or ſtalk of the melon, there are always regularly twelve of theſe faſciculi with their regular foramina; and it is evident to the eye that theſe foramina are perfectly empty, if a ſmall ſegment of the root or ſtalk be placed between the eye and a ſtrong light. The number of faſciculi in the ſtalk is the ſame, whether it be cut near the root, or at ever ſo great a diſtance from it: the ſame in the ſmaller branches, and even in the pedicle which ſuſtains the fruit. The number of the cellules in the fruit alſo anſwers to that of theſe faſciculi in the ſtalk, there being always the ſame number when the fruit is perfectly and regularly formed, tho' ſometimes from accidents there are only ten or eleven to be counted. In the pedicle of the fruit there are indeed more than twelve to be obſerved, but theſe ſupernumeraries are only ramifications of the orignal twelve; on the contrary in the pedicles of the leaves there are only nine of theſe faſciculi to be counted; five of theſe are placed on the convex ſide of the ſtalk, and are greatly ſtronger than the others; and there are two middle-ſized, and two others very ſmall, in the other part. Theſe have their origin from the nine faſciculi of the ſtalk which are neareſt the pedicle; the other three run on without any divarication or without ſending off any branches, and form the pedicle of the next leaf; ſo that new leaves are produced by thoſe alternate faſciculi. The three which run on uninterrupted, form the three great middle ribs of the leaf into which the pedicle expands, and the two lateral ſmaller ribs are formed each of three other faſciculi taken in from the ſtalk; and in ſome of theſe the three faſciculi may be eaſily diſcerned on cutting them tranſverſely; in others only two ſhew themſelves on examination; and ſome part of one of theſe faſciculi may be always traced running out into every ramification of theſe ribs in the leaf, ſo far as the beſt glaſſes are able to carry the ſearch. Theſe faſciculi, as they are continued both thro' the ſtalk and pedicles and even thro' the ribs of the leaves, carry the external appearance of a white ligneous fibre; and as they are protruded to great lengths and run into very ſlender ramifications, their foramina become leſs and leſs apparent, and at length eſcape the obſervation with the very beſt miſcroſcopes.

If at any time the ſtalk near the inſertion of a leaf, and the leaf itſelf near that part, has happened to rot; it is eaſy to draw out theſe faſciculi regularly in the proper number; and theſe in their larger part ſhew all their foramina very beautifully, while in the ſmaller they become leſs and leſs diſtinct. The main ſtalk or trunk of the plant has a cavity or hollow in the middle, which is not continued to the root, nor to the pedicles of the leaves; and near the origin of the young branches, in that part of the ſtalk to which the inner part of the leaf correſponds, there is a greeniſh diaphragm which occupies the middle of the ſtalk, into which the fibres of the ſtalk, after making their ramification for forming the faſciculi of the pedicle, are inſerted laterally; after which, penetrating the ſtalk, and coming out at that part where the origin of the leaf is to be, they form a ſort of thin membrane, which covers the tender firſt ſhoot of the leaf and the young branch. This membrane finally ſhews its twelve faſciculi; and thus the true number is every where continued, unleſs in ſome few places where two of them have happened to cohere on their running too cloſe together; but in this caſe they ſoon divide again, and ſhew their true number. Comment. Petropol. Vol. 4. p. 184.

From the whole it may be concluded, that if the *Tracheæ* of plants are continuous canals, containing only air, and compoſed of a firm matter in their ſides, theſe faſciculi before deſcribed, as found in the root, ſtalks, &c. of the melon, are true *Tracheæ*: for it is plain that they are empty canals, or containing no other matter than air; neither need it be doubted that there are ſuch in all plants, becauſe in ſome even the beſt microſcopes cannot diſcover them: for we find in this very plant that thoſe *Tracheæ*, which in a part of their length are very conſpicuous, become ſmall and not to be diſtinguiſhed as hollow, in their finer and ſmaller extremities; and in ſuch plants as are ſuppoſed to have none of them, they may either be ſo minute as not to have a diſcernable hollow, or elſe their cavity, or at leaſt the new made orifice of it, may be occluded by the other veſſels of the plant throwing out their juices into it, on being wounded. We ſee that in the melon theſe *Tracheæ* are carried from the root to every part of the plant with great regularity, and that they are included in what we commonly call the woody fibres of plants, and have their ſides formed of the matter of thoſe fibres; whether theſe fibres have any juices circulating thro' other ſmaller canals, or are only deſtined to ſupport the *Tracheæ*, or air veſſels, is a queſtion not eaſily determined: they are much dryer than any other fibres of the plant, and ſeem to contain no juices, except thoſe deſtined for their own proper nutrition. They have by ſome been ſuppoſed to ſerve for the carrying back to the root ſuch juices as were not employed in the nouriſhing the plant; but all experiments ſeem to diſcountenance this conjecture, and it ſeems to have been built upon the obſerving this part of the vegetable without ſeeing its true uſe, or finding out the numerous *Tracheæ* which it ſuſtained. The cavity in the middle of the ſtalk may be attributed to the expanſion of the green fibres, and of the utriculi which form ſo great a part of the plant; and the motion of the juices in theſe may poſſibly be owing to the motion of the air in theſe *Tracheæ*, regularly dilating and contracting them. But the great eaſe and plainneſs with which they are followed in this ſearch is owing to their largeneſs, and the tenderneſs of the ſtalk.

It is eaſy to ſee in what manner the ligneous parts of plants contribute to vegetation, ſince in thoſe parts only the *Tracheæ* are ſituated: and hence alſo the reaſon appears very obvious, why grafts do not ſucceed unleſs the ligneous part of the ſtock be touched in the operation; all the *Tracheæ* of the ſtock being in this part, and it being impoſſible that the *Tracheæ* of the graft ſhould have any communication with them, unleſs brought into contact by opening this ligneous part of the tree. Act. Petropol. Vol. 4. p. 187.

Nothing ſhews the *Tracheæ* of plants in ſo beautiful a manner as a tranſverſe ſegment of a young ſhoot of the vine. They may be in this diſcovered in a good light even by the naked eye; but with the help of but a ſmall magnifying glaſs they appear very beautiful and diſtinct. In the generality of other trees, theſe *Tracheæ* are ſo ſmall, that even the largeſt magnifiers in our microſcopes cannot well diſtinguiſh them: ſo that Fontenelle and many other great men have doubted their exiſtence: but even where theſe are ſmalleſt of all, as in the petiola or middle ribs of the leaves of plants, they may, tho' wholly imperceptible to the ſight, be proved to exiſt, by experiments. If a ſmall cylindric glaſs be filled with water, and have all its air exhauſted from it by the air-pump, and the middle rib of a leaf be then cleared from the other parts, and cut off at both ends, and plunged at one end into this water, while yet in the exhauſted ſtate, the bottom of the petiolum being ſupported from touching the bottom of the glaſs, the ſituation and number of the *Tracheæ* in it will be eaſily diſtinguiſhed by a ſtring of bubbles, which, ariſing from each of them, will make a row of beads, as it were riſing in a continued chain to the ſurface. Act. Erudit. Ann. 1722. p. 24.

TRACHELAGRA, a term uſed by ſome medical writers to expreſs the gout in the neck.

TRACHELIUM, in Mr. Tournefort's ſyſtem of botany, the name of a diſtinct genus of plants the characters of which are theſe: The flower conſiſts of one leaf, and is ſhaped like a funnel, and divided into ſeveral ſegments at the edge. The cup of the flower is finally converted into a membranaceous fruit, which is uſually of a trigonal form, and is divided into three cells, which uſually contain a number of very ſmall ſeeds.

The ſpecies of *Trachelium* enumerated by Mr. Tournefort are theſe: 1. The blue-flowered umbelliferous *Trachelium*. 2. The jagged-leaved violet-coloured umbelliferous *Trachelium*. 3. The hairy *Trachelium* with flowers growing in cluſters from the alæ of the leaves. 4. The rock-*Trachelium* with flowers collected into heads. 5. The violet-coloured African *Trachelium*, with flowers growing ſcatteredly all upon the ſtalks. 6. The American ſow-thiſtle-leaved *Trachelium*, with very long white flowers. *Tourneſ.* Inſt. p. 130.

TRACHELOMASTOIDÆUS, in anatomy, a name given by Albinus to a muſcle, called by Winſlow and others the *complexus minor*, or *maſtoidæus lateralis*.

TRACHELOS, a word uſed by ſome anatomical authors to expreſs the neck.

TRACHIDNA, in ichthyology, a name given by Jovius and ſome others to the *draco marinus* of the old authors, called by us the *weever*.

It is a ſpecies of the *trachinus*, deſcribed by Artedi under the name of the *trachinus* without beards and with the lower jaw longer than the upper. See the next article.

TRACHINUS, in the Linnæan ſyſtem of zoology, the name of a genus of fiſhes, of the general order of the acanthopterygii: the characters of theſe are, that the opercula of the gills are pointed, and the eyes are placed near one another in the top of the head. *Linnæi* Syſtema Naturæ, p. 53.

The characters of this genus, according to Artedi, are theſe: There is one or more prickles at the upper angle of the coverings of the gills, and the head has ſome rough tubercles

on it. The eyes are placed near one another in the upper part of the head. There are two back fins. The foremoſt one is very ſhort. The appendices of the pylorus are from eight to twelve in number.

The ſpecies of this genus are only two: 1. The *Trachinus* with the lower jaw longeſt, without beards. This is the fiſh called the *draco* and *araneus marinus*, and by us the *weever*. The other is the *Trachinus*, with ſeveral cirri in the lower jaw.

This is the uranoſcope, or *Trachinus* of authors, called alſo *callionymus*. *Artedi* Gen Piſc. See the article URANOSCOPE.

The name is originally Greek, the word τραχεινος ſignifying rough, ſharp, or prickly. It was given to this fiſh from the rays of its back-fin being remarkably rigid, and ſharp like prickles.

TRACHINUS *Lapis*, a ſtone mentioned by the writers of the middle ages, as poſſeſſing many great medicinal virtues. It ſeems to have been a kind of *lapis nephriticus*, being deſcribed as bright, but not tranſparent, and being of two kinds, the one blackiſh, the other green.

TRACHURUS, in zoology, the name of a fiſh of the cuculus-kind, called in Engliſh a *ſcad*, and by ſeveral authors, *ſuro*, *ſaurus*, and *lacertus marinus*.

It very much approaches to the nature of the common mackrel in colour, ſhape, and taſte; inſomuch that the French call it *maquereau-batard*, or baſtard-mackrel; but it never grows to the full ſize of the mackrel, and is of a more flat ſhape. Its back is of a very ſhining blue. Its belly white, with a faint bluſh of reddiſhneſs. Some have erroneouſly ſuppoſed, that it had no ſcales; but it is covered with conſiderably large ones. Its ſide-lines are one on each ſide, and are made each of a row of bony ſcales. Theſe have all eminences in their middle, and riſe ſo high near the tail, as to make that part of the body of the fiſh appear ſquare. The eyes are large, and the lower jaw is a little longer than the upper. The jaws are rough like files. The back has two fins, a ſhort anterior one, and a long one behind it; and the tail is conſiderably forked. This fiſh uſually ſwims in large ſhoals, and is caught in the Mediterranean, and on the Engliſh coaſts in Cornwall, and ſome other places. It is eſteemed a very well taſted fiſh. *Ray*'s Ichthyography, p. 290.

TRACHURUS *Braſilienſis*, a name given by Mr. Ray to a fiſh of the cuculus-kind, commonly eaten in the Braſils, and known among writers on theſe ſubjects by its Braſilian name *guaratereba*. *Ray*'s Ichthyology, p. 291. See the article GUARATEREBA.

TRACING, in huſbandry, a term uſed by our planters for the method of preſerving the maize, or Indian corn. This, being a large grain, is apt to ſpoil, if not carefully preſerved.

Some thraſh out the corn as ſoon as the ears are gathered, and lay it up in holes of the earth, which are their granaries: But thoſe who have not opportunities of doing this, *trace* it, that is, they leave it in the ear, and weave, or faſten together a great number of ears by the ends of the huſks: Theſe *traces* of corn they hang up within doors, on ſuch ſupports as will keep them from one another; and they will, in this manner, keep good the whole winter.

This is a method of our introducing; but their own, of burying the clean corn, was at leaſt as good, and was the ſame practiſed by the Ægyptians of old, and by all the wiſeſt nations of the eaſt at this time. But whether we have improved their huſbandry in this particular, or not, it is certain that we have greatly aſſiſted them in the planting this corn, which we do by the plough, inſtead of the troubleſome method they had of doing it with the hoe. The manner of our planting it is this: We plough ſingle furrows the whole length of the field, and at about ſix foot diſtance one from another; we then plough others acroſs at the ſame diſtance, and then, wherever the furrows meet, the corn is thrown in; it is then covered either by the hoe, or by running another furrow behind it with the plough; and when the weeds begin to overtop the corn, they plough the ſpaces again, and by this means deſtroy and turn in all the weeds, and give the earth ſtirring, that greatly aſſiſts vegetation.

The famous method of horſe-hoing huſbandry, ſo celebrated by Mr. Tull in a book written on that ſubject, is no other than a bringing home this method of our American planters, in the culture of the maize, and applying it to our European corn, with which, however it can never ſucceed ſo well. The Indians, and our planters, join in the method of raiſing a hill of earth round every ſtalk of the maize; and when the ground is poor, or out of heart, they bury two or three fiſhes, of a kind called by them the *aloofe*, under every hill, and by this means they have a crop double to what would otherwiſe have been produced. The Engliſh have learned this manure from the Indians; and in New England, where they are near the fiſhing-ſtages, they bury the heads and garbage of the cods, which ſucceed as well as the aloofe, and coſt nothing but the carriage.

The lands on which the maiz or Indian corn has grown, are as well fitted for our European corn as if they had been laid fallow. The reaſon of this is, that the plants of the Indian corn ſtanding at ſix feet diſtance from each other, the far greater part of the ground has remained unoccupied, and at the ſame time has had the advantage of often ploughing to kill the weeds, which is a benefit equal to that of dung and reſt. All this, though it tends to prove the doctrine of horſe-hoeing huſbandry not new, yet it ſtrengthens the ſyſtem greatly.

The Indians, who do not intend an after-crop of European corn, occupy all the ground which they have been at the pains of clearing for the maiz, in another manner: They plant with the corn, in the ſame hill, a kind of kidney bean; this grows up with the corn, and its ſtalks climb up about thoſe of the maiz, which ſerve as well as ſticks or poles for it. In the center, at every vacant place between the hills, they plant ſquaſhes or pompions, which ſucceed very well; and often, after the laſt weeding of the ground, they ſprinkle in a quantity of turnep-ſeed; ſo that when the harveſt is over, they have a crop of turneps for the winter. Phil. Tranſ. N°. 142.

TRACING, among miners. See the article TRAINING.

TRACTORIÆ, among the Romans, were diplomas or tickets given by the emperor to ſuch as he ſent into or called out of the provinces, whereby they were entitled to the uſe of the public poſt, and to be maintained at the expence of the government. *Pitiſc.* in voc.

TRAGACANTH, or *Goat's-Thorn*, *Tragacantha*, the name of a genus of plants, the characters of which are theſe: The flower is of the papilionaceous kind, and its piſtil, which ariſes from the cup, finally becomes a bicapſular fruit, containing ſeveral kidney-ſhaped ſeeds: To this it is to be added, that the leaves ſtand in pairs upon the ribs, which uſually terminate in a prickly point.

The ſpecies of *Tragacanth*, enumerated by Mr. Tournefort, are theſe: 1. The common *Tragacanth*. 2. The woolly *Tragacanth*, ſuppoſed to be the *poterium* of Cluſius. 3. The purple-flowered ever-green Alpine *Tragacanth*. *Tourn.* Inſt. p. 417.

TRAGACANTHUM *venereum Indicum*, in natural hiſtory, a name given by ſome writers to the birds neſts ſo famous in ſoops in China, and in ſome parts of Europe, for their cordial reſtorative, and provocative virtues. They are the neſts of a kind of Indian ſea-ſwallow, and are made up of a ſubſtance reſembling gum-tragacanth, and, like it, melting in a jelly in any warm and watery liquor.

TRAGASIAN *Salt*, a term uſed among the antients for a ſort of ſea-ſalt, very little different from the common kind, being made by the evaporation of the water of ſome ſalt ponds near the ſea-ſhores.

TRAGELAPHUS, in zoology, the name of an animal of the goat-kind, of which there are two ſpecies, the one deſcribed by Geſner, the other by Bellonius.

The *Tragelaphus* of Geſner is a little larger than our common deer; its colour the ſame with that of this creature, and its hair of the ſame ſort and length; but its body is thicker; and its legs much ſhorter. Under its chin it has the beard of the goat; and all the way along the under part of its throat there runs a ſeries of long hairs, which hang down almoſt to its knees; the upper part of its neck has a mane of long hairs alſo, which are much darker-coloured than thoſe of the body. Its knees are covered alſo with long and thick tufts of hair, reaching a good way backwards. Its hoofs fall off every year. The horns reſemble thoſe of the ram, or rather of the goat, and are black, and bent backwards. The ears are ſhort. The eyes, the tail, and the parts of generation, are the ſame as in deer. It is a very gentle animal, and full of ſport and play, and is found wild among the rocks.

The *Tragelaphus* of Bellonius, is a creature with the hair of the goat, but without its beard; its horns do not fall of, and are of the ſhape of thoſe of the goat, but not unfrequently curled like thoſe of the ram. Its head, face, and ears, are very like thoſe of the ram; and its ſcrotum is very large, and hangs down in the ſame manner with that creature's. Its legs are of the length of the ram's; its hips under the tail are white; its tail black; and its neck, both on the upper and under part, and its breaſt alſo, are ſo hairy, with long hairs, that they look as if covered with one continued beard. The hairs on the ſhoulders and breaſt are long and black; it has on each ſide a remarkable grey ſpot; its noſtrils are black, and its mouth and the under part of its body white. *Ray*'s Syn. Quad. p. 82.

TRAGIA, in botany, the name of a genus of plants, the characters of which are theſe: It produces male and female flowers on the ſame plant. In the male the perianthium is divided into three ſegments, which are ovated, acute, and expanded. There are no petals. The ſtamina are three capillary filaments, of the length of the cup; and the antheræ are roundiſh. Plumier makes this cup a monopetalous funnel-faſhioned flower; but this does not appear to be really the caſe. In the female flowers the cup is divided into five ſegments, which are ovated and hollow. The germen of the piſtil is roundiſh, and furrowed with three lines. The ſtyle is ſingle, erect, and longer than the cup. The ſtigma is trifid and expanded. The fruit is a very large tricoccous capſule, of a roundiſh figure. The ſeeds are ſingle and roundiſh. *Linnæi* Gen. Plant. p. 448. *Plumier*, Gen. 12.

TRAGIC *Dance*, in antiquity. See the article EMMELIA.

TRAGICUS *Muſculus*, in anatomy, a name given by Albinus to one of the muſcles of the eye, called by Santorini and Winſlow, *Muſculus Tragi*.

TRAGIUM, in botany, a name by which ſome authors have called the fraxinella, or baſtard-dittany, the root of which is uſed in medicine. *Ger.* Emac. Ind. 2.

TRAGIUM *Germanicum*, in botany, a name given by ſome authors to the *atriplex olida*, or ſtinking orach. *Ger.* Emac. Ind. 2.

TRAGO-ORIGANUM, in botany, a name given by ſome authors to the *marum Syriacum*, or Syrian herb maſtic. *Pluk.* Alm. p. 374.

TRAGOPOGON, *Goats-beard*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the ſemifloſcular kind, being compoſed of a number of ſemi-floſcules placed on the embryo ſeeds, and contained in a cup divided into many ſegments; but not of the ſcaly kind. The embryos finally ripen into ſeeds, which are enveloped in a ſort of covering, and winged with down, and are all fixed to the thalamus of the flower. See Tab. 1. of Botany, Claſs 13.

The ſpecies of *Goats-beard*, enumerated by Mr. Tournefort, are theſe: 1. The great yellow-flowered meadow-*Tragopogon*. 2. The leſſer yellow-flowered meadow-*Tragopogon*. 3. The *Tragopogon*, with long ſinuated leaves. 4. The *Tragopogon*, with leek-like leaves, and pale violet-coloured flowers. 5. The leek-leaved *Tragopogon*, with bluiſh purple flowers, commonly known by the name of *artiſi*. 6. The leek-leaved *Tragopogon*, with blackiſh-purple flowers. 7. The leek-leaved *Tragopogon*, with blue flowers. 8. The leek-leaved *Tragopogon*, with white flowers. 9. The graſſy-leaved *Tragopogon*, with bright red flowers. 10. The crocus-leaved *Tragopogon*, with bluiſh purple flowers. 11. The yellowiſh purple ſmall *Tragopogon*. 12. The hairy *Tragopogon*. *Tourn.* Inſt. p. 477.

There are two or three ſpecies of this plant well known among us, the one wild in our meadows and paſtures, by the name of *go to bed at noon*, from its flowers always ſhutting up in the middle of the day; another kept in our gardens for its beautiful red flowers; and a third cultivated for its eſculent root, and known by the name of ſalſafy. This was originally from Italy, and is ſtill kept in many gardens as a good root; but is not common in our markets.

Theſe plants are propagated by ſowing their ſeeds in ſpring on an open ſpot of ground. The ſalſafy ſhould be ſowed in rows at nine or ten inches diſtance; and when the plants are come up, they ſhould be left at about ſix inches aſunder in the rows; they then require no further care but to be kept clear from weeds; and if the ſoil be light, and not too dry, they will grow to a conſiderable ſize by winter. The roots are to be taken up for uſe when the leaves are decayed, and continue in ſeaſon till March; and then the young ſhoots, which are very large and thick, are by many boiled as aſparagus, and make a very delicate diſh. *Miller*'s Gardeners Dict. in voc.

TRAGOSELINUM, in botany, the name of a genus of umbelliferous plants, the characters of which are theſe: The flower is roſaceous, conſiſting of ſeveral heart-ſhaped leaves, irregular in ſize, and diſpoſed in a circular form, and ſtanding on a cup which afterwards becomes a fruit, compoſed of two oblong ſeeds, which are gibboſe and ſtriated on one ſide, and flat on the other.

The ſpecies of *Tragoſelinum*, enumerated by Mr. Tournefort, are theſe: 1. The great *Tragoſelinum*, or pimpernel-ſaxifrage, with white flowers. 2. The great *Tragoſelinum*, or pimpernel-ſaxifrage, with red flowers. 3. The great *Tragoſelium*, or pimpernel-ſaxifrage, with burnet-leaves. 4. The leſſer *Tragoſelinum*, or common ſmall pimpernel-ſaxifrage. 5. The tall African *Tragoſelinum*, called by authors the great African pimpernel-ſaxifrage.

TRAGULA, among the Romans, a ſtrong kind of javelin, with a barbed head. *Pitiſc.*

TRAGUM, in ichthyology, the name given by Ariſtotle, and others of the old Greek writers, to the *trugum* of Elian, Athenæus, and Oppian. Both names are uſed to expreſs the fiſh called by authors the *paſtinacha marina*, and by us the *fire-flaw*, or *fire-flaire*. The fiſh is a ſpecies of the raja, and is diſtinguiſhed by Artedi by the name of the ſmooth-bodied ray, with no fin on the tail, and with a long ſpine placed on it, ſerrated before. See the articles RAJA and PASTINACHA.

TRAINING, or TRACING, (*Cycl.*) in mineralogy, a term uſed by our miners to expreſs the tracing up the mineral appearances on the ſurface of the earth to their head or original place, and there finding a mine of the metal they contain.

The principle on which this practice depends, is the change wrought in the face of the earth by the deluge, of the effects of which theſe remains are a very great proof. The ſuperficial, or upper part of veins, or loads of ore, is always the pooreſt, the richer ores lying deeper down, the poor ones only ſerving to lead the way. Theſe poor ores, or ſtones impregnated with the metalline matter of the mine, and called by our workmen, *ſhoad-ſtones*, were, probably, at the creation of the earth, brought regularly up to the ſurface, and ſhewed the places of the metals below. But at the time of the covering the earth by the waters of the deluge, they were, with the reſt of the ſurface, waſhed off, and carried, with the deſcent of the water, down into the plains, or into the beds of rivers, and there carried many miles down the ſtream. This being an allowed truth, the art of *Training* a mine is eaſy; for though this carrying the ſhoad-ſtones and poor ore, was done ſo many ages ago, yet all the way that ſome pieces were carried on, others would be depoſited by the way; and the heavieſt and richeſt falling firſt, the lighteſt would always be carried fartheſt, and there would be always left a ſtream of this matter all the way from the place where it was firſt produced, that is, where the mine now is; for the breaking of the ſurface of the earth, at this great cataſtrophe, was not ſo deep as to reach that; and this ſtream or *train* of matter will be found richer and richer as it approaches the mine, and finally will ſtop at the place where it is.

Where there is ſuppoſed to be a mine of any metal, the hills and country all about are diligently ſearched; the ſituations, and deſcent of the lands, and the earth, ſtones, and other foſſile bodies, are examined, particularly the colour and nature of the various ſorts of earths and ſtones which are found on the hills where the mine is ſuſpected to lie, that they may be readily known again if any of them are found in the neighbouring valleys. The ſtones which denote the loads, and are called *ſhoad-ſtones*, are found two, three, four, or even five miles from the hills, where they originally lay; but if the ſame ſort of ſtones are remembered on the hills, the *Train* is to be made out.

After any great land-flood, in which it is ſuppoſed there are uſually ſome new frets made in the banks of the rivers, theſe are carefully examined, to ſee whether any metalline ſtones may be found in their ſides and bottoms, all being then ſo clean, that the ſmalleſt ſhoad-ſtone may uſually be ſeen. If no ſtones of this kind are found, it ſometimes is of uſe, in order to farther reſearches, to examine whether any pieces of earth, of a different colour and nature from that of the reſt of the bank be found; for this being, if any ſuch is found, waſhed alſo from the neighbouring hills, it proves a great direction which ſide of the hill to ſearch into.

If no ſhoad-ſtone or grewt of a different nature from the reſt be found in theſe frets or newly worn banks, the miners leave the place for the preſent. For though the bed of the river afford many metalline ſtones, they never regard them, the continual change of place they receive from the current of the water rendering them only tokens that there is metal ſomewhere in the country; but they confound and perplex rather than inſtruct in the ſearch after the places where it is.

If there be found indeed ſtones of the ſhoad-kind, full of protuberances, or having ſharp angles, as if newly broken, it may be worth while to ſee whether they are not waſhed out of ſome part of the neighbouring banks by the late floods; as this ſort of appearance is a token of their having been newly taken into the bed of the river. But if they are rounded and ſmooth, it may be concluded that they have been long ſubject to the action of the water, and brought, perhaps, many miles from the places where they were originally lodged in the earth, and where only they could have been of any uſe to the *Tracer* of the mine.

When the frets in the ſides of rivers have been traced in vain, the ſearcher after a mine goes up to the ſides of the hills moſt ſuſpected to have mines in them, and there ſeeks for a convenience of bringing a little ſtream of water to run down. When this is found, he cuts a trench about two foot over, and as deep as the ſhelf. The water is turned into this cut, and after two or three days running in it, all the filth will be waſhed away, and the looſer part of the earth cleared off; and if any ſhoad-ſtones are lodged within the whole courſe of this cut, they will be found. If any ſuch are found, it is an unqueſtionable proof that there is ore in the higher parts of the hill; this encourages the work, and there is always found a mine, or at leaſt a ſquat, which will, without much danger, repay the expence and trouble. The ſquats are flat parcels of the ore, lying in different and diſtinct places of the hills, and not communicating with one another.

Sometimes a great deal of this labour is ſaved, and the ſhoad-ſtones are found on the ſurface of the ground, either turned up by the plough, or thrown up in ſmall quantities in mole-hills, or raiſed by ſome other accident; for they are ſeldom found naturally lying on the very ſurface of the earth; for the putrid remains of vegetable and animal ſubſtances, and other adventitious matter, has raiſed the ſurface of the earth in all places, ſince the time of the flood, and made indeed a ſort of new ſurface. Theſe ſtones were certainly laid bare on the ſurface of the ground, at the time of their being carried down from the mines; but this adventitious matter has buried them in this long tract of time, and they are generally found under about a foot of a ſort of vegetable mould. If, by any of theſe ſearches, a ſhoad is found, the miners have nothing to do but to follow it to its head, and there make the opening; but if no ſuch direction can be had, nor any ſhoad found, and there is yet ſuſpicion that there is a mine in the hill, the method is to make an *eſſay-hatch*, as it is called; this is ſunk near the

foot or bottom of the hill, and is an opening of about ſix foot long, and four foot broad, made in the ſearch of a vein as deep as the ſhelf; this is a caution that muſt be always carefully obſerved, for if they are made leſs deep than this, they may miſs of the vein tho' there is one. And the ſinking thus deep is always attended with certainty, for if no ſhoad is found on this, it may be concluded there is none there; except that ſometimes it is found that the ſhoad has been waſhed clean away, within two or three foot from the land: and then the load or vein is two foot farther or thereabouts up in the hill. If any ſhoad is found in the eſſay-hatch, there is a certainty of a vein of ore; neither doth it add a little toward the making a conjecture how high up the hill, or how far off the vein ſtring, or bonny is, carefully to mark how deep from the ſurface of the earth the ſhoad lies, for this is held an infallible rule, that the nearer the ſhoad lies to the ſhelf or faſt ground, the nearer the vein itſelf is, and *vice verſa*.

When there is no ſhoad or appearance of a mine found in the firſt eſſay-hatch, if the conjecture of a mine being in the hill has any tolerable foundation, the *tracing* it does not end here; but they go ten or twelve fathom up the hill and there open a ſecond eſſay-hatch, and if no ore or ſhoad-ſtone is found in this, they go as many fathom on each hand at the ſame height with the ſecond hatch; and there open a third and a fourth hatch, of the ſame depth and dimenſions with the firſt; if in neither of theſe there is found any ſhoad-ſtone, they aſcend proportionably with three more hatches, if the ſpace of ground require, at every ten or twelve fathom, and in this manner open them three abreaſt, at twelve fathom diſtance up to the top of the hill. If no ſhoad is found in any of theſe, it is concluded then that there is no *tracing* a mine there, and the hill is left.

If any ſhoad is found in any of theſe hatches or openings, the aſcending hatches from this are kept on in a direct line, and the deeper the ſhoad lies the nearer the vein is. The ſhoad grows gradually deeper from the ſurface, but nigher the ſhelf as they approach the mine; as ſuppoſe it be but half a foot from the ſhelf and ſeven foot deep from the ſurface, the vein is then concluded to be within a fathom or two; and on this the firſt proportion of twelve fathom between every hatch is leſſened, to ſix, four, two, one, or even leſs than that, as the vein is conjectured to be more and more near.

It often happens, for want of a good gueſs in this matter, that the diggers over-ſhoot the load; that is, they open their next hatch too high up the hill, or above the load or vein: this is a miſtake eaſily diſcovered and eaſily rectified. If a ſhoad is found lying near the ſhelf in one hatch, and in the hatch above there is no ſhoad at all, it is a proof that the hatch is too high, and the remedy is only to ſink a hatch at a middle diſtance between the laſt two, which will probably fall upon the very point of the load, and finiſh the work of *tracing*.

Sometimes it happens, that in continuing the *tracing* of the firſt ſhoad, a ſecond or new one is found; it is not uncommon for two ſhoads to be thus found in one hatch, and this is eaſily diſcovered without any danger of miſtake; for ſuppoſe in the laſt hatch the ſhoad which they *trace* lay at eight foot deep, and in this it lies at ten foot, and beſide this there is a ſhoad found at two foot depth; it is very certain that the ſhoad at ten foot deep is the ſame they were before *tracing*, and this is a new one pointing to another vein or load, which is now firſt diſcovered ſo near the ſurface of the earth. This has generally gravel or earth mixed with it, and is to be carefully examined; when the higher hatches are opened, this is continually found as well as the old load; and when the firſt is *traced* to the point of the vein, this ſecond is to be continued in the ſame manner, by other hatches opened at the ſame diſtances above: it often happens that in *tracing* this ſecond ſhoad, the hatches dug for it diſcover another new one or a third ſhoad; all theſe are to be *traced* one over the other by the ſame hatches, and will all be found worth the ſeeking after. The old writers on mineralogy agree with us in this obſervation, and tell us, it is not uncommon in ſome places to find as far as ſeven loads lying parallel to one another in the ſame hill. In theſe caſes, however there is uſually one maſter-load, or grand vein; the other ſix, that is three on each ſide, being the leſſer or concomitant veins. Five in the ſame manner, ſometimes lie in this order, the grand load in the middle and two on each ſide, but the more common method is three, a large one, and two ſmaller.

Every load has a peculiar coloured earth or grewt about it, which is found alſo with the ſhoad, and this always in a greater quantity the nearer the ſhoad lies to the load, and becomes leſſened by degrees to the diſtance of about a quarter of a mile, further than which that peculiar grewt is never found in any quantity with the ſhoad; ſo that this is a proof that the load or vein is near when it is found in quantity.

A valley may chance to lie at the foot of three ſeveral hills, in ſuch a manner, as to contain three ſeveral grewts, or that earth which was moved with the ſhoad in the concuſſion of the ſtrata at the deluge, with as many different ſhoads or *Trains* of ſhoad-ſtones in the midſt of each: in this caſe it will be very neceſſary to know the caſt of the country, and of each hill in reſpect to its grewt, for the ſurer *training* of them one after another as they lie in order: according to the foregoing rules of eſſay-hatching, the uppermoſt in this caſe always directs which hill to begin with firſt.

It ſometimes happens, that after having *trained* the ſhoad found in a valley up to the upper parts of a hill, there is only a ſquatt, or bonny found inſtead of a right vein of ore, for theſe detached parcels of ore have their ſhoads as well as the right veins. Theſe are uſually about two or three fathom long, and a fathom broad; few of them are larger, moſt leſs, and they never communicate with any other load or vein, nor ever ſend forth any of their own. The extremities of theſe beds of ore terminate without ſending out any ſtrings, not lying within walls as the loads; but tho' they are in the ſhelf or faſt ground, not moved by the flood, their ſurface is equal every where with that of the imaginary ſhelfy one, and they go down five or ſix fathoms deep and there terminate at once. The ore contained in theſe are rich, and they are always wrought out to the conſiderable advantage of the owners.

Theſe are the general rules of *tracing* mines, and tho' ſomewhat tedious and expenſive, they are certain, and never liable to the error and diſappointment the other ſhorter ways, as they are called, are liable to. Theſe ſhort ways are by the *virgula divinatoria* or the hazel-wand, whoſe bending in certain places without any external viſible force, is to point out the place where the vein of ore lies: the waters thought to iſſue from the particular loads are alſo uſed by ſome as a ſhort means of finding the veins; other of theſe ways are alſo by mineral ſteams and effluvia, by the barrenneſs of the ſoil, and the pitching of nocturnal lights on the ſuppoſed orifices of mines. But theſe methods are too extravagant or too uncertain to be uſed in caſes of ſo much conſequence. When the mine is found by the more certain rules of *tracing*, the digging it is a matter of leſs difficulty. Phil. Tranſ. N°. 69. See the article DIGGING.

TRAMELLED, in the manege. A horſe is ſaid to be *tramelled*, that has blazes or white marks upon the fore and hind foot of one ſide; as the far foot before and behind. He is ſo called from the reſemblance the white foot bears to a half *tramel*.

Croſs-TRAMELLED *Horſe*, is one that has white marks in two of his feet that ſtand croſs-ways, like St. Andrews croſs; as in the far-fore-foot, and the near hind foot, or in the near foot before, and the far-foot behind.

TRAMMELS, a kind of net uſed in fowling, the deſcription of which ſee under the article LARK.

TRAMIS, a word uſed by ſome medical writers, to expreſs the line running along the middle of the *ſcrotum*, from the *penis* to the *anus*.

TRANCHEFILE, in the manege, the croſs chain of a bridle that runs along the bit-mouth, from one branch to the other.

TRANSCENDENTAL (*Cycl.*)—TRANSCENDENTAL *Coſmology*. See the article COSMOLOGY.

TRANSFORMATION (*Cycl.*)—TRANSFORMATION *of Inſects*. It is well known that flies are not produced in that form, from the eggs of their parent fly, but undergo a change like that of the butterfly, and the like winged inſects; the egg hatching into a worm; and this after eating, and performing all the operations of animal life for a certain time, enters into a ſtate of reſt, and thence is changed into a fly.

Though the general courſe of nature is the ſame in this reſpect in flies and butterflies, yet the means and manner of it are different; the butterfly makes its coat for this *Tranſformation*; the fly-worms of many kinds have only a ſhell of their own proper ſkin to undergo this change in.

All the fly-worms of the firſt and ſecond, and many of thoſe of the third claſs, have their caſe thus made only of their own ſkin; the different ſpecies afford indeed ſome varieties in the manner of this, but a general idea of the work may be had from obſerving the worm or maggot of the common fleſh-fly in its ſeveral ſtages.

When this creature has arrived at its full growth, it finds it not convenient any longer to remain among the food it has till then lived upon; it quits it and now goes in ſearch of a place where it may wait for its metamorphoſis. To this purpoſe it creeps into the earth, where it remains two or three days without any change; at the end of this time, inſtead of its pointed figure, its white colour, and ſoft fleſhy ſubſtance, it acquires the figure of an egg, and becomes of a cheſnut colour, or ſomewhat rediſh, and looks opake and cruſtaceous; it is in this ſtate perfectly ſtiff, and deſtitute of motion, and the creature ſeems not only to have loſt its form, but wholly to have loſt its life alſo. *Reaumur*'s Hiſt. Inſ. Vol. 4. p. 288.

This however is not the caſe, all that is done, is that the creature has abſolutely quitted its ſkin, which is now become hard and of a determinate figure, and is within it compleating all its changes. Ibid. p. 289.

The manner in which this change of figure is given to the ſkin, is by the creature's drawing its head, and the two or three firſt rings of its body, within the reſt, and by that means making itſelf of this ſhape, ſhort and equally thick at each end. It does this within a few hours after it creeps into the earth, and if taken out after that time is always found of this ſhape, and ſeems to be *transformed*, only that its ſkin has not yet acquired

quired its brown colour. This however is not at all the caſe, for it can now walk as before, and thruſting out its head and the rings it had drawn in, can again acquire its former figure, which however it loſes afterwards at once, and becomes rigid in a few minutes, and in two or three hours the ſkin it has quitted, and which is now a ſhell, becomes reddiſh, and after a little more time acquires its proper cheſnut colour. Ibid. p. 290.

This coat is now no more a ſkin, but a ſhell, and fit to perform all the offices of one; it is no longer connected to the body of the animal, but is become hard, brittle, and rigid. It may however yet be diſtinguiſhed, eſpecially by the help of the microſcope, to be made up of a great number of rings, which may be more diſtinctly counted than they could be in the worm: there are nine of theſe between the caps, which make the two ends; two rings at leaſt, without counting the head, go to the forming the anterior cap, which is purſed or wrinkled up like the top of a bag when cloſely drawn together; but theſe folds or wrinkles do not abſolutely meet and cloſe up the end. The microſcope ſhews at each extremity of one of the diameters of this cap two little bodies not at all diſtinguiſhable by the naked eye; each of theſe is one of the anterior ſtigmata.

On the two rings which follow this cap immediately, underneath each of theſe ſtigmata; there may be obſerved a ſmall band, very little elevated above the ſurface of the reſt of the ſhell. Theſe ſeem the two ſtrongeſt parts of the ſhell, but they are in reality on the contrary the two weakeſt, and are the places where the ſhell is to ſplit and open to give paſſage to the fly. Ibid. p. 293.

On the cap which makes the other extremity of the ſhell may be ſeen, the two poſterior ſtigmata, theſe are the moſt conſiderable in the creature, and are each a collection of three oblong ſtigmata. Ibid. p. 294.

The *Transformation* in this ſhell is double, before the inſect becomes what it is to be finally, a fly like its parent; the firſt *Transformation* is into an oblong maſs of matter, void of all form, either of the worm it was, or of the fly it is to be; but from this it by degrees aſſumes the figure of the nymph, in which all the lineaments of the future fly are diſtinguiſhable. This *Transformation* (which is in theſe, and perhaps in all the worms that make a caſe of their own ſkin, prior to their change into the nymph ſtate) may be called the change into the long ball or ſpheroide, or into the ellipſoide. This fly-worm of the blue fly is one of thoſe, which with moſt difficulty ſhews this *Transformation*; but on boiling it at a proper time and afterwards carefully opening the ſhell, it will always be found in this ſtate. Ibid. p. 295, 296.

It is a very eaſy thing to be provided with theſe worms in their ſhell ſtate, in a ſufficient quantity; and it is a very pleaſing examination to boil and open ſeveral of them daily, to ſee the progreſs in their reſpective *Transformations*; by this means after two or three days one may diſtinguiſh the legs on the anterior part of the body, but very ſhort; the day following, the wings will begin to ſhew themſelves, and the ends of the legs will be found extended toward the hinder part; a day afterwards the end of the trunk may be diſtinguiſhed, and the head begins to ſhew itſelf. And finally the legs will be ſeen in their due length and proportion, and the reticular eyes will very plainly ſhew themſelves. Ibid. p. 299.

Several accidents, as the heat or cold, and dryneſs and wetneſs of the ſeaſon, contribute much to the forwarding or backwarding theſe ſucceſſive changes: in ſummer the worms will remain ſometimes in a moiſt earth ſix or ſeven days without changing; and others will acquire their ſhell-ſtate in a dry earth in two or three days: a moiſt earth may alſo very eaſily much impede the ſecond *Transformation*, from the ſtate of the oblong ball into the nymph. Since in order to this there is required an evaporation of a great deal of moiſture, which is in the ſhell; and this cannot be ſuppoſed to be ſo readily performed in a moiſt as in a dry place; and that ſuch an evaporation is required is very plain, from the change of weight in the ſhell in theſe two ſtates; for when the contained animal is in the form of its oblong ball, the ſhell is in the whole heavy enough to ſink in water; but when it has acquired the form of the nymph, it is ſo light that it ſwims. Ibid. p. 305.

The time required for theſe ſeveral changes often differs a little, and ſometimes conſiderably; but at a medium it ſtands thus: the worms which have been ſeen to creep into the earth on the 21ſt of April, have come out perfect flies on the 16th of May, and that in a cold ſeaſon for the time of the year.

The ſhells of ſeveral of this brood opened on the 28th and 29th of April, ſhewed the inſect in form of the oblong ball; the parts of the nymph were not diſcoverable in any opened before the 30th of April; but theſe ſhewed the legs of a third part of the length of the body: theſe nymphs had all a cavity on their anterior part; but thoſe opened on the 2d and 3d of May had not this cavity; but the dart and hooks viſible in it before were now applied againſt the ſurface of the cap, and the head of the future fly ſhewed itſelf: on the fourth of May the trunk appeared very fair, and the reticular eyes were become viſible, tho' all that was now viſible, was ſeen thro' a thin and delicate ſkin. Ibid. p. 306.

On the 6th of May the *antennæ* were diſtinguiſhable, and their form very perfectly finiſhed; on the 7th the ſmooth ſmaller eyes were diſtinguiſhable. The 8th of May the reticular eyes had acquired a reddiſh colour; the 9th the colour was yet more natural; the 10th theſe were become of a deep red, and the ſmooth eyes looked reddiſh; and on ſome of the ſtigmata of the nymph, the ſpots of the former worm were now eaſily diſcoverable; on the 11th the nymphs were all become hairy; on the 12th theſe hairs were more viſible, and of their natural colour, and the legs were become greyiſh, and of their full length. The lips of the trunk were of their natural colour, almoſt black; and the antennæ began to be coloured; and the whole ſhape of the fly was very diſtinct. The 13th, 14th, and 15th days made no great changes, as the parts were now already formed, and only wanted their proper ſtrength and conſiſtence; and on the laſt day, before their egreſs, and not before, did they appear to have any power of motion; which, as ſoon as they had it, was applied to the freeing themſelves from their ſhell, and coming out in the form of the parent fly. Ibid. p. 308.

The changes a multitude of other fly-worms undergo, and their ſhells made of their proper ſkin, are the ſame in all eſſential points with thoſe of the flies firſt mentioned. Some ſpecies have their ſhell more deeply annular, others almoſt entirely ſmooth; ſome have the two ends ſomewhat pointed, and others only one of them ſo; and in ſome this larger inflated end is the anterior, and in others the poſterior. Ibid. p. 309.

Swammerdam, to whom the world is indebted for the firſt true inſight into the wonders of the inſect world, has evidently proved, that what had before been called by the pompous and myſterious names of changes and *Transformations* of one animal into another, as of a worm into a fly, and the like, is, in reality, no more than a gradual and natural growth and evolution of the parts, not any metamorphoſis of them; and this growth reſembles very well, when judiciouſly conſidered, not only the increaſe of other animals, but alſo the natural budding and increaſe of plants.

The progreſs of theſe changes, as they are called, in inſects, is expreſſed by two different terms in their two moſt remarkable ſtates; the words are the *nymphæ* and the *chryſalis*.

Theſe words are often miſunderſtood, and even miſapplied and confounded by authors one with another. What the moſt accurate authors have originally meant by them, however, is this:

The nympha is the change of the worm, which carries the proper ſhape of the future little animal; and the chryſalis, or aurelia (for theſe words have the ſame ſenſe, derivation and meaning) the change of that caterpillar, which ſhews no parts at all of the animal that is to come.

This is the regular meaning of the two words; but Swammerdam proves them to expreſs, as the ſchoolmen call it, diſtinction without difference, for that he was always able to diſcover the ſeveral parts of the future animal, as well in the chryſalis as in the nympha; and that others had only made the difference from the want of due attention and application.

This author therefore makes no other difference between the nympha and chryſalis, but this; that ſince the parts of the future animal are not ſo plainly diſcernable in the chryſalis as in the nympha, and a fine golden colour is very common in the more obſcure ſtate of the animal, and is not found on any of thoſe ſo perfect, as to be vulgarly called nymph; it may be proper to expreſs, by certain forms of ſpeech, thoſe ſlight but obvious differences; but not to give them the pompous names of *Transformations*, and the like. The nymphs he therefore calls ſimply puppets, and the chryſalis's by the name of gilt puppets.

Swammerdam refers the general changes, as they are called, of the inſect tribe, into four claſſes, one or other of which takes in that of every known inſect, a very few excepted, whoſe progreſſions have not yet been ſufficiently inquired into, to aſcertain their nature. The four general claſſes, or ranks of changes, are diſtinguiſhed by four different ways of production, change, and growth.

The firſt rank, which he expreſſes by the name of nympha-animal, hath a little animal fully formed in the egg, which, after the evaporation of the ſuperfluous moiſture, comes forth perfect, and ſo grows up. Such is the louſe, and the like.

The ſecond claſs are diſtinguiſhed by the name of *nympha-vermiculus*. Theſe have the parts of the future inſect imperfectly ſhaped in the egg, and, after hatching, leave the creature to acquire its perfection viſibly by outward food. Of this kind are the graſshopper, the locuſt, the cricket, and many other the like creatures.

The third claſs he diſtinguiſhes by the name of the *nympha-chryſalis*, or *nympha-aurelia*. Theſe, after hatching, obtain their perfection darkly, and not till after the caſting off the laſt ſkin; ſuch are the butterfly and the like. The ſecond and third claſs agree in this, that not a perfect animal, but a worm is produced from the egg, and precedes the growing of the perfect parts; yet with this difference, that in the ſecond the little creature grows up manifeſtly and obviouſly to the eye; but in the third all is in darkneſs and obſcurity under the ſkin, and, as it were, within the body of the creature.

The fourth claſs is diſtinguiſhed by the phraſe *nympha vermiformis*; and the creatures of this claſs remain always ſhut up in the caſe of the worm or maggot, without any poſſibility of diſcerning the parts, till caſting both ſkins at once, it becomes a perfect and free animal, capable of propagating its ſpecies.

Thoſe inſects which come forth perfect, and in their own proper form, out of the egg, ſuffer no future changes, but only the caſting off their ſkins; but thoſe which come forth under the envelopement of a vermicular coat, do, beſide caſting their ſkins, after a proper time of eating and crawling about in that ſtate, become nymphæ; and that all inſects, as well thoſe which come out of the egg in the worm ſtate, as thoſe which come forth in their own form, are originally, in the egg, all in the nymph-form; and that thoſe which come out of the egg perfect animals, have no other difference in the manner of their productions, from the others, but that they have ſuffered in the egg, and out of the way of our inſpection, all thoſe changes which the others do undergo in the chryſalis or nymph-ſtate, in our ſight. The parts of the nymphæ of theſe animals protuberate and expand themſelves by degrees, much in the ſame manner that the buds of flowers of plants do; and the caterpillar is certainly the butterfly itſelf, only covered with a mantle which hides its ſeveral limbs from our eyes till thrown off.

Thus are the general tribes of inſects regularly reduced to theſe four claſſes, in regard to the manner of their production. Thoſe particular ſpecies which ſeem not reducible to theſe, or any other rules, or for which farther obſervation at leaſt is required, are the glow-worm, the ſcolopendra, the julus, the weavil or curculio, the dung-beetle or pilularius ſcarabæus, the ſmalleſt water-beetle, and the ſcorpion. See theſe under their ſeveral heads. *Swam.* Hiſt. Inſects.

TRANSFUGA, in antiquity, a deſerter. Among the Romans, deſerters were commonly puniſhed by cutting off their hands, it being thought, that living in ſuch a miſerable truncated condition, would ſtrike more terror than death itſelf.

We find, however, that deſerters were likewiſe crucified, burnt alive, thrown from the Tarpeian rock, or expoſed to wild beaſts at public ſhews. *Pitiſc.* in voc.

TRANSMUTATION (*Cycl.*)—TRANSMUTATION *of Metals*. Among the many things urged in favour of the belief of the poſſibility of this effect of chemiſtry, the experiment of Thurneiſſer, who, in the preſence of the Great Duke of Tuſcany, converted one half of a common iron nail into gold, by only dipping it, while hot, into a certain liquor, has given great encouragement to the ſearchers after that famous ſecret. The nail is ſtill preſerved in the repoſitory of the Great Duke of Tuſcany at Florence; and we have, in a very famous Engliſh collection, the blade of a knife, half iron and half gold, ſaid to have been effected in the ſame manner, and purchaſed by the preſent poſſeſſor at a very conſiderable price.

Tachenius, however, has diſcovered the cheat of the Florentine nail; and probably the matter does not ſtand much better, on examination, with the Engliſh knife. This author gives a proceſs by which iron may be ſo prepared as to be made to mix perfectly with gold. This was the whole ſecret of Thurneiſſer, who in this manner made his nail half iron and half gold, and then coating it all over with a ferrugineous matter, made it appear all iron. When this had been, in this ſtate, ſubjected to the examination of the prince, and a great many other perſons, he heated it red hot, and by that means burnt off the ferrugineous part of the golden end; and then dipping it into a certain oil, which he pretended to have great efficacy, the gold appeared, and was pretended to have been made by the oil from the iron. *Tachenii* Hippocrat. Chem.

Mr. Boyle thinks there is no impoſſibility in the nature of the thing, that one metal ſhould be *tranſmuted* into another: And in confirmation of this opinion, he mentions a *tranſmutation* of gold into ſilver, by means of his *menſtruum peracutum*. Monſieur Homberg declares, he has changed ſilver into gold by heat [a]. Mr. Boyle alſo mentions an anti-elixir, which, in very ſmall proportion, would conſiderably debaſe gold [b] in many reſpects, and particularly by reducing its ſpecific quantity from 19 to 15 $\frac{2}{3}$ times that of water.—[[a] Mem. Acad. Scienc. Anno 1709. [b] Works abr. vol. 1. p. 78.]

TRANSMUTATION *of Colours*. The change of colour of a decoction of the nephritic wood, according to the different lights it was viewed in, long perplexed the wits of thoſe who attempted to account for it; but Wolfius has carried the experiments on this decoction much further, and found a way of giving it its colours again, after taking them wholly away. If this decoction be held between the eye and the light, it appears of a blue colour; but if the eye be placed between it and the light, it appears then of a yellowiſh or a reddiſh colour. If a few drops of oil of vitriol be dropped into it, it will appear of a gold yellow in whatever light it is viewed; but if too much of this oil be added, the whole becomes foul and obſcure; and if a few drops do not produce the effect, it is a ſign that the decoction is too ſtrong, and that it muſt be diluted with water.

Oil of vitriol has the ſame effect upon many other decoctions of the woods, particularly on that of Braſil wood, which is of a fine red, but immediately becomes yellow on dropping a ſmall quantity of this acid into it. And, as in the other inſtance, ſo in this, it is neceſſary to the ſucceſs of the experiment, that the tincture be not over ſtrong. A few drops of oil of tartar added to this yellow liquor turn it red again, as at firſt; and if more oil of tartar be added, the colour becomes bluiſh, with a tinge of red, much ſtronger than the colour of the nephritic wood at firſt, when held between the eye and the light. In all experiments of this kind, the weakneſs of the tincture produces the greateſt beauty; and therefore it is beſt, inſtead of making a decoction, to make only a cold infuſion, by putting a ſmall quantity of the chips of the wood into water, and letting this ſtand cold for ſome time. Act. Erudit. Ann. 1718. p. 321.

A tincture of red roſes, made with common water and oil of vitriol, is well known to be of a very beautiful red colour; yet when the water has ſtood ever ſo long on the roſes alone, it has ſcarce any colour: If it be ſtrained off in this colourleſs ſtate, and the oil of vitriol then added, the red colour is produced as ſtrongly as if this acid had been dropped into the water while the roſes were yet in it. When the liquor is of this fine red colour, a ſmall quantity of oil of tartar makes it immediately green; and if more oil of vitriol be added to this green liquor, it becomes red again, but is muddy, and not ſo well coloured as before. If a few drops of a ſolution of corroſive ſublimate be added to this, it does not at all change colour; and on adding more water, with ſalt of tartar diſſolved in it, the liquor became red again, but of a very different red from what it was before in its muddy ſtate, being now clear and deeper. When the tincture of roſes has ſcarce any colour, a ſmall quantity of ſalt of tartar makes it green, but a large quantity makes it yellow. A few drops of oil of vitriol added to this yellow liquor, turned it to a pale red, and this could never be made green again by oil of tartar. Alum-water, added to a ſolution of ſalt of tartar, makes a white and opake fluid, though they are both ſeparately pellucid.

What is moſt obſervable in theſe experiments on the infuſion of woods, is, that oil of tartar, and a ſolution of ſalt of tartar in water, have a very different effect. Thus an infuſion of Braſil wood is red; and on dropping to it a few drops of oil of vitriol, it becomes yellow. If oil of tartar be added to this liquor, it only makes it yet more yellow; but if a ſolution of ſalt of tartar in water be added to this, it makes it red again. Act. Erudit. Ann. 1718. p. 322.

TRANSPIRATION (*Cycl.*)—TRANSPIRATION *of Plants*. It is evident that plants as well as animals continually ſuffer a loſs of their ſubſtance and juices, and that in two manners; by a ſenſible *Tranſpiration*, and by an inſenſible one. The latter of theſe is perceived very plainly in obſerving, that in the heat of ſummer, toward the cloſe of the day, thoſe plants which in the morning were very lively and vigorous, and in a perfectly good ſtate, are then found feeble, and, as it were, withering, and bending down toward the earth. It is with theſe plants juſt as it is with men and other animals, who are in the ſame manner faint and languid, by reaſon of their great *Tranſpiration* during the heat of the day.

The ſenſible *Tranſpiration* of plants is leſs eaſily proved than this inſenſible one, which ſeems ſomewhat ſtrange. By ſenſible *Tranſpiration* in a plant we underſtand an evacuation made by means of the pores of the leaves of a ſubſtance too thick and coarſe to be evaporated as ſoon as diſcharged, as the matter of the inſenſible *Tranſpiration* is. This matter is, however, not unfrequently found on the leaves of trees, though it is there uſually miſtaken for the remains of dew fallen upon them.

This, however, is not the caſe, as may be eaſily determined by the following conſiderations: 1. That the fluid matter upon the leaves of theſe trees is not merely aqueous, but is viſcid and glutinous, and ſweet to the taſte. 2. That it is always found in greater quantity on thoſe leaves which are expoſed to the ſun, than on thoſe which are ſhaded. 3. The leaves which abound in this appear lucid and gloſſy in ſeveral places, theſe lucid parts ſometimes appearing only in form of ſpots, and ſometimes in ſmall ſpaces of a twelfth of an inch long; and ſometimes leaves are found with their whole upper ſurface covered with one continued coat of it. 4. There is no appearance of this matter upon the leaves, either in the night, or before ſun-riſe in the morning; the occaſion of which is, that it is only drawn out by the heat of the ſun; and being in itſelf of the nature of manna, that is, being ſoluble in aqueous menſtruums, it is carried off and diſſolved by the dews which fall in that time. 5. The bees are often found collecting this matter from the leaves of trees, as carefully, and loading themſelves with it in the ſame manner, in order to make honey, as they do the ſweet ſubſtances from the baſes of flowers. This matter is the ſame with that in flowers, both are extravaſated in the ſame manner, and both are collected by the bee without injury to the plant. Since honey, therefore, is the matter of the ſenſible *Tranſpiration* of plants, it cannot be wonderful that it ſhould ſometimes have the flavour of that plant whoſe juices it once was a part of, or that the Narbonne honey ſhould have the flavour of roſemary; and ſo of others.

The trees which yield this ſenſible *Tranſpiration* in the moſt obvious manner, are the ſeveral ſpecies of maple and of lime. It is found more or leſs on a vaſt number of others; and many

plants and all flowers abound with it, almoſt without exception. It is in theſe moſt obvious in the bottoms of the monopetalous kinds, ſuch as the jaſmine and the meadow-trefoil; on ſucking of which there is always a great deal of it evident to the taſte. The leaves of any of the trees which afford this ſenſible matter of *Tranſpiration* being put into water renders it purgative, and in all things analogous to a ſolution of manna; but, in general, more agreeably taſted. Mem. Acad. Par. 1707.

TRANSPORTATION (*Cycl.*) — TRANSPORTATION *of Plants*. In the ſending plants from one country to another, great cautions are neceſſary. The plants ſent from a hotter country to a colder ſhould be always put on board in the ſpring of the year, that the heat of the ſeaſon may be advancing as they approach the colder climates; and, on the contrary, thoſe which are ſent from a colder country to a hotter ſhould be ſent in the beginning of winter.

The beſt way of packing up plants for a voyage, if they be ſuch as will not bear keeping out of the earth, is to have boxes with handles, filling them with earth, and planting the roots as cloſe together as may be; the plants ſhould be ſet in theſe boxes three weeks before they are to be put on board, and in good weather they ſhould be ſet upon the deck, and in bad removed or covered with a tarpaulin.

If they are going from a hotter country to a colder one, they muſt have very little moiſture; if, on the contrary, they are going from a colder to a warmer, they may be allowed water more largely, and being ſhaded from the heat of the ſun, they will come ſafe.

Very many plants, however, will live out of the earth a great while; as the ſedums, euphorbiums, ficoides, and other ſucculent ones. Theſe need no other care than the packing them up with moſs in a cloſe box; and there ſhould be a little hay put between them, to prevent them from wounding or bruiſing one another, and holes bored in the boxes to keep them from heating and putrefying. In this manner they will come ſafe from a voyage of two, or three, or even four or five months.

Several trees alſo will come ſafely in the ſame manner, taking them up at a ſeaſon when they have done growing, and packing them up with moſs. Of this ſort are oranges, olives, capers, jaſmines, and pomegranate-trees. Theſe, and many others, are annually brought over thus from Italy; and though they are three or four months in the paſſage, ſeldom miſcarry. And the beſt way of ſending over ſeeds, is in their natural huſks, in a bag, or packed up in a gourd-ſhell, keeping them dry, and out of the way of vermin. *Miller*'s Gardeners Dict.

TRANSTRUM, in the naval architecture of the antients, a term uſed to expreſs a ſort of croſs or tranſverſe ſeats that were placed in the polycrote gallies of thoſe times, and ſerved for the places of ſeveral of the rows of men, who could move and work their oars under the ſeats of the other or lateral rowers of the next tire.

Meibom, who has written expreſly on the naval architecture of the antients, has better underſtood the places and uſe of theſe *Tranſtra*, than any other author of late times; by a proper arrangement of theſe ſeats, and the lateral ones above and below each, he has taken off greatly from the height allowed by Scaliger, and others, to the polycrote veſſels. *Meibom.* de Trirem.

TRANSVERSALES *Abdominis* (*Cycl.*) — Theſe are muſcles nearly of the ſame breadth with the oblique; they take their name from the direction of their fibres, and each of them is fixed to the ribs above, to the os ilium, and ligamentum Fallopii below; and to the linea alba before, and behind to the vertebræ.

Its upper part is fixed to the lower part of the cartilaginous ſurface of the two loweſt true ribs, and of all the five falſe ribs, by fleſhy digitations; the fibres of which become tendinous, as they approach the linea alba. The middle part is fixed to the three firſt vertebræ of the loins, by a double aponeuroſis or two tendinous planes. The internal and external planes having incloſed in their duplicature the muſculus ſacrolumbaris, and quadratus luborum, unite in one ſtrong aponeuroſis at the edges of thoſe muſcles. The inferior part of this muſcle is fixed by an inſertion wholly fleſhy to the internal labium of the criſta of the os ilium, and a great part of the ligamentum Fallopii. *Winſlow*'s Anat. p. 168.

TRANSVERSALIS *Anticus primus Capitis*, a ſmall, pretty thick, and wholly fleſhy muſcle, about the breadth of a finger, ſituated between the baſis of the *os occipitis* and the tranſverſe apophyſis of the firſt vertebra.

It is fixed by one end in the anterior part of that apophyſis, and from thence turning up a little obliquely. It is inſerted by the other end in a particular impreſſion between the condyle of the *os occipitis* and the maſtoide apophyſis of the ſame ſide behind the apophyſis ſtyloides, and under the edge of the jugular foſſula. *Winſlow*'s Anat. p. 238.

TRANSVERSALIS *Anticus Capitis ſecundus*, a ſmall muſcle, ſituated between the tranſverſe apophyſis of the two firſt vertebræ of the neck. It is fixed by one extremity very near the middle of the ſecond apophyſis, and by the other near the root or baſis of the firſt.

TRANSVERSALIS *Colli major*, a long thin muſcle, placed along all the tranſverſe apophyſis of the neck, and the four, five, or ſix under apophyſes of the back between the complexus major and minor, and lying as it were on the inſertions of the firſt of theſe muſcles.

It is compoſed of ſeveral ſmall muſcular faſciculi, which run directly from one or more tranſverſe apophyſes, and are inſerted ſometimes in the apophyſis neareſt to them, ſometimes in others more remote, the ſeveral faſciculi croſſing each other between the inſertions of the two complexi, which are likewiſe croſſed by them. *Winſlow*'s Anat. p. 243.

TRANSVERSALES *Colli minores*, very ſmall and ſhort muſcles, found in the interſtices of ſeveral tranſverſe apophyſes in which they are inſerted, and called by ſome alſo *inter-tranſverſales*. *Winſlow*'s Anat. p. 244.

TRANSVERSALIS *gracilis Colli*, a long thick muſcle, reſembling the *Tranſverſalis* major in every thing but ſize, and ſituated on the ſide of that muſcle.

It is commonly taken for a portion or continuation of the ſacrolumbaris. Diemerbroek diſtinguiſhed it by the name of *cervicalis deſcendens*; and Stone, and others after him, have called it *acceſſorius muſculi ſacrolumbaris*. *Winſlow*'s Anat. p. 243.

TRANSVERSALES *Dorſi minores*. Some particular muſcles of this kind are found fixed to the extremities of the three loweſt tranſverſe apophyſes of the back: The reſt are all in ſome meaſure continuations of the *Tranſverſalis major*; but theſe few which are diſtinct, and lie in the interſtices between the apophyſes and diſtinct muſcles, are properly enough called by this name. *Winſlow*'s Anat. p. 248.

TRANSVERSALIS *Digitorum Pedis*, a ſmall muſcle which lies tranſverſely under the baſis of the firſt phalanges, and which at firſt ſight appears to be a ſimple muſcular body, fixed by one end to the great toe, and by the other end to the little toe. When carefully examined, it is found to be fixed by a very ſhort common tendon to the outſide of the baſis of the firſt phalanx of the great toe, conjointly with the antithenar, and by three digitations to the interoſſeous ligaments which connect the heads of the four metatarſal bones next the great toe. The three digitations are very ſlender, and gradually cover each other. *Winſlow*'s Anat. p. 225.

TRANSVERSALIS *Penis*, in anatomy, a name given by ſome writers, particularly Cowper, to a muſcle called by others *virgæ lateralis parvus*, and by Albinus the *Tranſverſus perinæi*. Winſlow calls it *Tranſverſus urethræ*.

TRANSVERSO-SPINALIS *Lumborum*, called by ſome *ſacer*, a muſcle compoſed of ſeveral oblique converging or tranſverſo-ſpinal muſcles, in the ſame manner as in the back and neck.

It lies between the ſpinal and oblique apophyſes of the loins reaching to the os ſacrum. The loweſt of theſe muſcles are fixed to the ſuperior lateral parts of the os ſacrum, to the ligamentum ſacro-ſciaticum, and to the poſterior ſuperior ſpine of the os ilium. The reſt are fixed to the three loweſt tranſverſe apophyſes, and to the four loweſt oblique apophyſes of the loins, and to their lateral tuberoſities; from thence they run up to all the ſpinal apophyſes of theſe vertebræ. The external, or thoſe that appear firſt, being longer than the internal, eſpecially toward the lower part. *Winſlow*'s Anat. p. 248.

TRANSVERSUS *Auriculæ*, in anatomy, a name given by Albinus to a muſcle of the ear, not allowed to be ſuch by other authors; but deſcribed by Santorini, and others, under the name of *fibræ tranſverſæ in gibbo auriculæ*, and *fibræ in convexa conchæ parte*. See the article EAR.

TRANSVERSUS *Naſi*, in anatomy, a name given by Santorini, and others, to that muſcle of the noſe called by Winſlow *Tranſverſalis ſive inferior*; and by Albinus, the *compreſſor naris*. See the article COMPRESSOR.

TRANSUM, in gunnery, is a piece of wood which goes acroſs the cheeks of a gun-carriage, or of a gun to keep them fixed together; each *Tranſum* in a carriage is ſtrengthened by a bolt of iron. See the article CARRIAGE.

TRAPA, in the Linnæan ſyſtem of botany, a genus of plants; the diſtinguiſhing characters of which are theſe: The cup is a perianthium compoſed of one leaf, divided into four at the edges, and remaining when the flower is fallen. The flower is compoſed of four petals larger than the ſegments of the cup, and placed vertically. The ſtamina are four filaments of the length of the cup; the antheræ are ſimple. The germen of the piſtillum is of an oval figure; the ſtyle is ſimple, and of the length of the cup; and the ſtigma is headed, and has a ridge round it. The fruit is an oval oblong ſtony capſule, containing only one cell, and armed with four thorns placed oppoſitely on the ſides; theſe are thick and pointed, and are what were originally the leaves or ſegments of the cup. The ſeed is a nut of an oval figure. *Linnæi* Gen. Plant. p. 50.

TRAPEZIUM, in geometry, a plain figure contained under four unequal right lines.

TRAPEZIUM *Os*, in anatomy, is one of the bones of the carpus; it is the firſt bone of the ſecond row, and has its name from its figure, which is a ſort of unequal ſquare. Its outer ſurface is rough, and makes a part of the outer or convex ſurface of the carpus. On its inner ſurface is an oblong eminence, which makes one of the four eminences on the concave ſide of the carpus; and on the ſame ſide it has a groove

groove or channel; there is likewiſe a ſmall tubercle on its outer ſurface.

This bone has ſeveral articular cartilaginous ſides, *viz.* one brachial, one digital, and two cubital. The brachial ſide, which is hollow, is articulated with the os ſcaphoides; the digital with the firſt phalanx of the thumb; one of the cubital with the os trapezoides, and the other with the firſt bone of the metacarpus. The ſide which is articulated with the firſt phalanx of the thumb, appears to be made up of two ſuperficial ſigmoide or ſemilunar half-ſides, diſtinguiſhed by an eminence of the ſame figure, being each more hollow towards the ſides than at the middle, which makes a portion of a ſort of ſuperficial pulley, with the edges much worn. One of the cubital ſides, which is articulated with the os trapezoides, is large; and the other, which joins the firſt metacarpal bone, is ſmall. *Winſlow*'s Anat. p. 83.

TRAPEZIUS (*Cycl.*)—This muſcle is a large, broad, thin, fleſhy plane, ſituated between the occiput and back, and thence extending to the ſhoulder, in figure of a large irregular ſquare, and, together with the *Trapezius* of the other ſide, it forms a kind of lozenge. Above it is fixed in the ſuperior tranſverſe line of the os occipitis, by a thin ſeries of fleſhy fibres reaching to the muſculus occipitalis, and ſeeming to cover that muſcle by a kind of aponeuroſis. Behind it is fixed to the five ſuperior ſpinal apophyſes of the neck, by means of the poſterior cervical ligament, and immediately to the extremities of the two loweſt ſpinal apophyſes of the neck, and of all thoſe of the back. From all theſe inſertions the fibres run in different directions, and terminate by one continued inſertion in about one third part of the clavicula, in the poſterior edge of the acromium, and through the whole ſuperior labium of the ſpine of the ſcapula, all the way to the ſmall triangular ſurface in that ſpine, over which ſurface the fibres ſlide and paſs freely, without being fixed therein. This muſcle covers immediately the ſplenius or maſtoideus ſuperior, part of the complexus major, the angularis, rhomboides, and part of the latiſſimus dorſi. The common inſertion of the two trapezii in the cervical ligament, is the reaſon that in pulling either of them toward one ſide of the neck, the other will follow it a little beyond the ſpinal apophyſes. *Winſlow*'s Anatomy, p. 173.

TRAPEZOID, in geometry, a plane irregular figure, having four ſides, no two of which are parallel to each other.

TRAPEZOIDES *Os*, in anatomy, is the ſecond bone of the ſecond row in the carpus. It has its name from its figure ſuppoſed to approach that of an unequal ſquare; but it might much more properly have been called os pyramidale, being in figure rather a kind of a pyramid, with its point broken off. Its baſis makes a portion of the outer or convex ſide of the carpus, and its truncated point a part of the concave ſide.

It has ſeveral articular ſides; one brachial, which is the leaſt of all, and is articulated with the os ſcaphoides; one digital, of a conſiderable length, notched on each ſide, and divided into two halves by a ſort of middle line or angle, which gives it the appearance of a pulley, articulated with the baſis of the firſt metacarpal bone; one radial, irregularly triangular, and articulated with the os trapezium; and one cubical, a little hollow, and articulated with the os magnum. *Winſlow*'s Anat. p. 84.

TRAPEZUNTINA *Laurus*, a name uſed by ſome botanical authors, for the *Lauroceraſus*, or common laurel. *Chabræus*, p. 51.

TRAPPINGS. Among the antients ſome will have the horſe *Trappings* to have been placed on their breaſts; others, on their forehead; and others again, on their cheeks. That on the breaſt was a ſmall kind of ſhield, finely poliſhed. *Hofm.* Lex. univ. in voc.

TRAQUENADE, in the manege. See the article ENTREPAS.

TRASCINA, in zoology, a name by which ſome authors have called the fiſh, more uſually known by the name of the draco marinus, and araneus. *Salvian* de Aquatic.

TRAVAIL, in the manege. See the article TRAVICE.

TRAVELLING. The common method of *travelling* in England being on horſeback, it may be proper to give ſome general rules for the keeping the creature ſound, and doing the buſineſs agreeably, and without many of the accidents which uſually attend it.

Care muſt be taken that the ſhoes be not too ſtreight, and do not pinch the horſe's feet any way; but be well ſhaped, and ſet eaſy. It is proper to have them put on freſh a few days before the journey, that they may laſt well, and that they may be ſettled to the feet before the ſetting out. The bridle is next to be examined; that the bit of it be proper, and not too heavy: for if it be, it will incline him to carry low when he grows tired, and reſt upon the rider's hand: This is what they call the uſing a fifth leg. It is a very diſagreeable thing, but may often be avoided, only by taking a proper care of the bit. The mouth of the bit ſhould reſt upon his bars, about a finger's breadth from his tuſhes, ſo as not to make his lips uneaſy. The curb ſhould reſt in the hollow of his head, a little above the chin; and if it gall him, the place muſt be defended with a piece of buff or other ſort of leather.

The next thing to be regarded, is the ſaddle; and proper care muſt be taken as to this, that it do not reſt either upon the withers, reins, or back-bone; and that one part of it do not preſs upon the back, any more than another. Some riders gall a horſe's ſides below the ſaddle with their ſtirrup leathers: This is moſt likely to happen to a lean horſe; and to prevent it, a leather ſtrap ſhould be fixed between the points of the fore and hinder bows of the ſaddle, and the ſtirrup-leathers ſhould be made to paſs over theſe leathers.

It is always beſt to begin a long journey by ſhort ſtages, and this is the more neceſſary if the horſe has not been exerciſed for ſome time before. If it be a horſe that is rid, he ſhould be ſuffered to ſtale as often as he likes, and even invited to it; but, if a mare, ſhe is to be leſs indulged in it as leſs neceſſary, and often diminiſhing her Strength. It is always adviſable to ride very ſoftly for a quarter of an hour, or half an hour before coming in to the inn at night, that he may not be over hot when put into the ſtable; but if the haſte of the journey will not admit of this, the horſe ſhould be walked in ſome perſon's hands, to cool him gently before he is put up.

If the weather is cold a cloth ſhould be laid over him while he is walked; and when taken in, his whole body ſhould be rubbed and dried with ſtraw. Some have a cuſtom of ordering their horſes legs to be rubbed well down, on their firſt coming in; but this is very prejudicial while the horſe is hot, and ſhould always be let alone till he is perfectly cooled.

As ſoon as the horſe is cooled, and ceaſes to heat in the flanks, the bridle is to be taken off, the bit waſhed, and hay given him that he may eat at pleaſure. The duſt in very dry weather will ſometimes clog up the tongue of the horſe in ſuch a manner, that he cannot eat without great difficulty; In this caſe ſome bran and water ſhould be firſt given him to waſh his mouth, or the ſervant ſhould do it with a wetted ſpunge.

Theſe are the proper methods, when the horſe has been rode moderately; but when he has been hurried at a great rate, the ſaddle is to be taken off as ſoon as he is put up, and the ſweat rubbed off with a ſweat knife; and then the whole body and legs are to be rubbed carefully down, and the head is to be wiped with a cloth, as alſo the back under the ſaddle, and the thighs; then the ſaddle ſhould be clapped on again, and the horſe gently led up and down, till cool and dry. The feet are alſo to be examined, to ſee if a ſhoe be wanting, or if any of them preſs upon the ſole; and the dirt, gravel, or other foulneſs is to be picked out from between the ſhoe and the foot. The openings of the feet may be ſtopped with cow-dung, and the hoofs if brittle ſhould be anointed with ſome fatty ſubſtance juſt at the ſetting on; and in dry weather they ſhould be greaſed, not only at night, but noon. Many horſes, as ſoon as unbridled, will lay themſelves down, inſtead of eating.

Many are apt on this to ſuppoſe the horſe ſick; but it is generally owing only to the heat and pain they find in their feet, which renders them unable to ſtand upon them: In this caſe if their eyes are examined, they will be found briſk and good, and the hay being offered them as they lie, they will eat it greedily. This ſhews there is no inward diſorder, and the heat and tenderneſs of the feet, if examined, will ſhew that they are the part in pain. The principal thing to be done in this caſe, is taking care that the ſhoes do not reſt upon the ſoles. This is not eaſily known but by taking off the ſhoes, which in caſes of extremity ſhould always be done; it will then be found where the ſole is touched by the ſhoe, being in that part more ſmooth and ſhining than elſewhere. In this caſe the feet are to be pared in thoſe parts, and then the ſhoes are to be fixed on again, anointing the hoofs, and ſtopping the ſoles with hot black pitch or tar.

Theſe are the means by which *Travelling* will be rendered eaſy and commodius both to the rider and the horſe; but there is ſome care alſo to be taken of the creature, after he comes off from a long journey. The firſt thing to be done is, that the two heel nails of the fore-feet are to be drawn, and if the ſhoe be large, then four ſhould be drawn; two or three days after the horſe ſhould be blooded, and for ten or twelve days after this he ſhould be fed with wet bran, without any oats; but he is to be kept well littered. The reaſon of drawing the heel nails is, that the feet are apt to ſwell after journies; and if this is not done the ſhoes preſs upon them in that part, and become very uneaſy to them; it is adviſeable to ſtop them alſo with cow-dung for ſome time; but they are in the wrong who pare them down after taking off the ſhoes, for the humours being all in motion after this, they are apt to fall into the feet.

If there appear any danger of the creature's legs ſwelling after the journey, it may be eaſily prevented by this means: Take a quantity of the dung of an ox or cow freſh made, mix it with ſo much vinegar as will reduce it to a ſoft paſte, and add to it a handful of ſalt; with this rub all the hips thoroughly up to the knees, and let it dry on; give the water in a pail that evening that the legs may not be wetted, and the next morning the horſe is to be led to water, and the whole remaining matter waſhed off. The jockies have a very cunning trick to recover the hoofs of a horſe injured by a long journey:

journey: They make a hole in the foot, and fill it with moiſtened cow-dung; they keep this in it a month, and the continual moiſture occaſioned by it makes the hoof grow very quick, and ſoon recover the proper dimenſions, but it ſoon after drys and ſhrinks ſo, that the foot is ſtreightned, and the whole hoof becomes brittle.

Cow-dung applied to a horſe's foot always moiſtens the ſole; but it drys up the hoof, if continued any length of time to it.

The beſt method of recovering a horſe's hoofs is to make a hole in the ſtable floor filled with blue clay a little wetted, in this the horſe ſhould keep his fore-feet a month; this will have more effect then a ſmall portion of cow-dung in the foot; and the effect will be of ſo different a nature, that the hoof will be rendered more tough than before, inſtead of being made brittle by it.

Moſt horſes that are fatigued, or overworked by long journies, have their flanks altered by it, without being purſy; eſpecially horſes naturally vigorous, which have been worked too violently. The beſt remedy in this caſe, is to give the horſe half a pound of honey in the morning, mixed among a feed of ſcalded bran: If he eats the half pound readily, give him a pound the next morning; continue this till the honey ceaſes to purge the creature; after this, powder of liquorice may be added to the ſcalded bran, and this continued ſome time, and two or three glyſters at convenient diſtances of time will be found very ſerviceable. If the horſe be very lean, it will be proper to give him ſome wet bran over and above his proportion of oats; and graſs is alſo very proper, if the creature be not inclined to be purſy. This caution, however, is to be had at all times, that exceſſive feeding may be bad, by ſubjecting the horſe to the farcy. When the horſe begins to drink heartily, it is a ſign that he will ſoon recover. Though this ſometimes fails, it is a good general rule.

TRAVERSE (*Cycl.*)—TRAVERSE, in the manege. A horſe is ſaid to *traverſe*, when he cuts his tread croſs-wiſe; throwing his croupe to one ſide, and his head to another.

TRAVERSE-*Board*, in a ſhip, a little round board hanging up in the ſteerage, and bored full of holes upon lines ſhewing the points of the compaſs: Upon it by moving of a little peg from hole to hole, the ſteerſman keeps an account how many glaſſes, that is, half hours, the ſhip ſteers upon any point.

TRAVERSE-*Table*, in navigation, is the ſame with the table of difference of latitude and departure; being only the difference of latitude and departure ready calculated to every degree, point, half-point and quarter-point of the quadrant; and for any diſtance under 100 miles, though it may conveniently ſerve for more.

This table is one of the moſt neceſſary things a navigator has occaſion for; for by it he can readily reduce all his courſes and diſtances, run in the ſpace of twenty-four hours, into one courſe and diſtance; whence the latitude he is in, and his departure from the meridian may be found.

TRAVERSE *the Yard*, on board a ſhip, is to brace it aft.

TRAVICE, in the manege, is a ſmall encloſure, or oblong quadrangle placed before a farrier's ſhop, and conſiſting of four pillars or poſts, kept cloſe together by croſs-poles. This encloſure is deſigned for holding and keeping in a horſe that is apt to be unruly or diſorderly in the time of ſhoeing, or of any operation.

This in ſome of the remoter parts of England goes by the name of a *break*; and is called in French *Travail*.

TREACLE (*Cycl.*)—Dr. Shaw, in his Eſſay on Diſtillery, has endeavoured to bring into uſe ſeveral ſorts of *Treacles*, which might be made at home, and would ſerve very conveniently for the diſtillation of ſpirits, or the making of potable liquors. Theſe are the inſpiſſated juices or decoctions of vegetables: Such as the ſweet juice of the birch, or ſycamore, procured by tapping or piercing the trees in ſpring, and the common wort made from malt, or from other vegetable ſubſtances treated in the ſame manner. Theſe liquors are ſeverally to be boiled down in a copper till they begin to inſpiſſate, and then to be poured into a balneum mariæ, when the remainder of the evaporation may be finiſhed without burning the inſpiſſated juices: Thus prepared it may be at any time reduced to the ſtate of wort, only by adding a ſufficient quantity of warm water. *Shaw*'s Eſſ. on Diſtill.

TREAD, in the manege. See the article PISTE.

TREASURER (*Cycl.*)—TREASURER *of the County*, he that keeps the county ſtock.

There are two of them in each county, choſen by the major part of the juſtices of the peace, *&c.* at Eaſter ſeſſions.

They muſt have 10*l.* a year in land, or 150*l.* in perſonal eſtate, and ſhall not continue in their office above a year; and they are to account yearly at Eaſter ſeſſions, or within ten days after, to their ſucceſſors, under penalties.

The county ſtock, of which this officer hath the keeping, is raiſed by rating every pariſh yearly; and is diſpoſed of to charitable uſes, for the relief of maimed ſoldiers and mariners, priſoners in the county gaols, paying the ſalaries of governors of houſes of correction, and relieving poor almshouſes, *&c.* And the duty of theſe *Treaſurers*, with the manner of raiſing the ſtock, and how it ſhall be diſpoſed of, is ſet forth particularly in the ſtatutes of 43 Eliz. c. 7. Jac. I. c. 4. 11 & 12 W. III. c. 18. 5 Ann. c. 32. 6 Geo. I. c. 23.

TREASURER, in cathedral churches, an officer whoſe charge was to take charge of the veſtments, plate, jewels, relicks, and other treaſure belonging to the ſaid churches. At the time of the reformation, the office was extinguiſhed as needleſs in moſt cathedral churches; but it is ſtill remaining in thoſe of Saliſbury, London, *&c.*

TREASURY (*Cycl.*)—The Athenian *Treaſury* was ſacred to Jupiter Σωτὴρ, or the ſaviour, and to Plutus the god of riches. Beſides other public monies, there were always a thouſand talents kept in it, which it was capital to touch, unleſs on the moſt preſſing occaſions. See the article OPISTHODOMUS.

The funds among the Athenians which ſupplied their *Treaſury*, were four, *viz.* the *tele*, τελη; the *phori*, φοροι; the *eiſphoræ*, εισφοραι; and the *timemata*, τιμηματα. Each of which ſee in its place.

The public *Treaſury* was divided into three parts, according to the uſe it was applied to; as, 1. The χρηματα τῆς διοικησεως, or that expended in civil uſes. 2. The Στρατιωτικα χρηματα, or money deſigned to defray the charges of war. 3. The Θεωρικα, or money intended for pious uſes; in which they included the expences at plays, public ſhews, and feſtivals, *&c.* *Potter*. Archæol. Græc. T. 1. p. 82.

To each of theſe branches of the public revenue there was a *Treaſurer* appointed, as Ταμιας τῆς διοικησεως, των στρατιωτικων and Θεωρικων.

TREATY (*Cycl.*)—in antiquity. For the ſolemn manner in which the Romans uſed to conclude *Treaties*, ſee Liv. l. 1. c. 24. The ceremonies obſerved by the Greeks in making *Treaties* may be ſeen in *Potter*, Archæol. Græc. l. 2. c. 6. T. 1. p. 252. ſeq.

In general it appears that the antients were very religious, grave and ſolemn in making *Treaties*; which were always confirmed by ſacrifices and mutual oaths, with horrid imprecations to the party that ſhould break the terms of agreement.

TREBIUS, in ichthyology, a name given by Joannes Cuba and ſome other writers, to the fiſh called *phycis* by Ariſtotle, Ælian, and Pliny; and *truca* and *tinea marina* by the later writers. It is nearly allied to the blennus claſs. See the article BLENNUS.

TRECHON, one of the many names by which the chemical writers, have called quickſilver.

TRECHEDIPNA, τρεχεδειπνα, in antiquity, a kind of livery or diſtinguiſhing habit worn by paraſites; the wearing of which was a ſufficient paſport to the tables of their patrons whoſe livery it was. *Pitiſc.* in voc.

The word comes from τρεχω, *I run*, and δειπνον, *a ſupper*.

TREE (*Cycl.*)—Heat is ſo eſſential to the growth of *Trees*, that we ſee them grow larger and ſmaller in a ſort of gradation as the climates in which they ſtand are more or leſs hot. The hotteſt countries yield in general the largeſt and talleſt *Trees*, and thoſe alſo in much greater beauty and variety than the colder do; and even thoſe plants which are common to both arrive at a much greater bulk in the ſouthern, than in the northern climates; nay, there are ſome regions ſo bleak and chill, that they raiſe no vegetables at all to any conſiderable height. Greenland, Iceland, and the like places, afford no *Trees* at all; and what ſhrubs grow in them are always little and low.

In the warmer climates, where *Trees* grow to a moderate ſize, any accidental diminution of the common heat is found very greatly to impede vegetation; and even in England, the cold ſummers we ſometimes have, give us an evident proof of this; for tho' the corn and low plants have ſucceeded well enough, and gooſeberries, currants, raſberries, and other low ſhrubs, have brought forth fruit in ſufficient plenty, yet the production of taller *Trees* have been found very much hurt; and walnuts, apples, and pears have been very ſcarce among us.

Heat is heat be it from what cauſe it will, and acts as well upon vegetation one way as another. Thus the heat of dung, and the artificial heat of coal fires in ſtoves, is found to ſupply the place of the ſun.

Great numbers of the Indian *Trees* in their native ſoil flower twice in a year, and ſome flower and bear ripe fruit all the year round; and it is obſerved of theſe laſt, that they are at once the moſt frequent and the moſt uſeful to the inhabitants; their fruits, which hang always on them in readineſs, containing cool juices, which are good in fevers, and other of the common diſeaſes of that hot country.

Plantations of uſeful *Trees* might be made to very great advantage in many places in every country, and the country greatly enriched by it, while the public would be alſo benefitted by it, ſince it would raiſe a continual ſupply of timber uſed in ſhip-building, and on other public as well as private occaſions.

We have in many places, heaths, and other barren and uncultivated lands, of very great extent; and how great an advantage would it be to the public to bring theſe to be truly valuable. Many, if not all of theſe heaths, would be found on trial capable of producing *Trees*; and ſome of them are truly

the remains of deſtroyed foreſts; and though the profit to be reaped from the planting them would come late, yet the expence of doing it would be very trifling in compariſon of that profit, and the means eaſy.

The authors who have given rules for planting, having employed themſelves only about ſmall ſpots of ground, the eſtabliſhing orchards or parks, are by no means to be ſuppoſed proper guides in attempts of this kind; and Monſieur de Buffon, who had a great opinion of the knowledge of our Evelyn and Miller, who ſeem to ſpeak of every thing from their own experience, found when he ſet about large plantations, that their opinions and rules were erroneous; and was obliged to have recourſe to experiments only; which he varied a thouſand ways: and though many of them proved unſucceſsful, yet they all gave hints toward others, by which the attempt might afterwards be brought to ſucceed.

This ſagacious enquirer into the operations of nature in the growth of vegetables, having ſet apart a conſiderable quantity of land for the trial, and procured a number of young *Trees*, firſt divided the whole quantity into a number of ſmall ſquares, and having made a plan of it, examined the nature, depth, and other circumſtances of the ſoil in each, and minuted the whole down on a proper part of the plan: that himſelf or whoever ſucceeded him might judge from the different growths of a number of *Trees* planted in the ſame ſtate in theſe different ſoils, the different advantages and diſadvantages of every circumſtance in the depth and nature of the ground, in regard to the growth of uſeful *Trees*. Different numbers of labourers were employed about different ſpots of this ground, and the acorns for the young growth planted at different ſeaſons; but the reſult in general was, that what ſhould ſeem the beſt methods ſucceeded the worſt; and thoſe pieces where many labourers had been employed, and the acorns planted before winter, were much thinner of young oaks, than thoſe where the leaſt labour had been beſtowed upon the ground, and where the acorns had been planted in the ſpring: but thoſe places which ſucceeded beſt from the ſowing, were thoſe which had the acorns planted in holes made by a pick-ax, without any preceding culture of the ground. And thoſe where the acorns had only been laid upon the earth, under the graſs, afforded a great number of vigorous young *Trees*, though the greater part had been carried away by birds and other devouring animals. Thoſe ſpots of ground where the acorns were ſet at ſix inches depth, were much worſe furniſhed with young ſhoots, than thoſe where they had been buried but at an inch deep; and in ſome places where they were buried at a foot deep not one ſhoot appeared, though in others where they had been buried at nine inches there were many.

Thoſe acorns which had been ſteeped for eight or nine days in wine lees, and in the water of the common ſewers, appeared out of the ground much earlier than thoſe which were put in without this previous management.

But the moſt ſucceſsful of all the trials, was that of planting in the ſpring ſuch acorns as had been ſown together in another place, and had time to ſhoot there; of theſe ſcarce any one failed, and the plantation was perfectly flouriſhing, tho' the growth of theſe young ſhoots was not ſo quick or vigorous as thoſe of the acorns, which had remained when firſt ſown; which was probably owing to the injury the tender radicles received in tranſplanting.

Thus ſucceeded the experiments by ſowing, while of thoſe made by planting young *Trees*, ſuch as had been brought out of woods and places under covert, ſucceeded much worſe than thoſe which had grown in more expoſed places.

The young *Trees* of the ſeveral parts of the plantation kept on their growth in the manner they had begun to ſhoot, thoſe of the more laboured parts continuing more weak, and lower than thoſe of the leſs laboured.

Thus were a number of neceſſary experiments carefully tried, and the reſult of the whole was, that to make a plantation of oaks, on a ſoil of the common clayey or loamy kind, the moſt ſucceſsful method is this: The acorns muſt be preſerved during the winter in the earth in this manner: let there be made a bed of earth of ſix inches deep, on this place a layer of acorns two inches deep, over theſe lay a bed of another half foot of earth, over that another layer of acorns, and ſo on ſucceſſively, till as many are employed as there will be occaſion for; the whole is then to be covered with a foot depth of earth, to preſerve all from the froſt. In the beginning of March theſe beds are to be opened, and the acorns which will by that time have ſhot out, and are then in reality ſo many young oaks, are to be planted out at a foot diſtance each, and the ſucceſs of a plantation of this kind need not be feared.

This is a manner of planting that is done at a ſmall expence, and even that might be in a great meaſure ſpared, were it not for the birds and other devouring animals; ſince, could the acorns be defended from theſe, they might be only laid on the ſurface of the ground under the graſs in autumn, and they would infallibly ſhew themſelves in ſo many young oaks the ſucceeding ſpring.

It is eaſy to continue the carrying the acorns, when taken out of their winters bed, to the place where they are to be planted, without doing them much injury; and the ſmall ſtop the tranſplanting puts to their growth, is in reality rather an advantage than an injury; ſince it only retards the young ſhoots for about three weeks, or leſs than that: and by that means ſecures them from the few cold mornings that may be expected about the time of their natural appearance. Memoires Acad. Scien. Paris 1739.

Trees in corn fields are a worſe enemy than any weeds, they ſuck up the nouriſhment from the corn about them, even to a great diſtance: nor is it peculiar to corn to ſuffer by them. Mr. Tull gives an inſtance of a ſingle *Tree* ſtanding in a field of turneps, which ſpoiled no leſs than half an acre of the crop. It has been ſuppoſed that *Trees* injured theſe lower herbs by their ſhadow; and ſome thought that the miſchief they ſaw from them, was owing to their droppings; but by this inſtance, it is plain both theſe conjectures are erroneous: the ſouth ſide of the *Tree*, where no ſhadow comes, is found to ſuffer as much as any other; and the droppings reaching only as far as the bows, and the miſchief ſo much farther, it is plain that the miſchief is owing to neither of theſe cauſes, but to the *Tree*'s drawing all the nouriſhment, by extending its roots ſo far, and in ſuch numbers, on every ſide the extent of ground through which the turneps were thus injured, probably ſhewing the extent of the roots of the *Tree*, which are found by this to run farther than is uſually ſuppoſed.

On felling of *Trees*, letters have ſometimes been found in the midſt of them. We have inſtances of this kind, mentioned in the Phil. Tranſ. N°. 454. Sect. 16. Where the trunk of of a beach being ſawed, diſcovered ſeveral letters in the wood, about one inch and an half from the bark, and near the ſame diſtance from the center of the trunk. It ſeems theſe letters had been formerly cut into the bark, and in proceſs of time theſe might be covered. See the place cited. See alſo the ſame number Sect. 17. in the remarks.

In the ſame Tranſaction, we have an account of the horn of a deer, found in the heart of an oak. Crucifixes have alſo been found in *Trees*, and were to be ſure ſhewn as miraculous to the ignorant. See p. 236. of the ſaid Tranſaction in the remarks.

TREES are often found buried in the earth. See the article *Foſſile* WOOD.

How TREES may be injured by froſt. See the article FROST.

Fruit-TREES. See the article FRUIT-*Trees*.

Juices of TREES. See the articles JUICE and SAP.

Diſtemperature of TREES. See the article DISTEMPERATURE.

Felling of TREES. See the articles FELLING and TIMBER.

TREES in a ſhip are of ſeveral ſorts, as, *Cheſs-Trees*, *Croſs-Trees*, *Roof-Trees*, *Waſte-Trees*, *Treſſel-Trees*. See the article CHESS-*Trees*, CROSS-*Trees*, &c.

Roof-TREES, in a ſhip, ſmall timbers that bear up the gratings from the half deck to the fore-caſtle, ſupported by ſtantions that reſt upon the half deck.

TREENELS, in a ſhip, long pins or nails of wood, whence they are called *Tree-nells*, or *Tree-nails*, made out of the heart of oak, to faſten the planks to the timber; and thoſe have always oakam driven into them to prevent any leak.

TREET, *Triticum*, in our ſtatutes, is uſed for fine wheat. See Statute 51. Hen. 3. *Blount*.

TREFOIL, *Trifolium*, in botany, the name of a genus of plants; the characters of which are theſe: The flower is of the papilionaceous kind: The piſtil which ariſes from the cup finally becomes a capſule, which remains covered with the cup, and uſually contains kidney-ſhaped ſeeds. To this it is to be added, that the leaves grow three on every ſtalk; though there are ſome inſtances of theſe plants truly of this genus, which have four or five on the ſtalk.

The ſpecies of *Trefoil*, enumerated by Mr. Tournefort, are theſe: 1. The bituminous, or ſtinking *Trefoil*. 2. The common purple meadow-*Trefoil*. 3. The larger purple *Trefoil*, with longer and narrower leaves, and deeper coloured flowers. 4. The common white-flowered *Trefoil*. 5. The ſmaller and ſmoother white-flowered meadow-*Trefoil*, called by ſome the female meadow-*Trefoil*. 6. The white meadow-*Trefoil*, with a bivalve pod, a hollow ſtalk, and leaves marked underneath with purple ſpots. 7. The bladder purple *Trefoil*. 8. The wild hop-*Trefoil*. 9. The ſmalleſt hop-*Trefoil*. 10. The mountain hop-*Trefoil*. 11. The large purple mountain-*Trefoil*. 12. The purple mountain-*Trefoil*, with ſharp-pointed and crenated leaves. 13. The purple mountain-*Trefoil*, with obtuſe-pointed crenated leaves. 14. The leſſer purple mountain-*Trefoil*. 15. The white mountain-*Trefoil*. 16. The *Trefoil* with a round red ſpike, called the greateſt lagopus or hares-foot *Trefoil*. 17. The *Trefoil*, with an oblong red ſpike. 18. The mountain-*Trefoil*, with a very long red ſpike. 19. The narroweſt-leaved ſpiked mountain-*Trefoil*. 20. The narrow-leaved Spaniſh *Trefoil*, with a pale red ſpike. 21. The narrow-leaved Spaniſh hares-foot *Trefoil*, with very red flowers. 22. The common ſmall-ſpiked field-*Trefoil*, called common lagopus, or hares-foot *Trefoil*. 23. The ſmall hares-foot *Trefoil*, with ſharp-pointed and not crenated leaves, and ſmall pale purple flowers. 24. The yelloviſh flowered hares-foot *Trefoil*, called the meadow-*Trefoil*, with ſulphur-coloured flowers. 25. The ſtarry-headed *Trefoil*, with globoſe huſks. 26. The common purple ſtarry-headed French *Trefoil*. 27. The ſmall ſtarry-headed *Trefoil*, or dipſacus-headed *Trefoil*. 28. The globoſe *Trefoil*, or round-

headed

headed hares-foot *Trefoil*. 29. The creeping globoſe headed *Trefoil*, or bur-headed *Trefoil*. 30. The ſmooth or woolly-headed *Trefoil*. 31. The larger ſoft-headed, or woolly-headed *Trefoil*. 32. The larger rough-headed *Trefoil*. 33. The ſmaller rough-headed *Trefoil*. 34. The thyme-headed *Trefoil*. 35. The *Trefoil*, with oblong rough heads. 36. The ſtrawberry-*Trefoil*, with heart-faſhioned leaves and red flowers. 37. The ſtrawberry-*Trefoil*, with deep violet-coloured heads. 38. The long-leaved purple ſtrawberry *Trefoil*, which ſeems only a variety of the former ſpecies. 39. The reticulated *Trefoil*, which buries its ſeed under ground. 40. The annual *Trefoil*, with heads like thoſe of dodder. 41. The little procumbent *Trefoil*, with heads covered with a thick woollyneſs. 42. The ſmall hairy *Trefoil*, with large ſeeds, and ſoft heads in the alæ of the leaves. 43. The *Trefoil*, with round heads at the knots of the ſtalks. 44. The blackiſh luxuriant *Trefoil*, with four, five, or ſix leaves on a ſtalk, called the quadrifolium hortenſe. *Tourn.* Inſt. p. 405.

Trefoil, or clover, is a plant greatly eſteemed by the Engliſh farmers, for the great improvement it makes upon land, the goodneſs of its hay, and the value of its ſeed. The great advantage of *clover*, or *Trefoil*, to the land on which it grows is, that it feeds a vaſt number of cattle at a time, and their dung is ſo rich a manure to the ground that in two or three years time it becomes fit for corn again, though it had been ever ſo much exhauſted before. Clayey lands, in particular, are greatly improved by it.

There are ſeveral kinds of *clover*, but the great ſort is eſteemed the beſt, whoſe ſeed is like that of muſtard, except that it is more oblong. The Engliſh ſeed is preferable to that of all other places, and the farmer ſhould chooſe ſuch as is of a greeniſh colour, with a caſt of red; that which is black never growing ſo well. An acre of land will require ten pound of ſeed, ſometimes twelve pound, and it is better to ſow too much than too little. It delights moſt in a rich warm ſoil, and always thrives beſt in thoſe lands which have been well dunged or manured; but the clay-lands, which are long in acquiring a coat of graſs, or ſwarding as the farmers expreſs it, and are little ſubject to weeds, are of all others the beſt land for *clover*; becauſe in thoſe lands, where the common graſs grows ſpeedily, it ſoon eats out the *clover*. Light lands are in general more ſubject to this ſudden growth of common graſs, and they have alſo another diſadvantage in regard to the *clover*, which is, that they eaſily waſh away from its roots after ſharp rains; and then the roots, being left bare, are killed by the firſt froſt that comes; in good grounds it will bear crops for three or four years; but not longer than that, even in the moſt proper ſoil, and with all the neceſſary cautions.

There is a very eaſy method of determining what is good *clover*-ſeed and what bad; it is only neceſſary to throw it into a glaſs of water, and that which ſinks is good, what ſwims is bad, and will never vegetate. It is eaſy, from this trial, to know what ſeed is to be depended upon, and what is not; and to know what allowance is to be made in bad ſeeds, for the quantity loſt in the proportion for every acre.

The beſt way of ſowing of *clover* is, either with barley or oats after the corn is ſown; and, upon this account, the corn is to be ſown ſomewhat thinner than ordinary. The uſual time of ſowing it, is in the end of March, or the beginning of April in a calm day; but if the land be very dry, it is better to ſow it with black oats, as early in the ſpring as may be, that ſo it may get up while the ſpring rains laſt, and be of ſome ſtrength before the dry weather comes. Some ſow it with wheat or rye at Michaelmas; this gives it an opportunity of ſhedding its ſeed on the ground, and by that means, the crop of the next year is rendered much ſtronger than it would have been made by any other means; but then it is beſt to be ſown upon dry lands, which will bear the ſowing both of the wheat and the rye upon broad ridges; which is uſually very ſucceſsful, if a mild winter follows; but if there are long and ſevere froſts, or deep ſnows, it is very hazardous. Some adviſe the ſowing it alone, at Michaelmas; which they ſay makes it come up the freer from weeds, than if ſown in the ſpring; and that it will get ſtrength enough before winter, to ſupport itſelf againſt the froſts, and will grow finely in the enſuing ſpring.

Some farmers ſow rey-graſs with the corn at Michaelmas, and early in the ſpring they ſow *clover*, which they only cover by rolling it. The beſt management of all ſeems to be the feeding it bare before winter comes on, and then it is ſafe; for the froſts, though they often deſtroy the leaves of the *clover*, yet never hurt its roots, unleſs they happen to lie bare. About the middle of May, or at the utmoſt toward the end of that month, is the time of mowing the *clover* for the firſt crop. This takes up more time and labour in the making into hay, than the common graſs, and muſt be well attended; but if it grow not too ſtrong, it will be found exceeding rich for the fattening of cattle. The exact time for the cutting this firſt crop is when it begins to knot, and after this ſome mow two other crops before winter. *Mortimer*'s Huſb. p. 32. ſeq.

Hop-TREFOIL, or *Hop-Clover*, the farmers name for the ſmaller ſpecies of *Trefoils*, or three-leaved graſs, which they ſow in many places inſtead of the large clover: it is eſteemed much finer and ſweeter than the large clover, and upon ſome land is a very great improvement, though 'tis reckoned to grow upon any ſoil.

Hartlip, in his legacy, ſays, there are twenty-three ſorts of it, and that every ſort loves a peculiar ſoil; ſome ſpecies thriving beſt on clay, ſome on ſand, ſome in watery places, and ſome on ſun-burnt grounds. The ſeeing one kind or other of it thus growing on all ſorts of ſoils, may have been the occaſion of the error of ſuppoſing that every kind of it would grow every where: there are very certainly ſometimes ſeen thin crops of it, and the moſt natural ſuggeſtion as to the reaſon of it, ſeems, that a wrong kind for the ſoil has been ſown there. It may be no ſmall improvement in this branch of the farmer's buſineſs, to find out which it is that particularly loves each ſoil, and always ſow the proper ſpecies in the proper places. *Mortimer*'s Huſbandry, p. 41.

It may be ſown either with corn, or alone on ploughed lands, or ſprinkled over meadows to make a better crop with the common graſs. They commonly allow twelve pounds of the ſeed to an acre; and when ſown alone, it is eſteemed much more laſting than the rey-graſs, eſpecially the yellow hop-clover. When ſown among the hay-graſs in meadows, it much improves the crop both in quantity and quality.

The laſt crop is, however, often damaged by the weather, and it ſeems, upon the whole, better for the farmer to make only one crop after that in May. This ſecond crop he ſhould alſo calculate to get ſeed from; and for this purpoſe he muſt let it ſtand till the heads are thoroughly ripe before it is cut, for it is a ſort of ſeed that is not eaſy to ſhed.

When the ſeed is firſt perceived in the head, it is a notice that in a month's time it will be ripe, and fit for cutting. It muſt be watched about this time, and the ſtalk will be found to turn brown, and the ſeed greeniſh, at the time when it is fit for cutting. It muſt be mowed in a dry ſeaſon, and kept carefully as dry as can be.

It ripens ſome years conſiderably ſooner than others, and therefore there can be no rule laid down for the time of cutting, but this muſt be guided by the ripening of the ſeeds in the heads.

If the clover is apt to wear out the ground, and become thin upon it, let it be mowed in May, and after that let it ſtand till the ſeed is ripe, and falls out of the huſks upon the ground; then cattle may be turned in to feed upon it, and it will riſe up as freſh and full from theſe ſcattered ſeeds, as if it had been new ſown with all the art and care in the world. One acre of this graſs will feed as many cattle as five acres of common graſs; but the moſt advantageous way of feeding them, is not to turn them in upon it, becauſe in that caſe they tread down more than they eat; but to cut it with a ſcythe, and give it them in racks.

If the cattle are to be turned in to feed at large upon it, this muſt be done gradually, and with great caution; for if they are at once removed from common graſs into this, they will over-feed upon it, and even burſt themſelves; they are therefore to be put in at firſt only for half an hour in the middle of the day; a ſecond day they may be left in an hour; and the third day two or three hours; and after this, for three or four days, they are to be turned in as ſoon as the morning dews are off the ground, and driven out again before the evening dews fall. After this, it may be ſafe to let them remain in it entirely.

Clover is apt to do harm to milch cows, more than to any other cattle; and it is a very good method ſome have, to take off from the too great richneſs of the crop, by ſowing rey-graſs among the *clover*. This upright graſs grows well among the branches of the *clover*, ſhooting up its ſtalks above it, and being eaten with the *clover*, takes off from its too great richneſs, at the ſame time that it makes the crop the larger.

The *clover* that is intended for ſeed is preſerved dry all the winter, and in March it is to be thraſhed for the ſeed: what ſeed firſt comes out is to be cleanſed from the ſtraw, and the huſks then are to be traſhed again. When all is obtained that can at one time, let the ſtraw be well dried in the ſun, and toſſed about with a rake, and then on the thraſhing it again, more ſeed in conſiderable quantity will be obtained: two buſhels of ſeed may thus be procured, out of the produce of an acre of good Land where the *clover* has throve. Id. ibid.

Shrub-TREFOIL. See the article CYTISUS.

TREMELLA, *Laver*, in botany, the name of a genus of ſmall and ſeemingly imperfect plants, the characters of which are theſe: They are a kind of plants ſeemingly of a ſort of a middle nature between the *alga* and *conferva*. Theſe produce no flower, nor ſeed, ſo far as has been yet obſerved, but are throughout of one uniform and tender texture, pellucid and membranaceous, and frequently gelatinous; they for the moſt part live in the water, and conſiſt of flat and plain leaves, often very broad, and ſometimes tubular. See Tab. of Moſſes, N°. 3. *Dillen.* Hiſt. Muſc.

There are ſeventeen known ſpecies of this plant. 1. The common ſea *Tremella*, called oiſter-green or ſea-*Laver*. 2. The freſh-water *Laver*: this is much ſmaller than the former, and of a very tender ſtructure. 3. The navel-*Laver*: this is diſtinguiſhed by having its leaves rounded and umbilicated in the center. 4. The marygold-leaved *Laver*: this is of a blackiſh green colour, and has all its leaves oblong, jagged, and growing on pedicles. 5. The leek-leaved *Laver*: this grows

grows to three or four inches long, and is of a pale green. 6. The faſciated, or double ribband-*Laver:* this is of a bright green, and finely undulated. 7. The gut-*Laver*, commonly called the ſea-chitterling: this is hollow and waved in various manners; it is common in ſalt-water ditches. 8. The thready and tape-like *Laver:* this is naturally of a fine green, but becomes white with long lying on the ſhores. 9. The ſmall cluſter-*Laver:* this conſiſts of ſmall and convoluted branches, forming a thick tuft; it is of a duſky green, and is common on pebbles near the ſea-ſhore. 10. The jelly-like buckthorn ſea-*Laver:* this is common on the ſides of ſmall ſalt-water ditches, and is of a fine bright green; the branches are ſomewhat diſtended, but not wholly cylindric. 11. The gelatinous fern moſs-like *Laver:* this is a very beautifully ramified ſpecies, and grows on ſmall pebbles; it is very tender and of a beautiful green. 12. The tender criſp or curled ground-*Laver:* this of a beautiful deep green, and is very common under old walls and pales, in January, February, *&c.* 13. The horned ground-*Laver:* this grows to three or four inches high, and is variouſly and elegantly divided into a number of branches, or horns; thoſe are of a membranaceous ſtructure, and of a pale green colour when growing, but a little yelloviſh when dried: while growing, it much reſembles ſome of the lichenoides. 14. The jelly rain-*Laver*, called *noſtoch*. See the article NOSTOCH. 15. The black gelatinous tree-*Laver*, called by the country-people witches butter: this is of a duſky-reddiſh black, and conſiſts of a thick wrinkled membranaceous ſubſtance; it is common in Herefordſhire, and ſome other countries on the barks of old trees. 16. The bladdery gelatinous river-*Laver:* this is corrugated in the manner of the meſentery, and is covered with granulous tubercles reſembling ſeeds; it is of a bright green, and is found in the rivers of Wales. 17. The bladder-headed-*Laver:* this ariſes from a greeniſh irregular cruſt, into a ſort of hollow tubercles or bladders, which at firſt lie cloſe upon it, but afterwards riſe upon ſmall pedicles; theſe heads or bladders are diſtended each by a drop of water, which when it is rarified by the ſun's heat often burſts the bladder, and the whole collapſes and looſes its form. *Dillen.* Hiſt. Muſc. p. 50.

TREMOLANTE, in the glaſs-trade, a name for the preparation of calcined braſs, otherwiſe called orpello, uſed either for a ſky-blue, or a ſea-green. *Neri's* Art of Glaſs, p. 35.

TREMOR (*Cycl.*)—TREMOR *Artuum*, in medicine, a diſtemper conſiſting in a violent agitation of the limbs in contrary directions, owing to a deficiency of the due tone and proper niſus of the affected parts. Medical writers diſtinguiſh this *Tremor* into the active and paſſive; the active is that which happens in violent paſſions of terror, anger, joy, *&c.* or in intermittent fevers, and is to be referred to the ſemi-convulſive motions; the paſſive are owing to a privative cauſe, and are allied to the ſemi-paralytic affections.

The paſſive *Tremors* of the limbs, when conſidered as a diſeaſe, are to be diſtinguiſhed from thoſe which are cauſed by external accidents, ſuch as the being plunged into cold water, the drinking tea, coffee, or other warm liquors, in many conſtitutions, and other ſuch accidental cauſes. The perſons ſubject to *Tremors* of the limbs are principally old people, in whom the vital principle is weak and languid.

Cauſes. The internal cauſes, are a flaccidity of the nerves and remiſſion of the tone of the parts; the external and accidental ones are the omiſſion of accuſtomed evacuations, a diaphoretic regimen, and an abuſe of ſpirituous liquors. *Junker's* Conſp. Med. p. 680.

Prognoſtics and Method of Cure. This is uſually in old people a very obſtinate complaint, and the more it is confirmed by being grown habitual, the more difficult is the cure; but if a caſe of this kind be taken in hand, as ſoon as it ſeizes the patient, and be treated in a rational manner, it is often perfectly cured. In order to this, the firſt ſtep muſt be the perfectly cleanſing the *primæ viæ*, by repeated doſes of rhubarb, or of an extract of black hellebore; if any habitual evacuation have been omitted, as bleeding or the like, this muſt be reſtored in the accuſtomed manner; and if any natural flux of blood by the hæmorrhoids or otherwiſe have ſtopped, this alſo muſt be recalled by proper medicines, or by the application of leeches: after this the due tone of the parts is to be reſtored by nervine medicines, as by wine impregnated with ſerpyllum, lavender, ſaſſafras, guaiacum, and the like ingredients; and externally by rubbing the parts with ſpirit of caſtor and ſerpyllum, and bathing them in decoctions of tanzy, ſavin, feverfew, and the like herbs. One great rule in the cure of this diſeaſe, is, that the patient is to abſtain from all hot things, otherwiſe an atrophy is eaſily brought on, and proves a much worſe thing than the original diſorder. *Junker's* Conſp. Med. p. 681.

TRENCHING *Plough*, (*Cycl.*) in huſbandry, the name of an inſtrument uſed to cut out the trenches, drains, and carriages in meadow and paſture-ground. It is alſo uſed for cutting the ſides of turf even, which are to be laid down again either in the ſame, or in ſome other places.

It conſiſts of a long handle, with a knob or button at the end, and at the other end it turns upward like the foot of a plough, to ſlide in the ground. In this part is placed a coulter, of the length proportioned to the depth to be cut, and with a ſharp edge; this has two wheels to make it run eaſy, and does a great deal of buſineſs in a very little time. *Mortimer's* Huſbandry.

TREPAN (*Cycl.*)—Where it is ambiguous whether there be an extravaſation of liquors, or a depreſſion of the ſkull, the operation of the *Trepan* is ſaid to be the ſafeſt method. Mr. Queſnay gives us ſome hiſtories of the *Trepan* being performed ſeveral times with ſucceſs, for the ſame diſeaſe; and of large parts of the ſkull being taken away, without loſs of the patient's life. See Mem. de l'Acad. de Chirurg.

We have the deſcription and figure of a *Trepan*, differing from and turning more equally than the common, by Mr. Monro, in the Med. Eſſ. Edinb. vol. 5. art. 41.

TREPANING (*Cycl.*)—Not only the head, but the ſternum, is ſometimes neceſſarily the ſubject of this operation, as abſceſſes are ſometimes formed under the ſternum between the membranes of the mediaſtinum, by a fall or blow, an inflammation, or other cauſes; in which caſes there is hardly a poſſibility of diſcharging the matter by any other method.

The great difficulty is to determine when and when not this is neceſſary; that is, when there really is an abſceſs formed there. When this is known to be the caſe, the operation is to be performed in the following manner: The patient is to be inclined backward, and a crucial inciſion made in the integuments upon the lower part of the ſternum, where the abſceſs ſometimes makes a point; then the integuments being freed from the ſternum, the *Trepan* is to be applied, and worked in the ſame manner as in *Trepaning* the cranium; and when the perforation is made, the patient is to be ſtooped forward, and ordered to cough or breathe hard, in order to promote the diſcharge of the matter; and the abſceſs is afterwards to be cleanſed with detergent injections, and healed in the uſual way. *Heiſter's* Surgery, P. 2. p. 21.

TREPIGNER, in the manege, the action of a horſe who beats the duſt with his fore-feet in managing, without embracing the volt; and who makes his motions and times ſhort, and near the ground, without being put upon his haunches. This is generally the fault of ſuch horſes as have not their ſhoulders ſupple, and at liberty, and withal have ſcarce any motion with them. A horſe may *trepigner*, in going upon a ſtrait line.

TRESSEL (*Cycl.*)—TRESSEL-*Trees*, in a ſhip, are thoſe timbers of the croſs-trees that ſtand along ſhips, or fore and aft at the tops of the maſts. See the article CROSS-*Trees*.

TRESSIS, among the Romans, a copper coin equal in value to three *aſſes*. *Pitiſc.* in voc. See the article AS, *Cycl.*

TREWIA, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium is permanent, and is compoſed of three oval reflex and coloured leaves. There are no petals. The ſtamina are numerous capillary filaments, of the length of the cup. The antheræ are ſimple. The germen of the piſtil is placed under the cup. The ſtyle is ſimple, and of the length of the ſtamina, and the ſtigma is ſimple. The fruit is a three-ſquare turbinated coronated capſule, formed of three valves, and containing three cells. The ſeeds are ſingle, and are in figure convex on the one ſide, and angular on the other. *Linnæi* Gen. Plant. p. 236. Hort. Mal. vol. 2. p. 42.

TRIAD, *Trias*, (*Cycl.*) among the antient Mythologiſts. See the article FERNARY.

TRIANDRIA, in botany, a claſs of plants which have hermaphrodite flowers, with three ſtamina or male parts in each.

The word is formed of the Greek, τρὶς, three, and ἀνὴρ, male. Of this claſs of plants are the valerian, ſaffron, a great many of the graſſes, *&c.* See Tab. 1. of Botany, Claſs 1.

TRIANGLE (*Cycl.*)—Plutarch informs us, that Xenocrates the philoſopher reſembled the Deity to an equilateral *Triangle*, the genii to an Iſoſceles, and men to a ſcalenum. A *Triangle* has ſince been applied by Chriſtians to repreſent the Trinity, ſometimes ſingle, and at other times with additional lines, expreſſing a croſs. Thus we find them variouſly combined upon the medals of the popes, publiſhed by Bonanni. And nothing was more frequent formerly with printers, than to place theſe figures in the front of their books; at firſt, doubtleſs, with a religious intent, till at length, by common uſe, they became only preſs marks, and badges of diſtinction among the trade; as they now are with merchants, who mark their goods with them both here and abroad. Phil. Tranſ. N°. 474. Sect. 1.

TRIANGULAR (*Cycl.*)—TRIANGULAR *Leaf*, among botaniſts. See the article LEAF.

TRIANGULARIS (*Cycl.*)—TRIANGULARIS *Coccygis*, in anatomy, a name given by Santorini, and others, to the muſcle now generally called ſimply *Coccygæus*. See the article COCCYGÆUS.

TRIANGULARIS *Labiorum*, in anatomy, a name given by Santorini and Winſlow, to the muſcle called by Albinus *depreſſor anguli oris*, and by Cowper and others, *depreſſor labiorum communis*.

TRIANGULARIS *Penis*, in anatomy, a name given by Morgagni, and others, to a ſuppoſed muſcle, called alſo by ſome *dilatator penis*, and *dilatator poſticus urethræ*; and by others *levator ani*.

It is truly no diſtinct muſcle, but a proceſs of the *ſphincter ani* running into the perinæum.

TRIANGULARIS *Piſcis*, in zoology, the name of a ſea-fiſh of a very remarkable figure, called in Engliſh the *coney-fiſh*, of which there are two ſpecies, the one having two horns, the other wanting that character.

The horned kind is uſually ſix or ſeven fingers breadth long, and about three fingers broad. The tail ends in a ſomewhat long fin. The mouth is ſmall, and capable only of admitting a pea. It has twelve ſtrong ſerrated teeth in the upper jaw, and eight larger ones in the lower. The head riſes gibbouſly from the mouth to the horns; and the back is humped in the ſame manner in the middle. It has only one ſmall fin near the tail. Its eyes are large, and placed near the horns. Beſide the ſingle fin near the tail, it has four others, the tail making one, one more being ſituated on the back, and two on the belly. It has two horns like cocks ſpurs, growing ſtrait out of its forehead, and two others in a contrary direction, out of its belly near the tail. It has no ſcales, but has a hard ſkin, white on the belly, and brown every where elſe, and wonderfully marked with trigonal, tetragonal, and pentagonal and hexagonal figures. The ſpecies which has no horns, has a broader belly, a longer tail, and is marked all over its body only with hexangular figures, and innumerable ſmall tubercles. Its belly is yellowiſh, and the reſt of its body of a greyiſh or browniſh yellow. The mouth is narrow, and the teeth ſmall; five in the under, and eleven in the upper jaw. The eyes are large and round. It is hollow, and has very little fleſh. See Tab. of Fiſhes, N°. 68.

Both thoſe ſpecies are caught among the rocks, on the ſhores of the iſland of Java, and are ſometimes eaten by the inhabitants, being firſt ſkinned. *Cluſ.* Exot. L. 6. c. 27. *Willughby*'s Hiſt. Piſc. p. 150.

TRIANGULARIS *Splenii*, in anatomy, a name given by Spigelius and others, to a muſcle of the head called by Winſlow, the upper portion of the *ſplenius*, or *ſuperior maſtoidæus*, and by Albinus, the *ſplenius capitis*. The old authors have deſcribed it under the name of the *primus caput moventium*.

TRIBULASTRUM, in botany, a name given by Iuſſieu to a genus of plants, ſince called by Linnæus *neurada*. See the article NEURADA.

TRIBULOIDES, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the roſaceous kind, being compoſed of a number of petals, arranged in a circular form. From the cup ariſes a piſtil, which finally becomes, together with the cup, a roundiſh prickly unicapſular fruit, containing a ſeed like a cheſnut. The prickles of the fruit are only the leaves of the cup become rigid. There is only one known ſpecies of this plant, which is the water *Tribuloides*, commonly called the *water Tribulus*. The kernel of the fruit is eatable.

TRIBULUS, *Caltrop*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the roſaceous kind, conſiſting of ſeveral leaves, arranged into a circular form. From the cup ariſes a piſtil, which afterwards becomes a ſort of cruciform or turbinated fruit, compoſed of ſeveral parts, each ending in a prickly point, and all collected into a firm head, and containing oblong ſeeds.

The ſpecies of *Tribulus*, enumerated by Mr. Tournefort, are theſe: 1. The chich-leaved land *Tribulus*, with prickly ſeed-veſſels. 2. The great prickly-headed land *Tribulus* of Curaſſo 3. The long-leaved Armenian *Tribulus*, with turbinated heads. And 4. The vetch-leaved hairy *Tribulus* of the Eaſt-Indies. *Tourn.* Inſt. p. 265.

TRIBULUS *Marinus*, the *Caltrop-Shell*, in natural hiſtory, the name of a peculiar ſpecies of the purpura. It is of a whitiſh colour, and has three rows of ſpines. See the article PURPURA.

TRIBUNES *of the People*, (*Cycl.*) in antient Rome, by virtue of their office, claimed and exerciſed a power of ſummoning the ſenate at any time, whenever the affairs of the people required it, though the conſuls themſelves were in the city. It has been taken for granted, on the authority of Valerius Maximus, that the *Tribunes* of the people, on their firſt creation, were not admitted into the ſenate, but had ſeats placed for them before the doors in the veſtibule. But we may reaſonably conclude, that a magiſtrate ſo ambitious and powerful, who could controul, by his ſingle negative, whatever paſſed within doors, would not long be content to ſit without. *Dionyſ.* Halic. x. 31. *Middlet.* of Rom. Senat. p. 129. *Val. Max.* l. 2. c. 27.

A. Gellius ſays, that they were not made ſenators before the law of Atinius [a], who is ſuppoſed to be C. Atinius Labeo, *Tribune* of the people, A. U. 623. [b]; but that cannot poſſibly be true, ſince it is evident from the authority of Dionyſius, that near four centuries before, the *Tribunes*, by the mere weight, and great power of their office, had gained an actual admiſſion into the ſenate, within two years after their firſt creation [c]; in which we find them debating and enforcing, with great warmth, the demands of the commons, for a liberty of intermarriages with the nobles, and the choice of a plebeian conſul [d]. So that the intent of this Atinian law could not be, as it is commonly underſtood, that the *Tribunes* ſhould be ſenators in virtue of their office, for that they had been from the beginning; but that for the future they ſhould always be choſen out of the body of the ſenate, or, which is the ſame thing, out of thoſe who had already borne the office of quæſtor [e]. —[a] *A. Gell.* 14. 8. [b] V. *Pighil.* Annales, A. U. 623. [c] *Dionyſ.* l. x. 11. [d] *Dionyſ.* xi. 57. [e] *Middleton*, of Rom. Sen. p. 45.]

TRICEPS (*Cycl.*)—TRICEPS *Primus*, a fleſhy and flat muſcle, ſituated between the os pubis and the whole length of the os femoris; the firſt and ſecond croſs each other in ſuch a manner, as that the muſcle which is the firſt on the os pubis, becomes the ſecond on the os femoris; but the third keeps its rank.

The *Triceps primus* is fixed above by a ſhort tendon to the tuberoſity or ſpine of the os pubis, and to the neighbouring part of the ſymphyſis, its fibres mixing a little with thoſe of the pectineus. From thence it runs down, increaſing in breadth, and is inſerted by fleſhy fibres interiorly in the middle portion of the linea femoris aſpera. At the lower part of this inſertion a portion of the muſcle ſeparates from the reſt, and ſends off a long tendon, which, together with a like tendon of the *Triceps tertius*, is inſerted in the inner condyle of the extremity of the os femoris. *Winſlow*'s Anatomy, p. 208.

TRICEPS *ſecundus*, a fleſhy and flat muſcle, fixed above by fleſhy fibres below the ſuperior inſertion of the *Triceps primus* in all the outſide of the inferior ramus of the os pubis, as low as the foramen ovale; but ſeldom ſo low as the ramus of the os iſchium. This inſertion is broader than that of the former muſcle. From thence it runs down, and is inſerted in the upper part of the linea aſpera, between the pectineus and *Triceps primus*, mixing a little with each of thoſe muſcles. This inſertion appears ſometimes divided. *Winſlow*'s Anat. p. 208.

TRICEPS *tertius*, a fleſhy and flat muſcle, fixed above by fleſhy fibres to the anterior part of all the ſhort ramus of the iſchium, and to a ſmall part of the tuberoſity of that bone; this inſertion covers ſome part of the tendon of the ſemi-membranoſus; from thence it runs down and is inſerted by fleſhy fibres in the linea aſpera, almoſt from the little trochanter down to the middle of the os femoris.

It goes lower down than the firſt *Triceps*, ſending off a ſeparate portion, like that of the ſecundus. Theſe two portions join together and form a common tendon, which running down to the lower extremity of the os femoris is inſerted in the back part of the tuberoſity of the inner condyle; this ſeparate portion is ſometimes large enough to be miſtaken for a diſtinct muſcle, making a quadriceps inſtead of a *Triceps*. In all this progreſs this muſcle is joined to the vaſtus internus by a perforated aponeuroſis, through which the blood-veſſels paſs. *Winſlow*'s Anatomy, p. 208.

TRICHECHUS, in ichthyology, a name given by Artedi to the creature commonly called the manati, or ſea-cow. He makes it a diſtinct genus of the plagiuri or cetaceous fiſhes; the characters of which are theſe: The teeth are flat and ſtand in each jaw, and there is no fin on the back. This creature grows to twelve or fifteen foot in length, and to ſix or ſeven foot in breadth. The head is oblong and cylindric, and more reſembles that of a hog than any other creature's. The eyes are ſmall, there are ſmall apertures in the head by way of ears, and the lips are very thick; two teeth ſtand out on each ſide, of the thickneſs of a man's thumb, and five or ſix inches long. The pectoral fins are two, and ſtand on the breaſt; they are compoſed of five diſtinct bones reſembling fingers, joined together by a membrane; each bone has three articulations. The tail is placed horizontally, and there is no fin upon the back: In the females there are two round breaſts placed between the pectoral fins. The parts of generation are like thoſe of the human ſpecies in both the male and female; and there is a navel. The ſkin is hard, and almoſt impenetrable; the hairs are few, and of a greyiſh colour. The creature lives about the openings of great rivers into the ſea, and feeds on graſs and ſea-plants. The fleſh is white and well taſted. It makes a noiſe, and is ſaid to be eaſily tamed, and to love the human ſpecies. Its great enemies are the crocodile and the ſhark, both which are very fond of its fleſh. *Artedi* Gen. Piſc. 61. *Linnæi* Syſtem. Nat. p. 5.

The name is originally Greek, and is formed of the words θρίξ, a hair, and ἰχθύς, a fiſh. It is given this fiſh to expreſs its being hairy; as it is almoſt the only fiſh in the world that has a title to this adjective hairy.

TRICHERIÆ, in natural hiſtory, the name of a genus of foſſils, of the claſs of the fibrariæ; the characters of which are, that they are not elaſtic, and are compoſed of ſtrait and continuous filaments. See Tab. of Foſſils, Claſs 1.

The word is derived from the Greek τρίχες, capillaments or fibres. The bodies of this genus are divided into thoſe which have broader, and thoſe which have narrower filaments; and there are ſix known ſpecies of it: 1. The gypſum ſtriatum, or ſtriated plaſter-ſtone; ſee the article GYPSUM *Striatum*. 2. A yellowiſh white kind, found in the clay and gravel pits in Northamptonſhire, and elſewhere. 3. A white kind, with foliaceous flakes, made up of ſeveral conjunct ſeries of filaments, and emulating the external appearance of the talcs, though wanting their characters: This is found in the alabaſter pits of Derbyſhire. Theſe three are of the broad fi-

bred kind. Of thoſe with narrower fibres, there are, 1. A fleſh-coloured ſpecies, with very little gloſs, found in many parts of Yorkſhire, and worth enquiring after, as it readily burns to a very fine plaſter, like the gypſums. 2. A dull-looking white ſpecies, with very ſhort though continued filaments, found in the pits of red marl in Derbyſhire, and elſewhere. And, 3. A greeniſh white kind very gloſſy, with ſtrait narrow and continued filaments. This is a very ſcarce ſpecies, but is found ſometimes in the marl-pits of Derbyſhire and on the ſhores of Yorkſhire, having been waſhed out of the cliffs by the waves in high tides. All theſe ſpecies burn very readily to a fine plaſter, like the gypſums; and ſome of them are found in particular places in ſuch great abundance, that it would be a very advantageous thing to collect and burn them. *Hill*'s Hiſt. of Foſſ. p. 90.

TRICHESTRUM, in natural hiſtory, the name of a genus of foſſils, of the claſs of the ſelenitæ, but differing extremely in figure and ſtructure from the common kinds.

The word is derived from the Greek τρίχες, hairs or filaments, and ἀστὴρ, a ſtar; and expreſſes a ſet of bodies compoſed of filaments arranged into the form of a ſtar. The ſelenitæ of this genus are compoſed of filaments ſcarce any where viſibly arranged into plates or ſcales, but diſpoſed in form of a radicated ſtar, made of a number of disjunct ſtriæ. See Tab. of Foſſils, Claſs 2. *Hill*'s Hiſt. of Foſſ. p. 123.

Of this genus there is only one known ſpecies, which is of a pale brown, and is compoſed of extremely fine and ſlender filaments. It is formed like the lepaſtrum in the accidentally open cracks in the ſeptaria, or ludus Helmontii, and is no other way different from the bodies of that genus, than as in all the ſelenitæ the plates they are compoſed of are made up of filaments nicely arranged, in this as in ſome other of thoſe bodies, the filaments have never arranged themſelves into plates at all, but are diſpoſed into the form of a ſtar compoſed of ſingle threads. This body very readily and regularly ſplits according to the arrangements of the fibres, and is in ſome pieces tolerably pellucid. It is found only in one place, ſo far as is yet known, which is under the cliffs of Sheppy-iſland in Kent; where it is conſiderably plentiful, and makes a very elegant figure on the broken maſſes of ſeptaria, which are in immenſe numbers ſtrewed upon the ſhore. *Hill*'s Hiſt. of Foſſ. p. 150.

TRICHIASIS, in medicine, the name of a diſtemperature of the eyes, in which the eye-lids are inverted, and in which the eye-laſhes hurt and irritate the eyes.

The cilia or margins of the eye-lids are ſometimes inverted ſo as greatly to irritate the ſenſible coats of the eye, and bring on intenſe pains and inflammation, which, without timely aſſiſtance, may greatly injure, if not totally deſtroy the ſight. This diſorder is generally owing to accident, as the irregular cicatrix left on the part from a burn, the ſmall-pox, an ulceration, or wound, or ſome other external injury. But ſometimes a relaxation of the ſkin, and a paralytic diſorder of the eye-lids, are the chief cauſes of it.

Whatever cauſe it is from, it is always difficult enough to be remedied; for it is hardly poſſible for the ſurgeon to remove it, ſo as to prevent its returning, without extirpating the offending hairs; and if theſe be cut off cloſe, it will be to no purpoſe, becauſe the rigid ſtumps of the hairs will irritate the eye even worſe than the whole hairs did before. It is a very nice operation alone that can make a cure; here the hairs muſt be pulled up ſingly by the roots, and the places of their inſertion ſingly cauterized with a hot broad-pointed needle; but this the patient will ſeldom ſubmit to, and the only remaining method then, is to fill up the ſinus's out of which they were extracted with the lapis infernalis. But in this the greateſt care muſt be taken, that no part of that application get into the eye. The eaſieſt method is the touching the cavities, out of which the hairs have been pulled up, with a pencil-bruſh dipped in a mixture of ſpirit of ſal-armoniac and highly rectified ſpirit of wine, by which means they will cloſe up, and no more hairs will grow from them. *Heiſter*'s Surgery, p. 369.

TRICHIDES, in zoology, a name uſed by the antients, for a fiſh of the harengi-form kind, probably the pilchard, which they called alſo *Sardinia* and *Sardella*. *Willughby*'s Hiſt. Piſc. p. 224.

TRICHOMANES, in the Linnæan ſyſtem of botany, the name of a genus of capillary plants, deſcribed by Plumier; the characters of which are theſe: On the margin of the leaves ſtands a ſingle erect turbinated cup, and a ſtylus in the manner of a briſtle terminates at the capſule. The plants of this genus are very different from what other authors call the *Trichomanes*; which, according to Linnæus, is not a diſtinct genus of plants, but is a ſpecies of aſplenium. See Tab. I. of Botany, Claſs 16. and the article ASPLENIUM.

The characters of this genus, according to Mr. Tournefort, are theſe. The flowers are not diſcovered, but the ſeeds grow in cluſters on the backs of the leaves, as in fern. The leaves are compoſed of little uſually roundiſh leaves, which grow by pairs along a middle rib.

The ſpecies of *Trichomanes*, enumerated by Mr. Tournefort, are theſe: 1. The common *Trichomanes*. 2. The *Trichomanes*, with leaves elegantly jagged. 3. The ſmall tender *Trichomanes*. 4. The great branched *Trichomanes*. 5. The *Trichomanes* with round dents, ſurrounded by a black rim. 6. The *Trichomanes*, with leaves lightly prickly. 7. The *Trichomanes*, with triangular crenated leaves. 8. The *Trichomanes* with heart-faſhioned leaves. 9. The leſſer branched *Trichomanes*. 10. The *Trichomanes*, with leaves partly bifid, partly whole. 11. The broad-leaved dentated *Trichomanes*. 12. The pendulous ſoft and ſilky *Trichomanes*. 13. The ſilvery *Trichomanes*, black at the edges. 14. The *Trichomanes* with bifid indentings.

The fruit of the *Trichomanes* is a roundiſh capſule, of a membranaceous texture, and covered with a ſort of ſcales; theſe are ſurrounded with an elaſtic ring, by the contraction of which they are burſt, and the ſeeds thrown out. *Tourn.* Inſt. p. 539.

This plant ſerves with us, as a ſuccedaneum for the true adiantum, or maiden-hair, which is not a native of England, and by the careleſſneſs of our druggiſts is ſeldom brought over to us. The whole plant, ſtalks and leaves together are uſed, and the virtues are in their greateſt perfection, if it be gathered in the month of September; it it is ſpoken of by all authors, as a good medicine in diſeaſes of the breaſt and lungs, and is much recommended by ſome in the ſtone and gravel. *Dale*, Pharm.

TRICHOSANTHES, in botany, the name given by Linnæus to a genus of plants, called by Plumier, Micheli, and others, *anguina*: the characters are theſe: It produces male and female flowers, on diſtinct parts of the ſame plant; in the male flowers, the perianthium is one leaved, clavated, and very long; it is ſmooth on the ſurface, and has a ſmall mouth reflected backwards, and divided into five ſegments. The flower is divided alſo into five ſegments, it is fixed to the cup, and is plain and expanded; the ſegments are of a lanceolated oval figure, and are fringed at their edges, with a great number of long and branched hairs: the ſtamina are three very ſhort filaments, reaching to the top of the cup; and each anthera is an oblong erect cylindric body, ſurrounded above and below with a line containing a large quantity of farina. There are in this flower three ſtyles, which are very ſmall, and grow to the ſides of the cup, but they are always abortive. In the female flower, the perianthium is the ſame as in the male, but it ſtands in this upon the germen of the piſtil, and ſoon periſhes; the flower is the ſame with the male; the piſtil has an oblong and ſlender germen, and has a capillary ſtyle, ariſing from it, of the length of the cup; the ſtigmata are three in number, they are long, pointed, and gaping in the middle; the fruit is an extremely long pomum, and contains three cells, very remote one from another: the ſeeds are very numerous, and are compreſſed, and of an obtuſely oval form, and covered with a coat. *Linnæi* Genera Plant. p. 466.. *Micheli*, Nov. Gen. p. 9. *Plumier*, Rar. p. 100. Hort. Malab. Vol. 8. p. 157.

TRICHOSTEMA, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium is compoſed of one leaf, and is bilabiated; the upper lip is divided into three ſegments, and is twice as large as the under one, which is divided only into two. The flower conſiſts of one petal, and is of the labiated kind; its tube is very ſhort; its upper lip is compreſſed and falcated, and the lower is divided into three ſegments, the middle one is oblong, and is the ſmalleſt of the whole; the ſtamina are four capillary filaments, they are crooked and extremely long, two of them are ſomething ſhorter than the others; the antheræ are ſimple; the germen of the piſtil is divided into four parts; the ſtyle is capillary and of the length of the ſtamina; and the ſtigma is bifid; the cup remains after the flower is fallen, and then becomes larger and the upper lip falls over the under one, it then becomes diſtended in the middle and cloſed at the mouth, and contains four ſeeds. *Linnæi* Gen. Plant. p. 265.

TRICHOURI, in natural hiſtory, a term uſed by ſome authors to expreſs ſuch flies, as have one or more hairs growing out at their tails; theſe are called alſo ſeticaudæ, and are diſtinguiſhed into three genera, as they have one, two, or three hairs growing out at the tail. See the article SETICAUDÆ.

TRICHRUS, in natural hiſtory, the name of a ſtone deſcribed by the antients, and ſaid to yield three colours; in their common way of preparing bodies of this kind for medicinal uſe, (which was by rubbing them down on a porphiry, or other hard ſtone with water) this firſt coloured the water black, then red, and laſtly white. It ſeems to have been a kind of hæmatites, or blood-ſtone.

TRICIPITIS *Caput Primum*, in anatomy, a name given by many authors to a muſcle of the thigh, called by Albinus *abductor femoris*; Douglaſs calls it *abductor primus femoris*, and Winſlow the *muſculus primus tricipitis*. It is the *pars octavi femoris* of Veſalius; that author, and indeed many others of the earlier anatomiſts, not eſteeming it a diſtinct muſcle.

TRICOR, a name, by which ſome of the chemical writers have called gold.

TRIDE, in the manege, ſignifies ſhort and ſwift; thus a *Tride pace*, is a going of ſhort and quick motions, tho' united and eaſy. A *Tride career*, is a very faſt gallop, with the times or motions ſhort and nimble; and ſo of other motions. Some apply the word only to the motion of the haunches.

TRIEDROSTYLA, in natural hiſtory, the name of a genus of ſpars.

The word is derived from the Greek τρεις, thrice, ἕδρα, a ſide, and στυλος, a column.

The bodies of this genus are ſpars, in form of trigonal columns, adhering by one end to ſome ſolid body, and terminated at the other by a trigonal pyramid. Of this genus there are four known ſpecies: 1. A ſlender one with a long obtuſe pyramid: this is one of the moſt common of all the the ſpars, and is found in almoſt all parts of the world; ſometimes in ſingle and large ſpecimens, but more frequently in large congeries, coating over the fiſſures of ſtone in form of cruſts. 2. One with ſhort but pointed pyramids: this is common on Mendip hills, and is found in ſome other parts of England. 3. A thick one with a longer pyramid, found in Northamptonſhire, and ſome other parts of the kingdom, encruſting the fiſſures of ſtone. And 4. One with a very ſhort column, and a long obtuſe pyramid: this is frequent in the mines of Germany, and not leſs ſo in thoſe of England, particularly in Derbyſhire. *Hill*'s Hiſt. of Foſſ. p. 222.

TRIEMERUS, the three-day fly, in natural hiſtory, a fly ſomewhat like the butterfly; it has four large yelloviſh wings, and a long body, with a head furniſhed with long antennæ, large eyes, and a ſpiral trunk. It is found among the nettles and mallows.

TRIENTALIS, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium is compoſed of ſix leaves, and is permanent; the leaves are narrow, pointed, and wide expanded; the flower is of the ſtellated kind, and is compoſed of ſeven petals, which ſtand flat and open, and adhere together very ſlightly at the top, theſe are a little longer than the leaves of the cup; the ſtamina are ſeven capillary filaments, of the length of the cup, but inſerted into the flower; the antheræ are ſimple; the germen of the piſtil is globular; the ſtyle is capillary, and of the length of the ſtamina; and the ſtigma is headed; the fruit is a dry berry of a globular form, formed of an extremely thin cruſt, and having only one cell; the ſeeds are few in number, and are of an angular figure; the receptacle is large enough to hold a great number of them; the number of the leaves of the cup ſometimes varies. *Linnæi* Genera Plant. p. 187.

TRIERARCHI, τριηραρχοι, among the Athenians, commiſſioners choſen annually out of the richeſt citizens, who were obliged to provide all ſorts of neceſſaries for the fleet, and to build ſhips at their own charge. See *Potter*, Archæol. Græc. l. 1. c. 15. T. 1. p. 86.

TRIETERIS, τριετηρις, in the antient chronology, a cycle of three years. *Potter*, Archæol. Græc. T. 1. p. 459.

TRIEXAHÆDRIA, in natural hiſtory, the name of a genus of ſpars.

The word is derived of the Greek, τρις, thrice, ἕξ, ſix, and ἕδρα, a ſide.

The bodies of this genus, are perfect and pellucid cryſtalliform ſpars, conſiſting of thrice ſix planes, being compoſed of an hexangular column, terminated at each end by an hexangular pyramid: Of this genus there are three known ſpecies. 1. A clear one with narrow and oblong pyramids: this is found in the mountains of Germany, and in North-Wales; but with us it is ſmall and coarſe. 2. One with ſhort pyramids and a long column: this is found in the mines at Goſſelaer in Saxony. And, 3. One with ſhort pyramids, and a thick and ſhort column: this is found with us in the lead-mines of Yorkſhire. *Hill*'s, Hiſt of Foſſ. p. 204.

TRIFOLIUM *Trefoil*, in botany. See the article TREFOIL.

TRIFOLIUM *Paluſtre*, *Buckbean*. This plant, tho' mentioned by ſeveral writers, before Simon Pauli, yet he was the firſt who recommended it in ſcorbutic caſes. He ſays it is more ſubtle and penetrating than *naſturtium* or creſſes.

It ſeems at preſent to be coming into great repute in many chronical diſtempers; and frequently preſcribed among alexipharmics.

Many have got it into uſe in their families in the form of tea, and experience its conſtant uſe to be very effectual againſt ſcorphula's the king's evil, and obſtinate ſcorbutic diſtempers. Its taſte at firſt, is not very grateful, but time wears off that diſlike; its uſe in ſhop compoſitions is not yet known. Vid. *Quinc.* Pharm. P. 2. Sect. 4. p. 124.

Buckbean ſerves in Hampſhire to a very remarkable uſe; the brewers uſing it in their beer in the place of hops. It is as good a preſerver of the drink, and is a bitter of as agreeable a flavour: it has this advantage alſo, that one eighth part of the quantity is ſufficient, it is a very harmleſs plant, and is given by many as an antiſcorbutic, and by ſome in rheumatiſms, and other chronic caſes. It might be extremely worth while to try this practice in other parts, as the plant might be eaſily cultivated in any quantity, and that with this advantage, that it will grow on the worſt kind of boggy land, that will produce nothing elſe. *Mortimer*'s Huſbandry.

TRIFOLIUM *Acidum*, in botany, a name given by many authors to the oxys, or wood-ſorrel, from its having its leaves always three on a ſtalk, and being of an acid taſte. See the article OXYS.

TRIFAX, among the Romans, a javelin three cubits long, which was thrown by the catapulta. *Pitiſc.* in voc.

TRIGEMINI *Tertius*, in anatomy, a name given by Spigelius and others, to a muſcle called by Winſlow the *complexus minor* or *maſtoidæus lateralis*, and by Cowper and Albinus *trachelo-maſtoidæus*. See the article MASTOIDÆUS.

TRIGLA, in the Linnæan ſyſtem of zoology, the name of a genus of fiſhes, of the general order of the acanthopterygii: the diſtinguiſhing characters of theſe are, that the membrane of the gills has ſeven bones, and the pectoral fins have articulated appendages. Of this genus are the *lyra*, *hirundo*, *malvus*, *mullus barbatus*, &c. *Linnæi* Syſtema Naturæ, p. 53. See the article LYRA, HIRUNDO, &c.

The characters of this genus, according to Artedi are theſe: The branchioſtege membrane contains ſeveral bones; the head is very declivious, from the eyes to the end of the ſnout, and is large, aculeated, and as it were ſquare; the head is the broadeſt part of the fiſh, it thence grows gradually narrower, till it ends in a very ſmall tail: in many of the ſpecies of this fiſh, there are two or three articulated appendices growing under the pectoral fins: the eyes ſtand on the top of the head, and are covered with a ſkin; there are two back fins, the firſt of which is prickly; the pectoral fins in ſome of the ſpecies are very large.

Many of theſe fiſhes are capable of making a noiſe; and ſome of them by the help of their pectoral fins, can ſuſtain themſelves for a time out of the water, and fly to ſome diſtance. The appendices of the pylorus are from five to twenty.

Of thoſe *Triglæ*, which have continuous, obtuſe, and undivided ſnouts, the following are the ſpecies: The *Trigla* with a ſmooth head, and with two fins on the lower jaw: this is the *mullus barbatus* of authors. 2. The *Trigla* with a ſmooth head, with four yellow, not tranſverſe lines, on each ſide, parallel to one another: this is the *mullus major*, or ſurmullet of our fiſhermen. 3. The *Trigla* with a ſmooth head and and without beards, all over of a red colour: this is called by authors the *mullus imberbis*, or king of the mullets. 4. The *Trigla* with the head ſomewhat aculeated, and with a ſingle little pinnule at the pectoral fins: this is the *milvus* of authors, or the kite-fiſh; it flies four or five foot above the water, and that to a conſiderable diſtance. 5. The *Trigla* with a prickly head, and with three appendices on each ſide at the pectoral fins: this is the *hirundo* of authors, and is called by our fiſhermen the tub-fiſh. Of thoſe *Triglæ* which have the ſnout a little forked, the following are the ſpecies: 6. The *Trigla* with a ſomewhat biſid ſnout, and with the lateral line biſid at the tail: this is the *lucerna* of the Venetians, and the *milvus* of ſome authors. 7. The red *Trigla*, with the ſnout divided into two little horns, and with the opercula of the gills ſtriated: this is the *cuculus*, and *lyra* of ſome authors. This fiſh grunts when taken out of the water, and the noiſe has been ſuppoſed to be like that of a cuckow, whence the name.

Of thoſe *Triglæ*, which have the ſnout very deeply divided, and opened into two very broad parts; the following are the ſpecies: 1. The variegated *Trigla*, with the ſnout divided into two prickles, and with two little prickles to each part: this is *gurnardus griſeus* of Ray, or the grey gurnard. 2. The *Trigla* with the ſnout divided into two ſpines, and with tubulous noſtrils: this is the *lyra* of authors, called by our fiſhermen the *piper*. 3. The *Trigla* with many cirri, and with an octangular body: this is the *lyra cornuta* of authors: the body is rendered angular, by having ſix rows of acute and hard rhomboidal ſcales. *Artedi*, Gen. Piſc. p. 32.

TRIGONAL-*Leaf*, among botaniſts. See the article LEAF.

TRIGONELLA, in botany, the name of a genus of plants, including the fænugreek of authors; the characters are theſe: The perianthium is formed of one leaf, and is campanulated and lightly divided into five ſegments, which are pointed, and nearly equal in ſize; the corolla is papilionaceous, and ſeems compoſed of three petals; the vexillum is oval, obtuſe, and bent backwards; the two wings are of an oval oblong figure outwardly, by bending backwards, ſo that in the vexillum, they ſeem to compoſe a tripetalous flower of the common form; the carina is very ſhort and obtuſe, and occupies the middle of the flowers; the ſtamina are diadelphous and ſhort; the apices ſimple; the germen of the piſtil is of an oblong oval figure; the ſtyle is ſimple and erect, and the ſtigma is ſimple. The fruit is an oblong oval pod, of a compreſſed figure, containing ſeveral roundiſh ſeeds; the ſhape of the flower alone, ſufficiently diſtinguiſhes this from all the other genera of this claſs. *Linnæi* Gen. Plant. p. 362. *Tournef.* Inſt. p. 270. *Rivin.* p. 497.

TRIGONELLA *Foſſilis*, in natural hiſtory, the name of a foſſile ſhell, of the cockle-kind, but approaching to a triangular figure, having a broad bottom to which it deſcends, almoſt in ſtrait lines: on each ſide from the head or cardo, theſe are uſually found ſmall, but there are ſome met with of four or five inches round: they are found at different depths, in ſtone quarries, bedded in the matter of the ſtrata; and that often in the hardeſt ſtone. In ſome inſtances, the ſhells are found remaining in their native ſtate; but moſt frequently the ſhell itſelf is periſhed and gone, and there is a ſtony or ſparry matter depoſited in its place. *Hill*'s Hiſt. of Foſſ. p. 646.

TRILL-

TRILL-*Hooks*, thoſe uſed to hold the ſides of a cart up to the horſe. See the article CART.

TRILLETTO, in the Italian muſic, a little ſhort ſhake or quaver; it differs from *trillo*, only in point of continuance being its diminutive. See the next article.

TRILLO, in the Italian muſic, is often found marked with a ſingle T; or tr, and often alſo by a ſmall t, as well in vocal as inſtrumental parts. It is deſigned to intimate, that you beat quick upon two notes in conjoint degrees, as *e f*, or *d e*, alternately; beginning with the higheſt, and ending with the loweſt. This makes what the French improperly call *cadence*, and properly *tremblement*. But it is alſo very often found in the Italian muſic to give notice, that the ſame ſound be ſtruck many times over, beginning a little ſlow, and ending with all the quickneſs, that the throat or finger can form them. Thus, ſuppoſing the firſt two or three quavers, then as many ſemi-quavers, and then ending with demi-ſemi-quavers, all in the ſame pitch or tune.

The manner wherein we have deſcribed this, comes far ſhort of what able maſters can ſhew in practice: This *Trillo* is more particularly uſed, after a note has been long held out, to eaſe the voice; which ſo long a tenſion had weakened. *Broſſard.*

TRILOBOUS-*Leaf*, among botaniſts. See the article LEAF.

TRILOCULAR-*Capſule*, among botaniſts. See the article CAPSULE.

TRIMODIA, among the Romans, a bag like an inverted cone, in which ſowers carried their ſeed. It was ſuſpended from their necks, and was ſo called from its containing three buſhels. *Pitiſc.* Lex. Ant. in voc.

TRINGA, in the Linnæan ſyſtem of zoology, the name of a diſtinct genus of birds, of the order of the ſcolopaces: the diſtinguiſhing characters of this is, that the feet have each four toes, and the beak is ſhorter than the toes. *Linnæi* Syſtema Naturæ, p. 47.

There are three ſpecies of this genus: The firſt called by almoſt all authors *Tringa*; the others the *pinirole*, and our *ſandpiper*. See the article SANDPIPER and PINIROLE.

The firſt ſpecies, or *Tringa*, moſt uſually ſo called, has been however named *cinclus*, by Bellonius; and *gallinula*, *rhodopus*, *phœnicopus*, and *ochropus*, by Geſner. It is ſomewhat larger than the black-bird, the colour of all its upper-ſide, is a very gloſſy greeniſh brown; and its ſhoulders and the ſmaller feathers of its wings are ſpotted with white. In the male, there are numerous white ſtreaks, and ſpots on the head, but in the female theſe are wanting; the throat is white ſpotted with black; the breaſt and belly are of a pure ſnow white; the long feathers of the wings are brown, and thoſe of the tail variegated with brown and white; its beak is a finger and half long, and of a greeniſh colour; and its legs of a bluiſh green; the hinder toe is very ſmall. They live about the ſides of ponds and lakes; its legs are ſometimes ſeen reddiſh or yellowiſh. *Aldrovand.* Tom. 3. p. 481.

TRINGA *Minor*, in zoology, a name by which ſome authors called the bird, commonly known in England, by the name of the ſandpiper. See the article SANDPIPER.

TRINITY (*Cycl.*)—By a ſtatute of king William the 3d, if one educated in, or having profeſſed, the chriſtian religion, ſhall be convicted in any of the courts of Weſtminſter, *&c.* of denying any one of the perſons of the holy *Trinity* to be God, or maintaining that there are more gods than one, or of denying the truth of the chriſtian religion, or the divine authority of the ſcripture, he ſhall for the firſt offence be adjudged uncapable of any office; and for the ſecond diſabled to ſue any action, *&c.* Anno 9 and 10. *Will.* III. cap. 32.

TRINK, in our ſtatutes, is uſed for a fiſhing-net. 2 *Hen.* 6. c. 15. *Blount.*

TRIONUM, in botany, the name of a genus of plants, called by Ruppius *bammia*; the characters are theſe: The perianthium is double; the external one is compoſed of twelve ſlender leaves; the internal one is only compoſed of one leaf, and is inflated and divided into five ſegments at the end; the flower conſiſts of five petals, cordated at the top, and growing together at the bottom; the ſtamina are numerous, they grow into a cylinder at the bottom, and are free at the tops; the antheræ are kidney-ſhaped; the germen of the piſtil is roundiſh; the ſtyle is capillary and terminated, by five obtuſe reflex ſtigmata; the fruit is oval, but ribbed with five ridges, and is compoſed of five valves, and contains as many cells; the ſeeds are numerous and are kidney-ſhaped. It is plain from theſe characters, that this genus is nearly allied to the hibiſcus. *Linnæi* Gen. Plant. p. 383. *Ruppii* Flora Jenenſis, p. 16.

TRIOPHTHALMUS, a name given by authors to ſuch pieces of agate, or other ſemipellucid ſtones, as happen to have three ſmall circular ſpots, reſembling eyes upon them: theſe are of the nature of the common agate, *&c.* The ſpots are mere accidental varieties in the diſpoſitions of the veins, and do not make a diſtinct ſpecies of ſtone.

TRIOPTERIS, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium is very ſmall and permanent, and is compoſed of one leaf divided into five ſegments; the flower is compoſed of ſix equal petals of an oval figure, and theſe are ſurrounded by three other ſmaller petals, which are alſo of an equal ſize one with another; the ſtamina are two filaments, beyond the petals of the flower, and are fixed to the cup; the external ones are ſomewhat ſhorter than the interior, and the antheræ are ſimple; the germen of the piſtil is divided into three parts; there are three erect and ſimple ſtyles; and the ſtigmata are obtuſe: there is no fruit to encloſe the ſeeds, but they ſtand naked, and are three in number, and are hollowed at the back, and edged with alæ, which when newly produced have the appearance of petals. Indeed what are called petals in this deſcription, are not ſo; but are the alæ of the germen, for the ſtamina are placed without them; but as they very much reſemble petals, a young botaniſt will more eaſily diſtinguiſh the genus, by their being taken for ſuch, than by any other means. *Linnæi* Gen. Plant. p. 195.

TRIORCHIS, a word uſed by ſome, to expreſs a man who has three teſticles.

It is alſo uſed as the name of a buzzard; and of a plant, called ladies traces.

TRIPENTAHÆDRIA, in natural hiſtory, the name of a genus of ſpars.

The word is derived from the Greek, τρὶς, thrice, πέντε, five, and ἕδρα, a ſide.

The bodies of this genus are ſpars, compoſed of thrice five planes; being made of a pentangular column, terminated at each end by a pentangular pyramid. Of this genus we only know one ſpecies; this has a moderately long column, and very ſhort and broad pyramids; it is found in Derbyſhire, Yorkſhire, and Cornwall, and is very frequent about Goſſelaer in Saxony. *Hill*'s, Hiſt. of Foſſ. p. 205.

TRIPHARMACUM, an ointment, in the late London diſpenſatory, ſo called from its being compoſed of three ingredients: the preſcription is this: Take common plaſter four ounces, oil olive two ounces, vinegar one ounce; ſet them over a a gentle fire, and ſtir them continually, till they become an ointment. *Pemberton*'s, Lond. Diſpenſ. p. 370.

TRIPOLI, (*Cycl.*) in natural hiſtory, the name of an earthy ſubſtance, uſed by the lapidaries to poliſh ſtones, and by the braſiers, and other the like artiſts to clean metalline veſſels. It is of two kinds, the yellowiſh, and reddiſh white; the yellowiſh white kind is called by authors, *alana gleba*, *tripolis* and *terra tripolitana*; this is the produce of Germany, Saxony, and France; there is alſo of it in the neighbourhood of Venice, but it is found in greateſt plenty in many parts of Africa. It is found a dry hard earth, of a very pale yellowiſh white, of a firm texture, and moderately heavy; it is ſometimes found of itſelf, conſtituting a ſtratum; but is more frequently met with in detached pieces among ſtrata of other matter. It is of a rough, irregular, duſty ſurface; it adheres ſlightly to the tongue, is dry, hard, and harſh to the touch, is not to be broken between the fingers, and ſlightly ſtains the hands: it makes no efferveſcence with aqua fortis, and makes a ſlight hiſſing noiſe on being thrown into water. The reddiſh *Tripoli* is of our own production, though not peculiar to ourſelves; it is found in great abundance on Mendip-hills in Somerſetſhire, nor leſs plentifully in many parts of Germany. This is well known in the ſhops as a ſubſtance of great uſe in poliſhing braſs, but is not applied to any of the other uſes of the yellowiſh kind: this like the former is moſt frequently found in detached maſſes, and while in the earth is tolerably ſoft, and eaſily falls into flakes. When dry it becomes of a conſiderable hardneſs, and is of a fine pale reddiſh white, of a looſe open texture, compoſed of a multitude of extremely thin plates or flakes laid evenly on one another, and conſiderably heavy; it is of a ſmooth and ſomewhat gloſſy ſurface; it adheres very firmly to the tongue, is dry and harſh to the touch, too hard to be broken between the fingers, and does not ſtain the hands: it makes no efferveſcence with acids, and burns to a paler colour, with ſome additional hardneſs. *Hill*'s, Hiſt. of Foſſ. p. 68.

TRIPUDIUM, in antiquity, a ſpecies of divination, in which omens were drawn from the rebounding of corn thrown to chickens. *Hofm.* Lex. Univ. in Voc.

TRIPYRAMIDES, in natural hiſtory, the name of a genus of ſpars.

The word is derived from the Greek τρὶς, thrice, and πυραμὶς, a pyramid.

The bodies of this genus are ſpars, compoſed of ſingle pyramids, each of three ſides, ſtanding on no column, but affixed by their baſes to ſome ſolid body.

Of this genus there are only two known ſpecies: 1. A ſhort and thick one, found on the ſides of the ſtacks of ſtone in Northamptonſhire and elſewhere; but this is not common, and is uſually ſmall. 2. A long one with a narrow baſe: this is not found in England, but is common in the German mines. *Hill*'s, Hiſt. of Foſſ. p. 226.

TRISACTIS, in natural hiſtory, a name of a genus of ſtar-fiſh, compoſed of a body and three rays, the more uſual number being five. See the article STELLA *Marina.*

TRIQUETRA *Oſſa*, triangular bones found in ſome craniums.

TRIQUETRUM *Folium*, among botaniſts. See the article LEAF.

TRISCÆDECACTIS, in natural hiſtory, a name given by Linkius, and ſome other authors, to a kind of branched ſtar-

fiſh

fish or astrophyte; whose rays are thirteen in number, where they first leave the body, and each divides into many more.

TRIS-DIAPASON, *Triple-Diapason*, in music, what is otherwise called a *Triple eighth*.

TRISE, at sea, the seamen's word, for haling up any thing with a dead rope, or one that doth not run in a block, but is pulled by hand or by main strength: thus if any cask, chest, or other goods hath only a rope fastened to it, and so without a tackle be pulled up into a ship by hand, they say it is *trised up*.

TRISETÆ, the *three-haired* flies, a term used by the writers in natural history, to express a certain genus of the seticaudæ, or bristle-tailed flies, which are distinguished from the rest, by having three hairs or bristles growing from the tail: there are several kinds of these flies, found frequently among our hedges.

TRISEUS, in ichthyology, a name given by Salvian, Benedictus Jovius, and others, to that species of the gadi, which we call the eelpout, and authors in general the *mustela fluviatilis*.

TRISPERMUM, in pharmacy, the name of a cataplasm or pultice, consisting of three ingredients, these are cummin, and opium seed, and bay-berries.

TRISSA, in zoology, a name used by some authors, for the fish more commonly known by the name of alausa, and called in English *shad*, or the mother of herring. *Rondelet*. de Pisc. p. 21. See the articles ALAUSA, and AGONUS.

TRISTO, a word used by Paracelsus, to express what he calls the material fire; lodged in the matter of all the four elements, and exerting upon occasion its influence, under the form of the proper effects of each element.

TRITÆOPHYES, a word used by the medical writers of the antients, to express a kind of fever, much of the nature of the tertian, and taking its rise from it.

TRITE (*Cycl.*) — This chord of the antient tetrachord, was so named from its being the third from the nete; and hence we might call it the anti-penultimate. It was otherwise in some tetrachords called parypate. See the articles PARYPATE, DIAGRAM, and NETE.

TRITE *Diezeugmenon*, in the Greek music, was the anti-penultimate note of the diezeugmenon tetrachord, and answers to Guido's c, sol, fa, ut. *Wallis*, Append. *Ptolem.* Harm. p. 157. See the article DIAGRAM.

TRITE *Hyperbolæon*, in the Greek music, was the anti-penultimate note of the hyperbolæon tetrachord, and answers to Guido's f, fa, ut. *Wallis*, Append. *Ptolem.* Harm. p. 157. See the article DIAGRAM.

TRITE *Synemenon*, in the Greek music, was the anti-penultimate note of the synemenon tetrachord; and answers to Guido's b, fa. *Wallis*, Append. *Ptolem.* Harm. p. 157. See the article DIAGRAM.

TRITHEITÆ, in church history, a name given to such heretics, as admit not only of three persons, but of three distinct substances and natures, in the holy Trinity. See the article TRINITY, and TRITHEISM, *Cycl.*

TRITICUM, *Wheat*, in the Linnæan system of botany, makes a distinct genus of plants, the distinguishing character of which is, that the calyx is a glume containing several flowers, composed of two valves, and containing the flowers arranged into a short spike; the valves are of an oval figure, and obtuse; the flower is bivalve and of the size of the cup; the valves are nearly of the same size, and the exterior is bellied, obtuse and pointed, and the interior smooth and flat; the stamina are three capillary filaments; the antheræ are oblong and split at the ends; the germen of the pistil is of a turbinated form; the styles are two, capillary, and reflex; the stigmata are plumose; the flower incloses the seed till ripe, and then opens and lets it out; the seed is single, oval, and oblong, obtuse at both ends, and convex on one side, and marked with a deep furrow on the other. Whatever plant has all these characters, whether the grain be eatable or not, is properly a wheat. *Linnæi* Genera Plantarum, p. 16.

TRITON *Avis*, in zoology, a name under which Nieremberg has described a bird of the West-Indies, famous for its fine singing, and found in Hispaniola; it is said to have three different notes, and to be able to give breath to sounds of all three kinds at the same time; it is also said to be a very beautiful bird. *Ray*'s Ornithol. p. 299.

TRITOPATORIA, τριτοπατορεια, in antiquity, a solemnity in which it was usual to pray for children, to the Θεοι γενεθλιοι, or *god's of generation*, who were sometimes called τριτοπατορες. *Potter*, Archæol. Græc. T. 1. p. 434.

TRITTYARCHI, τριττυαρχοι, among the Athenians, were magistrates who had the command or government of the third part of a tribe. *Potter*, Archæol. Græc. T. 1. p. 78. See the article PHYLARCHUS.

TRITURATION, (*Cycl.*)—Mr. Lindern relates two observations, which contradict the doctrine of violent *Trituration*, said to be performed by the stomach in digestion. 1. A dog having swallowed a die, vomited it up again eleven or twelve hours after, when the bony part of the die was much diminished, but the pins of wood, on which the spots are marked, were entire, and stood out a considerable way from the bone. 2. Three stomachs of swine, were crusted so thick over their interior surface with a stony substance, that all their cavity was filled, except a canal in the middle, of about an inch diameter. Notwithstanding this, the flesh of the creature was fair and sound, and sold well. Hist. de L' Acad. des Sciences. 1732.

TRIUMFETTA, in botany, the name of a genus of plants, the characters of which are these: There is no cup unless the flower itself be called so; this consists of five strait erect concave petals, obtuse at the ends and bending backwards, and have a prominent point within the leaf, below the apex; these fall soon after they open, whence they appear rather the petals of a flower, than the leaves of a cup; the stamina are sixteen erect subulated filaments, of equal height and of the length of the flower; the antheræ are simple; the germen of the pistil is roundish; the style is simple, and of the length of the stamina; and the stigma is bifid and acute; the fruit is a globular capsule, every way beset with crooked prickles, and containing within it four cells, in each of which are two seeds, convex on one side, and angular on the other. It is very rarely, however, that more than one seed comes to maturity in the same cell. *Linnæi* Genera Plant. p. 243. *Plumier*, Gen. 8.

TROADENSE *Marmor*, a name given by the antients, to a species of white marble, dug in mount Ida, and greatly used in building.

TROCHILUS, (*Cycl.*)—TROCHILUS, in zoology, a name used by Aristotle, Pliny, and others of the antient naturalists, for the *regulus cristatus*, or, as we call it, the golden-crowned wren. *Ray*'s Ornithol. p. 163. See REGULUS.

TROCHILUS is also the name of a remarkable water-bird, being very long legged, yet web-footed.

It is a very swift runner on the ground, and is thence called by the Spaniards *corriza*. Its beak is strait and black at the end, and the opening of its mouth very wide; it has black eyes, surrounded by a white naked membrane, and that by a brown one. On its under part it is white; its back, shoulders, and wings, are of a ferrugineous colour; its running is so very swift as to equal the flight of most birds. *Aldrovand*, de Avib. l. 19. c. 35.

TROCHISCI *e Nitro*, a form of medicine, prescribed in the late London dispensatory, the preparation is thus: Take purified nitre four ounces, fine sugar a pound, reduce them to fine powder, and make them up into *Troches*, with mucilage of gum tragacanth. *Pemberton*'s Lond. Disp. p. 323.

TROCHISCI *e Sulphure*, a form of medicine, prescribed in the late London pharmacopœia, and made in this manner: Take of flower of sulphur washed two ounces, of double refined sugar four ounces; beat them together, and by gradually adding mucilage of quince-seeds, form *Troches*. *Pemberton*'s Lond. Disp. p. 324.

TROCHITÆ (*Cycl.*)—These single joints of the entrochus are found in some places in such vast numbers, as to make people suspect that they could never have been so strangely collected together, if they ever had been of animal origin; but this is one of the many too rash conclusions of the modern naturalists.

If we consider the vast number of arms or branches, of which the star-fish consists, whence these are produced, it will not a little tend to solve the difficulty: but if after this we consider the manner of life of the animal, we shall find yet more reason to be satisfied, that the number of these fossils is no argument against their being its remains. The species of star-fish, whence they have their origin, is famous for the immense, and indeed amazing, number of its arms; each of these arms is composed of an immense number of these single joints, and the creatures while living usually herd together; and it frequently happens that in grasping after their prey, an arm or limb breaks off; the consequence of this is, that wherever the mutilated limb touches the arm of another fish of the same kind with its truncated end, it adheres and grows to it, so as never to be separated again: thus the two fish are for ever fastened together. As they are continually reaching out their arms in search of prey, this accident often happens among them; and it is not unusual to find a cluster, of twenty or more, of them thus growing together, and with their expanded arms forming a sort of net. Now if it be considered, what a large number of single joints or *Trochitæ*, go to the formation of the thicker part of one arm; and how immense a number of arms, such a cluster as this possesses, from so many fish, each furnished with so large a number, we shall find, that the dis-united joints of one such cluster as this, scattered over a stratum of clay, would appear an amazing number: how much more then, the produce of twenty, fifty, or a hundred such, which it is no wonderful thing should be found in one place, since they are gregarious animals.

The comparison of a single *Trochite*, or entrochus, with the arm of this recent star-fish, will at once evince the truth of this account of their origin, and the great error of those who have supposed them of a vegetable nature, and called them rock-plants. *Kepellus*, Epist. de Entroch. See the article ENTROCHI.

TROCHITIFER *Glans*. See the article GLANS *Trochitifer*.

TROCHLEARIS (*Cycl.*) in anatomy, a name given by Fabricius, and ſome other writers, to one of the muſcles of the eye, called by Albinus the *obliquus ſuperior oculi*; and by ſome, from its office, the *opifex circumgyrationis oculi*.

TROCHUS, in natural hiſtory, the name given by authors to a genus of ſhells; ſome of the ſpecies of which reſemble the figure of the *Trochus*, or top, which boys play with. As there are many ſpecies of this ſhell, however, which are flatted and have nothing of this form, the whole ſeries of them are much better named, by a denomination taken from the ſhape of the mouth, which is of an oval figure, and is alike in all theſe ſpecies, and different from all other ſhells. They are therefore aptly characterized by a late French writer under the name of *cochleæ ore depreſſo*. See the article COCHLEA.

TROCTUS, in ichthyology, a name given by Ariſtotle, Ælian, Atheneus, and others of the Greek writers, to the fiſh called *amia* by Pliny, and moſt other of the later as well as antient Latin writers; but by ſome, *lechia* and *glaucus*. It is properly a ſpecies of the ſcomber, and is diſtinguiſhed from the others by the name of the ſcomber with two fins on the back, and with the laſt ray of the hinder fin very long. This is an obvious character, by which it is eaſily diſtinguiſhed from all the other ſcombri, of which it is a genuine ſpecies. See the article SCOMBER.

TROGLODYTES, in the Linnæan ſyſtem of zoology, the name of a diſtinct genus of birds, of the order of the paſſeres; the diſtinguiſhing character of which is, that the beak is thread-like and pointed, and is crooked, and longer than the head. *Linnæi* Syſtema Naturæ, p. 49. See the article PASSER.

TROIS *Cinque*, in the French diſtillery, a term uſed to expreſs their brandy when of a peculiar ſtrength, conſiſting of five parts alcohol, and three parts phlegm.

The method of diſtilling the wines into brandy in France, is exactly the ſame with that uſed with us to draw the ſpirit from our waſh or fermented liquor of malt, treacle, ſugar, or whatever other kind. They only obſerve more particularly to throw a little of the natural lee into the ſtill, along with the wine; and the pooreſt wines are found to ſucceed beſt on the trial, making by much the fineſt brandies. We are apt to wonder, that we cannot from the wines of particular countries diſtil their particular brandies; but the whole myſtery conſiſts in this, that they do not ſend us over the ſame wines which they uſe in diſtilling, becauſe theſe latter would not be liked as wines, nor would keep in the bringing over. Sometimes in Scotland, they meet with the poor and prick'd wines, the ſame that the French diſtil their brandies from; and from theſe they diſtil a ſpirit, not to be known from the brandy diſtilled in France.

The lee, which the French add in the diſtillation, gives the brandy that high flavour, for which we ſo much eſteem it; but they themſelves like it much the worſe for it. The French notion of a proof ſtrength, determined by the chapelet or crown of bubbles, is the ſame with ours; and all their fine ſpirits are found of this ſtrength.

But they have one particular expedient for thoſe brandies, which prove foul and ſeedy, or retain the taſte of certain weeds which grow among the wines; they draw them over again, with a deſign to free them from that adventitious flavour. In this operation they always leave out the faints, or rather they change the receiver as ſoon as ever the ſtream comes proof; then mixing together all that run off before, they make a brandy ſtronger than the ordinary kind, and this is what they call *Trois-cinque*.

The diſtillers in France ſcarce ever bring their brandies higher than this; for they have the art to perſuade the foreign merchant, that the phlegm of French brandy is natural and eſſential to it: but the truth is, that the ſpirit alone contains the flavour and excellence of the brandy, and it might as well be reduced to half its bulk for exportation, and ſent over in the ſtate of alcohol, and then lowered with common water, to the proof ſtrength.

The French uſe no art in colouring their *Trois-cinque*, any more than their common proof-brandy, nor do they add any thing to give them an additional flavour. The thing which they principally value themſelves upon, both in regard to brandies and wines, being to make them perfectly natural: ſo that all the colour we find in their brandies, is acquired from the caſk, and the time they are left in it. This is often twelve or eighteen months, ſometimes two or three years; in this time they acquire a brown colour, and loſe their acrid taſte.

The greateſt adulteration of brandies is in England; the French have no temptation to do it, they having no cheaper ſpirit, ſince the prohibition of molaſſes in their country. The Dutch are in the ſame condition, having no melaſſes ſpirit; and only a very coarſe and nauſeous ſugar-ſpirit, and a yet worſe malt ſpirit of their own manufacture; a ſingle gallon of which, would ſpoil a whole piece of brandy. The French brandy alſo paying no duty in Holland, is as cheap, or nearly ſo, there as in France itſelf. The duties being high upon brandy in England, it is greatly adulterated, and that with all ſorts of ſpirits; as malt, melaſſes, cyder, and ſugar ſpirits; and when this is done in a dexterous and ſparing manner, the cheat is not eaſily found out. *Shaw*'s Eſſay on Diſtillery.

TROMBA, in the Italian muſic, either denotes the common trumpet, the buccina of the antients, or the modern ſacbut, but more properly our trumpet. See the articles TRUMPET, SACBUT, and BUCCINA, *Cycl.*

TROMBETTA, in ichthyology, a name given by the Italians to the fiſh commonly called *ſcolopax* by authors. See the article SCOLOPAX.

It is properly a ſpecies of the baliſtes, and is diſtinguiſhed by Artedi, by the name of the baliſtes with two ſpines in the place of the belly-fins, and another ſingle ſpine below the anus. See the article BALISTES.

TROMBETTA, in the Italian muſic, a ſmall trumpet, being the diminutive of *tromba*. See the article TROMBA.

TROMBONE, in the Italian muſic, a ſacbut. See the article SACBUT, *Cycl.*

TROMBONE, *picciolo*, *groſſo*, *primo*, *ſecundo*, &c. See the article SACBUT. Ibid.

TROMPE, in the manege. See the article DECEIVED.

TRONCO *per Grazia*, in the Italian muſic, by the French called *coup de grace*; is uſed to intimate to the voices, as well as inſtruments, that they are not to draw out the ſound to its natural length, but cut it ſhort; that is, only continue it long enough to be heard, by which means there is a ſmall ſilence between each ſound; which has a very good effect in expreſſions of grief, to make ſigns; and alſo in expreſſions of wonder and ſurpriſe, &c.

TRONE (*Cycl.*)—TRONE-*Pound*, in Scotland, contains twenty Scotch ounces. But becauſe it is uſual to allow one to the ſcore, the *Trone-pound* is commonly 21 ounces.

TRONE-*Stone*, in Scotland, according to Sir John Skene, contains 19½ pounds. Vid. Treat. Pract. Geom. p. 153.

TROOPER, in the military art, a private man in a troop of horſe.

TROPER, in our old writers, is uſed for a book of alternate turns and reſponſes in ſinging maſs. *Lindewode* calls it *liber ſequentiarum*. *Hoved*. Hiſt. p. 283.

TROPHY (*Cycl.*)—TROPHY, in architecture, an ornament which repreſents the trunk of a tree, charged or encompaſſed all round about with arms or military weapons, both offenſive and defenſive.

TROPIC (*Cycl.*)—TROPIC-*Winds*. Dr. Liſter has advanced a very ſtrange ſyſtem as to the nature and origin of theſe, which is, that they are owing to the halitus of ſea-plants, growing in great abundance in particular places; he ſuppoſes that the Levant breezes are briſkeſt about noon, becauſe the ſun at that time exhales moſt from the plant. The direction of this breeze from eaſt to weſt, he ſuppoſes may be partly owing to the general current of the ſea; for a gentle air will be led by the ſtream of our rivers, for example; and partly to this, that every plant is in ſome meaſure an heliotrope or turnſole, bending itſelf in ſome degree after the ſun, and conſequently emitting its vapours according to the courſe of the ſun. Phil. Tranſ. N°. 156. See the article TROPICAL, *Cycl.*

TROSSULI, among the Romans, a name given by ſome to the guards that attended the kings of Rome, otherwiſe called *Celeres*. See the article CELERES.

TROUSSEQUEUE, in the manege. See the article DOCK.

TROUT, (*Cycl.*) a very valuable river-fiſh, the diſtinguiſhing characters of which are theſe: Its body is long; its head ſhort and roundiſh; the end of its noſe or ſnout obtuſe and blunt; its tail is very broad; its mouth large; and each jaw furniſhed with one row of ſharp teeth; and in its palate there are three parcels of teeth, each of an oblong figure in the congeries, and all meeting in an angle near the end of the noſe; and the tongue has ſix, eight, or ten teeth alſo on it; and its ſides are beautifully variegated with red ſpots.

This delicious fiſh is obſerved to come in; and go out of ſeaſon with the ſtag and buck; the time of its ſpawning is remarkable; moſt other fiſh do this in warm weather, but the *Trout* in October or November. Among the ſeveral kinds of *Trout*, the red and the yellow are the beſt for the table; and in the ſame ſpecies the female has always the preference to the male; the head of the female is ſmaller, and the body deeper than in the male. They are known to be in ſeaſon by the bright colour of their ſpots, and by the largeneſs and thickneſs of their backs; which laſt is a general rule in regard to all fiſh, to know when they are in ſeaſon.

In the winter the *Trout* is ſick, lean, and unwholeſome, and very often is louſy. The louſe, as it is called, of the *Trout* is a ſmall worm with a large head, which ſticks very faſt to the ſides of the fiſh; they live upon the juices of the fiſh all the time of the cold weather, while he is poor and lies quiet in the deep waters; but when the warm weather in the ſpring comes on, and the fiſh leaves his lazy life at the bottom, and comes up to the ſhallow gravelly places, where the ſtream is ſwift, he ſoon ſhakes them off.

The *Trout*, at its firſt coming into the ſhallow waters, may be ſeen to rub his body continually upon the ſharp gravel at the bottom; it is by this means that he gets off theſe worms

or lice, as they are called. From this time he begins to feed on flies; but in May the peculiar fly that he is fond of is produced, and after feeding that whole month on this inſect, the fleſh of the fiſh becomes more red and firm, and its higheſt ſeaſon begins.

The general baits for a *Trout*, are a worm, a minnow, or a fly, whether natural or artificial: among worms there are ſeveral kinds which this fiſh is fond of; ſuch are the earth-worm, and dung-worm in particular; the lob-worm and branding-worm alſo are eſteemed: but the beſt of all is the ſquirrel-tail worm, which has a ſtreak down the back, a red head, and a broad tail. The brandling is commonly found in a old dung-hill, or under cow-dung, or elſe among tanners-bark; the others are found in the earth, and under large ſtones or ſtumps of trees: whatever worm is uſed, the longer it is kept to ſcower firſt, the better the *Trout* will take it: they are to be kept in an earthen pot among moſs, which is to be ſhifted once in three or four days, or oftner if the weather be very hot.

To take the *Trout* with a ground-bait, the angler ſhould have a light, taper, rod, with a tender hazel top; and may angle with a ſingle hair of three links, the one tied to the other, for the bottom of the line; and a line of three haired-links for the upper part: with this ſort of tackle, if the ſportſman have room enough, he will take the largeſt *Trout* in the river. Some fiſh with three haired-links at the bottom of the line, but there is very little ſport to be expected this way, for the *Trout* is very ſuſpicious and very quick ſighted. The angler muſt always keep out of ſight, and the point of the rod muſt be down the ſtream. The ſeaſon for fiſhing for the *Trout* with a ground-bait begins in March, and the mornings and evenings in general are the beſt time; but if the weather be cloudy, the ſport may be followed all day long. There muſt be a plummet at ten inches from the hook, which the angler muſt feel always touching the ground, and this muſt be heavier the ſwifter the ſtream is. The common worm is a good bait.

The minnow is a very good bait for the *Trout*, and with this the tackle need not be ſo ſlight, for the *Trout* will make at this bait with leſs conſideration, and ſieze it as ſoon as it comes in ſight; the upper part of the line with this bait, may be of three ſilks and three hairs for the upper part, and two ſilks and two hairs for the lower; and the hook may be moderately large. The whiteſt minnows and thoſe of the middle ſize are the beſt bait for the *Trout*, and they ſhould be ſo fixed on the hook, as to turn round when they are drawn up againſt the ſtream. The beſt way of baiting this fiſh, is to put the hook in at the mouth and out at the gills, then drawing it thro' about three inches, to put it again in its mouth, and let the point and beard come out at the tail, and then to tie the hook and his tail with a fine white thread, letting the body of the minnow be almoſt ſtrait down the hook; by this means it will turn, as it is pulled againſt the ſtream; and the more and quicker it turns the better: for want of a minnow, a ſmall loach or a ſtickle-back will ſerve.

The moſt agreeable manner of fiſhing for *Trout* is, however, with the fly, when the ſportſman has found the true method of doing it; the rod in this caſe muſt be light and pliable, and the line long and fine; if one hair be ſtrong enough, as it may be made, by proper ſkill in the angler, there will be more fiſh caught, than where a thicker line is uſed; and the fly-fiſher ſhould have the wind in his back, and the ſun before him.

TRUFFLES, (*Cycl.*) *Tubera*, in botany. See the article TUBERA.

The antients, it is evident from their writings, were not acquainted with the ſort of *Truffles* which we have in uſe at preſent; they deſcribe theirs to have been of a reddiſh colour, and ſmooth on the ſurface; we at preſent know this kind very well; it is common in Italy, and is called the wild *Truffle*, and diſregarded. They had indeed the white African *Truffle*, ſometimes brought to them, and held it in vaſt eſteem for its flavour. The Romans called it the Lybian *tuber*, and the Greeks the Cyrenean *miſy*; theſe people were very little acquainted with the African affairs, and called all the things they had from that part of the world by the name of Cyrenean.

Aviſenna recommends thoſe *Truffles* as the beſt which were of a whitiſh colour within; and this not being a clear white, he expreſſes himſelf by a word which ſignifies ſand-coloured, alluding to duſky white ſand, in common uſe at that time. Pliny has ſo far miſtaken the ſenſe of the author from whom he takes his accounts, that he ſays, the Lybian *tubera* or Cyrenean miſy were more fleſhy than the others: but Theophraſtus ſays only, that they had a rich fleſh-like ſmell, by which he diſtinguiſhes them from the inſipid *Truffle* in common uſe with the Greeks at that time. The word *ramul* which the interpreters of Aviſenna have rendered ſand-coloured, may be perhaps properly *ramad*, which is aſh-coloured; and if this be the true reading, we get over a great many difficulties, among the later writers about what the tubera arenoſa or ſandy *Truffles* of the antients were.

It is certain that the fineſt *Truffles* were called by ſome authors by this epithet *arenoſa*, with a very different meaning, only expreſſing that they were produced in ſandy countries: the European *Truffles* both then were, and now are moſtly produced in dry ground on the ſides of hills; but the Lybian were produced only in the burning ſands of that country, and theſe were therefore called ſand-*Truffles*. Serapio tells us, that the beſt of all *Truffles* were thoſe produced in ſand; and Martial alludes to theſe, where he deſcribes the fineſt *Truffles* as breaking the ſurface of the earth into cracks, and by that means directing people where to ſearch for them. This paſſage of Martial has been indeed ſeverely criticiſed on by many; and our own obſervation, and the teſtimony of Pliny called in to prove the poet in an error: we do not indeed ſee the ground burſt or crack where the *Truffles* are; and Pliny tells us expreſly, that the *Truffles* of his time never broke the earth where they grew, but remained quietly under it without giving any indication of their being there. This may all be true both of the common Roman *Truffle* and of ours; but as Martial here plainly ſpeaks of the fineſt kind, that is the Lybian *Truffles*, we muſt ſee whether the African *Truffles* do or do not break the ground where they lie, before we cenſure or applaud the poet. Leo Africanus is the moſt expreſs in the account of the Lybian-*Truffle* of any author, and he ſays, that the places where they are may always be known by the earth on the ſurface being raiſed into hillocks, and breaking in numerous cracks: thus we find the poet is ſo far from being culpable in his expreſſion, that he appears to have been better acquainted with the nature of the ſubject, than the author who wrote expreſly upon it.

The *Truffle* is moſt abundantly produced in dry fields of a reddiſh loamy earth, not too poor; and they are found to flouriſh moſt near the roots of elms, the ilex, and ſome other trees. They do not well bear the ſeverity of hard winters, but are uſually ſcarce all the ſeaſon after ſuch. The ſmalleſt are found about the bigneſs of a pear, and they grow from this ſize ſometimes to a pound weight, but ſuch are not common; what are taken up in the ſpring are diſtinguiſhed by their white colour, and inſipidity to the taſte, and are commonly called white *Truffles*: thoſe taken up in autumn are of a variegated colour within, and are called marbled *Truffles*; the inner ſubſtance having ſwelled extreamly and changed colour, and the white part now remaining only in form of a number of pipes or tubules, which ſeem in many places to run to the extremity, and terminate in the chaps and wrinkles of the back. The greyiſh ſubſtance, which is wrapped up among theſe tubules, when examined by the microſcope, appears to be a tranſparent parenchyma, compoſed of little bladders or hollow veſſels, in the midſt of which may be ſeen ſmall round bodies, which are unqueſtionably the ſeeds of the *Truffle*.

When the *Truffles* are arrived at this degree of maturity, which is generally in Auguſt, they are of a fine high flavour and agreeable ſmell; and the heat and rains at this ſeaſon greatly promoting their growth, has been the occaſion of the old error, that thunder produced them; after this they continue good to the middle of winter, and ſometimes even till March; but thoſe gathered from this time till the end of July are ſmall and only white, never marbled nor of their high taſte.

If the *Truffles* are not taken up when fully ripe, they always rot and burſt; whence it is plain that they are an annual plant, which lives no longer than till they have perfected their ſeeds. And if the place where the old ones have rotted and burſt be examined, the ſeeds will be found after ſome time to have vegetated, and a great number of young *Truffles* to be produced in the place: theſe, if not deſtroyed by the froſts, are what in the enſuing ſpring furniſh the younger white *Truffles*.

The *Truffle* is very apt to be pierced and eaten within by a worm, and this tho' a damage to the particular *Truffle*, is of ſome ſervice to the people, who make it their buſineſs to ſeek for them: for this worm, after a proper time paſſed in that ſtate, changes into its chryſalis ſtate in the body of the *Truffle*; whence he ſoon after comes out, in the ſhape of a beautiful violet-coloured fly; and wherever theſe flies are found, they are an indication that there are beds of *Truffles* near, as they are never bred in any other root.

Theſe communicate a bitterneſs to the whole *Truffle*, and and make it unfit for the table; tho', if the whole be carefully ſearched into, the part eaten by the worm, and the hole by which it made its way in, will be found to be in reality the only bitter parts, and the reſt of the *Truffle*, when theſe are cut out, as good as ever: but, beſide theſe deſtroyers, the microſcope uſually diſcovers on the ſurface of the *Truffle* a multitude of other devourers, which are ſmall white animalcules, continually eating, and ſearching the cracks of the bark, as the places where the pulp is moſt eaſily come at; theſe ſomewhat reſemble mites.

The earth that produces *Truffles* rarely affords any other plants, theſe taking up all the nouriſhment it can afford: the earth all about them ſmells ſo very ſtrongly of them, that they are eaſily found out by it, by the animals which carry their noſes near the ground: and thoſe who ſought after them

ſoon

ſoon found the way of uſing hogs to ſearch them out; but theſe being a ſort of unmanageable animal, dogs were found, which would ſupply their place with more certainty, and much leſs trouble. Mem. Acad. Scien. Paris, An. 1711.

TRUFFLE-*Worms*, in natural hiſtory, a ſpecies of fly-worm which is found in *Truffles*, and lives in and feeds on them, till the time it undergoes the common metamorphoſis of theſe creatures, for the production of a fly, like that from the egg of which it was hatched.

Theſe are a great nuſance to the *Truffles*, and often wholly ſpoil them: on preſſing them in this ſtate with the finger, one may uſually perceive ſome places give way, and on opening theſe the worms are found.

They are very ſmall, and have two brown ſpots, eaſily diſtinguiſhable near their hinder end; which are the two poſterior ſtigmata. They are all over white, and very tranſparent; and one may very eaſily diſtinguiſh the two black ſtalks of their two hooks, with which they tear the ſubſtance of the *Truffle*, as the other ſpecies do their food: the anus in theſe is very viſible, and is placed near the extremity, and under the belly; the creature ſecrets from this a whitiſh viſcid matter, which is a great means of haſtening the corrupting of the *Truffle*: while in the *Truffle*, theſe worms are always ſurrounded with this viſcid matter; but when they have arrived at their full growth, which is uſually in a few days, they then leave the *Truffle*, and go to ſeek ſome proper place, where they may reſt during the time of their transformation; they enter the earth for this purpoſe, and twelve hours after they have gone into it they are transformed into an egg-ſhaped ſhell, of a cheſnut-brown, of the ſame ſort with that of the blue fleſh-fly.

This ſhell is in theſe, as in all the other inſects of the ſame claſs, made of their proper ſkin; what it has particular is, that it is ſomewhat flatted, eſpecially at the anterior end; and all the way down this flatted part, on each ſide, it is bordered by a ſort of band or filament, like that on each ſide at the anterior end of the ſhells of the common fleſh-fly worm.

The ſtigmata are placed in a line with theſe, and the anterior ones terminate them; at the middle of the anterior end, there are ſeveral folds, like a purſe when drawn together, which encompaſs the opening by which the firſt ring is drawn in at the time of the formation of this ſhell.

Theſe are the worms in a manner peculiar to the *Truffles*; but beſide theſe, they often furniſh nouriſhment to another ſpecies, very common in muſhrooms of the ordinary eatable kind, and which has a yellow body and a black cruſtaceous head. *Reaumur*'s Hiſt. Inſ. Vol. 4. p. 374.

TRUMPE, in ichthyology, a name given by ſome of the Engliſh writers, to that ſpecies of whale, called by the generality of authors *cete*, and *balæna major*.

It is, according to the new ſyſtem of Artedi, one of the catodons; and is diſtinguiſhed from the other ſpecies of that genus, by having the fiſtula ſituated in the neck: the Dutch call this the pot whale-fiſh. See the articles CATODON, and BALÆNA.

TRUMPET (*Cycl.*)—TRUMPET-*Flower*, *Bignonia*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is compoſed of only one leaf, of a tubular form, wide open at the mouth; and ſeeming as if bilabiated: from the flower-cup ariſes a piſtil, which is fixed in the manner of a nail to the hinder part of the flower; this afterwards becomes a fruit or pod, divided into two cells by a longitudinal membrane, and containing flatted and uſually alated ſeeds.

The ſpecies of *Bignonia* enumerated by Mr. Tournefort are theſe: 1. The aſh-leaved American *Bignonia*, with great ſcarlet-flowers. 2. The aſh-leaved tree-*Bignonia* of America, with yellow flowers. 3. The ſhort-podded American *Bignonia*, with tendrils to the ſtalks. 4. The long-podded American *Bignonia*, with long tendrils to the ſtalks. 5. The two-leaved climbing American *Bignonia*, with long and broad pods, and broad ſeeds. 6. The bifoliate-climbing American *Bignonia*, with ſweet-ſcented, violet-coloured flowers, and dry, oval fruit. 7. The bifoliate-climbing American *Bignonia*, with purpliſh-yellow, ſcentleſs flowers, and hard, oval fruit. 8. The tree-*Bignonia* of America, with thin box-like leaves. 9. The tree-*Bignonia* of America, with ſingle undulated-leaves, and very long and narrow pods. 10. The heart-leaved tree-*Bignonia*, of the Eaſt-Indies. 11. The long-leaved Indian tree-*Bignonia*. 12. The five-leaved Indian tree-*Bignonia*, with a roſe-coloured flower, and flat pods. 13. The ſmaller five-leaved Indian tree-*Bignonia*, with a roſe-coloured flower, and angular pods. *Tourn.* Inſt. p. 164.

TRUMPET-*Shell*, *Buccinum*, in natural hiſtory, the name of a large genus of ſhells, the characters of which are theſe; they are univalve ſhells of the form of a *Trumpet*, according to old pictures; with a wide belly, and a large, broad, and elongated mouth. They have a diſtinct and regular tail, uſually long, tho' ſometimes ſhort; they have a crooked beak, and the clavcile is often elevated, tho' ſometimes depreſſed and contabulated. See Tab. of Foſſils, Claſs 9.

The family of the *Buccina*, when examined ever ſo ſtrictly, is very large; but according to the general cuſtom of authors, of confounding together ſeveral genera under the name, it is uſually made to appear much larger than it really is. Liſter has made it comprehend a vaſt number of ſhells, by confounding with it the families of the *murex* and *purpura*.

It is not indeed peculiar to this author, to have confounded theſe genera; thoſe who went before him have done the ſame: and Pliny has compriſed the *buccinum*, *murex*, and *purpura*, under the general name *ceryx*.

To avoid the general confuſion, which ariſes from not diſtinguiſhing the families of the *buccinum*, *murex*, *purpura*, and *vis*, or ſcrew-ſhell, it will be proper to obſerve, that there are regular characters, which diſtinguiſh them all, one from another: the characters are theſe:

The *buccinum* differs from the *purpura*, in that it has a very long mouth of an oval figure, and has an elevated head; whereas the *purpura* has a round mouth, and a head ſomewhat flatted. The tail of the *purpura* is alſo uſually furrowed, and is ſhorter than that of the *buccinums*.

The *buccinum* differs alſo from the *murex* in having a longer tail, by the ſmoothneſs and variety of colours of its coat, and by having a larger mouth leſs furniſhed with teeth; the *murex* having a ſmaller and longer-ſhaped mouth, its ſurface covered with points or ſpires, and ſeveral teeth.

It is eaſier to diſtinguiſh the *Buccinum* from the ſcrew-ſhell, as this is always more long and ſlender than the *buccinum*; it has alſo a flat mouth, and has rarely any tail. Theſe are all very large families in nature, and it is highly neceſſary for the naturaliſts to be well acquainted with them.

The moſt ſingular ſpecies of the *buccinum* claſs, is one that has its mouth turned the contrary way to all other ſhells: this has been thence called by authors, the *unique* and the *ſans pareille*. Aldrovand is of opinion, that the *buccina* may be ranked among the bivalve ſhells; becauſe they have an operculum, or ſhelly ſubſtance, fixed to the end of their body, which occaſionally ſtops up the aperture of the mouth; but if this were a ſufficient reaſon we ſhould have many more genera to add to the bivalves, particularly the ſnails of ſeveral kinds.

The *buccina* generate in the warm months, and ſome ſpecies of them are ſeen very frequently remaining in pairs together, upon the rocks deſerted by the tide on that occaſion. Theſe have been thence ſuppoſed to be of a different genus, and have been called *buccina littoralia*; they are uſually found in copulation early in the morning. *Rumphius*, de Teſt. *Aldrovand.* de Teſt. l. 3. c. 231. *Liſter*, Hiſt. Animal. Angl. p. 158.

The ſpecies of the *buccina* being very numerous, they are arranged under ſeveral diſtinct heads, according to certain obvious diſtinctions; and are as follow: 1. Of the *buccina* with long diſtinct tails and oblong mouths, there are theſe ſpecies. 1. The great browniſh white, contubulated, and tuberous *buccinum*. 2. The ſmall brown furrowed *buccinum*. 3. The *buccinum* with double and dentated lips. 4. The *buccinum* called the tower of Babel. 5. The red-ſpotted *buccinum*. 6. The Perſian *buccinum*. 7. The radiated *buccinum*, with broad, blackiſh-red ſpots. 8. The *buccinum* faſciated and undulated on each ſide, with a dentated columella. 9. The thick *buccinum*, with oblong and ſpotted tubercles. 10. The ſtriated and bottle *buccinum*. It is to be obſerved that when the laſt ſpecies but one is poliſhed, the loſs of its outer coat gives it a very different appearance; and it is found in many of the cabinets of the curious, variegated with blue and whitiſh-brown ſpots. 11. The *buccinum*, with a contabulated and pulvinated clavicle. 12. The ſtriated *buccinum*, with three tuberous eminences. 13. The coſtated and ſtriated *buccinum*.

Of the *buccina* with a ſhort tail and a wide mouth, we have the following known ſpecimens: 1. The hairy *buccinum* of Rumphius. 2. The thick *buccinum* called Midas's ear, with a dentated columella: this when poliſhed aſſumes a very different appearance, and is found in many cabinets under the name of the agate *buccinum*, as it carries a great reſemblance of that ſtone. 3. The grey wide mouth *buccinum*: this alſo when poliſhed aſſumes a very different appearance, and is ſpotted and lineated in an elegant manner; tho' wholly plain while it has its outer coat. 4. The undulated and ſtriated *buccinum*. 5. The *buccinum* covered with pointed tubercles placed in regular order. 6. The depreſſed umbilicated *buccinum*, with the lip and columella both dentated. 7. The yellow umbilicated *buccinum*. 8. The *ſans pareil*, or *buccinum* with the mouth opening the contrary way to all the other. 9. The alated and punctuated *buccinum*. 10. The tuberous *buccinum*, with two high ribs. 11. The rough furrowed *buccinum*, with a thick lip and an oval mouth. 12. The hermit *buccinum*: this uſually has the hermit-fiſh, a kind of ſmall crab in it, and has its clavicle full of ſmall balani.

Of the *buccina* which have long and erect clavicles, theſe are the following known ſpecies: 1. The Chineſe town ſhell, with a dentated columella. 2. The *buccinum* ſurrounded with red and white faſciæ. 3. The *buccinum* called tiara or papal crown, with the columella and lip dentated. 4. The mitre or plume *buccinum*. 5. The yellowiſh *buccinum*, with a dentated columella. 6. The *buccinum* with zones of brown and yellow. 7. The great triton *buccinum*. 8. The wide mouthed

mouthed *buccinum*. 9. The ſtriated *buccinum* with prickly ribs. 10. The reticulated *buccinum*, with oblong tubercles. 11. The red-mouthed ſpotted *buccinum*, with an irregularly ſtriated clavicle.

Of thoſe *buccina* which have leſs erect clavicles and crooked roſtra, there are the following known ſpecies: 1. The rough *buccinum*, called the Swiſs-ſhell. 2. The diſtortion or grimace ſhell, with a ſtriated lip and columella. 3. The *buccinum* with its lip elevated above the reſt of the ſurface. 4. The ſmooth-lipped *buccinum*. 5. The ſmoother bodied *buccinum*: theſe are all of the grimace kind. 6. The rough *buccinum*, with elevated tubes or pipes. 7. The tuberous *buccinum*, with a dentated wide mouth, and a long crooked and furrowed roſtrum. 8. The yellowiſh tuberous ſtriated *buccinum*, with a depreſſed clavicle, and with furrowed lips and columella. 9. The yellow *buccinum*, with an erect clavicle and a red mouth. 10. The ſtriated *buccinum*, with oblong tubercles. 11. The ſtriated gold-yellow *buccinum*. 12. The *buccinum* with brown, yellow, and white ſtriæ. Hiſt. Nat. Eclair. p. 263.

It appears from the writings of the antients, that the famous purple dye, which they obtained from a ſhell-fiſh was not peculiar to any one ſpecies; but was found in ſeveral of the ſmaller kinds of *buccina*; ſome of which they called *murices*, from the hollow ſpines, or long and ſlender proceſſes, which run in different directions from their ſhells.

Mr. Reaumur when on the coaſts of Poitou, found certain eggs of fiſhes, arranged in regular order, and in great numbers, on the rocks and ſalted banks, which had the ſame property with the purple-dying liquor of the *buccinum*; and which, as it is not yet known to what particular fiſh they belong, or what uſes they may hereafter be brought to ſerve, it may be proper to deſcribe here.

Each egg is of an elliptic ſpheroidal figure, the ſmalleſt part of which is about a twelfth of an inch in diameter, and the largeſt about one fifth, and it is attached to the rock or ſand by a pedicle reſembling that of a fruit; this is about a twelfth of an inch long, and a fourth part of its length in diameter. The egg itſelf is hollow, and is filled with the ſtaining liquor; its ſurface is only a membrane in the nature of parchment: at the end, oppoſite to that where the pedicle is fixed, there is a hole or aperture, reſembling the mouth of a glaſs-bottle; but that the liquor may not run out at this, it is ſtopped with a tranſparent ſubſtance, which ſerves as a cork to it; this however is placed exactly in a contrary direction to the corks of our bottles; for the larger end is on the inſide, ſo that all the force the included liquor can have on it, can be only to ſtop up the mouth the more firmly: beſide this alſo, it is cemented down all round by a ſort of glue. This egg contains two liquors, the one white and the other yellow; as the common eggs have their yolk and white: but the yellow liquor in this, is not collected all into one body; but ſwims about freely in the white in eight diſtinct drops. The glutinous liquor by which the pedicles of theſe eggs are faſtened to the ſtone or ſand, is of ſuch force, that it is not eaſy to pull them off without breaking the eggs; but by help of the thin blade of a knife, they may be taken off without injury. As there are always a great number of the *buccinas* of the ſmaller kinds, about the places where theſe eggs are found, Mr. Reaumur was led to believe that they were the eggs of this fiſh; in favour of which ſuppoſition, the colour they afford in common with that fiſh, is alſo no ſmall argument; what made this opinion appear leſs probable to him, was the largeneſs of theſe eggs in proportion to thoſe animals; but we are ſo well aſſured of the largeneſs of many ſhell-fiſhes eggs, in proportion to their own ſize, that this ſeems but a weak argument againſt ſo probable an opinion. Mem. Acad. Par. 1711.

Pliny ſeems to derive the name *buccinum* from *buccina*, a kind of muſical inſtrument[a]; but it is more probable that inſtrument took its name from the ſhell to which it bore a reſemblance, and of which it might probably have been antiently made[b].—[a *Plin.* Hiſt. Nat. l. 9. c. 36. b Phil. Tranſ. N°. 282. p. 1277.]

Buccina are of ſome uſe in phyſic; when calcined they have a drying cauſtic quality. *Liſter*, Ap. Phil. Tranſ. N°. 197. p. 645. See Tab. of Shells, N°. 9. and Tab. of Foſſils, Claſs 9.

Buccinum lapidoſum is a figured ſtone, ſhaped like the former, and probably only a petrifaction of the ſhell above-mentioned. *Mercat.* Metalloth. Arm. 9. loc. 36. c. 33. p. 301.

Ray ſpeaks of a *buccinum* which not only petrified, but after petrifaction was converted into a pyrites. *Ray*, Phil. Lett. p. 202. See PYRITES, *Cycl.* and *Suppl.*

TRUMPETER, (*Cycl.*) in zoology, a name given in England, to a particular ſpecies of pigeon, called by Moore the *columba tibicen*.

This ſpecies is of the middle ſize of the common pigeon, and made conſiderably like it; but it is pearly-eyed; is of a mottled black, and is feathered down the legs and feet, and is turn-crowned like the nun, and ſome of the other ſpecies; ſometimes like the finnikin, but much larger: this ſeems to be the beſt ſort as being the moſt melodious. The beſt character to know them by, is a tuft of feathers growing at the root of the beak; and the larger this tuft is, the more they are eſteemed. The reaſon of their name is, that they imitate in their cooing the ſound of the trumpet; but to be often entertained with their melody, it is neceſſary to feed them frequently with hemp-ſeed. *Moore*'s Columbarium, p. 45.

TRUMPETER, in a man of war, one whoſe office is always to attend the captain's command, and be ready at the entertainment of ſtrangers. In the time of an engagement his proper ſtation is on the poop.

TRUNGIBIN, in natural hiſtory, a name given by Rawwolf, Tournefort, and others; to a ſort of manna collected from the *alhagi maurorum*, as the common manna is from the aſh; and uſed in the eaſtern parts of the world as a purge. It is what we call the *manna perſicum*, and tho' in itſelf a very fine and clean kind of manna, yet it is uſually ſo careleſly collected, and mixed with ſo much filth, that it requires to be given in three times the doſe of ours, in order to purge. The name ſeems very evidently to be a corruption of the *tereniabin* or *teren-jabin* of the Arabians, which was the word uſed by all their authors to expreſs the *manna perſicum*.

TRUNCATED *Leaf*, among botaniſts. See the article LEAF.

TRUNK, (*Cycl.*) in natural hiſtory, a pointed, hollow, ſlender, and oblong body; joined to the fore-part of the heads of many inſects, and ſerving them for ſucking the blood or juices of the animals or vegetables, on which they feed.

The *Trunks* of flies ſerve for diſtinguiſhing many genera of thoſe little animals, from their different form and other accidents. Some of theſe are a tube formed all of one ſimple piece, and others compoſed of ſeveral ſhorter pieces, nicely joined together: ſome are thin and as it were ſhelly, others thick and fleſhy; thoſe of ſome flies are terminated by a ſort of broad foot, or by a ſort of thick lips; and thoſe of others have no lips, or at leaſt no ſenſible ones; and others are made in form of a ſpindle hollowed at the end.

It is often neceſſary to have recourſe to the microſcope, to diſtinguiſh with nicety and exactneſs between theſe; and how indeed is it poſſible to do any thing without the help of glaſſes, in the diſtinctions of the parts of animals, the whole bodies of which are ſo very minute.

Without the aſſiſtance of glaſſes, however, it is eaſy to diſtinguiſh among the flies of different genera, three different manners of carrying this organ when in a ſtate of inaction. Many flies have *Trunks* which they can ſhorten, when they are not uſing them; theſe are fixed in the fore-part of the creature's head, where there is a cavity deſtined to receive them when they are not in uſe. In many ſpecies, this cavity is no more than a mere ſinus or hole, in the fore-part of the head; but in others it is more nicely contrived, the anterior part of the head lengthening itſelf, and forming a kind of arched vault for its reception. Other flies have *Trunks*, which in the time of inaction are turned, or ſomewhat folded from above downwards; the *Trunks* of bees are of this kind. Ibid.

There are others alſo, which have their *Trunks* contained entirely in a ſort of caſe, where they lie ſtrait at length, without being either turned or folded; but they are able to encline them in any direction, in regard to the poſition of their legs: of this kind are the *Trunks* of the cicadæ, gnats, &c.

Among the butterfly claſs, a great number are furniſhed with a *Trunk*; but there are alſo a great number that have it not: the fly of the ſilk-worm, and many, as well larger as ſmaller kinds, are without this, (as it ſeems neceſſary) organ, by which they ſuck the juices from flowers; and which is the only way of their taking in nouriſhment. Thoſe ſpecies which have it, ſhew it to the firſt view; it is placed in the middle of the head directly between the two eyes. And tho' in ſeveral ſpecies it is very long, yet it takes up even in theſe but very little room; when it is not in uſe, it is always rolled up in a ſpiral form, in the manner of the ſpring of a watch; and even the ſhorteſt of them are thus turned as well as the longeſt. Some of them make only one or two turns of this kind, others of a middling length make four; and finally the longeſt of all frequently make eight turns. In the rolled ſtate, we can ſee only a ſmall part of one of the outer turns of the ſpiral; the origin and extremity, with a great part of the intermediate ſpires, being hid under a remarkable ſort of hood or mitre; which is formed of two hairy bodies, following the contour of the eyes, and ariſing from their under-part in form of pieces of the ſkin of ſome animal, with the hair upon it. Theſe are moveable at the pleaſure of the animal, and ſeem intended by nature only as a caſe, for the defence of this tender and neceſſary organ to the creature. *Reaumur*, Hiſt. Inſ. vol. 1. P. 1. p. 287.

This is the caſe in moſt of the ſpecies, but in ſome others the office of theſe hairy bodies is ſupplied by two rounded and very prominent parts, which in the ſame manner follow the contour of the lower part of the eyes, and fill up a great part of the front of the head; leaving only a ſort of channel or furrow between them as a place for the *Trunk*. Theſe parts the French naturaliſts call the beards of the butterflies, and in ſome ſpecies they are of a very ſingular figure; extremely different from thoſe which have been here deſcribed. If one is deſirous to know in what manner this *Trunk* is uſed, he need only follow a butterfly to a flower, and there obſerve its motions. As ſoon as it is ſettled on the verge, it unrols

roſs this *Trunk*, and extends it into a perfectly ſtrait piece; it then directs it into the flower, and thruſts its extremity to the very bottom, where it is affixed to the cup; this is the caſe, however deep the flower be. When it has been a few minutes in the flower, it draws it out and rolls it up; and after a few moments, it extends and plunges it into the flower again: this it repeats four or five times, and then flies away to another flower. This is the thing that has occaſioned the poets to make the butterfly the emblem of inconſtancy, in its flying immediately from one flower to another; but the truth is, that the flower it leaves is no longer capable of affording it the nouriſhment it wants.

There are among the butterflies, ſome which never ſettle upon any thing, but are eternally upon the wing in the manner of ſwallows: theſe feed on the wing as thoſe birds do. We often ſee them buzzing about a flower in the manner of a bee, and in that caſe they ſuſtain themſelves in the air with their wings, while they unrol their *Trunk*, and thruſt its extremity into the flower, to ſuck from its bottom the honey-dew, which is the common food of them, of the bees, and of many other inſects.

The *Trunk* of the butterfly is a flat body, being broader than it is thick, and is formed of a matter ſomewhat reſembling horn; if the head of the creature be ſqueezed, it becomes neceſſitated to unrol the *Trunk*, and may thus at any time be made to ſhew it at its length. Its origin is juſt in that part of its face, where the noſe in other animals takes its origin; and hence ſome authors who have obſerved it when unrolled, have called thoſe butterflies which are poſſeſſed of it the long-noſed ones; but this is very improper, as it aſſuredly ſupplies the place of a mouth. It is always largeſt at the inſertion, and thence gradually decreaſes to a point at the other end.

The *Trunk* of the butterfly may alſo be unrolled, by getting the point of a pin between the circles at the center, and then drawing it gently from the head, the *Trunk* will by this means be drawn out to its full length; and if we tieze the creature a little, by gently preſſing any part of it, it immediately opens a crack, in the middle of which it runs up by degrees to the origin or baſe, and ſplits it in a manner into two.

It has been much diſputed, among the curious obſervers of nature; whether the *Trunk* be originally compoſed of two parts, or two *Trunks* laid cloſe to one another; or whether it were owing to its tender ſtructure, that it was eaſily ſplit by breaking its parts.

Mr. Bonani was of the firſt opinion, and Mr. Riget agreed with him at firſt, but he afterwards became of the contrary ſentiment; and thought that they really broke in this ſplitting, being originally only one: but Reaumur has determined the queſtion in favour of Bonani; having, by repeated obſervations, found them compoſed of two parallel *Trunks*, nicely and evenly laid ſidewiſe together. This indefatigable ſearcher after truth, examined the *Trunk* in the butterfly, while yet in its cryſalis, and when juſt iſſuing from it: he obſerves that, in the firſt caſe, the *Trunk* is not rolled up, but is laid evenly lengthwiſe along the body, and in this ſtate it is eaſily ſeen to be made up of two parallel *Trunks*; but in the ſucceeding ſtate, of juſt hatching from the cryſalis, one may ſee that it is compoſed of two: for one of the firſt efforts of the creature, is to roll this organ up into its ſpiral form, and in doing this, the two pieces often gape ſo wide aſunder, and are rolled up ſo irregularly, that it is ſcarce to be conceived how the animal will be able to lay them even afterwards. This however is done by ſeveral times rolling and unrolling it; they join firſt regularly at the baſe, and then by degrees all the way along to the point. It ſometimes happens that there are difficulties in this, and the parts become folded, wrinkled, or otherwiſe injured in their figure; and if all this be not ſet right in a few minutes, by the action of rolling and extending it; it never is done afterwards, but the organ dries in that form, and the creature loſes the whole uſe of it, and is doomed ſoon to periſh by hunger. Mr. Ray mentions a butterfly with a double *Trunk*; but Mr. Reaumur never having been able to find any ſuch, it is very probable, that as Mr. Ray was unacquainted with this ſtructure of the *Trunks* of all theſe creatures, he only found one whoſe *Trunk* had never cloſed. *Reaumur*, Hiſt. Inſ. vol. 1. P. 1. p. 293.

The union of the two parts, of which the *Trunk* in theſe creatures is formed, is too ſtreight to be owing merely to their contact; were they no better joined, they would frequently open and ſeparate, in the frequent rolling and unrolling of the whole, for the taking in of food. It is evident, on the contrary, that they are faſtened together by a nice joining, and a very viſcous fluid.

There are among the *Trunks* of butterflies, only two ſuch eſſential differences, as to deſerve a general diſtinction; the one kind of theſe are longer, flatter, and rolled up into more ſpirals; the others are ſhorter, thicker, and make fewer turns. The firſt reſemble a ſort of thin blades, the others reſemble a cord; ſome of the flat ones are two or three inches long, and thick in proportion: theſe are the propereſt for a microſcopic obſervation, in order to know their true ſtructure; and when examined in this manner, they are found to be formed in an elegant manner, and made up of fibres, which divide themſelves into a number of rings, and reſemble the annular ſtructure of the *aſpera arteria* in large annimals. Some of the *Trunks* of theſe animals are bright and gloſſy, both on the under and upper ſide; and ſome of them have a number of ſmall flat bodies iſſuing from them which are uſually placed at the extremity, tho' ſometimes at a diſtance from it; theſe have been ſuppoſed by ſome, to be a ſort of fingers, whoſe uſe was to collect together the nouriſhment fit to be received into the *Trunk*; and others have ſuppoſed them the organs of ſuction: but they appear rather to be only intended by nature, as ſupports to the end of the *Trunk* while employed in ſucking, as they have no organization proper for anſwering either of the other purpoſes aſſigned to them, and as they are obſerved only in the more weak and tender *Trunks*, the ſtrong and thick ones having none of them. The two bodies which form the *Trunk* of the butterfly, have each of them a hollow running all the way along them, or are each of them properly a ſeparate canal, capable of receiving a fluid and conveying it up into the body of the animal. *Reaumur*, Hiſt. Inſ. vol. 1. P. 1. p. 301.

Mr. Reaumur found out their ſtructure with great eaſe, by moiſtening or ſoaking them in water after the creature was dead: after this treatment they became much more manageable and pliant than before, and could be rolled and unrolled at pleaſure, and cut tranſverſely or in any other direction. The matter of which theſe *Trunks* are formed ſeems more of the nature of whalebone, than of any other known ſubſtance; and, like that, if thus ſuppled by ſoaking in water, they are in ſome degree tranſparent, from the thinneſs of their ſides; and when they have been long enough in water, if they are preſſed with the finger, there may be ſeen a ſeparate column of water moving about in each. And as this obſervation is moſt eaſily made on ſuch *Trunks* as have been cut off tranſverſely from the head, theſe receiving the water the moſt readily, the whole may in theſe be at pleaſure preſſed out at the ends where they are cut; and the joining of the two canals, or parts of the *Trunk*, along the middle, is more like that of the feathered part of a bird's plume, than any other combination in the parts of the animal world; and the joining of the two parts is ſo nice, that there is another or third canal formed by it, which is nearly as cloſe at the ſides as the other two: this may ſerve the creature for the conveying its food as well as the other two, but it appears more probable that its office is to convey the air for the creature's reſpiration, and that the *Trunk* in this manner ſerves in the office both of a mouth and a noſe.

The other kind of *Trunks* of the butterfly claſs, are the ſhort and thick ones; theſe are not flat, but rounded like a cord; they are very robuſt and ſtrong, and they terminate in a ſharp point, which in ſome ſpecies is capable of wounding the finger if preſſed againſt it: in all, however, it is capable of wounding and making its way into the tender ſubſtance of the leaf of a flower. The manner of the creature's getting its nouriſhment is this: it plunges the end of the *Trunk* into the ſubſtance of the flower, by means of the hole made by this ſharp end, ſo far, that its apertures are in the place where the juices extravaſate themſelves, from the wound the point has made; the point itſelf being often on the other ſide, having pierced quite through. When it has thus drained away all the juice it can, it flies to another flower, and acts in the ſame manner. There is a ſpecies of butterfly, remarkable for having a ſort of a figure of a death's head on its breaſt; this ſpecies has a thick *Trunk* of this kind, ſo very ſharp at the point, that it is capable of wounding the hand.

The action of the *Trunk* in ſucking is eaſily ſeen on giving a piece of ſugar to a butterfly, that has been kept without food for ſome days, after its being produced out of the cryſalis; many of the ſpecies will in this caſe feed on the ſugar in the ſame manner that they would on the juices of flowers, and will ſhew that the uſe of their rolling up their *Trunk* at times, is the ſwallowing what they have received into it. The *Trunks* of the ſeveral ſpecies of butterflies are as different in colour as in ſhape; ſome are black, others reddiſh, many of a cheſnut colour; ſome are alſo of a pale brown, and ſome of a beautiful yellow; many of them alſo are hairy on the under ſide, and many are ſmooth. The thicker *Trunks* are always ſhorter than the flat ones, and have only one canal. *Reaumur*, Hiſt. Inſ. Vol. 1. P. 1. p. 309.

TRUNKS *of Gnats*, the inſtrument by means of which, the gnat ſtrikes the fleſh, and ſucks the blood from animal bodies.

This is a machine well worth an attentive obſervation. As fine and ſmall as this inſtrument appears, it is nevertheleſs of a very complex ſtructure. The piercer, or more properly piercers of this inſtrument, are all entirely hid in the ſheath which makes what we call the *Trunk*; and is the only part we naturally have offered to our view. *Reaumur*, Hiſt. Inſ. Vol. 4. p. 580. ſeq.

This *Trunk* appears to be cylindric, in the greateſt part of its length; and is covered with ſcales, not unlike thoſe on the nerves of the wings of the creature; and reſembling ſmall leaves. Near its end, it has a little ſwelling, where there is an oblong button, broader at its inſertion than at its point: the end of this button is furniſhed with an aperture, out of which the creature occaſionally thruſts a fine point. Many naturaliſts have obſerved this point; Swammerdam conſidered

it as a ſingle pointed body, formed to pierce the ſkin; but Lewenhoek diſcovered that it was made up of a vaſt number of pointed bodies. There is no occaſion, however, for all the accuracy of obſervation of Swammerdam, nor all the power of the magnifying glaſſes of Lewenhoek, to diſcover that this is a complex body; a common ſmall magnifying-glaſs, and a careful examination, will at any time diſcover it.

If a gnat be held by the corcelet between the fingers, and a little ſqueezed, the ſheath or caſe of the *Trunk* will be frequently ſeen to open itſelf lengthways on each ſide, ſometimes only a little way, and at others almoſt along its whole length; and a fine gloſſy reddiſh filament ſhews itſelf at the opening of this caſe. This filament is bent and turned inwards, and one very ſoon diſtinguiſhes that it is indeed a congeries of a great number of filaments: theſe one may eaſily ſeparate, in ſome meaſure, from one another, by means of any pointed inſtrument; and very often the filament ſeparates of itſelf into ſeveral in the bending. It is plain, therefore, that the inſtrument deſtined to pierce the ſkin, and ſuck the blood, is of a complex ſtructure; that what we might naturally take for this inſtrument, is only its caſe or ſheath, and that this caſe, inſtead of a plain cylindric body, is really a compoſition of two ſemi-cylindric ones, which have the power of ſeparating from one another for the animal's occaſions.

The beſt way to get a regular ſight of the *Trunk* of this creature, and of its manner of uſing it, is to ſuffer a gnat to ſettle upon the hand, and not diſturb him in the operation; but with a magnifying glaſs in the other hand, to obſerve all his motions. In this caſe, we may firſt ſee a ſmall and ſlender point thruſt out at the end of the caſe, and try ſeveral different parts of the ſkin with this ſharp inſtrument; when it has done this, it chooſes that part which is moſt eaſily pierced; and where there lies a veſſel underneath, capable of furniſhing as much blood as he will have occaſion to ſuck.

As ſoon as he has made his choice, the wound is immediately given; and ſince the point of the compound piercer cannot be protruded ſo far out of the caſe as it is neceſſary it ſhould to ſtrike to a proper depth, the uſe of the ſlit in this caſe is ſeen; for while the button at the end of this remains firmly applied to the orifice of the wound, where the piercer is introduced, and ſupports that delicate and feeble inſtrument from bending, the caſe opens at the ſlit, and its two ſides bend to give room to the piercer to penetrate; and at length, when the piercer is ſunk to its utmoſt depth, the two extremities of each piece touch, and the ſides are brought cloſe together.

Sometimes alſo one may obſerve in peculiar ſpecies of the gnat kind, when they are about to ſtrike the fleſh, a more complex ſtructure of this ſheath; for one may ſee, inſtead of the two antennæ which all the gnats have, an appearance of four, while the creature is in the act of ſucking. It will be eaſy for any one to gueſs, that the ſecond pair of theſe, which do not appear at any time, except when the creature is thus employed, are not true antennæ; and on a nice examination, they appear indeed to be no other than parts of the caſe of the piercers, which, as ſoon as the gnat of this ſpecies ſtrikes the ſkin, are ſeparated from the upper part of the caſe, and are two ſlender oblong bodies, of the ſame length with the caſe, except that part of it which we call the button. Theſe two pieces of the caſes at this time ſtand always in a parallel direction with the true antennæ, and are very nearly of their length. Each of theſe, examined in this ſtate, has the appearance of a regular cylinder, but, probably, in its ſtate of reſt, is hollowed, and of a proper ſhape, to encloſe and ſurround a part of the ſurface of the caſe; and this muſt of neceſſity be their real ſhape, ſince when the *Trunk* is in a ſtate of reſt, they are no other way diſtinguiſhable on it, than by the making it a little thicker; whereas, were they really cylindric bodies, as they appear in the ſtate of action of the *Trunk*, they muſt, when it was at reſt, be ſeen in form of two prominent lines on its ſurface.

The ſeveral ſpecies of gnats have great variety in their *Trunks*; and in the obſerving many kinds, the true ſtructure of that organ in all will be moſt regularly and eaſily found. Some have the caſe of the piercers only one ſingle tube ſplit lengthwiſe along its upper part; others have this ſlit made by the junction of two caſes, which cover cloſely a great part of its circumference; and others have the two tubes ſo well adjuſted, and nicely fitted to one another, that a good glaſs cannot diſcover them from the reſt of the *Trunk*, when in a ſtate of reſt; but in others this ſtructure is eaſily diſcoverable, as the extremity of one of them, when beſt fixed, is ſtill to be diſcovered ſomewhat ſeparated from the *Trunk*, and adorned with a pencil of ſmall hairs, like thoſe of the antennæ. The male gnats, which have their antennæ feathered, are thoſe which have the plumes at the extremities of theſe additional pieces of the caſe of the *Trunk*; and theſe have not the beards which are found ſituated over the *Trunks* of the other ſpecies of gnats.

There is, beſide all theſe, one ſpecies of gnat whoſe piercer has no need of the button at the end of the caſe, common to all the reſt, to ſupport it while it enters the fleſh. This has a caſe on which it reſts itſelf as on a ſeventh leg, from which it darts a piercer, which, without any ſupport, is of ſufficient ſtrength to penetrate the fleſh, and do its office for the animal. This ſpecies of gnat has two very long beards placed above its *Trunk*, and terminated by an end, covered with white ſcales; what remains of theſe beards is covered with brown ſcales, and the body of the gnat is brown, and the corcelet reddiſh.

Tho' it is eaſy to find that the *Trunk* of a gnat is compoſed of ſeveral pieces, yet it is by no means eaſy to ſay what the number of them is. The beſt microſcopes often ſhew the whole a ſingle body, its ſeveral parts are ſo extremely well joined; and when they have been found to be more than one, it is very difficult yet to ſay how many they are. Lewenhoek imagined them to be four in number; and Swammerdam, who had firſt believed the whole a ſingle filament, afterwards thought he diſcovered ſix pieces going to its compoſition.

After ſeparating the piercer of the gnat wholly from its ſheath, if it be cut tranſverſely near its baſe or inſertion in the head, and the ſection laid upon the plate of a microſcope, and there touched with an extremely fine pointed inſtrument, it may be divided into four, and ſometimes into five ſeparate pieces. Two of theſe may often be ſeen to come out of a third, as out of a canal or tube: the ſeeming neceſſity of a tube in this inſtrument, for the ſucking the blood, has made many ready to perſuade themſelves that they have ſeen one: but if we follow the analogy of nature in her other works, we ſhall find there is no abſolute neceſſity for ſuch an organization in this part; ſince, in the gad-fly, the ſeveral pieces of which the piercer is compoſed are of themſelves able to form a tube for the paſſage of the blood.

The figures of the ſeveral conſtituent parts of this inſtrument are as difficult to be determined as their number; thus much is certain, however, that the points of all the pieces are by no means alike, for ſome are much longer than others.

Out of the immenſe number of gnats that one ſees in ſummer, in wet places, it is eaſy to determine that very few have any chance, even once in their lives, to ſuck the blood of larger animals. The reſt, however, are far from being doom'd to perpetual famine; the herbs of the field afford them a ſufficient nouriſhment; for theſe, like many other of the inſect tribes, are partly carnivorous, partly otherwiſe, and feed equally on fleſh and vegetables. *Reaumur*, Hiſt. Inſect. vol. 4. p. 580. ſeq.

TRUNK-*Manna*. See the article MANNA.

TRUNSCHIBIL, a word uſed by Tournefort, to expreſs the manna Perſicum, called alſo by ſome *Trungibin*; both evidently corruptions of the terenjabin of the Arabians. See the article TRUNGIBIN.

TRUSSED, in the manege. A horſe is ſaid to be *well truſſed*, in French *bien gigoté*, when his thighs are large and proportioned to the roundneſs of the croupe. On the contrary, a horſe with thin thighs, that bear no proportion to the breadth of the croupe, is ſaid to be *ill truſſed*.

TRUTTACEOUS, in zoology, the name of a genus of fiſhes of the trout kind, which are diſtinguiſhed from all other fiſhes by a ſmall fat fin, which they all have near the extremity of the back, and which has no rays or nerves. Of the fiſh of this genus, ſome live only in freſh waters, never entring the ſea or ſalt rivers: others frequent both the freſh and ſalt waters, and are therefore called *anadromi* or *catanadromi*. Theſe leave the freſh waters while young, and go into the ſalt waters to feed and grow, and again return into the freſh rivers at the time of their full growth and ſpawning, that their offſpring may have the ſame advantages themſelves have had, of being hatched into life in freſh water.

The *truttaceous* fiſhes are divided into two orders, thoſe which have, and thoſe which have not teeth. Of the edentulous kind, or ſuch as have no teeth, are the lavaretus, ferra, thymallus, oxyrynchus, and albula; and of the toothed kind, are the ſalmo, umbra, trutta, carpio, *&c.* In diſſection, the *truttaceous* fiſhes have all apophyſes to the pylorus, and are all a high-taſted and fine ſet of fiſh for the table. *Ray*'s Ichthyography, p. 182.

TRY (*Cycl.*)—TRY, at ſea. A ſhip is ſaid to *try*, when ſhe has no ſails but her main-ſail aboard; when her tacks are cloſe aboard, the bowlings ſet up, and the ſheets haled cloſe aft; when alſo the helm is tied cloſe down to the board, and ſo ſhe is let lie in the ſea. And ſometimes when it blows ſo hard that they cannot maintain the main-ſail, as they ſay, that is, cannot bear it out, they make her lie a *Try* under a miſſen-ſail only.

TRYBLION, a word uſed by the old medical writers, to expreſs the pot or diſh in which the medicines uſed in fumigations were placed at the time of uſe.

TRYCHNUS, in botany, the ſame as *Strychnus*, the name of the nightſhade. The Greeks called it τρυχνος, and the Latins, as well as themſelves, often left out the initial σ, as they do in many other words; thus they write *milax* for *ſmilax*, *maragdus* for *ſmaragdus*, *&c.*

Pliny uſes the word *Trychnos* as the proper name of the plant; and Dioſcorides, willing to diſtinguiſh the mad nightſhade from the ſleepy nightſhade, which are the two poiſonous kinds, ſo called from their different effects, calls the one *Trychnos* and the other *Strychnos*. But this is a trivial difference in the name, and would never be eſteemed any difference

ference by thoſe who know the Greek language, in which this is familiarly done without any intent of diſtinguiſhing.

Theocritus mentions the plant *Trychnus*; but he is to be underſtood of a third kind, differing from both theſe poiſonous ones, and bearing an eſculent fruit. This was the plant we now call *lycoperſicon*, or *pomum amoris*. The writings of Theophraſtus warrant the poet in calling this plant, as well as the others, by the common name *ſtrychnus*, or *Trychnus*; for he expreſsly ſays, there are three kinds of *Trychnus*, one which cauſes ſleep, another which cauſes madneſs, both poiſonous, and a third, which is eſculent.

The *poma amoris* are at this time eaten by the Jews with us, and by ourſelves in ſoups, and the like. The Italians, Spaniards, and Portugueſe, all eat them, and eſteem them a very delicate diſh. The later Greek writers have left off the uſe of the word *ſtrychnus*, and uſe the term *melintzanion* for this plant. See the article MELINTZANIUM.

TRYGUM, in ichthyology, the Greek name given by Elian, Athenæus, and Appian, to the fiſh which we call the *paſtinacha marina*, or fire-flaire. Ariſtotle and ſome others write it *tragum*. The fiſh is a ſpecies of the ray, and is accurately diſtinguiſhed by Artedi by the name of the ſmooth-bodied ray, with no fin on the tail, and with a long ſpine ſerrated on the anterior parts. See the article RAJA.

TRYING, in pharmacy, the purifying fat ſubſtances, by means of melting, and ſeparating them from their membranes, *&c.* In the college diſpenſatory, the method laid down for the purifying lard, ſuet, *&c.* is this: Melt them at a gentle fire, with the addition of a little water intermixed, and, when melted, ſtrain them from the membranes. The addition of water in this keeps the fat from burning and becoming black, which it would otherwiſe do; for the water, not being capable of receiving any greater degree of heat than that of boiling, will keep the bottom of the veſſel from growing too hot, much better than the niceſt management of the fire could do. *Pemberton*'s Lond. Diſp. p. 146.

TSAPHARI, in the materia medica of the antients, a name given by ſome to the cadmia, called by Dioſcorides, *placitis*, and by others of the Greek writers, *zonitis* and *onychitis*. It was a flat kind, forming a ſort of coat or cruſt on the walls or ſides of the furnace: hence it had the name *placitis* or *cruſtaceous*; and it was called *onychitis* and *zonitis*, becauſe, when broken tranſverſely, it appeared made up of ſeveral ſucceſſive plates, which had the appearance of ſo many belts or zones. Serapio tells us that this and the botryoide cadmia were dug out of the mines; that is, that they were natural productions; but this is erroneous, and contrary to all the accounts of the antients.

TSHINKA, in the materia medica, a name by which ſome authors have called the clove-tree, the tree which produces the ſpice of that name. *Piſo*. Mant. A. p. 117.

TSIA, in botany, a name taken from the Japoneſe, and uſed by ſome authors for the tea tree.

TSIAM *Pangam*, in botany, a name uſed by ſome authors for the tree whoſe wood is the logwood uſed in dying and in medicine. Hort. Malab. vol. 6. p. 3.

TSIANA *Cua*, in the materia medica, a name given by ſome authors to the coſtus root. Hort. Malab. vol. 4. p. 15.

TSIN, in natural hiſtory, the name given by the Chineſe to a ſtone which they make great uſe of in their manufacture of porcelain ware. It is of a deep blue colour, much reſembling Roman vitriol in appearance, and is found in lead mines, and ſuppoſed to contain ſome particles of lead; its effects being the ſame in the porcelain manufacture as thoſe of ceruſs or white lead; in making the other colours penetrate into the ſubſtance of the veſſels. The deep violet colour that we ſee ſo beautiful on the China ware, is uſually made with this ſtone. They find it about Canton and Peking; but the latter place affords the beſt, and it ſells at greatly the beſt price.

The painters in enamel melt this ſtone in their way, and uſe it very much; they form many beautiful works, by laying it upon ſilver; but it is apt to come off in time. When the *Tſin* is uſed in the porcelain manufacture, it is only uſed to the vaſes that paſs a ſecond baking, and are intended as the beſt kinds.

The *Tſin* is prepared by only beating it to powder, not roaſting it in the common way. They mix the powder with large quantities of water; and ſtirring it together, they let it ſubſide a little to ſeparate any earthy or extraneous matter that might be among it. They then let the powder ſubſide. The water which is thrown away has no colour from this matter; and the powder itſelf is not of that fine blue it was in the lump, but of a pale aſh-colour; but this recovers all its beauty when it is laid on the China, and baked. The ſettlement taken from the water is dried and preſerved in powder, and when it is to be uſed, they only mix it up with gum-water, or a ſolution of glue, and lay it on with a pencil. Obſervations ſur les Coutumes del' Aſie.

TSUBAKI, in botany, a name by which Kæmpfer calls the concellia. See the article CONCELLIA.

TUB (*Cycl.*)—TUB-*Fiſh*, in ichthyology, an Engliſh name given to a ſpecies of the *trigla*, commonly called the *flying fiſh*, and by authors *hirundo*, *corvus*, and *milvus*.

It is diſtinguiſhed by Artedi from the other fiſh of the ſame genus, by the name of the *trigla* with a prickly head, and with three appendages on each ſide to the pectoral fins. This is the only name to be judged ſpecific for this fiſh; for the others are ſo vague in their ſignification, that they have been applied by different authors to fiſh of different ſpecies, and even different genera, which had a power of ſuſtaining themſelves out of the water by means of their long pectoral fins. *Artedi*, Gen. Piſc. p. 74. See the articles HIRUNDO and TRIGLA.

TUBA, in natural hiſtory, a name by which many old authors call the buccinum.

TUBBER, in mining, a name given in Cornwall to that mining inſtrument, which is in other parts of England called a *beele*. It is an iron inſtrument, pointed at each end, and having a hole in the middle for the handle. See the article DIGGING.

TUBBER-*Men*, are, in Cornwall, the people who work with this tool, and who are, from its other name of *beele*, called in other places *beel-men*. See the article BEELE.

TUBE *of a Flower*, among botaniſts. See the article PETAL.

Glaſs TUBES. See the article GLASS *Tubes*.

TUBEL, a word uſed by ſome chemical writers to expreſs ſcales of copper or braſs.

TUBEROUS, or TUBEROSE *Roots*, among botaniſts, ſuch as are large and fleſhy, thicker than the ſtalk of the plant, of an irregular figure, and wanting the characters of the bulbous. See the article ROOT.

TUBERA, *Truffles*, in botany, the name of a genus of plants, the characters of which are theſe; they are of a fungous fleſhy ſtructure, and are of a roundiſh figure, growing ſometimes ſingle, ſometimes many together, and always remaining under ground.

The ſpecies of *Truffles* are only two. 1. The common *Truffle*; and 2. The teſticulated *Truffle*. *Tourn.* Inſt. p. 565. See the article TRUFFLE.

TUBIPORA, in botany, the name given by Linnæus to the ſea plants uſually called by authors *tubularia*. See the article TUBULARIA.

TUBOR *Terræ*, a name uſed by ſome botanical authors for the cyclamen or ſow-bread. *Ger.* Emac. Ind. 2.

TUBULARIA, in botany, the name of a genus of plants, the characters of which are theſe: That it grows under water, and is of the ſtony hardneſs of coral, and compoſed of a congeries of hollow pipes or tubes.

There is only one known ſpecies of this, which is the purple *Tubularia*. *Tourn.* Inſt. p. 575.

TUBULARIA *Foſſilis*, in natural hiſtory, the name of a ſpecies of coral found very often foſſile in Germany and Italy, and compoſed of a great number of tubes, or longitudinal pipes, often reſembling ſo many worms ranged perpendicularly in the maſs. See Tab. of Foſſils, Claſs 7.

They are uſually found either in maſſes of a lax ſtone, or in ſingle tubules in thoſe of the harder and firmer texture. In theſe two ſtates this foſſil makes two very different appearances; and, according to the different directions in the maſs, or the different views of them that the ſections of it place them in, they make a number of very elegant figures. *Hill*'s Hiſt. of Foſſ. p. 641.

TUBULATED *Flower*, *Tubulatus Floſculus*, in botany, a term uſed by authors to expreſs thoſe ſmaller flowers, a great number of which go to compoſe one large compound flower. Theſe are called tubulated in diſtinction from another kind of them, which are, from their ſhape, called ligulated. The tubulated floſcules generally compoſe the diſk, and the ligulated ones the radius of the compound flowers. The tubulated ones are formed into a hollow cylinder, which expands into a mouth at the top, and is divided into five equal ſegments, which ſtand expanded, and in ſome meaſure bent backward. See Tab. 1. of Botany. Claſs 1.

TUBULUS (*Cycl.*)—TUBULI *Concamerati*, in natural hiſtory, the name of a genus of the *Tubulus marinus*, diſtinguiſhed abundantly from all the others by its figure and inner ſtructure.

They are long ſhelly bodies, uſually either of a conic or cylindric form, or elſe reſembling the dentales in ſhape; and ſometimes, but that very rarely, they have their ſmaller end bent and twiſted round. They are compoſed within of a number of hollow compartments, each of which communicates with the next by means of a ſiphunculus, which runs through the whole length in the manner of the thick nautilus, or the cornu ammonis. We know not theſe in their recent ſtate at this time, but frequently meet with them foſſile in the ſtones brought from Sweden for pavements, and in ſome others.

Some authors have called theſe by the name *alveoli*, confounding them with the conic body found in the belemnitæ. See ALVEOLUS. Others have called them *pyramidal entrochi*, others *obeliſci marmorei alveolares*; and they are the bodies deſcribed by Geſner and Aldrovand under the names of *lapides caudæ cancri* or *cancrites*. Some late authors have called them alſo *polythalamii*, and other *cone-ſtones*. *Klein.* de Tubul. p. 7.

TUBULI *Foſſiles*, in natural hiſtory, the name given by authors to the caſes or *tubules* of ſea-worms, found buried in the earth.

They

They are in their native ſtate of very various kinds, but by different accidents attending them in their accidental one, they are ſubject to a multitude of other appearances. They are found of very various ſizes, ſometimes compleat, and buried in the ſtrata of earth or ſtone; ſometimes they are more or leſs perfect, and are immerſed in maſſes of the *ludus helmontii* or *ſeptariæ*, and in this ſtate, they make one kind of *lapis ſyringoides*, or pipe-ſtone; but the moſt beautiful *ſyringoides*, or pipe-ſtones, are the parts of the bottoms of ſhips, or poſts fixed in the ſea, which have been pierced, in their original ſtate of wood, by theſe ſea worms, and afterwards, petrified with the caſes or *Tubuli* of the worms remaining in them; theſe are uſually of a pale yellow or whitiſh wax colour; and the body of the maſs of a browniſh or blackiſh hue, but retaining the ſtructure of the wood: of theſe, there are beautiful ſpecimens in great abundance on the ſhore of the iſland of Sheppy. We have the very ſame ſubſtances alſo buried in our clay-pits, about London and at Richmond; but in theſe the wood is highly ſaturated with the matter of the common vitriolic pyrites, and the pipes often filled with the ſame ſubſtance.

Thoſe *Tubuli* called *dentalia* and *entalia* are not leſs frequent, and are found of various ſizes; ſmall ſmooth ones are common in our clay-pits about London; and the larger ſtriated ones are not unfrequent in the hills of Yorkſhire; but they are much more plentiful in thoſe of France and Italy. *Hill*'s Hiſt. of Foſſ. p. 648.

TUBULUS *Marinus*, or *Canalis*, in natural hiſtory, the name of a genus of univalve ſhell-fiſh; the characters of which are theſe: It is of an oblong figure, terminating in a point, and hollow within; ſo that it reſembles a tube or horn. Theſe are alſo called by the older writers *dentalia*, from their reſembling the tooth of a dog.

It has been a common error of authors to confound under the general name of *Tubulus marinus*, theſe ſhells, and thoſe very different ones of the *vermiculi marini*, which make a number of pipes or tubes joined together; theſe by their number and joinings, have induced a late French author to place them among the multivalve ſhells, while the *canales* are uſually ſingle and ſeparate, and can have no title to any claſs, but the tubular univalve one. Aldrovand obſerves, that the *Tubuli* called *dentalia*, and thoſe called *antalia*, differ only in ſize; and he thinks they have no title to the name *conchæ*, ſince they are neither of the nature of the common bivalve, nor univalve ſhells, ſuch as the patella and *auris marina*; but this is very idle, ſince by this rule the ſnails, and many other families, might be excluded as well as theſe. This author ſays, in another place, that the *antale* is formed of many circumvolutions; whence he ſeems to have taken in the *buccina* under this name; but later writers have more nicely diſtinguiſhed in theſe caſes. The ſea pencile is evidently of this genus, tho' extremely different from all the other ſpecies of it, in having its head pierced with a multitude of holes, in the manner of the head of a watering pot. Some authors, from the figure of the ſhell, call this *phallus marinus*, and the French call it *le priape*. *Aldrovand*, de Teſtac. l. 3. p. 382.

Of this general claſs of the *Tubuli* or *Canales*, there are four ſubordinate diſtinctions: 1. Some are ſtriated. 2. Some are ſtrait. 3. Some are bent like a horn: and, 4. Some are ſmall and even on the ſurface, and are bent a little into a figure approaching to that of a creſcent; theſe are now called by many *antalia*.

Of the ſtriated *Canalis*, we ſeem to have at preſent only one known ſpecies; tho' this varies ſo greatly in ſize and colour, that it might in its ſeveral ſtates be miſtaken by many for ſeveral ſpecies. There is alſo another very different form it aſſumes in our cabinets; this is owing to its being poliſhed, the ridges being by this manufacture taken off, and the ſhell made to appear extremely different.

Of the ſtrait kind we ſeem alſo to have only one ſpecies, tho' varied by accidents into ſeveral different appearances.

Of the crooked kinds we have. 1. The horn *Canalis*: this is a *Tubulus marinus* exactly of the ſhape of a horn moderately inflected. 2. The root-ſhaped *Canalis*. 3. The biſtort *dentalia*, or *Canalis*, of the figure of the biſtort-root. 4. The rape-*dentalia*, or *Canalis*, of the figure of the rape-root. 5. The *Canalis*, called vulgarly *dens-canis*, or the dog-tooth ſhell. 6. The *dens elephantis* or elephant's-tooth ſhell. 7. The whitiſh *Canalis*. And, 8. The greeniſh *Canalis*. To theſe is to be added, the *phallus* or *priape* of the French; called alſo by ſome of that nation the *arroſoir* or watering-pot; it is an oblong and ſtrait ſhell, with the head pierced full of ſmall holes like the head of a watering-pot.

Of the *Canalis* called by the French *antales*, we have only two ſpecies. 1. The white: And, 2. The yelloviſh *antalis*. Hiſt. Natur. Eclairc. P. 2. p. 245. See the articles PENICILLI *Marini*, DENTALIS, SOLEUS, BELEMNITES, and TUBULUS *concameratus*.

TUBULOSE-*Leaf*, among botaniſts. See the article LEAF.

TUCANA, in zoology, a name given by ſome to the toucan, a very remarkable American bird of the magpye-kind; but having a beak as long and thick as its whole body. *Ray*'s Ornithol. p. 88. See the article TOUCAN.

TUCK *of a Ship*, the truſſing or gathering up the quarter under water; which if ſhe lie deep, makes her have a broad, or as they call it, fat quarter, and hinders her ſteering, by keeping the water from paſſing ſwiftly to her rudder; and if this truſſing lie too high above the water, ſhe will want bearing for her works behind, unleſs her quarter be very well laid out.

TUFECSI, a body of the Spahis, or horſe, in the ſervice of the Grand Seignior. *Pocock*'s Egypt, p. 166.

TUFFO, in botany, a name given by the people of Guinea to a plant common in that country, and uſed in decoction to waſh ſore eyes with. It is of the ſun-flower kind, and is called by Petiver, *flos ſolis Guineenſis folio ſcabro flore minore*. It much reſembles ſome of the American ſun-flowers. Philoſ. Tranſ. N°. 232.

TUFTED *Duck*, in zoology, the Engliſh name for the *capo negro*, a ſpecies of duck with a blackiſh head, and a tuft of feathers hanging from it. See the article CAPO *Negro*.

TUGUS, in botany, the name of a ſweet aromatic plant, much eſteemed in the eaſtern parts of the world, and ſuppoſed by father Camelli, who very ſtrictly compared it with the accounts given by Dioſcorides and the antients of their amomum, to be that very plant. The cluſtered manner of growing of the fruit, together with its oblong ſhape, and the aromatic taſte of the ſeeds, ſeem greatly to countenance this opinion.

The *Tugus* is a plant of conſiderable height, growing up ſometimes to eight or nine cubits. Its leaves are of an oblong form, marked with large veins and ribs, covered with a ſoft hoary down underneath, and of a very agreeable aromatic ſmell. The flowers are red, and grow in cluſters, of a hand-breadth or more in length, in a kind of ear, ariſing either from the root, or from the main trunk of the plant. The fruit follows theſe flowers, and is no other than the inflated or enlarged cup of the flower, containing the ſeeds: this makes but a very thin and tender covering for them; and they, being delicious to the taſte, are much ſought after by birds, inſects, and field mice. One or other of theſe creatures uſually devours them before they become really ripe; and this makes the fruit ſcarce, even in the places where the plant grows, ſince very little of it can be collected.

Each fruit of the *Tugus* contains five or ſeven ſeeds; theſe are of an oblong figure, of a reddiſh colour, and of an agreeable aromatic taſte, but not too acrid.

The natives ſeem as fond of theſe, as the antients were of the amomum; and the young women ſtring them on threads, and wear them as bracelets; ſometimes they make the bracelets of the ſeeds alone; but more uſually they ſtring them alternately with pearls, and pieces of red coral: theſe bracelets they call *caropi*, as well as the fruit itſelf.

In ſome places, where the *Tugus* is ſcarce, they uſe the ſeeds of the abelmoſch, the cannacorus, or the ſago, inſtead of theſe of the *Tugus*; but the true are much more eſteemed. They are ſuppoſed, when worn by way of a necklace, to keep off the effects of a bad air, and to preſerve them from the bites of ſerpents or the centipes. If not a preſervative, they are however found, upon experience, to be a very good remedy in the laſt caſe, the common application for the bite of this animal being ſome of the ſeeds of the *Tugus* chewed in the mouth to a ſort of paſte.

The cluſter of fruit of the *Tugus*, or true amomum, when newly formed and unripe, ſomewhat reſembles the pſeudo-amomum of Garcias; but this likeneſs wears off as they ripen. Camelli, who hath given this excellent account of the *Tugus*, has added a figure of it in the Philoſophical Tranſactions, from which ſome at firſt ſight may object to the juſtice of his making it the ſame plant with the amomum; ſince Dioſcorides, and from him Pliny, affirm the leaves of the amomum plant to be like thoſe of the pomegranate; this no more agrees with his figure, than with his general deſcription of the common leaves of the *Tugus*, which are not at all like thoſe of that tree, but greatly larger and longer in their ſhape: but this is a difficulty eaſily cleared up, by obſerving that Dioſcorides, Pliny, and the reſt of the antients, when they deſcribe the amomum, never concern themſelves about the plant which produces that precious fruit, which probably they never ſaw; but all they mean by its leaves, are thoſe ſmall and ſhort leaves which they found adhering to the cluſter of the fruit, as brought over to them for ſale. Theſe are the leaves of the ear only, and theſe are not unlike thoſe of the pomegranate, on the plant while growing. Philoſ. Tranſ. N°. 248. p. 2.

TUI, in zoology, a name by which ſome call the *paroquette*.

The word is originally Braſilian; and the names of ſeveral of the Braſilian ſpecies of this bird, deſcribed by Marggrave, have the word *Tui* as a part of them; as the *tuiete*, the *tuipara*, the *tuitirica*, and *tuiaputejuba*. See the article TUIETE, *&c.*

TUIAPUTEJUBA, in zoology, the name of a Braſilian ſpecies of paroquette, all over of a green colour, but in different ſhades, very deep on the wings, very pale and ſomewhat yelloviſh on the belly, and of a faint colour all over the reſt of the body. Its tail is very long; it is about the ſize of a ſwallow;

ſwallow; its eyes are large and black, and have a circle of yellowiſh green feathers round them, and over the beak, which is black and crooked; and on his head he has one ſpot of gold yellow feathers. *Marggrave*'s Hiſt. Braſil.

TUIETE, in zoology, the name of a Braſilian ſpecies of paroquette, of the ſize of a lark, and all over of a pale green colour, variegated with blue. The origin of its wings is blue, as are alſo all the ends of the wing-feathers, ſo that when the bird ſits ſtill, there is, as it were, a blue line ſeen running down each ſide; on its rump there is alſo a blue ſpot; its tail is but ſhort; its beak ſmall, crooked, and of a pale red; and its legs and feet grey. *Marggrave*'s Hiſt. Braſil.

TUITIRICA, in zoology, the name of a Braſilian paroquette, which is a little larger than the common kind; all over of a fine beautiful green, but deeper on the back and wings than elſewhere. Its beak is very hooked, and of a pale red; its eyes black, and its feet blue; its tail is but a little longer than the wings when cloſed. This is a ſpecies much eſteemed in the Braſils, as it eaſily learns to talk, and becomes ſo tame, as to eat out of any one's mouth. *Marggrave*'s Hiſt. Braſil.

TULACUM, in natural hiſtory, a name given by the people of the Eaſt Indies to a ſpecies of yellow orpiment, of the coarſer kind, variegated with red. They prepare this by ſeveral calcinations, and then give it internally in fevers, and many other diſorders, eſteeming it a ſort of panacea. They ſay that gold may be extracted from it, which is not improbable; for it is well known, that ſome of the Roman emperors did actually procure gold from one of the other kinds of orpiment, which is now found at Goſſelaer in Saxony.

TULIP, *Tulipa*, in botany, a large genus of plants, the characters of which are theſe: The flower is of the liliaceous kind, and is compoſed of ſix leaves, and ſomewhat of the form of a pitcher; the piſtil occupies the center of the flower, and finally becomes an oblong fruit, divided into three cells, which contain flat ſeeds, arranged in a double order; the root is tunicated, and the fibres grow from its bottom.

The ſpecies of *Tulip*, enumerated by Mr. Tournefort, are theſe: 1. The yellow early-flowering *Tulip*. 2. The red early *Tulip*. 3. The purple early *Tulip*. 4. The amethyſtine early *Tulip*. 5. The early *Tulip*, with a duſky blackiſh purple flower. 6. The purple *Tulip*, with a pale cup. 7. The bright red *Tulip*, with a yellow cup. 8. The early white *Tulip*. 9. The early ſcarlet *Tulip*, with pale red edges, and red heart-faſhioned ſpots at the bottoms of the leaves. 10. The early *Tulip*, with a crimſon and red flower. 11. The variegated amethyſtine early *Tulip*. 12. The early *Tulip*, with a bright red flower, with white edges. 13. The early crimſon *Tulip*, with white edges. 14. The variegated white and reddiſh early *Tulip*. 15. The early variegated red *Tulip*. 16. The variegated roſe-coloured many-flowered early *Tulip*. 17. The early yellow variegated *Tulip*. 18. The early yellow *Tulip*, with red edges. 19. The early *Tulip*, of a blended red and yellow colour. 20. The beautiful ſcarlet *Tulip*, with yellow edges. 21. The broad-leaved yellow *Tulip*, with crimſon edges. 22. The yellow *Tulip*, with edges ſtriated with red, and a green bottom. 23. The yellow *Tulip*, with numerous ſmall ſpots. 24. The yellow *Tulip* with gold-coloured ſpots. 25. The yellow *Tulip*, with roſe-coloured edges. 26. The yellow *Tulip*, with red ſpots. 27. The yellow *Tulip*, with a red mark near the cup. 28. The yellow *Tulip*, with bright red ſpots. 29. The greeniſh yellow *Tulip*. 30. The pale lemon-coloured *Tulip*, with green ſtreaks on the back. 31. The brimſtone coloured *Tulip*, with deep red edges, and roſe-coloured ſpots near the ſtamina. 32. The bright ſtraw-coloured *Tulip*, with red edges. 33. The early purple variegated *Tulip*. 34. The roſe-coloured *Tulip*, with yellow veins. 35. The bright red *Tulip*, with greeniſh ſtreaks. 36. The *Tulip*, with reflex flowers of a bright red throughout within, and on the outſide of a greeniſh colour, with a bright vermillion edge. 37. The early white *Tulip*. 38. The white *Tulip*, with green veins. 39. The white *Tulip*, with roſe-coloured ſpots. 40. The white *Tulip*, with broad red ſpots. 41. The white *Tulip*, with red edges. 42. The ſilvery white *Tulip*. 43. The yellowiſh white early *Tulip*, with long red ſtreaks. 44. The reddiſh white *Tulip*, with red edges. 45. The white wide-open *Tulip*, with red ſtreaks. 46. The early narrow-leaved *Tulip*. 47. The early hyacinth-leaved *Tulip*. 48. The late flowering yellow *Tulip*. 49. The plain gold yellow *Tulip*. 50. The yellow *Tulip*, variegated with red and green. 51. The late-flowering ſcarlet velvety *Tulip*. 52. The late globoſe *Tulip*, ſpotted with gold colour. 53. The white *Tulip*, with a ſcarlet edge. 54. The white *Tulip*, variegated with a yellowiſh purple, and with yellow bottoms to the leaves. 55. The ſnow-white *Tulip*, with purpliſh-red edges. 56. The ſnow-white *Tulip*, with deeper purple edges. 57. The late-flowering ſtellate *Tulip*. 58. The changeable white-flowered *Tulip*, with red edges. 59. The ſcarlet *Tulip*, with white edges. 60. The late-flowering globoſe vermillion *Tulip*. 61. The late deep red *Tulip*. 62. The red changeable *Tulip*, with greeniſh ſpots in the middle of the petals. 63. The great branched late-flowering *Tulip*. 64. The ſmaller late-flowering branched *Tulip*. 65. The late green-flowered *Tulip*. 66. The late green *Tulip*, with double flowers. 67. The late flowering green *Tulip*, with white edges. 68. The late *Tulip*, with double red flowers. 69. The double late yellow *Tulip*. 70. The large dubious *Tulip*. 71. The largeſt dubious *Tulip*. 72. The middle-ſized dubious *Tulip*, with ſulphur-coloured flowers. 73. The yellow *Tulip*, with bright red ſpots. 74. The yellow *Tulip*, with red edges. 75. The large dubious *Tulip*, with orange-coloured flowers. 76. The middle-ſized dubious *Tulip*, with variegated flowers. 77. The *Tulip* which bears bulbs in the alæ of the leaves. 78. The dwarf broad-leaved white *Tulip*. 79. The dwarf broad-leaved yellow *Tulip*. 80. The dwarf broad-leaved red *Tulip*. 81. The dwarf narrow-leaved *Tulip*. 82. The dwarf graſſy-leaved *Tulip*. 83. The little yellow Italian *Tulip*. 84. The ſmall broad-leaved *Tulip*. 85. The little red *Tulip*. 86. The cottony cretic *Tulip*. 87. The little French yellow *Tulip*. 88. The little yellow and purple *Tulip*. 89. The Perſian variegated *Tulip*. 90. The Candey *Tulip*, with ſhining leaves. 91. The middle-ſized changeable *Tulip*, with curled leaves adhering to the baſe of the flower. 92. The many-leaved yellow *Tulip*, called by ſome the monſtrous double yellow *Tulip*. And 93. The great yellow *Tulip*, with jagged flowers, and ſpots of yellow and blood-red, in different parts of them. *Tourn.* Inſt. p. 373. ſeq.

The characters of a good *Tulip* are theſe: 1. It muſt have a tall and ſtrong ſtem. 2. The flower ſhould conſiſt of ſix leaves, three within, and three without; and the former ſhould be larger than the latter. 3. The bottom of the flower ſhould be proportioned to the top, and the ends of the leaves ſhould be rounded, not pointed. 4. The leaves, when opened, ſhould neither turn inward, nor bend outward, but ſtand erect; and the whole flower ſhould be of a middling ſize, neither too large, nor too ſmall. 5. The ſtripes muſt be ſmall and regular, and ſhould all ariſe from the bottom of the flower: The chives alſo ſhould not be yellow, but of a brown colour.

Tulips are generally divided into three claſſes, according to their times of flowering; the early, the middling, and the late.

The early ones are not near ſo high as the late, but they are valued for their earlineſs, as they flower in February. The roots of theſe are to be planted in the beginning of September, under a warm pale or hedge. The proper ſoil for them is paſture-land with the turf rotted among it, and a mixture of one fourth part ſand; this ſhould be laid about ten inches deep, and ſhould be renewed every year. If the weather is very ſevere when they firſt appear, they ſhould be covered with mats; as alſo at nights, when they are in flower, if it be very froſty. When their flowering is over, and their leaves decay, the roots ſhould be taken up and laid in a dry place, and afterwards cleaned and laid up in a ſafe place from vermin, till the September following.

The late blowers are propagated from what they call breeders, which are plain flowers, brought over principally from Flanders, which is the great mart for flower-roots; and theſe by culture, are changed into ſtriped and variegated ones. They are alſo propagated by ſowing the ſeeds; but this requires great care, as in the raiſing all the other fine flowers from ſeeds.

The ſeeds muſt be ſaved from the choiceſt flowers, and ſowed in ſhallow pans or boxes of earth, in September. The ſpring following they appear like the leaves of graſs, or young onions, and after ſtanding two or three months theſe decay. The boxes are to be kept clear of weeds, and removed to different ſituations where they may enjoy the morning-ſun, and be defended from ſharp winds and froſts; at the Michaelmas of the following year they are to be removed out of the boxes into beds, where they ſhould be planted two inches deep, and at two inches diameter from one another. In October, an inch depth of new earth ſhould be ſifted on them, and they are to remain two years in theſe beds; at the end of this time they will flower, and the beſt of them muſt be marked with ſticks, that their roots may be diſtinguiſhed when the leaves are decayed.

But there is no judgment to be paſſed either on *Tulips*, or any other flowers, on their firſt flowering; becauſe the next year the good ones are often found to have degenerated, and the bad to have improved: After this, however, they may be concluded good or bad.

The breeders, as they are called, being thus raiſed, are to be ſhifted every year into freſh earth, and they will in time break out into very fine ſtripes. The earth they are planted in ſhould be every year of a different kind, and the beſt general ſoil is made of a third part paſture-land with the graſs rotted in it, a third part fine ſea-ſand, and a third part lime-rubbiſh; theſe ſhould be mixed half a year before they are uſed, and often turned. The beds muſt be laid eighteen inches deep with this earth. This ſhould be laid in firſt ten inches thick, and on this the roots ſhould be placed in regular order, and at even diſtances; and then the other eight inches ſhould be laid over theſe, the top of the bed being a little rounded to throw off the wet. Thus they are to remain till the buds appear, and then if the nights are very ſevere they are to be ſheltered by covering them with mats. The flowers which break out into fine ſtripes here, ſhould be ſeparated

afterwards from the reſt, and if they hold on their beauty to the laſt, which the floriſts call dying well, they will never return to plain flowers again; and the off-ſets from the roots of theſe will always produce ſuch flowers, and often more beautiful than thoſe of the parent root.

When the *Tulips* have flowered, their heads ſhould be broken off to prevent their ſeeding, which would make them flower much the worſe the next year. *Miller*'s Gardener's Dict.

The Dutch have always been admirers of flowers, and before the preſent faſhion of cultivating the auriculas and carnations came up among them to the height it now is at, they took the ſame care of *Tulips*. The prices they ſold theſe at among one another, are amazing. Munting tells us, that in the years 1634, and the four or five following, they not only purchaſed them at extravagant rates beyond credibility, but many of the burghers, ſhopkeepers and tradeſmen, quitted their ſhops and trade, and addicted themſelves ſolely to the culture and cure of their *Tulips*. The fineſt of them were then valued above gold or gems; and there is an account of one bargain for the purchace of that *Tulip* which they call the viceroy, preſerv'd: The perſon who purchaſed this, not having money, paid for it the following things; two laſts of wheat, four laſts of rye, four fat oxen, twelve fat ſheep, eight fat hogs, two hogſheads of wine, four tons of beer, two ton weight of butter, a thouſand pound weight of cheeſe, a bed, a ſuit of cloaths, and a large ſilver beaker; the whole valued at two thouſand five hundred gilders. We have another account about the ſame time, of twelve acres of good land offered for one *Tulip* root. And at a publick ſale of a private perſon's collection there was made ninety thouſand gilders. This madneſs would have run yet higher among them, but the ſtates at length took it into conſideration, and finding it very detrimental to ſubſtantial and neceſſary trade, put a ſtop to it, and reduced the price. *Munting*. de Plant.

TULIP-*Tree*, a very beautiful American tree, which produces flowers ſuppoſed like thoſe of the *Tulip*. Theſe trees uſed to be kept in tubs, and houſed in winter with great care; but ſome of them having been planted out in the open air at Lord Peterborough's at Fulham, they throve much better than thoſe which were ſo carefully nurs'd up, and ſoon produced abundance of flowers.

The tree is commonly found wild in all the northern parts of America, where its timber is of very great uſe. The flowers are not in reality much like thoſe of the *Tulip*, tho' vulgarly ſaid to be ſo. The flowers are ſucceeded by canes, which are often ſent over from America; and the trees are frequently raiſed with us, from the ſeeds contained in them. The ſeeds muſt be taken out of the canes in ſpring, and ſown in pots of light earth, which muſt be placed in a back bed, and covered with mats, and frequently refreſhed with a little water. When the young plants appear, they ſhould be placed, during ſummer, in a ſhady ſituation; and in winter they ſhould be put into a frame, where they may have the benefit of the open air in mild weather, and be ſheltered from ſeverity of froſts. In the ſpring following, the plants ſhould be tranſplanted into ſmall pots, and taken the ſame care of for four years, as while they were in the ſeed-pots; after this they will be ſtrong enough to tranſplant finally into the places where they are to remain: it ſhould be planted on a light loamy ſoil near other trees, but not over-ſhaded by them. Some raiſe them from layers, but they are two or three years before they take good root, and then never make ſuch ſtrait and regular trees. *Miller*'s Gardiner's Dict.

TULIPIFERA, a name given by Cateſby, to the *liriodendron*. See the article LIRIODENDRON.

TULOS, a word uſed by ſome medical writers to expreſs a callus.

TUMBABA, a word uſed by chemiſts, to expreſs *ſulphur vivum*, or crude ſulphur.

TUMBALA, a word uſed by ſome authors, to expreſs the *ſquammæ* or ſcales of any metal.

TUMBLER, (*Cycl.*) a name given to a particular ſpecies of pigeon, called by Moore the *columba revolvens*.

It has its name from its peculiar property of *tumbling*, when it is in the air, which they are very fond of doing; and effect exactly in the ſame manner as our poſture-maſters do it; by throwing themſelves over backward. It is a very ſmall pigeon, and is always ſhort bodied, full breaſted, thin neck'd, narrow beak'd, and has a ſmall ſhort head; the iris of the eye in this ſpecies, is uſually of a bright pearl-colour.

The Engliſh *Tumbler* is uſually of one plain colour; black, blue, or white: the Dutch is much of the ſame make, but has different colours, and is feathered on the legs ſometimes; it has alſo a larger head, and thin ſkin round the eye. Some of the fineſt pigeons of this ſort are bred from a mixture of the Dutch and Engliſh kinds. Theſe pigeons are remarkable for the height they fly to; they never ramble far from home, but will riſe almoſt perpendicularly, till they appear no larger than a ſparrow, or become quite out of ſight; they will often keep at this height five or ſix hours, and then come gradually down again: they never tumble when they are at any great height, but only as they aſcend or come down again. There are particular times alſo, at which theſe birds will take much higher flights than at others; but they ought to be kept by themſelves, and practiſed to it by the company of one of their own ſpecies; for if they mix while young, with other pigeons, they will learn to fly as they do: a flight of a dozen of theſe birds ſent out together, will keep ſo cloſe, as to be all in a compaſs that might be covered with a handerchief; but they ſhould never be turned out in foggy weather, or in high winds; in the firſt caſe, they loſe ſight of their home, and perhaps never find it again; and in the others, they are blown away; and if they return, it is not till another day; in the mean time lying out, they are in danger of cats, and other accidents.

Laſtly, the hen ſhould never be turned out with egg, for ſhe is then ſick, and not fit for flying; and beſide often drops her egg, and the breed is loſt by it. *Moore*'s Columbarium, p. 39.

TUMEX, in the materia medica of the antients, a name given by authors to a ſort of tutty, the ſame with the *cadmia placitis* of Dioſcorides and the Greeks. This was a worſe kind than the *botrytis*. The *botrytis* was formed on the roof of the furnace, and hung down thence in form of cluſters of grapes; this was the pureſt kind.

The *Tumex* or *cadmia placitis*, was a heavier and coarſer ſort, which not being volatile enough to aſcend to the top of the furnace, applied itſelf to the ſides, and there formed a ſort of coat or cruſt, which was taken off at times, and reſerved for the more common uſes. This ſort of cadmia, being formed by the ſucceſſive application of new coats of matter, at different times, was found to be of a cruſtated texture, when broken tranſverſely, and reſembled, in ſome ſort, the onyx, with its different zones or belts. It was therefore called by ſome, *cadmia onychites*; and by Aviſenna *mantheca*, which ſignifies in the Arabian, *zonites*, or compoſed of plates or zones.

TUMORS *of the Breaſts*, *Mammarum* TUMORES. *Tumors* and inflammations of the breaſts are a diſorder that very frequently afflicts child-bearing women, and almoſt conſtantly happens, in ſome degree, a few days after their delivery.

If the milk be impelled into the breaſts too plentifully and forcibly, which frequently happens at that time, and the mother be at the ſame time ſeized with a violent cold, or indeed be but affected by any violent paſſions, the veſſels become obſtructed, and the breaſts tumified, with great heat, redneſs, reſiſtance, and violent pain. The ſame thing happens alſo very frequently to women who give ſuck after their lying in, and often to ſuch whoſe milk is very ſmall in quantity. Women at other times are alſo ſubject to them, and even men have been known to have the ſame diſorder, from no other cauſe than a great fright. One breaſt of a man, opened on ſuch an occaſion, has afforded above two pounds of matter. This ſort of abſceſs is uſually attended with a fever, thirſt, head-ach, and difficult reſpiraton, and is often preceded by ſhiverings.

Tumors of this kind are generally prevented in thoſe who do not intend to ſuckle their children, by applying, ſoon after their delivery, plaſters of ſperma-ceti warm, all over the breaſts, but perforated with a hole for the nipples. A moderately tight bandage ſerves alſo as a help to keep away milk; and cooling plaſters are of ſervice to the ſame purpoſe, applied between the ſhoulders. But if the lying-in woman intend to ſuckle the child, there is no better way to prevent theſe *Tumors*, than very carefully to avoid colds, and violent paſſions of the mind, and to let the child ſuck very frequently, to prevent the milk from ſtagnating. Plenty of ſmall broth, and thin fluids, muſt alſo be taken, which will prevent the milk, for the firſt two or three weeks, from being too abundant, or from ſtagnating in the breaſts. But when the milk has once ſtagnated, and a *Tumor* is begun, all endeavours are to be uſed to diſcuſs what has ſtagnated in the ſmall veſſels, with all poſſible expedition, both by internal and external remedies, in order to prevent the *Tumor* from running to a ſuppuration, or into a ſchirrus.

The beſt external application, on theſe occaſions, is the ſperma-ceti plaſter, covered with a warm bag, or cataplaſm of ſalt and bran, or of chamomile, elder, and melilot flowers. The carminative ſeeds of fennel, anniſe, *&c.* are alſo very good external applications over a plaſter, on theſe occaſions. A calf's bladder, filled with a warm decoction of elder and chamomile flowers in milk, applied to the breaſt, and renewed as often as neceſſary, is alſo found of excellent ſervice. Theſe not proving ſufficient, recourſe muſt be had to Venice treacle, rob of elder, litharge vinegar, cummin vinegar, and lime water, which muſt be all applied hot to the breaſts by means of linnen cloths dipped into them, and put to the breaſts, as warm as can be conveniently borne.

If the breaſts are very full of milk, part of it muſt be diſcharged by ſucking, or by a glaſs pipe; and this, with the other means, often repeated, till the pain and *Tumor* diſappear.

If the *Tumor*, however, proves large, and will not be diſperſed in four or five days by theſe methods, or when, as it very frequently happens, the ſurgeon is called in too late to put this method in practice, the beſt method is to forward its maturation and ſuppuration as quick as poſſible, leſt it turn to

a ſchirrus or cancer by delay. The plaſter of diachylon, with the gums, or ſome other ſuch ripening plaſter is to be applied forthwith; and with all convenient ſpeed the proper cataplaſms are to be uſed, to digeſt the matter; theſe are to be applied hot to the breaſts, and very frequently renewed, keeping them on with large compreſſes and bolſters, the better to retain the heat. The *Tumor*, when the matter is ripe, will by this means either break of itſelf, or elſe it muſt be opened by the ſcalpel, the inciſion being always made in the lower part of the breaſt; and after the matter is all diſcharged, the wound is to be cleanſed with the common digeſtives, incarned with the ſarcotic, and healed with the balſam of Peru, or ſome other ſuch vulnerary balſam. But where the ſuppuration has run very deep, the wound muſt be waſhed by means of a ſyringe, with vulnerary decoctions; and to prevent the opening from cloſing, before the bottom is healed, and filled up with new fleſh, a ſort of tent of ſcraped lint muſt be introduced, which may be ſhortened at every dreſſing, as the wound fills up, and at length wholly laid aſide. *Heiſter*'s Surgery, p. 187.

Encyſted TUMORS, *Tumors* ariſing in different parts of the body, but contained in certain membranous coats: Theſe are ſometimes harder, ſometimes ſofter, of a paliſh colour, and uſually attended with little pain. Theſe *Tumors* ariſe from obſtructions either in the glands, or in the adipoſe membrane, more eſpecially about the face and neck, where they occaſion great deformity.

The membranous coat with which theſe *Tumors* are inveſted, is often of a conſiderable thickneſs, and is uſually the coat of the diſordered gland, or ſome of the adipoſe cells. At their beginning they are uſually very ſmall and moveable; but encreaſing by ſlow degrees, they grow ſometimes to an enormous bulk.

The conſiſtence of ſome of theſe *Tumors* is ſoft and fluctuating, and of others more hard and firm. They are of all ſhapes and ſizes, and ſome of them become hard as a callus, and unmoveable, while others are, for the generality, ſoft and moveable.

They are diſtinguiſhed according to the conſiſtence of their contents; ſome are called *atheromata*, from their contents reſembling paſte, others, which have them of the conſiſtence of honey, are called *meliceres*; but if they are of a fatty ſubſtance, like ſuet or lard, they are called *ſteatomata*. If they happen in a gland which becomes indurated, they are called *ſchirrous*; and laſtly, when they are of a fleſhy conſiſtence, they are called *ſarcomata*. Some of theſe *Tumors* have been found alſo full of hair.

They are diſtinguiſhed by others according to the places where they are ſituated. Thoſe ſeated under the ſcalp are called *talpa*, *teſtudo*, or *lupia*. Thoſe in the neck, *ſtrumæ* or *ſcrophulæ*; and thoſe in the hands and feet, eſpecially if among the tendons, are called *ganglions*.

There is no general method for the cure of them; but the ſurgeon, according to their different circumſtances, attempts this by diſcuſſion, ſuppuration, or extirpation. *Heiſter*'s Surgery, p. 323.

Fungous TUMOURS, in ſurgery, are a ſort of ſwellings much approaching to the nature of the œdema, and are often diſorders of very bad conſequence.

Theſe are *Tumors* of a limb, taking their riſe at the joint; they look pale, are void of heat and pain, eaſily yield to the preſſure of the fingers, but riſe again inſtantly on removing the finger, leaving no pit or impreſſion behind; tho' no joint of the upper or lower limbs can be ſaid to be ſecure from this diſorder, yet the knees are ever moſt ſubject to it, and that becauſe they abound in fat and glandular bodies, which are concealed among the ligaments and tendons. It is what we commonly know by the name of white ſwellings or ſcrophulous *Tumors* in the joints, and is of ſeveral ſpecies; for ſome *Tumors* of this kind are larger, ſome ſmaller, ſome ſofter, ſome harder; and with regard to the ſtate of the inſpiſſated fluid, ſome are more, ſome leſs glutinous. The noxious humours are uſually ſituated without the joint, and are, in that caſe, properly what we are here treating of. But in ſome they are collected and retained in the joint itſelf, as the ſerum is contained in the teſticle in an hydrocele. This laſt diſorder is not improperly to be called a dropſy of the joint; and this may be commonly diſtinguiſhed from the external fungous *Tumors* of the joints, by the inlargement which appears all round the joint; whereas the fungous *Tumor* is uſually ſituated more on one or the other ſide of it.

The proximate cauſe of theſe *Tumors* is, doubtleſs, the viſcidity of the ſerum about the ligaments of the joints, which is apt to ſtagnate after the ligaments have received any conſiderable violence from a fall or a blow. The *Tumor* ſometimes riſes in the external parts, ſometimes in the articulation itſelf, by which the ligaments being weakened, the part loſes its natural motion; and when the nerves or blood-veſſels are greatly preſſed upon by the *Tumor*, the parts below are uſually deprived of nouriſhment; and while the joint, by degrees, becomes greatly enlarged, the parts below it diminiſh and waſte.

In order to render the cure of recent and milder *Tumors*, of this kind, the more eaſy, by diſperſing remedies, it will be proper to rub the diſordered part with warm cloths every day, fomenting it afterwards with tartarized ſpirit of wine; and this method is to be carefully purſued, till the natural ſtrength and form of the limb are reſtored. Purmannus's fomentation is excellent for this purpoſe. It is made of ſix ounces of roch-alum, an ounce and half of Roman vitriol, and two handfuls of ſage leaves, boiled in a quart of herring-pickle, mixed with a pint of the ſharpeſt vinegar; it is to boil together for about half an hour, and then to be uſed as the before-mentioned.

When the tumours begin to diſperſe, and the parts to recover their ſtrength, it will be a great forwarding of the cure, to foment the limb well ſeveral times every day with tartarized ſpirit of wine, or with the fœtid oil of tartar, laying the bandages carefully on every time afterwards, to defend it from the injuries of the external air, of which it is very ſuſceptible: And laſtly, the following is an application by which many of theſe *Tumors* have been perfectly and happily cured. Take litharge half a pound, bole armenic an ounce, maſtic and myrrh of each half an ounce, white wine vinegar a pint; mix theſe together, and let them boil for a quarter of an hour, and let coarſe linnen rags be dipped in this liquor, or fine ones often doubled, and applied morning and night in bed to the part; and at the ſame time the patient is not to omit the proper internal remedies, which are the attenuants and ſudorifics.

But if the *Tumor* be of long ſtanding, and will not give way to any of theſe remedies, all the hope left is to make an inciſion into the dependant part of it, taking great care to avoid wounding the ligaments or tendons of the joint; and by this means the ſtagnating ſerum, if contained in one cavity, is inſtantly evacuated, and if it be lodged in ſeveral different cells, it will yet make its eſcape through the ſame orifice in the ſpace of a few days. Before the inciſion is made, in this caſe, the *Tumor* ſhould be pulled down as low as may be with the fingers, and a tight bandage made above to retain it in that ſituation; by this means the moſt convenient part for the inciſion to be made in will lie fair, and when the opening is made, the ſerum will readily burſt forth like blood on the opening a vein, or lymph in the tapping for the hydrocele or aſcites. When this is done, if any *Tumor* ſtill remains, the part is to be dreſſed with diachylon or oxycroceum plaſters, and waſhed with lime-water or ſpirit of wine. By continuing the applications, what remains inſpiſſated in the *Tumor* will entirely diſperſe. When the limb is reſtored to its natural ſhape, the wound is to be healed with vulnerary balſams, diligently avoiding the uſe of fatty or oily medicines, as they are hurtful to the tendons and ligaments, with which thoſe parts abound. If the ſerum, contained in the *Tumor*, is ſo glutinous that it cannot diſcharge itſelf for want of fluidity, throw up attenuating injections at every dreſſing. The beſt for this purpoſe are thoſe prepared from a decoction of agrimony, birthwort, or ladies mantle, mixed with honey, in which roſemary or celandine have been infuſed. Notwithſtanding that ſuch of theſe *Tumors* as are opened by the knife are ſooneſt diſcharged and healed, yet ſome ſurgeons prefer the application of cauſtic medicines to the knife, diſcharging the ſerum upon the falling off of the eſchar. In either caſe it would be proper to warm and invigorate the ligaments and tendons, eſpecially when the diſorder falls upon the knee, by the uſe of ſome nervous ointment, or aromatic ſpirit.

It too frequently happens, however, that after the wound has been cauterized, the inſpiſſated ſerum having been firſt ever ſo carefully evacuated, that there will be a freſh collection of a vitiated fluid in the part. In order to prevent therefore an accident of this kind, let the patient be kept in a ſtrict courſe of purging, ſudorific and attenuating medicines, and the wound be kept open with tents, cleanſing it thoroughly every day, by throwing up an injection, ſuch as has been before directed. It may be proper alſo ſometimes to inject lime-water, and afterwards to cover up the part with a warm plaſter, or foment it with ſome liquor of the ſame intention. It is, however, finally to be obſerved, that it is not every fungous *Tumor* of the joints that can be opened with ſafety; for if the *Tumor* is of a very long ſtanding, hard, or of a very large ſize, or the patient is of an infirm weakly habit of body, the knife muſt not be thought of, as it would occaſion diſorders worſe than the firſt; to wit, caries, fiſtulas, and gangrene. *Heiſter*'s Surgery, p. 285.

We have an account of a very extraordinary *Tumor* in the knee of a perſon, whoſe leg was taken off by Mr. Peirce at Bath. The leg and foot weighed ſixty-nine pounds. See Phil. Tranſ. N°. 452. Sect. 4.

Windy TUMORS. Theſe *Tumors* are formed by the air incloſed under ſome membrane, which is dilated more or leſs by that air, according to its quantity, and from within which it cannot eſcape, at leaſt not of a certain time.

Theſe *Tumors* are uſually round, circumſcribed, or determinate, and if they are ſtruck with a finger, they give a ſound like that of a blown bladder. They have no particular ſeat in any part of the body, but almoſt every part is more or leſs liable to them.

The great difficulty in accounting for theſe *Tumors*, is to ſay how the air comes to be collected there; but the moſt probable cauſe ſeems to be the collecting together of a quantity of a

fluid in ſome adjoining part where there is ſome obſtruction. The air, which is naturally mixed with all the fluids in the human body, always remains in them while they continue in their fluidity, and in their natural motions; but when they are amaſſed together in any particular part, and their fluidity and motion become impaired, the air that was in them becomes immediately in a ſtate of diſengaging itſelf from them; and it uſually does ſo diſengage itſelf. The membranes of the part where this collection of the fluids is made, are relaxed by it, and their pores conſequently enlarged, and the air which has diſengaged itſelf, eſcapes eaſily by theſe pores, while the fluids are much too thick to be able to follow it, ſo that it eſcapes alone.

The air, thus ſeparated, runs under ſome other adjoining membrane, which it immediately elevates and diſtends. As the liquors amaſſed in the other place are not yet ſo far altered, but that part of them are continually received again into the road of circulation, and conſequently more freſh fluids left in their place: theſe freſh fluids contain more air, which is, by degrees, ſeparated from them, as from the others, and finds its way, in the ſame manner, to the place where the reſt of the air is; and hence is the continual increaſe of the *Tumors*; and it is very evident, that when a *Tumor* is once formed in this manner, it cannot go down, even though the firſt extravaſation, which occaſioned it, ſhould wholly diſappear, and all the fluids be again received into their veſſels again; but, in fine, the air included in the *Tumor* may dilate the membrane, which encloſes it, ſo far, that its pores may be ſufficiently opened to let it eſcape; this, however, wholly depends on its quantity, and on the cloſer or laxer texture of the membrane.

Thoſe acute pains which we call ſtitches in the ſide, and which are principally felt on the ſides, and about the region of the breaſt, may poſſibly be ſometimes occaſioned by acrid humours, which prick the nervous fibres; and the pain, in this caſe, is ſometimes very acute, and even attended with a ſharp fever; but very often this pain is occaſioned only by air included between the fibres, where it occaſions a violent tenſion and pain; but often the relief from this is ſudden, the natural elaſticity of the parts reſtoring all to their priſtine ſtate, and the air being condenſed again almoſt as ſoon as dilated. Very often the natural ſpring of the parts either entirely ſends off the air, or elſe drives it to another place; and this is the reaſon why pains of this kind are often found to ſhift about and change place ſo ſuddenly.

But of all the effects of air in the body, none is ſo great as that found in the bodies of thoſe who have died by loſs of blood, whether that has been occaſioned by wounds or natural hæmorrhages. There may, in this caſe, often be perceived, through the coats of ſome of the veins, little bubbles of air floating on the ſurface of the blood contained in them; and this is no way to be wondered at, ſince as a great part of the blood has been loſt out of the body by the hæmorrhage, the remainder has been by this much injured in its power of motion, as well by loſs of quantity to impel it, as of animal ſpirits to enliven it; and by the want of ſtrength in the arteries to perform their pulſations, in order to the keeping it in motion; the conſequences of theſe joint cauſes, according to the principles before laid down, muſt be, that the air muſt eſcape out of the blood, and appear freed as we ſee it.

If we perceive this only in the veins, the reaſon is plain, ſince there is no blood any where but in the veins of perſons who have died in this manner, the arteries having been already drained; whereas, in other bodies there always remains ſome blood, though but little, in the arteries. Another conſequence of dying by an hæmorrhage is, that the ventricles of the heart are always found empty of blood; which is not the caſe in thoſe who have died by other means. The cauſe of this is, that the force with which the veins drive up the blood from their extremities toward their larger trunks, and thence to the heart, is much weaker than that by which the arteries throw the blood they contain toward the extremities. This being allowed, a great loſs of blood cannot but diminiſh the force of the arteries and veins both; but its effect will certainly be greater on the veins; ſo that they may wholly loſe their force before the arteries have loſt theirs; and theſe laſt making at length one general contraction, may throw off all their contents into the veins, while they, having already loſt all their power, can no longer move it forwards; ſo that, in this caſe, it all remains there, and conſequently what blood remains in the body, muſt, on opening it, be found lodged in the veins.

It is ſometimes obſerved in bodies which have died of hæmorrhages, that the ſmaller veſſels, at conſiderable diſtances from the heart, have been all full and diſtended with wind; in this ſtate it is not impoſſible that they may have been ſometimes miſtaken for lymphatic veſſels; but in tracing them up to their trunks, they ſoon diſcover what they really are. After a large quantity of blood has been loſt, it is plain that there can be but little in the lungs, while the quantity of air is always equal there; and as the air always eaſily diſengages itſelf from the blood, when it is leſs fluid, and in ſmaller quantity than before, the air may, in this caſe, paſs from the lungs to the heart with the blood, without being ſo intimately mixed with it as at other times; when the arteries have, after this, not power enough to impel the blood into the veins, their power may yet be ſufficient to drive this wind into them, it being much lighter, and more ſuſceptible of motion; and this alone ſeems a very natural and eaſy ſolution of this phænomenon. This ſuppoſes, indeed, that the motion of the blood being ſtopped, death comes on, as well by this means, as by the ſtoppage of reſpiration. Mem. Acad. Par. 1714.

TUMORS *of the Teſticles*. See the article TESTICLES.

TUNA, in botany, the name by which ſome authors have called the *opuntia*, the Indian fig, or *ficus Indica*, as it is uſually called. *Jonſ.* Dendr. p. 57.

TUNALLUS, in ichthyology, a name given by Albertus, and ſome others, to that ſpecies of the coregoni called by the generality of authors the *thymallus*, by us the *grayling*, or *umber*. Artedi diſtinguiſhes it by the name of the *coregonus*, with the upper jaw longeſt, and with twenty-three rays in the back fin. See the article COREGONUS.

TUNG, in natural hiſtory, the name given by the Indians to a little inſect, called by the Spaniards *Piqué*, which is very common, and very troubleſome in ſome parts of the Eaſt and Weſt Indies.

It is of the ſize of a ſmall flea; its place of laying its eggs is within the ſkin of the human body, and it diligently ſearches opportunities of doing this, and often ſucceeds in the attempt, to the great pain and trouble of the perſon who ſuffers it. The creature, knowing that it ſhall be ſoon cruſhed to death under the ſkin, generally makes its way either under the nails, or where there is ſome callus on the ſurface; there it eats its way along, and, in fine, lays its eggs, which hatch into ſo many young ones, and ſpread themſelves between the fleſh and ſkin all over the finger and hand, if not prevented by taking out the old one in time.

The perſon often does not perceive the creature's getting in, it enters ſo gradually and eaſily; but he is ſoon adverti ſed of the place where it is by a violent gnawing pain, the creature really eating its way as it goes along. The only remedy in this caſe is, to enlarge the orifice at which it entered, and take it out whole; the wound ſoon heals up, and there is an end of the matter. This may often be done with the point of a needle; but if not, it is much better to ſubmit to the opening it with a lancet, than to the ill conſequences which otherwiſe will attend it. Obſerv. ſur les Coutumes de l'Aſie. p. 184.

TUNICA (*Cycl.*) TUNICA *Albuginea*, the name of the membrane that covers the body of the teſticles. It is of the ſame ſubſtance with others of the thicker membranes of the body, and is ſupplied with proper veſſels for its nouriſhment; but under this the body of the teſticle is, on a ſtrict examination, found to be only a congeries of veſſels rolled up in regular and even folds, without any intermediate ſubſtance of whatever kind. It is neceſſary to have recourſe to the uſe of glaſſes to ſee this ſtructure; and there is one caution neceſſary to the perſons who would make the experiment, which is, that as theſe veſſels all contain a liquor, which being ſomewhat thick and whitiſh, ſoon dries when expoſed to the air, and, in drying, acquires ſomewhat of the appearance of fleſh, it is very apt to deceive the inſpector into an opinion, that there is really a fleſhy matter in the ſubſtance of the teſticle, diſtinct from the veſſels: What will ſet this right, will be the obſerving, that the object, when newly cut, and immediately viewed, has none of this fleſh-like matter about it; but only a mucous humour may be ſeen ouzing from the mouths of the rolls or folds of the veſſels where cut; and that afterwards, when the fleſh-like matter becomes viſible, it is only ſeen about the ends and edges of the piece of the teſticle that is examined, and only in thoſe places where it was before ſeen ouzing out in form of a fluid from the apertures of the veſſels.

Theſe veſſels, of which the ſubſtances of the teſtes are compoſed, are extremely tender and fine; yet, while the ſubject is freſh, they may, by a delicate hand, be drawn out, and will ſometimes be extended to half a yard long without breaking. The ſingle veſſel, when thus extended, has much the appearance of the external coat of the epididymis, and its corrugations. Theſe tubes receive their contents in ſome ſort from the arteries, and have a communication with them, inſomuch that on injecting a coloured matter into the *arteria preparans*, and afterwards opening the teſticle, this matter will be found to have made its way into ſeveral of the tubes compoſing the rolls or folds of the ſubſtance of the teſticle.

It might be ſuppoſed, that this colouring of the tubes was only external, and that the matter of the injection had only ſpread itſelf on their ſurface, or penetrated into the plexus of veſſels that cover them; but, on trying to waſh off the colour with ſpirit of wine, it proves ſo permanent as not to give way to that; and, on curiouſly examining a part of a ſingle tube pricked with a fine needle, the coloured matter of the injection may be diſtinctly ſeen ouzing out of the puncture. The glands in general are no other than the teſtes; and the pancreas, and many other parts of the body, have no parenchyma or intermediate fleſhy ſubſtance between the veſſels, but are made up of veſſels or tubes filled with peculiar liquors, and generally owe their colour to that of the liquor they contain. No reputed gland is any other thing than a mere congeries of veſſels, through which peculiar juices come and go; and the very

coats of the larger veſſels ſo much approach to this ſtructure, that, though not wholly compoſed of other veſſels, they have ſo many in them, that the far greater part of their ſubſtance is made up of thoſe veſſels, and of the fluids which are continually paſſing through them, and which keep open their paſſages.

Theſe liquors being deſtined for the ſupport of the coat of the veſſel, are in general the ſame with that which flows within it.

As to the teſticles being wholly compoſed of theſe veſſels or tubes, without any other ſubſtance, it is, perhaps, carrying the matter too far, to aſſert it in ſuch abſolute terms. That there are certain membranes, connecting ſeveral of the veſſels into, as it were, one roll or tube, appears in the nice examination of the teſticles of the rabbit, and ſome other animals; and though there be no parenchyma, or fleſhy ſubſtance, yet it is very probable, by the lubricous appearance of theſe veſſels on the outſide, that there is originally among and between them a mucous or ſlimy matter, which may ſerve in the place of a parenchyma. Philoſ. Tranſ. N°. 53.

TUNICATED *Roots*, among botaniſts, ſuch as are formed of a multitude of coats ſurrounding one another. See the article ROOT.

TUNNEL-*Net* (*Cycl.*)—This net muſt be made of three-twiſted thread, and muſt not be too thick: It ſhould be dyed green, that the colour may give no ſuſpicion to the birds, and the meſhes ſhould be about two inches and a half broad.

Into the hind meſhes, at the larger end, there muſt be put a ſmooth wooden rod, about the bigneſs of a gun-rammmer; of this muſt be made a ſort of hoop, both ends being tyed together, and at different diſtances from one another, there muſt be placed many more ſuch, which are to be rounded in the ſame manner, and are to ſupport the net its whole length in the tunnel form. Two ſtakes, or ſtrong pegs, muſt be faſtened at the ſides of the entrances into the net, and one at the farther end, or narrower part; the two firſt are to keep the mouth of the net ſufficiently extended, and the laſt is to keep it pulled out lengthwiſe to its full dimenſions, the hoop preventing its falling in.

There muſt be uſed with this net two others of that kind, which they call *halliers*. Theſe are long and ſtrait nets, and are to be faſtened down to the mouth of the *Tunnel-net* on each ſide, extending ſeven or eight fathoms on each ſide from it, ſo as to take in fourteen or ſixteen fathoms in front, beſide the breadth of the mouth of the *Tunnel-net*, and to direct all that ſhall move forward within that compaſs into the net.

In order to uſe this net, a covey of partridges is to be found, and then the net is to be placed at a conſiderable diſtance behind them: When this is fixed, the ſportſman is to take a compaſs, and get before the birds with a ſtalking horſe or ſtalking ox, and then to move forward, driving them towards the net. This is to be done gently, and carefully, they are not to be driven at once ſtrait forwards; but the ſportſman is to wind and turn about, and, at times to ſtand ſtill, as if the horſe was grazing. If the partridges, in the time of driving, make a ſtand, and look at the machine, it is a ſign they ſuſpect it, and are ready to take wing: In this caſe the ſportſman muſt ſtand ſtill, or even go back a little; and when they are become compoſed again, he is again to advance upon them. If any ſingle bird lies remote from the reſt, the ſportſman muſt take a compaſs round him, and fetch him in; for if he takes wing the reſt will all follow; in this manner, with patience and caution, the whole covey may be driven like a flock of ſheep up to the nets. A real horſe, trained to the purpoſe, is, however, much better than a ſtalking machine.

The halliers, or wings of the *Tunnel* muſt not be pitched ſtrait, but in a ſort of ſemicircle; and the birds, when they ſtop their march, will run along them to the middle, where the mouth of the *Tunnel* is open.

When they come to the mouth of the *Tunnel*, the old ones will make a ſtand, as if to conſider what was before them; but on preſſing gently on them with the horſe, the young ones will run in, and then all the reſt will follow.

The ſportſman muſt then make all the haſte he can to the mouth of the net, to ſecure them from coming back again.

The ſtalking-horſe is to be made of canvas or linnen, painted in the figure of a horſe, and ſupported by two croſs ſticks, by which the ſportſman carries it before him, ſo that his own body is compleatly hid by it. There are to be holes made through it, by which the ſportſman ſees his game; and the tail is to be made of hair, and to hang looſe from the body, that it may play in the wind in moving.

TUNNY, a name given by us to the Spaniſh mackrel, a larger fiſh of the ſcomber kind, called by authors *thynnus* and *arcynus*, by Salvian *limoſa*, and *pelamys* by Ariſtotle, Ælian, and the other old writers. See Tab. of Fiſhes, N°. 29.

It is properly a ſpecies of the ſcomber, and is expreſſively named by Artedi, the ſcomber with eight or nine fins in the hinder part of the back, riſing out of a furrow; and a furrow at the place of the belly-fins. See the articles THYNNUS and SCOMBER.

TUNUPOLON, in zoology, the name of an Eaſt Indian ſpecies of viper, found principally in the iſland of Ceylon. It is of a ſmall ſize, and of a fine ſattin-like gloſs, beatifully variegated with different ſhades of brown. *Ray*'s Syn. An. p. 332.

TUPUTA, in zoology, a name under which Nieremberg has deſcribed an American bird, which, he ſays, is like a pheaſant in ſhape, and loves low buſhes and ſedgy places, never flying into high trees, and which has no fleſh, but merely a vaſt aſſemblage of living worms between the ſkin and the bones. Mr. Ray has ſufficiently laughed at the abſurdity of this account; which probably had its origin from the diſtempered ſtate of one bird of ſome well known ſpecies; though Nieremberg thinking the worms a ſufficient character, has given no farther account of it. *Ray*'s Ornithol. p. 298.

TURBAN-*Shell*, *Cidaris*, in natural hiſtory, the name of a genus of the echinodermata, which are of a hemiſpheric or ſpheroidal figure, and have their name from the Latin *Cidaris*, a *Perſian Turban*, as in ſome degree reſembling that headdreſs. See Tab. of Teſtaceous and Cruſtaceous Animals, N°. 1, 2, 3, 4.

Of this there are ſeveral kinds: 1. The *Cidaris miliaris*, ſo called from its eminences or tubercles, being as ſmall as the grains of millet. Of this there are three known ſpecies; one with a high top, a ſecond with a flatter and more of a hemiſpheric figure, and a third which is ſomewhat angular.

The ſecond kind is the *Cidaris variolata*. The eminences of this are of a middle ſize, between thoſe of the miliary and mammiliary kinds, and ſomewhat reſemble the puſtules of the ſmall-pox when ripe, whence they have their name. Of this kind there are three known ſpecies: 1. The briſly echinus of Rumphius. 2. The ſmall ovarius of Langius. And 3. The Turk's *Turban* of moſt authors. And to theſe may be added a fourth, a very remarkable one of an elliptic form, with very few tubercles, and a large mouth. *Klein*'s Echinod. p. 17.

The third kind is the *Cidaris mammillata*, or the mammillary echini. The tubercles of theſe are very large, and imitate the appearance of breaſts, with nipples to them. Of theſe alſo there are two known ſpecies. 1. The fingered echinometra of Rumphius. 2. The ſpecies called the *moor's Turban*.

The fourth kind is the *Cidaris coronalis*; the tubercles of which are ſo diſpoſed as to make it repreſent the diadem of antient kings. Of this there is only one known ſpecies, and that extremely rare.

The fifth kind is the *Cidaris corollaris*; the tubercles of which are ſo diſpoſed, as to imitate the garlands made of flowers. Of this there are two known ſpecies, the one thicker, and the other thinner.

The ſixth kind is the *Cidaris aſteriſans*. Of this there is only one known ſpecies, the tubercles of which are diſpoſed in form of a radiating ſtar.

The ſeventh is the *Cidaris aſſulata*, or tiled *Cidaris*. This is ſo called, becauſe the ſeveral parts of the ſhell are joined tranſverſely to one another. Of theſe there are eight known ſpecies. 1. Olearius's ſpecies, compoſed of twenty orders of aſſulæ. 2. Aldrovandus's *echinometra maxima pelagica Sardica*. 3. The flammated kind, the vertex of which has ten rays, like ſo many flames. 4. The variegated kind, whoſe tubercles are variegated with white, and a fine roſe colour. 5. The puſtuloſe kind, which is thick beſet with tubercles, reſembling ripe puſtules. 6. The granulated kind; the tubercles of which are very ſmall. 7. The ſmooth kind, with a flat crown. 8. That ſpecies called by Mercatus *anachytis*, which has a very gibboſe back.

The eighth kind is the *botryoide Cidaris*. Of this there is only one known ſpecies, which bears a very great reſemblance to the central part of the ſea ſtar-fiſh, with contracted fragments of the rays.

The ninth kind is the *Cidaris toreumatica*. This has its name from the Latin *toreuma*, ſignifying a chaſed or wrought plate, the ſuperficies of this being as if chaſed and engraved into figures. There is only one known ſpecies of this genus.

This claſs of the echinodermata is made out by the aſſiſtance of the foſſile, as well as the recent animals; many of the kinds being now unknown on any ſhores. Id. Ibid.

TURBINATA *Oſſa*, the name of the turbinated bones of the noſe. See the article NOSE, *Cycl.*

TURBINATUM, a name given by ſome to the glandula pinealis.

TURBINES, in natural hiſtory. See the article TURBO.

TURBINITÆ, foſſile ſhells of the turbo kind, or ſtones found in thoſe ſhells. Among the people who have objected to the ſhells found buried in the earth being the remains of real animals, it has been alledged by ſome, that theſe in particular are always of a blackiſh or aſh-colour, when found in chalk or clay, and white from the rocks, or when they have been bedded in ſtone.

To this Auguſtino Scilla has very judiciouſly anſwered, that the *Turbinitæ* found in chalk and clay, are not the real ſhells, but are ſtones which have been formed in thoſe ſhells, the ſhells themſelves, which gave ſhape to them, being decayed and gone; whereas thoſe found bedded in ſtone, are, at this time, the ſhells themſelves, preſerved in their natural beauty by the hardneſs of the bed they lie in; or, if not real ſhells, that the only ſtone which can form itſelf there being ſpar, that is white, and the ſhells giving origin to ſuch a ſtone will

appear

appear as white in its ſubſtance, or more ſo, than they would in their own. *Auguſtino Scilla*, de Petrifac.

TURBAT, in ichthyology, the ſame with *Turbut*. See the article TURBUT.

TURBIT *Pigeon*, a particular ſpecies of pigeon, remarkable for its ſhort bill, and called by the Dutch *cort bek*, that is, ſhort-beak. Moore calls it in Latin, *columba fimbricata*: And its Engliſh name ſeems no other than a bad pronunciation of its Dutch one. It is a ſmall and ſhort-bodied pigeon, and has a beak no longer than that of a partridge; the ſhorter this is, the more the pigeon is eſteemed: It has a ſhort round head, and the feathers upon the breaſt open, and reflect both ways, ſtanding out like the frill of the boſom of a ſhirt. This is called by many, the *purle*, and the more the bird has of it, the more it is eſtemed. The tail and back are generally of one colour, as blue, black, red, yellow or dun, and ſometimes chequered. The flight feathers, and thoſe of all the reſt of the body, are white. They are a light nimble pigeon, and, if trained to it, will take very high flights, in the manner of the tumblers. *Moore*'s Columbarium, p. 53.

TURBITH (*Cycl.*)—There is great uncertainty and confuſion among the old writers, in regard to the drug called by this name. Aviſenna, and the reſt of the Arabian phyſicians, all preſcribe *Turbith*; and we are apt to believe, that they mean our *Turbith*-root; but it does not appear ſo either from the form or virtues of that medicine.

All the writers of later ages have placed the *Turbith*-root among the things of value and uſe, brought as merchandize from the Eaſt Indies; and Garcias juſtly deſcribes the plant: But his deſcription plainly proves, that it cannot be the *Turbith* of the Arabians; for all that they have ſaid about the *Turbith* is tranſlated from Dioſcorides, and he has ſaid it of the tripolium.

The tripolium of the Greeks is therefore the *Turbith* of the Arabians, and this is a very different thing from the *Turbith* of our times. Meſue indeed ſeems to make the *Turbith* a different thing from what all the others have made it; he ſays, that it is the root of a plant of the lacteſcent kind, which had leaves like the ferula or fennel giant. This is a deſcription that can by no means agree either with the tripolium of the Greeks, or the *Turbith* of Garcias; and proves, that if Meſue was right in ſaying it belonged to the plant, of which what he calls *Turbith* was the root, then his *Turbith* is different from both the one and the other of theſe. Some other of the writers on theſe ſubjects have alſo called two roots, different from all theſe, by the names of white and black *Turbith*. The black *Turbith* is the pityuſa-root, a kind of ſpurge; and the white *Turbith* the root of the alypum.

Aviſenna calls the *Turbith*, *terbadh*. Some have ſuppoſed this word expreſſed a thing different from all the others; but this is by no means the caſe, for the *Turbith*, or *turbadh* of Aviſenna is the ſame with the *Turbith* of Serapion, that is, with the tripolium of Dioſcorides.

From this *turbadh* of the Arabians, the later Greek writers have formed the word τερβιθ; but they have applied it, in a very looſe and vague manner, to ſeveral very different things. Neophytus makes the *Turbeth* a ſpecies of myrobalan; but in this he errs, no other author having ever underſtood the word in that ſenſe. Upon the whole, it appears, however, that there are three different plants, called *Turbith* by authors, the tripolium, the pityuſa, and the alypum; but all theſe are different from the Indian *Turbith*, which is the *Turbith* of Garcias, and the *Turbith* of our ſhops. There is alſo in one part of Aviſenna an account of *Turbith* different from all theſe, and making it a kind of wood.

TURBITH-*Mineral* has been uſed as a ſternutatory, and is ſaid to have made wonderful cures in diſtempers of the eyes. Mr. Boyle relates a cure of this ſort, performed by the famous empiric Adrian Glaſs-maker on Mr. Vatteville, a Swiſs officer of diſtinction in the French ſervice, and totally blind. This gentleman was ordered to ſnuff about a grain of *Turbith* up each noſtril, which immediately operated in a violent manner by vomit, ſtool, ſweat, ſalivation, and the lacrymal glands, for twelve hours together; and alſo cauſed his head to ſwell greatly; but within three or four days after this ſingle doſe had done working, he recovered his ſight. *Boyle*'s Works abr. vol. 1. p. 103.

TURBO, the *Screw-Shell*, in natural hiſtory, the name of a genus of ſhell-fiſh, the characters of which are theſe: They are univalve ſhells, with a long, wide, and depreſſed mouth, in ſome ſpecies approaching to a round ſhape, and in ſome having teeth, in others not. They all grow narrow toward the baſe, and are auriculated, and terminate in a very long and ſharp point. See Tab. of Shells, N°. 11.

Aldrovand, and many others of the old authors, make no difference between the *Turbines* and ſcrew-ſhells, though the diſtinction of the genera is very obvious; the ſcrew-ſhells having a long, large, and dentated mouth, which terminates toward the baſe in a narrower aperture than elſewhere: And the ſhell itſelf always runs to a very ſharp point at the end; whereas the *Turbines* terminate in a leſs ſharp point, and have thicker bodies, and always much wider mouths. The ſcrew-ſhells are indeed very eaſily confounded with the buccina; and it requires more accuracy to diſtinguiſh them, than has fallen to the ſhare of the generality of writers on theſe ſubjects an age or two ago. Aldrovand and Rondeletius have confounded theſe genera, and have brought in a third among them, by the epithet *muricatum*, which, when applied to the buccinum, is generally obſerved to bring into that family a ſhell of the murex claſs, and which might have been very properly called by that ſhorter name.

That theſe may be, however, more juſtly diſtinguiſhed for the future, it may be proper to add the genuine character of the *ſcrew-ſhell*; which is, that it is of a very long and ſlender ſhape, and ends in a very ſharp point. Its ſpires run on imperceptibly, without any great cavity, and the baſe is ſmall and flat, as is alſo the mouth. Liſter, who was for making all the long ſhells buccinums, calls the ſcrew-ſhell, the intervals of the ſpires of which are deep, a long twiſted buccinum, with a flat mouth. Fabius Columna has confounded yet more the genera of ſhells together; he brings in the trochus into the family of the buccina; and tells us, that the words *ſtrombus*, *trochus*, *rhombus*, and *Turbo*, which he calls the poetical name, are all ſynonymous terms, and expreſs the ſame ſort of ſhell. *Liſter*, *Fabius Columna* Aquat. & Terreſtr. P. 59. p. 65.

To avoid the obſcurity which muſt naturally ariſe from ſuch confuſion of words, it is proper to obſerve, that *Turbo* and *ſtrombus* are derivatives of the ſame Greek word στρεφω, to turn, and therefore are, properly, but one word in ſenſe, and always to be accepted as ſynonymous terms, and ſignifying a long and ſlender ſhell, whoſe baſe and apex are both very ſmall. *Bonani* Recreat. Ment. & Occul. p. 126.

The trochus has a ſmall mouth, but then its baſe is large and flattiſh, and its conic figure is one of the characters of its genus. Thus is this diſtinguiſhed from the former; and as to the *rhombus*, when we have obſerved, that, though the word properly ſignifies a lozenge figure, it is uſed in ſhells for the name of a cylindric kind; it will appear, from the whole, that theſe four words are not all ſynonymous, but that three diſtinct genera are meant by them, the firſt two only being of the ſame ſignification.

The moſt remarkable ſpecies of the *Turbo* or ſcrew-ſhell, is that called *ſcalare* by Rumphius, from its ſpires running up hollow, or with a ſpace between them. This is a very ſcarce and valuable ſhell, when large, but is often found ſmall in the Adriatic.

The ſpecies of the *Turbo* are ſo numerous, that it is proper to arrange them under different heads.

1. Of the *Turbines* which have a long and toothleſs mouth, and a wrinkled columella, theſe are the following ſpecies: 1. The nail-*Turbo*, variegated with blue ſpots. 2. The awl-*Turbo*, with yellow perpendicular lines. 3. The *Turbo*, with points diſpoſed in circles. 4. The ſpotted and lineated needle-*Turbo*. 5. The ſcrew-*Turbo*, with variegated lines and ſpots. 6. The whitiſh reticulated and granulated *Turbo*. 7. The virgated and corded *Turbo*.

2. Of thoſe *Turbines* which have dentated mouths and a wrinkled columella, we have the following ſpecies: 1. The faſciated contabulated *Turbo*. 2. The *Turbo*, called the child in ſwadling clothes.

3. Of thoſe *Turbines* which are of a pyramidal figure, and have depreſſed mouths, we have the following ſpecies: 1. The teleſcope-*Turbo*, with tranſverſe furrows. 2. The whitiſh *Turbo*, with yellow circular lines. 3. The Chineſe pyramid or obeliſk *Turbo*. 4. The rough *Turbo*, with elated rows of tubercles. 5. The granulated and lineated little tower *Turbo*.

4. Of thoſe *Turbines* which have long and erect mouths, we have the following ſpecies: 1. The alated borer *Turbo*. 2. The whitiſh borer *Turbo*. 3. The variegated borer *Turbo*. 4. The lineated borer *Turbo*.

5. Of thoſe *Turbines* which have a flat mouth, and are of a longer ſhape, theſe are the following: 1. The contabulated and roſtrated caterpillar-*Turbo*: this is covered with tubercles, and has blue ſpots and lines. 2. The white roſtrated caterpillar-*Turbo*, with many tubercles and ſpires.

6. Of thoſe *Turbines* which have a large oval mouth, we have the following: 1. The *Turbo* called *vitta*, with black, yellow, and red veins. 2. The claviculated and variegated agate-coloured *vitta*. 3. The whitiſh *vitta*, with a variegated clavicle.

7. Of the round-mouthed *Turbines*, we have the following ſpecies: 1. The hollowed wreathed *Turbo*. 2. The bone-coloured *Turbo*, with twenty wreaths, depreſſed into ſeveral ſinuſes. 3. The yellow and white thick-wreathed *Turbo*. 4. The *Turbo* with ſeventeen furrowed wreaths. 5. The ſcalar *Turbo* of Rumphius, with white lines. 6. The aurited *Turbo* of Rondeletius. Hiſt. Nat. Eclairc. p. 271.

TURBO *Cochlea*, in natural hiſtory, a name by which ſome authors have called the Perſian ſhell, a ſpecies of *concha globoſa* or *dolium*.

Many have been puzzled with this ſhell, not knowing in what claſs to rank it; and Aldrovand has placed it at the end of his work, ſaying, that it would ſeem to belong to the turbinated kinds, but that it wants the *Turbo*. See the article DOLIUM.

TURBUT, in ichthyology, a name given by us to the fiſh called by authors the *hippogloſſus*, *paſſer major*, and *paſſer Britannicus*.

According to the new ſyſtem of Artedi, this is a ſpecies of the pleuronectes, and it is diſtinguiſhed by him by the name of the wholly ſmooth pleuronectes, with the eyes on the right ſide. See the articles HIPPOGLOSSUS and PLEURONECTES.

TURCICA *Terra*, *Turkey Earth*, in the materia medica, a very fine bole or medicinal earth, dug in great plenty in the neighbourhood of Adrianople, and uſed by the Turks as a ſudorific and aſtringent, and famous among them in peſtilential diſeaſes. It is ſometimes brought over to us alſo, made up into flattiſh orbicular maſſes, of two or three drams weight, and ſealed with ſome Turkiſh characters. This earth is of a ſomewhat lax and friable texture, yet conſiderably heavy, of a greyiſh red colour, but always redder on the ſurface than within; extremely ſoft, and naturally of a ſmooth ſurface. It breaks eaſily between the fingers, and melts freely in the mouth, with a conſiderably ſtrong aſtringent taſte. It adheres but ſlightly to the tongue, raiſes no efferveſcence with acids, and burns to a duſty yellow colour. *Hill*'s Hiſt. of Foſſ. p. 15.

Many authors who have written of the materia medica, and of foſſils in general, have indiſcriminately called the various kinds of Lemnian earth by this name; but the true *Terra Turcica*, deſcribed by Schroder, Wormius, *&c.* is a different ſubſtance, though not ſufficiently characteriſed by thoſe authors to diſtinguiſh it from all the other earths.

TURCOIS (*Cycl.*)—See the Appendix.

TURDUS, in the Linnæan ſyſtem of zoology, the name of a genus of birds, of the order of the paſſeres. The diſtinguiſhing characters of this genus are, that the tongue is jagged, and has a rim or margin round it; the bill is of a conic pointed figure, a little convex, and naked at the baſe. *Linnæi* Syſt. Natur. p. 49.

This genus comprehends the thruſh, black-bird, and ſtarling. The diſtinguiſhing characters of this genus, according to Mr. Ray, are theſe: They are of a middle ſize between the pigeon and the lark. Their beak is moderately long and thick, and is a little bent downwards; their mouth yellow within; their tail long; and their food both vegetable ſubſtances, and inſects in common. Moſt of theſe birds ſing very melodiouſly, and may be taught to imitate the human voice in ſpeaking. *Ray*'s Ornithol. p. 137.

There are three ſubdiſtinctions of the *Turdus* kind: 1. The thruſh, called by authors ſimply *Turdus*. 2. The merula, or black-bird, diſtinguiſhed by its dark colour: And 3. The ſtrurnus or ſtarling, known by the breadth and flatneſs of its beak. We have four ſpecies of thruſh in England: 1. The *Turdus viſcivorus major*, or miſſel-bird. 2. The *viſcivorus minor*, or ſong-thruſh, or mavis. 3. The *Turdus pillaris*, or field-fare. And 4. The *Turdus iliacus*, or ſwine-pipe. See the articles MISSEL-*Bird*, MAVIS, FIELD-*Fare*, and SWINE-*Pipe*.

The two firſt of theſe build and remain the whole year with us, the others only viſit us in winter. Id. ibid.

TURDUS *Chiappæ*, in zoology, the name of a bird of the Weſt Indies, oddly and imperfectly deſcribed by Nieremberg, and ſaid to be very dexterous at filling a pine with acorns, which are its only food, by making holes in its bark. Theſe it fixes in ſo nicely, that it is not eaſy to get them out; and theſe are its ſtore, which it eats occaſionally. It is, from this practice, called alſo *paſſer faber*. *Ray*'s Ornithol. p. 303.

TURDUS, in ichthyography, the name of a genus of fiſhes, of the claſs of thoſe which have only one back-fin, the anterior rays of which are prickly; the hinder ones ſoft and ſmooth.

Of theſe fiſhes there are ſeveral ſpecies, which may properly be divided into two orders; the firſt, of thoſe which are ſmaller and broad; the ſecond, of thoſe which are larger and oblong.

Of the firſt order are the *tinca marina*, or wraſſe. See the article WRASSE. The *merula*, or *Turdus niger*. See the article MERULA. The *lepros*, and *pira pixanga*, which ſee. And the *Turdus viridis* or *verdone*. See the article VERDONE. *Ray*'s Ichthyogr. p. 320.

Of the ſecond order are the *pavo*. See the article PAVO. And the *Turdus viridis major*, and *Turdus fuſcus maculoſus*.

The *Turdus viridis major*, or great green *wraſſe*, is of a fine green on its back and ſides, even to the ſide-lines; and the lower part of the ſides and belly are of a pale whitiſh yellow, variegated with greyiſh and pale blue ſpots. Its body is long, and not much unlike that of the pike in figure. Its back-fin is long, and has thirty-two ribs, the anterior nineteen of which are rigid and prickly, the hinder twelve ſoft, flexile, and ramoſe. The ſcales are large, the eyes ſmall, and the teeth very large and ſtrong.

The *Turdus fuſcus maculoſus*, or brown ſpotted wraſſe, ſcarce at all differs from the other, except in colour. It is of a duſky hue on the back and ſides, variegated with blue ſpots; and on the belly blue, with lines and ſpots of red. All the fins, except thoſe of the gills, are of a red colour, ſpotted with blue; the tail alſo is of this colour, and the gill-fins are yellow. *Ray*'s Ichthyogr. p. 322.

TURF (*Cycl.*)—TURF *Sweating*, an Indian method of curing diſeaſes, which has been found to ſucceed very happily on many trials.

Paul Dudley, Eſq; gives an account of a man of ſeventy-four years old in New England, who drinking cold water when very hot, had a pain ſettled in one ſide and arm, which baffled all art to remove; till after nine weeks confinement to his bed, when he was given over by every body, it was propoſed to try this method of cure upon him.

An oven-full of *Turf* was ordered to be cut; the *Turfs* were of about eighteen inches ſquare each, and were of the nature of the Engliſh *Turf* uſed in Gardens.

The Indian doctor, before the *Turf* was put into the oven, rubbed over their graſſy ſide with ſome ſort of oil or ſpirit, and then putting the two graſs ſides together, placed them in the oven. When they had been two hours there, and were well baked, he took them out, and made a bed upon the floor, the place for the head being a little raiſed: The old man was then taken out of bed without his ſhirt, but wrapped in a ſheet, and being laid on the *Turf*-bed, ſuch another parcel of the hot *Turf* was laid over him. The *Turf* was laid thickeſt on that ſide where the pain was, but none of it was put upon his breaſt or head.

He was then covered with a blanket to keep in the heat; and while he was in this warm bath, he was continually ſupplied with warm cordials to keep him from fainting, of which he was in great danger. After he had lain in this bath about three quarters of an hour, which was as long as he could bear it, he was put into a bed very well warmed, without his ſhirt, where he ſoon fell aſleep, and ſweated to that degree, that it run through the pillow and bed on the floor. After about two hours ſweat, they rubbed and dried him, and put on his cloaths; and the old gentleman found himſelf much eaſed and refreſhed. The operation was performed in the morning, and before night he walked about the houſe comfortably, his pain being almoſt all gone. The cordials were, after this, repeated, and, on the fourth day, the ſweating was performed again; the day after which the old gentleman was well enough to go about his buſineſs. He lived eleven years afterwards in perfect health, and free from pain.

Great care is to be taken in this operation, that the patient do not lie too long in the *Turf*: In many caſes, a quarter of an hour is found to be long enough; and the general rule is, that as ſoon as the patient begins to fetch his breath ſhort or faint, he muſt be put to bed immediately, and the cordials muſt by no means be omitted; for the life of the patient is endangered without them. Philoſ. Tranſ. N°. 384. p. 129.

TURKEY, in zoology. See the article MELEAGRIS.

TURKINS, in our ſtatutes, is uſed for a ſky-coloured cloth. Stat. 1 R. 2. c. 8. *Blount*.

TURMERIC (*Cycl.*)—A plaſter of *Turmeric*, well bruiſed, top and roots, is thought to be good againſt the bite of the ratttle-ſnake. See Phil. Tranſ. N°. 479. p. 144.

TURN, (*Cycl.*) in mining, is a pit ſunk in ſome part of a drift. If the mine be deep, there are many of theſe *Turns* one below another. *Houghton*'s Compl. Miner, in the Explan. of the Terms.

TURN, in the manege, is a term commonly uſed in directing to change hands. See the article CHANGE and ENTIER.

TURN, in the ſea language. See the article LAND-*Turn*.

TURNEP, *Rapa*, in botany. See the article RAPA.

It is but of late years that the farmers have brought *Turneps* into uſe, as an improvement of their fields. All ſorts of land, when made fine either by dung and tillage, or by tillage alone, will produce *Turneps*, but not all equally.

Chalky land is too dry for them, and they are ſo long on it before they get into the rough leaf, that the fly often takes them, and they are deſtroyed. Sometimes, however, they ſucceed well in this ſort of land, though rarely. Charlock is a weed very apt to infeſt *Turnep*-lands, and when the *Turneps* and this are both young, they are ſo alike, that there have been inſtances of the people ſent to weed, miſtaking one for the other, and cutting up all the *Turneps*, and leaving all the charlock.

Sandy and gravelly land are found to be the beſt for *Turneps*, becauſe theſe ſoils are moſt eaſily pulverized, and have a warmth that makes the *Turneps* grow much faſter than they would in a colder ground. By this means they are preſerved from the danger of the fly, which only infeſts them while not yet grown into the rough leaf; and this ſort of ſoil, when well tilled and hoed, never wants moiſture even in the hotteſt weather. The dews reach as deep as the plough or hoe penetrates, which is ſix or eight inches; and the ſun's heat with us is never ſo great as to exhale it wholly from that depth. *Tull*'s Horſehoing Huſbandry, p. 44.

When *Turneps* are ſowed by hand, and hoed by hand-hoers, the plants grow too cloſe, and the operation is never half performed, the workers uſually leaving one half of the land unhoed, and covering it with the earth they cut up from the other parts; ſo that the weeds there being only buried an inch or two deep, grow more vigorouſly than before. The true method is to ſow them by the drill, and horſe-hoe them afterwards. By this means the plants are kept at a proper diſtance, and the earth opened between them. The effect of this, upon a fair trial, has been proved to be, that the drilled *Turneps*, when gathered, have been twice the quantity of the ſown ones, upon an equal quantity of ground, though the hand-hoing of the latter had coſt at the rate of ten ſhillings an acre.

In the method of drilling, they are ſure to come up quickly, becauſe in every row half the ſeed is planted at four inches

deep, from which, or even a greater depth, this ſeed will come up well; and the other half is planted exactly over that at half an inch depth, falling in upon the earth that has covered the firſt half. Thus planted, if the ſucceeding weather be ever ſo dry, the deep half of the ſeed will certainly come up; and if it chance to rain much ſoon after the ſowing, then the ſhallow half will be up firſt. The plants may alſo be made to come up at four ſucceſſive times, by mixing the ſeed half new and half old, for the new will be ſure to come up two days, or thereabout, before the old.

Turnep-ſeed ſhould always be ſown in this manner, in order to its eſcaping the danger of the fly, which otherwiſe often deſtroys whole fields of the young plants; but theſe four chances ſecure it; for though one coming up ſuffers, another eſcapes it, being often found, that the ſeed ſown over-night has been ruined by the fly, while that ſown the next morning has wholly eſcaped.

When the fly is found likely to devour them, they may be horſe-hoed; this will bury the greateſt part of thoſe animals; or they may be drilled in another row, without new ploughing the land. This fly feeds only on the two firſt or ſeed-leaves of the *Turnep*, which are very ſweet; the following leaves are rough, and do not ſuit its taſte; ſo that if the plants eſcape being eaten up while in the ſeed-leaves, they eſcape entirely.

The moſt infallible of all methods of preventing the miſchief from this fly, is to make the ground very fine, and then roll it with a heavy roller acroſs the ridges, after it is drilled; this method cloſes up the cavities in the earth, and prevents the fly's entrance or exit to lay the eggs, hatch, or bring forth the young ones, to prey upon the *Turneps*. This rolling always diſappoints the fly; but it ſometimes alſo diſappoints the owner, if he has ſown the crop by hand in a ſcattering manner. Theſe ſeeds, lying near the ſurface, are injured, and the ground, hardened by the rolling, will not let them grow well, but they become yellow, dwindle, and come to no perfection, unleſs they have a thorough hoing, as ſoon as the rough leaves appear. The drilled *Turneps*, being in ſingle rows, with ſix-foot intervals, may be rolled without danger; for, be the ground ever ſo hard, the hand-hoe will eaſily ſingle them out to a proper diſtance, at the expence of ſix-pence an acre, or leſs, if not in harveſt, and the horſe-hoe will plough in thoſe wide intervals to great advantage, whether the ſeaſon be wet or dry. Three or four ounces of ſeed in the drill way, anſwers for as much land as three or four pounds in the hand-ſowing; and there is this other advantage, that the plants, all ſtanding in rows, will be eaſily diſtinguiſhed, and properly ſingled out to their due diſtances, while very young; which is a thing of great advantage, as they thrive much the better for being early ſeparated from their uſeleſs neighbours. The ſix-foot ridges, whereon *Turneps* are drilled in ſingle rows, may be left higher than for double-rowed crops; becauſe there will be more earth in the intervals, as the ſingle rows take up leſs.

There is no prefixed time for planting *Turneps*, becauſe the nature of the ſoil muſt be conſulted; ſome land will bring them as forward when planted in Auguſt, as other land will when planted in May; but the uſual time is the middle between theſe, that is, about Midſummer. It is a practicable ſcheme, when *Turneps* are planted in rows, with theſe large intervals, to ſow wheat between. In the latter end of September, when the *Turneps* are full grown, a ridge is to be ploughed in the middle of each of the intervals, taking the earth to the ridge in ſuch quantity, as only to leave enough with the *Turneps* to keep them alive; wheat is to be drilled on this ridge: Toward ſpring the *Turneps* are, in this caſe, to be pulled up, and carried off the ground. The wheat being now left alone, the land is to be well horſe-hoed in the intervals. In Spring the wheat may be ſown in treble rows, and will afford a good crop. If the *Turneps* ſtand ſo thick in theſe ſingle rows as to touch one another, when half grown, provided the intervals between the rows be well horſe-hoed, they will yet attain to their full bigneſs; and they are often found to have thruſt one another out of ſhape, and become oval inſtead of round.

It is beſt to give the firſt hoing alternately; that is, to hoe only every other interval; this keeps them from being ſtunted, and it proves better thus to give them their food at twice, than to do it all at once. Id. Ibid.

In horſe-hoing it is not well to come nearer than within three inches of the ſides of the rows; but where the *Turneps* are planted in double rows, as ſoon as their roots are grown as large as a finger, the prong-hoe is to be uſed between the plants; and even in that little ſpace of three inches, left by the horſe-hoe, when they are in ſingle rows. Four of the alternate hoings in the intervals are found, on trial, to be equal in uſe to four whole hoings, though they are done at half the expence; for this half-hoing furniſhes the *Turneps* with as much nouriſhment as they require, and 'tis in vain to give more.

Dry weather is very injurious to *Turneps*, when ſown in the common way, and only hand-hoed; becauſe the hoe, in this caſe, does not penetrate deep enough to keep the ground moiſt; but in horſe-hoing the earth is cut ſo deep, that it is always kept moiſt, and a dry ſeaſon does the crop no hurt. Dung and tillage will, in all caſes, do their buſineſs quicker than tillage alone. On this principle, *Turneps* have more occaſion for dung than any other plants, becauſe they have leſs time to grow.

Twelve pound weight may be eſteemed the middle ſize for the great *Turneps*, and they ſometimes grow to ſixteen or nineteen pound weight. The farmers great intereſt in them is their ſize; and it ſeems evident that every *Turnep* in a field may be made to grow to its full ſtandard, or the largeſt ſize that nature has allotted it, provided it be properly managed, and nouriſhment ſupplied in a due manner. The greateſt inconvenience that attends *Turnep* huſbandry, is, that when they are to be eaten off in the Spring, which is their chief uſe, they do not leave time for bringing the land in tilth for barley; and the loſs of a crop of this is more than the gain by the *Turneps*; but this is wholly remedied by the horſe-hoing huſbandry, in which the land may be almoſt as well tilled before the *Turneps* are eaten off, as afterwards.

If the *Turneps* be ſown in June, the moſt experienced farmers will have only thirty plants left to a ſquare perch in the hand-hoing, finding that if more are left, they ſtarve one another, and the crop will be worſe; but in drilling the rows at ſix foot intervals, there will be at leaſt ſixty left to the perch, and theſe will thrive well, if the ſoil be rich, and well broken.

Sixty *Turneps* to a ſquare perch, at five pound each, which is but a third part of the ſize of ſheep-*Turneps* at their full growth, will make a crop of above eighty quarters to an acre.

When *Turneps* are planted late upon poor ground, they may be left more numerous; becauſe they will not have the advantage of heat for the hoing, that would make them grow larger, when ſet out at greater diſtances.

The greateſt *Turnep* improvement of the farmer is for his cattle in winter; one acre of *Turneps*, at this ſeaſon, will maintain more than fifty of meadow or paſture land. Moſt cattle will eat *Turneps*, and they breed milk better than any other food whatever. Sheep always refuſe them at firſt, and, unleſs they have eaten them while lambs, they will be ready to ſtarve before they will touch them; but as ſoon as hunger compels them to fall to, they are ſoon fattened by them. Lambs of three weeks old will eat them, ſcooping them very prettily, while thoſe of a year old, which are called *tegs*, will not touch them of three or four days, till almoſt famiſhed.

In ſome places, the greateſt uſe of *Turneps*, except for fattening oxen and ſheep, is for ews and lambs in the ſpring, when natural graſs is not grown up on poor grounds. Sometimes the farmers are obliged to keep their ews and lambs upon them till April, though they were run up to ſeed in the mean time. Id. Ibid.

There are three manners of ſpending *Turneps* with ſheep. See the article SHEEP.

The white and purple-rooted *Turnep* are the two kinds raiſed for the uſe of the table in England. They thrive beſt in a dry ſandy ſoil, that is not too rich; if the ground be too rich, they are apt to grow ſticky; but they are always the beſt taſted when produced on freſh, not on worn-out lands. The common time of ſowing them is from the beginning of July to the middle of Auguſt; but the gardeners about London ſow them every month from March to Auguſt, that they may have a conſtant ſupply; thoſe ſown early always ſucceed beſt when ſown on a moiſter ſoil than the others; for when on a dry one, they are ſubject to great damages, and are often almoſt wholly deſtroyed by a fly.

Turneps muſt always be ſown in an open place, for if they ſtand near hedges, or under ſhelter, they run up into tall ſtalks, and do not grow at the root. *Miller*'s Gardener's Dict.

TURNESOL, a plant of conſiderable uſe by the colour prepared from it, and known under its name. The root of theſe plants is long and white; the leaves reſemble in ſhape thoſe of the xanthium, or leſſer burdock; they grow on long pedicles, and are of a whitiſh or aſh-coloured green. The flowers form a ſort of cluſter, and grow out of the alæ of the leaves; they are of two kinds on the ſame plant, barren and fruitful, or, as botaniſts expreſs it, male and female.

The barren, or male flowers, occupy the top of every cluſter, and are placed each in a cup, divided into five ſegments, and themſelves conſiſt each of five ſmall yellowiſh leaves, with a bundle of ſtamina in the middle. The female, or fruitful flowers, are placed at the bottom of the cluſter, and are ſurrounded each by a cup, divided into ten ſegments; they are compoſed of five ſtamina, which ſurround a piſtil which is furniſhed with three forked filaments. This piſtil, which is fixed in the bottom of the cup, finally becomes a round fruit, of a rough ſurface, and green colour, its protuberances only appearing a little whitiſh. This fruit is divided into three cells, and each of theſe contains one round ſeed. The whole fruit is attached to the cup by a very long pedicle, ſo that when the flowers are withered, and it has arrived at its maturity, it is found hanging from the alæ of the leaves, and ſeems to have been produced without any flower; and this is what has led ſome writers into the error of imagining, that the flowers and fruit of this plant grow on different ſtalks.

Some have tranſlated *Turneſol* by the Engliſh word *ſun-flower*, which has led many to ſuppoſe that the great yellow ſun-

flower which we keep in gardens, was the plant that afforded the *Turneſol* colour: But this is a miſtake; and it is to be obſerved, that the true *Turneſol* plant here deſcribed, is very common in the fields of France and Germany, but does not grow wild with us in England.

The juice of the berries of the *Turneſol* rubbed upon paper or cloth, at the firſt appears of a freſh lovely green, but preſently changes into a kind of bluiſh purple. The ſame cloth, afterwards wet in water, and wrung out, will turn the water into a claret-colour: And it is to be obſerved, that theſe are the rags of cloth uſually called *Turneſol* in the druggiſts ſhops. *Boyl*'s Works abr. vol. 2. p. 79.

The lixivium of this plant in lime-water and urine, or in the volatile ſpirit of wine, turns marble blue. See the article *Colouring of* MARBLE.

TURNESOL, in botany, *&c.* See the article HELIOTROPIUM.

TURNING (*Cycl.*)—TURNING-*Evil*, in cattle, a diſeaſe that cauſes them frequently to turn round in the ſame place. It is alſo called the *ſturdy*.

The common remedy, recommended by Mr. Markham, is to throw the beaſt down, and bind him; then to open his ſkull, and take out a little bladder, filled with water and blood, which uſually lies near the membrane of the brain, and then gradually heal the wound. *Boyle*'s Works abr. vol. 1. p. 87.

TURNO *Vicecomitum*, a writ that lies for thoſe that are called to the *ſheriff's turn*, out of their own hundred. Reg. orig. 173. *Blount*, *Cowel*.

TURNSTONE, in zoology, the Engliſh name of a bird called by authors the *morinellus marinus*, or ſea-dotterel.

It is a little larger than the blackbird; its head moderately thick, and its body of a longiſh ſhape; its beak a finger's breadth long, thick at the baſe, and ſharp at the point; and its head, neck, ſhoulders, wings, and the upper part of its breaſt, are of a browniſh colour; its throat and belly are ſnow-white; the middle of its back has a very large white blotch; and its rump is variegated by a broad tranſverſe ſtreak of black; its legs are ſhort, and of a reddiſh yellow or orange colour. *Ray*'s Ornithol. p. 231.

TURONILLA, in zoology, a name given by ſome authors to the common little prickly fiſh called the *ſtickleback* or *barnſtickle*, and more uſually known among authors by the names *pugnitius* and *aculeatus piſciculus*. *Rondelet*. de Aquat. p. 9. See the article PUGNITIUS.

TURPENTINE (*Cycl.*)—In the diſtilling of *Turpentine* and other balſams by a gentle heat, it has been obſerved, that there ariſes firſt an acid ſpirit, that will mix with water; which ſpirit, except the fire be very gentle, is loſt. This grateful acid ſpirit, that firſt comes over, is, as a learned chemiſt and phyſician informs us, highly refrigeratory, diuretic, ſudorific, balſamic, or preſervative from putrefaction, excellent in nephritic caſes, and for quenching thirſt; all which virtues the biſhop of Cloyne thinks contained in the cold infuſion of tar, which draws forth only its fine flower, or quinteſcence, or the native vegetable ſpirit, together with a little volatile oil. See the article TAR-*Water*.

Turpentine is a fine reſin, whereof there are four kinds in uſe; the *Turpentine* of Chios or Cyprus, which flows from the *Turpentine*-tree; the Venice *Turpentine*, which is got by piercing the larch-tree; the Straſburgh *Turpentine*, which Mr. Ray informs us is procured from the knots of the ſilver fir; it is fragrant, and grows yellow with age. The fourth and laſt kind is common *Turpentine*, which is neither ſo tranſparent nor ſo liquid as the former; and this Mr. Ray takes to flow from the mountain pine. All theſe *Turpentines* are uſeful in the ſame intention. Theophraſtus ſays, the beſt reſin or *Turpentine* is got from the terebinthus growing in Syria, and ſome of the Greek iſlands. The next beſt is that from the ſilver fir and pitch-pine.

Turpentine may be of uſe to preſerve the bodies of inſects. Mr. Boyle [a] took clear Venice *Turpentine*, and evaporating to two thirds, obtained a reddiſh tranſparent gum, clear of bubbles, eaſily ſoluble by heat, and as eaſily rendered brittle by cold. Having firſt pulverized it, he melted it for uſe, with a gentle heat, and dipped the body to be preſerved ſeveral times therein, till it acquired a caſe of due thickneſs.—[[a] Works abr. vol. 1. p. 29, 30.]

Oil of TURPENTINE. The *oil of Turpentine*, taken in too large a doſe, hath often very bad conſequences, ſuch as a ſtrangury, bloody urine, and its total ſuppreſſion, with a fever, violent thirſt, and vomiting.

In the Medic. Eſſ. Edinb. vol. 2. art. 5. we have an account of ſuch ſymptoms produced by the taking two drams of this oil in warm ale. The patient was cured by a warm bath, and drinking plentifully of Fuller's *emulſio Arabica*.

TURPENTINE-*Tree*. This tree, beſides its proper fruit which ſucceeds the flowers in the uſual way, is remarkable for producing what authors of little curioſity have named another fruit, called its *horn*. This horn is a membranous production, of the length and thickneſs of a man's finger; and what ſurprized thoſe authors who eſteemed it a ſort of pod, was to find that it produced not ſeeds, but living animals, which they called flies.

The true hiſtory of this horn is, that it grows from the ſurface of the leaves, not from the ſtalks in the manner of fruit; and is no natural production of the tree, but a mere accidental thing, occaſioned by the wound of an inſect on the leaf. There are a genus of ſmall animals called *pucerons*, ſome of which have wings, others not, and which we ſee very frequently in vaſt cluſters on the leaves and ſtalks of ſeveral plants. A certain ſpecies of theſe animals is peculiarly fond of the juices of the *Turpentine*-tree, and always takes its abode upon its leaves. The female of this animal, ſoon after it is produced from its parent, makes its way under the covering or upper membrane of the leaf, and there lives ſecure till it produces its young. Theſe, as ſoon as they are brought forth, begin to ſuck, and fixing uſually upon the ſides and top of the cavity in which they are placed, they occaſion a great derivation of juices to that part of the membrane of the leaf which covers them; and the conſequence of this is, that it riſes up from the leaf, and begins to grow into a long body; the formation of this afterwards is the ſame with that of all other galls, and is owing to the ſame cauſe, a wrong derivation of juices. This gall-horn, or bladder, which ever it be called, continues to grow in length, till it burſt ſomewhere at the ſides, and then the winged and creeping brood appear. This, though eſteemed ſo great a wonder by many, is far from being peculiar to this tree, for our common elm affords galls much of the ſame kind. See the article PUCERON.

TURPENTINE-*Tree*, in botany. See the article TEREBINTHUS.

TURREBA, the *Earth-Apple*, in natural hiſtory, a name given by the people of Guinea, and ſome other parts of Africa, to a very fine kind of truffle, which they find in great plenty in their barren deſarts, four or five inches under the ſand.

TURRITIS, *Tower-Muſtard*, in botany, a genus of plants which have four-leaved cruciform flowers, ſucceeded by long pods, containing a number of ſeeds. The plants of this genus differ from the heſperis, in that they have flat pods; from the leucoium, in that the ſeeds are not marginated; and from the cabbage, both in the flatneſs of the pods, and in the whole appearance of the plant.

The ſpecies of *Turritis*, enumerated by Mr. Tournefort, are theſe: 1. The common or larger *Tower-Muſtard*. 2. The ſmaller *Tower-Muſtard*. 3. The branched *Turritis*. 4. The leucoium-leaved *Turritis*. 5. The cut-leaved alpine *Turritis*. 6. The *Turritis* with the lower leaves like thoſe of ſuccory, the others perfoliate. And 7. The purple ſpring *Turritis*. *Tourn.* Inſt. p. 223.

TURSIO, in zoology, a name by which Bellonius, Scaliger, and ſeveral others, have called the *phocæna* or *porpeſſe*, diſtinctively from the dolphin, with which it is confounded by the vulgar. *Willughby*'s Hiſt. Piſc. p. 31. See the articles DELPHINUS and PHOCÆNA.

TURTLE, in zoology. See the article TURTUR.

TURTLE, in ichthyology, the name by which we commonly call the great ſea tortoiſe. See the article TESTUDO.

TURTUR, in zoology, the *Turtle-Dove*, a very beautiful little bird of the pigeon kind. The head, neck, and back, are of the bluiſh-grey colour of the common pigeon, with ſome mixture of a reddiſh brown near the rump, and at the bottom of the neck. Its breaſt and belly are white; but its throat of a fine bright purple; and the ſides of the neck are variegated with a ſort of ringlet of beautiful white feathers, with black baſes. It feeds on hempſeed, and other vegetable matters. *Willughby*'s Hiſt. Avium. p. 134.

TURTUR, in ichthyology, a name given by Paulus Jovius, and ſome other writers, to the fiſh called the *paſtinacha marina*. It is the *tragon* and *trygon* of the old writers, and is a ſpecies of the rayfiſh diſtinguiſhed by Artedi by the name of the ſmooth-bodied ray, with no fin in the tail, but with a bony ſpine in it, ſerrated on one ſide.

TURTUR, the *Turtle-Shell*, in natural hiſtory, the name given by the collectors of ſhells to a very beautiful ſpecies of murex, common in the cabinets, but not found any where on the ſhores. This is owing to its having greatly altered its appearance in the poliſhing; for it is no other than the white and brown-mouthed murex, which is common in its rough ſtate, with its outer coat taken off. See the article MUREX.

TUSHES, in the manege, are the fore-teeth of a horſe, ſeated beyond the corner teeth, upon the bars; where they ſhoot forth on each ſide of the jaws, two above, and two below, about the age of three, three and a half, and ſometimes four: and no milk or foal-teeth ever come up in the place where they grow. See the article TEETH.

TUSSILAGO, *Coltsfoot*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the radiated kind. The diſk is compoſed of floſcules; and the outer circle of ſemi-floſcules; theſe ſtand upon the embryo ſeeds, and are all contained in a ſcaly cup. Theſe embryos finally become ſeeds winged with down, and adhering to the thalamus of the flower. To this it is to be added, that the flowers appear before the leaves. *Tourn.* Inſt. p. 487.

There is no other known ſpecies of this plant but the common *Coltsfoot*. See Tab. 1. of Botany, Claſs 14.

The common *coltsfoot* ſtands generally recommended as a very great medicine in coughs, and all diſorders of the breaſt and lungs. It is alſo ſometimes uſed externally in inflammations.

TUSSIS, the *Cough*. Medical writers define a *Cough* to be a diſcuſſory and eliſory motion of the breaſt, by means of which nature attempts to throw off ſomewhat that is offenſive to her.

Phyſicians diſtinguiſh *Coughs* into the idiopatic and the ſymptomatic; the firſt is truly pectoral; the other only affects the breaſt, by means of the conſent of parts. Of the ſymptomatic, or, as ſome expreſs themſelves, the conſenſual *Coughs*, ſome have a catarrhal diſpoſition, and have a coryza for their origin or attendant, or, more ſtrictly ſpeaking, a gravedo; ſometimes a bronchus, hoarſeneſs, and inflammation of the tonſils; others are called hypochondriacal, which ſometimes ariſe from diſorders of the ſtomach, and are therefore called dry ſtomachic coughs; and ſometimes from ſchirroſities of the liver, whence they are common to people in cachexies, and in hectics and dropſies.

A *Cough*, which riſes from internal cauſes, is to be carefully diſtinguiſhed from one that riſes from external. The dry and the moiſt *Cough*, that is, thoſe in which matter is ſpit up, and thoſe in which nothing is evacuated, differ alſo greatly, as well in regard to their ſymptoms, as to the perſons they attack. The dry *Cough* is always more tedious in cure than the moiſt, and more eaſily returns. The ſtomachic *Cough*, which is owing to conſent of parts, is known by the quantity and thickneſs of the matter that is ſpit up, which is always moſt frequent after meals, and gives a tendency toward a reaching to vomit. This moiſt ſtomachic *Cough* differs in this manner, in all particulars, from the dry cough of the ſame name and origin with it, as mentioned before.

The hypochondriac *Cough* is abundantly diſtinguiſhed from the other kinds, by its dryneſs, and by its vehement violence, for it always leaves a hoarſeneſs behind it; this always is moſt violent after eating, and after drinking large draughts of cold liquors, or aſcending ſteep places. As alſo by its bearing very well a cold and humid air, and not being exaſperated by it, as the pectoral *Coughs* are; and finally, by a ſenſation of a concuſſion of the diaphragm, when the effects in coughing are violent. *Junker*'s Conſp. Med. p. 514.

The common habitual dry *Cough* is diſtinguiſhed from the other kinds by its remarkable dryneſs; and the common moiſt habitual *Cough* by its abundant quantity of matter diſcharged, and by its appearing pulpy and greeniſh, and not ſanious, or ſtreaked with blood, and continuing in the ſame degree uſually for a conſiderable time. In this habitual *Cough* there is no waſting of the fleſh, nor is there that violent exacerbation on the taking of opiates, which is always found in the phthiſical *Coughs*, to which all opiates ſeem the greateſt enemies. This *Cough* alſo always receives great benefit from purging medicines, but the phthiſical *Cough* none at all: But both theſe differ greatly, according to the age and temperament of the body of the perſon afflicted with them.

Perſons ſubject to Coughs. The ſimple idiopathic *Cough*, ariſing from internal cauſes, whether it be of the moiſt or dry kind, is almoſt peculiar to young people, and thoſe of plethoric habits. The catarrhal ſymptomatic *Cough*, which ariſes from external accidents, is common to perſons of all ſtates and ages; but is more frequent among old men than among others. The perſons moſt ſubject to the common dry *Cough* are young people of a florid conſtitution and dry habit of body; and men of the middle or more advanced ages are ſometimes alſo afflicted with it, from ſuppreſſions of the hæmorrhoidal diſcharges, or from omiſſions of habitual bleedings; as are alſo people who are badly conformed, gibboſe or crooked, and ſuch as are afflicted with the evil, or have calculi in the bronchia, or nodes of a ſchirrous nature in the lungs; and finally, ſuch as have been ill-treated in the ſmall-pox, or have had the itch, or any other violent cutaneous eruption ſtruck in upon them. People moſt ſubject to a common moiſt *Cough* are thoſe of a phlegmatic habit, ſuch as are apt to cool their neck and breaſt in autumn in damp cold air in evenings; ſuch as have omitted their habitual bleedings, and ſuch as have drank too freely of ſpirituous liquors, or taken too much of acids. The idiopathic pectoral *Cough* ariſes from a congeſtion of humours in the breaſt; and the hypochondriac *Cough* is either owing to a fault in the ſtomach, or to a ſchirroſity in the liver. *Junker*'s Conſp. Med. p. 515.

Prognoſtics in Coughs. The ſimple idiopathic pectoral *Cough* very frequently goes off of itſelf, without the aſſiſtance of medicines, or with no farther aſſiſtance to nature than bleeding, judiciouſly managed; but though thus gentle while recent, yet when it is become habitual, and fixed upon a perſon, it is very obſtinate; and though at firſt it is far from a conſumptive *Cough*, yet there is no certainty but that it may, at ſome time or other, occaſion ulcerations in the lungs. A dry *Cough* in young people is much to be feared, when of long ſtanding, for it not unfrequently degenerates into a ſpitting of blood, or into a conſumption: This kind ſometimes alſo changes into what authors call the *ferine Cough*, which is ſo violent, that perſons afflicted with it are ſcarce able to recover themſelves after a fit of it. In general, any *Cough* that ſeizes a perſon in the Spring, is much eaſier cured than one that attacks in Autumn. Periodic *Coughs*, that have been long uſed to return upon people at certain times, are always to be ſuſpected of danger, if they leave them ſuddenly, and no natural or artificial evacuation is made in their place; for they too often bring on faults in digeſtion, and ſometimes ſuffocative catarrhs, and paralytic diſorders: A moiſt habitual *Cough*, when it ſuddenly changes into a dry one, is alſo a bad prognoſtic. A violent dry hypochondriac *Cough*, that frequently remits and recurs again, and is uſually worſt in the night, gives great reaſon to ſuſpect a ſchirroſity in the liver; and the more regularly it returns at ſtated times, the more certain is the defect of this or ſome other of the viſcera; ſo that the prognoſtic is very fatal and very certain from it. *Junker*'s Conſp. Med. p. 518.

Method of Cure. In caſe of a moiſt pectoral *Cough*, it is proper firſt to give a purge, not violent, but yet moderately ſtrong, to derive the matter from the breaſt; and the catarrhal matter muſt then be prepared for evacuation; when it is ſimply mucous, the common reſolvent and diſcutient catarrhal medicines are to be depended upon; ſuch are decoctions of the roots of pimpernel and iris, with the leaves of hyſſop, horehound, ſcabious, and ſpeedwell; with theſe are to be given the attenuant gums, as ammoniacum, benjamin, and ſagapenum, with the warm carminative ſeeds. When the matter is too tough and viſcous, the buſineſs then is, on the contrary, to incraſſate and reduce it to a ſoft pulpoſe body. This is effected by liquorice-root or juice, with gum arabic, figs, ſtarch, together with all the ſulphureous medicines. If, on the contrary, the matter is thin and acrimonious, and irritates violently, then the cure is to be effected by ſuch things as obtund and ſweeten it; of this kind are emulſions of almonds, and the cold ſeeds, with barley-water, water-gruel, the mucilages of quince, and fleawort ſeeds, and the like; and to theſe are to be added occaſionally, ſperma ceti, and oil of ſweet almonds: When the *Cough* is habitual, laxatives are to be given after theſe, or in the intermediate times, during the taking them; and if the *Cough* returns, when the matter of it is no longer the cauſe, it is to be quieted by gentle opiates, ſuch as the ſtorax pill; and finally, corroborants are to be given to reſtore the due tone of the lungs.

In the dry *Cough* the gentleſt purges only can properly have place, and nothing is ſo proper as to begin with ſmall doſes of rhubarb; after this, to diſcuſs the ſtagnating blood about the breaſt, decoctions of the pectoral herbs are to be taken in large quantities, ſuch are coltsfoot, ſcabious, maiden-hair, and the like. While the patient is taking theſe, he ſhould frequently waſh his feet in warm water; and finally, the cure is to be compleated by ſuch corroborants as reſtore the due tone of the lungs; of this kind, Stahl's tonico-nervine mixture is a very excellent medicine.

In the hypochondriacal *Cough*, as there is generally a fault in the liver, the *Cough* can never be cured, unleſs that defect can be removed. The *Cough* is therefore to be judged, in this caſe, only a ſymptom of the diſeaſe, and the method of treatment muſt be the ſame as in the infarctions of the liver. See the article HEPATIS *Infarctus*.

When this obſtruction is removed, the *Cough*, occaſioned by it, goes off of itſelf. In caſes where the hypochondriac *Cough* depends on a fault in the ſtomach, the firſt conſideration to be had, is, whether it be dry or moiſt; when it is dry, we may conclude that the fault is not ſo much in the ſtomach, as in the parts about it; and hence the motion of the congeſtions of blood toward the vena porta are to be regarded.

The moiſt ſtomachic *Cough* always brings the breaſt into conſent, and is hence often called a *ſtomachico-pectoral Cough*; for the mucous matter which lies in the fauces, and is daily evacuated rather by hawking than coughing, probably aſcends up the œſophagus, and cauſes a ſlight *Cough* in the day-time; but in the night, when that excretion ceaſes, it is eaſy for ſome little humidity to ſlip down the aſpera arteria; and this will be again thrown up by coughing in the morning. In the cure of this, there muſt be firſt given ſome gentle purges; after theſe, ſuch medicines as reſolve viſcoſities in their firſt formation; in which intention the roots of elecampane and pimpernel, with that of florentine orrice, are of great effect; and in the food it will be proper to eat large quantities of ginger, pepper, and the other ſpices; and at night, going to bed, drink a ſmall glaſs of brandy. When the diſeaſe begins to mitigate, the eſſence of amber is a medicine that will do the greateſt ſervice.

Bleedings in *Coughs* in general, when the conſtitution is plethoric, and they are done at proper times, are of great ſervice in breaking the force of the diſeaſe; nay, in caſes of a true phthiſis, bleeding often greatly retards, and keeps off the bad ſymptoms. It is to be obſerved, however, in all theſe caſes, that, when the conſtitution will bear it, the quantity taken away ſhould be larger, for otherwiſe they only invite a larger afflux of blood to the breaſt, and ſo increaſe inſtead of mitigating the force of the diſeaſe.

Bleeding is always more neceſſary in a dry *Cough* than in a moiſt one, unleſs the ſuppreſſion of ſome natural hæmorrhage, or the omiſſion of the habitual bleedings, have been the occaſion of it. Bleeding is alſo the more neceſſary in *Coughs*, as they

they return at times with renewed violence, and hurt the breaſt and lungs; and, in this caſe alſo, if cupping has been frequently uſed, and lately omitted, it muſt be had recourſe to again. Purging medicines have the moſt ſpeedy effects in moiſt *Coughs*, and indeed in dry ones they are not always ſafe, or, at the moſt, very gentle purgations alone are proper in this laſt caſe, where there is not a load of attending matter to be evacuated, as in the firſt. Sweating medicines are by ſome preſcribed in *Coughs*; but they have no proper place in any judicious regimen for theſe caſes, unleſs after the *Cough* is cured, and the matter carried off, when they may perhaps be of ſome ſervice to compleat the reſtoration of the conſtitution to its priſtine ſtate, by an equal diſtribution of the humours through the whole body. In ſimple *Coughs* there is occaſion for very few medicines, and, in general, inciding things, which diſpoſe the matter to an eaſy evacuation, with gentle laxatives, do the whole buſineſs.

The commotions occaſioned by humid *Coughs* are never extremely violent, nor of any great danger, and therefore it is not neceſſary to be at any great pains to allay them by opiates; but theſe are very ſucceſsfully given in caſes where the emotions are greatly too violent for the quantity of matter, or where they continue after the matter is carried off and evacuated. In this caſe the ſtorax pill is of great ſervice. *Junker*'s Conſp. Med. p. 520.

TUTSAN, in botany, *&c.* See the article ANDROSÆMUM.

TUTTI, in the Italian muſic, is uſed to ſignify that all the parts are to play together, or to make a full concert.

In this ſenſe *Tutti* ſtands oppoſed to *ſoli* or *ſolo*. See the article SOLO.

It is often found expreſſed by *omnes*, *ripieno*, *da capella*, *choro*, &c.

TUTULUS, among the Romans, a manner of dreſſing the hair, by gathering it up on the forehead into the form of a tower. *Pitiſc.* in voc.

TUTULUS likewiſe ſignified a woollen cap with a high top.

TUTTY, *Cadmia fornacum* (*Cycl.*)—Dioſcorides and Pliny differ conſiderably in their accounts of this ſubſtance, though they and all other authors agree in the material part of its hiſtory, *viz.* That it is a recrement of metals collected in the furnaces where they are melted.

Pliny mentions a kind called *capnitis*, or the *ſmoak Cadmia*. This is not mentioned by Dioſcorides. This *Cadmia capnitis* was the fineſt and moſt ſubtile of all the kinds; it was found at the mouths of the furnaces, where the flames burſt out on ſtirring up the fires.

The botryoide *Cadmia* was eſteemed a very good kind. This was, according to Pliny, of two colours, grey and red. The red, he tells us, was very much the better kind. Dioſcorides mentions no ſuch thing as a red *Cadmia*, but only ſays, that the grey botryoide kind, when broken, appeared of a ruſty colour, and ſpotted within. This is the worſt kind, according to Pliny.

Dioſcorides no where mentions his red kind, but he names after this a blue ſort, which was greatly preferable, and which was white within.

As Pliny does not mention this blue *Cadmia*, nor Dioſcorides the red, it is probable that they are the ſame thing, eſpecially as both agree in their being the moſt excellent kinds. The Greeks had a way of expreſſing all things that were blue by the word *cyanizuſa*, or reſembling the *cyanus* in colour. This word κυανιζουσα ſeems to have been the word that Pliny miſtook in his deſcription taken from this or ſome other Greek author, for the other or better kind of botryoide *Cadmia*, and reading φοινισσουσα for κυανιζουσα, tranſlated it red inſtead of blue. We have ſo many inaccuracies of this kind in Pliny, that it is much better to reconcile his account of the cadmia thus, than to ſuppoſe he was acquainted with a ſpecies of that ſubſtance, which no body elſe ever knew.

TWAITE, in our old writers, a wood grubbed up and converted into arable land. Co. Litt. 4. *Blount*.

TWENTY *four Men*: Men choſen every half year to redreſs the grievances of the mines and miners; but every man generally ſerves his year when choſen. *Houghton*'s compl. Miner. in the Explan. of the Terms.

TWISTED, (*Cycl.*) in the manege, called in French *Biſtourné*, is uſed for a horſe reduced to the ſame ſtate of impotency with a gelding, by the violent wringing or *twiſting* of his teſticles twice about; which dries them up, and deprives them of nouriſhment.

TYGER, or TIGER, *Tigris*, in zoology. See the article TIGRIS.

TYING *Courſe*, among brick-makers. See the article BRICK.

TYLOS, in zoology, a name by which many authors have called the *turdus iliacus*, or red-wing. See the article RED-*Wing*.

TYMPANA, Τυμπανα, among the Athenians, a capital puniſhment, wherein the criminal being affixed to a pole, was beaten to death with cudgels. *Potter*. Archæol. Græc. l. 1. c. 25. T. 1. p. 134.

TYMPANOTRIBA, among the antients, a deſignation given to an effeminate perſon, who could do nothing but play on the tympanum. *Pitiſc.* in voc.

TYMPANUM (*Cycl.*)—The *Tympanum*, or barrel of the ear, is a cavity irregularly ſemicircular, the bottom of it being turned inward, and the mouth joined to the circular groove of the external auditory paſſage. It has both eminences and cavities obſervable in it. The remarkable eminences are three in number, a large tuberoſity lying in the very bottom of the barrel, a little toward the back part, and a ſmall irregular pyramid, ſituated a little above the tuberoſity, and a little more backward; the apex of it is perforated by a ſmall hole, and on one ſide of the baſis, two ſmall bony filaments are often found in a parallel ſituation. They are ſeldom found to be wanting, on a careful inveſtigation, though their tender ſtructure expoſes them to be very often broken. In the third eminence is a cavity ſhaped like the mouth of a ſpoon, ſituated at the upper, and a little toward the anterior part of the bottom of the *Tympanum*. This cavity is part of a half canal, and at a very ſmall diſtance from its point, is a little bony ridge, which goes from one edge of it to the other, but is ſeldom found entire. The principal cavities are the openings of the cells of the maſtoide ſinuoſities, the opening of the euſtachian tube, the bony half canal, the feneſtra ovalis and rotunda; and to theſe may be added the ſmall hole in the pyramid. The opening of the maſtoide cells is at the poſterior and upper part of the edge of the barrel; the cells themſelves, which end there, are dug in the ſubſtance of the maſtoide proceſs, being very irregular and full of windings and turnings. The opening of the euſtachian tube is at the anterior, and a little toward the upper part of the edge of the barrel. This tube, which in France is uſually termed the aqueduct, runs from the *Tympanum* toward the poſterior openings of the naſal foſſæ and arch of the palate. The bony portion of it, the only part ſpoken of here, is dug in the apophyſis petroſa along the duct of the carotide apophyſis; and when it leaves that, it is lengthened out by the ſpinal apophyſis of the os ſphenoides. Theſe too cavities, the maſtoide cells, and the euſtachian tube, are, in ſome meaſure, prolongations of the *Tympanum*, one anterior, the other poſterior. The bony half canal, of which the cavity, like the mouth of the ſpoon, is the extremity, lies immediately above the euſtachian tube, toward the upper ſide of the apophyſis petroſa, or rather in the very ſubſtance of that upper ſide, and in a natural ſtate a ſmall muſcle is lodged in it. *Winſlow*'s Anatomy, p. 47.

TYMPANY (*Cycl.*)—This diſeaſe has been generally accounted, both by the antients and moderns, a ſpecies of dropſy, but very improperly; for though it is often productive of, or complicated with an aſcites, yet it is in itſelf a perfectly diſtinct diſeaſe, and accompanied with no extravaſation of water in the abdomen, perſons who have died of it having been found, on opening the body, with the abdomen as dry as in a ſtate of health; but the ſtomach has been found, in ſome, greatly diſtended with flatulencies, and containing a viſcid humour, though in no great quantity. The inteſtines are alſo uſually found diſtended, and, as it were pellucid, and, on being pricked, they collapſe, without the appearance of any water. And, in ſome caſes, on opening the abdomen, the whole ſwelling has ſubſided, on the excluſion of a groſs flatulence which had diſtended it. The inteſtines have, in ſome ſubjects, been found diſtended to the bigneſs of a man's thigh, in ſome parts, and in others lower down, ſo contorted and twiſted together, that there could be no paſſage either for the wind or the excrements. It is not uncommon alſo, on diſſection, to find great numbers of worms, of the common long kind, in the inteſtines.

A *Tympany*, without a dropſy, is moſt incident to women after labour, when the lochia have been ſuppreſſed by colds or otherwiſe, or diſcharged in too ſmall quantities; a bad regimen during the lying in, and the omitting to ſwathe the belly properly down, has alſo often a bad effect this way. In caſes of this kind, women find ſoon afterwards the abdomen inflated, with a conſiderable uneaſineſs, a difficulty of breathing, coſtiveneſs, and an unaccountable anxiety. Theſe are the breeding ſymptoms of the approaching *Tympany*; and the ſame often happens after unſkilful treatment in abortions, and after the leaving a part of the lochia behind, or the injuring the uterus in delivery.

Children are alſo ſubject to *Tympanies*, when violently afflicted with worms, and ſometimes after the meaſles and ſmall-pox; and if due care is not taken of theſe caſes, at their beginning, the ſuperior parts ſoon become extenuated, and the patients die. Extream voracity of children alſo, and their eating great quantities of food at a time, when the ſtomach is weak, ſometimes brings on this diſorder.

The *Tympany* is juſtly accounted one of the more dangerous kinds of diſeaſes, ſince the perſons afflicted with it much oftener die than recover. When it is accompanied with a dropſy, it is ſcarce ever cured; and a ſimple *Tympany* in women and children, if neglected at firſt, degenerates into a chronic diſorder, and hardly admits of a cure. Some, indeed, have gone ſo far as to ſay, they never knew a patient, afflicted with a *Tympany*, recover; but this ſeems too raſh a judgment. That diſtention of the abdomen, which is properly called a flatulent colic, is by ſome accounted a ſpecies of *Tympany*; but this is not naturally dangerous, and is eaſily cured, except

when it is attended with ſpaſms of the viſcera, in which caſe the medicines, given to reſtore the due tone of the inteſtines, are by no means proper in regard to the ſpaſms.

In curing flatulencies of the ſtomach and inteſtines, the proper method is to promote the diſcharge of the vapours by the anus, and to attenuate and carry off by ſtool the viſcid matter which is the occaſion of them. To this purpoſe diſcutient and evacuating glyſters are very ſerviceable: theſe ſhould be prepared of chamomile, hyſſop, juniper-berries, and the carminative ſeeds, a little quantity of ſal gem, crude ſal ammoniac, or Epſom ſalt, in veal broth. After theſe, laxative medicines are to be given, with balſamic and carminative ingredients; and then the powders of zedoary, orange-peel, tartarum vitriolatum, are to be given; and, when neceſſary, the pillulæ de ſtyrace at proper intervals. In the mean time much ſervice may alſo be done by external applications; ſuch as the oils of mint, rue, nutmeg, and the like, with balſam of Peru; and the rubbing the belly with Hungary-water is often of immediate relief: By theſe means the ſlighter inflations of the ſtomach and inteſtines are uſually cured with eaſe, and often beginning *Tympanies* yield to a continuance of them. *Hoffman.* Opera. T. 4.

TYPHIUM, in botany, a name uſed by ſome authors for colts-foot. *Ger.* Emac. Ind. 2.

TYPHLE, or TYPHLINE, a name by which ſome authors have called the fiſh, more uſually known by the name of the *acus*. *Willughby*'s Hiſt. Piſc. p. 158. See the article ACUS.

TYPHLINUS, in zoology, the name by which the Greeks, and from them ſome others, have called the *cæcilia*, or ſlow-worm. See the article CÆCILIA.

TYPHOS, the name of a diſeaſe deſcribed by Hippocrates and the old writers, and by them diſtinguiſhed into five kinds.

The firſt kind of *Typhos* is a legitimate and continual fever, impairing the perſon's ſtrength, and accompanied with pains in the abdomen, and a preternatural heat and weakneſs of the eyes, and a failure of ſpeech.

The ſecond kind begins with a tertian or quartan fever, and is attended with a pain in the head, and a large diſcharge of ſaliva, and ſometimes worms. The feet, and other parts of the body, are afflicted with ſoft ſwellings, the eyes are painful, and the voice tremulous and faint, from the ſticking of the ſaliva in the throat. The belly and back are alſo often in pain.

The third kind is diſtinguiſhed by the intenſe pains it gives in the joints, and ſometimes over the whole body, and often with a lameneſs.

The fourth is known by the violent tenſion and pain of the abdomen which attends it; this is uſually followed by a diarrhœa, and ſometimes by a dropſy.

The fifth kind is diſtinguiſhed by an unnatural paleneſs all over the body, and a ſort of tranſparence, as if the whole ſkin were only a bladder, containing a watery juice, though not inflated; the eyes are hollow in this caſe, and the patient is continually feeling about the bed-cloaths, as if picking out threads. There is always an uneaſineſs after eating, and frequent nocturnal pollutions.

The word *Typhos* is alſo uſed in a more general ſenſe for *Typos*, to import the remiſſions and exacerbations of diſeaſes.

TYPIC *Fevers*, an appellation given by medical writers to thoſe fevers which are regular in their attacks, and in their general period: They are thus called by way of diſtinction from the erratic, which obſerve no regular type, or determinate appearance.

TYRANNUS, in zoology, a name given by ſome to the lanius, or butcher bird, a ſpecies of hawk, not larger than a thruſh, but a very fierce and fatal enemy to the ſmall birds. *Ray*'s Ornithol. p. 52. See the article LANIUS.

TYRBE, Τυρβη, in antiquity, a feſtival celebrated by the Achæans, in honour of Bacchus. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 434.

TYRIUM *Marmor*, a name given by the antients to a ſpecies of marble of a beautiful white, ſometimes free from veins, and ſometimes variegated with duſky blackiſh grey ones. When pure, it was little inferior to the Parian, and often was uſed inſtead of it by the ſtatuaries.

TYROSIS, a name given by the antients to a diſorder in the ſtomach, occaſioned by milk curdling in it, from the too great acidity of the humours.

TYRUS, a word uſed by ſome of the barbarous writers for a ſerpent or viper.

TZANATL, in zoology, the name of an American bird deſcribed by Nieremberg, which, he ſays, has all over very long and beautiful feathers, of a fine green, and of the ſhining gloſs of the feathers of the peacock. The upper ſide of the wings is black, but their under part is of a very fine and ſhaded green. It has a very beautiful creſt on its head; its throat and breaſt are of a fine ſcarlet. The wing feathers are very long, and very beautifully variegated with ſeveral colours. The Indians eſteem the feathers of this bird more valuable than gold; they dreſs up the images of their gods with them. *Ray*'s Ornithol. p. 303.

TZANGÆ, among the antients, a kind of Parthian garments, according to ſome; but others will have them to have been ſhoes ſet with precious ſtones, formed into the figure of eagles, and deſigned for the emperor's uſe. *Pitiſc.* in voc.

TZANPAU, in zoology, the name of an American bird, deſcribed by Nieremberg, and kept by the Spaniards in cages for its melody. It is famous for the modulations of its voice, and is by many eſteemed the female of the polyglotta avis, or cencontlatolli of the Indians.

It is of the ſize of our ſtarling. Its breaſt and belly are mottled with white, grey, and black, and its back with white, black, and a duſky brown. *Ray*'s Ornithol. p. 305. See the article POLYGLOTTA *Avis*.

TZICATLINA, in zoology, a ſpecies of ſerpent, ſaid to be found in America, and reckoned among the moſt beautiful of that kind of animals. It is nine inches long, about the thickneſs of a man's little finger, and variegated with alternate ſwaths of white and red, croſſing its body. It is likewiſe one of the harmleſs kinds of ſerpents.

The name ſignifies the *ſerpent of ants*, becauſe it lives always in their neſts, and comes out along with them. *Hofman.* Lex. in voc.

TZINITZIAN, in zoology, the name of a very beautiful American bird, deſcribed by Nieremberg, of the ſize of a ſmall pigeon, and ornamented with variouſly-coloured feathers. The beak is ſhort, crooked, and of a pale colour; the head and neck are like thoſe of the pigeon; the breaſt and part of the belly are red; but that part which is next the tail is of a fine elegant blue, and a bright white, beautifully intermixed with one another; the tail is green on the upper part, and black underneath; the wings are variegated with white and black; the feet and legs are grey; and the ſhoulders of a very beautiful green. It is moſt frequent near the South-ſea, and feeds on vegetables. It is kept in cages for its beauty, but never ſings. The Indians make ſeveral beautiful works of its feathers. *Ray*'s Ornithol. p. 303.

TZTACTZON, in zoology, an American name under which Nieremberg has deſcribed a ſpecies of duck, remarkable for the variable and beautiful colours of its head, which are purple, blue, white, and green, and ſhine like ſattin. Its body is variegated with black, grey and white. Its legs are red, and is eaten as the other water-fowl. It is common in the lakes of Mexico; and has feet much more adapted to ſwimming than to walking. *Ray*'s Ornithol. p. 299.

V

V, in muſic, is often uſed to ſhew that a piece is deſigned for the violin; and VV, for two violins, or more.

V. S. is an abbreviation for *Volti Subito*. See the article VOLTI *Subito*.

VACCA, in zoology, the female of the ox-kind. See the articles BOS and OX.

VACCARY, *Vaccaria*, in our old writers, a houſe or place to keep cows in; a dairy-houſe, or cow-paſture. *Flet.* lib. 2. *Blount*, *Cowel.*

VACCINIUM, in botany, a name by which ſome authors have called the great bilberry, or *vitis idæa magna* of other writers. *Dale.* Pharm. p. 294.

VACUNALIA, among the Romans, a feſtival kept in honour of the goddeſs Lacuna.

It was celebrated in December by the country labourers, after the fruits were gathered in, and the lands tilled. *Pitiſc.* Lex. Antiq. in voc.

VADIATION, *Vadiatio*, in the civil law. See the article VADARI, *Cycl.*

VA-EMBU, in the materia medica, a name given by ſome authors to the *acorus Aſiaticus*, or Aſiatic ſweet flag. Hort. Malab. vol. II. p. 99.

VAGINA (*Cycl.*)—VAGINÆ *Femoris Tenſor*, in anatomy, a name given by Albinus to a muſcle of the thigh, called by others the *membranoſus*, and the *muſculus faſciæ latæ*; and by ſome *muſculus aponeuroticus*. See the article MEMBRANOSUS.

VAGINANS *Folium*, among botaniſts. See the article LEAF.

VAGUE *Acid*, a term much uſed by the modern chemiſts, and ſignifying a certain volatile fluid ſalt or acid, ſuppoſed to be found every where in mines, and in combination with different other ſubſtances, to form many of the ordinary compound foſſils.

This mixing with foſſile oil, petroleum, oleum terræ, or the like, probably conſtitutes the various ſorts of native foſſile tranſparent ſulphurs; uniting with ſemi-metals, it forms cinnabar, antimony, and other foſſils, both ſolid and fluid; uniting with metals, it forms divers kinds of vitriols; with calcarious earths, different alums; and laſtly, with pyrites, which is the matrix of vitriol, calcined in a wood-fire, it produces common ſulphur.

It may probably be held much of the ſame nature with that acid, which burning ſulphur diffuſes from its blue flame, ſo ſuffocating and fatal to all animals. Certainly the analyſis ſeems to intimate as much. And hence this may probably be looked upon as a male ſalt, ſerving to impregnate the female ſalts and earths. *Boerhaave*, Chem. 112.

There ſeems to be a certain *vague* ſalt or acid diffuſed in all parts of the earth, which, when alone, is volatile; but when it has a body, or proper ſubject to adhere to, it becomes fixed. The idea of this ſalt we are at a loſs how to convey, otherwiſe than by its effects; it ſeems to come neareſt the nature of ſpiritus ſulphuris per campanam, and is diſcovered in all ſulphur, in all vitriol, in all alum, in all nitre, in all foſſile coal, and many other ſubſtances; and is, perhaps, that pernicious fume or damp found in mines, and the ſmoke which flies from bituminous turf, and other the like bodies.

It is looked upon as an indeterminate principle, diſtributed through every part of the globe, both inſide, and out. It is this acid that diſſolves iron and copper near ſome hot baths. It is this that, meeting with foſſile oil, becomes coagulated, and is converted into ſulphur; that being received into the earthy part of the lapis calcarius, converts it into alum; and inſinuating itſelf into the ſubſtance of iron, produces green vitriol; into that of copper blue vitriol.

This doctrine of a *vague* acid may ſeem a little hypothetical, till the actual ſeparate exiſtence of ſuch an acid can be ſhewn; of which we do not know any clear inſtances. The argument for it ſtands thus: We find ſeveral mineral bodies that afford acids upon their analyſis; or appear to contain acids; and therefore nature makes uſe of theſe acids in the compoſition of ſuch mineral bodies: But to render this argument concluſive, the acids ſhould be ſhewn to exiſt in the earth, and inſtances be produced of nature's working in this manner, with the ſeveral ſteps of the proceſs. Inſtead of this direct proof, we only find a prejudged theory in authors, ſupported indeed by probable reaſonings, and a plauſible ſolution of phænomena: But all this may poſſibly be no more than a bare accommodation to the mind. *Shaw*, Chem. 112.

VAI-*Hio*, in the materia medica, a name uſed by ſome authors for a kind of lignum aloes, which is brought from China, and is very black, and ſcented. *Dale*, Pharm. p. 448.

VAISSEAUX *Enfilez*, a term uſed by the French writers in chemiſtry, for thoſe veſſels uſed in diſtilling in an open fire, or in ſand, which do not conſiſt in the common way of a retort, joined immediately to a receiver, but have a receiver with a double opening, and a neck at each end, placed between the retort and the ordinary receiver. The neck of the retort is let into one of the necks of this middle veſſel, and its other neck is thruſt into that of the receiver; by this means the receiver, into which the liquor is to fall, ſtands at a greater diſtance than it otherwiſe would from the fire, and the vapours are more eaſily condenſed in it by its coolneſs, while they have alſo a double or treble ſpace to expand in, and by that means are not ſo likely to burſt the veſſels.

VALDIA, in botany, a name given by Plumier to a genus of plants, ſince called by Linnæus, *ovieda*. *Plumier*, Gen. 24. See the article OVIEDA.

VALE *of a Pump*, at ſea, a term for the trough by which the water runs from the pump along the ſhip-ſides, to the ſcupper-holes.

VALERIAN, *Valeriana*, (*Cycl.*) in the Linnæan ſyſtem of botany, makes a diſtinct genus of plants, taking in the *valerianella* of Tournefort, and the *valerianoides* of Vaillant.

The characters of this genus are, that the cup ſcarce deſerves the name of one, and is only a ſort of rim or foliaceous edge, ſurrounding the germen. The flower conſiſts of a ſingle petal, in form of a tube, prominent in its inferior part, and containing a honey juice, divided into five ſegments at the edge, all which are obtuſe. The ſtamina are three, or fewer, pointed, erect filaments, and of the ſame length with the flower. The antheræ are roundiſh. The piſtillum has its germen below the receptacle. The ſtyle is thread-like, and of the ſame length with the ſtamina; and the ſtigma is ſomewhat thick. The fruit is a capſule, that ſplits and falls off. The ſeeds are ſingle and oblong. Theſe are the characters of the genus; but there is great variation among the different ſpecies. *Linnæi* Gen. Plant. p. 8.

The characters of this genus, according to Tournefort, are theſe: The flower conſiſts of one leaf, and is ſhaped like a funnel, and divided into ſeveral ſegments at the edge. This ſtands upon a cup, which finally becomes an oblong ſeed, of a flattiſh form, and winged with down.

The ſpecies of *Valerian*, enumerated by Mr. Tournefort, are theſe: 1. The great Pyrenean *Valerian*, with the leaves of cacalia. 2. The ſcentleſs Alpine *Valerian*, with undivided leaves, and a creeping root. 3. The middle marſh *Valerian*, with ſlightly divided leaves. 4. The firſt Alpine *Valerian* of Caſpar Bauhine. 5. The other Alpine *Valerian*, of the ſame author. 6. The figwort-leaved Alpine *Valerian*. 7. The roundiſh-leaved mountain *Valerian*. 8. The Alpine *Valerian*, reſembling the celtic Spikenard. 9. The cretic *Valerian*, with the dropwort-root. 10. The celtic *Valerian*, commonly called celtic ſpikenard. 11. The common broad-leaved red *Valerian*. 12. The ſmall narrow-leaved red ſea-*Valerian*. 13. The common narrow-leaved red *Valerian*. 14. The great broad-leaved ſea *Valerian*. 15. The ſmall narrow-leaved, white-flowered ſea *Valerian*. 16. The garden *Valerian*. 17. The great wild *Valerian*. 18. The great wild *Valerian*, with ſhining leaves. 19. The great marſh *Valerian*. 20. The ſmaller marſh *Valerian*. 21. The little marſh *Valerian*, with a ſmall flower. 22. The little Alpine *Valerian*. 23. The annual *Valerian*, with leaves like thoſe of the calcitrapa. 24. The broad-leaved annual jagged Portugal *Valerian*. *Tourn.* Inſt. p. 131.

The *Valerians* may be known, when not in flower, by their roots being ſcented, and their leaves always ſtanding two at a ſtalk.

The great garden *Valerian* is an alexipharmic, ſudorific, and diuretic. The root is the only part of it uſed in medicine; this is to be taken up in September, and carefully dried. It is then given in powder in aſthmas, pleuriſies, coughs, obſtructions of the liver and ſpleen, and in the plague, and all malignant and petechial fevers. It is alſo recommended by ſome as a vulnerary, and by others as one of the greateſt medicines in the world for weakneſſes of ſight.

The wild *Valerian* root is much more famous than this, but in a different intention. It is of a ſtrong diſagreeable ſmell, and is given in nervous caſes with very great ſucceſs. There are not wanting inſtances of perſons cured of confirmed epilepſies by it. In all convulſions it is a very ſucceſsful medicine.

VALERIANELLA, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf,

leaf, ſhaped like a funnel, and divided into ſeveral ſegments at the edge. This ſtands upon a cup, which afterwards becomes a fruit, always containing one ſeed only, but yet is of very various figures; one ſort is like a ſpear-point in ſhape, being compoſed of two flat pieces, containing a ſeed in one or the other of them; another is of an oval ſhape, umbilicated, and terminated by three points; others have beautifully regular hollows cut in each for a ſingle ſeed; others are longer, fungoſe, and lunated, containing a cylindric ſeed; and finally, others terminate in three hooks, and contain a ſomewhat crooked ſeed.

The ſpecies of *Valerianella*, enumerated by Mr. Tournefort, are theſe: 1. The low early field *Valerianella*, with flatted ſeeds. 2. The low early field *Valerianella*, with ſerrated leaves. 3. The taller late-flowering field *Valerianella*, with more turgid ſeeds. 4. The *Valerianella* with naked round umbilicated ſeeds. 5. The *Valerianella* with naked umbilicated ſeeds. 6. The *Valerianella*, with large hairy umbilicated ſeeds. 7. The *Valerianella*, with ſmall hairy umbilicated ſeeds. 8. The Indian *Valerianella*, with a galeated, purple, or white flower. 9. The ſtarry ſeeded *Valerianella*. 10. The great Portugal *Valerianella*, with ſeeds like thoſe of ſcabious.

The ſeveral ſpecies of this genus may be known, when not in flower or ſeed, by their ſtalks being always divided regularly into two, and their leaves being ſmooth, veiny, and and placed two at each joint. *Tourn.* Inſt. p. 132.

VALET, (*Cycl.*) in the manege, a ſtick armed at one end with a blunted point of iron, to prick and aid a leaping horſe.

Formerly a *Valet* was called *Aiguillon*, *i. e.* goad, and ſome of them had ſpur-rowels upon them, only the points beaten down: And when a horſe was firſt begun round a pillar, without a rider, they uſed to prick his flanks with the *Valet*, to make him know the ſpur, and obey it, without reſiſting. At preſent the *Valet* is not uſed for that purpoſe, and the name of *goad* is ſuppreſſed, as being only proper for oxen.

VALIGA, a name given by ſome medical writers to an infuſion or tincture of jalap in ſpirit of wine, or ſpirit of citron, with the addition of a little ſaffron.

VALVULÆ *Conniventes*. Mr. du Vernoi is of opinion, that the *Valvulæ Conniventes* of the inteſtines are formed by the arched veſſels and fat in the internal cellular coat, and covered by the villous or nervous coat. See Comment. Acad. Petrop. Tom. 4. p. 192.

VAN (*Cycl.*)—VAN *of a Fleet*. See the article SQUADRON.

VANDOSIA, in zoology, a name by which ſome authors have called the *leuciſcus*, the common dace, or dare. *Willughby*'s Hiſt. Piſc. See the article LEUCISCUS.

VANELLUS, in zoology, a name given by many to the lapwing, more commonly known by the name *capella*. See the article CAPELLA.

VANILLA (*Cycl.*)—This fruit is principally brought to us by the Spaniards, who traffic with the Americans for it. It grows in the warmer parts of America, and that uſually in places where there is water near. The natives diſtinguiſh it into three kinds, which the Spaniards call the *pompona*, the *ley*, and the *ſimarona*.

The pods of the *pompona* kind are thick and ſhort; thoſe of the kind called *ley*, are longer and ſlenderer; and thoſe of the *ſimarona*, which is alſo called *baſtard Vanilla*, are the ſmalleſt of all the kinds.

The *ley* kind is the only good *Vanilla*. It ought to be of a good reddiſh brown, neither too black nor too red, and neither too dry nor too moiſt; when perfect they always appear full, though dry; and a parcel of fifty in number ought to weigh above five ounces.

There is a kind which is larger, fifty pods of which uſually weigh eight ounces; this is called the *ſobre buena*, and is eſteemed of all others the moſt excellent.

The ſmell of the *Vanillas* ought to be penerating and agreeable. And when the pods are freſh, and in good condition, they are found, when opened, to be full of a blackiſh oily balſamic liquor, in which there ſwim a great number of very ſmall black ſeeds. The ſmell, when the pod is freſh opened, is very lively, and in ſome degree intoxicating.

The *pompona Vanilla* has a ſtronger, but leſs agreeable ſmell than the former, and when taken, gives men violent headachs, and women diſorders of the womb. The liquid ſubſtance in the *pompona* is thinner than in the *ley*, and the ſeeds much larger, being nearly of the ſize of thoſe of muſtard.

The *ſimarona*, or *baſtard Vanilla*, has very little liquor, and has few ſeeds in the pod, and has ſcarce any ſmell.

The *pompona* and *ſimarona* are no ſaleable commodities, nor ever brought to market, except cunningly by the Indians, who mix them among the pods of the *ley*, or true kind. It is not yet certainly known, however, whether theſe three kinds are the produce of different ſpecies of plants, or whether they differ only as to age, or the ſoil where the plant grows.

They never put *Vanilla* into chocolate in any part of New Spain. There has been ſent over into France *Vanilla* from Caracca and Maracaybo. The pods of this are ſhorter than thoſe of the true *Vanilla*, and thicker than the *pompona* kind. It is, however, plainly a ſpecies of *Vanilla*, and is of a very good ſmell and taſte. There is alſo mention made by ſome of a *Vanilla* of Peru, the dried pods of which are two fingers wide, and above a foot in length; but of a much inferior ſcent to the *Vanilla*, and not retaining any long time even what it has.

The leaves of the *Vanilla* plant are about a foot long, and three fingers breadth wide. They are obtuſe at the end, and of a very dark duſky green. The flowers are ſingle, and of a whitiſh colour, variegated with red and yellow. The pods appear as ſoon as theſe fall, and are green at firſt, but grow of a yellowiſh colour as they ripen. It is at this time that they gather them. The whole ſhrub is a climber, of the nature of the vine, and muſt be three or four years old before it produces any fruit.

The time of gathering the pods for ſale is from September to December. They require no other management than to be gathered in a dry ſeaſon, and laid twenty days, to dry away the ſuperfluous humidity, and, at times, preſſing the pods gently with the hands.

The plant climbs up the talleſt trees, and its main ſtock, in time, becomes woody and hard as that of the vine; the root ſends up many off-ſets, which are planted by the natives, near the foot of a tree, and thrive very eaſily; and it is thus that the ſhrubs are propagated; and the time for doing this is in winter, or toward the beginning of ſpring.

It is remarkable that the young ſhoot is not to be planted into the ground as with us, but on the bark of the tree; this is, however, no ſingular caſe in the hot countries, for nature ſhews the way; the branches of trees, broken off by winds, often being blown againſt other ſpecies, and yet always taking hold on them, and growing; this is owing to the great abundance of the ſap in trees in theſe climates. Memoirs Acad. Scien. Par. 1722.

Vanillas are accounted cordial, carminative, ſtomachic, and reſtorative; they are alſo ſaid to be diuretic, and to promote the menſes.

VANNING-*Shovel*, among miners, an inſtrument uſed for waſhing the ores of any metal, after being reduced to powder, thereby to diſcover the richneſs and other qualities of the ore. See the article SHOAD.

VAPOUR (*Cycl.*)—*Fiery* VAPOURS, *Halitus Ignei*, a term uſed by ſome to expreſs thoſe exhalations from the earth, which either take fire of themſelves on the burſting forth into the air, or are readily inflammable on the bringing a candle to them.

Many of the ſuppoſed burning lakes are owing to theſe fumes burſting up through the water, and not to any quality of the water itſelf. Our famous burning well at Wigan in Lancaſhire is of this kind. The common people affirm, that the water of this ſpring burns like oil; but there is nothing of truth in this. There burſts up a *Vapour* through the earth in this place, which keeps the water bubbling, as if boiling over the fire, though it is not warm; and the ſtream of this breath may be felt iſſuing up in theſe places like a ſtrong wind. This breath alone is inflammable, and takes fire at the approach of a candle, burning with conſiderable violence for ſome time.

There are coal-pits in the neighbourhood, and the air is certainly of the ſame kind with that inflammable *Vapour*, often met with in thoſe places, and which may alſo be prepared from iron diſſolved in a proper menſtruum. The water itſelf, taken from the place, does not burn; and if the bottom be made dry, the vapour which aſcends from it will burn as ſtrongly as if the water were there. The flame is not diſcoloured like that of ſulphureous bodies, nor has it any bad ſcent; and the fumes, as they are felt burſting out of the earth, by the hand held over the place, are not hot. Phil. Tranſ. N° 20.

VAPPA, a word uſed by the antients to expreſs dead wine, or wine deprived of all its ſpirituous part.

The word is alſo metaphorically uſed to a peculiar ſtate of the blood, when it is in a low, diſpirited condition, as is the caſe even in healthy perſons, when worn out with exceſſive labour, and in cachectic and ſcorbutic perſons.

VARA, in commerce, a long meaſure uſed in Spain and Portugal. It is of various lengths in different places. That of Seville is $33\frac{127}{1000}$; that of Madrid, $39\frac{166}{1000}$; that of Portugal, $44\frac{11}{1000}$ inches Engliſh meaſure. Treat. Pract. Geom. p. 8.

VARIA, in zoology, a name by which ſome authors have called the leopard, or *pardalis*, from the beautiful variegations it is marked with. See the article PARDALIS.

VARIATION (*Cycl.*)—VARIATION *of Curvature*, in geometry, is uſed for that inequability, or change, which happens in the curvature of all curves, except the circle. And this *Variation* or inequability conſtitutes the quality of the curvature of any line. *Newton*, Meth. of Flux. and Inf. Series. p. 75.

Sir Iſaac Newton [a] makes the index of the inequability, or *Variation* of curvature, to be the ratio of the fluxion of the radius of curvature, to the fluxion of the curve; and Mr. Maclaurin, to avoid the perplexity that different notions, connected with the ſame terms, occaſion to learners, has adopted the ſame definition; but he ſuggeſts [b], that this ratio gives rather the *Variation* of the ray of curvature, and that it might have been proper to have meaſured the *Variation* of curvature, rather by the ratio of the fluxion of the curvature

itſelf,

itſelf to the fluxion of the curve; ſo that the curvature being inverſely as the radius of curvature, and conſequently, its fluxion as the fluxion of the radius itſelf directly, and the ſquare of the radius inverſely, its *variation* would have been directly as the meaſure of it, according to Sir Iſaac Newton's definition, and inverſely as the ſquare of the radius of curvature. According to this notion, it would have been meaſured by the angle of contact contained by the curve and circle of curvature, in the ſame manner as the curvature itſelf is meaſured by the angle of contact contained by the curve and tangent. The reaſon of this remark may appear from this example [c]. The *variation* of curvature, according to Sir Iſaac Newton's explication, is uniform in the logarithmic ſpiral, the fluxion of the radius of curvature in this figure being always in the ſame ratio to the fluxion of the curve; and yet, while the ſpiral is produced, though its curvature decreaſes, it never vaniſhes, which muſt appear a ſtrange paradox to thoſe who do not attend to the import of Sir Iſaac's definition. — [[a] Meth. of Flux. and inf. Series, p. 76. [b] Fluxions Art. 386. [c] Phil. Tranſ. N°. 468. ſect. 6. p. 342.—]

The *variation* of curvature at any point of a conic ſection, is always as the tangent of the angle contained by the diameter that paſſes through the point of contact, and the perpendicular to the curve at the ſame point, or to the angle formed by the diameter of the ſection, and of the circle of curvature. Hence the *variation* of curvature vaniſhes at the extremities of either axis, and is greateſt when the acute angle, contained by the diameter, paſſing through the point of contact and the tangent, is leaſt.

When the conic ſection is a parabola, the *variation* is as the tangent of the angle, contained by the right line drawn from the point of contact to the focus, and the perpendicular to the curve.

VARICULA, a diminutive of the word *varix*, a term applied by ſome authors to the intumeſcence of the veins of the tunica adnata in the eye, ariſing from thick blood.

VARIETIES, in natural hiſtory, a word uſed to expreſs an accidental change in ſome body which is not eſſential to it, and therefore does not conſtitute a different ſpecies.

The naturaliſts of former ages have run into great errors, in miſtaking the accidental *varieties* of plants, animals, and minerals for diſtinct ſpecies. Many of them have called a plant a new ſpecies, becauſe its flower, which ſhould have been blue or red, is white on account of the poorneſs of the ſoil, or ſome other ſuch reaſon. Mr. *Ray* has eſtabliſhed a very good teſt for *varieties* in botany; he allows every thing to be a diſtinct plant which will propagate itſelf in its own form by its ſeeds; but ſuch, as when ſown, loſe their difference, and run back to the old ſtandard, he accounts *varieties*, however great their diſtinctions may appear. In the hiſtory of fiſhes as much confuſion has been introduced by miſtaking *varieties* for diſtinct ſpecies as in botany. Artedi is the only author who has rationally attempted to bring this part of natural hiſtory into order in this reſpect, and to ſettle regularly the rules by which to diſtinguiſh real and eſſential, from accidental differences.

The principal grounds of the error of ſuppoſing *varieties* diſtinct ſpecies of fiſh, have been theſe: The variable and inconſtant colour of fiſhes has been miſtaken for a ſpecific difference; in this manner Rondeletius has deſcribed many *varieties* of the turdi, labri, and other fiſhes, under the names of diſtinct genera.

Others have paid the ſame too great regard to the more conſtant *varieties* of colour, which are found only to differ in degree, in the ſeveral individuals of the ſame ſpecies, and their differences to be only in the degrees of the ſame colour, which is much more intenſe in ſome, and more remiſs in others. Theſe differences can only make *varieties* of the ſame fiſh, the ſpecies remaining always the ſame. Of the ſame kind are the miſtakes of thoſe who eſteem ſize or magnitude a ſpecific character: and thus, out of the *varieties* of the ſame fiſh, occaſioned by ſcarcity or plenty of food, or other ſuch occaſions, make larger or ſmaller ſpecies. The place where fiſh are caught, is alſo another occaſion of making new ſpecies, with theſe ſort of authors; thus though the *perca fluviatilis* of Bellonius, and the *perca marina* of other authors be the ſame fiſh, yet they are pretended to be different ſpecies. The time of ſpawning is alſo with ſome made a diſtinction of ſpecies; and thus we find the common pike divided into three ſpecies, according to its ſpawning, in ſpring, ſummer, and autumn, which it does according to the heat or coldneſs of the climate. See the article SPECIFIC *Names*.

All theſe differences are falſe and frivolous, and the utmoſt they can do, is to make what are properly called *varieties*, though few of them are ſufficient even for that. A ſalmon caught at ſea, is not different from one of the ſame brood caught in a river: and if the *perca marina*, falſly ſo called, be a little different from the *perca fluviatilis*, yet if its ſpawn will produce regular *percæ fluviatiles*, its difference can only amount to a *variety*, not a diſtinct ſpecies.

The trifling nature of diſtinction by colour, is ſeen by the variety we daily ſee in the colours of ſome of our moſt common fiſh; as the tench, the eel, the ſalmon, and ſome others, which vary more or leſs, from every change of the water; all the other diſtinctions, of ſize and place, are as frivolous; and the giant and the dwarf, the black and the white man, the Aſiatic and the European, may as well be called diſtinct ſpecies of men, as theſe of fiſhes.

Finally, the time of ſpawning is no eſſential difference; for we daily ſee the change of climate make changes of that kind in all creatures; and even in the ſame climate, and under the ſame circumſtances, the ſame ſpecies of birds will afford ſome individuals much earlier or later in laying their egg sthan others. *Artedi* Ichthyol.

VARIUS, in zoology, a name uſed by moſt authors for a ſmall freſh-water fiſh, common in brooks and running waters, and well known in England, by the name of the *minow*, or *menow*; and called *Phoxinus lævis* by ſome other writers.

It is diſtinguiſhed from other fiſh of its ſize, by being of a duſky browniſh olive colour on the back, by its having a yellow line running on each ſide, from the gills to the tail, below which the belly and ſides are of a very varying colour; in ſome white, in others of a fine bright red, and in others, there is a line of a fine blue running on each ſide; and in others, the ſides are variegated with yellow, brown, and red lines. Its ſcales are ſo extremely ſmall, that it has been generally ſuppoſed to have none. Its mouth is very large. It is a very well taſted fiſh, and if but a little larger, would be very much valued. *Ray*'s Ichthyogr. p. 268.

VARIUS *Mus*, in the old authors of zoography, a name uſed for the ſame creature they otherwiſe called *mus ponticus*; which ſeems to have been no other than our ſquirrel. See the article SCIURUS.

VARNISH *(Cycl.) Amber* VARNISH. *Amber Varniſh* is prepared in the following manner: Put four ounces of amber into a crucible, and melt it with a ſmall degree of heat, and pour it out upon an iron plate, when cold, reduce it to powder, and add to it two ounces of drying oil, that is, linſeed oil thickened by boiling it up with litharge, and one pint of oil of turpentine, and diſſolve the whole together into a liquid *Varniſh*. *Shaw*'s Lectures, p. 424.

This has been long a great ſecret in the hands of the traders in theſe things; but deſerves to be made public, as a leading experiment towards the perfecting the arts of *varniſhing* and japanning.

China VARNISH. The *China Varniſhes* have been always famous; the manner of making which is ſaid to be as follows: Take crude *Varniſh* ſixty ounces, common water the ſame quantity, mix them well together till the water diſappears; afterwards put this into a wooden veſſel five or ſix palms long, and two or three broad; mix them together with a wooden ſpatula, for a whole day in the ſummer's ſun, for two days if in winter, and afterwards keep it in an earthen veſſel, covered with a bladder. The water will not unmix itſelf again: this is called the ſun *Varniſh*. See VARNIH *for Porcelain*, *infra*.

The oil of wood, called by the Portugueſe *azeile de Pao*, is made in the following manner: Take twenty ounces of that oil, which they call oil of wood, and ten drams of the oil of the fruit; boil theſe a little together, and the oil will look yellow; then let it cool, and add to it five drams of quick lime powdered. To make the firſt grounds called *camiſeca*, take ſwine's blood and quick lime powdered, of each an equal quantity; ſpread this mixture upon the wood, and when it is dry, ſmooth it with pumice-ſtones.

To make the black *Varniſh*, take of the *Varniſh* prepared in the ſun ſixty ounces, ſtone black alum (ſuppoſed to be a ſort of copperas) diſſolved in a little water, three drams, and ſeventy drams of lamp-oil, called by the Portugueſe *azeile de Candea*. Theſe things are all to be mixed together in a wooden veſſel, putting the lamp oil in at twice, and ſtirring the whole together with a wooden ſpatula.

The pitch-coloured *Varniſh* is made in the following manner: take oil of wood, crude, forty drams; called *da Pao*, of the lamp-oil, called *da Candea* crude, forty drams; mix them together in the ſun in a wooden veſſel, in the ſame manner as the common *Varniſh* and water are ordered to be mixed in the firſt proceſs.

To make the red *Varniſh*, take ten drams of cinnabar, twenty drams of prepared *Varniſh*, and a little lamp-oil; mix, them all together.

To make the yellow *Varniſh*, take of the yellow colour ten drams, prepared *Varniſh* thirty drams, a little lamp-oil; mix all together: and

To make a *Varniſh* of a muſk colour, take of the red *Varniſh* ten drams, and of the black *Varniſh* four drams; mix them well together. Philoſ. Tranſ. N°. 261. p. 524.

Theſe are the accounts ſent to the great duke of Tuſcany by the jeſuits in China: Dr. William Sherard communicated them to the royal ſociety; and to render the accounts uſeful to the world, he preſented with them the ſeveral ſubſtances mentioned; theſe are depoſited in the muſæum of the ſociety, and may ſerve as inſtructions to all who are curious in this art.

VARNISH *for Porcelain*. The Chineſe have of late years diſcovered a new kind of *Varniſh* for their ware: they call this *Tſekinyeou*, that is to ſay, the browniſh gold varniſh; it is of the colour of the brown images, or of what we call coffee colour. The novelty of this has made it much eſteemed: it is made in the manner of all their other varniſhes, by diſſolv-

ing the finer part of an earthy ſubſtance in water. The ſubſtance which they make it of is a common yellow earth: this they diſſolve in water, and letting the coarſe parts ſettle, they pour off the yet thick liquor, and what afterwards ſubſides from this, is the pure and fine part, which they keep in form of a ſoft paſte, or thick cream. They uſe this only to the thinneſt and moſt delicate porcelain ware.

The manner of uſing it is this: they mix a quantity of this fine ſediment with ſo much water as renders it thin and liquid, like the common *Varniſh*: this and the common kind are to be uſed together, ſo that care muſt be taken that they are nicely of the ſame degree of thickneſs: this the workmen try by dipping a petunſe or brick of their earth into both, and ſeeing which comes out moſt covered, that which lies on the thickeſt, is to be diluted with more water, or the other to be heightened with more of the earth, to bring them to the ſame ſtandard. They are both judged to be ſufficiently liquid when they enter the pores of the petunſe. They then mix ſome of the oil of fern aſhes and lime, (ſee the article FERN-*Oil*) along with the brown *Varniſh*, and add as much of this mixture to the common *Varniſh* as they find upon trial will give ſuch a colour as is required. The common proportion for the brown colour moſt eſteemed at preſent, is two pints of the brown *Varniſh* to eight pints of the common; and to four pints of this mixture they add one pint of the *Varniſh*, or oil of fern. It might puzzle a ſtranger to their terms, to underſtand what theſe people meant by oil; but it is a word with them in uſe for any thing liquid; and they call all their *Varniſhes* ſo, though made of the powders of earths and ſtones mixed with water. They apply this *Varniſh* to the veſſels by dipping them into it, and ſo compleatly covering them inſide and out before they put them into the oven; and the baking gives a great brightneſs to the colour. This is the niceſt part of the whole manufactury of the porcelain, and other wares of that kind. The *Varniſhes* uſed by the Chineſe are two; the one they call *oil of ſtones*, the other, *oil of fern*; which ſee. They mix theſe together, and with great caution and delicacy apply them to the veſſels all over equally, with a ſteady hand and a fine pencil. Obſervat. ſur les Coutum. de l'Aſie, p. 304.

When the porcelain is very thin and fine, they give it two beds of the *Varniſh*, the one over the other, when dry; theſe are to be very thin, and they anſwer to the ſingle covering of *Varniſh* given to the common good China, that is thick and ſtrong. They give theſe coats by dipping, and uſe the foot of the veſſel to hold it by: after this, they hollow the foot, and paint the circle that we ſee round it, or mark it with ſome Chineſe character.

The *Varniſh* they lay on is ſo thick, that it often hides the colours, till the baking afterwards brings them out again: this is the caſe with the fine deep blues; we ſee none on the beſt china; it is all hid under the coat of white, and the veſſel appears plain, till it has paſſed through the fire again; but then the colour appears deeper than when at firſt laid on. Obſerv. ſur l'Aſie.

VASTUS *(Cycl.)*—VASTUS *Externus*, a very large fleſhy muſcle, almoſt as long as the os femoris, broad at the extremities, and thick in the middle, and lying on the outſide of the thigh.

Its upper inſertion being ſomething tendinous, is in the poſterior or convex rough ſurface of the great trochanter. It is likewiſe fixed by a fleſhy inſertion along the outſide of the os femoris, for above two thirds of its length downward, in the correſponding part of the linea aſpera, and in the neighbouring portion of the faſcia lata. From all this extent, the fleſhy fibres running downward, and a little obliquely forward, towards the rectus anterior, terminate inſenſibly in a kind of ſhort aponeuroſis, which is fixed in all the neareſt edge of the tendon of the rectus, in the ſide of the patella, in the edge of the ligament of that bone, and the neighbouring lateral part of the head of the tibia. The body of this muſcle is bigger than its extremities, and its loweſt fibres run a little below the rectus. *Winſlow*'s Anatomy, p. 213.

VASTUS *internus*, a muſcle very like the *vaſtus externus*, and ſituated in the ſame manner on the inſide of the *os femoris*.

It is fixed above by a ſhort flat tendon in the anterior rough ſurface of the great trochanter, and by fleſhy fibres in that oblique line, which terminates the baſis of the collum of the os femoris anteriorly on the foreſide of the inſertions of the pſoas and iliacus, in the whole inſide of the os femoris, and in the linea aſpera on one ſide of the inſertions of the three tricipites, almoſt down to the internal condyle. From all this extent, the fibres run downward, and a little obliquely forward, and the body of the muſcle increaſes in bulk: it terminates below in an aponeuroſis, which is fixed in the tendon of the rectus anterior, in the ſide of the patella, and of its tendinous ligament, and in the ſide of the head of the upper extremity of the tibia. *Winſlow*'s Anatomy, p. 214.

VATERIA, in botany, the name of a genus of plants; the characters of which are theſe: The perianthium is ſmall, acute, and permanent, and is compoſed of one leaf, divided into five ſegments; the flower conſiſts of five oval expanded petals; the ſtamina are numerous filaments, ſhorter than the flower; the antheræ are ſimple; the germen of the piſtil is roundiſh; the ſtyle is ſimple and ſhort, and the ſtigma is headed; the fruit is turbinated and trivalved; the ſeeds ſingle and oval. *Linnæi* Gen. Plant. p. 235. Hort. Mal. vol. 4. p. 15.

VATICANÆ *Pillulæ*, the name of an old form of medicine, intended as a purge. The recipe is in the Old London Pharmacopœa; but the late ones have diſcarded it.

VAULT *(Cycl.)*—VAULT, in the manege. To *vault* a horſe-ſhoe, is to forge it hollow, for horſes that have high and round ſoles; to the end that the ſhoe, thus hollow or *vaulted*, may not bear upon the ſole that is higher than the hoof; but after all, this ſort of ſhoe ſpoils the feet; for the ſole being tenderer than the ſhoe, aſſumes the form of the ſhoe, and becomes every day rounder and rounder. In Mr. Solleyſel's Compleat Horſeman, may be ſeen the true method of ſhoeing for high and round ſoles.

VAUNING, in mineralogy, a term uſed by our miners to expreſs a coarſe and expeditious way of waſhing ores, for the examination of their nature and richneſs.

This inſtrument called the *Vaun*, is a long and moderately deep wooden ſhovel; into this they put the earthy or ſtony matter, which they ſuſpect to contain the metal, in powder: they then add water many times, and ſhaking and ſtirring it thoroughly about, they throw out the water, and add freſh, till at laſt the matter is ſeparated; the earthy part is waſhed away, and the ſtony and mineral matter only remain, the one at the hinder part, the other at the point of the ſhovel. This laſt is collected ſeparate; and on being examined either by the eye or teſt, they are able to judge very nearly of the general profit of the mine.

This method is often uſed with the ſtones and earths found in the ſhoads, or trains of mines. Phil. Tranſ. N°. 69.

VAZABU, in the materia medica, a name by which ſome authors have called the *Acorus Aſiaticus*, or Aſiatic ſweet flag. *Herm.* Muſ. Zeyl. p. 56.

UBIRRE, in zoology, a name given by ſome to the anguilla marina, or ſmall ſea eel, a long fiſh of the eel kind, living among rocks about the ſea ſhores, and growing to be very fat and well taſted. *De Laet*'s Ind. occident. See the article EEL.

UDNON, in botany, the name by which Theophraſtus and Dioſcorides have called the truffle commonly uſed at table in their time.

Dioſcorides tells us, that it was a root dug up at ſmall depths under ground, and had neither ſtalks, nor flowers, nor leaves; and that it was of a reddiſh colour, and ſmooth ſurface. By this, which is alſo the account of Theophraſtus and Athenæus, we find, that the *Udnon* was indeed the truffle; but we alſo find that they were not acquainted with the better kind of truffle, which we cultivate at preſent.

This ſmooth reddiſh-coated truffle is common in Italy at this time, and is eſteemed of no value, and called the wild truffle: the ſort that is eaten there, and in all other parts of Europe, is the blackiſh and rough-coated kind. In Africa they have a yet finer kind than ours; it has a white coat, and is of the moſt delicious flavour. The Greeks were alſo acquainted with this, and denominated it Cyrenean, as they did almoſt all the things they had from Africa: they alſo gave it the name *miſy*; but this word being alſo the name of a vitriolic mineral, allied to the *ſory* and the *melanteria*, ſome confuſion has been thereby introduced. Many having thought, that the Cyrenean miſy was only a finer kind of the mineral of that name. See the article MISY.

UDO, in the materia medica, a name given by the *Portugueſe* to the lignum aloes. See the article LIGNUM *Aloes*.

It ſeems only a corruption of the monoſyllable *Ud*, by which the Arabian phyſicians have called that drug; and even this *Ud* poſſibly was only a contraction of the orthography of the word *Heud*; which ſeems to have been the original name of this drug among the Arabs. See the article HEUD.

VEERING, in huſbandry, a term borrowed of the ſailors, and uſed for the turning two furrows toward each other, as they muſt do to begin a ridge; they therefore call the top of a ridge a *Veering*; and they call the two furrows that are turned from each other at the bottom between two ridges, a *henting*, that is, an ending, becauſe it makes an end of plowing ridges.

VEGETABLE *(Cycl.)*--- *Vegetables*, according to the analyſes made of them by chemiſtry, are diſtinguiſhable into two grand tribes, the acid and the alkaline; the firſt affording a volatile acid, and the ſecond a volatile alkali, upon a dry diſtillation: thus guaiacum, cedar, box, cinnamon, cloves, ſorrel, mint, balm, &c. afford an acid; but garlick, leeks, onions, horſe-radiſh, ſcurvy-graſs, muſtard, &c. afford an alkali, which, when rectified, is hardly diſtinguiſhable from that of animal ſubſtances, ſo as nearly to reſemble the ſpirit and ſalt of hartſhorn.

For the analogy between the animal and *vegetable* world. See the article ANIMAL.

Muſcles of VEGETABLES, ſee the article MUSCLE.

VEGETABLE *Salt*. In the Philoſophical Tranſactions we have ſome very curious proceſſes and obſervations by Redi, on the ſubject of the ſalts of *Vegetables*. Burn any wood, herb, fruit, or flower to aſhes; make a lye with theſe aſhes with common water, not heated; filtre this through paper till it is clear as rock-water; then evaporate this lye to a proper degree in a balneum mariæ, in a glaſs veſſel. This degree of evapora-

tion muſt be carefully obſerved, according as the congelation of the ſalt is intended to be haſtened or retarded. In the common way of evaporating lixiviums of this kind in earthen veſſels over a naked fire, a great quantity of the ſalt is always loſt; part of this is carried off with the vapours raiſed too haſtily in this manner, and part penetrates the ſides and bottom of the veſſel, though it be ever ſo well glazed. The quantity of water neceſſary, is, in moſt caſes, about five pints to two pound weight of the aſhes. After all the ſalt that can be got is extracted by this operation, the aſhes being calcined again in a kiln, will afford more ſalt of the ſame kind, but in a much ſmaller quantity.

The ſalts of *Vegetables* made in this manner, are ſubject to run into water in damp weather, unleſs very carefully kept; but in this, art may be employed, and the running in a great meaſure prevented. Thus, if ſome ſulphur be added to the aſhes, when their burning is almoſt over, and conſumed by burning among them, very little difference will be made in the nature of the ſalts, but they will be more white and cryſtalline, and will keep much better. The proportion of ſulphur is to be in ſome meaſure regulated by the quantity of ſalt the aſhes are known to yield; but on a medium, five ounces of ſulphur is enough to add to a hundred pounds of aſhes. When the *vegetable* ſalts are thus made, they have each their peculiar figure, and this they retain, though diſſolved and cryſtalized again ever ſo often. If two or three of theſe ſalts, thus carefully made, and which have each their determinate figure, be diſſolved together in water, they will each of them ſhoot again ſeparate, and in their reſpective figures, not mixing and forming different figures, as might be expected.

This experiment holds good alſo, not only in theſe ſalts, but in all other kinds, which have naturally their determinate figures: thus, if in a veſſel of water, there be diſſolved together ſome blue vitriol, ſome roach alum, and ſome ſalt petre, the whole liquor will be of a blue colour from the vitriol; but when it is carefully evaporated to a proper ſtandard, the ſalts will all form themſelves again into their own regular and natural cryſtals: the vitriol will be blue as before, but all the reſt, though found in a coloured fluid, will be as colourleſs as at firſt, and each will have its own determinate ſhape. Though the lixivial ſalt of every plant thus treated, have its own peculiar figure, when diſſolved, and regularly ſhot again; yet, as in the ſea ſalt, and ſome other natural ſalts, there appear, on cryſtallization, maſſes of different figures, ſo in ſome of theſe the ſame ſalt will have two or three different figures, all peculiar however to itſelf. Two ſorts of cryſtals have been obſerved in the ſalts of the lettuce, the ſcozonera, the melon, and ſome others: three ſorts in the black pepper, and in the flowers of the red roſe; and four ſorts in the ſalts of the roots of white hellebore.

Beſides this diverſity of figures in many of the kinds of ſalts, there is one kind of cryſtals which run through the ſalts of almoſt all the kinds, in a greater or leſſer proportion: theſe are certain cubic grains or cryſtals. It is probable, that theſe are cryſtals of ſea ſalt, which is a ſalt found mixed among many others, and is naturally of this cubic figure in its firſt or ſimple concretions. It ſeems alſo a general rule, that the different parts of the ſame plant form cryſtals of a different figure; for the leaves of laurel form cryſtals very differently ſhaped from thoſe procured from the wood of the ſame tree; and the figures of the cryſtals in the ſalt of the pulp of a gourd are very different from thoſe of the ſalts made from the rind of the ſame fruit. See Tab. of Microſcopical Objects, Claſs 3.

Many ſalts made from different ſubſtances, have either abſolutely the ſame or very ſimilar figures in their cryſtals. The ſalt of the cucumber has a figure very like that of the ſalt of eye-bright; and the ſame form is obſerved in the cryſtals of orange-flowers, endive, liquorice, and many other plants.

In order to obtain theſe ſeveral cryſtals of the lixivial ſalts, determinate and exact in their figures, and not mixing one with another, it is neceſſary to uſe great caution in the evaporating the lye; for if it be totally evaporated, there remains only a cruſt of ſalt at the bottom of the veſſel, if it be only too far evaporated, though not totally: the ſalts ſhoot into large cluſters, and are never regular and perfect; and finally, if the lye is left too weak, then the evaporation afterwards, in order to the forming the cryſtals, is ſo tedious, that few can have patience to attend to it. Nothing but practice and experience can dictate when to ſtop the evaporation; but when this has been learned, the veſſel is to be taken out of the *balneum mariæ*, and the clear liquor is to be poured out of it into ſeveral ſmall vials. Theſe are to be ſtopped to keep out duſt and moiſture; and, after a time, the ſalts will congeal into cryſtals, which will be fixed to the ſides and bottoms of the vials, in their true and proper ſhapes, and in the likeneſs of rock-cryſtal, as to brightneſs and tranſparency.

Different plants and trees yield aſhes, which are impregnated in a different degree with ſalts. The ſame plants, at different ſeaſons of the year, contain alſo different quantities; and all theſe varieties make it neceſſary to attend carefully to the time of ſtopping the evaporation. It is alſo to be obſerved, that there is a great difference in the quantity of aſhes, to which plants and their flowers and fruits burn, as well as in that of the ſalt they yield; and what is moſt remarkable, is, that theſe have no connection one with the other. There are various inſtances of this kind in Redi's paper; he obſerves particularly, that an hundred weight of orange flowers reduced to aſhes, yielded only four pounds ſix ounces of them, and theſe aſhes only five drams of ſalt: that eight hundred weight of gourds made only four pounds of aſhes; but theſe yielded no leſs than ten ounces of ſalt, while an hundred weight of maiden-hair yielded nine pounds of aſhes, and theſe only four drams of ſalt. A great number of other proceſſes of this kind are mentioned in the ſame place; to which we refer the curious.

It was obſerved, that all theſe ſalts thus cryſtallized, had a purging virtue, from whatever plant they were made; and the ſalt drawn from pomegranate peels, or other aſtringents, is as ſtrongly purgative, as that from the moſt purgative drugs. The doſe in which theſe ſalts are to be taken, is from half an ounce to an ounce diſſolved in warm water; and it is all the ſame thing what *Vegetable* they are made from; the ſharp-pointed cryſtals and the blunt ones having the ſame degree of virtue. Garlick, and the like ſhop *Vegetables*, yield no ſalt at all of this kind. Philoſ. Tranſ. N°. 243. p. 296.

VEGETATION (*Cycl.*)—The great attention of all who ſtudy botany, is at preſent placed on the diſcovery of new plants; but we are yet unacquainted with many peculiarities in the moſt common ones, which may prove not a leſs worthy employment for our thoughts.

The irregularities in the *Vegetation* of the ſeveral parts of plants ſeems a ſubject well deſerving our attention; and Mr. Marchand has laid before us an inſtance of this in one of our moſt vulgar plants, the common garden radiſh.

In the month of July, this gentleman obſerved a plant of this ſpecies, which had accidentally fixed itſelf in an open place, and was then full of flowers and pods. Toward the end of one of the branches, he obſerved a kind of tuberoſity of an oblong ſhape, which looked ſomewhat like one of the pods of the plant, but that it was too long, and was very oddly twiſted and contorted; this daily increaſed in ſize, and in a week was come to its full growth, which was, in the whole, about two inches and a half in length, and three quarters of an inch thick. It was of a very rough and knotty ſurface, and like the reſt of the ſtalk, had ſeveral pedicles of flowers growing on each ſide from it; it terminated in a ſmooth end, divided into three parts, which all turned upwards.

The longeſt of theſe points terminated in a green cartilaginous flower of the ſame ſubſtance with the protuberance which produced it; in this there were all the regular parts of the flowers of the more perfect kind; there were four leaves which ſerved for a cup; four more within theſe, which repreſented the petals; ſix other ſmall bodies there ſtood in the middle of the flower, which repreſented the ſtamina; and among theſe another body which repreſented the piſtil; ſo that, here was in this irregular *Vegetation*, a repreſentation at large of every part of the perfect flower of the radiſh, excepting only the apices; but theſe were all very different in their nature and ſtructure, from their ſimilar parts in the natural flowers, being all of a hard, thick, and tough cartilaginous ſubſtance, and in colour of a greeniſh brown.

The ſhorteſt of the three points which terminated this tuberoſity, had alſo at its end a reſemblance of a flower compoſed of all the parts mentioned in the former, and of the ſame colour and ſubſtance with it, only differing in being a little ſmaller: and the third point had no regular reſemblance of a flower, but was of the ſame cartilaginous ſubſtance, and of a ſemi-circular figure, and had its upper ſurface ornamented with ſeveral irregular protuberances. This irregular *Vegetation* remained in vigour till October, when it gradually faded away, and there was no appearance of ſeeds in any part of it.

The radiſh, when its ſtalks are wounded by the pucerons, or other inſects, will often throw out a protuberance of ſome irregular figure; but the reſemblance of flowers in this, was a ſingularity never before obſerved.

To explain this, it will be neceſſary to obſerve, that every organized part of a plant contains in it a number of inviſible ſeminal principles, capable of producing plants like that to which they have owed their origin; and this is a truth of which the ſucceeding inſtances will all bring very familiar and obvious proofs.

The graft of a tree, which from only one ſingle bud, produces a tree like that from which it was taken, certainly acts upon this principle; for the whole tree is quite different from the ſtock on which it is grafted, which ſerves for no other purpoſe but merely to convey to it a proper nutritive juice for the developing its parts.

We very well know, that there are many roots, which being cut into little ſlices of only a quarter of an inch thick, each of theſe will propagate its ſpecies, and ſend up new plants, like that which the root belonged to; and ſome roots being ſplit longitudinally into four quarters, each of theſe will in the ſame manner grow and flouriſh, and ſhoot out roots from one part, and ſtalks from another, ſo as to furniſh perfect plants the ſame year: and how can this be, but by their having been ſeminal points in all theſe pieces and ſections of roots, which being dilated, and put in action by the humidity of the earth, have grown into perfect plants. Several of the bulbous rooted plants produce off-ſets from the ſeveral ſcales of their roots, and from the

ſides of their ſtalks; theſe in three years time produce perfect plants with their flowers; and what are theſe but ſo many ſeminal points ready upon occaſion to be developed.

Nothing is ſo obvious, as that the ſlips, or cuttings of trees, when planted in the ground, produce roots in one part, and buds for branches from another, and ſo finally become trees, like thoſe from which they were cut; and this, though the piece that is planted, has no viſible appearance of any bud in any part of it.

We alſo know, from daily experience, that many plants ſhoot out roots from their ſtalks as they grow, and that though this uſually happens in places where there is ſome ſolid ſubſtance for theſe new roots to faſten themſelves to, yet it happens alſo in ſome plants where there is no ſuch uſe for them; and what are theſe roots in a new part of a plant, but the effect of ſo many ſeminal points, ready to grow both into roots and into branches, in all thoſe places.

Among the thick and fleſhy leaved plants, as the opuntia, and other of the ſucculent plants of the Indies, there needs no more to produce a new plant, but to cut off a part of a leaf, and ſtick it into the earth, where it will at once take root, and produce a new plant in a very ſhort time. A thouſand other inſtances of this kind might be given; but theſe may be ſufficient to prove, that there are, in almoſt all parts of plants, certain ſeminal points, which, like the plantula ſeminalis, incloſed in the perfect ſeed of each, need only humidity, and a proper degree of warmth, to develop and unfold themſelves into perfect plants.

We are not therefore to wonder at the imitation of perfection in any irregular productions of vegetables, ſince it appears that there are numbers of perfect plants contained in every part of a growing plant, of the ſame kind. Mem. Acad. Par. 1709.

The perpendicular aſcent of the branches and trunks of trees, while their roots are at the ſame time running perpendicularly downwards, has been a ſubject of admiration to all who have conſidered the laws of *Vegetation*; and none ſeem to have well underſtood or explained it, till Mr. de la Hire, in the memoirs of the Paris Academy in 1708. He ſuppoſes that, in all vegetables, the root is furniſhed with juices of a much thicker and coarſer kind than thoſe of the trunk and branches, and that the juices of this part are heavy and denſe; while thoſe of the upper parts of the ſame vegetable are much more light and fine.

In effect, the root of the plant paſſes with all naturaliſts as a part analogous to the ſtomach in animals, where the nouriſhment is digeſted, and refined to ſuch a degree as is neceſſary for its being received into the finer and tenderer veſſels of the trunk and branches.

This difference of the juices for the ſervice of the different parts of the plant, neceſſarily ſuppoſes a different ſhape and ſize of veſſels for its reception, and, in a word, a different contexture in the parts; and there is no doubt but that this contexture is preſerved in its different manner, even in the firſt rudiments of the plant or tree, in the ſeed.

We are therefore to conceive, even in this embryo plant, a ſort of diviſion between the root and the ſtalk; ſo that all that is to be on the one ſide of that diviſion, is to receive a finer juice for its nouriſhment, and all that is on the other ſide, a coarſer. Now ſuppoſing that the plantula ſeminalis, or embryo plant in the ſeed, be turned the wrong end upwards, in the ſowing or placing that ſeed, ſo as to have its root turned upward, and its ſtalk downward; yet the veſſels of the root being larger than thoſe of the ſtalk, and conſequently capable of receiving coarſer and heavier fluids; theſe weighty fluids muſt always bend its tender fibres downwards, though their natural poſition in the ſeed would point them upward; they will always be bent downward alſo by the greater force, the longer they grow. For, ſuppoſing the fixed point, already mentioned, to be at firſt at any given diſtance from the extremities of the roots, and they bending downward, it is plain that, as they increaſe in length, they will be of more force, as the arms of a lever are always more powerful the longer they are.

While all this is doing in the root, the communication being open between that and the ſtalk, the finer juices are received there, and theſe as naturally throw the ſtalk into an erect poſture, as the others bend down the root; ſo that, in a few days the whole plant becomes turned right, the fixed point between the root and ſtalk having remained unmoved, and all on the one ſide of it having conſtantly had a tendency upwards, while all on the other had the ſame tendency downward.

From this time forward the root puſhes with more regularity downward, and the ſtalk upward, than before. There is, however, this great difference in their growth, that the ſtalk and branches find no reſiſtance to their ſhooting up, while the roots find a great deal to their ſhooting downward, by means of the ſolidity of the earth, whence the branches advance much faſter and farther in their growth than the roots; and theſe laſt, often finding the reſiſtance of a tough earth unſurmountable, turn their courſe, and ſhoot almoſt entirely horizontally. Mem. Acad. Par. 1708.

Artificial VEGETATION. Many of the proceſſes and operations in chemiſtry afford productions, whether of ſalts or metals, or of whatever other ſubſtance, which very much reſemble plants of one kind or other, whence they have been called *metallic Vegetations*. But though many have been hence induced to believe, that theſe productions were formed in the manner of vegetables, there is not the leaſt ground for ſuch an opinion from reaſon or experiment.

Mr. Homberg, who has treated very accurately of the ſeveral kinds of theſe *chemical Vegetations*, divides them into three different claſſes.

Thoſe of the firſt claſs are ſuch as conſiſt of a pure maſſy metal, without the mixture of any foreign matter whatever. Thoſe of the ſecond claſs are compoſed of a diſſolved metal, which, though it has concreted afterwards, yet retains a part of the menſtruum in it: And the third claſs contains thoſe which have no metal in them, but are merely compoſed of ſalts, oils, or earths, or of combinations of theſe.

All the productions of the firſt kind are made without the admixture of any liquor, and are merely owing to the force of fire. Theſe are of a firm and ſolid texture, and may be taken out of the veſſels in which they were made, without danger of breaking them. On the other hand, the *Vegetations* of the ſecond kind are all formed in a fluid, and are all ſo brittle, that they are not to be touched without breaking. Of the third kind, ſome are formed, or will ſubſiſt at leaſt, in the dry air; others are very tender, and are formed only in fluids, the very ſtirring about of which deſtroys them.

Examples of the firſt kind may be ſeen in the following proceſſes: Make an amalgama, with an ounce or two of fine gold or ſilver, with ſix times the weight of pure mercury revived from cinnabar; break the amalgam to pieces, and waſh it ſeveral times with river water, till it leaves no longer any colour or foulneſs in the water; after this, let it be dried, and, putting it into a glaſs retort, diſtil it in a gentle ſand heat, which ſhould be continued two days. The longer the heat is preſerved, before all the quickſilver is raiſed and carried over, the more beautiful and perfect will the *Vegetation* be. At the concluſion of the operation, the fire muſt be raiſed to ſuch a degree, as to carry over all the mercury, after which, let the fire go out. All the mercury will be found in the receiver, and all the gold or ſilver will be left in the retort. It will be ſoft and pliable, and of the moſt beautiful colour the metal is capable of receiving; and from the main maſs, at the bottom, there will be thrown out a number of beautiful branches, of different heights, and differently ramified, ſo as to repreſent ſhrubs or plants. Theſe may be ſeparated from the maſs at the bottom, and preſerved. They really reſemble, with great exactneſs, ſome ſorts of vegetables; but when we conſider the fortuitous riſe of theſe, and the regular organized bodies of the true vegetables, with their manner of explication from the ſeed, there is but a very faint reſemblance to be perceived between the one and the other.

Another of theſe *Vegetations* of the firſt claſs, is this: Melt an ounce or two of pure ſilver in a crucible, and when it is in fuſion, caſt upon it, at different times, an equal weight of common ſulphur in powder. Stir the whole about with an iron rod, and, taking it from the fire, let it cool. Beat the maſs to powder, and put it into another crucible. Set it in a ſmall fire, or in a ſand heat, to drive off the ſulphur in fumes, without running the metal into fuſion. As the ſulphur riſes into vapour, it will carry up along with it a part of the ſilver, above the ſurface of the reſt, in form of fine ſlender filaments, or flat and thin plates, which will remain fixed at their lower end to the maſs out of which they are raiſed, and will be very ſoft and pliable, and extremely bright and gloſſy. The filaments will often riſe to two inches high in this proceſs, and the flakes or plates will be of the length and breadth of a card uſed in play.

A third *Vegetation* of this claſs is the following: Melt together two ounces of ſilver, and ſix ounces of lead. Put the mixture into a copel under a muffle in a furnace, and give ſuch a fire as is neceſſary to purify ſilver by the copel. When the ſilver appears fine, take the copel out of the fire, and leave it to cool. Soon after it is taken from the fire, there will ariſe out of the ſurface ſome filaments of melted ſilver, of the thickneſs of a hog's briſtle, and of three quarters of an inch high. They are often larger and thicker than this, and not unfrequently emulate the figure of branches of coral. They are uſually hollow within, and are fixed at the bottom of the maſs of the ſilver.

Of the ſecond claſs, of metallic *Vegetations*, is the famous arbor Dianæ, and the ſeveral other ramifications of metals after ſolution. See the article DIANÆ *Arbor*, *Cycl.* & *infra*.

The third claſs, that is, of ſuch chemical *Vegetations* as contain no metallic matter, the following proceſs gives an inſtance: Take eight ounces of ſalt petre, fixed by coals; ſet it in a cellar, and let it run into an oil per deliquium: Filtre this liquor, and pour on it, by a little at a time, as much oil of vitriol as will perfectly ſaturate it. After this, evaporate all the humidity, and there will remain a compact ſaline maſs, which will be hard, very white, and of an acrid taſte; powder it groſsly, and pour upon it a ſufficient quantity of water, in an earthen veſſel; the water will begin to evaporate, after it has ſtood uncovered

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a few days; and, as this is effected, the ſalt will vegetate in ſeveral places into branches; theſe will ſurround the whole ſurface of the water, and will continue to form themſelves anew as the water evaporates, till it is all gone; after which they will ceaſe; but if more water be added to the ſalt, they will appear again in all their beauty, as that afterwards evaporates.

Another example of theſe ſaline *Vegetations* is ſeen in the branched cryſtallizations of ſalts, naturally produced on the ſhore of the Spaniſh and other ſeas, and which may eaſily be imitated by art: This is no other than a natural conſequence of the ſea plants growing on the ſhore, being, when their leaves are decayed, cruſted all over their branches with cryſtals of ſea-ſalt, left by the evaporation of the water, which had been left upon them by the receſs of the ſea; this proceſs being very frequently repeated on them, every wetting leaves a freſh coat of ſalt over them; ſo that, at length, the whole appears a mere plant of ſalt. Very beautiful ſpecimens of this kind are often met with on the ſhores; and may be imitated by art by means of ſea-ſalt diſſolved in water, and the ſolution carefully filtred. But, in doing this, it is neceſſary to peel off the bark of the plant which ſerves for the mould; for as the bark is uſually brown or green, or of ſome colour different from that of the ſalt, it diſcovers itſelf too plainly, and takes greatly off from the beauty of the whole.

A third very ſingular inſtance which Mr. Homberg gives of theſe *Vegetations* is this: He collected about three pints of rain-water from the bottom of an old wooden trough, in which it had ſtood about half an hour, after running down from the tiles of an old houſe. This water had fallen in the time of a tempeſt, attended with thunder. He had ſet this bottle of water, careleſsly ſtopped with a piece of paper, in a window, which looked toward the ſouth, where it ſtood three months. The water had appeared tolerably clear, when it was firſt ſaved; but, by degrees, as it ſtood, there ſubſided to the bottom a greeniſh ſediment, of about a quarter of an inch in thickneſs. There was apparently a fermentation in this matter, and it appeared ſpongy and cavernous, and had frequently air-bubbles riſing up from it. In the middle of a hot day, in July, Mr. Homberg obſerving this bottle, ſaw that there was no muddy ſediment at the bottom, but only a clear and beautiful green *Vegetation*, part of which had alſo raiſed itſelf to the ſurface of the water, and part remained ſuſpended, in form of ſlender filaments, in the middle. The extremity of every one of theſe filaments was furniſhed with a ſmall round globule, which appeared white and bright as ſilver, and reſembled a ſort of fruit at the top of the branch.. On ſhaking the bottle about, the whole *Vegetation* diſappeared, and the matter of it blended itſelf among the water in a looſe irregular manner. About ten o'clock the next morning, when the ſun began to warm the bottle, the *Vegetations* appeared again in their former ſhape, and were only owing to ſmall bladders of air which, in their riſing from among the green mud at the bottom, drew up long ſtrings of it along with them, and appearing in form of ſmall round pearls at the tops of the branches. This appearance continues ſo long as the ſun ſhines upon the bottle; after which the bubbles, and their pedicles, gradually ſink together, and lie confuſedly at the bottom, till the morning ſun of the ſucceeding day raiſes them again in the ſame manner from the bottom to the ſurface. Mem. Acad. Par. 1710.

The moſt beautiful of all metallic *Vegetations* is the *arbor Dianæ*, or ſilver-tree. A great many proceſſes for the making this have been publiſhed; but ſome of them are not found to ſucceed, upon experiment; and others are too tedious to follow. Mr. Homberg gives a ſuccinct account of the method by which he uſed to make it, and this is never known to fail. Make an amalgam in the cold, with four drams of pure ſilver, and two drams of crude mercury; diſſolve this in four ounces of aqua fortis; mix this with a pint and half of water, and ſet it by in a bottle well ſtopped. When there is occaſion to uſe it, pour about an ounce of it into a little vial; put into this a piece of the bigneſs of a ſmall pea of the common amalgama, either of gold or ſilver, made as ſoft as butter. Leave the vial to reſt for two or three minutes; and in that time there will begin to ariſe a number of little upright ſtalks from the ball. Theſe will viſibly increaſe in length every moment, and, ſoon after, will throw out ſeveral ſide branches. Thus, by degrees, the whole will have the form of a little tree; the ball of amalgama will be of a dead whitiſh colour; but the trees will be like the brighteſt ſilver. The whole of this beautiful *Vegetation* will be performed in a quarter of an hour: But it is to be obſerved, that the liquor which has ſerved once, will not do again.

The matter which forms the tree is not formed by the amalgam put into the liquor; but by the firſt amalgam which was diſſolved in it, the water added afterwards having ſo much weakened the diſſolvent, that it is not able to keep the matter ſuſpended, when there is offered any opportunity for its precipitating; and the mercury, thus diſſolved, meeting here with mercury undiſſolved, quits the diſſolvent, and applies itſelf to it; but that not in its own form of globules, but in ſuch ſhapes as the mixture of ſilver, and of the ſalts of the nitrous acid in the diſſolvent, determine it to.

This proceſs may be varied a great many ways, as to the thickneſs or thinneſs of the branches, and the ſlow or ſpeedy manner in which they are formed, according to the nature of the liquor, and of the amalgama. The weaker the liquor is, the ſlower will the branches be formed; and they will, in this caſe, be longer, and fewer in number, and by that means the more imitate a tree. On the contrary, when the liquor is too ſtrong, the whole ſurface of the globule of amalgam thrown into it, will, in a few minutes, be covered with a low and ſhort tuft of buſhes; and that water, which is ſtrong enough of the ſolution to produce trees upon a thick amalgam, will not be able to produce any thing upon ſimple mercury, and but very little upon a thin amalgam. And, on the contrary, that liquor which is ſtrong enough to produce a ramification upon ſimple mercury, will, on a thin amalgam, produce only a few ſhort buſhes; ſome yet lower than theſe will be formed by it on a thicker amalgam, and it will, in fine, diſſolve the amalgam.

It appears from the whole, that there is in this nothing of true *Vegetation*, but merely a ſimple cryſtallization in this form. There is alſo another *Vegetation* formed by cryſtallization, without the aſſiſtance of mercury; but it is more ſlow, and wants the beautiful metalline colour of the laſt. It is thus performed:

Diſſolve one part of fine ſilver in three parts of aqua fortis, evaporate half the diſſolvent, and add to the remainder of it twice its weight of diſtilled vinegar, well dephlegmated; ſet this mixture by for a month, and at the end of that time there will be found, in the middle of the vial, a tree, in form of a fir, with its branches reaching up to the ſurface of the water. This is no other than a cryſtallization of the diſſolved ſilver, whoſe parts have been thrown into this form by the mixture of the ſalts of the vinegar with thoſe of the nitre. This therefore has not the colour of ſilver, but is white and tranſparent, in the manner of a genuine ſalt, and makes a very elegant figure in the menſtruum.

A third *Vegetation* of the metallic kind is thus performed: Take a quarter of a pound of common white river pebbles, calcine them two or three times over, quenching them every time in water; after this, beat them to a fine powder, and mix them exactly with twelve ounces of ſalt of tartar. Melt the whole in a ſtrong fire, and let it cool, it will be a vitrified maſs. Powder it, and lay it on a marble in a cellar, it will diſſolve into an oil per deliquium: Keep this in a vial; then take any metal you pleaſe; diſſolve it in aqua-fortis or aqua-regia; evaporate the diſſolvent, and there will remain a grey powder. When you have a mind to ſee the *Vegetation*, put a ſmall piece, about the bigneſs of a pea, of this calx into ſome of this liquor. In three or four minutes there will iſſue out of it a ſtalk, which will grow longer and thicker every moment; and finally will ſhoot out two or three branches from its ſides, and each of theſe, as well as the main trunk, will be terminated by a large round air-bubble.

This is a *Vegetation* extremely different from either of the others. In them the branches were only cryſtallizations of the diſſolved metal; and the little maſs of matter, thrown into the liquor, furniſhed nothing to them. In this, the whole is owing to the matter thrown in, and is the mere effect of a fermentation. The calx of the metal yet contains ſome acids. The alkaline liquor ferments with theſe; the fermentation indeed is but ſlow, becauſe the metalline particles envelope the acid ſalts. But as, in all fermentations, there is air diſcharged; ſo in this air-bubbles are ſent upward from the maſs; but the metalline particles riſing with them, detain them, and make their aſcent very ſlow, while they are compelled to draw up a long filament of the metallic matter with them. The metal is ſoftened during the time of the fermentation, otherwiſe it could not be thus drawn up with the air-bubbles; but it immediately hardens again, when out of the ſtate of ferment, and becomes able to ſupport itſelf in the branched form, even when taken out of the liquor it is formed in.

There is another metallic *Vegetation*, which is formed by merely amalgamating a metal with mercury, without the mixture of any acid liquor. Take three or four parts of mercury, purified by five or ſix ſublimations, and one part of fine gold or ſilver; make an amalgam without heat; ſet this amalgam to digeſt for fifteen days in a ſlow heat, in a matraſs hermetically ſealed; the amalgam will in this time harden, and all its ſurface will be covered with branches and trees, ſome of them riſing to an inch high; the quantity of mercury muſt be nicely adjuſted in this experiment, for otherwiſe there will be no *Vegetation*, whether the quantity be too much or too little; and if the veſſel be not perfectly cloſed, the proceſs will fail, though the quantities and the degree of fire have been ever ſo well obſerved. This *Vegetation* is only made by the fire heating the mercury, and raiſing it, in order to its flying off; in which riſing it lifts up parts of the metal with it, and leaves them in that poſture, in the forms of trees and plants. Mem. Acad. Par. 1692.

VEGETATION *of Salts*, a name given by Mr. Petit, of the academy of Paris, to the concretions which ſalts form, after ſolution in water, when ſet in the air to evaporate.

Theſe concretions always appear round the ſurface of the liquor, affixed to the ſides of the veſſel, or ariſing above its top,

and are very different in the different ſalts, and in moſt of them very beautiful.

This gentleman acknowledges that the obſervation was owing to accident; for having ſet out ſeveral ſmall veſſels full of ſolutions of ſalts, in order to obſerve the progreſs of their *Vegetation*, he was greatly pleaſed and ſurprized to find this remarkable accident attending them. The firſt ſalt he obſerved it in was nitre; but ſoon after, finding that the ſolution of ſal armoniac did the ſame, and that with different-figured concretions, the figures which the reſt would aſſume appeared to deſerve an enquiry. He choſe to call theſe figures, not before obſerved, *Vegetations*, in the language of the chemiſts; not that he ſuppoſed them to be produced as plants, by a regular aſcent of juices, but merely by appoſition of ſaline particles one to another. Theſe are all properly of the third claſs of the chemical *Vegetations*, according to Mr. Homberg's diſtinctions.

The ſeveral ſalts he choſe to experiment upon, were refined ſalt-petre, ſal prunellæ, ſal armoniac, ſea-ſalt, ſal ex duobus, or the impregnation of the caput mortuum, left after the diſtillation of aqua-fortis, *&c.*

Theſe ſalts were diſſolved in the ſeveral following liquors; common water, lime water, white wine, red wine, ſpirit of nitre, ſpirit of ſalt, ſpirit of vitriol, oil of tartar per deliquium, ſpirit of ſalt, and the volatile ſpirit of urine, and mixtures of oil of tartar per deliquium, with ſpirit of vitriol, and with ſpirit of nitre.

Salt-petre, diſſolved in common water, produced *Vegetations* reſembling the rugged points of rocks; and the more the water is ſaturated with this ſalt, the more beautifully the *Vegetations* are formed: For this purpoſe, one part of ſalt may be diſſolved in three parts of water, in warm weather; but in colder weather the proportion of the water muſt be increaſed to four times, or four and a half, the quantity of the ſalt.

Salt-petre, diſſolved in lime-water, affords the ſame *Vegetation*; but the points are finer, and the whole bodies of the concretions ſmaller. Wine diſſolves a ſmaller quantity of ſalt-petre than water; and though the *Vegetations* are ſmaller from this ſolution, yet every particle compoſing theſe is granulated in manner of the ſurface of a mulberry; and the whole concretions reſemble ſome of the botryoide mineral bodies in miniature, or grapes thick ſet upon the bunches.

Spirit of nitre, and oil of tartar, being mixed together to the point of ſaturation, and the ſalt formed by this diſſolved in a quantity of water juſt ſufficient for this purpoſe, and the ſolution expoſed in a glaſs or earthen veſſel to the ſun, there are formed concretions of the ſame kind with thoſe of the common ſalt-petre diſſolved in water, except that they are more fine and more ramified. It need not appear wonderful, that this mixture ſhould produce the ſame concretions with pure nitre, ſince it is well known, that true and proper nitre is the reſult of it.

An ounce of crude ſal armoniac being diſſolved in three ounces of common water, and expoſed to the ſun, there form, upon the edges of the veſſel, *Vegetations* more thick and leſs pointed than thoſe from nitre, and more reſembling rude maſſes of flints thrown confuſedly one upon another. This ſolution being ſet out in veſſels of tin, the appearances are much altered, the concretions are all of a roundiſh figure, and are covered on their outſides with numbers of fine points.

The ſame ſalt, diſſolved in lime-water, produces a different ſort of concretion; thoſe in glaſs veſſels are compoſed of round heads, beſet with ſeveral tolerably large points; and in veſſels of other kinds, the concretions vary a little, but always keep the ſame general form.

Spirit of ſalt, and ſpirit of urine, mixed to the point of ſaturation, and expoſed in earthen veſſels, produce concretions very little differing from thoſe of ſal armoniac, when they are nicely examined; on a careleſs view, however, they appear very different, the ſeveral granules they are compoſed of being much ſmaller than in the common ſolution of that ſalt.

It is not ſtrange that this mixture produces theſe concretions, as well as the ſimple ſolution of ſal armoniac, ſince this mixture produces a true and genuine ſal armoniac.

Sal armoniac diſſolved in white or red wine, and expoſed, produces, inſtead of theſe roundiſh concretions, a ſort of oblong ones, ſomewhat irregular in form, and granulated all over their ſurfaces, in the manner of a mulberry. Theſe are faſtened to a ſort of tails, and by this means are made to reſemble, upon the whole, cluſters of grapes. This might give perſons of warm imaginations an opinion, that the wine was ſhewing itſelf again in the form of the grape, whence it was made; but it is to be obſerved, that the flowers of ſal armoniac, which riſe in the diſtillation of the volatile ſpirit with ſalt of tartar, being diſſolved in water, produce the ſame grape-like cluſters. And the common ſal armoniac, diſſolved in an impregnation of the caput mortuum of aqua-fortis, affords the ſame grape-like concretions as when diſſolved in wine.

The concretions of theſe ſalts will form themſelves in the ſhade, but they are always much more beautiful when the veſſels have been expoſed to the ſun; they are alſo much ſooner formed by aſſiſtance of the ſun's heat: It will take a month at leaſt to produce good *Vegetations* of either in the ſhade; but in the ſun, a week, or, at the utmoſt, ten or twelve days, will be found ſufficient. There are many ſolutions of ſalts, however, which have no occaſion for the ſun's heat to form them. Of this kind are the following:

A mixture of ſpirit of vitriol, and oil of tartar per deliquium, being made up to the point of ſaturation, add ſo much water as will be ſufficient to diſſolve the ſalt precipitated to the bottom of the mixture; if this ſolution be ſet to *vegetate*, the concretions will form themſelves into a ſort of little buſhes: Theſe are very beautiful; but ſo many accidents muſt concur to their formation, that they will not always appear, even from the ſame quantities of the ingredients, managed ſeemingly in the ſame manner.

One of the moſt ready and moſt beautiful of all the ſaline *Vegetations*, is that formed by a ſolution of the ſalts in the caput mortuum of aqua-fortis, with common water. If a pint of water be put to half a pound of this caput mortuum, and the whole boiled together, that the ſalts may be diſſolved, and the liquor afterwards filtrated, and expoſed in an earthen veſſel, there will be formed, in about eight and forty hours, *Vegetations* wholly like thoſe from the mixture of ſpirit of nitre and oil of tartar, except that theſe from the caput mortuum are more ramified and more beautiful. When the ſolution is expoſed in a glaſs veſſel, they form themſelves on the ſurface into very beautiful figures of trees, ſhrubs, and buſhes; and this not only on the ſurface, but on both the inſide and outſide of the glaſs. Theſe can be compared to no known concretions, except to the *Vegetations* of iron, deſcribed by Mr. Lemery; they differ indeed in nothing from theſe, but that the *Vegetations* of the metal are of a browniſh colour, whereas thoſe of the ſalt are white.

This impregnation ſucceeds beſt in dry weather, for in a moiſt ſeaſon the *Vegetations* form themſelves more ſlowly, and are much leſs beautiful. Glaſs veſſels are alſo eſſential to the *Vegetations* being formed in their greateſt beauty; they are never nearly ſo beautiful in earthen ones; and even in the former the *Vegetations* ſucceed much better in ſome ſorts of glaſs, than in others. The caput mortuum of aqua-fortis alſo is very different, from the different diſtillations; and all of it does not ſucceed alike in this *Vegetation* of the ſalt. That which looks lighteſt, and of the reddeſt colour, ſeems the beſt for this purpoſe. An impregnation of this caput mortuum in red wine, produces no *Vegetations*, but only forms a cruſt with ſmall eminences on the ſides of the veſſel; and ſalt-petre, diſſolved in the impregnation of this caput mortuum in water, produces a much more beautiful *Vegetation* than that of ſalt-petre alone; but at the ſame time much leſs beautiful than that of the impregnation alone. Sea-ſalt, diſſolved in the ſame impregnation, ſometimes will produce beautiful *Vegetations*, but ſometimes only a rough cruſt. Common rough ſalt-petre forms no *Vegetations*, but only cruſts over the veſſel, as is the caſe with the ſolutions of many of the metals in different acid menſtruums. And the ſame is the caſe in regard to many ſalts from which it might be natural to expect concretions of this kind. Memoirs Acad. Par. 1722.

VEGI, or UGI, the names given by the Arabian phyſicians to the acorus. Theſe writers ſeem not to have been acquainted with the plant itſelf in its growing ſtate, but only to have known that part of it which was uſed in medicine in their time; but the Greeks deſcribe the plant in ſome ſort.

Serapion mentions the *Vegi* or *acorus* as a medicine; but he quotes no one Arabian who has named it, but tranſcribes his account of it from Dioſcorides; and Aviſenna ſays it is the root of a plant much reſembling the alburdi, that is, the paper-reed of the river Nilus. Aviſenna adds, that the acorus grows only in wet places; and the old manuſcripts of Dioſcorides have the epithet *papyraceum* for the *acorus*, though imperfectly expreſſed; and thence probably this author took the hint of reſembling it to the paper-reed.

VEIENTANA *Gemma*, in natural hiſtory, the name of a gem deſcribed by Pliny, and ſaid to be found in Italy; he ſays it was black, but ſurrounded with a circle of white; it was probably a ſtone of the camea kind.

VEIN (*Cycl.*)—*Pulſations of the* VEINS. The pulſations of the arteries are well known; but though no ſuch motion be natural to the *Veins*, yet there have not been wanting inſtances in which a morbid ſtate has been able to produce them. The pulſations of the arteries anſwer to the motions of the heart, that throws the blood into them; but when this fluid has once got into the *Veins*, it uſually returns through them to the heart again in an uniform and equable motion; and this is not only the caſe in the human body, but alſo in other animals, whether they be in health or in ſickneſs. One of the inſtances in which the contrary has been obſerved, and where the *Veins* have had a pulſation, is a caſe related by Mr. Homberg to the Paris Academy. The patient was a lady of about thirty-five years old, afflicted with a grievous aſthma, a pain in the head, a continual want of reſt, and terrible palpitations of the heart.

On opening her body after death, the heart was found of twice its natural dimenſions, its cavities very large, and its ſides very thin; and in each trunk of the arteries there was a fleſhy polypus fixed to their internal ſurface. That in the trunk of

the aorta was found to be two foot long, and plainly of a fibrous fleshy substance, for six or seven inches of its length; but from that downwards, it became only like clotted blood.

At the time that this lady was most violently afflicted with her asthma, the veins of her arms and neck were plainly perceived to have a pulsation wholly like that of the arteries, and plainly followed the motion of the heart: She had, in the latter time of her life, usually two of these fits in four and twenty hours; and when they were over, the pulsations in the *Veins* ceased. Mem. Acad. Par. 1704.

VEINS *of plants*, a term used by Dr. Lister, to express certain vessels in plants, which are analogous to the *Veins* of animals, and have been observed in some degree, by the naturalists of almost all ages, though differently described by authors. Pliny has described these parts of a plant under the names of *venæ* and *pulpæ*; and Dr. Grew calls them *fibres* and insertments on the ligneous body, interwoven with that substance which he takes to be the cortical body, that is, the several distinctions of the grain. This author also calls them the pores of the ligneous body; but that they are not merely such, may be plainly seen in cutting off a transverse piece of the stalk of some large wild plant, as the great wild angelica, or the like. In the cut stalk of this plant, the *Veins* every where shew themselves to be distinct from fibres, observable in the parenchyma of the same cortical body with themselves, the milky juice always rising beside the fibres not in any fibre: also in a transverse cut of the root of the common burdock, the like juice springs on both sides of the several radii of the woody circle, that is, in the cortical body, and the pith only.

Again, where there is no pith, there is none of this juice to be observed, and consequently none of these *Veins*, as in the roots of plants, and trunks of trees, but even in the bark of either. The sphondylium, the cicutaria, and many of the thistle kind, are instances of this. Dr. Grew describes pores in the cortical body, and pith; but these vessels are not of the number of the things designed by those pores; these pores are extended by the breadth of the plant; but the pores of this juice are extended lengthwise. The pith of a dried fennel stalk will shew these very beautifully, and with due care, they may be traced all along the whole length of that pith.

It remains therefore, that if these are pores, they must be of those pores of the cortical body, that are supposed to be extended the length thereof; but it is much more proper to call them *Veins*, or vessels, analogous to those of the human body, and covered with their proper membranes; for they are to be found in the pith, and sometimes in the cortical body of the plant, not included within the common tunicle of any fibres, but having their own proper membranes; which indeed, if they had not, the porous and spungy parts of the pith and cortex would be in all places filled alike with the juice; but on the contrary, it is found to rise in a few set and determinate places only, that is, according to the disposition and order of the vessels. If a ligature be made on the trunk of the spurge, and the trunk wounded, the juice bursts immediately out in large quantities; but if not wounded, none is discharged by means of the ligature: now the exterior part of the trunk of these plants is allowed by all observers to be perforated in almost innumerable places; and therefore, if this milky juice were not contained in its peculiar vessels, there is nothing to hinder, but it should rush out at these pores on the ligature made above; but it is evident, that it does not do this till the containing vessels are wounded.

The juices of plants are probably then all contained in these *Veins*, or distinct and proper vessels, covered with their own membranes, and not loosely distributed through the substance of the plants. Those things which are essential to *Vegetation*, are alike allotted to all plants; and it is to be supposed, that all plants have these vessels, though we cannot alike distinguish them in all. Those plants, whose juices are white or yellow, or of any other colour different from that of the body of the trunk, are always distinctly seen, pouring out those juices at separate holes in a wound. Those whose juices and stalks are of the same colour, do not so readily shew them; but there is a time, when they are, in some parts of these plants, if not in all, sufficiently plain to the naked eye.

The tender shoots of the greater and lesser maple, in May, are full of a milky juice, which is the known liquor of these *Veins*; and if a clean knife-blade be applied to a transverse cut of a young shoot of elder, and then raised gently away, the liquor of those *Veins* will be drawn up into strings, answering to the orifices of the *Veins* made by the wound. The pedicles of the leaves of our garden rhubarb, frequently shout out a sort of white and transparent gum: this must be an accidental exsudation of a gum, very constantly contained in the *Veins* of the plant, though not distinguishable in these stalks: this, and many other like instances, prove the existence of such vessels, though they are not obvious to the eye; and there remains no doubt but they are to be found in all plants by some trials. Even the mushrooms, the lowest class of plants, are not destitute of these vessels; there is one which shews them very evidently, this is the wood mushroom, whose stalk, when broken, or cut, discharges a milky juice, as hot as pepper, or more so; and this does not exsudate from the whole spungy substance of the stalk, but is plainly discharged from the mouths of certain wounded vessels.

The primary use of these *Veins* is certainly to carry the nutritious juice of plants; and this appears plainly in that where they are not, there is no vegetation, as is seen if an engrafted branch or arm is bared, or the clay stripp'd off; in this case, all the course of the vegetation will appear to have been made only by the bark, the wood having had no share in it. The bark is the place where these *Veins* lie, not the wood; and therefore, it is no wonder that the vegetation, if dependant on these *Veins*, is carried on only where these *Veins* are. The vegetable drugs of our shops are all of this nature, the juices contained in these *Veins* being evidently what give them their virtue. Phil. Trans. N°. 79.

VEIN, among miners, is that space which is bounded with woughs, and contains ore, spar, canck, clay, chirt, croil, brownhen, pitcher-chirt, cur, which the philosophers call the mother of metals, and sometimes soil of all colours. When it bears ore, it is called a *quick vein*; when no ore, a *dead vein*. *Houghton*'s Compl. Miner, in the Explan. of the terms.

The *Veins* of Mines differ greatly from one another in depth, length, and breadth; some stretch obliquely, from the surface toward the central parts of the earth; and these the miners call deep *Veins*; others lie shallow, and circular, so as to encompass a large space; and these are termed spreading *Veins*; others possess a great part of the space they lie in, both in length and breadth; and these are called accumulated *Veins*, being no more than a space possessed by a large group of fossils of one kind. To give the compleat history of *Veins*, and fibres which are smaller *Veins*, their differences, their directions, their interstices, their discontinuations, their risings and fallings, and their goodness, would be a large work. Let it be oberved, however, that these things seem all to proceed in a certain order, though that order, and the laws and rules of it, are not perfectly understood, so as to afford sure directions for practice; whence it sometimes happens, that after a *Vein* has been successfully traced for some time, it dips, breaks off, or takes a different course, leaving the workmen as it were at a fault.

When the *Vein* is found, a pit is to be sunk upon it, and a crane fixed at the top of the pit for craning up the ore. Burrows, or adits, are also to be cut horizontally through the hill in one or more places, reaching to the mine, and serving to wheel out the ore, instead of craning it up. *Shaw*'s Lectures, p. 246.

The manner of digging varies according to the nature of the *Vein*. If this be soft, it is dug with the spade, and turned out into wooden trays, placed to receive it. If the *Vein* be harder, it is to be knocked out with the hammer and chissel. If it be too hard for this method, they soften it by fire, which makes all stones brittle; but the most expeditious of all mine working, is that by gunpowder, which tears up, and breaks to pieces vast rocks in a moment.

VELITIS, in the natural history of the antients, the name of a peculiar sort of sand used in the making glass.

The antients, in their different ages, made glass of different materials. These, however, were principally thin natrum, which was, in most respects, the same thing with our alkali salts used in glass-making, mixed with flints, shells, or sand. Sand was the most universal mixture; and for this purpose, they always chose such sand as was found washed clean on the banks of rivers; and this they therefore called glass-sand, or *Velitis*, or *hyalitis*. *Hill*'s Theoph. p. 11.

VELLA, in botany, the name of a genus of plants; the characters of which are these: The perianthium is of a cylindric figure, and erect, and is composed of four slender and obtuse leaves, which fall with the flower; the flower is composed of four petals, and is of the cruciform kind; the petals are of an oval figure, and of the length of the cup; the stamina are six filaments of the length of the cup, only two of them are a little shorter than the other four; these two stand opposite to one another; the antheræ are simple; the germen of the pistil is oval; the style is conic; the stigma is simple; the fruit is a globose, cristated, pendulous pod, containing two cells, divided by a membrane, twice as large as the pod itself, and of an oval figure; the seeds are roundish. *Linnæi* Gen. Plant. p. 317.

VELLIA, in zoology, a name used by some authors for the *lanius minor*, or *lanius tertius* of Aldrovand, called in England the *flusher*. *Ray*'s Ornithol. p. 54. See the article FLUSHER.

VELOCE, in the Italian music, is used for quick.

VELOCISSAMENTE, or VELOCISSIMO, in the Italian music, is used for very quick, or with great rapidity. It is seldom met with; *presto*, or *prestissimo*, being mostly used in its stead. *Brossard.*

VELOCITY, (*Cycl.*) — In the doctrine of fluxions it is usual to consider the *Velocity* with which magnitudes flow, or are generated. Thus, the *Velocity* with which a line flows, is the same as that of the point, which is supposed to describe or generate the line. The *Velocity* with which a surface flows, is the same as the *Velocity* of a given right line, that, by moving parallel to itself, is supposed to generate a rectangle, always equal to the surface. The *Velocity* with which a solid flows, may be measured by the *Velocity* of a given plain surface, that

that by moving parallel to itſelf, is ſuppoſed to generate an erect priſm, or cylinder, always equal to the ſolid. The *Velocity* with which an angle flows, is meaſured by the *Velocity* of a point, ſuppoſed to deſcribe the arc of a given circle, which ſubtends the angle, and meaſures it. See *Mac Laur.* Fluxions, B. 1. ch. 1.

All theſe *Velocities* are meaſured at any term of the time of the motion, by the ſpaces which would be deſcribed in a given time, by theſe points, lines, or ſurfaces, with their motions continued uniformly from that term. *Mac Laur.* ibid.

The *Velocity* with which a quantity flows, at any term of the time, while it is ſuppoſed to be generated, is called its *fluxion*. See the article FLUXION.

VELVET (*Cycl.*)—*Colour of black* VELVET. The manner of giving this deep and fine colour to glaſs, is this: Take of cryſtalline, and pulverine frit, of each twenty pounds, of calx of lead and tin four pounds; ſet all together in a pot in the furnace, well heated; when the glaſs is formed and pure, take ſteel well calcined and powdered, ſcales of iron that fly off from the ſmith's anvil, of each an equal quantity; powder and mix them well; then put ſix ounces of this powder to the above deſcribed metal while in fuſion; mix the whole thoroughly together, and let all boil ſtrongly together, then let it ſtand in fuſion twelve hours to purify, and after this work it. It will be a moſt elegant *Velvet* black.

There is another way of doing this, which alſo produces a very fair black. It is this: Take an hundred weight of rochetta frit, add to this two pound of tartar, and ſix pound of manganeſe, both in fine powder; mix them well, and put them to the metal while in fuſion, at different times, in ſeveral parcels; let it ſtand in fuſion after this for four days, and then work it. *Neri*'s Art of Glaſs, p. 95, *& ſeq.*

VELUM, in eccleſiaſtical writers, the ſame with what is otherwiſe called *brandeum*. See the article BRANDEUM.

VELUM *quadrageſimale*, a veil, or piece of hangings, antiently drawn before the altar in *Lent*, as a token of mourning and ſorrow. *Blount.*

VENABULUM, in antiquity, a long kind of ſpear uſed in hunting wild beaſts. *Hofm.* Lex. Univ. in voc.

VENCU, in botany, the Chineſe name for an excellent fruit found in that country, which the Portugueſe call *jamboa*, and the Dutch *pompehinoes:* It grows on prickly trees, like the limon-tree, only larger. Its flowers are white, exactly the ſame in ſhape with thoſe of the limon, and have an exceeding ſweet ſmell; a very fragrant water is diſtilled from them. The fruit itſelf far exceeds the citron in bulk, being in ſize equal to, and ſometimes exceeding a man's head. The rind is like that of the golden rennet; the pulp is of a reddiſh colour, and its taſte partakes of ſweet and acid, reſembling that of grapes not fully ripe. A liquor is preſſed from it, as in Europe, from apples, pears, &c. It will keep for a whole year. *Hofm.* Lex. Univ. in voc.

VENDITOR *regis*, the *king's ſalesman*, or perſon who expoſed to ſale, goods and chattels ſeized or diſtrained to anſwer any debt due to the king. This office was granted by king Edward I. to Philip de Lardimer, in the county of York, *Ita quod ipſe, vel certus ſuus attornatus, ibit ad mandatum vicecomitis de loco in locum infra com. præd. ſumptibus ſuis ad venditiones faciendas, & capiat de unaquaque venditione pro feodo ſuo* xxxii. Den. but the office was ſeiſed into the king's hands for the abuſe thereof. Anno 2 Ed. 2. *Blount.*

VENENUM *cocci*, a term uſed by many of the antients for the purple tinge, which the kermes berry, as it is uſually called (ſee the article KERMES) gave to linnen, or other things.

The word *Venenum* being generally underſtood to expreſs poiſon, it has been ſuppoſed by many, that the kermes was eſteemed poiſonous, or that there were two ſorts of this drug; the one a harmleſs medicine, and the other poiſonous. But there is no warrant for this in any of the old writers, and the whole ſeems indeed but a miſtake about the ſenſe of the word *Venenum*, which we find by many paſſages of the beſt authors, ſignified a ſtain, as well as a poiſon.

The antients called the veſtments dy'd ſcarlet with the kermes indifferently, by the names of *flammeæ*, or *venenatæ*. Servius tells us, that in certain ſacred ceremonies, it was neceſſary that the prieſt ſhould be clothed in a ſcarlet robe; and he uſes the word *venenato* to expreſs it in ſome places, and *flammeo* in others.

VENER, one of the many names by which the chemiſts call Mercury.

VENEREA *concha*, in natural hiſtory, the name of a very large and elegant genus of ſhells, more uſually called the *porcellanæ*. See the article PORCELLANA.

VENETA *bolus*, a fine red earth uſed in painting, and called in the colour-ſhops *Venetian red*.

It is improperly denominated a bole, being a genuine ſpecies of red ochre. It is of a fine bright, and not very deep red, approaching, in ſome degree, to the colour of minium, or red-lead, and is moderately heavy, and of an even and ſmooth texture, yet very friable, and of a duſty ſurface: it adheres firmly to the tongue, is very ſmooth, and ſoft to the touch, eaſily crumbles to pieces between the fingers, and very much ſtains the ſkin in handling. It has a ſlight aſtringent taſte, and makes no fermentation with acids.

It is dug in Carinthia, and ſent from Venice into all parts of the world, being an excellent colour, and very cheap; our colour-men, however, find too many ways of adulterating it. *Hill*'s Hiſt. of Foſſils, p. 59.

VENISON, *Cycl.*—The old huntſmen have determined, that every beaſt of the foreſt, that is food for man, is *Veniſon*. In many parts of the world, the bears are as regularly hunted, as the hare and buck, *&c.* are with us, and there are called *Veniſon*; but with us, at preſent, the word *Veniſon* ſeems limited to the fleſh of the hart, the hind, the buck, the doe, and the other creatures of that kind.

Some have extended the ſignification of the word to the beaſts of the foreſts, which were chaſed as game, and afforded the diverſion of hunting, whether their fleſh were eaten or not; thus, in ſome places, the wolf and the fox are reckoned among the *Veniſon* beaſts. See the article FOREST.

VENOSA *arteria*. See the article ARTERIA *venoſa*.

VENOSE *Leaf*, *Venoſum folium*, among botaniſts. See the article LEAF.

VENTININA, a term uſed by Paracelſus and his followers, to expreſs the art of divining, or knowing by the winds and their courſes, the good or ill effects of ſeaſons.

VENTRICULUS *ſuccenturiatus*, in medicine, a name given by ſome to the duodenum, when very large. Medic. Eſſ. Edinb. abridg. Vol. 2. p. 34.

VENUS (*Cycl.*)—A ſmaller ſtar having been obſerved by Mr. Short near *Venus*, which had the ſame phaſis as that planet, has given ſome ſuſpicion of its having a ſatellite. See Phil. Tranſ. N°. 459. ſect. 23. where it is ſaid, that M. Caſſini, in his Elemens d'Aſtronomie, mentions a like obſervation.

VER-*puceron*, in natural hiſtory, a name given to a kind of inſects which are fond of eating the *puceron*, and deſtroy them in vaſt numbers. See the article PUCERON.

They are thus called, as the ant-eater is, *formica leo*, from their deſtroying great numbers of them.

Theſe *Ver-pucerons* are a ſort of worms produced from the eggs of flies, and are of two principal kinds; the one having legs, the other none.

When we obſerve the vaſt number of young produced by every puceron, and the quick progreſs they make in their multiplication, we are apt to wonder, that every plant and tree in the world is not covered with them; but on the contrary, when we obſerve the deyaſtation theſe devourers make among them, we are apt to wonder how any of them eſcape at all, to perpetuate the ſpecies. Theſe worms indeed ſeem created for no other purpoſe but to deſtroy them; and this they do in ſo violent a manner as is ſcarce to be conceived. As the flies of many kinds lay their eggs on meat and other ſubſtances, which they know will afford food for the young ones, when hatched from them: ſo the parents of theſe worms lay their eggs on the branches and leaves of trees loaded with pucerons, on which they know they will feed. The worms produced from them are devourers from the very inſtant they are hatched, and find themſelves placed in the midſt of prey, being every way ſurrounded by a nation of creatures which are their proper food, and which are furniſhed with no weapons, either offenſive or defenſive, and which never ſo much as attempt to fly from them, but ſeem wholly ignorant of their danger, till ſeized upon by the devourers. *Reaumer*'s Hiſt. of Inſects, Vol. 6. p. 111.

Theſe worms are very large in proportion to the pucerons, the difference not being leſs than that between the lion and the ſmalleſt quadruped. Their figure is varied at pleaſure; but ſeems, in its moſt natural ſtate, to be much larger at the poſterior part than at the anterior; the poſterior part alſo uſually remains fixed, while the other is twiſted about various ways; but the creature can, at its pleaſure, ſhorten the body, by drawing in the ſeveral rings, and then it appears of an oval figure.

Theſe worms are of different colours, and different ſpecies; thoſe which are found on the elder are green, with a white ray down the back; thoſe on the ſloe and gooſeberry-tree are whitiſh, variegated with yellow undulations. Other ſpecies are of a pale yellow, others of a ſomewhat deeper yellow, with two ſtreaks running down their backs of a bright cheſnut colour, between which there is one black one. Some have reckoned theſe ſeveral ſpecies among the caterpillars, but very improperly, as they have no one character of this kind, but every way reſemble the worms or maggots, produced from the eggs of the common flies. Theſe creatures have at their head a dart of a brown colour and hard ſubſtance, ornamented with two ſmaller points at the baſe, ſo that it repreſents, in ſome degree, a flower-de-luce: this is the weapon with which they deſtroy the pucerons, and this they either draw back within the head, or thruſt out at pleaſure. The mouth of the creature is placed under this dart, but is not eaſily diſcovered, the creature uſually keeping it very cloſely ſhut; there are times however, when the creature is ſeen bending its head down ſeveral times towards its belly; and if the anterior and under part be then examined, the place of the mouth will be diſtinguiſhed by means of a yellowiſh liquor which it throws out of it.

All theſe worms have two ſtigmata or apertures for the receiving air at the hinder part of the body. Theſe are very di-

ſtinctly

ſtinctly ſeen, and are either round protuberances, placed at the two ſides of the upper part of the ring; or two tubes or cylinders, either ſo placed or joined together, and elevated above the reſt of the ſurface. They have alſo two ſtigmata near the head; theſe are called anterior, as the others are poſterior; but theſe are ſmaller than the others, and have been generally overlooked by authors. There are ſeveral ſpecies of theſe worms that are hairy, and ſome are prickly. One very ſingular ſpecies is ſo much ſo, that it reſembles a hedgehog; it is of a greeniſh white colour, but has three lines running along the back, compoſed of three ſeries of ſpots, thoſe of the middle line being black, and thoſe of the others brown. The ſpines or prickles upon this ſtand in the number of ten or twelve on every ring, and are all hooked, and have their points turned toward the hinder part of the body. They only are placed on the back and ſides, the belly being perfectly ſmooth. See Tab. of Inſects, N°. 24.

Theſe creatures have no legs; there are indeed certain fleſhy eminences on the under part of the rings of ſome of them, which aſſiſt them in walking; but their common method of moving is by fixing their head to any part, and then drawing the reſt of the body to it. This creature, however, has very little occaſion for motion; its whole buſineſs, in this ſtate, is to eat, and its parent has ſo placed it, that it need not hunt its food ſingly, like other creatures of prey; but it finds itſelf every way ſurrounded with the creatures it is to feed upon, and touched by them before, behind, and on every ſide; nay, they often walk upon its back without any apprehenſion of the danger: They remain in their places till he has cleared them away, by eating them; and when he has devoured all within his reach, it is then only that he need move his quarters, and that but a little way; for he ſeldom has farther to go than to the fartheſt place his head could reach, while he remained fixed in the former place. *Reaumur*'s Hiſt. Inſ. vol. 6. p. 117.

The way to ſee him eat, ſo as to diſtinguiſh the manner of it, is to keep one a few hours without food, and then placing him on a paper, or on the hand, and placing ſome of the pucerons about him, the manner of his feeding on them will be ſeen. It appears evidently that he has no eyes, for he tries to find them only by feeling, ſtretching out his head, and trying every where with it, before, behind, and on every ſide, while his hinder part remains fixed. As ſoon as he perceives a puceron, he darts his triple weapon into it, and ſticks it juſt as we do a mouthful of meat upon a fork; he then draws back the dart into the firſt ring, and that ring into the ſecond, and then uſes his mouth, which has a kind of trunk, with which he ſucks the juices of the puceron.

When the *Ver-puceron* is of the white, or otherwiſe pellucid kinds, it is a very ſurpriſing ſight to obſerve the manner of the feeding, which is clearly ſeen through the ſkin. The puceron being drawn into the ſecond ring of the body, there is ſeen juſt below that an oblong body, which is, at times, darted up to the body of the puceron, and down again from it. The movements of this are very ſwift, and the ſpace of reſt between them but ſhort. This is a ſort of pump, which ſucks in the parts and juices of the animal, and delivers them again to the œſophagus or ſtomach, placed behind it. During the ſhort ſpace of reſt, we ſee it diſtinctly diſcharge from its hinder part what it had before received from the animal, into this paſſage. This is ſometimes only its juices, which look like ſmall bubbles of air, and ſometimes a great number of little roundiſh granules, which are evidently the embryo pucerons, with which we know the body of all the grown ones to be loaded, all the pucerons being breeders.

When the worm is hungry it feeds very voraciouſly, when not ſo, it eats more at its leiſure. The ſkin of the puceron is always thrown out of the mouth, as ſoon as its juices and entrails have been ſucked, and it then looks perfectly like the exuvia, which the pucerons naturally throw off when they change their ſkins. The worm will ſuck one of theſe creatures thus dry in leſs than a minute, and then loſes no time, but throws it out, and immediately ſeizes another. In this manner Mr. Reaumur ſaw one worm eat twenty of theſe creatures in twenty minutes, and ſuppoſes that he continued the ſame ravage long afterwards; for having put him among an hundred pucerons, there was not one left after two or three hours.

When the worm is placed at its eaſe among vaſt quantities of them, it does not eat ſo very quick, but ſeems to amuſe itſelf by eating one in two or three minutes. This manner of feeding, however, deſtroys prodigious numbers, for they ſeldom reſt, but are almoſt continually at it; and it is hard to find one of them, at any time, without a puceron in its mouth. So that a branch of elder, which is covered on every part with theſe animals for four or five inches, ſhall be found wholly cleared in three or four days, by only three or four of theſe worms. *Reaumur*'s Hiſt. Inſ. vol. 6. p. 127.

The pucerons are never free from their enemies; there is no place where they are ſeen in any conſiderable number, where theſe worms are not alſo found; and their ſecureſt retreats do not preſerve them. The bladders of the elm, and other trees; the galls of the leaves and pedicles of the poplars, and the folded leaves of the ſame trees, which are all inhabited by the pucerons, are all ſubject to be viſited by theſe worms alſo. They do not always immediately make their way into them; but as ſoon as one of the winged pucerons has eſcaped out of the place, the hole at which he came out, lets in one of theſe worms, which ſoon deſtroys all the remainder of the family. Another great misfortune to theſe poor creatures, is, that the worms are not confined to any one ſpecies of them, but eat all indifferently.

The anus of the worm is placed in the fold of the two laſt rings of the body, and is almoſt continually voiding a blackiſh liquid excrement.

Theſe worms, when full grown, are greatly an over-match for the pucerons; and it is odd to obſerve the young worms in their attacks upon them. A worm juſt hatched, and not a third part ſo big as the puceron, will immediately, however, attack any one that is next it: The puceron, feeling itſelf wounded, will immediately run away; but the worm keeps its hold, and, raiſing its body by the head, ſticks to the puceron, and even kills and ſucks its juices while it is carried away. When it has done with this, it gets upon another, and ſo on, till it grows and gains ſtrength and ſize enough to reſiſt the force of the puceron, in endeavouring to carry it away, and then fixing itſelf by the tail among the heaps of them, it feeds at pleaſure. When it has eaten till it has arrived at its full growth, the time of its transformation into the fly ſtate approaches: It then ceaſes to eat, and crawling along the leaf or ſtalk of the plant, ſeeks out a proper place where it may be at reſt during its cryſalis ſtate.

When it has pitched upon the place, it begins to void the viſcous liquor before-mentioned in great quantity from its mouth. It extends this over a ſpace equal to its body, and then placing itſelf on the place, it becomes fixed there, and moves no more. It draws back its head, and the ſkin of the whole body hardens ſo as to form a ſhell, under which it paſſes the cryſalis ſtate. In this ſtate it makes a very beautiful appearance; for the ſkin, though become as hard as horn, yet has loſt nothing of its tranſparence, but, on the contrary, has gained a yet greater degree of it; and the nymph of the fly is ſeen clearly within it, the motion of the heart being very diſtinctly viſible.

After this, as the nymph grows every day more and more perfect, the eyes, the antennæ, and the ſeveral other parts, may be diſtinctly ſeen: And this indeed would prove the beſt of all ſubjects to convince thoſe who ſuppoſe, that maggots are ſuddenly changed into flies, and caterpillars into butterflies, of the error of their opinion; as they might here ſee, by the cleareſt occular demonſtration, that the change is very ſlow and regular.

The flies which are produced from theſe worms, are all of the two-winged kind; but there are ſeveral different ſpecies of them; the generality of them reſemble waſps, and have a very flat body. Goedart, who has deſcribed ſome of theſe flies, was ſurprized to ſee them very ſmall, when firſt produced from the cryſalis, yet growing very large in a quarter of an hour's time, and that without taking any nouriſhment; but this was only owing to their ſeveral parts having been greatly ſqueezed while in the cryſalis, and expanding themſelves when they were at liberty from the compreſſion. Theſe are the changes of this kind of *leo puceron*; but the other devourer of theſe creatures, which has ſix legs, is of a different kind, and indeed is in itſelf reducible to ſeveral ſpecies, ſome of theſe ſix-legged worms becoming four-winged flies, and others a kind of beetles. Theſe, from their near reſemblance to the formica-leo, are by Reaumur diſtinctly called *puceron-lions*. *Reaumur*, Hiſt. Inſ. vol. 6. p. 131. See the article PUCERON-*Lion*.

VER *Polipe*, in natural hiſtory, a name given by Reaumur, and ſome other authors, to a ſpecies of water-worm, by no means to be confounded with the creature called ſimply the *polype*, and which is ſo famous for its reproduction of parts cut off, and for many other ſingular properties. See the article POLYPE.

This *Ver-polype* is a ſpecies of water-worm, produced from the egg of a tipula, and had this name given it from ſome remarkable productions, placed at the anterior and poſterior parts of the body, which are ſuppoſed to have ſome analogy with the parts of the ſea-fiſh called the *polypus*.

Theſe worms are found in muddy ditches, uſually either crawling upon, or buried in the mud. They are of various ſizes, from more than an inch in length, to a fifth of an inch, and are ſmooth and even on their ſurface; they are compoſed of ſeveral rings, as other inſects of this kind, and have a brown ſcaly head, of a regular figure, and much harder than the reſt of the body. Juſt below the head, on the under part of the body, there are placed two membranaceous productions, which ſeem fragments of arms; they are conſiderably thick, and are cut off obliquely at the ends, and furniſhed with many hairs. At the other extremity of the body there are placed four other productions, reſembling four pieces of cords; two of theſe are affixed to the middle of the lower ſide of the laſt ring but one, and the other two, at the joining of this to the laſt ring. The anterior pair ſerve the creature greatly in its moving, and theſe hinder ones have their uſe in fixing that part of the body in the earthy caſe the creature ſometimes makes for itſelf, while the head is at liberty to move every where about in

ſearch of prey. Theſe hinder ones are broadeſt at their inſertion, and ſomewhat narrower at the point, and are very flexile and moveable every way.

The anus of the creature is placed near the end of the laſt ring of the body, and is of a ſquare figure; it is ſurrounded with a number of rigid hairs or ſpines, and at each corner has a fleſhy tubercle, which ſtands out a conſiderable way from the level of the body; the two under ones are much larger than the other two, and the creature evidently uſes them to puſh itſelf forward in its moving about. Probably, however, theſe parts have ſome other more important uſe. The taking in of air or water is likely enough to be the uſe they are aſſigned for.

The cells which theſe creatures uſually live in are compoſed principally of fragments of a light and ſpungy earth, and to this they add the broken pieces of ſticks and leaves, and other ſuch ſubſtances as are juſt heavy enough to ſink in water. Mr. Reaumur ſuſpects that they have a method of ſpinning ſome glutinous fluid out of their bowels, to fix theſe things together with. But though they uſually reſide in theſe caſes, they often quit them, and are found ſwimming about the water, or with their tails at the top, and playing about with their bodies; or at the bottom, crawling on the ſurface of the mud.

When the creature has lived its deſtined time in this ſtate, it changes into a nymph, in the caſe in which it had lived to the time of this change; it throws off the head, and the productions that ſerved as arms, and to faſten it at the botttom of the caſe. Nature has generally made the nympth and cryſalis ſtate of animals a time of reſt and incapacity of motion; but in this, as in the great worms, has given even the nymph a locomotive power, and that a very briſk one. The creature, in this ſtate, had ſufficient need of it, and could never arrive at its laſt change without it. When the time of this final change comes on, the nympth riſes to the ſurface of the water, and a crack opening on the back, the winged inſect begins to appear. The getting thoroughly out is a work of time; and this is the moſt perilous period of the creature's life; for if the weather be windy, it is commonly blown into the water, and drowned, before the hinder parts are looſe. *Reaumur*, Hiſt. Inſ. vol. 9. p. 49.

VERANO *Ave*, or *Ave de* VERANO, in zoology, the name by which the Portugueſe in the Braſiils call a large bird of the thruſh kind, approaching to the ſize of a ſmall pigeon, remarkable for its loud noiſe; and more commonly known by its American name, *guirapanga*. *Ray*'s Ornithology, p. 145. See the article GUIRAPANGA.

VERATRUM, *white Hellebore*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the roſaceous kind, conſiſting of ſeveral petals, arranged in a circular form. The piſtil ariſes from the middle of the flower, and finally becomes a ſeed-veſſel, compoſed of three capſules joined together, and containing oblong ſeeds, ſomewhat reſembling grains of wheat, and alated or ſurrounded with a foliaceous edge.

The ſpecies of *white Hellebore*, enumerated by Mr. Tournefort, are theſe: 1. The greeniſh-flowered *Veratrum*. And 2. The earlier-flowering *Veratrum*, with blackiſh purple flowers. *Tourn.* Inſt. p. 272.

VERBASCULUM, in botany, a name given by many authors to the primroſe, and with the title of *odoratum* to the cowſlip. *Dale*, Pharm. p. 187.

VERBASCUM, *Mullein*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of a ſingle leaf, rotated, and divided into many ſegments at the edge. From the cup there ariſes a piſtil, which is fixed in manner of a nail to the middle part of the flower, and finally becomes a fruit or caſe of an oval pointed figure, divided by an intermediate ſeptum into two cells, which uſually contain a number of ſmall angular ſeeds fixed to a placenta.

The ſpecies of *Mullein*, enumerated by Mr. Tournefort, are theſe: The common broad white-leaved yellow-flowered *Mullein*. 2. The white-flowered common *Mullein*, called by many the female *Mullein*. 3. The great female *Mullein*, with a large yellow ſcented flower. 4. Branched *Mullein*, with narrow thick leaves, and a gold-coloured flower. 5. Black *Mullein*, with a purpliſh yellow flower. 6. Annual green-leaved *Mullein*, with yellow flowers. 7. The black *Mullein* of Dioſcorides. 8. Black *Mullein*, with leaves like the yellow horned poppy. 9. The powdery *Mullein*, with ſmall yellow flowers. 10. The taper *Mullein*, with ſmall white flowers. 11. The branched perennial French *Mullein*. 12. The perennial Alpine black *Mullein*, with white flowers, and purple ſtamina. 13. Branched *Mullein*, with ſmall white flowers. 14. Low perennial Alpine *Mullein*, with leaves and flowers like thoſe of borrage. 15. Hoary Alpine borrage-leaved *Mullein*, with white flowers. *Tourn.* Inſt. p. 146.

VERBENA, *Vervain*, in botany. See the article VERVAIN.

VERBENA *Femina*. See the article ERYSIMUM.

VERDELLO, in natural hiſtory, the name of a green marble, uſed in Italy as a touch-ſtone, for the trying of gold, *&c.*

VERDETUM, the name of a green ſubſtance, uſed as a colour in painting. It is a very pure kind of verdegreaſe, being an ærugo of copper, produced by the vapour of vinegar.

VERDITER *Cycl.*—Mr. Boyle informs us, that the London refiners, to part ſilver and copper, diſſolve the mixture of them in aqua-fortis, and afterwards dilute the ſaturated menſtruum with water, and then with copper plates ſtrike down the ſilver. But as much copper remains in the menſtruum, to improve their liquor to the beſt advantage, they pour it upon whiting, that is, white chalk or clay finely powdered, cleanſed, and made up into balls, wherewith the tinged parts incorporating themſelves, will in ſome hours conſtitute a ſort of *Verditer* fit for painters, leaving the reſt of the menſtruum an indifferently clear liquor; whence they afterwards, by boiling, obtain a kind of ſalt-petre, fit, with the addition of vitriol, to yield them a new aqua-fortis. But he obſerves, that ſometimes the refiners could not make this *Verditer* for a great while together. But a remedy was found at laſt, which is, to warm the menſtruum well before it be poured on the whiting. *Boyle*'s Works abr. vol. 1. p. 169.

We have a way of making this colour in England by a mixture of powdered verdegreaſe and whiting. This is much inferior to that *Verditer* which is made with the copper-water uſed in the waſhing of ſilver; but its cheapneſs, and readineſs of preparation at all times, has recommended it into general uſe.

VERDONE, in zoology, the name of a fiſh of the turdus or wraſſe kind, called by ſome authors *turdus viridis minor*.

It is of a fine green colour in all parts of its body; the back, ſides, and belly, have all plainly the ſame colour; but in ſomewhat different degrees, the back being of the deepeſt dye; the belly has ſomething of yellowneſs with the green, and the ſides are variegated with lines of a fine blue. It has only one long fin on the back, which has thirty rays or ribs, the eighteen foremoſt of which are rigid and prickly, the others ſoft and flexile. It is caught in the Mediterranean, and ſold in the markets in Italy. *Salvian* de Aquat. p. 88.

VERGADELLE, in zoology, the name of a fiſh of the mullet kind, called by others the *chelon*, remarkable for the thickneſs of its lips. *Rondelet.* de Piſc. See the article CHELON.

VERITH, in ichthyology, a name given by Iſidore to the fiſh commonly called by authors, *thriſſa*; by us, the *ſhad*, or the mother of the herrings. See the article THRISSA.

It is eaſily diſtinguiſhed from the herring, by the top of the upper jaw being bifid, and the ſides ſpotted; but it is the opinion of that accurate obſerver Artedi, that it differs only in ſize from the pilchard, and the agone, alauſa, and ſardina, or ſmall pilchard.

VERKENS *Viſch*, in zoology, the Dutch name of a fiſh caught in the Eaſt Indies. It is about ſeven inches long, of a blackiſh-green colour, with fins and tail wholly black, and with yellow iriſes to the eyes. It is caught in freſh waters in the Eaſt Indies, and is a very delicate fiſh. It is very near related to the capriſcus, if not the ſame ſpecies. *Ray*'s Ichthyogr. Append. p. 1. 3. See the article CAPRISCUS.

VERMELHO, in zoology, the name of an American fiſh, more uſually known by the name of the *pudiano*. It is a ſmall fiſh, of the ſhape of the pearch, with a purple back, and yellow ſides and belly. *Willughby*'s Hiſt. Piſc. p. 339. See the article PUDIANO.

VERMES, *Worms*. See the articles VERMIS and WORMS.

VERMICULARIS *Cruſta*, a term uſed by ſome anatomical writers, to expreſs the internal hairy and corrugated coat of the inteſtines.

VERMICULUM, a word uſed by ſome chemiſts to expreſs a tincture or elixir.

VERMICULUS *Marinus*, the *Sea-Worm*, in natural hiſtory, the name of a genus of ſhell-fiſh of the multivalve kind.

The characters are theſe: They are multivalve ſhells, formed in the ſhape of tubes or pipes, and are rounded, wrinkled, and uſually crooked, though ſometimes ſtrait. Theſe ſhells are called *vermiculi*, or ſea-worms, from the fiſh contained in them, which is always a ſort of worm. They uſually are found in great cluſters together, interwoven oddly with one another.

Bonani calls them ſea-ſerpents, incloſed in ſhells, from the various twiſted forms in which they adhere to ſhips and rocks. The author eſtabliſhes them among the multivalves, becauſe they are never found ſingle, but always in theſe cluſters; in this ſenſe he looks upon the whole cluſter as the ſhell-fiſh under conſideration, not any one of the ſingle tubes: Though he acknowledges that each of theſe tubes is a perfect ſhell, independant of the reſt, and has its proper inhabitant. Strictneſs in natural hiſtory therefore would not bear him out, in arranging them among multivalves, for they are certainly an univalve ſhell, though many of them happen always to be found together.

Care muſt be had not to confound theſe with the *dentalia* and *entalia*; for theſe laſt are always found ſingle; and the *vermiculi*, of the kind here treated of, are always found together in great numbers, forming cluſters of ten inches, and often much more in diameter.

Of the *Vermiculi*, which are ſtrait, we have the following ſpecies: 1. The *Tubularia Purpurea*, by many eſteemed a ſpecies of coral. This is called by ſome the *ſea-organ*, and has greatly the appearance of common red coral, but is in reality only a maſs of theſe tubes of worms. 2. The pale red

Tubularia. 3. The thicker *Vermiculus*, called the *great organ-pipe.* 4. The ſmooth *Vermiculus.* 5. The ſtriated *Vermiculus.* 6. The canaliculated or deep furrowed *Vermiculus.*

Of the crooked kind we have the following ſpecies: 1. The gut *Vermiculus.* This ſpecies always forms a large cluſter, and reſembles the inteſtines of animals. 2. The variouſly curled *Vermiculi.* 3. The *Vermiculi*, terminating in elegantly twiſted ends. 4. The brown wrinkled *Vermiculus.*

Of thoſe *Vermiculi* which are diſpoſed in a ſort of circles, we have the following: 1. The earth-worm *Vermiculus.* 2. The concamerated *Vermiculus.* This is a ſpecies of *Vermiculus*, divided in the inner part into a number of chambers or cells, in the manner of the nautilus, and having a ſiphunculus of communication running through the whole. 3. The mud-*Vermiculus.* This ſpecies lies under the mud of the bottom, and adheres to ſtones. 4. The oiſter *Vermiculus.* 5. The muſcle *Vermiculus.* 6. The buccinum *Vermiculus.* Theſe are three diſtinct ſpecies, which always take up their abode on thoſe peculiar ſhells. 7. The red cancellated *Vermiculus.* 8. The brown twiſted *Vermiculus.* 9. The roſe-coloured and white *Vermiculus.* Hiſt. Nat. Eclairc. p. 354.

VERMINA, a word uſed by many of the medical authors to expreſs a tormenting pain in the bowels, feeling as if worms were gnawing them.

VERMIS, *Worm*, in natural hiſtory. See the article WORM.

VERMIS *Cæruleus*, a name given by the antient naturaliſts to an animal they deſcribe as living in the Ganges, and ſome other rivers in the Eaſt Indies, and of an enormous length. Pliny tells us that they are ſeventy feet in length; but he at the ſame time convinces us, that they were not properly worms; for he tells us they had gills like thoſe of fiſhes, and ſays they were called *Vermes*, only becauſe they were like worms. Cteſias mentions theſe Indian water-worms, and ſo do many other old writers, all giving them the ſame characters, but differing ſomewhat in the length, which the laſt-mentioned Greek author makes to be only ſeven feet, not ſeventy. Solinus has miſtaken this account of the gills of this creature, and has tranſlated or copied the authors he took his account from ſo ill, as to call them arms, and gives them the length the other authors attribute to the whole animal. This creature was of a blue colour, and lived in the deep waters; but would, according to their accounts, riſe up to the ſurface near the ſhore, to ſeize upon cattle that came to drink. They even tell us of its ſeizing on the elephant in this manner; and, at this rate, the whole ſeventy foot length is neceſſary. Inſtead of ſeventy feet, ſome copies of Pliny have it ſixty; and the later authors from this have made it only ſix: And Solinus has miſtaken what Pliny ſays of the creature, being called *Vermis* from its having the ſhape of a worm, and ſuppoſes he means that it was called *cæruleus*, becauſe of its being of a blue colour; but we find nothing of this in the old authors, nor any other name for it but *Vermis.* The naturaliſts of late ages have given no account of any ſuch animal as this; and it is very probable that the authors who firſt deſcribed it meant nothing but the crocodile, which they had heard of as a terrible voracious reptile, living in the Ganges, as it does to this day; but had never had any tolerably accurate account of it. See the article CROCODILE.

VERMIS *Cerebri*, the *worm* in the brain, a name given by ſome writers to an epidemical fever in Hungary, attended with terrible deliriums.

VERONICA, *Speedwell*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is rotated and divided into ſegments at the end. From the cup there ariſes a piſtil, which is fixed in the manner of a nail to the middle part of the flower, and afterwards becomes a membranaceous fruit, divided into two cells, and containing uſually ſmall, but ſometimes larger ſeeds. *Tourn.* Inſt. p. 143.

The ſpecies of *Veronica*, enumerated by Mr. Tournefort, are theſe: 1. The common ſmall procumbent *Veronica*, called *male Speedwell.* 2. The longer-leaved ſmooth creeping Pyrenean *Speedwell*, 3. The upright male *Speedwell.* 4. The broad-leaved ſpiked *Speedwell.* 5. The purple ſpiked *Speedwell.* 6. The narrow-leaved ſpiked *Speedwell.* 7. The long-leaved ſpiked *Speedwell.* 8. The ſmall ſpiked *Speedwell.* 9. The ſmall rock *Speedwell*, with naked ſtalks. 10. The common meadow *Speedwell*, with leaves like ſerpyllum. 11. The ſmooth erect Alpine male *Speedwell*, with lightly indented leaves. 12. The ſmaller Roman ſmooth *Speedwell*, with leaves like the ſmall baſil. 13. The ſmall creeping *Speedwell*, with roundiſh hollowed leaves. 14. Hairy daiſy-leaved Alpine *Speedwell.* 15. The Alpine ſhrub *Speedwell.* 16. The hard ſhrubby *Speedwell*, with a long germander-like leaf. 17. The ſhrubby Alpine *Speedwell*, with a roundiſh ſmall leaf. 18. The ever-green rock *Speedwell.* 19. The Auſtrian *Speedwell*, with finely divided leaves. 20. The greateſt *Speedwell.* 21. The greateſt ſingle-ſtalked not-branched Pyrenean *Speedwell.* 22. The great ſhrubby *Speedwell.* 23. The procumbent *Speedwell*, with the appearance of meadow teucrium. 24. The ſmaller *Speedwell*, with the lower leaves round. 25. The white-flowered ſmall *Speedwell*, with round-bottom leaves. 26. The little narrow-leaved branched procumbent *Speedwell.* 27. The many-ſtalked *Speedwell.* 28. The leaſt mountain erect, ſquare-ſtalked *Speedwell.* 29. The creeping *Speedwell*, with teucrium leaves. 30. The common *Speedwell*, with flowers growing to the ſtalks. 31. The great round-leaved water *Speedwell.* 32. The ſmaller round-leaved water *Speedwell.* 33. The larger long-leaved water *Speedwell.* 34. The ſmaller long-leaved water-*Speedwell.* 35. The creeping olive-leaved water *Speedwell.* 36. The narrow-leaved water *Speedwell.* 37. The round-leaved Pyrenean *Speedweed.* 38. The ivy-leaved ſpring *Speedwell.* 39. The germander-leaved *Speedwell*, with flowers ſtanding on long ſtalks. 40. The germander-leaved *Speedwell*, with flowers ſtanding on long ſtalks, and with leaves placed alternately on the ſtalks. 41. The common ſpring *Speedwell*, with trifid or quinquifid leaves. 42. The white-flowered annual knot-graſs-leaved *Speedwell.* And 43. The branched upright American ſhrubby *Speedwell*, with vervain-like leaves. *Tourn.* Inſt. p. 144.

In the Linnæan ſyſtem of botany, *Veronica* likewiſe makes a diſtinct genus of plants; the characters of which are, that the cup is a perianthium, divided into four ſegments, and remaining after the flower is fallen. Its ſeveral ſegments are narrow and pointed. The flower conſiſts of a ſingle petal, in form of a cylindric tube, of the length of the cup, or nearly ſo; flat in poſition, and divided into four ſegments at its extremity, each of an oval ſhape, and the lower the narrower. The ſtamina are two filaments, narroweſt at the bottom, and bending toward the top. The antheræ are oblong. The piſtillum has a compreſſed germen; a thread-like ſtyle, bent, and of the length of the ſtamina; and a ſimple ſtigma. The fruit is a turbinated and heart-faſhioned capſule, flat at the top, containing two cells, with four valves, and full of a great number of roundiſh ſeeds. *Linnæi* Gen. Plant. p. 4.

VERONUS, in zoology, a name given by many to a ſmall river-fiſh, well known in England by the name of the minow. *Ray's* Ichthyogr. p. 268. See the article PHOXINUS.

VERSIO *Chemica*, a term uſed by chemical writers to expreſs a change, wrought by their art, of manifeſt forms into occult ones, which, they ſay, is done by a corruption of the ſpecific form, and the generation of a more general one; that is, by a converſion of decompounded elements into compound bodies, and of impure into ſuch as are perfectly pure. Theatr. Chem. vol. 1.

VERTEBRÆ (*Cycl.*)—Anatomiſts, in the deſcription of theſe bones, divide them into the body, apophyſes, and cavities.

The body of the *Vertebræ* is that principal part or large maſs, ſituated anteriorly, and ſupporting all the other parts. In moſt of the *Vertebræ* the body repreſents a portion of a cylinder cut tranſverſely, the circumference of which is more or leſs round on the fore-part, and ſloped on the back-part. It has two ſides, the upper and lower, each of which is, as it were, bordered by a thin lamina, in form of an epiphyſis.

The apophyſes of moſt of the *Vertebræ* are ſeven in number; one poſterior, called the ſpinal apophyſis, which ends in a ſmall epiphyſis, and has given the name to the whole ſyſtem of the *Vertebræ*; two lateral, called *tranſverſe apophyſes*, and four others, which are likewiſe lateral, two on each ſide; one above, and one below. Theſe are called by the common name of *oblique apophyſes*, and diſtinguiſhed into the ſuperior or aſcending, or inferior or deſcending. Theſe four are the leaſt of all the apophyſes of the *Vertebræ*, and each of them has a cartilaginous ſide. It would be more proper to call them *articular*, inſtead of *oblique apophyſes.*

The cavities in the *Vertebræ* are theſe: A large middle hole between the body and apophyſes; four notches, two on each ſide, one ſuperior and ſmall, the other inferior and large. The great foramen is part of the vertebral or ſpinal canal; and the notches in one *Vertebra* meeting thoſe in another, form the lateral holes which communicate with the canal. The inner ſubſtance of the *Vertebræ* is ſpongy, or like a diploe, covered with an outer compact ſubſtance; which in the body of the *Vertebra* is very thin, but thicker in the proceſſes. The *Vertebræ* are joined together by their bodies, and by their ſmall apophyſes. The bodies, in a natural ſtate, are principally united by a cartilaginous ſymphyſis; that is, by the intervention of a pliable and elaſtic cartilage, as is very manifeſtly ſeen in the freſh bones. This cartilaginous connection makes the lateral holes of the ſpine larger in the body than they appear in the dry ſkeleton, where theſe cartilages are wanting. Their connection, by the ſmall apophyſes, is by arthrodia, and not by ginglimus. And theſe two articulations are ſecured by very ſtrong ligaments. *Winſlow's* Anatomy, p. 54.

The cartilages between the *Vertebræ* of the back yield conſiderably to the preſſure of the body, in an erect poſture, and expand themſelves in the night when perſons lie down. Hence ariſes a very ſingular phænomenon, but a very true one: which is, that a man is conſiderably taller at his riſing in a morning, after the expanſion of theſe cartilages, during the abſence of preſſure for ſeveral hours, than at night, when they have been preſſed down all the day.

The reverend Mr. Waſſe ſeems to have examined this difference more ſtrictly than any other perſon. He found that ſeveral perſons, enliſted as ſoldiers in a morning, had been diſcharged for want of height, on their being meaſured again

before the officers in the evening; and on this occaſion meaſured ſeveral other people, and found the difference in many caſes to be not leſs than an inch. This gentleman obſerved in himſelf, that fixing a bar of iron where he juſt reached it with his head on getting firſt out of bed in the morning, he could loſe near half an inch in an hour, or leſs, if he employed that time in rolling his garden, or any other exerciſe of that laborious kind. He obſerved alſo, that riding often took off the height very ſuddenly; and what was more particular, that in ſitting cloſe to ſtudy for five or ſix hours without any motion, he loſt often a whole inch in height. People who uſe hard labour, ſink rather leſs in the whole, than thoſe of ſedentary lives; and the height once loſt, is never to be recovered that day, not even by the uſe of the cold bath; but a night's lying down alone can reſtore it. Philoſ. Tranſ. N°. 383. p. 87.

This difference in height takes place only in the human ſpecies, as we are the only creatures who walk erect, and throw the preſſure of our whole weight upon the back-bone. This gentleman meaſured horſes before and after riding, and could find no difference, even after the longeſt journeys.

The alteration in height, is much greater in young people, than in thoſe who are more aged. It is evident from this change happening to perſons when they ſit, as well as when they ſtand, that it is brought about merely by the back-bone; and we muſt admire the ſtructure of that part of the body, which owes its giving way thus, to its being formed together in that manner which alone could ſuit it to the ſeveral purpoſes it was intended for. The thickneſs and ſhortneſs of the bones, with the intervening cartilages, aſſiſted by the bony proceſſes, diſpoſe it to a motion peculiar to itſelf; whereas, had the bones been of any conſiderable length, upon bending the body, the articulations muſt have made a large angle upon their inmoſt edges, and the ſpinal marrow would have been continually liable to be injured; and had the cartilages been intirely wanting, it would have been as uſeleſs as if it were but one bone, whereby the trunk of the body being rendred incapable of bending, muſt have remained for ever in an erect poſture. Another particular, which beſpeaks the utmoſt wiſdom and deſign in the contrivance of this part is, the remarkable difference there is in the cartilages placed betwixt the ſeveral bones of the ſpine.

The *Vertebræ* of the back require but little motion, and the cartilages there are for that reaſon ſmall and thin, in compariſon with thoſe of the loins, which being very thick, the loweſt more eſpecially, the motion is much greater there, and much better to be borne. This being the ſtate and diſpoſition of the parts, during the whole ſpace of time in which we are uſually employed about our ſeveral buſineſſes, till the time that we diſpoſe ourſelves to reſt, the cartilages of the ſpine, will, by their compreſſible and yielding properties, become more cloſe and compact from the preſſure they ſuſtain, and conſequently the ſpine, which is the only ſupport of the trunk of the body, will become ſhorter; but when this ſuperior weight ſhall be intirely removed, by placing the body in an horizontal poſture, as it always is when we are in bed, the compreſſed cartilages will, by their natural elaſtic power, begin gradually to enlarge themſelves, till they, by degrees, recover the expanded ſtate they had before they gave way.

The cartilages between the ſeveral *Vertebræ*, are twenty-four in number, and every one of theſe is preſſed ſomewhat in our daily employments, ſo that when they all come to expand, the aggregate of their ſeveral expanſions cannot be ſuppoſed leſs than about an inch. Now, if this be the difference occaſioned by the preſſure of the common weight of the body alone upon itſelf, it muſt neceſſarily be much greater in thoſe perſons whoſe conſtant employment it is to carry heavy burdens. The compreſſion and expanſion of the cartilages in older people being leſs than in younger, is a neceſſary conſequence of the cartilages in time of age growing harder, and leſs capable of compreſſion; for they often grow almoſt bony in length of time; and hence it is, that old people are obſerved to loſe ſomewhat of their former height, the cartilages in them ſhrinking to a ſomewhat ſmaller compaſs as they grow bony; and this ſhortening is therefore not imaginary, as many have believed, but real, and owing to this plain cauſe. Phil. Tranſ. N°. 383. p. 90.

VERTEBRÆ *fractured.* When any of the *Vertebræ* are fractured without hurting the ſpinal marrow, we may reaſonably ſuppoſe, that the fracture is confined to ſome of the oblique, or ſpinal proceſſes, and therefore the patient will be in no great danger; but when the body of the *Vertebra* is either broke or ſplit, and the contiguous ſpinal marrow bruiſed or compreſſed; all parts of the limbs and viſcera beneath that *Vetebra* become immoveable and rigid, and death often follows. Laſtly, if the tranſverſe proceſſes of the *Vertebræ* are broken, which incline toward the cavity of the thorax, it is ſcarce poſſible, that the heads of the ribs which are connected there, ſhould eſcape being fractured alſo, which makes the caſe very deplorable. When only the proceſſes of the *Vertebræ* are broken, it will be the beſt way to reduce the bones into their places with the fingers, placing narrow compreſſes dipped in warm ſpirit of wine on each ſide the *Vertebræ*, and over them thick pieces of paſtboard, to be kept on by the proper bandages; for by this means the bones of the *Vertebræ*, which are very ſoft and ſpungy, will very quickly and eaſily grow together again.

If in theſe fractures the ſpinal marrow be divided, death is generally an inevitable conſequence; all that the ſurgeon can attempt in this caſe, is to lay bare the fractured *Vertebra* with the ſcalpel, and replace, or elſe remove, ſuch fragments as injured the ſpinal marrow; and the wound muſt be afterwards gently cleanſed, and treated with the vulnerary balſams, to be kept on with the napkin and ſcapulary bandage, till either the wounds ſhall be terminated by a perfect cure, or by death. *Heiſter*'s Surgery, p. 125.

VERTEBRÆ *luxated.* The luxations which happen to the ſpine, and *Vertebræ* of the back, are generally imperfect ones; for it appears from an accurate conſideration of the ſtructure, and articulations of theſe bones, that none of the *Vertebræ* can be intirely diſplaced without being fractured, and alſo compreſſing and wounding the ſpinal marrow, which muſt produce danger of inſtant death. Even the imperfect luxations of theſe bones are very dangerous; which happen either between the two ſuperior *Vertebræ* of the head and neck, or between the reſt of the *Vertebræ*, when they are forced from each other. Such as have a luxation between the head and upper *Vertebra*, ſeldom eſcape being carried off by a ſudden death; for by this means, the tender medulla, which joins immediately with the brain, and is lodged in the ſpine, the brain itſelf, and the nerves which ariſe from beneath the occiput, are too much diſtended, compreſſed, or lacerated. The two condyloide proceſſes of the occiput uſually ſlide out of their glenoide ſinuſſes in the firſt *Vertebra* of the neck, when a perſon falls headlong from an high place, or from on horſeback, or when he receives a violent blow upon the neck. People die uſually very ſuddenly by this accident, and are uſually ſaid to have broke their necks, though there is really no more than a bare luxation; though it does really ſometimes happen, that the *Vertebræ* of the neck are broken. If life ſhould remain after ſuch an accident, which very rarely happens, the head muſt neceſſarily be diſtorted, commonly with the chin cloſe down to the breaſt, ſo that the perſon can neither ſwallow, ſpeak, or move any part that is below the neck; therefore, if ſpeedy aſſiſtance is not had, death enſues, from the compreſſure, or hurt of the medulla.

In order to reduce this luxation, the patient muſt be laid flat upon the ground, then the ſurgeon kneeling down with his knees againſt the patient's ſhoulders, muſt bring them together, ſo as juſt to contain the patient's neck between them; this done, he is quickly to lay hold of the patient's head with both his hands, and ſtrongly pulling and extending it, he muſt gently move it from one ſide to another, till he finds by a noiſe, the natural poſture of the neck, and a remiſſion of the ſymptoms, that the diſlocation is properly reduced.

The imperfect luxations of the *Vertebræ* of the back, are no more than their two upper or lower proceſſes being diſplaced, and that often but on one ſide: this happens ſometimes to only one of the ſpinal *Vertebræ*, ſometimes to more. Theſe luxations are generally very difficult to reduce; the beſt method of doing it is thus: When the apophyſes of the *Vertebræ* are diſlocated on both ſides, the patient is to be laid leaning on his belly over a caſk, drum, or ſome other gibbous body; and then two aſſiſtants are ſtrongly to preſs down both the ends of the luxated ſpine on each ſide; by this means the bones of the ſpine will be ſet free from each other, lifted, or puſhed up in form of an arch, and ſo gradually extended: this done, the ſurgeon puſhes down the luxated *Vertebræ*, and at the ſame time nimbly puſhes the ſuperior part of the body upwards, and by this means the luxated bones are ſometimes happily reduced into their places; if ſucceſs does not attend the firſt attempt in this way, the operation is to be repeated. When the *Vertebra* comes out on one ſide, the patient is to be placed inclining in the prone poſture now mentioned; but ſo, that when the left apophyſis is diſplaced, one aſſiſtant may preſs the lower *Vertebræ* inward to the right, and another may depreſs the right humerus, and *vice verſa*: After the *Vertebræ* are reduced, the part is to be bathed with ſpirit of wine camphorated, or to have compreſſes dipped in the ſame ſpirit laid on it, and the napkin and ſcapulary bandage is to be applied. *Heiſter*'s Surg. p. 153.

VERTEBRÆ *of fiſhes.*—The *Vertebræ* of fiſhes are extremely different in ſhape in the ſeveral kinds, and even vary in number in the different ſpecies of the ſame genus. The anterior *Vertebræ* in ſome have three apophyſes, as in the cyprini, eſoces, pleuronecti, &c. and in the clupeæ they have no leſs than ſeven of theſe apophyſes, but they are ſlender and capillary. *Artedi* Ichthyol.

VERTIBULUM, a word uſed by ſome writers to expreſs the round head of a bone, which, in its articulation, is inſerted into the ſinus, or cavity of another bone.

VERTUMNALIA, among the Romans, a feſtival celebrated in honour of the god Vertumnus in the month of October. *Pitiſc.* in voc.

VERU, a comet, according to ſome writers, reſembling a ſpit, being nearly the ſame kind as the lonchites, only its head is rounder, and its train longer and ſharper pointed.

VERVA, a word uſed by ſome authors to expreſs an ivory amulet to be worn for the epilepſy.

VERVAIN, *Verbena*, in botany, the name of a genus of plants; the characters of which are these: The flower consists of one leaf, and is of the labiated kind. The upper lip is erect, and divided into two segments, the lower into three; and these are so disposed, that at first sight the flower has not at all the appearance of a labiated one, but seems only divided into five segments. The pistil arises from the cup, and is fixed in the manner of a nail to the lower part of the flower. It is surrounded by four embryos, which afterwards become four slender oblong seeds, which ripen in the cup, and fill it almost wholly up. To these marks it may be added, that the flowers of the *Vervains* grow in spikes, or sometimes in short heads, but never verticillately.

The species of *Vervain*, enumerated by Mr. *Tournefort*, are these: 1. The common *Vervain*. 2. The common *Vervain* with white flowers. 3. The taller broad-leaved Portugal *Vervain*. 4. The fine leaved *Vervain*. 5. The nettle-leaved *Vervain* of Canada. 6. The nettle-leaved *Vervain*, with jagged leaves, and larger flowers. 7. The narrow-leav'd nettle *Vervain*, of America, with blue flowers, and branched spikes. 8. The very narrow-leaved nettle *Vervain* of America, with numerous spikes and purple flowers. *Tournef.* Inst. p. 200.

Vervain was used among the Antients at their sacrifices, and was thought to contain something divine. The Romans, in the beginning of the year, made a present of this herb to their friends. *Danet.* in voc.

VERVISE, in our statutes, is used for a kind of cloth, Stat. 1 R. 3. cap. 8. *Blount*, *Cowel*. See the article PLONKETS.

VERULCA, the same as *Verva*, a name for an amulet of ivory worn on the arm as a cure for the epilepsy. *Scribonius Largus*.

VERZELLINO, in zoology, the name of a bird common in Italy, and kept in cages for its singing, called by authors *citrinella*, and *thraupis*. See the article CITRINELLA.

VESICARIA, a name given by Rivinus to a genus of plants, the same with the *corindum* of Tournefort. *Rivinus*, 4. 144. See the article CORINDUM.

VESICULÆ *seminales*. These vessels are very evident in fishes; the females of most fish have double ovaria, though in some they are single, as in the osmerus, and perca fluviatilis of Bellonius; but the *Vesiculæ seminales* in the males are two in number in all fish, not excepting the males of these here mentioned. They differ, however, very much in regard to their figure and situation. As to their situation, they in some fish occupy almost the whole length of the abdomen, as in the spinose kinds in general, and in the petromyzum, accipenser, and many of the other cartilaginous kinds. In some fish, they are placed only in the lower part of the abdomen, as in the cetaceous kinds, *&c.* As to figure, in the generality of fish, they are oblong, and compressed, but in some they are round, as in the cetaceous kinds. The other parts of generation are wanting in most fish. *Artedi* Ichthyolog. See the article TESTES.

VESP, or WASP, *Vespa*, in the history of insects. See the article WASP.

VESP-*Ichneumon*. Of this insect, Mr. Ray mentions a great number of species; the greater part of which are common on the sides of mud banks in the borders of fields. These have all slender bodies, and are armed with stings.

The origin of this creature is very strange; it is usually found issuing from the body of the common cabbage caterpillar. The occasion of which is this: The parent fly strikes her tail through the skin of the back of this caterpillar, and deposits her eggs in the creature's flesh. The eggs hatch into small maggots of the carnivorous kind; and these prey upon the flesh of the caterpillar till they arrive at their full growth: the creature that supports them, keeping itself alive all this time by the vast quantities of nourishment it is continually taking in. At length, when these worms are arrived at their full growth, they spin themselves a webb, under which they change into chrysales, and soon after come out in form of the fly that laid the egg. This is not peculiar to this single species of fly; but many are educated thus in the bodies of caterpillars of several kinds: some of these spin their webs under the skin of the caterpillar, and eat their way through it, when arrived at their perfect state; but others crawl out while yet in their worm state, after having eaten their full time, and bury themselves under ground in order to spin their webs.

The species are these: 1. The red-tailed *Ichneumon*, with long wings spotted with black. 2. The black-tail'd *Ichneumon*, with a long and slender body, variegated with annular marks of red and black. 3. The black *Ichneumon*, with three hairs at its tail; the body of this species is intirely black, without the least variation. 4. The black *Ichneumon*, with a white circle on the legs, and on the antennæ. 5. The *Ichneumon* with a thick breast, and a body beginning by a slender filament, and terminating in a thick tail. 6. The great large winged *Ichneumon*, with a yellow body, and large yellow spots on the wings. 7. The smaller large-wing'd *Ichneumon*, with black wings, and a black body and tail. 8. The red-leg'd *Ichneumon*, with a body red at the beginning, and a white large spot upon the back. 9. The large *Ichneumon*, with a black head, breast, and legs, a red body, and black tail. 10. The flat-body'd *Ichneumon*, with a black back, and greenish white belly. 11. The slender body'd *Ichneumon*, brown on the back, with one yellow transverse line, and yellowish on the belly. 12. The small three-haired *Ichneumon*, with long antennæ.

13. The small black *Ichneumon*, with a white cross upon its back. 14. The reflex horned *Ichneumon*, with its anterior feet clypeated. 15. The black body'd *Ichneumon*, with two broad circles of yellow on the middle of the back. 16. The black body'd *Ichneumon*, with a white tail, and a white triangular spot on the shoulders. 17. The long bodied *Ichneumon*, with a yellow body and black tail: this is an inch and quarter in length, and is a very beautiful species. 18. The large caterpillar *Ichneumon*, with the anterior half of the body of a bright orange colour, and the other half black. This is produced in the body of another species of caterpillar. 19. The black *Ichneumon*, with orange coloured legs. 20. The small *Ichneumon*, with yellow legs, and a yellow back, and three hairs at the tail. 21. The small *Ichneumon*, with three hairs at its tail, with shining wings. 22. The black *Ichneumon*, with several narrow yellow circles on the hinder part of the body. 23. The black breasted *Ichneumon*, with the anterior part of the body yellow, and the hinder part black. 24. The caterpillar *Ichneumon*, with no hairs at the tail, and with very long horns. 25. The long-bodied caterpillar *Ichneumon*, with only one hair at the tail: these are produced of worms lodged in the bodies of different kinds of caterpillars. 26. The black and yellow *Ichneumon*, with purple wings. 27. The slender bodied *Ichneumon*, with purple wings. 28. The orange-coloured *Ichneumon*. The whole body in this species, is of a reddish yellow, with no spot, or variegation in it. 29. The black bodied *Ichneumon*, with red legs, and shining wings; each marked with one spot. 30. The variegated leg'd *Ichneumon*, with a white circle on each antenna. The legs of this species are partly black, and partly red. 31. The large *Ichneumon*, with a yellow body and black tail: and, 32. The inky wing'd *Ichneumon*. *Ray*'s Hist. of Insects, p. 254, *& seq.*

VESPERTILIO, the *bat*. In the Linnæan system of zoology, this animal makes a distinct genus; but that not as a bird, as the vulgar esteem it, but as one of the quadruped class. The characters of the genus are these: That the creature is viviparous, whereas all the birds are oviparous: that it has two paps: its feet have five toes on each; and the four feet are expanded into a sort of wings. Under this class, the author takes in the canis volans, and glis volans; the flying dog and flying dormouse, as they are called by other authors. *Linnæi* System. Nat. p. 37.

Bontius describes a very strange kind of *Vespertilio*, or bat, as he calls it, found in the East-Indies; and Piso, who has thoroughly considered the subject, doubts much, whether it can properly be referred to the bat kind or not. Indeed, it seems more properly to belong to the class of the flying squirrel. *Bontius* calls it the *Verspertilio admirabilis*, and describes it as being of the size of a cat, and of a fleshy body; and says, that it flies by means of membranes annexed to the sides of its body, and to its fore-legs; and that it can expand these to a vast compass. From all this it appears to be of the squirrel kind; but he adds, that they fly in flocks, like our wild geese, which seems very improbable; and it seems rather, that the creature was intended only for long leaps. If Scaliger had known this animal, it would be very natural to believe he meant it under the name of the *felis volans*, or flying cat; which is generally supposed another name only for the common flying squirrel.

VESPERTILIO, in conchyliology, the name of an elegant species of voluta, supposed to have some resemblance to the colour of a bat. See the article VOLUTA.

VESPIVORUS *buteo*, in zoology, a name given by some authors to the bird, called in English, the honey-buzzard, from its feeding its young with the maggot worms out of honey-combs. *Willughby*'s Ornithol. p. 39. See the article APIVORUS *Buteo*.

VESSEL (*Cycl.*)—*Extraordinary* VESSELS, in anatomy. It is not uncommon to meet in the bodies of dissected persons remarkable variations from the common course of nature in the structure of the body; and among these, sometimes duplicates of parts naturally single: thus Kerkring mentions a double *vena cava*, and a treble ductus thoracicus in different bodies, as also four spermatic arteries in one body, with no spermatic veins: there are accounts also of defects of parts usually judged essential; but it is to be observed, that the ends of nature being much more easily answered by the excess, than by the defect of parts, the accidents of excess are greatly more common than those of defect. *Kerkring*'s Spicil. Anat.

Chemical VESSELS. See the Appendix.

VESSIGON, in the manege, a wind-gall, or soft swelling, on the in and outside of a horse's hough, that is, both on the right and left of it.

VETCH, *Vicia*, in botany. See the article VICIA.

Horse-shoe VETCH. See the article FERRUM *equinum*.

Bitter VETCH, in botany. See the article AROBUS.

VETO, in Roman antiquity, was the solemn word used by the tribunes of the people, when they inhibited any decree of the senate, or law proposed to the people, or any act of other magistrates. *Liv.* 6. 37. *Middlet.* of Rom. Sen. p. 160. See the article INTERCESSION.

VETOLA, in zoology, a name used by the Venetians, and from them by many others for a water-bird of the godwit kind,

kind, called by Aldrovand, the *Totano*, and by Geſner, the *Fedoa ſecunda*.

It uſually weighs about nine ounces; its beak is ſhaped like that of the woodcock, and is red all over, except at the end, where it is blackiſh; its neck is grey; its belly and breaſt white; its head of a browniſh grey; and its back brown; but its rump has a white ring on it; its tail is compoſed of black and white feathers. *Ray*'s ornitholog. p. 216.

VETTONICA, in botany, the antient way of ſpelling the word *Betonica*, the name of a plant called in Engliſh, *Betony*.

It is called *Vettonica* by Pliny, who ſays, it obtained that name from a people of Italy ſo called, among whoſe woods it grew.

We are far from being certain what plant the antients mean when they preſcribe *Betony*, ſome having applied the name to the ſame plant, which we at this time call by it; others calling the *ſerratula* or ſaw-wort, by this name, and others roſemary.

Dioſcorides mentions only one kind of *Betony*, which he calls *ceſtra* and *pſuchrotropha* in the Greek, and which his tranſlators explain by *Vettonica vel roſmarinus*; and this is countenanced in expreſs words by the author himſelf, in one place, where he ſays the plant *ceſtra* is called *pſuchrotropha*, from its being produced in damp places; and that the Romans called it *Betonica*, or *roſmarinus*.

This ſeems abſolutely confounding the two plants *roſemary* and *Betony*.

The *Betony*, ſaw-wort, and roſemary, of the preſent times, are three very different plants; and we are therefore not to cenſure the antients, if any one of them wants the virtues they aſcribed to *Betony*, but to try them all round.

However, if any thing certainly can be judged of the *betonica* of the antients, it is, that it was our *ſerratula*. See the article SERRATULA.

VEXILLARII, among the Romans, were veteran ſoldiers, the ſame with thoſe the old Romans called *triarii*. There were ſix hundred of them in every legion. See the article TRIARII, *Cycl.*

VIATORES, among the Romans, officers whoſe buſineſs it was to go into the country, and acquaint the ſenators of the extraordinary days on which they were to meet. See Mem. de l'Acad. vol. 1. p. 405.

VIBA, VUBA, or VABA, names by which ſome botanical authors call the common ſugar-cane. *Piſo*, p. 119. *Marggrave*, p. 82.

VIBEX, (*Cycl.*) a word uſed by ſome to expreſs a black mark upon the ſkin, from a bruiſe.

VIBRANT, or VIBRION, in natural hiſtory, the name of a claſs of flies, commonly known by the name of the *ichneumons*.

The word is derived from the Latin *vibro*, to ſhake or quiver, and is applied to theſe flies, from the continual vibrating motion obſerved in their antennæ.

VIBRISSÆ, a word uſed by medical writers to expreſs the hairs in the noſtrils.

VIBURNUM, in botany, the name of a genus of trees, the characters of which are theſe: The flower conſiſts of only one leaf, and is of the rotated kind, and divided into ſeveral ſegments at the edges. The center of this flower is perforated by the pointal of the cup, which finally becomes a roundiſh, ſoft and juicy berry, containing a hard ſtriated ſeed, of a flattiſh figure.

There is only one ſpecies of this tree, which is the common *Viburnum*. *Tourn.* Inſt. p. 607.

VIBURNUM *Galls*, in natural hiſtory, the name of a ſpecies of galls, or ſmall protuberances, frequently found on the leaves of the *Viburnum*. Theſe are of a very ſingular nature, and ſeem to be compoſed of a different ſubſtance from that of the leaf. They appear in form of brown circular ſpots, of which there are ſometimes forty or more on one leaf. Theſe are about a fifteenth of an inch in diameter, and they riſe a little above the ſurface of the leaf, as well on the under as the upper ſide; each of theſe has alſo a ſmall prominence in the center, on each ſide of the leaf, looking like a nipple ſtanding on the breaſt.

Theſe are found in great plenty in the months of June, July, and Auguſt, and, when opened, each contains one inſect, which is a ſmall worm of a white colour, with ſix legs, and two hooks of a brown colour at the head. The manner of watching the changes of this inſect is this: Place ſeveral of the leaves of this ſhrub, with their pedicles, in a veſſel of water; ſet this upon a ſheet of white paper, on a ſmooth table, and cover it with a box, the edges of which muſt touch the paper every where; by this means the leaves will be kept freſh, ſo long as is neceſſary for the feeding of the animal in the galls; and this, after its proper changes, eſcaping out of the galls, muſt be found within the outer box. Mr. Reaumur tried this method with ſucceſs, and found that theſe worms became, in fine, a very ſmall ſpecies of beetle, ſeveral of which he found crawling upon the paper. They were of a cinnamon colour, and had conic and granulated antennæ of a beautiful figure. *Reaumur*'s Hiſt. Inſ. vol. 6. p. 209.

VICARDI, the name of an office in the iſland of Candia.

The word is probably a corruption of the Latin *vicarii*. The *Vicardi* is the governor of a village, and is ſometimes the pariſh-prieſt; his office is to levy the public taxes, and to ſend offenders to the cadic. This office is always appointed yearly. *Pocock*'s Egypt, vol. 2. p. 2. p. 12.

VICARIO *Deliberando occaſione cujuſdam recognitionis*, &c. An antient writ that lies for a ſpiritual perſon impriſoned. Reg. Orig. 147. *Blount*, *Cowel.*

VICES, a term uſed by the dealers in horſes to expreſs certain faulty habits or cuſtoms in that creature, which render him troubleſome to the rider, and are never to be worn off, but by attention to the regular methods.

The following are the tricks generally underſtood as *Vices* by dealers, and their methods of preventing, correcting, and curing them.

1. If a horſe carry his head or neck awry, ſtrike him twice or thrice with the ſpur on the contrary ſide; but if he be very ſtiff-necked on the right ſide, and very plying or bending on the left, the rider is to hold the right rein ſhorter than the other, and give him ſudden checks every time he inclines that way, having a ſharp wire faſtened in the reins, that ſtriking in his neck, he may be compelled to hold it ſtrait; but in this care muſt be always taken to check him upwards, for otherwiſe he will get a habit of ducking his head, which will prove very troubleſome.

2. If a horſe is apt to ſhake his head and ears, upon the leaſt occaſion, or move his ears, when he is going to kick or bite, or caſt his rider; the way of curing this, is to ſtrike him on the head with a wand, as ſoon as he ſhews the firſt attempt to it; and, at the inſtant of ſtriking him, he is to be checked with the bridle, and be ſtruck with the ſpur on the contrary ſide; this will put him out of his pace, and he is then to be ſtopped, that he may have leiſure to underſtand the rider's meaning. Every time that he ſtarts or winches, which are ſignals that he is going to bite, or to ſtrike with his heels, the ſame is to be done, and he will, by degrees, be broke of theſe habits.

3. If a horſe is ſubject to ducking down his head frequently, the rider muſt, every time he is guilty of it, check him ſuddenly with the bridle, and at the ſame time ſtrike him with the ſpurs, in order to make him ſenſible of his fault. If he be ſtanding, he is thus to be made to bring his head in the right place as he ſtands; and when he does ſo, he is to be cheriſhed, that he may underſtand the rider's meaning, which, in time, he will certainly do.

4. If a horſe be ſkittiſh, and apt to ſtart, ſo that the rider is never free from danger, while on his back, the cauſe of the malady is firſt to be carefully enquired into: If it be found to proceed from a weak ſight, which repreſents objects to him other than they really are; the method of curing him is, every time he does it, to give him leiſure to view the things, and ſee what they really are; he muſt have time to view them well, and then be rid gently up to them. If, on the contrary, his ſkittiſhneſs depends on his being naturally fearful, and alarmed at every noiſe, he is to be cured of it by the inuring him to loud noiſes of many kinds, as firing of guns, drums, trumpets, and the like; and he will, in time, come to take delight in what he was before afraid of.

5. If a horſe be reſtive, and refuſe to go forward, the rider is to pull him backwards, and this will often occaſion his going forward; this is uſing his own fault, as a means of reclaiming him. The rider is firſt cautiouſly to find whether this *Vice* proceeds from real ſtubbornneſs, or from faintneſs; if from the latter, there is no remedy but reſt; but if actual ſtubbornneſs be the fault, the whip and ſpur, well employed, and perſiſted in, will, at length, be found a certain cure.

6. If a horſe rear up an end; that is, if he riſes ſo high before as to endanger his coming over the rider, the horſeman muſt give him the bridle, and bear forwards with his whole weight. As he is going down, he ſhould have the ſpur given him very roundly; but this muſt by no means be done as he is riſing, for then it will make him riſe higher, and, probably, come over.

7. If a horſe be ſubject to lie down in the water, or upon the ground, there is no better remedy than a pair of ſharp ſpurs reſolutely applied. But there is ſome caution to be uſed in the applying them, for bad horſemen generally are the occaſion of the faults in horſes, by correcting them out of due time. The proper moment of ſpurring is juſt when he is going to lie down; but when this has diverted him from the thought of it, he is not immediately to be ſpurred again. For the doing this frightens the creature, and puts him into confuſion to that degree, that he at length becomes reſtive, and thus one fault is only changed for another, and that perhaps a worſe.

8. If a horſe be apt to run away, very cautious means muſt be uſed to break him of it. The rider muſt be gentle, both with a ſlack curb, and keeping an eaſy bridle-hand. He is firſt to be walked without ſtopping him; but only ſtaying him, by degrees, with a ſteady, not a violent hand, and always cheriſhing him when he obeys: When he is thus made very manageable in his walk, he is to be put to his trot, and finally to his gallop; and from theſe he is to be brought into a walk again, always by degrees, and ſtaying him with a ſteady hand. By uſing this method from time to time, with

judgment and patience, it is probable he may at length be cured.

9. If a horſe is apt to fly out violently, it is certain, that the more the bridle-rein is pulled, and the more he is hurt by tugging the curb, the faſter he will run: The beſt method is therefore, if there be field-room enough, to let him go, as ſoon as he is going, by ſlackening the bridle, and giving him the ſpur continually and ſharply, till he ſlacken of his own accord. Thus, by degrees, he will find that himſelf is the ſufferer, by all his flights, and he will then leave them off, tho' he could be never broke of them any way elſe.

10. Some horſes will not endure the ſpurs when they are given them, nor ever go forwards; but faſtening themſelves to them, they will ſtrike out and go back; and if they are preſſed more hard, they will fall to piſſing without ever going out of the place. If the horſe who has this *Vice* be a gelding, it will prove very difficult to cure him of it. A ſtone-horſe, or a mare are much eaſier cured; but even theſe will be trying at it again afterwards; and if ever they get the better of their rider, they will not fail to keep it up in this particular.

Every horſe, of whatever kind, that has this fault of cleaving to the ſpurs, as the jockies call it, and not going forwards with them, is to be rejected, in the buying for any gentleman's riding, for it is a ſign of a reſtive nature, and is a fault generally accompanied with many others.

VICIA, *Vetch*, in botany, the name of a large genus of plants, the characters of which are theſe: The flower is of the papilionaceous kind; and the piſtil, which ariſes from the cup, finally becomes a pod, furniſhed with roundiſh or angular ſeeds; to this it is to be added, that the leaves ſtand in pairs on the rib, and that terminates in a tendril.

The ſpecies of *Vetch*, enumerated by Mr. Tournefort are theſe: 1. The common cultivated *Vetch*, with black ſeeds. 2. The common cultivated *Vetch*, or tare with grey ſeeds. 3. The cultivated *Tare*. 4. The great wild buſh *Vetch*. 5. The buſh-*Vetch*, with roundiſh, but pointed leaves, and with black ſeeds. 6. The buſh-*Vetch*, with roundiſh, but pointed leaves, and with ſpotted ſeeds. 7. The buſh-*Vetch*, with narrower-pointed leaves, and a ſmall black ſeed. 8. The many-flowered *Vetch*. 9. The hoary perennial many-flowered *Vetch*. 10. The great-many-flowered *Vetch*, with variegated blue and white flowers. 11. The hairy perennial many-flowered *Vetch*, with pea-like pods. 12. The white-flowered hairy wild *Vetch*. 13. The great early French hairy wild *Vetch*, with red flowers. 14. The buſh *Vetch*, with a roundiſh, ſhort, and blunt-pointed leaf. 15. The corn *Vetch*, with numerous hairy pods. 16. The corn *Vetch*, with ſingle ſmooth pods. 17. The leaſt *Vetch*, with numerous ſmooth pods. 18. The long-leaved *Vetch*, with longer pods. 19. The narrow-leaved violet purple-flowered *Vetch*, with broad ſmooth pods. 20. The many-leaved *Vetch*, with ſmooth pods. 21. The *Vetch* that buries many of its pods under the ground. 22. The leaſt early French *Vetch*. 23. The procumbent *Vetch*, with broad, not ſerrated leaves. 24. The procumbent *Vetch*, with very broad leaves, and with ferrugineous-coloured flowers and fruit. 25. The procumbent *Vetch*, with very broad ſerrated leaves. 26. The largeſt wild *Vetch*, with the appearance of the wild pea. 27. The wild yellow *Vetch*, with a hairy pod. 28. The perennial late-flowering yellow *Vetch*, with hairy pods. 29. The perennial late-flowering yellow *Vetch*, with ſmooth pods. 30. The yellow-flowered *Vetch*, with a brown galea to the flower. *Tourn.* Inſt. p. 397.

VICOMAGISTER, among the Romans, an officer whoſe buſineſs it was to take care of the ſtreets, that nothing might obſtruct, or render them anywiſe incommodious. *Hofm.* Lex. Univ. in voc.

VICTORIATUS, among the Romans, a coin with victory repreſented on one ſide, equal in value to half the *denarius*. See the article DENARIUS, *Cycl.*

VICTORIOLA, in botany, a name uſed by ſome authors for the hippogloſſum, called in Engliſh the *Alexandria-laurel*, *horſe-tongue*, or *double-tongue*. *Ger.* Emac. Ind. 2.

VIDIMARUM, in botany, the name of the tree which bears the ſebeſtens, a medicinal plum, of Aſia and Ægypt. Hort. Mal. vol. 4. p. 77.

VIELLE *ridée*, the *wrinkled old Woman's Shell*, a name given by the French authors to a ſpecies of *chama* of the mutilated kind, very much reſembling the famous *concha veneris*, but longer, and without that peculiarly-ſhaped oval aperture to which that ſhell owes its name.

It has ſeveral ſpines about the lips, as the *concha veneris* has, but they are ſhorter and more obtuſe than in that ſhell. The whole ſurface of this ſpecies is deeply and irregularly wrinkled. It is of a whitiſh colour, variegated with brown.

VIELLEUR, in natural hiſtory, the name of a ſpecies of fly, common in Surinam, and ſome other places. It is moderately large, though leſs ſo than the lanthorn-fly, ſo common in that place, and has a long head, and ſome other particulars, in which it reſembles that creature. Mrs. Merian has given a figure of it, and reports it as the opinion of the natives, that it changes at length into a lanthorn-fly. See the article LANTHORN-*Fly*.

VIGOROSO, or VIGOROS AMENTE, in the Italian muſic, is uſed to direct a performer to ſing or play with vigour, ſtrength, and firmneſs.

VIGESIMA, among the Romans, a tax of the twentieth part of the yearly incomes of all inheritances. It was firſt eſtabliſhed by Auguſtus. *Pitiſc.* Lex. in voc.

VIGESIMA was likewiſe a cuſtom paid for ſlaves ſold, as alſo for one made free. *Pitiſc.* in voc.

VIGESIMARIUS, among the Romans, an officer who had the management of collecting the *vigeſima*. See the article VIGESIMA.

VILLANELLA, in the Italian muſic, a ſort of air or tune to which the peaſants of that country dance. There are ſome of theſe *Villanellas* very agreeable, having ſomething gay and enlivening in them, well adapted to their deſign. The firſt couplet is uſually played plain and ſimple, afterwards come an infinity of variations, diminutions, *&c.*

VILLEIN *Fleeces*, in our Statutes, are bad fleeces of wool, ſhorn from ſcabby ſheep. 31 Ed. 3. c. 8. *Blount*, *Cowel.*

VILLOSE *Stalk*. See the article STALK.

VILTRUM, a word uſed ſometimes alone to expreſs a filtre, inſtead of the word *filtrum*. But *Viltrum* is more commonly joined with the word *philoſophorum*, and then expreſſes the common alembic for diſtillation.

VIMMALA, in natural hiſtory, a name given by the people of the Eaſt Indies to a kind of pyrites, of a braſſy appearance, and of a cubic figure.

They alſo give it in the ſame places to the *pyritæ* in general, when ſmall and of a ſimple internal ſtructure.

VINAGO, in zoology, a name given by ſome authors to the wood-pigeon, from the colour of its breaſt, ſhoulders, and wings, reſembling that of red wine. Its more uſual name among authors is *OEnas*. See the article ŒNAS.

VINDICTA, among the Romans, the prætor's rod or ſwitch, with which he touched a ſlave's head when he was affranchiſed. *Danet.* in voc.

VINCETOXICUM, in botany, a name uſed by many authors for the aſclepias, or ſwallow-wort, from its ſuppoſed virtues as an antedote. See the article ASCLEPIAS.

The people of Stiria and Carinthia are more ſubject than any other nation to ſcrophulous diſeaſes; but nature has provided them alſo with a very ready and ſafe remedy, which is the *Vincetoxicum*, or ſwallow-wort. This grows in vaſt abundance all over theſe countries; and the common people know it as a certain cure for this terrible diſeaſe. It is alſo found of excellent uſe in dropſies; and as it might be cultivated with us, or its roots imported in any quantities, it is wonderful that we do not uſe it.

VINE, (*Cycl.*) *Vitis*, in botany. See the article VITIS.

All the ſorts of *Vines* are propagated either from layers or cuttings. The former is the method uſually practiſed with us, but the latter ſeems much the better.

In order to propagate them by cuttings; theſe muſt be choſen ſuch as are ſtrong and well-ripened ſhoots, of the laſt year's growth, and ſhould be cut from the old *Vine*, juſt below the place where they were produced, taking a knot of the two years wood, which ſhould be pruned ſmooth. The upper part of the ſhoot ſhould then be cut off, ſo as to leave the cutting about ſixteen inches long. Theſe cuttings are to be placed with their lower part in the ground, in a dry place, laying ſome litter about their roots to prevent them from drying. In this place they ſhould remain till the beginning of April, which is the time to plant them. They are then to be taken up and wiped clean, and if they are very dry, they ſhould ſtand with their lower parts in water ſix or eight hours. Then, having prepared the beds for them, they are to be ſet at about ſix foot diſtance from each other, and making their heads ſlant a little toward the wall. The cutting is to be ſo buried in the ground, that only the uppermoſt bud be upon a level with the ſurface; the earth is then to be well cloſed about the plant, and a little mould heaped up over the eye of the bud, to keep it from drying. After this, there is no more trouble neceſſary, but to keep the ground clear from weeds, and to nail up the ſhoot as it grows, to the wall, rubbing off all the ſide-ſhoots.

The Michaelmas following, if the cuttings have produced ſtrong ſhoots, they ſhould be pruned down to two eyes. In the ſpring following the ground is carefully to be dug up about the ſhoots, and the ſtalks to be earthed up to the firſt eye. During the ſummer all the lateral ſhoots muſt be rubbed off as they appear, and only the two from the two eyes which were left, muſt be encouraged; theſe, as they grow, are to be nailed up againſt the wall; and in the middle of July theſe ſhould be ſhortened, by nipping off their tops, and this will greatly ſtrengthen the ſhoot. At the Michaelmas following theſe ſhould be pruned, leaving them each three eyes, if they are ſtrong; but if they are weakly, only two. The next ſummer there will be two ſhoots from each ſhoot of the laſt years wood; but if there ſhould be two from one eye, which is ſometimes the caſe, then the weaker is to be rubbed off. At midſummer the ends of the ſhoots are to be pinched off as before; all the weak lateral ſhoots are to be diſplaced, as in the preceeding ſummer, and the whole management is to be the ſame. This is all the culture neceſſary to young *Vines*.

As to the management of grown *Vines*, it is to be obſerved that theſe rarely produce any bearing ſhoots, from wood that is more than one year old; the great care muſt therefore be always to have plenty of this wood in every part of the tree.

The bearing ſhoots for the following year ſhould be left at the pruning with four eyes each. The under one of theſe does not bear, and conſequently there are only three which do. Many leave more eyes on the ſhoots, that they may have more fruit, which is the conſequence; but then the fruit is much poorer; and this is ſo well known in the wine countries, that there are laws to direct that no more than ſuch a number of eyes are to be left on each ſhoot, for the grapes would elſe be of a poor juice, and deſtroy the reputation of their wine. Each of the three eyes left, will produce two or three bunches; ſo that each ſhoot will give ſix or nine bunches, which is as much as it can bring to any perfection. Theſe ſhoots muſt be laid in at about eighteen inches aſunder on the wall; for if they are cloſer, when the ſide-ſhoots are produced, there will be no room to train them in upon the wall; and the largeneſs of the leaves of the *Vine* requires alſo that the ſhoots ſhould be at a proportionable diſtance.

The beſt ſeaſon for pruning *Vines* is the end of September, or beginning of October. The cut is always to be made juſt above the eye, and ſloped backward from it, that if it bleed, the juice may not run upon the bud; and where there is an opportunity of cutting down ſome young ſhoots to two eyes, to produce vigorous ſhoots for the next year's bearing, it ſhould always be done. In May, when the *Vines* are ſhooting, they ſhould be looked over, and all the ſhoots from the old wood ſhould be rubbed off, as alſo the weaker, whenever there are two produced from one eye. During the month of May the branches muſt be nailed up againſt the wall as they ſhoot, and toward the latter end of this month, the ends of the bearing branches ſhould be nipped off, which will greatly ſtrengthen the fruit. Thoſe, however, which are to bear the next year, ſhould not be ſtopped before the beginning of July.

When the fruit is all gathered, the *Vines* ſhould be pruned, whereby the litter of their leaves is all removed at once, and the fruit will be forwarder for this the ſucceeding year. *Miller*'s Gardener's Dict.

The *Vine* is one of the trees moſt liable to be injured by froſts with us; its trunk is often ſplit in froſty weather, and that moſt frequently when it ſtands in the warmeſt aſpects. In the year 1683, the great froſt ſplit almoſt all our timber-trees; but this was owing to defects in them, by which the ſap was detained in very large quantities in particular places, from their being wind-ſhaken, coltie, or otherwiſe diſtempered; but the *Vines* ſuffered the ſame accident, ſeemingly from another cauſe.

Thoſe *Vines* were moſt ſplit this year, which were expoſed to a ſouth aſpect, and planted againſt the warmeſt walls. The ſun, their uſual friend, now proved their enemy, and daily thawing the ſap in the trunk, it was again frozen every night. This often bending and unbending, ſoftening and hardening the vivid ſpirituous juice of this plant, deſtroyed it; and the ſap, being the ſame year diſordered, and not gradually ſeaſoned, but even ſtopped before Michaelmas-day, and the freſh ſap wholly detained by the ſucceeding froſts from ariſing, the frozen and hard earth alſo denying its juices, even though the veſſels of the plant had been in a condition to receive them; the trunks and branches of the *Vines* were filled only with a thin, watery, and mortified ſap, and this moſt of it extravaſated by the burſting of the veſſels it was frozen in, many of them ſuffered as much as if cut off from the root. Thus periſhed the greater part of the *Vines* expoſed to the ſun's action; while the other, which ſtood in more ſhady places, not having their juices thawed and frozen daily, ſuffered but one change, and often eſcaped. It was alſo obſerved this year, that the red grap-trees eſcaped in general much better than the white, being hardier than they.

Other wall-trees, containing viſcous juices, eſcaped very well, while the *Vines* thus ſuffered, even though expoſed in the ſame manner. Among others, the plums, apricots, peaches, and wall-cherries, had very little damage. It is eaſy to conceive why plants with viſcous juices ſhould ſuffer leſs by froſt, than thoſe with more thin ones; and we ſee that this is the caſe between theſe two ſorts of trees, the plums, *&c.* often exſudating their juices in form of gum-arabic; but the *Vines*, when they throw out any, ſhew that theirs is as thin as common water. The different kinds of trees have, doubtleſs, all their different conſiſtences in their juices; and it may have principally been owing to that diverſity in others, as well as in the plum and *Vine*, that ſome eſcape, while others periſh by froſts. Phil. Tranſ. N°. 165.

VINE *Gallinſect*, an inſect of the *gallinſect* claſs, principally found on the *Vine*, though capable of living on ſome other trees, and ſometimes found on them. It is much of the ſame ſhape, figure, and manner of life with the other animals of this claſs; but differs from them in this; that as they lay their eggs all under their body, and continue abſolutely to cover them, till they are hatched; theſe protrude them from their body, and they are found in prodigious abundance, lodged in a ſort of cottony or ſilky bags all over the ſtalks and branches of the *Vines*; the dead animal is ſometimes found covering them in part; but more frequently they are abſolutely naked, and often are ſo numerous as to appear like thin cobwebs hung one over another all over the *Vine*. See Tab. of Inſects, N°. 32.

Theſe eggs might be eaſily miſtaken for thoſe of ſmall ſpiders; they always hatch well, and come to maturity on the *Vines* they are found on; but if removed to others, they ſeldom come to any thing, which is very ſingular, ſince the *Gallinſects* of almoſt all other trees may be removed and propagated either on the ſame or on different trees. Theſe neſts of eggs, covered with down, and thus lodged on the *Vine*, are of no certain ſhape or form; ſometimes they are convex and roundiſh; but that is not always the caſe, they ſtick to the fingers on touching, and are pulled away in ſmall irregular threads; if theſe are pulled away to any conſiderable diſtance, the eggs come among them; they are oblong, reddiſh, and of ſmooth ſhining ſurfaces, and are amaſſed in vaſt numbers in the center of each of theſe little packets.

The inſect, as it lays theſe eggs, directs them under its body toward its head, and thence downward toward the tail again; they are all arranged like the beads of a necklace, and make long chains or ſtrings, thus directed, and running backward and forward with ſeveral ſinuoſities; and the cottony matter in which they are enveloped, is not like that of ſpiders, produced from certain particular organs appointed for the ſpinning it, but ſweats out, as it were, from every pore of the creature's body; but moſt of all from its ſides; it ſeems to be produced in extremely ſmall and ſhort filaments; but, being of a viſcous nature, will draw out on the touch like glue or warm reſin; and long threads of it are originally formed by the courſe of the chains of eggs before deſcribed, which take it up in their courſe, and form it into numerous threads of their own length, as it goes on.

Theſe *Vine* inſects are of the boat-faſhioned kind; but, beſide theſe, there are ſome other ſpecies which lodge their eggs in a cottony neſt of the ſame kind. The common thorn affords a ſhorter and more convex kind that this does; theſe are a very ſmall ſpecies; others are ſomething larger; but the oak affords a ſort equal in ſize, if not exceeding thoſe of the *Vine*; ſome of theſe are brown, others bluiſh, and others reddiſh; and there are ſome minute differences in their ſhape. *Reaumur*, Hiſt. Inſ. Tom. 4. p. 61.

VINE *Grubs*, in natural hiſtory, a name given by ſome authors to the pucerons, or little inſects, which are uſually of a green colour, and are found often in prodigious numbers, ſticking to the leaves of trees and plants, and to their young ſtalks.

Mr. Reaumur has been very curious in his inveſtigation of the nature of this inſect; but its manner of propagating its ſpecies was never clearly obſerved, till Mr. Bonet diſcovered it.

Reaumur obſerves, that in every family of pucerons, there are ſome that have wings, and ſome that have not; and that, according to the uſual courſe of nature, the winged ones ſhould be males, and the others females; but, on the contrary, that both the winged and the unwinged *Vine-grubs* are females, all being viviparous, and each kind producing a number of living young; ſo that the males of theſe pucerons were never diſcovered, even by that careful obſerver; nor could he ever find out what it was that impregnated the one and the other kind. He leaves us queries on this ſubject, whether there is no copulation among them, and whether they are all hermaphrodites, each having in itſelf the organs of both ſexes, as is the caſe in the river muſcles.

Mr. Bonet, in order to inform himſelf of the proceſs of nature in theſe creatures, brought up one of them in perfect ſolitude from its birth; he had an opportunity of obſerving it in the place where it was kept, and watched it very ſtrickly for many months together. At the end of twelve days this creature, without having had any copulation with a male, began to breed. She produced in the whole ninety-five young ones, all alive, and conſtantly under the eye of the obſerver. This experiment was repeated ſeveral times with the ſame ſucceſs; and, at length, repeated upon the young ones produced in this manner, and they were found to breed at the ſame period, and in the ſame manner with their parent, without having had any copulation with a male, as far as to the fourth generation.

A haſty obſerver would immediately conclude from this, that there was no copulation among the pucerons; but farther enquiry proves, that this is not the caſe; for the ſame obſerver has found a ſpecies of them in which there is copulation; ſo that both the winged and the unwinged kinds are truly females, and the male is a ſmall fly, of a very different ſhape, as is the caſe in regard to many other inſects. This male is the moſt ſalacious creature imaginable, copulating a vaſt many times ſucceſſively, with the ſame, and with different females. As this is the caſe in regard to one ſpecies of this creature, it doubtleſs is ſo alſo in regard to the reſt, though that has not yet been obſerved: And the ſingularity ſeems to be this, that after the male has copulated with the female, ſhe not only becomes prolific, but her young ones are born ready impregnated, as far as to the fourth generation; after which, probably, there is a neceſſity for the copulation with the male again.

There is another very ſingular obſervation alſo in the production of the young pucerons; the females are properly viviparous, and uſually bring forth live young; but they ſometimes produce only a ſort of fœtus's, which are laid in long ſeries one beſide the other, as the caterpillar-eggs are laid by the

the butterfly; and they are left to hatch, as it were afterwards, by the heat of the sun. Philos. Trans. N°. 469.

VINEGAR (*Cycl.*)—It is plain that the original component matter of *Vinegar* is sugar, which, in the art of acetification, seems wholly converted into a fluid tartar, and if the aqueous liquor be separated from *Vinegar*, we find the *Vinegar* is thereby made the stronger, insomuch that if *Vinegar* were to be highly concentrated by congelation, it would become almost solid, or a kind of actual tartar.

Whence the rule is easy, that, in order to make an almost solid *Vinegar*, we should endeavour to dissolve tartar in an aqueous liquor, whence to perfect the art of acetification. The dissolving of tartar largely with sugar or treacle, and the strongest *Vinegar*, by repeated imbibitions, that and a proper management is much to be recommended to the persons concerned in this trade. *Shaw*'s Lectures, p. 205.

It is very well known that a very large quantity of water, or mere insipid phlegm, is contained in *Vinegar*, and that what we call *Vinegar*, would be infinitely stronger, if cleared of that. It is for this reason, that a great quantity of *Vinegar* will saturate but a very small portion of an alkaline salt; and a great deal of this aqueous acid is, for the same reason, required to dissolve a small portion of metal. A pint of the strongest *Vinegar* will scarce dissolve more than two drams of iron, and will not saturate more than the same quantity of pure salt of tartar.

It has been wished by many, that some method could be contrived of concentrating *Vinegar*, so as to give it more strength; this must depend alone on the extracting the aqueous humidity; and this has been attempted several ways. Of all others, however, that succeeds best which we find recommended by Stahl, which is by freezing. This method so far deprives *Vinegar* of its superfluous water, and so far collects its acetous penetrating sharpness, as to render it an extremely powerful menstruum, throwing out five or six parts of phlegm, which scarce tastes at all sour, and having one sixth or one seventh part possessed of all the virtues of the whole. Dr. Shaw assures us, that he has repeated this experiment, and found it to answer perfectly upon the trial.

This condensed *Vinegar*, toward the end of the operation, or in the last congelations, lets fall a white shining powder, which is a tartar that, though dissolved in great quantity in the whole aqueous fluid, could not be retained in this concentrated one. *Stahl* de Condensat. Vini.

The thicker *Vinegar* is, the less fit it proves for distillation, as there is always the greater danger of an empyreuma, or burnt smell, which would spoil the whole process, and as it usually in this case comes over oleaginous. And the purest white salt of tartar, saturated with this distilled *Vinegar*, being afterwards ignited, turns black, and yields a smell extremely like that of crude tartar in the calcination. *Shaw*'s Chemical Essays.

On the other hand, the more the *Vinegar* is diluted immediately before distillation, the less danger there is of burning: And if the thick remaining mass, when the thinner part is distilled from it, be again diluted with water, it may, by a second distillation, be brought to afford an acetous substance; though this latter be by no means comparable to this former volatile part. This Vigani justly suspects to be a thing known but to very few. And even when the *Vinegar* it distilled with the utmost labour and care, it still has this effect in a higher degree, and contains an immense quantity of phlegm, in proportion to its acid salt.

In this case, the method of condensation by freezing is of the utmost service; first of all separating the more aqueous part, and in the next place, that which is somewhat acetous, tho' not comparable to what remains behind; so that, by this means, a most concentrated and subtle spirituous distilled *Vinegar* may be produced, *viz.* by freezing the whole parcel of distilled phlegm and distilled *Vinegar* together, a thing of great moment to the curious in the *chemia sublimior*, and particularly to those who understand Hollandus. And when the *Vinegar* is froze without distillation, by this means you have a noble rob, or a rich concentrated *Vinegar*, freed from its distillating aqueous and useless part. *Vigani*, Medull. Chem.

Vinegar, when applied to sores in animal bodies, stimulates and resists putrefaction. When weak, it also enjoys the virtues of water; when strong, approaches in its effects to those of salts and acid spirits. Med. Ess. Ed. vol. 5. art. 24. See the articles SALT and SPIRIT.

Portable VINEGAR, a name given by the chemists to a sort of *Vinegar*-powder, or *Vinegar* in a dry form. It is a preparation of tartar with *Vinegar*, and is made in this manner: Take white tartar, half a pound; let it be carefully washed, then dried and powdered; infuse this powder in the strongest wine-*Vinegar*, then dry it, and infuse it again, repeating this operation ten times. After this the dry powder is to be kept for use; at any time a sort of extemporaneous *Vinegar* may be made by dissolving a small quantity of this powder in any proper liquor.

Eels in VINEGAR. The common opinion, from the discovery of eels in *Vinegar*, that its sharpness to the taste was occasioned by these animals, occasioned the accurate Lewenhoek to attempt a careful examination of it by the microscope.

Some of the strongest and sharpest *Vinegar*, after having been exposed for some hours to the air, and afterwards examined by the microscope, entertains the sight with a number of corpuscles, called the salts of *Vinegar*, which are acute at both extremities, and have many of them in the middle an oblong figure of a brownish colour, and others were altogether clear, pellucid, and bright as crystal. Others of these particles appeared of an oval figure, and some of the half of such a figure, hollowed like a small boat, or the half of a nut-shell. The more perfect figures, pointed at both ends, and pellucid, are so very minute, that some thousands of them are comprehended in a small drop.

These seem to be what affect the tongue with the acid sharpness, when we taste of *Vinegar*; and it is very probable, that beside these, minute as they are, there are multitudes of others equally pointed, and infinitely smaller than these.

If *Vinegar* be placed in an open glass, and suffered to remain some weeks, the surface of it will be found, on examination with good glasses, to be full of the same figures, double-pointed, and very pellucid; and in these, very often, there may be cavities plainly discovered; but examining the liquor a little deeper down, there are found numbers of minute eels; yet these, though minute, are prodigiously larger than the salt particles, and can never be supposed to be the occasion of the sharpness of *Vinegar* to the taste, by any who rightly consider, since it is not all *Vinegar* that contains them; nay, the much greater part of *Vinegar* is wholly without them, and in winter they all die; yet *Vinegar* is not less sharp at that season, than in the summer.

If *Vinegar* be impregnated with crabs-eyes, or any other alkaline substance, which blunts, and in a great measure destroys its acidity, these double-pointed figures are no longer found in it, on a microscopical inspection; but in their places we find others with an oblong quadrangular base, from which they shoot up into pyramids, and appear like polished diamonds. These are also so very minute, that six thousand of them are computed to be contained in a drop of the liquor, no larger than two corns of barley. And these will be usually found all of the same size, or very nearly so, which is by no means the case with the other salts of *Vinegar* in its natural state.

Mr. Mentzelius was so lucky as to see these undergo their last metamorphosis, and change into small flies: And though this is a single instance, in regard to the microscopical world of animalcules, yet it is highly probable that the whole race of those, whose appearance in medicated fluids we have been so long puzzled to account for, may, like these, be the worm state of some winged aerial insect, and have owed their origin, where we see them, to the eggs of parent flies, too small for our sight. *Reaum.* Hist. Inf. vol. 4. p. 404.

VINNET, in our statutes, is used for a flower or border, which printers use to ornament printed leaves of books. Stat. 14 Car. 2. c. 33. *Blount.*

VINOUS (*Cycl.*)—VINOUS *Liquors.* All sorts of *vinous* and fermented liquors, both before and after the fermentation, consist not of similar, but heterogeneous parts, which are joined together in one certain and determinate order; thus the action of fermentation being a separation and destruction of the former connection of the subject, and transposing its parts anew, there must of necessity have been a kind of firm or durable texture in the subject so disjoined, separated, and new-ranged.

For example: Grapes being laid upon dry straw, in a cold place, will, for some time after they are separated from the vine, preserve that texture, which gives them their saline, unctuous, and slimy sweetness; which the juice also retains after pressing, and becomes a clear and transparent must, without separating itself into parts, but continuing regularly and uniformly mixed, so as to preserve the different matters it consists of, intimately connected among themselves. In this firmly connected state they may be kept many months, if a cask be filled with this juice, and set in a cool place, as we evidently see in stum. *Shaw*'s Essay on concentrating Wines.

Wine, in the precise chemical or philosophical notion of it, is a saline clammy oleaginous matter, diluted with a large proportion of water, whereby 'tis expanded, or set at a distance from itself, while the saline parts are saturated with, and interspersed among the subtile earthy ones that make the slimyness; thus they together imbibe, detain, and hold the grosser parts, beside which there are other oily parts vastly more subtile, which, by means of the highly attenuated saline portion adhering closely to them, remain as much connected with the water as the rest; and these are what we call the spirituous parts; but the connection of them all together is so strong and durable, that they move for a long time as one body, without separating, if carefully preserved. An acquaintance with the true nature, history, and effects of *vinous* fermentation, will fully explain and justify these positions.

If the spirituous part be once separated and drawn away from the wine by distillation, though it were immediately to be returned back to the remaining mass from whence it came, and ever so well shook again with it, the whole by no means retains its former taste, odour, and durability, but turns to a confused turbid mixture, of a different and nauseous taste, and a disagreeable smell; and, on the whole, approaches nearly to

a ſtate of vapidity. The only objection to this general rule, is, that if a new fermentation, or even but a fret be raiſed, when the ſpirit is newly joined to the remainder in the ſtill, the ſpirit may be thus re-inſtated, and the wine rendered perfect. The proceſs is different and uncertain; but a nice management, and a proper intermedium, will bring it about.

If an inflammable ſpirit diſtilled from the ſame, or any other *Wine*, be put to a parcel of *Wine* which is too ſaline, or not ſufficiently ſpirituous, the bare addition, or tumultuous admixture thereof, very far from giving the fine and intimate ſoftneſs of a good *Wine*, will rather manifeſt its own burning acrimony and nidorous flavour to the ſmell and taſte, and will add a nauſeous bitterneſs to the former tartneſs or acidity. This is an obſervation of Stahl's, and is allowed by Dr. Shaw to be true in general; but he obſerves, that, under a nice and proper management, a fine and taſteleſs ſpirit may be prepared and introduced into *Wines*, and will, after a time, become intimately mixed with their other part, and remain abſolutely undiſcoverable to the taſte or ſmell, unleſs by the excellency and the ſtrength it gives. *Stahl*'s Schediaſma de concentrat. Vini. See the article WINES, SPIRIT, &c.

VINUM *Aloeticum Alkalinum*, a form of medicine in the late London Diſpenſatory, intended to ſtand in the place of Helmont's elixir proprietatis: It is prepared in this manner: Take of bay fixed alkaline ſalt eight ounces, aloes, myrrh, and ſaffron, of each an ounce, purified ſal armoniac ſix drams, white wine a quart; infuſe them together without heat for a week, or longer, and then filtre the wine through paper for uſe. *Pemberton*'s London Diſpen. p. 262.

VINUM *chalybeatum*, *Chalybeate Wine*, is thus prepared: Take filings of iron four ounces, cinnamon and mace, of each half an ounce, of Rheniſh *Wine*, two quarts; infuſe a month without heat, often ſhaking the veſſel; then filtre it off for uſe. This is the preſcription of the new London Diſpenſatory, and is vaſtly preferable to that of the former, where only ſaffron was ordered.

This *Wine* is an excellent ſtomachic and aperient; it may be drank a moderate glaſs once or twice a day, or mixed in apozems of the aperient vegetables.

VINUM *Eſſatum*, in chymiſtry, a term uſed by Paracelſus, and ſome others, to expreſs *Wine* concentrated by freezing, after a long and low heat; the method of making it was this: They ſet the *Wine* in horſe-dung three months in a glaſs, hermetically ſealed, and then expoſed it to the froſty air for a month, after which they threw away the ice, and ſaved the unfrozen liquor.

This was their *Vinum Eſſatum*, called alſo eſſence of *Wine*; and ſpirit of *Wine*, and it is in this ſenſe, that Paracelſus ſays, ſpirit of *Wine* is a not-inflammable liquor, a paſſage that very few have underſtood.

Moſt of the antient chemical philoſophers profeſs, that they uſed ſpirit of *Wine* for the diſſolving of gold. We know very well, that what we call ſpirit of *Wine* has no ſuch power; and if we may judge from Rolfink, the emperor Rudolphus employed the *Vinum Eſſatum*, or concentrated *Wine* of Paracelſus, for that purpoſe. *Vigain*, in his *Medulla Chemiæ*, has ſaid a great deal of the virtues of the ſpirit of *Wine*, ſome of which deſerve to be carefully enquired into; the others are evidently idle and imaginary. What Paracelſus delivers on the ſame ſubject, deſerves alſo to be conſidered. *Vigain* Medul. Chem. *Paracelſ.* de Archidoxis.

Stahl, who has written a great deal on the concentration of *Wine* by freezing, concludes his eſſay, by telling us, that he who has this ſecret, by means of a little dry powdry body of turning water into wine, will not perhaps eaſily divulge the capital uſe he may make of ſuch a ſecret.

Dr. Shaw obſerves, that the author of this treatiſe intimates ſomewhat conciſely, but candidly and philoſophically enough, the poſſibility of doing wonders with a thing that is not difficult to be had with us: the myſtery lies in the words, little, dry, and powdery; and Dr. Shaw, tho' he does not perfectly explain himſelf upon the ſubject, ſays, that the body is common, and that England abounds with it; that it is totally and tranſparently ſoluble in water, fermentable, perfectly white, and ſweet as ſugar; the other goes not ſo far as this, nor is it certain that this is his meaning; but if not, it is at leaſt a very remarkable fact, and comes atteſted by a very good hand. Whatever may be the uſes of concentrated *Wine* in chemiſtry, it is plain, that it may be of the greateſt ſervice in the common affairs of life, as it may be eaſy to have it prepared in ſufficient qantities in the *Wine* countries, and imported hither, where a very ſmall portion of it will render the loweſt and worſt of our *Wines* very rich. *Shaw*'s Chem. Eſſay.

VINUM *extemporaneum*, a name given by Dr. Shaw and others, to a ſort of extemporaneous vinous liquor, made without fermentation, from the melaſſes ſpirit, lemons, water, and ſugar, in the following manner: Some good ſound lemons are to be cut into ſlices, rind and all, and put into a quantity of pure and fine melaſſes ſpirit; when they have ſtood in infuſion three or four days, the liquor is to be ſtrained clear off, and filter'd; and having before prepared a very thin ſyrup of the fineſt ſugar diſſolved in ſpring-water; the two liquors are to be mixed together. The proportions of this mixture can only be hit by repeated trials, but when once found, it will be eaſy to continue them; and a vinous liquor will thus be prepared not inferior to many foreign wines.

VINI *Oleum*, *oil of wine*, a very precious liquid, kept as a ſecret in the hands of ſome dealers in ſpirits, and uſed to give the brandy flavour to ſpirits of leſs price. It is certain, that all the ſpirits we uſe take their flavour from the eſſential oil of the ſubſtance they are made from, that of malt is very nauſeous and offenſive, and renders the ſpirit horribly diſagreeable, if not carefully kept back in the diſtillation of it; that of the grape, on the other hand, is extremely agreeable, and is what gives the delicious flavour to French brandy: this therefore is to be carefully brought over among the ſpirit in diſtillation.

This is that *oil of Wine* ſo much celebrated among our diſtillers, and is for their uſe made ſeparate, and is of ſuch effect, that half an ounce of it will determine a pure and clear malt ſpirit to be French brandy, ſo as to ſtand the teſt of the niceſt palate; and all the trials that can be invented, provided the oil and the ſpirit have both been carefully made.

The manner of making the oil is this: They take ſome cakes of dry wine lees, ſuch as are uſed by our hatters, and diſſolving them in ſix or eight times their weight of water, they diſtil the liquor with a ſlow fire, and ſeparate the oil by the ſeparating pot, reſerving for this nice uſe only that which comes over firſt, the oil that follows being coarſer, and more reſinous. To render this buſineſs perfectly ſucceſsful, there muſt be ſeveral things obſerved: 1. The lee muſt be of the right kind, that is, of the ſame nature with the French brandy propoſed to be imitated. 2. The malt ſpirit muſt be extremely pure. 3. The doſe of the oil muſt be very well proportioned: and, 4. The whole muſt be artificially united into one ſimple and homogene liquor. Theſe cautions all regard only the taſte, and beſide theſe, in order to come up to a nice counterfeit, ſeveral other particulars muſt be attended to; ſuch as the colour, proof, tenacity, ſoftneſs, and the like; ſo that, in ſhort, the operation has too much nicety in it to be hit of by every ordinary dealer. When this fine *Oil of wine* is procured, it may be mixed into a quinteſſence, with pure diſtilled alcohol, or the totally inflammable ſpirit of wine, to prevent its growing diſtaſteful, rancid, or reſinous; and thus it may be long preſerved in full poſſeſſion of its flavour and virtues.

The ſtill bottoms, or remaining matter after the diſtillation of this oil, will yield many productions to advantage, particularly tartar, and ſalt of tartar, as alſo an empyreumatic oil, and a volatile ſalt, like that of animals. Some kinds of lees afford all theſe in much greater quantity than others; the lees of canary and mountain wines yield very little of them, and indeed, ſcare any tartar, or fixed ſalt at all; but the white French lees of thoſe thin wines, that afford the ordinary brandies, yield them all very copiouſly, inſomuch, that ſometimes a ſingle hogſhead of dry and cloſe-preſſed lees will afford by this proceſs, three gallons of brandy, forty pounds of clean tartar, a large proportion of empyreumatic oil, and volatile ſalt, beſide full four pounds of good ſalt of tartar. It is not to be expected, however, that every parcel of this lee ſhould yield fully in this proportion. *Shaw*'s Eſſay on Diſtillery.

Chium VINUM. See the article CHIUM *Vinum*.

VIOLA, the *Violet*, in botany, the name of a genus of plants; the characters of which are theſe: The flower is of the polypetalous, anomalous kind, much reſembling the papilionaceous ones. The piſtil ariſes from the cup, and finally becomes a ſeed veſſel, uſually of a trigonal form, which opens in three places when ripe, and contains roundiſh ſeeds.

The ſpecies of *Violet*, enumerated by Mr. *Tournefort*, are theſe: 1, The common purple ſweet-ſcented *Violet*. 2. The ſweet-ſcented garden purple *Violet*, with large leaves. 3. The common wild ſcentleſs *Violet*, with larger and rounder leaves. 4. The common wild ſcentleſs *Violet*, with longer, narrower, and more pointed leaves. 5. The common white *Violet*. 6. The blue flowered *Violet*, with ſmaller flowers, and ſmaller leaves. 7. The double purple *Violet*. 8. The double red *Violet*. 9. The double white *Violet*. 10. The double variegated red and white *Violet*. 11. The greyiſh flowered double *Violet*. 12. The double *Violet*, with very large flowers. 13. The double *Violet*, with very deep purple ſmall flowers. 14. The round-leaved marſh *Violet*. 15. The mountain *Violet*, with leaves divided into many ſegments. 16. The purple alpine *Violet*, with very ſmall leaves. 17. The round-leaved yellow flowered alpine violet. 18. The leſſer round-leaved yellow flowered alpine *Violet*. 19. The dwarf narrow-leaved mountain *Violet*, with ſnow-white ſcentleſs flowers. 20. The purple-tree *Violet*. 21. The tree *Violet*, with blue and white flowers. 22. The yellow-flowered tree *Violet*. 23. The ſweet-ſcented three-coloured mountain *Violet*, or heart's-eaſe. 24. The great flowered yellow mountain *Violet*. 25. The great flowered white mountain *Violet*. 26. The yellow mountain *Violet*, with roundiſh crenated leaves. 27. The blue three coloured mountain *Violet*, with roundiſh crenated leaves. 28. The great flowered blue mountain *Violet*. 29. The yellow mountain *Violet*, with leaves not crenated. 30. The mountain three coloured *Violet*, or panſie, with variegated flowers. 31. The common creeping garden panſie. 32. The creeping garden panſie, with yellow and white flowers. 33. The creeping garden panſie, with white and blue flowers. 34. The

The creeping garden panſie, with purple and yellow flowers. 35. The creeping garden panſie, with plain white flowers. 36. The creeping garden panſie, with *violaceous* velvety flowers, of a deep purple and gold yellow. 37. The creeping garden panſie, with a large blackiſh purple flower. 38. The creeping garden panſie, with a pale velvety flower. 39. The creeping garden panſie, with a gold, yellow, and ſtraw-coloured velvety flower. 40. The two coloured, or white and yellow field *Violet*. 41. The two coloured field *Violet*, with blue and yellow flowers. 42. The two coloured field *Violet*, with blue and white flowers. 43. The field *Vielet*, with wholly yellow flowers. 44. The field *Violet*, with wholly white flowers. 45. The long leaved ſhrubby Spaniſh *Violet*. 46. The American *Violet*, with paſſion-flower leaves. 47. The Teucrium leav'd Pyrenean *Violet*, with a long tail to the flower. 48. The rock *Violet*, with a thick, crenated, leaf, like that of baſil, and a large ſcentleſs flower, of a blue colour with white ſtreaks. 49. The purple ſcentleſs *Violet* without a ſtalk, and with leaves like the panſie, but ſcarce at all ſerrated. 50. The ſmall hairy-branched erect two coloured *Violet*. 51. The ſmalleſt alpine *Violet*, with leaves like *nummularia*. 52. The great hairy cucumber leav'd Virginian *Violet*, with blue flowers. 53. The great hairy cucumber leaved Virginian *Violet*, with yellow flowers. *Tourn.* Inſt. p. 420.

Violet flowers, freſh gathered, are emollient, and gently purgative. They are greatly recommended by authors in fevers, head-achs, pleuriſies, and peripneumonies. A ſyrup of them made in a ſtrong infuſion in water, is the only preparation kept in the ſhops: it is given to children as a gentle evacuant, and ſerves as a teſt to diſtinguiſh acids from alkali's, the former turning it immediately red, and the latter green.

VIOLA, in ichthyography, a name by which ſome authors have called the ſmelt, from its ſweet ſmell, which has been ſuppoſed to reſemble that of the *Violets*. *Willughby*'s Hiſt. Piſc. p. 202. See the article EPERLANUS.

VIOLA *ſerotina*, the *late Violet*, a name given by the antiens to a garden-flower, not properly of the *Violet* kind, but to which we, as well as they, have connected the name *Violet*, though with a diſtinctive epithet, we call it *Viola matronalis*, or dames *Violet*.

Pliny is very expreſs in this diſtinction, but is not ſufficiently attended to in it; and by this means is miſunderſtood in ſome other parts of his works, where he alludes to this flower in his deſcription of the colour called by the Romans *conchylius*, or *conchyliaceus color*; he ſays, that the deepeſt degree of it was that of the flower of the *Viola ſerotina*. The commentators on his works have generally explained this into his ſaying, That the deepeſt colour of this name was a blue purple, like that of the *Violet*; but he only means that it is of a deeper red than the colour of the mallow flower, and with a proportionate mixture of purple, as there is in that flower. See the article CONCHYLIACEUS *color*.

VIOLARIS *Lapis*, in natural hiſtory, a foſſile body, called by the Germans *Violſtein*, and by many authors, *Lapis odore Violarum*, from its having a ſweet ſmell when freſh broken, which has been ſuppoſed to reſemble that of the *Violet*.

The Germans have many ſtones, which have more or leſs of a ſweet ſmell when freſh broken, as they have many which ſtink very ſtrangely; the latter of theſe they call all by the common name of *ſwine-ſtone*, and the former, all by that of *Violet ſtone*. The ſubſtance, however, which poſſeſſes this quality in the higheſt degree of all others, and is therefore moſt proper to be called diſtinctly by this name, is a ſpecies of talc, of the genus of the bractearia, called by Dr. Hill *bractearium niveum lucidiſſimum bracteis undulatis*, or the ſnow-white ſhining bractearium, with undulated ſcales. This is found in maſſes of an extremely rude and irregular ſtructure, but very compact and firm, uſually of a roundiſh, or oblong figure: theſe are of various ſizes, from an inch or two, to a foot in diameter, and are compoſed of almoſt an infinite number of thin extremely beautiful and ſnow-white plates, which are all broad, thin, and flaky, and of various ſizes, and perfectly irregular in ſhape and figure, and are naturally waved, bent, and curled: its ſmell, when broken, is not like that of any of the known perfumes, but is a ſort of mixed one, reſembling that of roſes and *Violets* together: it is very heavy, and will neither give fire with ſteel, nor ferment with acid menſtruums. It is common on the ſhores of rivers in Italy, and in the mountains in Germany. *Hill*'s Hiſt. of Foſſ. p. 83.

VIOLET, *Viola*, in botany. See the article VIOLA.

VIOLONCELLO. See the article VIOLIN, *Cycl.*

VIOLONE. See the article VIOLIN, *Cycl.*

VIPER, *Vipera*, (*Cycl.*) a poiſonous ſpecies of ſerpent, well known in moſt parts of the world.

Its ſize is uſually two foot and a half in length; its upper part is of a duſky colour, with an admixture of a reddiſh tawney; and in the females with a great deal of whitiſhneſs. Along the middle of the back there runs a broad dentated black line, or a long ſeries of conjunct rhomboidal ſpots, reaching from the head to the tail. A little below this, there is on each ſide a ſeries of ſmall black ſpots; and in the lower part of each ſide there runs a continued line, made by a ſeries of white ſpots, which are very ſmall; then another of larger black ones, and next to this another of ſmall white ones; again, the belly is covered with long black ſcales placed tranſverſely.

This ſeems the general diſpoſition of the colours of the *Viper*, but it is by no means fixed and unalterable; for there are *Vipers* whoſe back is wholly black. The belly however ſeems to be black in all, and the tail does not run to more than a fifth part of the length of the body beyond the anus, and is terminated in a very ſharp point. Wormius ſays, the *Viper* feeds on herbs; but this aſſuredly is not its only diet, ſince there are frequently found in its ſtomach, mice, beetles, ſmall birds, and the like; many of which are often found whole: And it is ſurpriſing to conceive how they were ſwallowed, ſince they are often three times as thick as the whole neck of the ſerpent.

The canine teeth of the *Viper* are only two, and thoſe hollow from the apex to the root; and theſe are not poiſonous in themſelves, but ſerve to make the wound by means of which the poiſon they contain is mingled with the blood. This poiſon ſeems to be a matter ſecreted like ſaliva, by peculiar glands placed in the bags at the roots of theſe dog-teeth. *Ray*'s Syn. Quad. & Serp. p. 285.

By Mr. Boyle's experiments made upon *Vipers in vacuo*, it appeared, that on the withdrawing the air from the veſſel where the *Viper* was put, ſhe began to ſwell, and after ſome time ſhe opened her mouth very wide, and frequently; but on continuing two hours and a half in the receiver, ſhe did not appear to be quite dead. The gaping of the jaws was attended with a loſs of the ſwelling, obſerved at firſt in her whole body; but after every time cloſing them ſhe ſwelled again, and thus became lank and plump reciprocally many times in an hour. During the firſt moments this creature crawled about, as if in ſearch of air, and afterwards foamed at the mouth.

The neck and body continued ſwelled longer, in a ſecond experiment with another *Viper*, and a bliſter appeared on the back. This creature lived an hour and a half. The mouth remained vaſtly diſtended after death, and the internal parts of it were much diſtorted, and thruſt forwards. After the admitting the air the mouth cloſed, and opened again after a time; and in fine, on pinching the tail there was ſome motion perceived in the body, that ſeemed to argue life. The common ſnake bears the exhauſted receiver better than the *Viper*, and after many hours remaining in it, and ſeeming dead, will give ſigns of life on being warmed by bringing the glaſs to the fire; but a longer continuance in the rarified air abſolutely kills it, as it does all other creatures. Phil. Tranſ. N°. 62.

The ſtory of the rattleſnake's charming its prey has been laughed at by many, and by others the effects of the animal's fear have been ſuppoſed the reſult of a previous bite; but we have a great deal of reaſon to believe, that this ſort of faſcination is juſt what it is related to be, from an experiment mentioned in the Philoſophical Tranſactions, of a like thing in regard to a *Viper*. It is well known, that no *Viper* will feed while in confinement, except a female which is with young, but that ſuch a one will. A *Viper*-catcher, who had more than ſixty living *Vipers* in a cheſt, put a living mouſe in among them; there happened to be one female big with young among theſe, none of the others at all regarded the mouſe, but ſhe raiſed up her head a little, and looked furiouſly at it. The mouſe was terrified, and ſtood ſtill for a conſiderable time, though the *Viper* continued rolled up in a ſpiral, only raiſing up its head and looking at it, and vibrating its tongue; the mouſe at length recovered of its fright, and began to move, but without running away, only walking in a terrified manner round and round the *Viper*, and often ſqueaking; at length ſhe came before the head of the creature, which was ſtill raiſed, and the mouth open. The mouſe, after ſome time, went up to the creature, and crept into its mouth, where ſhe was gradually ſwallowed without the *Viper*'s altering its poſture.

The poiſon of *Vipers* is neither in their teeth, their tail, nor their gall, but in two veſicles or bladders which cover their teeth, and which upon compreſſion when the *Vipers* bite, emit a certain yellowiſh liquor, that runs along the teeth and infects the wound.

The poiſon of the *Viper* is only noxious when immediately conveyed into the blood. Nor is it mortal to eat the fleſh of creatures killed by *Vipers*, or to drink the wine in which they have been drowned, or to ſuck the parts they have wounded. On the contrary, Signior Redi ſays, ſucking the wound is a ſovereign remedy againſt the bite of *Vipers*. This author denies, what had been affirmed by Ariſtotle and Galen, that the ſpittle of a faſting perſon kills *Vipers*. Phil. Tranſ. N°. 9. p. 160.

Vipers are viviparous. Phil. Tranſ. N°. 84. p. 138.

The bite of the *Viper* having been ſuppoſed certainly curable by oil of olives alone, and a *Viper*-catcher in England having ſuffered himſelf to be bitten by one of theſe creatures, and having recovered after many dangerous ſymptoms; and the cure being attributed to the oil alone, though other medicines were given him internally; Meſſieurs Geoffroy and Hunauld of the Royal Academy of Sciences at Paris, made a number

of experiments, by which it appeared that this oil was not the great remedy that was pretended. (See the article OIL *of Olives*.) And added to their accounts, ſome others of perſons bitten, in which all the dreadful conſequences of that poiſon are ſhewn, and the remedies by which they were cured are mentioned. Philoſ. Tranſ. N°. 443, 444, 445.

Their firſt inſtance is in the caſe of Mr. Piron, who was bitten at the end of the fore-finger by an enraged *Viper*; there immediately iſſued a drop of blood from the wound, and the firſt application made to it was the covering up the whole finger with a quantity of Venice-treacle; the finger, however, ſwelled violently, and was ſcarified in ſeveral places, and the patient was made to eat the body of the *Viper* boiled, and drank after it a glaſs of wine with ſome Venice-treacle, and with a few drops of the volatile ſpirit of *Vipers*; and the finger was wrapped round with compreſſes and bandages, wetted in aqua vitæ. Soon after this the patient began to have inclinations to vomit, he vomited very plentifully, the ſwelling increaſed, and his arm, which was now very much diſtended, was ſcarified in twenty places, and compreſſes of linnen dipped in aqua vitæ laid on the wounds; he afterwards took volatile ſalt of *Vipers* in repeated doſes, had more ſcarifications made on his arm, and he drank in the ſpace of an afternoon and evening a quart of ſtrong wine. He ſlept very ſound after this, and the ſymptoms all diſappeared, he was almoſt recovered by ſix o'clock the next morning, only the ſcarifications took two months to heal, and after that time he enjoyed a perfect ſtate of health.

A ſecond inſtance, is that of a young lad of a robuſt conſtitution bitten by a *Viper*, enraged and kept for ſome time in a very hot place near the fire; he felt a pain like that of oil of vitriol dropped on a wound, but without delay he cut off the head of the *Viper*, bruiſed it, and applied it to the wound, and tied the finger on which he was bitten very tight round with a binder: He after this had ſome ſcarifications made, and rubbed into them a quantity of the fat of the *Viper*; he killed four *Vipers*, and uſed all their fat, and took three drams of Venice-treacle in ſome wine. His whole arm ſwelled, he perceived a violent heat over his whole body, and the other hand was ſo ſwelled at length that he could ſcarce ſhut it: On this he took a large doſe of Venice-treacle, camphor, volatile ſalt of *Vipers*, of amber and of ſal-armoniac, and a dram of volatile ſpirit of ſal-armoniac, and ſal volatile oleoſum; this he repeated at ſome diſtance of time, he was blooded in the oppoſite arm, the patient vomited violently, and an inciſion being made all along the finger, there followed no blood. The hand, arm, and breaſt were embrocated with a mixture of ſpirit of lavender, camphor, Venice-treacle, and the fat of *Vipers*. After having vomited plentifully, and been embrocated with this warm mixture, he found himſelf much eaſier, at eight o'clock at night he took another doſe of his volatile medicines, and ſlept till four in the morning, he then took a large glaſs of wine and ſlept till ſix, and at ſeven eat a part of a chicken with a good appetite. The ſurgeons would have made more ſcarifications on the arm, but he would not ſuffer it; and three days afterwards an eriſipelas appeared, to which he applied a mixture of aqua vitæ and ointment of marſhmallows, and finally was perfectly recovered.

Theſe are two inſtances in which the ſymptoms of the bite appeared in much the ſame manner with thoſe of the man who ſuffered himſelf to be bitten in England, in order to be cured by the oil. The ſleep came on in all in the ſame circumſtances, and they were all cured, as well he who uſed no unctuous application at all, as he who uſed the fat of the *Vipers*, or the Engliſhman who depended upon the oil. The internal medicines given to them all were of much the ſame kind; and all that can be concluded from the whole, is, that either theſe bites would not have proved mortal in themſelves, or that the cordial medicines, which they took internally were the remedies that prevented the miſchief that would have enſued; and theſe ſeem to have acted not as ſpecifics againſt the bite of this animal, but merely as medicines that would ſtop the ſpreading of a gangrene; the unprevented increaſe of which is the thing that proves fatal from this creature's bite.

The diſſections of the animals which had died by the bite of the *Viper*, whether they had or had not been rubbed with oil, afforded all the ſame appearances. The limb which had received the wound was in all ſwelled and livid, and theſe ſymptoms uſually were carried along the thigh to the belly, and ſometimes up to the breaſt. Inciſions made along theſe parts always diſcovered the cellules of the membrana adipoſa full of a bloody-coloured water, and the membrane itſelf was ſwelled, blackiſh, and gangrened. And this appeared always more plainly in the belly, than in any other part; the membrana adipoſa in all other parts of the body was in its natural ſtate. The injured parts often had a cadaverous ſmell; the muſcles of the wounded limb were alſo found of a browniſh colour, and their fibres had loſt their conſiſtence, and ſeemed ready to give way to the approaching gangrene. Nor is this effect confined to the external parts alone; a gooſe that had been bitten had three gangrenous ſpots on its heart, and all the indications of a beginning gangrene in other parts of it; the concave ſide of the liver was alſo gangrened, and had wholy loſt its conſiſtence; and the lungs of a fowl that had been bitten on the wing, were found in part gangrened. The effects however were different in degree, from the bites of the ſeveral *Vipers*; and there ſeems no reaſon to doubt, but that the bites of different animals, though of the ſame ſpecies, under different circumſtances, either in regard to the creature wounding, or the creature wounded, may be followed with very different conſequences; ſo that remedies are not to be depended on from their ſucceſs in one or two trials. Mem. Acad. Scienc. Par. 1737.

VIPERA, *Viper*, in zoology. See the article VIPER.

VIPERA *Pileata*, or *Vittata*, in zoology, a name by which ſome authors have called a remarkable ſpecies of Indian ſerpent, more uſually known by the name of *Cobra de Capella*. See the article COBRA *de Capella*.

VIPERARIA, in botany, a name given by ſome authors to the *Scorzonera*, or vipers-graſs. *Dale*'s Pharm. p. 83.

VIRGA (*Cycl.*)—VIRGA *Aurea*, *golden Rod*, in botany, the name of a genus of plants; the characters of which are theſe. The flower is of the radiated kind; its diſk is compoſed of floſcules, and its outer circle of ſemi-floſcules. Theſe all are placed upon the embryo fruits, and are contained in a common ſcaly cup: Theſe embryos finally ripen into ſeeds, winged with down. To this it is alſo to be added, that the flowers uſually ſtand in long ſeries towards the tops of the ſtalks.

The ſpecies of *Golden-rod*, enumerated by Mr. Tournefort, are theſe: 1. The broad-leaved *Golden-rod*, with ſerrated leaves, called the ſaracens conſoud. 2. The broad-leaved *Golden-rod*, with ſerrated leaves, variegated with white. 3. The common broad-leaved *Golden-rod*. 4. The white-flowered *Golden-rod*, with narrower and leſs ſerrated leaves. 5. The mountain *Golden-rod*, with broad ſmooth leaves. 6. The mountain *Golden-rod*, with broad hairy leaves. 7. The alpine *Golden-rod*, with rigid bay-like leaves. 8. The alpine *Golden-rod*, with long ſoft and ſharp-pointed leaves. 9. The narrow-leaved Canada *Golden-rod*, with a ſpecious panicle. 10. The narrow-leaved hairy Canada *Golden-rod*, with a leſs ſpecious panicle. 11. The ſea lavender-leaved *Golden-rod*, with the flowers all placed on one ſide the ſtalks. 12. The large flowered dwarf *Golden-rod*. 13. The annual white-flowered toad-flax-leaved acrid *Golden-rod*, called acrid annual ſleabane. 14. The great *Golden-rod*, with viſcous and ſtrong-ſcented leaves. 15. The great *Golden-rod*, with viſcous and ſtrong-ſcented leaves, and with excreſcences like galls. 16. The leſſer *Golden-rod*, with viſcid and ſtrong-ſcented leaves. 17. The ſhrubby Portugal *Golden-rod*, with long, narrow, and viſcous leaves. 18. The pale purple-flowered *Golden-rod*, with broad auriculated leaves. 19. The purple-flowered *Golden-rod*, with broad and not auriculated leaves. 20. The broad-leaved *Virga-aurea*, with deep violet-coloured flowers. 21. The broad and undulated leaved *Golden-rod*, with pale purple flowers. 22. The Tripolium-flowered *Golden-rod*. 23. The Canada *Golden-rod*, with ſmooth, roundiſh, and ſerrated leaves. 24. The Canada *Golden-rod*, with extremely broad ſmooth leaves. 25. The tall Canada *Golden-rod*, with leaves hoary underneath. 26. The New-England *Golden-rod*, with broad rigid leaves. 27. The dwarf Canada *Golden-rod*, with toad-flax leaves. 28. The dwarf Canada *Golden-rod*, with the leaves of the ſmaller willows. 29. The great flowered American *Golden-rod*, with aſphodel roots. *Tourn.* Inſt. p. 483.

The common *Golden-rod* is an aſtringent, and its root is given in powder with great ſucceſs in diarrhœas, dyſenteries, and in hæmorrhages of all kinds; particularly in ſpittings of blood.

VIRGA *Paſtoris*, in botany, a name given by ſome authors to Dipſacus. Vid. *Lemery* & *Miller* in voc *Dipſacus*; alſo *Tourneſ.* Inſt. Bot. p. 466.

Where the name *Virga paſtoris* occurs in the tranſlation of the Arabian writers, it is not to be ſuppoſed to mean the plant we call *Virga paſtoris*.

It is indeed the literal tranſlation of the haſſalelrheir of Serapion and Aviſenna; but they called the common horſetail by this name, when they applied the adjective female to it; and when they added male, they meant by it the common knot-graſs.

Both theſe plants poſſeſſed the common virtues of aſtringents and agglutinants, and were for that reaſon placed together by the old Greek writers, and were both called *Polygonum* by them, having both an equal title to that name, as it expreſſes no other than a plant that has many joints; and they diſtinguiſhed the knot-graſs by the name of the male *Polygonum*, and the horſe-tail by the name of the female; as the Arabians did by the names male and female *Virga paſtoris*.

VIRGA *Sanguinea*, in botany, a name given by Mathiolus, and ſome other authors, to the cornus fæmina, or dogberry-buſh, common in our hedges. *Ger.* Emac. Ind. 2.

VIRGÆ *Lateralis Minimus*, in anatomy, a name given by ſome writers to a muſcle, called by others *levator ani parvus*, and by ſome *tranſverſus ani*. It is called by Albinus the *tranſverſus perinæi*, and by ſome *tranſverſalis penis*.

VIRGATA *Sutura*, a term uſed by ſome anatomiſts for the ſagittal ſuture of the cranium.

VIRGILIAN *Huſbandry*. See the article HUSBANDRY.

VIRGINALE *Clauſtrum*, a term uſed by ſome writers to expreſs the hymen.

VIRGINS-*Bower*, *Clematitis*, in botany, the name of a genus of plants; the characters of which are theſe: The flower is of the roſaceous kind, and uſually conſiſts of four leaves arranged in a circular form, and without a cup. The piſtil ariſes from the center of the flower, and finally becomes a fruit compoſed of ſeveral ſeeds arranged into a ſort of head, and each ending in a long plume.

The ſpecies of *Clematitis*, enumerated by Mr. Tournefort, are theſe: 1. The common broad-leaved wild *Clematitis*, with leaves indented. 2. The broad-leaved wild *Clematitis*, with leaves not indented at the edges. 3. The pear-tree-leaved indented *Clematitis*. 4. The creeping *Clematitis*, called by many authors flammula. 5. The creeping ſea *Clematitis*. 6. The white flowered upright *Clematitis*. 7. The early red-ſtalked upright *Clematitis*. 8. The geranium-leaved alpine *Clematitis*. 9. The blue-flowered upright *Clematitis*. 10. The white-flowered upright *Clematitis*. 11. The blue-flowered procumbent *Clematitis*. 12. The purple procumbent *Clematitis*. 13. The double blue flowered *Clematitis*. 14. The double purpliſh-blue *Clematitis*. 15. The double pale-red *Clematitis*. 16. The upright dwarf Spaniſh *Clematitis*, with white flowers. 17. The narrow-leaved Portugal *Clematitis*, with ſmall blue flowers.

Authors have added to this genus, the *Clematitis* trifolia flore roſeo, which is properly a granadilla; and the *Clematitis* Daphnoides, which is a pervinca. *Tourn.* Inſt. p. 293.

The ſeveral ſpecies of this plant make a very fine ornament in the quarters of gardens allotted to flowering ſhrubs. They are all propagated, by laying down their branches in ſpring, as is practiſed in vines and other ſuch ſhrubs; and in a year's time they will have taken ſufficient root, and may be taken up and removed to the places where they are to remain. This ſhould be done in ſpring, and a little mulch muſt be laid about their roots, and they muſt be watered in dry weather. In two years after planting they will make very ſtrong ſhoots, which are to be trained up to ſtakes, that they may not trail upon the ground. After this, they require no farther care, than to cut out their dead branches every year, and in the ſpring to ſhorten ſuch branches as are too long and rambling.

They may alſo be raiſed from ſeeds, ſown either as ſoon as ripe, or in the ſpring; but this is a more tedious way, as they lie ſix or twelve months in the ground before they appear, and after that require two years care in a nurſery-bed before they are fit to be planted out where they are to ſtand.

VIRIDELLUS, a word uſed by ſome medical writers, to expreſs the epilepſy; and by ſome of the chemical ones, as a name for the common green vitriol.

VIRILIS *Teſtis Muſculus*, in anatomy, a name given by Veſalius, and others, to the muſcle generally known by the name of the *Cremaſter*.

VIRITES, a name by which the writers of the middle ages have called the Pyrites.

VISCAGO, in botany, the name of a genus of plants, deſcribed by Dillenius, and ſince called by Linnæus *Silene*. *Dillen.* Hort. Elth. p. 309. See the article SILENE.

VISCAGO is alſo uſed by ſome pharmaceutic writers, to expreſs a mucilage.

VISCERA (*Cycl.*)—*Wounds of the* VISCERA. If any of the *Viſcera* ſituated in the abdomen, as the liver, ſpleen, or kidney, has received a wound from a ſharp inſtrument, at the firſt dreſſing the wound muſt be filled as tenderly as poſſible with lint well ſaturated with highly rectified ſpirit of wine, or ſpirit of turpentine, ſecuring the dreſſings with compreſſes and a bandage; by this means the hæmorrhage will be ſtopped, if no large veſſel is divided. When this part is gained, the wound muſt be treated in the common manner, and the patient kept very low; bleeding him, if of a plethoric habit, and giving daily two or three doſes of Lucatellus's balſam; for balſams of this kind are of great ſervice in healing internal wounds. This is the method to be taken with wounds of the *Viſcera*, which may be diſcovered by the eye or touch. But in ſuch of them as are hidden, and not to be thus diſcovered, all that can be done is to inject vulnerary decoctions, and keep a paſſage open for the evacuation of ſordes, or grumous blood. *Heiſter's* Surg. p. 68.

VISCERALIA, a term uſed by phyſicians, to denote ſuch medicines as impart ſtrength and firmneſs to the ſanguineous *Viſcera*, ſuch as the liver, ſpleen, *&c.*

VISCERATIONES, among the Romans, a feaſt conſiſting of the intrails of animals, given to the people at the burial of great men in Rome. *Danet.* in voc.

VISCUM, *Miſletoe*, in botany, the name of a genus of plants; the characters of which are theſe: The flower conſiſts of one leaf, hollowed into the ſhape of a baſon, and uſually divided into four ſegments at the edge, and ſprinkled over with apices in the form of little protuberances. The embryo fruits do not ſucceed there, but appear on other plants of the ſame ſpecies, and are ſurrounded with four little leaves; theſe finally become round berries full of a glutinous juice, and containing flatted and heart-faſhioned ſeeds.

The ſpecies of *Miſletoe*, enumerated by Mr. Tournefort, are theſe: 1. The common, or white-berry'd *Miſletoe*; and 2. The *Miſletoe* with red berries. *Tourn.* Inſt. p. 609. See the article MISLETOE.

VISCUM is alſo uſed for *Birdlime*. This was eſteemed a poiſon among the antient Greeks, and is ſeldom omitted under the claſs of deleterious things enumerated in their writings.

It is called by theſe authors *Ixias*; but this word has occaſioned great errors in late writers, the word *Ixias* having been applied for the white camelion thiſtle, not becauſe of any poiſonous quality it had; for they all declare it to be innocent, but becauſe of its yielding a viſcous, or clammy juice. The black chamæleon thiſtle was always eſteemed poiſonous among them; and hence ſome have ſuppoſed the word *Ixias* to be applied to that, and the poiſon *Ixias*, mentioned by the Greeks, to be the root of that plant. Paulus Ægineta indeed ſeems to have underſtood it ſo, the poiſon *Ixias* being by him placed among the roots; but Galen, who calls it a ſlow poiſon, and ſays, that it kills by ſtopping up and glewing together the inteſtines, plainly enough means *Birdlime*, not the root of any plant.

VISCUM *Caryophylloides*, a name given by Sir Hans Sloane, and many other authors, to a genus of plants of a very peculiar kind. They are called *Viſcum* from their growing upon other trees, in the manner that the miſletoe does with us; and *Caryophylloides*, from their leaves, in ſome degree reſembling thoſe of our pinks or carnations; but the plant itſelf, in all its ſpecies, is wholly different, both from the miſletoe and pink, in all other reſpects.

The ſeveral ſpecies of theſe plants differ greatly alſo from one another; the moſt fragrant ſpecies in Jamaica is a very large one called by the common people, the wild pine. The root of this plant is compoſed of a great number of brown filaments, which encompaſs the whole branch of the tree on which it grows; theſe are very different from the roots of our miſletoe, for they enter into the ſolid ſubſtance of the tree, but the roots of the miſletoe are expanded over its ſurface, and are often confuſedly interwoven one with another. The roots of *Viſcum* give a very firm baſis for the plant, and from theſe there ariſe the rudiments of the leaves, which at length grow to the likeneſs of thoſe of leeks, or of the leaves of ſome of the aloes, being folded one within another; they in ſome ſort alſo reſemble thoſe of the pine-apple, or ananas, and it is on this account that the plant is called the wild pine. Theſe leaves are between two and three foot long, and are three inches broad at the baſe, from whence they run tapering all the way, till they terminate in a point; they are very round or convex on the outſide, and very hollow within; by means of this ſhape of the leaves is formed a very fine reſervatory of water in every plant of this kind.

All the leaves being thus hollow within, and ſtanding in a circle at the bottom, form a round hollow maſs, which ſwells out into a ſort of bulb, looking like a turnep, except in colour, and very large; they afterwards draw nearer to the ſtalk, and form by that a ſort of neck to this bottle cavity, which is cloſe and firm on all ſides: in the rains, the trees on which theſe plants grow, drop off vaſt quantities of water from their leaves, and this is in great plenty catched by one or other of the long leaves of this plant; each of which is a ſort of hollow pipe, conveying all that it receives into the bottle, or reſervoir at the bottom; this ſoon runs over, but in conſequence of this, it is at laſt left full, and this water it retains a long time, by means of the narrow neck they form above, which prevents the evaporation that would otherwiſe naturally happen by the ſun's heat: this water gives a continual ſupply of juices to the leaves, which are of a pale green in the bottle part, and as green as a leek above.

In the midſt of theſe leaves riſes a ſmooth branched and ſucculent ſtalk of about three foot long; this, when wounded, yields a white mucilaginous juice; the flowers are numerous, and conſiſt each of three leaves, ſtanding in a three-leaved green cup; after theſe come three corner'd capſules; at the baſe of this are three ſmall and ſhort leaves, and within it are contained ſeveral ſeeds, of an oblong, pyramidal form, ſmall in themſelves, but winged with a very long and fine down. The plant is very common in woods and foreſts, and grows uſually to the branches, but ſometimes to the trunks of the trees, eſpecially when they are ſomewhat decayed, their bark then more eaſily receiving the ſeed, and giving a free paſſage to the roots. Phil. Tranſ. N°. 252. p. 114. See the article SOWING.

VISION (*Cycl.*)—*Diſtinct* VISION, that by which an object is ſeen diſtinctly. An object is ſaid to be ſeen diſtinctly, when its outlines appear clear and well defined, and the ſeveral parts of it, if not too ſmall, are plainly diſtinguiſhable, ſo that we can eaſily compare them one with another, in reſpect to their figure, ſize, and colour. Dr. *Jurin's* Eſſ. on diſt. and indiſt. Viſion.

In order to ſuch *diſtinct Viſion*, it has hitherto been commonly thought, that all the rays of a pencil, flowing from a phyſical point of an object, muſt be exactly united in a phyſical, or at leaſt, in a ſenſible point of the retina. But it ſeems certain,

certain, from the experiment mentioned by Dr. Jurin, that such an exact union of rays is not always neceſſary to *diſtinct Viſion*.

Hence the doctor divides *diſtinct Viſion* into two ſpecies, *viz.* into *Viſion perfectly diſtinct*, or *perfect Viſion*, and *Viſion imperfectly diſtinct*; which he calls ſimply by the name of *diſtinct Viſion*. The former, is that in which the rays of each pencil are collected into a ſingle phyſical, or ſenſible point of the retina; the other ſpecies, is that in which thoſe rays occupy ſome larger ſpace upon the retina, yet ſo far as the object is diſtinctly perceived.

Perfect *Viſion* in a given eye, and a given diſpoſition of that eye, depends only upon the diſtance of the object; it has no dependance upon the magnitude of the object; but diſtinct *Viſion*, in a given eye, and a given diſpoſition of the eye, depends upon the diſtance and magnitude of the object jointly. There appearing therefore a real difference between perfect *Viſion*, and what we call *diſtinct Viſion*, the learned doctor has enquired very particularly into the reaſon why an object may be ſeen diſtinctly without perfect *Viſion*; for which we refer to his eſſay at the end of Dr. *Smith*'s Opticks.

VISITATION (*Cycl.*) — The *Viſitation* of the Virgin Mary is a feaſt inſtituted firſt by pope Urban IV. in the year 1389. and ordained to be kept on the ſecond of July. *Hofm.* Lex. in voc.

VISITATION is likewiſe an order of monks founded by Francis de Sales and his mother Chantalia. Id. ibid.

VISPELLIONES, among the Romans, were ſlaves who could not be manumitted. *Pitiſc.*

VISTAMENTE, in the Italian muſic, is uſed to give notice to play, or ſing, quick, briſkly, &c.

VISTE, in botany, a name given by ſome authors to the common white mountain coralloides: it is the Lapland name for the ſame plant; the rain-deer, and many other creatures feeding on it when all other vegetables are deſtroyed.

VITA (*Cycl.*)— VITA *longa*, a name given by ſome botanical authors to the *piper Æthiopicum*, or Æthiopian pepper. Gen. Herb. p. 1335.

VITALBA, in botany, a name given by ſome authors to the viorna, or traveller's joy, a tall climbing plant with white flowers, common in the hedges. *Ger.* Emac. Ind. 2.

VITALIA, a name given by ſome authors to the cardiac medicines.

VITALIS, in botany, a name given by ſome authors to the common telephium, called in Engliſh *Orpine*, and live-long, from its quality of living and flouriſhing a long time after it is taken from the root. *Ger.* Emac. Ind. 2.

VITEX, the *chaſte Tree*, in botany, the name of a genus of trees; the characters of which are theſe: The flower conſiſts of one leaf, and is, as it were, bilabiated, and tubular behind; the piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower; this finally becomes a roundiſh fruit, divided into four cells, each containing oblong ſeeds.

The ſpecies of *Vitex*, enumerated by Mr. Tournefort, are theſe: 1. The *Vitex*, with broad ſerrated leaves. 2. The *Vitex*, with narrower leaves, diſpoſed in the manner of thoſe of hemp. 3. The narrow hemp-like leaved *Vitex*, with bluiſh flowers. 4. The white flowered *Vitex*: and 5. The *Vitex*, with extremely narrow leaves. *Tournef.* Inſt. p. 603. See the article AGNUS *Caſtus*.

VITIFERA, in zoology, a name by which many have called the common œnanthe, a bird well known in England by the name of the wheat-ear; and called in ſome places the fallow-finch and white-tail. See the article WHEAT-*Ear*.

VITILIGO, a diſeaſe frequent among the Arabians: it is the ſame with what is otherwiſe called *Alphos*. *Hofm.* Lex. in voc. See the article ALPHOS, *Cycl.* & *Suppl.*

VITIS, the *Vine*, the name of a genus of plants; the characters of which are theſe: The flower is of the roſaceous kind, and is compoſed of ſeveral petals, arranged in a circular form; from the middle of the flower there ariſes a piſtil, which is ſurrounded by a number of ſtamina; this finally becomes a round, ſucculent, or juicy berry, containing uſually four pear-faſhioned ſeeds. See the article VINE.

The ſpecies of *Vine* enumerated by Mr. Tournefort, are theſe: 1. The common, or wild *Vine*. 2. The Corinthian, or currant *Vine*. 3. The parſley *Vine*, or *Vine* with deeply laciniated leaves. 4. The early *Vine*. 5. The damaſk *Vine*. 6. The muſkatel, or Apian *Vine*. 7. The Pergulane *Vine*, with fruit of the ſize and ſhape of plums. 8. The African *Vine*. 9. The Allobrogic *Vine*. 10. The large bunched *Vine*, with white ſweet and firm grapes. 11. The large bunched *Vine*, with rediſh, or blackiſh ſweet grapes. 12. The large bunched, with whitiſh oval grapes. 13. The hairy *Vine*. 14. The climbing five-leaved Canada vine. 15. The maple-leaved Canada *Vine*. 16. The abutilon-leaved Canada *Vine*, with purple grapes. 17. The American *Vine*, with ſerrated ivy-like leaves. 18. The round leaved American *Vine*, with blue cluſtered grapes. 19. The great, trifoliate, American *Vine*, with ſmall round grapes in large cluſters. 20. The ſmaller trifoliate American *Vine*, with larger turbinated grapes diſpoſed in cluſters. 21. The ſow-bread leaved American *Vine*, with racemoſe corymbi of black grapes. *Tourn.* Inſt. p. 613. See the article VINE.

VITIS *Idæa*, the *Whortle*, in botany, the name of a genus of plants; the characters of which are theſe: The flower conſiſts of one leaf, and is of the globoſe campaniform kind. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower; the cup finally becomes a ſoft umbilicated berry, juicy, and containing ſmall ſeeds.

The ſpecies of *Vitis Idæa*, enumerated by Mr. *Tournefort*, are theſe: 1. The *Whortle*, with oblong crenated leaves, and black fruit. 2. The *Whortle*, with roundiſh, and not crenated leaves, and with red fruit. 3. The long leaved white berry'd *Whortle*. 4. The great round leaved *Whortle*. 5. The ſweet-ſcented *Whortle* of Ceylon. 6. The pyrola-leaved Canada *Whortle*: and 7. The myrtle-leaved Canada *Whortle*. *Tourn.* Inſt. p. 608.

VITISALTUS, a word uſed by ſome medical writers for the *Chorea ſancti Viti*. See the article VITUS's *Dance*.

VITRAGO, in botany, a ſpecies of plants, reſembling that of which the glaſs is made. It is otherwiſe called *Helxine*. *Hofm.* Lex. in voc. See the article HELXINE.

VITREA *Tabula*, a name given by ſome authors to the internal table of the cranium.

VITREUS *Humor*, the *vitreous humour* of the eye. See the article EYE.

VITRIOL (*Cycl.*)—The manner of making the common green *Vitriol*, or copperas, at Brickleſy in Eſſex, is this: They gather the pyrites, or copperas ſtone on the ſhores of Shepey-Iſland, and in other places; and this they lay upon a large bed, or floor prepared in the open air, underneath which there are gutters, or troughs diſperſed to receive and carry away the liquor impregnated with the mineral, to a ciſtern where it is kept till worked.

The air and weather diſſolves, and breaks theſe ſtones; and the rain falling on them, waſhes gradually out all the *Vitriol*; which is thus ſeparated from it: they boil the liquor in large leaden pans, putting in a great quantity of old iron, and when ſufficiently evaporated, they let it out into troughs, where the *Vitriol* ſeparates itſelf, and cryſtalizes, ſticking to the ſides of the troughs, and to ſticks and bars placed acroſs them. The remaining liquor they call the mother of *Vitriol*, and ſave it to be afterwards boiled and evaporated again. *Ray*'s Engliſh Words, p. 139.

There is contained in the original liquor, of which *Vitriol* is made from the pyrites, a white, acrid, and pungent ſalt. This is ſeparated from the mother liquor, or brine, when no more *Vitriol* will ſhoot; and is called by the chemiſts, the ſaline principle of *Vitriol*.

Common green *Vitriol*, when diſſolved in water, and ſeparated from its metalline, and ochreous, or earthy particles, by zink, or any other of the imperfect metals, added in filings to the ſolution, is then much of the nature of this white ſalt, called the ſaline principle: it is white, not green, more unctuous than the common *Vitriol*, and has a grain rather appearing like nitre than like *Vitriol*.

The native white *Vitriol* of Goſſelaer has alſo ſomewhat of this nature in it, having leſs metal, and much leſs mineral ſulphur than the common green, or blue *Vitriols*. The common *Vitriol*, thus ſeparated from its earthy and metalline parts, will yield its ſpirit eaſily, and with the gentle heat of a ſand furnace; as the white ſalt extracted from the mother liquor of *Vitriol* will: whereas, in the common *Vitriol*, the metalline part ſo detains the ſaline, that it cannot be driven off in form of vapour, till that compages is broken, by a very intenſe and violent heat; what remains in the retort after the diſtillation of either this or the other ſalt, is not red like colcothar of *Vitriol*, but is white and ſpungy, and rather reſembles burnt alum, than any other ſubſtance, in its appearance. It is inſipid when firſt taken out of the veſſel; but on being expoſed to the air, it receives ſtrange impreſſions and alterations. Phil. Tranſ. N°. 103. See the article SALINE *Principle*.

There is great reaſon to believe, that *Vitriols* are no other than metals of different kinds, penetrated and reduced into a new form by ſulphur. If thin plates of copper be cemented with beds of brimſtone between, and the operation repeated four or five times with freſh brimſtone every time, moſt of the copper will be converted into *Vitriol*; and this diſſolved in water, filtrated and cryſtallized, will afford elegant rhomboidal blue cryſtals, no way diſtinguiſhable from common blue *Vitriol*.

The ſame proceſs may be repeated with iron inſtead of copper, and the *Vitriol* will then be the common green kind, or copperas; or if the acid liquor, called ſpirit, or oil of ſulphur by the bell, be rubbed on plates of iron or copper, and ſuffered to dry away in the air, or over a gentle heat, and this repeated three or four times, the metal being afterwards put into water, will be ſo far corroded and diſſolved by it, that there will be a liquor produced, which will yield, on a proper evaporation, blue or green cryſtals, according as iron or copper have been uſed. This ſhews evidently, that the metal thus corroded by the acid of *Vitriol*, is ſoluble in water, ſo far as it has been ſo corroded; and that this ſolution affords true *Vitriol*. Such may be the formation of *Vitriol* about the copper mines in many countries, and ſuch the formation of the common green *Vi-*

triol or copperas in the pyrites with us in England. That ſtone is well known to contain ſulphur and iron, both in large quantity; and the combination of theſe in the earth, or in the air, where moiſture enough can get at them, may very well be underſtood to form *Vitriol*, which is the natural reſult of ſuch a ſolution. Phil. Tranſ. N°. 104.

It is obſervable, that before metallic *Vitriols* are diſſolved in water, they cannot be perfectly dried without changing their nature; and when diſſolved, they conſtantly let fall much ochre to the bottom; ſo that by repeated ſolution and cryſtallization of *Vitriol* in water, all the *Vitriol* is at length turned into ochre, and an unctuous liquor, that cannot eaſily be dried. Whence the eaſier, the quicker, and with the leſs water, ſome ſalts are diſſolved, the more eaſily they retain their water.

There is alſo ſomething particular in the ſolution of metals by water, for certain ſalts are required to diſſolve them; and when they are diſſolved into cryſtals of *Vitriol*, they then readily and eaſily diſſolve in water, ſo long as theſe cryſtals retain that ſalt which is the ſolvent of the metal; but when this ſaline ſolvent is wanting in the *Vitriols*, water will ſcarce diſſolve them at all, but ſuffers the metallic part to precipitate; but when the metal is previouſly diſſolved by its own ſolvent ſalt, it readily yields to water, and may thus, by a gentle evaporation, be reduced to cryſtals, wherein the metal, its ſolvent, and water always concur in a certain proportion. By this method metals are made potable, and act in the body as well, according to the acid ſolvent, as to the nature of the metal diſſolved. The action of all *Vitriols* depends thus upon theſe two principles united with water; and of this kind are the *Vitriols* of gold, ſilver, copper, iron, lead, and tin.

This rule does not extend, however, to all the *Vitriols*; for thoſe of the ſemi-metals, though they are firſt diſſolved by their acid ſolvents, ſo as to appear in a ſaline form, cannot therefore be diluted with water like the ſalts of the true metals: Thus pure regulus of antimony, perfectly diſſolved in ſpirit of ſea-ſalt, adhering to the mercury ſublimate, in the diſtillation of the butter of antimony, is a true *Vitriol* compoſed of antimony, diſſolved in ſpirit of ſea-ſalt: Whence one might ſuſpect, that it would diſſolve in water; but, on the contrary, as ſoon as water touches it, the acid ſolvent quits the regulus, mixes with the water, and lets fall the metallic calx entire. *Boerhaave*, Chem. part 1. p. 451.

Liquamen Pyriticum, or mother of *Vitriol*, is of an acrid and firey taſte, very different from that of *Vitriol*, and has been proved by ſome late experiments, to contain a ſalt very different from the *Vitriol*. The method of ſeparating this pure, is to evaporate a quantity of the water, impregnated with *Vitriol*, and received from the beds of the pyrites; this being evaporated to a pellicle, the *Vitriol* will ſhoot in the cold, and a quantity of ochre will be precipitated. After this, ſucceeding evaporations will yield more *Vitriol* and more ochre, to the fifth time; but if the experiment be continued after this, the firſt ſucceeding ſhooting of the liquor yields, inſtead of *Vitriol*, a yellow ſalt.

This contains the laſt portion of the ochre remaining in the liquor. After this, the matter yielding no more *Vitriol*, is called the waſh, or *Liquamen of Vitriol*. It taſtes acrid and firey, and the quantity left from a gallon of the well impregnated liquor from the bed, is about a pound. From this may be procured a white pungent ſalt, by ſubſequent evaporations. This is the ſaline principle of *Vitriol*, according to the chemiſts, and is contained in ſo large a quantity, that near thirteen ounces of it may be ſeparated from a pound of the liquor; the remaining liquor, after this, is what is called *Liquamen Vitrioli* by ſome chemiſts, but not properly. It will never coagulate into ſalt, but is very firy and acrid to the taſte, and extremely ponderous, not leſs ſo than oil of *Vitriol*, nor leſs pungent; and is the ſtrongeſt liquor any way obtained from a natural ſubſtance without diſtillation. This liquor being expoſed to the air in a veſſel not cloſed, will in a little time attract double its weight of water from it. All corroſive and ſaline liquors have ſomewhat of this property of imbibing moiſture from the air, and weakening themſelves by it; but this liquor attracts it faſter and in greater quantity than any other. This liquor receives moſt moiſture, and inceaſes moſt quickly in wet weather, leſs ſo in dry; and this may have given occaſion to that error ſo common among the chemiſts, that ſeveral preparations of *Vitriol* derive moiſture from the moon, and have more or leſs of it, according to her different phaſes. The changes of the conſtitution of the air have effected what, in this caſe, they ſuppoſed to be done by the different phaſes of the moon. Phil. Tranſ. N°. 103.

VITRIOL *of Copper*. The glaſs-makers have a method of making this without corroſives, which was originally practiſed by Neri, and with which they make ſome very fine colours in glaſs, particularly a fine ſea-green.

The method of making the preparation is this: Take little thin pieces of braſs, and lay them *ſtratum ſuper ſtratum* in a crucible, with powder of brimſtone. When the veſſel is full, ſet it luted and covered in an open wind furnace, with burning coals over it, and let it ſtand two hours; then let the furnace cool of itſelf, and take out the crucible, the maſs within will be of an obſcure blackiſh purple; powder and ſift it fine, and then mixing with every pound of it ſix ounces of powdered brimſtone, take a round veſſel of earth, that will bear the fire, place it upon iron bars ſet acroſs in an open wind furnace, fill it with coals, and then put in the powder; keep it burning and ſtirring about till all the brimſtone is burnt up; then take out the pan, and powder the calcined maſs again; ſift it fine, and proceed with it thrice as before; the laſt time let it ſtand on the fire till it become red. Put a pound of this calcined copper into a glaſs body, with ſix pints of water; evaporate two pints or thereabout in a ſand heat; the water is then of a fine blue, and muſt be poured off clear; then filtrate it. Evaporate the water from the remaining ſediment of copper left in the glaſs, and with new ſulphur calcine it again and again; repeat this five or ſix times, and extract the blue tincture with water as before; filtrate all the waters, and put them together. Evaporate all to a fifth part or thereabouts, and ſet it in a cool place, and fine pointed cryſtals will be formed, reſembling emeralds; ſeparate theſe cryſtals, and evaporate the water again, till all the cryſtals be procured. Then put a pound of them into a glaſs retort, well luted and fitted to a capacious receiver; let the joints be well cloſed, and make a moderate fire for four hours; then make it violent for twenty hours, or till no more white fumes ariſe. The next day open the receiver, and ſeparate the liquor into a glaſs, where it muſt be kept carefully ſealed up. *Neri*'s Art of Glaſs, p. 50.

Very great things are to be done in the glaſs art by means of this liquor; the remainder in the retort expoſed to the air for a few days, will acquire a blue colour, and this, mixed with zaffer, will give glaſs a fine ſea-green.

White VITRIOL. It has been diſputed whether *white Vitriol* is any thing elſe than green *Vitriol* calcined. But it ſeems that *white Vitriol* is of a quite different ſpecies from either the green or the blue *Vitriols*. See *Geoffroy*. Mat. Med. Tom. 1. p. 124.

In the condition in which *white Vitriol* is uſually bought, it contains ſomewhat both of copper and iron; but, being purified by ſolution, filtration and cryſtallization, it is freed from both theſe metals, and appears to be a native *Vitriol ſui generis*. See *Cramer*, Elem. Art. Docim. vol. 1. p. 302. ed. 2. Med. Eſſ. Edinb. Abr. vol. 2. p. 472.

If four ounces of alum be put in concoction with two parts of *cadmia foſſilis* pulverized, the earth of the alum precipitates, and its acid takes hold of the earth of zinc, ſo that a true *white Vitriol* is the reſult.

This *Vitriol* being precipitated by an alkaline lye, and dried, after its ſalts are ſeparated in water, and then mixed with charcoal-duſt, it will give zinc, in the manner mentioned under the article ZINC.

The ſame thing happens in mixing *Vitriol* of iron with two or three parts of lapis calaminaris; but the operation is eaſier with alum and *Vitriol* of copper. *Marggraf.* in Mem. de l'Acad. de Berlin, 1746.

Blue VITRIOL is made by evaporating ziment-water to a proper ſtandard; after which it is let out into coolers, where it ſhoots into regular and beautiful cryſtals of a rhomboidal form, and compoſed of ten planes. Theſe have the ſame qualities with the water; and being diſſolved in common water, they make a ziment liquor, undiſtinguiſhable from the native kind. See the article ZIMENT-*Water*.

Blue Vitriol is alſo contained in ſory or ruſma, and many of the pyritæ and marcaſites or mundics, but ſeldom pure. There are alſo ſome earths which contain it, but they principally owe it to ziment-waters paſſing through them.

Blue Vitriol has copper for its baſis, and is never uſed internally, but only in external applications. There are ſeveral preparations of it recommended in diſpenſatories, the moſt valuable of which ſeems to be the *aqua Vitriolica cerulea*. See the article AQUA.

VITRIOL *of Quickſilver*, the name of a chemical preparation of quickſilver, with acid ſpirits, the proceſs of which is this: Let ſo rich a ſolution of quickſilver be made in ſpirit of nitre, or aqua-fortis, that no more can be contained; let this ſolution be made by the aſſiſtance of heat, and the liquor immediately afterwards poured off into a clean and cold glaſs. There will, on this, ſpontaneouſly ſhoot on the bottom of the glaſs a ſaline white tranſparent matter, from which the liquor being poured, it is found to be a ſharp moiſt ſaline ſubſtance, or true *Vitriol* of mercury, ſoluble in water, and not ſafe to be touched: If the liquor, poured off from this, be evaporated half away, and the remainder ſet in a cool place, more cryſtals of the ſame nature with the firſt will ſhoot.

Another method of making the *Vitriol* of mercury, is this: Reduce to powder ſome deſcrepitated ſea-ſalt, and with two parts of this mix one part of crude mercury; diſtil the whole in a glaſs body, with a ſtrong fire, continued for five or ſix hours; when the veſſels are cold, break them, and there will be found a ſolid dry mercury, ſublimed to the top and ſides of the body, in form of *Vitriol*: Nay, Boerhaave affirms, that the common mercury ſublimate is a true *Vitriol* of mercury, though ſemi-volatile. *Boerh.* Chem. part 2. p. 301.

Preparations of VITRIOL are, 1. The acid ſpirit, or oil of *Vitriol*. 2. Colcothar, or calcined *Vitriol*. 3 *Tartarum Vitriolatum*. 4. *Spiritus Vitrioli dulcis*. 5. The compound

triolatum.

ſpirit of *Vitriol*. See the articles SPIRIT, COLCOTHAR, *&c. Cycl.* and *Suppl.*

Oil of VITRIOL. Mr. Boyle informs us, that if the caput mortuum, after the diſtillation of the *oil of Vitriol*, be ſuffered to lie a conſiderable time in the air, it will be ſo impregnated with new ſaline particles, as to be worth a ſecond diſtillation. Works abr. vol. 1. p. 142.

This ſtrong acid, when expoſed to the air, attracts the moiſture from it in very great quantity, increaſing in weight gradually to more than three times what it was when firſt expoſed, and gradually diminiſhing in ſtrength. The quantity of water it attracts from the air, in any given time, is not, however, in proportion to its own quantity, but to its ſurface; and Mr. Boyle has found by experiment, that if the ſame quantities be expoſed to the ſame air in glaſſes, in the one of which the ſurface is nine times greater than the other, that with the larger ſurface will gain eighteen grains addition in weight, while the other gains only two grains; and ſo in proportion for any longer time.

When the oil of *Vitriol* is fully ſatiated in the moiſteſt air, or wetteſt weather, it afterwards retains or loſes its acquired weight, as the air proves more or leſs moiſt. It may therefore be very practicable to make it a means to eſtimate the moiſture and dryneſs of the air. A very eaſy machine may be contrived to anſwer this purpoſe; for even a common pair of ſcales will do very well; and by a ſcale, on which the tongue of the balance ſhould move, would mark out the ſmalleſt changes in the moſt nice and accurate manner.

If a quantity of *oil of Vitriol* be expoſed in a wide-mouthed glaſs, till thoroughly ſated with the moiſture of the air, and then put into a ſcale, and in the moiſteſt weather exactly poiſed with a weight in the oppoſite ſcale, it will only continue exactly poiſed ſo long as the weather continues in that moiſt ſtate; but as the air becomes gradually more and more dry, it will weigh leſs and leſs, and mount, while the ſcale with the weights preponderates and ſinks.

The tongue of a ballance of but an inch and half long, thus deſcribes an arch of the third of an inch, by the different riſing and falling of the ſcale in which the *oil of Vitriol* is; and conſequently if the tongue were a foot long, it would deſcribe an arch of near three inches, which would be a ſufficient ſpace to mark a ſcale of degrees very nicely upon; and, as the tongue is pointed to theſe, it would be an excellent hygrometer.

This ballance may be contrived two ways, either ſuch whoſe pin ſhould be in the middle of the beam, with a very ſlender tapering tongue, of a foot or a foot and half long, pointed to the diviſions on a broad arched place fixed above; or elſe the ſcale with the liquor may be hung to a point of the beam, very near the pin, and the other extreme made ſo long as to mark a large arch on a board, placed conveniently for that purpoſe; and the ſcale, in either caſe, may very conveniently be a concave glaſs of four or five inches in diameter. On the diviſion of the arches ſhould be inſcribed the different temperature of the air ſhewn by the liquor. Phil. Tranſ. N°. 157.

The oil of *Vitriol*, being a cauſtic of an oppoſite nature to *lapis infernalis*, has been known to remove the pain occaſioned by the application of the latter. See the article OPPOSITE *Cauſtics*.

VITRIOLIC (*Cycl.*) —VITRIOLIC *Minerals* are compound foſſile ſubſtances, formed of various ſtony and earthy particles, mixed with others of iron and copper, and that either ſeparately or conjunctly; ſo that, in effect, they are ores of *Vitriols*.

The different kinds of theſe minerals are, 1. The chalcites. 2. The miſy. 3 Sory or ruſma. 4. Melanteria. 5. Pyrites, or fire-ſtone. 6. Marcaſites. See the articles CHALCITIS, MISY, *&c. Cycl.* and *Suppl.*

In Europe the only uſe made of chalcitis is as an ingredient of Venice-treacle, and even here its place is generally ſupplied with common green *Vitriol* calcined to a redneſs. The antient Greeks uſed it externally in hæmorrhages and collyriums for the eyes; alſo for the herpes and eryſipelas; but never ventured to give it internally.

The antients uſed *miſy* for the ſame purpoſes as *chalcitis*, being eſteemed milder than this laſt.

At preſent it is no where put to any uſe, nor indeed does it merit it, as containing no other virtues than thoſe of green *Vitriol*, though we are not ſure what pernicious ſubſtance it may be mixed with.

VITRIOLIC *Waters*. The countries which abound with mines of copper and iron uſually afford a great many *vitriolic* waters.

One of the moſt remarkable ſprings of this kind, of which we have an account, is that near Padderborn in Germany: This is a ſort of treble ſpring, having three openings, and all three yielding very different waters. Two of theſe openings are not more than a foot and half diſtant from one another, and yet of ſo different qualities, that the one is limpid, bluiſh, milk-warm, and bubbling, and contains ſal armoniac, ochre, iron, vitriol, alum, ſulphur, nitre and orpiment; all theſe ſubſtances having been ſeparated in its analyſis. The other is cold as ice, and is turbid, whitiſh, and much heavier, and ſtronger to the taſte than the other. This holds much orpiment, with ſome ſalt, alum, nitre, ſal armoniac, and vitriol. The firſt of theſe waters is taken by the people in the neighbourhood, againſt worms, and diſorders of the ſpleen, as alſo againſt epilepſies; the other is poiſonous to birds, all that drink of it dying in a very little time. The experiment has been tried on common hens, with the water brought from the ſprings into other places, and given them to drink.

Thoſe to which ſalt is given, after the ſwallowing this poiſonous water, ſtruggle longer before they die by it; and vinegar is found to ſave them very often from death, after drinking largely of it; but in this caſe they are ſickly for ſeven or eight days after it, and have the pip, as the good women expreſs it.

In the diſſecting thoſe birds which have died by drinking this water, the lungs are always found quite ſhrivelled up.

The people of the country have not been deterred by this bad effect of the water, from uſing it in medicine; they take ſmall quantities of it diluted in water, to deſtroy the worms, and it performs this very well; but gives them a grievous ſickneſs while it operates.

The third ſtream, or opening of this remarkable ſpring, is about twenty paces diſtant from the others; the water is here very clear, of a greeniſh colour, and of a ſour, but not very diſagreeable taſte. It is of a middle weight, and of middle qualities between the other two, and is evidently formed of the joining of thoſe two ſprings with ſome other freſh water in the way; for a liquor exactly reſembling this third kind may be prepared, by mixing equal quantities of the other two with a ſufficient quantity of commom well-water. Phil. Tranſ. N°. 8.

There is a ſpring in Baſil diſcharging its water through the tanners-ſtreet, or gerber-gaſſe, which is of a bluiſh colour, and ſomewhat turbid. This holds blue vitriol, that is, copper, in the form of a ſalt, and with it bitumen and antimony; but a much larger proportion of the firſt ingredient, than of either of the others. The analyſis of it ſhews, that it contains three parts copper to one of bitumen, and two of antimony. It ſerves the tanners of the place to good purpoſe, their ſkins receiving one of their preparations from this native water.

The ſame town affords ſeveral other ſprings of peculiar qualities, all owing to the veins of metalline ores, with which the earth of the place abounds. The one of theſe is called *Bandulph's-well*, and affords a water of great uſe in medicine, ſeveral being regularly and perfectly cured of hydropical diſtempers by it. And another very remarkable one contains, as is found by its analyſis, ſulphur, nitre, and ſome gold. Theſe, however, are in ſuch ſmall quantity in it, as not to prevent its being fit for the common uſes of life. It is very ageeable to the taſte, and is much eſteemed for drinking, and ſent for all over the town.

Another *vitriolic* water runs out of a cavern near Gelſbach in Alſace. It is a fattiſh and oily liquor, and is uſed by the country-people for greaſing their wheels; but it is fit for much better purpoſes. If it be boiled to the evaporation of a third part, there will remain very little water, but a fatty bituminous ſubſtance, like tar, will ſubſide to the bottom, and there will ſwim at the top a yellow, thin, and limpid liquor, very much reſembling linſeed oil; and this, diſtilled in a ſand heat, yields an oily and watry liquor; the firſt very good for external uſes, for burns and ſcalds; and the other a good internal medicine, in conſumptions, and other diſeaſes of the lungs. Id. Ibid.

Some time ago there was a water diſcovered in England, that gave, on many experiments, an appearance of containing natural and perfect vitriol. This water was found near Egling-ham in Cumberland; and being examined, by adding galls to it, it became abſolute ink, much deeper than any of the atramentous waters ever do: When one half the quantity was ſlowly evaporated, the remainder retained this quality to a higher degree than before; and, on evaporating it yet farther, there concreted in it fair cryſtals of pure and genuine vitriol.

This was an appearance wholly new in England, and not eaſily accounted for, as we have no mineral, except the common pyrites, which contains vitriol; and it is very well known, that there requires a fermentation in the air, before the vitriol, contained in that ſtone, will be diſintangled from its other principles, ſo as to be capable of appearing in its own form; and as this ſtone, lying under water, can never impregnate that water with its vitriol, it did not ſeem eaſy to conceive in what manner a genuine vitriol ſhould be communicated to water, where there was no other ſubſtance which could give it. The ſuſpicions that theſe thoughts gave the gentleman who examined this water, occaſioned his making a viſit to the place where it was produced, when he found that the ſuppoſed *vitriolic* ſpring was no other than an old drift made for the draining the water from ſome old wrought coal-pits; the people who had worked in theſe, remembered to have ſeen great quantity of pyrites there. This drift was ſometimes dry for a conſiderable time together, and ſometimes run in a plentiful ſtream; and there is no doubt but that, in theſe dry ſeaſons, the air acted upon the pyrites, and cauſed it to ſhoot its vitriol, which the next tide of water waſhed away, and it came off diſſolved in it, and highly impregnating it.

This proved therefore no better a medicinal ſpring than ſome of a like kind, deſcribed by Mr. Leigh in his natural hiſtory

of Lancaſhire; and all theſe are very little better than the diſcovery of a medicated water in Oldſtreet, from the remains of an old colour-ſhop, or Kircher's reckoning the common ſhores of Rome among the medicated ſprings of Italy.

The *vitriolic* ſpring which has been ſo much talked of near Haigh in Lancaſhire, is no other than an accidental impregnation of common water, in the ſame manner, it being only the runnings of an old drift, or drain, made to carry off the water from ſome pits of cannel-coal; and this, like the other, as it ſometimes has water, and at other times is dry, gives time for the pyrites to let go its vitriol while dry, and then imparts it to the waters that paſs that way afterwards. Theſe are not to be accounted medicated ſprings, ſince neither natural nor continual, and ſuch may be any day made at home, by laying the common pyritæ of our clay, or coal-pits, out to moulder in the air, and then pouring water upon it, and after a ſhort time ſtanding, taking it off again. Phil. Tranſ. N°. 245. p. 380.

VITRUM, in botany, a name given by ſome of the old writers to the plant we now call *glaſtum* or *woad*.

This plant has always been a native of England, and was in uſe among the ſavage inhabitants of this iſland, for painting their bodies. Thoſe who have not underſtood this to be the name of that plant, have been ſtrangely perplexed to account for theſe people's painting their bodies with *Vitrum*, glaſs, as they underſtood it: But the whole meaning of this plant obtaining the name of *Vitrum*, ſeems to have been its ſtaining the ſkin to a pale blue colour, or, as it was called by many, a glaſs-colour.

VITRUM, *Glaſs*. As impenetrable as glaſs is to the common menſtruums, we find it eaten by the air in length of time, when expoſed in old windows; but the effects of its being kept in a ſubterraneous place are much more ſtrange. Borrichius tells us, that at the time when he was at Rome, there was dug up a whole houſe from under the kitchen-garden of a citizen. The houſe had been buried there ten ages, and there were found in it ſeveral glaſs urns, or lachrymatories. The glaſs of theſe had no holes made in it, as our old glaſs in chamber-windows has, but ſtill retained its ſmooth ſurface and tranſparence; but it was ſplit into a vaſt number of thin laminæ, which were as pellucid and fine as Muſcovy glaſs; and in ſome places were tinged with all the beautiful colours that art could have given. We are not acquainted perfectly with the antient way of working their glaſs; but it is not probable there could be any thing particular in the formation of the veſſel, to determine it to ſplit thus into flakes; but that glaſs of the ſame kind, in any form, would have done the ſame. *Borrich.* de Ortu Chemiæ.

VITRUM *Antimonii Ceratum*, in pharmacy, is thus prepared: Take glaſs of antimony in powder, one ounce, bees wax one dram; melt the wax in an iron ladle, then add the powder; ſet them on a ſlow fire without flame, for the ſpace of half an hour, continually ſtirring them with a ſpatula; then take it from the fire; pour it upon a piece of clean white paper, powder it, and keep it for uſe.

The glaſs melts in the wax with a very ſlow fire. After the materials have been about twenty minutes on the fire, they begin to change colour, and in ten more come to the colour of ſnuff; which is a mark of the medicine's being ſufficiently prepared.

The ordinary doſe for adults is ten or twelve grains; but it is ſafeſt to begin with ſix grains. The quantity of a ſcruple has been given to a ſtrong man, which wrought gently.

This medicine has for ſome time been held a ſpecific in dyſenteries; but the preparation and manner of giving it have been kept a ſecret, till Dr. Young generouſly made it public. Dr. John Pringle ſays, he tried it in a dyſentery of four years ſtanding, with ſurprizing ſucceſs. See Med. Eſſ. Edinb. vol. 5. art. 15.

It has been given in dyſenteries, with or without a fever, whether epidemic or otherwiſe, and whether bleeding and vomits have been premiſed, or not. In its operation, it ſometimes makes the patient ſick, and vomits him; it purges almoſt every perſon; but it has been known to cure without any evacuation or ſickneſs. It is to be given with an empty ſtomach, for then it operates moſt mildly. Nothing is to be drank after it for three hours, unleſs the patient is very ſick, and diſpoſed to vomit; in which caſe warm water may be given, as in other vomits.

This medicine ſhould not be given for diarrhœas in the end of conſumptions. Other diarrhœas have been cured with large doſes of it; but in ſuch caſes it fails oftner than in dyſenteries. During the uſe of this powder, fermented liquors ſhould be abſtained from, and a milk diet is proper. See Medic. Eſſ. Edinb. ibid.

This preparation has alſo been found ſucceſsful in uterine hæmorrhages, both in young and old.

It has alſo been tried in colic pains, from viſcidities in the inteſtines, and found a ſafe and eaſy purgative, and ſometimes a gentle emetic.

The method of giving it is in a bolus, with conſerve of roſes, diaſcordium, or theriaca Edinenſis. An opiate, after the operation, is proper. See Medic. Eſſ. or the Abridgment, vol. 1. p. 193. ſeq.

VITRUM *Morrhinum*, *Morrhine*, or *Myrrhine Glaſs*, a name given by Pliny, and ſome of the antients, to a ſort of manufacture made in Egypt, which though truly no other than a kind of glaſs diveſted of its tranſparency, yet was made ſo nicely to imitate the *myrra* or *morra* of the Indies, ſo famous among the Romans, under the form of cups and veſſels, called *murrhina vaſa*, that it was called by ſome, *murrha altera*, another ſort of *murrha*, and the cups made of it honoured with the name of *murrhine veſſels*. This ſerves to ſhew, that the *myrrhina vaſa*, properly ſo called, were not of any precious ſtone, as vulgarly ſuppoſed, but of a ſort of porcelain. See the article MORRINA.

VITTA, among the Romans, a fillet with which the women in Rome bound their hair. The matrons wore a double one, to diſtinguiſh them from the virgins, whoſe *Vittæ* were ſingle.

Vittæ were alſo worn by prieſts and poets, in which caſe they were made of branches of olive or laurel; the ſtatues of the gods were likewiſe adorned with *Vittæ*, as were altars, the doors of temples, victims and ſupplicants. *Pitiſc.* in voc.

VITTA *Cærulea*, in conchyliology, a ſpecies of *dolium*. See the article DOLIUM.

VITTA, in ichthyology, a name given by Gaza, and ſome others, to the fiſh called by others, *tænia*, and by the Italians, *cepole*. See the articles TÆNIA and CEPOLE.

VITULUS *Marinus*, the *ſea-calf*, in zoology. See the article PHOCA.

VITULUS, *Calf*, in zoology. See the article CALF.

VITULI *Aquatici*, in the hiſtory of inſects, a name given by the German writers to thoſe ſlender and long worms found in waters, and reſembling horſe-hairs, and which are ſuppoſed by the vulgar to be no other than real hairs, animated by lying in the water. We are not yet perfectly informed of all parts of their hiſtory; but Dr. Liſter has found them in the bodies of ſeveral of the common beetles.

VITUS's *Dance*, or ST. VITUS's *Dance*, in medicine, the name of a peculiar ſort of convulſion, to which young women are principally ſubject, toward the time of the firſt eruption of the menſes.

It ſeems to have had its name from the account which Horſtius gives of ſome women who once every year paid a viſit to the chapel of *St. Vitus* near Ulm, and there exerciſed themſelves day and night in dancing, being diſordered in mind, till they fell down like people in an extaſy: By this means they were always reſtored to health for a whole year, till the return of May, at which time they were again ſeized with a reſtleſsneſs, and diſorderly motions of their limbs, ſo as to be obliged, at the anniverſary of *St. Vitus*, to repair again to the ſaid chapel, for the ſake of dancing. *Horſtius*, Ep. Med. S. 7.

It is the moſt frequent with girls, yet not peculiar to them, attacking boys alſo, from the age of ten to fourteen. It firſt ſhews itſelf by a ſort of lameneſs, or rather unſteadineſs of one of the legs, which the patient draws after him like an idiot, and afterwards affects the hand on the ſame ſide; which being brought to the breaſt, or any other part, can by no means be held in the ſame poſture for a moment, but is diſtorted or ſtretched by a ſort of convulſion to a different poſture and place, notwithſtanding all poſſible efforts to the contrary.

If a glaſs of liquor be put into the patient's hand to drink, before he can get it to his mouth, he makes a hundred odd grimaces and geſtures, for not being able to carry it ſtrait, becauſe his hand is drawn different ways by the convulſion, as ſoon as it has reached his lips, he throws it ſuddenly into his mouth, and drinks it very haſtily, as if he meant only to divert the ſpectators.

As this diſorder appears to proceed from ſome ſharp humours thrown upon the nerves, which, by their irritation, excite preternatural motions, it ſeems that the curative indications are to be directed firſt to leſſen thoſe humours by bleeding and purging, and ſecondly, to ſtrengthen the nervous ſyſtem. Dr. Sydenham therefore propoſes the following method: Firſt to take from the arm ſeven or eight ounces of blood, more or leſs, according to the ſtrength of the patient. The next day let him take a gentle purge of rhubarb, ſena, manna, *&c.* In the evening of this day, let him take a draught, with a ſcruple of Venice-treacle, and eight drops of liquid laudanum mixed in honey and milk-water. This purging and opiate draught is to be repeated at ſome days diſtance, and the bleeding is alſo to be repeated to the fourth time; and in the intermediate days, a cordial and nervous electuary is to be given, compoſed of the conſerves of roſemary, orange-peel, and Roman wormwood, with Venice-treacle, candied nutmeg and candied ginger; of this the bigneſs of a nutmeg may be given every morning and afternoon, drinking after it a decoction of piony, maſter-wort, and elecampane, and angelica-roots, the leaves of rue, ſage, betony, and other cephalic plants, with orange-peel, and juniper-berries.

Spirit of harts-horn may alſo be given every night in ſmall doſes, in a nervous julep, and plaſters of gum caranna may be applied to the ſoles of the feet. According as the cure advances, the patient recovers the uſe of his hand and foot, and his amendment may always be diſcovered by letting him attempt to bring a glaſs of any liquor to his mouth in a ſtrait line; though the bleeding ſhould not be repeated beyond the fourth time,

time, yet the alterative and purging medicines ſhould be continued till the patient is quite well; and as people are ſubject to relapſes in this diſorder, it is proper to give the ſame medicines, and to bleed at the return of that ſeaſon of the year.

The firſt ſymptoms in this diſeaſe are often perceived to come on at the hips and os ſacrum, or extremity of the back-bone; from thence a pain extends itſelf acroſs the navel, and thence the pain runs up to the top of the head: as ſoon as this happens the convulſions uſually begin; theſe often firſt appear in the belly, and are ſo violent, that two or three perſons can ſcarce hold the patient, and are forced to lie upon the bed to prevent him from raiſing up his belly in a ſtrange manner.

After this, in ſome caſes, the nerves of the lungs become affected, and the patient will imitate the barking of a dog, or the ſnarling and howling of that animal when hurt: after this, the nerves of the jaws generally ſuffer, and the teeth are ſnapped violently together, and the mouth foams; perſons have ſometimes beaten out their teeth with the violence of ſnapping them together in theſe agonies.

There is, in the Philoſophical Tranſactions, an account of a caſe of this kind following a fever, in which the patient attempted to bite every body about him, and would have even gnawed his own fleſh, if he had not been prevented; but, though the people about him thought, from all theſe ſymptoms, that he had been bitten by a mad dog, and that this was madneſs, yet, on offering him water, he drank, or rather lapped it greedily; which proved it could be no effect of that bite, becauſe the great ſymptom of ſuch diſorders, the dread of liquids, did not ſhew itſelf in him. Theſe were merely the effect of this *Chorea Sancti Viti*, and were attended with twitching of the arms and legs, which conſtitute that diſtemper; his noiſes alſo were not confined to thoſe of a dog, but in different fits, he repreſented the ſounds of different animals, as the roaring of a bull, the grunting of a hog, and the noiſe of a gooſe.

Theſe were not premeditated, or meant by the patient, as imitably of ſuch ſounds, but merely proceeded from the forcing out the air from the lungs in different manners, according to the different power of the convulſion, which affected their nerves. The patient in this caſe was ſpeechleſs, not only in the time of the fits, but for a week together; and the country people fell into the common error of ſuppoſing that he was bewitched, but the phyſician cured them of that belief, by the curing the patient of his diſtemper by the common means, as they were convinced, that a diabolical ſpirit could not be caſt out by a regular courſe of phyſick. Phil. Tranſ. N°. 287. p. 1480.

VIVACE, VIVACEMENTE, or VIVAMENTE, in the Italian muſic, ſignifies to play with life and ſpirit. It requires a degree of movement between *largo* and *allegro*, but neareſt *allegro*. See the articles LARGO and ALLEGRO.

VIVACISSIMO, in the Italian muſic, denotes a degree or two quicker than *Vivace*, and is much the ſame with *allegro*. See the article ALLEGRO.

VIVERRA, in zoology, the name by which authors call the *Ferret*; called by ſome alſo *muſtela ſylveſtris*, *furo*, and *furunculus*.

The uſe we make of this creature, is the ſending it into rabbet holes to drive them out; but we are obliged to faſten up their mouths, that they may not tear the rabbets to pieces; but it ſtill is able to annoy them with its claws, and ſoon drives them out. It feeds on milk, ſmall birds, and the fleſh of animals, and is a creature eaſily kept tame, and will breed and bring up its young in that ſtate; and theſe will naturally hunt the rabbet, in the ſame manner as their parents.

It is of a middle ſize, between the weaſel and polecat; its head is ſmall and flattiſh; its ears ſhort, erect, and very wide; its noſe, or ſnout, long, like that of a hog; and its eyes ſmall and red; its colour is a pale, yellowiſh white; the back and ſides a little darker than the belly; and its feet have all five claws each: it breeds very well with us, but is ſaid not to be a native here, but brought from Africa. *Ray*'s Syn. Quad. p. 198.

VIVERRA *Indica*, the Indian *Ferret*, a name by which ſome have called the animal known in America by the name of *quirpele* and *quil*. See the article QUIRPELE.

VIVES, a name given by our farriers to a diſeaſe of horſes, which conſiſts in the growth of certain flattiſh kernels in cluſters, like bunches of grapes, beginning from the ears, and creeping downwards, between the chap and the neck of the horſe toward the throat.

When they are inflamed they ſwell, and become not only painful to the creature, but are even mortal, ſtopping his wind unleſs a ſpeedy courſe be taken for their cure. The difficulty of breathing, which they occaſion in their progreſs toward this higheſt degree, occaſions many ſymptoms, which being miſunderſtood by the farriers not being well acquainted with the nature of this diſeaſe, are often treated as peculiar diſtempers themſelves, and the creature periſhes by the treatment of them in an improper manner.

The horſe will often lie down, and ſtart up again, and tumble about in a ſtrange manner, and be ſuppoſed to have convulſions, when he has really no other complaint but the difficulty of taking his breath.

The common cauſe of this diſtemper, is the drinking cold water after any violent heat: It is alſo ſometimes ſaid to ariſe from the eating too much bad corn. The method of cure is to be varied according to the progreſs and ſtate of the diſeaſe, and the immediate danger.

If the tumors be not grown ſo large as to put the horſe in abſolute danger of ſuffocation, the farrier uſually attempts to rot them away, by taking hold of each gently with a pair of pincers, and beating them gently with the handle of a ſhoeing-hammer, or bruiſing them with the hand alone, till they grow ſoft; this will often make them diſappear; but this method is only to be uſed when they are nearly ripe; for otherwiſe they will return after a time; their being in a proper ſtate for this, is known by the ſeparation of the hair, which eaſily comes off on the taking hold of it between the fingers. If the caſe be more deſperate, and the horſe likely to be immediately ſuffocated, it is beſt to open them with an inſtrument. Whether this, or the other method be taken, the horſe ſhould immediately after be blooded under the tongue, and afterwards in the flanks, and his mouth waſhed with ſalt and vinegar, and ſome of the ſame mixture ſhould be put into his ears, rubbing and ſqueezing them hard to make it penetrate: this will wonderfully aſſwage the pain. After this, the horſe is to take a quart of white wine, with two handfuls of hempſeed bruiſed, two nutmegs ſcraped, and the yolks of ſix eggs, all thoroughly mixed in it. About an hour after this draught, he is to have the following glyſter: Boil an ounce and half of ſal polycreſtum, finely powdered, in five pints of beer; when this is taken off the fire, two ounces of oil of bays is to be put to it; and the whole is to be thrown up blood-warm. This is a regular method, and ſeldom fails of a cure; but ſome, who are not willing to have ſo much trouble and expence, only cut holes where the kernels are, and pick them out at theſe with a wire; they then fill the hole with ſalt, and at the end of three days it will run; after this they waſh the wound ſome days with the juice of ſage, and heal it with the common green ointment, or with a mixture of honey, butter, and tar.

VIVIPAROUS (*Cycl.*) — The females of all the quadruped claſs are *viviparous*, and thoſe of the bird claſs are all *oviparous*.

The laws of nature in the larger animals, are therefore, in a great meaſure, fixed and certain; but it is not ſo in the inſect tribes, nor in the fiſhes; for of theſe ſome are *viviparous*, and others *oviparous*; and thoſe of genera nearly allied to one another.

Among inſects, the much greater number are *oviparous*; but there are many which are not ſo, as the pucerons, progallinſects, cochineal, &c. The millepedes and ſcorpions are alſo well known to be ſo; all the females of the butterfly, and of ſome other claſſes, lay only eggs; but the moſt ſingular and remarkable inconſtancy in nature, if we may be allowed the expreſſion, is that in the fly kingdom; the ſame claſs of inſects, and even the ſame genus, will furniſh us with ſome which are *viviparous*, and others which are *oviparous*; the two-winged flies give us inſtances of this; but theſe are not ſingle in that reſpect; for among the reptile world, there are other creatures which are ſubject to the ſame varieties; and Swammerdam has obſerved a viviparous ſnail. The two-winged *viviparous* flies bring forth worms, in all reſpects the ſame with thoſe hatched from their eggs in the other ſpecies.

Many authors having obſerved the flies in general to lay eggs, have too haſtily declared flies to be oviparous; and, on the contrary, ſome having ſeen them produce living worms, were of opinion, that they were all *viviparous*. Redi very juſtly blames both ſides for making general inferences from particular facts, and then propoſes a queſtion, whether the ſame fly, in different circumſtances, may not depoſit eggs, or living animals, and whether external cauſes, as the heat of the air, &c. may not make thoſe eggs, naturally ordained to have been laid in that form, hatch in the creature's body, and thence appear in form of a living offſpring: but as there is no probability of a chicken being in the body of the hen, though it may eaſily happen that an egg may be detained there, ſo neither is there any probability of that which nature ordained to be produced in the egg ſtate by the fly, ſhould by any accident be made to hatch into a young one, in the body of the mother.

The ſpecies of *viviparous* two-winged flies, are much more rare than the oviparous; and among the four-winged claſs, they are yet more uncommon. It is not certain, that any of the latter, beſide the winged pucerons, are of this kind; but among the former, there are ſix or ſeven ſpecies which are known always to produce living worms, and probably many more will be diſcovered, by a more cloſe attention than has hitherto been given them, to be ſo too. When we ſee the eggs of a fly depoſited in great numbers on food, excrements, or other ſubſtances, it is eaſy to follow the changes of the creature produced from thoſe eggs; and when one has it in the fly ſtate, there is a ſufficient proof that this ſpecies of fly is oviparous: but it is much otherwiſe in reſpect to the *vivipa-*

rous kinds; ſince when we ſee the multitudes of ſmall fly-worms already living on any of theſe ſubſtances, it is not to be known from all their ſucceeding changes, whether they were produced from the body of the parent-fly in that ſtate, or as eggs.

To diſtinguiſh with certainty, whether a fly be oviparous or *viviparous*, the beſt means is certainly to obſerve it in the inſtant of its producing its eggs, or young ones, which ever they are; but as that is a moment not eaſily ſeized, its place may be ſupplied either by opening the body of a female fly, diſtended and full of eggs or young, and the arrangement and form of the bodies contained, will eaſily determine the obſerver, whether he is to look on them as eggs, or embryo-animals: But a yet more certain way is to take a fly which appears ready to depoſit its future progeny, and ſqueezing its body, force out a part of what would naturally have been thrown out in a little time, and it will be eaſy to ſee whether theſe are eggs or worms.

It is eaſy to find about our houſes one of theſe ſpecies of *viviparous* flies; the creature is always buzzing about the places where meat is kept, and loves to depoſit her young as the common blue fleſh-fly does its eggs, on meat. Its way of carrying its wings is the ſame with that of the blue fly, and its antennæ are of the ſame form. It at leaſt equals the blue fly in length, but its body is leſs thick, and is a little bent at the hinder part; its colour is grey. On the corcelet this colour ariſes from a ſeries of long but irregular aſh-coloured lines ranged on a brown ground: A ſimilar colour is alſo ſeen on the upper part of the rings of the body; but the grey ſpots here are much ſhorter than on the corcelet, and almoſt ſquare, and the colour between theſe is a ſhining brown, which, in ſome lights, has a caſt of blue. Its legs are black; its petty wings whitiſh; and its reticular eyes reddiſh.

When a female of this ſpecies is taken on meat, and has not too flat a body, one may always expect the ſucceſs of an attempt to find that ſhe is big with living young. Taking a fly of this kind, and in this ſtate, between ones fingers, and obſerving its hinder part, one ſhall uſually ſee a ſmall and ſomewhat cylindric oblong body thruſt itſelf out, and move from ſide to ſide, and ſometimes make many ſinuoſities; this will be found to become more and more long, as it is more and more diſengaged from the body of the fly, and is indeed no other than a worm now firſt appearing, and endeavouring to diſengage itſelf from the body of its parent; a few moments now ſets it at liberty; and it is no ſooner fallen off, than the end of another like worm appears at the ſame apperture, and in a few moments gets its liberty, as the former did; this is ſucceeded by another, and ſo on for ten, twenty, or ſometimes many more; and when the creature ſeems to have done producing them, the ſlighteſt preſſure on the belly will ſend out numbers more, and ſometimes two or three are, by this means, forced out at the paſſage together. The aperture is naturally large, through which they are to paſs, and is, beſide this, capable of great extenſion.

It is uſually the head of the worm that firſt makes its appearance; but this is not always the caſe; and eſpecially where external preſſure has been uſed, 'tis not uncommon for the hinder part of the worm to appear firſt; and when many of them have, by this means, been forced out together, and the paſſage by this means is become enlarged, 'tis no uncommon thing for a number of them coming out together, to bring with them a part of the membrane in which they had been encloſed, while in the body of the parent-fly.

The conſideration, however, of the many animals of the inſect claſs, which are often found to breed and nouriſh in their bodies worms, not their own offspring, but that of the eggs of other inſects lodged in their fleſh, and eating them up alive, might lead one to doubt whether theſe worms, inſtead of being the genuine offspring of the fly, were not a ſet of cruel enemies which had been long devouring and preying on its entrails; and what might ſomething favour this opinion, is, that the fly uſually dies ſoon after it has finiſhed its depoſiting them. But there needs no more to refute this error, than to give theſe new-born worms ſome meat; the eagerneſs with which they bury themſelves in it, is a proof of their being in a condition to eat, and that greedily; whereas the worms bred in the bodies of inſects, from the eggs of other creatures, when they leave the body of the creature, have no farther occaſion for food, but have nothing to do but to prepare for their transformation. On the other hand, if one continues to obſerve theſe worms produced from the fly, one ſhall find that they behave in all reſpects like thoſe produced from the eggs of the blue fleſh-flies; they eat the meat to a certain time; then having obtained their full growth, they leave the ſubſtance they had fed on, and run into the earth, where they are afterwards found in form of nymphs, encloſed in a ſhell made of their own ſkin; and, at proper diſtances of time, there are produced from theſe, flies male and female; the latter, in all reſpects perfectly like the parent-fly, from whoſe body the worms had been ſeen to come.

There are, beſide this ſpecies, two other of the *viviparous* flies, which are not uncommon. Both theſe, in a great meaſure, reſemble the former; but their bodies are ſhorter; and, in the whole, they much more than the other approach to the form of the blue fleſh-fly. They are alſo ſmaller than the former ſpecies; the one of them, however, on the whole, is not much ſo, and, though ſhorter, yet is much thicker both in the corcelet and body. They are both, though ſmaller than that kind, yet tolerably large flies, and are bigger than the common horſe-fly.

On the leaves of ivy alſo there are often ſeen, about autumn, two other ſpecies of *viviparous* flies, which are eaſily diſtinguiſhed from all the others. Thoſe of one of theſe ſpecies are larger than the great blue fleſh-fly, and have a ſhorter and thicker body than that kind. The manner of carrying the wings is alſo the ſame in both; but though both have antennæ of the battledore kind, yet they are evidently diſtinguiſhed by this, that the extremities of the one are lenticular, and thoſe of the others priſmatic. Near the origin of each wing theſe have a browniſh ſpot, as have thoſe oviparous flies which uſually have in their body only two large eggs at a time, and which are produced of the yellow worms, ſo common in cow-dung. But theſe *viviparous* ones differ from thoſe flies, in that they are larger, and of a deep, but dead brown; whereas the others are black, or nearly ſo.

The other ſpecies is not much unlike this in form, but is ſmaller, being not more than of the bigneſs of the blue fleſh-fly, and of a bluiſh black; ſo that it might eaſily be miſtaken for one of the common fleſh-flies, were it not for the two brown ſpots at the inſertion of the wings; and both this and the former ſpecies are plainly diſtinguiſhed from the cow-dung-fly before deſcribed, by their wanting the gold-coloured down which that has on the fore-part of its head. *Reaumur*, Hiſt. Inſect. vol. 4. p. 405. ſeq.

ULCER (*Cycl.*)—*Callous* ULCERS. The cure of callous *Ulcers* is attended with very great difficulties, and indeed no cure is to be expected, till the callus is perfectly extirpated. This is to be done three ways; the mildeſt of theſe, which is ſuited to recent calluſes, and ſuch as are not yet become very hard, is by means of corroſive medicines, and of theſe the milder kinds are often ſufficient; burnt alum either rubbed on the parts alone, or applied with an equal part either of the common digeſtive or baſilicon, will ſometimes anſwer this purpoſe in theſe caſes, as will alſo the Ægyptian ointment, to which a ſmall quantity of red precipitate may be added occaſionally. If the callus will not yield to theſe remedies, it muſt be attacked with the common cauſtic, or with butter of antimony, or with a ſolution of quickſilver in ſpirit of nitre.

Another mild method of extirpating calloſities we are alſo taught by Le Dran. This author adviſes to apply, for four or five days, a plaſter made of the diachylon with the gums, and the mercurial plaſter, with a quadruple proportion of mercury, mixed in equal quantities; this is to be renewed morning and night, in order to ſoften the callous lips as much as poſſible; after this he makes numerous inciſions, ſo deep as to paſs quite through the ſubſtance of the callus, and ſtops the blood which flows from theſe with dry lint; then the ſame plaſter is again applied, and ſo laid on, that it may touch the naked inciſed lips. After about four days of this treatment, the ſcarifications are again repeated, and this to a third or fourth time, if the calloſity be not before deſtroyed.

If callous *Ulcers* are attended with fiſtulous ſinuſes, theſe muſt always be laid open, before we can attempt to deſtroy the callus, with any probability of ſucceſs; after this they may be cured as before directed; or, if the uſe of the knife be not ſafe, or the patient dreads it too much, it will be proper to form tents, and thruſt them up the ſinus, firſt anointing them with the Ægyptian, or with Wurtz's brown ointment. By theſe methods a callus, that is not of long ſtanding, may be extirpated; if the ends of the tents, laſt mentioned, be touched with butter of antimony, red precipitate, or the infernal ſtone, the buſineſs, in that method, will be the more eaſily effected; and, in caſes of this kind, where the callus cannot be reached by the corroſive end of the tent, it is a very good method to inject into the ſinus either the phagedenic-water, or a ſolution of the Ægyptian or brown ointment in ſpirit of wine. The opening of the ſinus ſhould be then cloſed, to keep in the injection as long as may be, and the operation frequently repeated.

Sometimes, however, it is found abſolutely neceſſary to uſe the knife, as in callous *Ulcers*, or fiſtulæ, that are of very long ſtanding, and that have formed variety of ſinuſes, and when either nothing can be done by corroſive medicines, or elſe that they tear and corrode the nerves, and bring on convulſions, and other bad ſymptoms, before they affect the callus. In theſe caſes the beſt and ſafeſt way is to lay open the ſinus, taking care not to wound the nerves, tendons, and arteries; and, after that, all the calluſes may be eaſily deſtroyed by the common methods. Finally, if even this method ſhould not have the deſired effect; and if the patient has a conſiderable ſhare both of ſtrength and courage, and the ſituation of the nerves and arteries is favourable, the callus parts muſt be all either entirely cut out with the knife, or burned away by the actual cautery. This operation, though a very painful one, is attended with this great good conſequence, that it will reduce the moſt inveterate callous *Ulcer* to the ſtate of a freſh wound; and unleſs a caries, or bad habit of body, or the pox, ſcurvy,

ſcurvy, or dropſy, or ſome other conſtitutional complaint, be in the way, it may be cured as eaſily as a freſh wound. *Heiſter*'s Surgery, p. 251.

Cutaneous Ulcers. Such of theſe as attack the ſkin of the face, both in infants and adults, approach very much to the nature of the truly phagedenic *Ulcers*; for they, like thoſe, ariſe from an acrimony of the blood, and are very apt to ſpread abroad.

In both theſe caſes therefore purging medicines, with ſuch as ſweeten the blood, will always prove of ſervice. Decoctions of the woods, or of the ſharp-pointed dock root, or the herb fumitory, ſhould be drank on theſe occaſions, half a pint at a draught, as hot as can well be borne, three or four times a day. And ſome of theſe draughts ſhould be taken in bed, and a gentle ſweating be promoted for ſome time afterwards. And abſorbent and ſweetening powders; as thoſe prepared from antimony and flower of brimſtone, ſhould be taken at the ſame time. When this caſe happens to infants at the breaſt, they can only take ſome ſlight doſes of medicines to open the bowels; but the mothers or nurſes ought to be enjoined the regimen juſt mentioned.

In regard to the external applications, oil of tartar per deliquium will be found of great ſervice; a pencil or feather is to be dipped in this, and rubbed over the parts three or four times a day. This may either be thus uſed alone, or elſe mixed with oil of eggs and wax, and a plaſter laid over it, of the de minio, or any other of the lead plaſters, or one of ſperma ceti and camphor.

If the whole face be affected, which in infants is not unfrequently the caſe, a plaſter would prove highly troubleſome; but, in this caſe, the proper ingredients may be ſpread in a ſofter form over a linnen maſk. Lime-water is a medicine of great power and value alſo in theſe caſes, as is likewiſe the water uſed in the waſhing diaphoretic antimony. The *Ulcers* may very properly be waſhed with either of theſe, and the litharge or pompholyx ointment afterwards applied; to which, in very ſtubborn caſes, a little crude mercury may be added; and ſometimes a ſmall admixture of red precipitate is found neceſſary; and finally, if theſe *Ulcers* are attended with a large and foul diſcharge, it will be proper to ſprinkle them with ſome of the abſorbent powders, as tutty, lapis calaminaris, cerus, chalk, or the like, mixed up occaſionally with a little native cinnabar, or red precipitate; or, if it be found more convenient, theſe powders may conveniently enough be made into an ointment with cream. *Heiſter*'s Surgery, p. 247.

Fiſtulous Ulcers. When it is diſcovered, either by the eye or probe, that *Ulcers* are become fiſtulous, though the fiſtulæ or ſinuſes are not yet become callous, the readieſt way of curing them is by laying them open, if that can be conveniently done, down to the bottom with the knife, and after this they may be cleanſed and healed. As patients, however, are always averſe to the knife, the cure of theſe may be attempted by injecting them with the decoctions of vulnerary herbs, ſuch as agrimony, birth-wort, or ladies mantle, and dreſſing them with digeſtive ointments or lint. Many ſurgeons are, in theſe caſes, fond of thruſting their dreſſings to the bottom of the ſinus with tents; but they are very apt to do miſchief by their hardneſs, and too great length, often bringing on a callus, inflammation, or too great flux of humours on the part. They ought therefore either wholly to be laid aſide, in theſe caſes, or elſe to be made as ſoft and as ſhort as the nature of the caſe will admit. The next particular, in the cure of theſe fiſtulous ſinuſes, is to preſs the fundus as near to the mouth or opening as poſſible; and when the wound is cleanſed, and the proper dreſſings applied, a ſmall compreſs, or a ſlip of plaſter, doubled up in the form of a ſmall compreſs, muſt be laid on the part where the fundus, or bottom of the fiſtula, is judged to be ſeated, ſecuring all on by a larger compreſs, and the proper bandages. In rolling up, in theſe caſes, the proper method is always to place the beginning of the roller upon the fundus of the fiſtula, or at leaſt to make the preſſure tight upon that part; the continuation of this will urge the contained matter up toward the opening, and the fundus, or bottom of the ſinus, will naturally be the firſt part that heals. When theſe ſinuſes penetrate ſo deep, that there is no coming at their bottoms with the dreſſings, vulnerary injections muſt be frequently uſed; and, of theſe, none are more ſerviceable in theſe caſes, than the following: Take of the common digeſtive, prepared with turpentine, diſſolved in the yolk of an egg, an ounce and half; honey, either ſimple, or the honey of roſes, or of celandine, an ounce; common-proof ſpirit, nine ounces; mix theſe together for an injection. Or take of a decoction of ſcordium, or elſe of ſouthern-wood or agrimony, eight ounces; common-proof ſpirit, three ounces; elixir proprietatis, or eſſence of myrrh and aloes, one ounce; honey of roſes, two ounces; mix all together. Theſe are to be injected at every dreſſing, and the opening of the fiſtula muſt afterwards be kept cloſed, to keep them in its cavity for ſome time, which will much haſten the agglutination of the part. If this method of cure does not ſucceed, recourſe muſt at laſt be had to the knife; and, indeed, in very many of theſe caſes, there is no great probability of relief from any other means, particularly where the fundus lies directly downward, or where the fiſtula takes ſuch an irregular courſe, that the fundus of it cannot, with any ſucceſs, be preſſed toward the opening. In this caſe there is no relief to be had, but by laying it open to the bottom. To do this, a grooved probe, or director, ſhould be gently paſſed down the fiſtula, and then directing the knife along the groove, the fleſh, and common integuments, are to be laid open, as far as is ſafe and neceſſary; a free paſſage is, by this means, given to the corrupted matter, and the part may be come at with the proper dreſſings. If the opening is attended with a large diſcharge of blood, as is frequently the caſe, the wound muſt be, at the firſt dreſſing, filled with dry lint, and afterwards it is to be dreſſed with the common digeſtive, with a ſmall mixture of the Ægyptian ointment, or with a little red precipitate, till the wound is perfectly cleanſed, and it may then be eaſily healed in the common way. *Heiſter*'s Surgery, p. 244.

Putrid Ulcers. When *Ulcers* become putrid or fetid, this accident ariſes either from a very bad habit of body in the patient, or elſe from the negligence and unſkilfulneſs of the ſurgeon.

The acrimony of the blood is by all poſſible means to be taken off in theſe caſes, and the *Ulcer* to be frequently dreſſed, and every time thoroughly cleanſed. When wounds are dreſſed but ſeldom, as will be the caſe after the ſharp engagements in an army, where great numbers have been wounded, it cannot happen, but that the injured parts, in many patients, will be annoyed with heat, putrefaction, and worms.

To prevent and remedy theſe, the wounds muſt be dreſſed with the Ægyptian ointment, mixed with Wurtz's brown ointment, or the phagedenic water may be uſed with great ſucceſs, as alſo red precipitate, either alone, or mixed with burnt alum, or with the common digeſtive. Theſe applications are to be continued till the fungous fleſh ſeparates from the bottom of the *Ulcer*; and while this is doing, it will be very proper to cover the part with lint, dipped in ſpirit of wine, which is a very powerful remedy againſt putrefaction.

When the putrid parts are caſt off, the cure will be perfected by the common means uſed in *Ulcers*; and where there are worms bred in the *Ulcer*, no particular cautions need be given againſt them, ſince the ſame applications anſwer the purpoſe, whatever reſiſts putrefaction, will alſo be found to deſtroy worms. *Ulcers* ſometimes prove, however, ſo very malign and obſtinate, that they will give way to none of theſe remedies; and in theſe caſes, though there be nothing venereal at the bottom, yet the only relief ſeems from a ſalivation. *Heiſter*'s Surgery, p. 248.

Running Ulcers. When ſtubborn *Ulcers* are attended with a large diſcharge, there is reaſon to apprehend that the blood abounds with too large a quantity of a thin acrimonious ſerum. This cannot be drawn off any way more properly than by cathartic medicines; theſe and diuretics are to be repeated as often as the ſtrength of the patient will conveniently permit, and he muſt be particularly cautioned againſt drinking too freely.

Millepedes, in any form, are very properly preſcribed to be taken internally in theſe caſes, as are alſo the eſſence of amber, myrrh, balſam of Peru, tincture of ſalt of tartar, tartarized tincture of antimony, and the like; large and frequent draughts of ſmall liquors are frequently the cauſe of theſe diſorders, and are therefore moſt carefully to be avoided; ſtrong ale, or old wine, ſhould be drank ſparingly at meals, and nothing between them.

Such meats are beſt, on theſe occaſions, as have feweſt juices in them, and are very well roaſted, and the external medicines muſt be thoſe which have the greateſt reputation as dryers.

The principal of theſe are lime-water, lapis calaminaris, tutty, chalk, maſtic, frankinſence, colophony, and native cinnabar; when any of theſe have been ſprinkled in fine powder upon the *Ulcer*, a plaſter of diapompholygos, or the like, is to be laid over it. *Heiſter*'s Surgery, p. 246.

Venereal Ulcers. Theſe are almoſt always ſituated either in the groins, after the ſuppuration of venereal bubo's, or elſe in the prepuce, frænum, or glans penis, which is uſually termed a *chancre*. In females they are frequently ſituated in the vagina, or labia pudendi, and in either ſex ſometimes in the noſe, palate, lips, fauces, tongue, and uvula; and ſometimes the os frontis, and other bones both of the head, and other parts of the body, are ſubject to them.

The great intention, in theſe caſes, is to expel the venereal poiſon by proper remedies; for one *Ulcer* of this kind, if neglected or ill-treated, will produce an univerſal pox. The internal medicines are principally calomel, mixed with purging medicines; and in the intermediate times, decoctions of the woods, with tincture of antimony, and the like; theſe laſt are to be taken before riſing in the morning, to bring on a gentle ſweat, and may be repeated afterwards many times in the day. A ſtrict regimen of diet ought alſo to be obſerved; wine, and all vinous or ſpirituous liquors, are to be forbidden, and all aromatics, ſpices, ſalt, and acrimonious or acid things, are poiſon to perſons in theſe caſes: If ſuch a regimen, and a courſe of theſe medicines, will not effect a cure, ſuch quantities of mercury muſt be ſent into the blood, as will raiſe a ſalivation, by which both the *Ulcers* and the pox, which was the cauſe of them, will be cured at the ſame time. When the

Ulcers are ſituated in the mouth, uvula, fauces, or tongue, the patient ſhould frequently uſe a gargle, made of decoctions of the woods, and ſweetened with honey of roſes, and the *ulcerated* part ſhould be frequently touched with honey of roſes, acidulated with ſpirit of vitriol, and, after this, they may be healed with eſſence of myrrh, amber, or with oil of myrrh made per deliquium.

When the *Ulcers* are on the external parts, they muſt be dreſſed either with the common digeſtive, or with baſilicon, with red precipitate mixed in them; and theſe dreſſings are to be covered, and kept on by a mercurial plaſter; and when they are thoroughly cleanſed, they may be healed in the ordinary way.

Another excellent medicine for cleanſing theſe *Ulcers*, is the phagedenic-water, or, in its place, lime-water, impregnated with calomel; either of theſe may be applied every day many times, and the parts may be, when neceſſary, touched with the cauſtic; and when they are thoroughly cleanſed, they may very ſucceſsfully be healed, either with an ointment made only of crude mercury mixed with turpentine, or with the following: Take of the diapompholygos ointment, and crude mercury, killed with a ſmall quantity of Venice-turpentine, of each equal quantities; mix them in a glaſs mortar into an ointment, or take of the amalgama of lead and tin an ounce, of bole armenic two ounces; mix theſe, and make them into an ointment, by mixing with them a ſufficient quantity of ointment of roſes, or any other ſimple ointment, in a glaſs mortar. If there be at the ſame time a caries of the bone, which is indeed too frequently the caſe, that is to be dreſſed with euphorbium, oil of cloves, phagedenic-water, or ſpirit of nitre with quickſilver diſſolved in it; or, if it can conveniently and ſafely be done, the actual cautery is of ſignal ſervice.

Sometimes, when theſe *Ulcers* fall on a ſoft part of the body, as the groin, they throw out continually ſo large a quantity of lymph, that all the medicines that can be invented or applied, are of no conſequence to ſtop it. This accident is occaſioned either by the rupture or eroſion of ſome of the lymphatic veſſels. In this caſe the ſurgeon ought to try what can be done by proper compreſſes, and a tight bandage; but when theſe, and the other milder applications are of no ſervice, the actual cautery muſt be employed, but with great care and caution to the vitiated parts.

If venereal *Ulcers* of the penis and glans are negligently or unſkilfully treated, an univerſal pox is very frequently the conſequence; the urethra will, in theſe caſes, be often perforated in various places, and the urine will be diſcharged through it, as through a ſieve; and ſometimes the whole glans, or penis itſelf, will be either totally eaten off, or ſo miſerably affected with ſchirruſes and cancers, that the ſurgeon is obliged to extirpate them with a knife. When the noſe is affected by theſe *Ulcers*, it is very frequently entirely demoliſhed by them; ſometimes the palate, with its bones, are ſo eroded and perforated, that an open communication is made between the mouth and noſtrils, and the fluid part of the aliment, in eating, is thrown out by the noſtrils. Theſe paſſages can ſcarce ever be perfectly covered again by fleſh; but when the extremities and edges of them are healed, they may be cloſed with a ſmall plate of ſilver or gold. The tonſils alſo, the external coat of the uvula, and frequently the whole uvula itſelf, are alſo deſtroyed by the virulence of theſe ulcers: And laſtly, the cranium itſelf, particularly the frontal bone, is frequently ſo eroded and perforated by a caries, that the brain lies bare, and the motion of the pulſation of the arteries may plainly be ſeen. 'Tis no wonder if the worſt of ſymptoms, and even death itſelf, follow this, if neglected, or improperly treated. *Heiſter*'s Surgery, p. 249.

ULCERS *of the Head.* See the article HEAD.

ULCERS *in the Leg.* See the article LEG.

ULEX, in botany, the name by which Linnæus calls the plants named by Tournefort and other botaniſts, *geniſta ſpartium. Linnæi* Gen. Plant. p. 348. See the article GENISTA *Spartium.*

ULMARIA, *Meadow-Sweet*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the roſaceous kind, conſiſting of ſeveral petals, diſpoſed in a circular form. From the cup there ariſes a piſtil, which finally becomes a fruit, compoſed of ſeveral ſmall capſules arranged together in form of a head, each of a crooked ſhape, and each containing one ſmall ſeed.

Mr. Tournefort allows no other ſpecies of this genus, beſide the common *Ulmaria. Tourn.* Inſt. p. 265.

ULMUS, the *Elm*, in botany, the name of a genus of trees, the characters of which are theſe: The flower is of the campaniform kind, conſiſting of one leaf, and containing a great number of ſtamina. The piſtil ariſes from the bottom of the flower, and finally becomes a membranaceous or foliaceous fruit, of a heart-like ſhape, in the center of which there is placed a pear-faſhioned capſule, which is alſo of a membranaceous ſtructure, and contains a pear-faſhioned ſeed.

The ſpecies of *Elm*, enumerated by Mr. Tournefort, are theſe: 1. The common *Elm.* 2. The broad and rough-leaved *Elm.* 3. The leſſer *Elm*, with narrow and rough leaves. And 4. The ſmooth-leaved *Elm. Tourn.* Inſt. p. 601. See the article ELM.

ULNA (*Cycl.*)—*Cartilages of the* ULNA. The two ſigmoide cavities, in the upper extremity of the *Ulna*, are covered by a cartilage common to both, which is a little interrupted about the middle of the edges of the cavities, by the tranſverſe notches in this part of this bone. The inferior extremity, or ſmaller head of the *Ulna*, is cruſted over by a cartilage round its cylindric border, in the notch near the ſtyloide apophyſis, and for ſome ſpace on the apophyſis itſelf. The cartilage which covers the head of the radius, is alſo ſtretched over the cylindric border thereof, and the lateral portion of the muſcular tuberoſity immediately below the neck, is alſo covered by a thin ſhining cartilage. The lateral half-grooves or channels, at the baſis of this bone, appear likewiſe to be cruſted over with a cartilaginous matter: But this may poſſibly be only from portions of the annular ligaments. *Winſlow*'s Anatomy, p. 140.

ULNARIS *Externus*, (*Cycl.*) a long muſcle, lying on the outſide of the fore-arm, fleſhy toward the os humeri, and tendinous toward the carpus.

It is fixed above to the external condyle of the os humeri, being there united to the anconæus minor, to the annular ligament of the head of the radius, and to the upper half of the external angle of the *Ulna*; from thence it advances and forms a tendon, which paſſes through the external notch, at the lower extremity of this bone, on one ſide of the ſtyloide apophyſis. The tendon, after having paſſed under a particular ligament, ſituated near the os cunieforme of the carpus, is inſerted in the outſide of the baſis of the fourth metacarpal bone; ſending ſome tendinous filaments to the baſis of the little finger; it is likewiſe often fixed in the baſis of the third metacarpal bone. *Winſlow*'s Anatomy, p. 192.

This muſcle is alſo called *cubitalis externus*, and it is named by Cowper, *extenſor carpi ulnaris.*

ULNARIS *Graciiis*, a muſcle called by ſome, *palmaris longus.* It is a ſmall muſcle, lying between the os humeri and the carpus, on the inſide of the fore-arm.

Its body is ſmall and ſlender, and its tendon very long and flat. It is fixed by its fleſhy portion in the ſmall cryſta of the inner condyle of the os humeri, ſometimes cloſely united to the *ulnaris internus*; from thence it runs down fleſhy for ſome ſpace, turning a little obliquely toward the middle of the fore-arm, and ends in a long narrow thin tendon. This tendon paſſes down the middle of the fore-arm, over all the other muſcles, to which it ſlightly adheres, and advancing over the large internal annular or tranſverſe ligament of the carpus, is inſerted in the ſurface thereof, ſending off ſome radiated filaments to the aponeuroſis palmaris. This muſcle is ſometimes fixed to the condyle of the os humeri, by a tendon about a finger's breadth in length, to which the fleſhy body joins toward the middle of the fore-arm. The inferior tendon is alſo ſometimes inſerted in the os ſcaphoides of the carpus, without communicating with the large annular ligament; and ſometimes the aponeuroſis palmaris ariſes from this ligament. From all which variations it may reaſonably be concluded, that that aponeuroſis has no eſſential dependance on this muſcle; and ſometimes this muſcle appears to be only a production from the *ulnaris internus. Winſlow*'s Anatomy, p. 193.

ULNARIS *Internus*, a long muſcle, fleſhy at its upper extremity, and tendinous at the other, ſituated on the outer part of the *Ulna.* It is fixed in its upper part, in the backſide of the long or internal condyle of the os humeri, in that part of the olecranium which is next the condyle, along the upper half of the *Ulna* very nearly, and to the middle common tendon of the neighbouring muſcle, commonly termed the *profundus.* It runs in the direction of the external angle of the *Ulna*, and ends by a long tendon in the os piſiforme, or orbiculare of the carpus, reaching likewiſe to the os unciforme, being united to the ligament common to theſe two bones. *Winſlow*'s Anatomy, p. 191.

This muſcle is alſo called *cubitalis internus*, and is named *flexor cubiti ulnaris* by Cowper.

ULOPHONUS, in botany, a name given by the antients to a poiſonous plant, ſince called the *chamæleon thiſtle*, and even at that time known to Dioſcorides, Galen, and others, under the name of the *black chamæleon thiſtle.* The white plant of the ſame name, or the *ixias chamæleon*, ſo called from its yielding a gum like maſtic, but of a viſcous texture while moiſt and freſh, was an eſculent plant.

The antients have taken great care, in all their writings, to expreſs which of the two chamæleon thiſtles they mean, when they uſe the word; but the giving it an abſolutely diſtinct name, or preſerving to it the name chamæleon, and giving to the black kind an appellation wholly different, ſuch as this of *Ulophonus*, mentioned by Pliny, ſeems much better than the diſtinguiſhing them by epithets, which we find, however well underſtood at the time when they were uſed, never proved ſufficient to prevent errors and confuſion in after-writers. See the article IXIAS.

ULPHA, a term uſed by ſome authors to expreſs the muddy ſubſtance which falls off from whetſtones, grindſtones, and the like, which is ſometimes ordered in medicines among the chemical

chemical writers, and is only the communicated particles of the ſtone, with a very ſmall portion of iron abraded from the things ground on them.

ULPICUM, in botany, a name by which Columella, and ſome other authors have called the *allium*, or garlick. *Ger.* Emac. Ind. 2.

ULRACH, a name given by ſome writers to the *ſanguis draconis*, or dragon's blood.

ULVA, a name given by ſome botanical authors to a genus of imperfect plants, conſiſting of the common oyſter-green, the ſea-chitterling, and the like, which have been ſince called by Dillenius, *tremellæ*. See the article TREMELLÆ.

The word *Ulva* is frequent in Latin authors; but its ſignification has been much controverted. Some have been of opinion that it expreſſed the Cyprus graſſes, others the cat's-tail, and others other particular plants; but it rather ſeems that the antients uſed it as a word expreſſive of all plants that grew by river or water-ſides; Pliny, having called the ſagitta, or water-arrow-head, one of the *Ulvæ*; and others, having expreſſed the bur-reed, ruſhes, and many of the common water-plants, very different from one another, by the ſame name. Bauhine makes the *Ulva* a purple ſea-moſs allied to the alga. *Dillen.* Hiſt. Muſc. p. 4.

It is ſuppoſed by ſome, that *Ulva* is a name uſed by the antients for the hop; but it happens only in one author, that is, Cato[a], and there is certainly owing to an error of the preſs, not to any intention of the author. He mentions the hop as a plant climbing upon the willows, and by its branches affording a good ſort of litter for cattle; and this by the name of *Ulva*; but as the word appears in no other author, it is reaſonable to ſuppoſe, that it is an error of the copiſts for *upulus*, which was the old name for the hop, the adding of the initial L being only of later times. Pliny, in the ſame manner, calls the hop *lupus*, by a like error of the tranſcriber.—[a *Cato* de Re Ruſt. c. 38.]

ULULA, in zoology, the name of the grey owl, called alſo *ſtrix cinerea*. It is a very light bird for its ſize, being very thick covered with feathers, and has a ridged circle of feathers, compoſed of two rows, round its face. And there is, within this, another greyiſh circle, compoſed of ſlenderer and more diſtant plumes, which ſurround the eyes. It is of a mottled colour, mixed of a grey and brown, and is feathered nearly to the feet. It has alſo ſeveral long black ſtreaks on the breaſt, and the inner circle of the face is variegated with no other colours than brown and white. *Ray*'s Ornithol. p. 66.

UMBER (*Cycl.*)—UMBER, or OMBER, in zoology, an Engliſh name for a fiſh of the truttaceous kind, more commonly called the *greyling*, and by the authors in ichthyography, *thymallus*, a freſh-water fiſh of a very fine taſte. *Willughby*'s Hiſt. Piſc. p. 187. See the article THYMALLUS.

UMBER, in natural hiſtory, an earth of the ochre kind, uſed in painting. It is found in Ægypt, Italy, Spain, and Germany; but what we have brought into England is principally from different parts of the Turkiſh dominions. But it might be found in conſiderable plenty alſo in England and Ireland, if properly looked after, ſeveral large maſſes of it having been thrown up in digging on Mendip-hills in Somerſetſhire, and in the county of Wexford in Ireland.

The characters by which it is known from other earths, are theſe: It never conſtitutes a ſtratum of itſelf, as the generality of other earths do, but is found ſometimes in ſmall lumps among gravel, and other looſe matter, and ſometimes in the perpendicular fiſſures of the ſolid ſtrata. It is of a cloſe compact texture, yet very light, of a ſmooth ſurface, and of an elegant pale brown, in different degrees. It is ſmooth and ſoft to the touch, and adheres firmly to the tongue, breaks eaſily between the fingers, and ſcarce at all ſtains the hands, and makes no fermentation with acids. *Hill*'s Hiſt. of Foſſils, p. 63.

UMBILICAL (*Cycl.*)—UMBILICAL *Vein*. Dr. Trew aſſerts contrary to Caſſerius, that the *umbilical* vein enters the liver towards the left part of it; and that there is but one *umbilical* vein, which empties itſelf into the left extremity of the *ſinus venæ portarum*, and ſends no branches to the liver. See Phil. Tranſ. N°. 457. Sect. 7.

Dr. Trew endeavours to ſhew how, after birth, the *umbilical* veins and arteries, ſeparating from the navel, gradually retract within their ſheaths, which they have from the peritoneum; and leave the ſides of the ſheath to grow together, as the ſides of the remains of the veſſels alſo do. Hence he infers, that the hæmorrhages, which ſometimes happen at the navels of adults, muſt not be from the *umbilical* veſſels, but from ſome other. Commerc. Norimb. 1737. Hebd. 13 §. 1.

UMBILICUS *Marinus*, a name given to a ſmall oval body of a ſhelly matter, from its reſemblance to the human navel. It is properly the operculum of a ſhell-fiſh, ſerving to cloſe up the aperture of the ſhell in the buccinum, and other turbinated ſhells; and to that purpoſe it is fixed to the anterior extremity of the body of the animal; ſo that when it retracts its body into the ſhell, this naturally fills up the mouth of it: it is convex on one ſide, and flat on the other; the convex ſide is plain and white; the flat ſide is yelloviſh or reddiſh, and marked with a ſpiral line.

It is ſaid by authors to have great virtues as an abſorbent and aſtringent; but is not uſed at preſent in the ſhops, though it holds a place in the catalogues of the materia medica, as well of our own as other nations. *Pitiſc.*

UMBINUS, among the antients, a kind of coin current in Gallia Narbonenſis.

UMBLA, or, as ſome write it, UMBRA, in zoology, the name of a fiſh of the truttaceous kind, and nearly allied to the ſalmon. There are four ſpecies of this fiſh mentioned among naturaliſts; but the *Umbla prior* and *Umbla altera* of Rondeletius, which are two of them, ſeem only to be the different ſexes of the ſame fiſh. Theſe are conſiderably large, very like the common ſalmon, but have blue backs and yellow bellies. The third is the fiſh commonly called the *ſalvelin*. See the article SALVELIN. And the fourth is the red charre. *Willughby*'s Hiſt. Piſc. p. 198. See the article CHARRE.

UMBO, in antiquity, the round protuberant part of a ſhield. See the article SHIELD, *Cycl.*

UMBRA (*Cycl.*)—UMBRA, in ichthyography, the name of a ſea-fiſh caught in the Mediterranean, and brought to the markets in Italy and other places; called by ſome *chromis*, and by the Venetians *corvo*.

Its uſual ſize at market is about twelve or fourteen inches in length; but it grows to ſixty pound weight, and to the length of five or ſix feet. It is of a ſomewhat flatted figure, and its back is ridged, and riſes up from the head. It ſomething reſembles the carp in its general figure, but is broader. It is very elegantly coloured, for there are a number of long oblique lines covering its whole ſides, which are alternately of a fine pale blue, and a beautiful yellow. Its ſcales are moderately large, and its coverings of the gills, and great part of its very head, as well as its body, are covered with theſe. Its head is moderately large, but its mouth ſmall, and it has a ſingle beard hanging down from its chin. *Rondelet.* de Piſc. p. 182.

UMBRATILIS *Pugna*, the fighting with ones own ſhadow. This was one of the kinds of exerciſe much recommended by the antient phyſicians; they ordered the perſons who uſed it, not only to box, but wreſtle, with his ſhadow; that is, not only to uſe his arms, but his legs alſo; and often to put themſelves into a leaping poſture, and throw their bodies violently forward, and often to retreat haſtily backwards. The cuſtom ſeems to have been of antient date; Plato expreſsly mentions it; and St. Paul ſeems to allude to it in that paſſage where, glorying in the reality of his conflicts, he ſays, he does not fight as one who beats the air. The phyſicians greatly recommended this exerciſe to people of ſedentary lives, and to thoſe who had weak nerves, and were afflicted with tremors. They eſteemed it uſeful alſo in diſeaſes of the kidneys, and of the thorax.

UMBRINO, in zoology, a name uſed by ſome authors for the *coracinus*, or *umbra*, as ſome call it. The *Umbrino* has by ſome been eſteemed a diſtinct ſpecies of fiſh from the coracinus; but they ſeem to differ no other way than as the one is the older, the other the younger fiſh. *Willughby*'s Hiſt. Piſc. p. 330.

UMBUNCULUS, in natural hiſtory, a name given by antient authors to the ſmall prominences in the ſurface of certain ſtones. It was originally derived from the word *umbo*, which expreſſes the prominent knob, or round lump in the center of a ſhield; and its firſt uſe that we find in the naturaliſts, is, in expreſſing a very ſimilar thing; that is, the prominent part of the zmilampis. This was a ſtone of the nature of what we call *oculus beli*, or *bellocchio*, and was of a white ground, and roundiſh figure, ſomewhat reſembling an eye. It was found in the Euphrates, and other rivers, and had always an *Umbunculus* of a glaucous or bluiſh colour. This *Umbunculus* was a prominent round ſpot, ſuch as we ſee in our *oculi beli*, and and call the *pupil*. It was afterwards uſed to expreſs the inequalities on the ſurfaces of flints and agates, which frequently are roundiſh and obtuſe, and repreſent a kind of umbones.

UMPLE, in our ſtatutes, ſignifies fine linnen. 3 Ed. 4. c. 5. *Blount.*

UNANNEALED *Bottles*, or BOLOGNA *Bottles*, a kind of *unannealed* glaſs bottles made at Bologna, and many other places, in the year 1742, which, though appearing very ſtrong, yet are to be broken by a fragment of flint, ſcarce larger than a grain of ſand, thrown into them. Acta Eruditor. 1745. p. 81. See the article *Unannealed* GLASS.

UNAROTA, among the antients, a carriage with only one wheel. *Pitiſc.* in voc.

UNCATA, in botany, a name given by ſome authors to the ſtramonium or thorn-apple. *Ger.* Emac. Ind. 2.

UNCEASESATH, in our old writers, an obſolete word, uſed where one killed a thief, and made oath that he did it as he was flying for the fact, and thereupon *parentibus ipſius occiſi juret* unceaſath, *viz.* that his kindred would not revenge his death; or they ſwore, that there ſhould be no contention about it. Leg. Ino. c. 37. *Blount.*

Du Cange derives the word from the negative particle *un*, and the Saxon *ceath*; which laſt ſignifies the ſame with *aſſithment* in the law of Scotland. See the article ASSITHMENT.

UNCERTAIN, in the manege. We call a horſe *uncertain*, that is naturally reſtleſs and turbulent; and is confounded in the manege he is put to; ſo that he works with trouble and uncertainty.

UNCIFORME *Os*, in the carpus, is the fourth bone in the ſecond row; it has its name from the Latin *uncus*, a hook, and is compoſed of a body, and a hooked or uniform apophyſis. This apophyſis, which is one of the four eminences on the concave or inner ſurface of the carpus, is flat, and the hollow ſide of its curvature is turned toward the os magnum. The outer ſurface of its body is rough, and in ſome meaſure triangular; it compleats the convex ſide of the carpus, and, toward the ulna, terminates in a ſmall tuberoſity, which is all the cubical ſide of this bone.

It has three articular or cartilaginous ſides, one radial, one brachial, and one digital. The radial ſide is double, anſwering to the cubital ſide of the os magnum. The brachial ſide is very oblique, ſome part of it being gently concave, the reſt gently convex, anſwering to the digital ſide of the os cuneiforme. The digital ſide is double, or diſtinguiſhed into two halves, by a ſigmoide angular line, for its articulation with the two laſt bones of the metacarpus. *Winſlow*'s Anatomy, p. 84.

UNCINUS, in ſurgery, the name of a ſmall hooked inſtrument ſerving to many purpoſes.

UNCTUARIUM, a room in the antient baths, where people were anointed before they went away.

UNCTORES, among the Romans, ſervants whoſe employment it was to anoint their maſter when he bathed. *Pitiſc.* Lex. Antiq. in voc.

UNCUS, among the Romans, an inſtrument uſed in torturing criminals. It was a kind of club bent and inclined to one ſide. *Pitiſc.* Lex. Antiq. in voc.

UNDE *Nihil Habet*, a writ of dower. *Blount*, *Cowel.* See the article DOTE *Unde nihil habet.*

UNDERWOOD, (*Cycl.*)—In the cutting the *Underwood* of coppices, when the ſtubs are great, they ſhould be ſtubbed up, for they only take up a great deal of room, and ſend up few ſhoots, their cracks and holes letting in water, and uſually half killing them. The taking up theſe ſhould be performed in winter, and the ſpaces they leave will be ſoon occupied by young trees, if not, a long branch of ſome neighbouring tree may be laid down, and will ſoon ſend up a ſufficient ſupply of ſuckers for the place.

In felling the *Underwood*, it is always proper to leave young trees enough. The worſt of theſe may be taken down the next fall, eſpecially if any of them grow near a great tree that will be fit to fell the next ſeaſon, becauſe they may be ſpoiled by its fall. When trees are at their full growth, there are ſeveral ſigns of their decay, as the withering or drying of their top branches; their taking in water at ſome of their knots, their being hollow or diſcoloured, and their making but ſmall ſhoots. If wood-peckers make holes in the body, it is a bad ſign, and according to the appearance of one or more of theſe ſymptoms, it is very proper to cut down the tree before it decays farther. Large and ſpreading trees in coppices are often of more miſchief than advantage, as they ſpoil a great deal of the *Underwood* by their droppings.

The owner of a coppice muſt be very careful when he ſells the wood ſtanding, by the acre, to mark beforehand what ſtandards are to be left, elſe the purchaſer ſeldom fails to cheat him, by felling ſome of them. *Mortimer*'s Huſbandry, vol. 2. p. 69.

UNDETERMINED, in mathematics, is ſometimes uſed for indeterminate. *Maclaur.* Algeb. p. 298. See the article INDETERMINATE, *Cycl.*

UNDIMIA, in ſurgery, the name of a kind of an œdematous tumour, the matter contained in which is glutinous and ropy, like the white of an egg.

UNDULAGO, in natural hiſtory, a name given by Mr. Lhuyd to a ſpecies of fungites found foſſile, and uſually of a ſort of undulated figure. See the article FUNGITES.

UNDULATED *Leaf*, among botaniſts. See the article LEAF.

UNDULATION, (*Cycl.*) in medicine, the term uſed by ſome to expreſs an uneaſy ſenſation in the heart, of an undulatory motion, which may ſometimes be perceived externally.

UNDULATION is alſo a word uſed by ſome authors to expreſs the riſing of the water of the ſurface of the ſea into waves. See the article WAVE.

UNDY, in heraldry. See the article WAVED, *Cycl.* and *Suppl.*

UNEDO, in natural hiſtory, a name uſed by the antients for a fruit which they recommend as cooling and ſub-aſtringent. The generality of the world are lead into a common error of believing this to be the fruit of the arbutus or ſtrawberry-tree. Pliny has given occaſion to this error, by ſaying expreſsly that the *Unedo* is the fruit of the arbutus; but we find this to be contrary to the practice of all the antient Latin writers, who have always called the fruit by the ſame name with the tree, not by a different one. Varro de re Ruſtica, ſpeaking of gathering the autumn fruits, calls them all by the name of the trees; and among them, mentioning the fruit of the arbutus, he expreſſes it in the ſame manner, not by the word *Unedo*, *decerpendo arbutum mora pomaque*: And both Galen and Paulus Ægineta deny the *Unedo* to be the name of the fruit of the arbutus or ſtrawberry-tree, and make it the fruit of the epimelis. Servius explains the word *Unedo* by the fruit of the ſtrawberry-tree; but in this he too raſhly follows Pliny's opinion, and plainly errs from the truth. See the article EPIMELIS.

UNGUENT (*Cycl.*)—UNGUENTUM *Album*, the white ointment, a medicinal preparation, well known by name, and much uſed in families.

The late London diſpenſatory has made very great alterations in it, and indeed given a new ointment under this name; it is there ordered to be made thus: Take oil-olive a pint, white wax four ounces, ſperma ceti three ounces, melt all together with a gentle heat, and ſtir them very briſkly without ceaſing, till they are fully cold.

The ointment, formerly known by this name, had ceruſs, or white lead, for its principal ingredient; but as this is principally intended for frettings of the ſkin, that ingredient was judged dangerous. *Pemberton*'s Lond. Diſp. p. 363.

UNGUENTUM *Baſilicum Viride*, a form of medicine preſcribed in the late London pharmacopœia. It is ordered to be made thus: Take of yellow baſilicon eight ounces, oil of olives three ounces, verdegreaſe in fine powder one ounce, mix the whole into an ointment. *Pemberton*'s London Diſp. p. 366.

UNGUENTUM *Nardinum*. See the article NARDINUM *Unguentum.*

UNGUENTUM *e Pice*, *Tar Ointment*, a form of medicine preſcribed in the late London Pharmacopœia, and ordered to be made in the following manner: Take of tar, and of tried mutton-ſewet, each equal quantities, melt them together, and and ſtrain the whole while it is hot. *Pemberton*'s Lond. Diſp. p. 368.

UNGUENTUM *Saturninum*, a form of medicine preſcribed in the late London Pharmacopœia, and ordered to be made in this manner: Take of oil-olive half a pint, white wax an ounce and half, ſugar of lead, firſt brought to a very ſubtile powder, with ſome part of the oil; then add this to the reſt of the oil, with the wax melted in it, and ſtir the whole till it is cold. *Pemberton*'s Lond. Diſp. p. 369.

UNGUENTUM *Simplex*, a name given in the London Diſpenſatory, to the compoſition commonly called *pomatum*; the manner of making which, is according to the method now univerſally practiſed, delivered there in the following manner: Take of tried hogs-lard two pounds, of roſe-water three ounces; pound the lard with the roſe-water, till they are well mixed; then melt the lard with a very gentle fire, and ſet it by awhile, that the water may ſubſide, afterwards pour out the lard, and leave the water; then ſtir and beat the lard without ceaſing, while it is growing cold, that it may be broke into as light and yielding a maſs as may be; and then add as much eſſence of lemons as will give it an agreeable ſcent. *Pemberton*'s London Diſp. p. 362.

UNGUENTUM *e Sulphure*, *Sulphur-Ointment*. Take of ſimple ointment half a pound, of flower of ſulphur unwaſhed two ounces, eſſence of lemons a ſcruple. This is the preparation ordered in the late London Diſpenſatory, and expected to be kept ready mixed in the ſhops. *Pemberton*'s London Diſp. p. 370.

UNGUENTUM *Veſicatorium*, *Bliſtering Ointment*, a form of medicine preſcribed in the late London Pharmacopœia, and no other than bliſtering plaſter in a ſofter form. It is made by equal quantities of hogs-lard and bliſter-plaſter, with a very gentle heat, ſtirring them till they are cold. *Pemberton*'s Lond. Diſp. p. 371.

UNGUENTUM *Viride*, the *Green Ointment*, a form of medicine preſcribed in the late London Pharmacopœia, and ordered to be made by melting ten ounces of yellow wax in three pounds of the *oleum viride*, or green-oil, of the ſame pharmacopœia. *Pemberton*'s Lond. Diſp. p. 371.

UNGUICULI, in botany, is uſed for the ends of the petals of roſes, or other flowers, where they adhere to the plant.

UNGUIN, in botany, a name given by the people of Guinea to a plant, of which they are very fond, for its medicinal virtues: They boil it in water, and give the decoction in large draughts for pains in the back. The leaves of this plant grow alternately on pedicles of an inch long, and have the exact ſhape and ſize of thoſe of the common bay-tree; but they have neither its taſte nor ſmell, nor any thing approaching to either. Phil. Tranſ. N°. 232.

UNGUIS (*Cycl.*)—The nails both of the fingers and toes are ſubject to very great diſtemperatures in their growth. We have, in the Philoſophical Tranſactions, an account of a young fellow, whoſe finger ends were, as it were, armed with horns inſtead of nails; they grew to a very amazing length, but then would wear away, or drop off at the ends. The horny excreſcence on the thumb was the longeſt on each hand, and next to it was that of the middle finger, the reſt being gradually ſhorter; his feet were well armed with the ſame ſort of weapons, only that the two little toes had none of them.

Theſe horns ſeemed to owe their origin to a thickening of the body of the nails, which, inſtead of growing out in length in the common way, elevated themſelves in height from the back; and when they had riſen to a certain height in this direction, they turned downward, and became crooked, ſo as to repreſent a bird's claw, only that it was not taper and ſharp, but all of the ſame thickneſs, and blunt at the end. The upper or convex part of each was marked with a great many chaps, but the concave or under part was ſmooth.

The lad had no ſenſe in thoſe parts of the horns which were at a diſtance from his fingers; but they might be cut or pulled any way, without giving him pain; when they were moved near the roots, where they joined the finger, the pain was very great. The back of his hand was full of horny ſubſtances, of a like texture with theſe, but not elevated above the ſkin; they had the appearance of broad and flat warts, but were much larger and harder. The diſeaſe ſeized the lad after the ſmall-pox. The common length of theſe horns on his fingers was between three and five inches. Phil. Tranſ. N°. 229.

UNGUIS *Odoratus*, in the materia medica, a thin flat teſtaceous ſubſtance, of an oval or oblong figure, rounded at both ends, and marked on the ſurface with three or four concentric circles, or oval lines. Its colour is a duſky brown, with ſome admixture of the orange, ſometimes of a purpliſh tinge. Its uſual ſize is that of a full grown nail of a man's thumb; and its thickneſs rather leſs than that of the nail. It is tough, flexile, and elaſtic; and has no peculiar ſmell or taſte.

The want of ſmell might ſeem to argue this to be a different ſubſtance from the *Unguis odoratus* of the antients; but the truth is, that theirs owed all its ſweet flavour to its being brought over among aromatic drugs.

There were two kinds of it, the largeſt of which they had from the red-ſea, and the other from Babylon; and both were the opercula of two ſpecies of murex-ſhells. See the article MUREX.

Dioſcorides tells us that this *Unguis* was the operculum or poma of the ſhell, which ſtopped the mouth at pleaſure, and from under which the creature thruſt out its tongue to feed; and he adds, that the ſhell-fiſh to which it belonged was taken in the marſhes of India, when the waters were dried away; and that the Indian ſpikenard growing in great abundance in theſe marſhes, the creature became ſweet-ſcented in every part, by feeding on it. But in the latter part of his account he ſeems to forget the beginning; for he concludes with telling us, that there were only two kinds brought into Greece in his time, the one from the Red Sea, the other from Babylon.

The truth is, that ſpikenard grows neither in the Red Sea, nor any where about Babylon, but only in India beyond the Ganges, or about its banks. The ſpikenard alſo does not grow in the water, but only in marſhy places, and therefore can never be in the way of feeding ſhell-fiſh. Nay, this very author, in his deſcription of the ſpikenard, tells us, that it grows on mountains, and that the ſpikenard which grows in wet places, is another kind, and not the fine aromatic ſpikenard ſo valued in the ſhops; even the laſt kind, however, could not ſerve for the feeding the fiſh neither; for he ſays, that it grows in wet or moiſt grounds, but not in the water.

From this, and ſome other ſuch paſſages, it appears that Dioſcorides was an author too much of Pliny's ſtamp, and collected his accounts of things from different authors, and that without a ſufficient knowledge of the ſubject; ſo that he often contradicts himſelf. As to the Indian ſpikenard, Garcias tells us, that it is not produced wild, but is a cultivated plant, raiſed by ſowing the ſeeds in gardens, not under water. Aviſenna ſeems to have ſeen this abſurdity in Dioſcorides, about the ſhell-fiſh feeding under water on the ſpikenard, and though he tranſlates the account of his *Unguis odoratus*, or *adſer althaib*, *verbatim* from Dioſcorides in other parts, yet he here alters the ſenſe, and ſays, that the ſhell-fiſh was found in an iſland in the Indies, on which iſland the ſpikenard alſo grew in great abundance.

This, however, is but avoiding one error by another; for though, by this, he gets over the abſurdity of the ſpikenard's growing under water; yet he falls into a much worſe, which is, of the ſhell-fiſh to which the *Unguis odoratus* belongs, being found on dry land.

It is very certain that no ſhell-fiſh, living in the water, can ſubſiſt, without ſome means of cloſing up its cavity, ſo as to keep out the water at pleaſure; this is done in the bivalve kinds, by cloſing the two valves; but in the ſtromboide ones, by drawing down this operculum, which is the *Unguis odoratus*, to the mouth of the ſhell. A land-ſhell therefore can have no occaſion for ſuch a part as the poma or operculum, and no ſuch drug as the *Unguis odoratus* can be found about it. But it is to be obſerved, that Aviſenna did not know that the *Unguis odoratus* was a covering or operculum of the mouth of a ſhell, but thought that it was only a fragment cut or broken indeterminately from any part of the ſhell. This therefore might appear no abſurdity to him, and the thin and flat *Ungues* he ſaw might appear fragments artificially cut from ſome of the thin-ſhelled kind of land ſnails.

UNGUIS *Oſſa*, in anatomy, are two bones which help to compleat the internal ſides of the orbit of the eye, to cover the fore-part of the labyrinth of the noſe, and form the lachrymal duct.

They have their name from the Latin *Unguis*, a nail of the hand, and are alſo, by ſome authors, from their office in forming the lachrymal duct, called *oſſa lachrymalia*.

They are each ſituated in the orbit of the lower part of the internal angle; they are the leaſt bones of the face, and are very thin and tranſparent. They are in ſhape ſomewhat longer than broad, and not unaptly reſemble the figure of the finger nails, eſpecially while in their natural places; for, being taken out of the ſhell, their figure becomes ſomewhat more irregular. Each of them is divided, by anatomiſts, into two ſides, the one external, the greateſt part of which appears in the orbit in an entire ſkull; the other internal, which is hid; two extremities, the one upper, the other lower; and two edges, one anterior, the other poſterior. The outſide is ſmooth, and a little concave; toward the anterior edge is a groove full of ſmall holes like a ſieve, called the lachrymal groove. It begins at the upper extremity, and runs down lower on this ſide than any other part of the bone, the lower extremity of it being hid by the os maxillare. It is diſtinguiſhed from the reſt of the outſide by a very ſharp prominent edge. The inſide is rough and unequally convex, with a perpendicular depreſſion anſwering to the ſharp prominence on the outſide. On the upper part of this inſide, ſmall portions of cellulous laminæ are ſometimes obſervable, which communicate with the entry of the frontal ſinus; and there are likewiſe ſome about the middle, which compleat the anterior ethmoidal cells; and others toward the lower end, which communicate with the rugged portions of the upper border of the ſinus maxillaris: theſe, however, often vary, and are ſometimes wanting. Theſe bones are altogether without diploe; they are connected with the os frontis, and with the os ethmoides, covering a part of the cells in that bone, with the naſal apophyſes of the os maxillare, and with the groove of that bone in ſuch a manner, that the two grooves, joined together, form an entire tube, called the lachrymal duct; they alſo cover a little the opening of the maxillary ſinuſes, and join the inferior conchæ of the nares, of which they appear to be only a continuation in advanced age. *Winſlow*'s Anatomy, p. 36.

UNGUIS *of a Flower*, among botaniſts. See the article PETAL.

UNGUIS, in natural hiſtory, a name given by authors to a genus of ſhells, called more uſually *ſolenes*. See the article SOLEN.

UNGULA *Oculi*, the name given by ſome to a diſeaſe of the eye, called by others *pterygion*.

UNGULUS, in antiquity, a remarkable kind of bracelet. *Hofm.* in voc. See the article BRACELET.

UNHALTER, in the manege. A horſe is ſaid to *unhalter* himſelf, that turns off his halter. See the article HALTER.

UNICORN (*Cycl.*)—*Sea* UNICORN, in natural hiſtory, the name of a fiſh of the whale kind, remarkable for having a horn growing out at its noſe, in the manner of the ſuppoſed *Unicorn*'s horn, as deſcribed by many too credulous authors.

This fiſh feeds on fleſh, or other fiſh, and is not only found in the main ſea, but ſometimes gets up into large rivers. In the year 1636 there was a large one caught in the river Oſte, near its diſcharging itſelf into the Elbe, in the duchy of Bremen; this place is four German miles from the ſea. The ſkin of this fiſh was ſpotted with dark brown ſpots upon a white ground, the epidermis was tranſparent, and under it was another ſkin very thin and ſpotted; but the true ſkin was brown, and near an inch in thickneſs. On the top of the head there is only a ſemilunar hole, as in the porpoiſes; this hole opens into the two channels, which run through the ſkull to the palate, and are called the ductus hydrogogi. The people who examined this creature, were not able to find any aperture in the body for the diſcharge of the excrements; whence it has been generally believed, that the creature voids them through this paſſage in the head.

Authors have differed in the name of the proceſs iſſuing from the head, ſome calling it a horn, others a tooth; ſome are of opinion that it ſerves it to break the ice with for air; but others pretend that it is an offenſive weapon, with which it wounds the common whale, and other large fiſh; and that when it has plunged it up to the head in the whale's body, it ſucks the juices of that animal. See Tab. of Fiſhes, N. 1.

The fiſh was near twenty foot long, and about four foot in diameter. The horn ſtood on the fore-part of the head, juſt above the mouth, and was ſix foot long, white like ivory, and curiouſly wreathed or twiſted. The body was ſmooth and ſlippery, like that of an eel; the head, in proportion to the body, was ſmall, not exceeding ſixteen inches in length; the eyes not larger than a ſix-pence. It had, on each ſide of the neck, two black fins, one above, another at a ſmall diſtance; theſe were two foot long, of the breadth of a hand, and about half an inch in thickneſs. Phil. Tranſ. N°. 447. p. 149.

Unicorn's horn has been ſo common in the Daniſh and neighbouring ſeas, that there was a magnificent throne built only of them in that kingdom; the horns are from ten to fifteen foot in length, and are all white, and furrowed with a ſpiral line. They are the horns of that kind of whale called *narwal*, or the ſea-*Unicorn*. *Brown*'s Travels.

Unicorn's horn has the ſame medicinal virtues with hart's-horn and ivory; but at preſent is only kept as an ornament to druggiſt's ſhops.

Sea-UNICORN is alſo a name given to two ſorts of ſmall fiſhes caught in the American ſeas, and known among authors under the name of *monoceros piſcis*. See the article MONOCEROS.

UNICORNU *Foſſile*, *Foſſile Unicorn's Horn*, the name of a ſubſtance much uſed in medicine in ſome parts of the world, but which ſeems to have been very little underſtood by many who have written of it. Dr. Hill, from the examination of the

ſeveral varieties of ſhapes it is found in, and trying it by the ſeveral teſts which fix the criterions of foſſils, has determined it to be no other than a terrene cruſtaceous ſpar, not very different from the oſteocolla, and other bodies of that genus, which he has called the *cibdeloplacia*; and has diſtinguiſhed this peculiar ſpecies by the name *cibdeloplacium albido-ſubcinereum, friabile ſuperficie lævi*, or the whitiſh-grey friable cruſtaceous ſpar, with a ſmooth ſurface.

It differs principally from the oſteocolla in its ſoftneſs and the ſmoothneſs of its ſurface; but from its having, like many other of the cruſtaceous terrene ſpars, the property of encruſting, and ſometimes even permeating the pores of bodies, and in a manner petrifying them, it has obtained the names of the things it thus lodges itſelf in and about, which being uſually bone, and ſome of them bones of an extraordinary ſize and figure, have been taken for the bones and horns of *Unicorns*; and the name and nature of the body itſelf wholly loſt and neglected, and that of the horn, with that of its imaginary animal, only preſerved.

They are, however, now ſenſible in Germany, that it is not the horn, but this ſubſtance which is lodged about it, which is the medicine; for they never uſe the foſſile bones, which are petrified in the common way, but only ſuch as are impregnated with this ſparry ſubſtance; and even uſe all ſubſtances whatever, which are impregnated with this, whether bones or wood, under the ſame name, calling the natural tubular pieces of it, which are very common, and alſo the pieces of branches of tree impregnated with it, by the common name of *Unicorn's horn*, while they allow plain bones, petrified in the common way, no ſuch name. So that the word is now become a mere technical term, and ſignifies either this ſpar in its pure ſtate, or any ſubſtance whatever which is impregnated with it.

It is a lax and ſpongy terrene ſpar, and is naturally of a regular form, in ſome degree like that of the oſteocolla, being always found, where it has concreted pure and not been in the way of any extraneous ſubſtance, an oblong and moderately thick cylindric tubular body, frequently narrower at one end than the other, and approaching to a conic form. Uſually its hollow is empty, but ſometimes it is found filled up with a ſubſtance of the ſame nature with itſelf, only compoſed of a larger proportion of earth with leſs ſpar, and therefore more crumbly and ſoft. Theſe are found of various ſizes, from an inch to three feet long. The larger ſpecimens are moſt frequent. And it is very probable, that the ignorance of the firſt ages, which brought it into uſe in medicine, might take theſe natural concretions for *Unicorns horns*.

It is found in other parts of the world beſide Germany, and is in great eſteem in many places as a ſudorific and aſtringent; and is given in fevers, attended with diarrhœas, with great ſucceſs. *Hill*'s Hiſt. of Foſſ. p. 361.

UNIFORM (*Cycl.*)—UNIFORM *Matter*, in natural philoſophy, that which is all of the ſame kind and texture.

UNILOCULAR *Capſule*, among botaniſts. See the article CAPSULE.

UNISETA, in natural hiſtory, the name of a ſpecies of fly, found frequently ſitting on the ammi or biſhops-weed, and inguiſhed by having one long hair or briſtle growing out at its tail. See the article HENOTHRIX.

UNITE, in the manege. A horſe is ſaid to *unite*, or walk in union, when, in galloping, the hind quarters follow and keep time with the fore. See the article SINEW.

UNITY (*Cycl.*)—It is to be obſerved in algebra, that *Unity* itſelf has three different expreſſions of its cube root, one real, and the other two impoſſible or imaginary. Thus the three cube roots of 1, are 1, $\frac{-1+\sqrt{-3}}{2}$ and $\frac{-1-\sqrt{-3}}{2}$.

This is ſometimes of uſe in finding the cube roots of quantities, appearing under impoſſible expreſſions. See *Maclaurin*'s Algebra, p. 128. ſeq.

The two impoſſible expreſſions of $\sqrt[3]{1}$ may be thus found: Let $x = 1$ then $x^3 = 1$ or $x^3 - 1 = 0$ and $x - 1 = 0$. Divide $x^3 - 1$ by $x - 1$ the quotient is $xx + x + 1 = 0$. Or $xx + x = -1$ reſolve this quadratic equation, by adding $\frac{1}{4}$ to both ſides. Then $xx + x + \frac{1}{4} = -\frac{3}{4}$, and extracting the ſquare root, $x + \frac{1}{2} = \sqrt{-\frac{3}{4}} = \frac{\sqrt{-3}}{2}$. Therefore $x = -\frac{1}{2} \pm \sqrt{-\frac{3}{4}} = \frac{-1 \pm \sqrt{-3}}{2}$. That is, $x = \frac{-1+\sqrt{-3}}{2}$ and $x = \frac{-1-\sqrt{-3}}{2}$. See *Maclaurin*, lib. cit. p. 226.

UNIVALVE *Shells*, in natural hiſtory, a term uſed to expreſs one of the three general claſſes of ſhell-fiſh; the other two are the bivalves and multivalves. The *univalve* ſhells are thoſe which conſiſt only of one piece, not of two or more joined together. Of theſe *univalve* ſhells, nature affords a very great variety; ſo that they are aptly diſtributed by a late French author into fifteen diſtinct genera. Theſe are, 1. The *patellæ*, or limpets. 2. The *patellæ planæ*, called alſo *auris marina*, the ear-ſhell. 3. The *canales*, or *tubuli marini*, the ſea-tubes. 4. The lunar cochleæ, or round-mouthed ſnails. 5. The *cochleæ ſemilunares*, or ſnails with ſemicircular mouths. 6. The *cochleæ ore depreſſo*, or flat-mouthed ſnails. 7. The *naviculæ* or boat-ſhells, commonly called *nautili* or *nautilus*. 8. The *buccina*, or trumpet-ſhells. 9. The *turbines*. 10. The *volutæ*. 11. The *rhombi*. 12. The *murices*. 13. The *purpuræ*. 14. The *conchæ globoſæ*. And 15. The *porcellanæ*, each of which ſee under its proper head, PATELLA, AURIS *Marina*, &c. Hiſt. Nat. Eclairc. part 2. p. 235.

UNIVERSAL (*Cycl.*)—UNIVERSAL *Equinoctial Dial*. See the article RING-*Dial*, *Cycl.*

UNIVERSAL *Problem*. See the article INDETERMINED *Problem*, *Cycl.*

UN POCO, in the Italian muſic, is often put before the terms *allegro*, *adagio*, *preſto*, *piano*, &c. Where it ſhews that the movement, with their direction, is ſomething leſs than it would otherwiſe have been, had this word been omitted. Thus *allegro* ſhews that the movement is to be made in a briſk and gay manner; and *Un poco allegro* the ſame, only in an inferior degree, and ſo of the reſt.

But if *piu* is put between *Un poco*, and the above-mentioned terms, then their uſual ſignification is a little increaſed, as *Un poco piu allegro* ſignifies a little more briſkly than *allegro* alone requires. The contrary of this happens if, inſtead of *piu*, the word *men*, or *meno*, be uſed, as *Un poco meno allegro*, i. e. a little leſs gayly than if *allegro* were alone. See the articles ALLEGRO, ADAGIO, PRESTO, &c.

VOARCHADUMIA, a kind of cabala, or ænigmatic art, relative to metals, which propoſes the exultation of gold by cementations, and other methods; among which charms made of the Hebrew letters have their place.

VOCA, in ichthyology, a name given by Gaza, and ſome other writers, to the fiſh called *boops* by the generality of writers. It is a ſpecies of the ſpari, and is diſtinguiſhed from the reſt by having four longitudinal parallel lines, of a bright yellow and white colour, reſembling gold and ſilver on its ſides. See the article SPARUS.

VOCATORES, among the Romans, were ſervants whoſe buſineſs it was to call the gueſts, receive them, and aſſign every one a place according to his dignity. *Pitiſc.* in voc.

VOCE *Sola*, in the Italian muſic, denotes a piece compoſed for a ſingle voice, generally accompanied with a thorough baſs on the harpſichord or organ, without other inſtruments. But if beſides that it is to be accompanied by other inſtruments, they add, *con violini*, with violins; *due violini, e violoncello, e baſſo per l'organo*, i. e. with two violins, a baſs violin, and a thorough baſs on the organ; *con violini o ſtromenti*, i. e. with violins, or inſtruments; *parti, con parti ſenza violini*, i. e. part with, part without violins, &c.

VIOLATICA, in medicine, a name given by authors to a ſort of wandering pain, attended with a tumor, and affecting, at different times, different parts of the body; it is by ſome accounted a ſpecies of the ſcurvy; by others, of the leproſy.

VOLATILE *Salts*. It is the opinion of many of the greateſt chemiſts, that our diſtinction of ſalts into fixed and *volatile*, is far from juſt, for that there are in nature no ſuch thing as fixed ſalts.

Tartar is generally allowed to contain as much fixed ſalt as any thing, yet this ſubſtance, treated by fermentation, in Langelot's method, yields all in *volatile* ſalt that it would otherwiſe have yielded in fixed, and leaves ſcarce any fixt at all. The ſame proceſs will have the ſame effect on the ſuppoſed fixed ſalts of moſt other ſubſtances; and upon this, and many other conſiderations, it appears highly probable, that our diviſion of ſalts into fixed and *volatile* is unknown to nature; there not being to be formally found in any body, before calcination, any fixed ſalt; but ſalts are in themſelves all *volatile*, though by the action of the fire they are apt to be colliquated among themſelves, and blended with the earthy parts, and by that means rendered fixed.

The diviſion of ſalts into acids and alkalis has much more reaſon for its foundation: Theſe are differences which really exiſt in them, and by means of theſe all fermentations, and all motions in natural things begin. Both theſe ſalts appear to be in their own nature volatile, and therefore eaſily reſoluble by the ſupervening ſalt of the air.

It appears that all vegetables, eſpecially the aromatic claſs, if they are any conſiderable time expoſed to the air, loſe their ſalts. The ſoundeſt wood, loſing its ſalts in proceſs of time, in the ſame manner moulders away.

Theſe are proofs that the ſalts of theſe bodies are in themſelves volatile, though they are all liable to be rendered fixed by the action of fire, by which means the acid and the alkali are blended together, and the mixture becomes fixed.

There is an old axiom among the chemiſts, that things volatile are rendered fixed by ſuch things as are fixed; and thoſe fixed are rendered volatile by ſuch as are volatile; but it appears from theſe proceſſes, when rightly underſtood, that this is an erroneous maxim, that two volatile things may fix one another; and two fixed things may become volatile together, according to the nature of the proceſſes by which they are treated. The common traders in timber are well acquainted with theſe properties of the ſalts of wood, though they know not the reaſons of them; and as the air or fire may alter or drive off the ſalts of timber, and ſo render it leſs firm and ſtrong, they ſink ſuch pieces under water as they would

preſerve a long time. When they are to place the ends of poſts in the ground, they, on the ſame principle, burn them a little, that the volatile ſalts, which would eaſily be conſumed by the moiſture of the earth, may be, in ſome degree, liquated and blended together by the heat, and be rendered ſo much the more fixed, as to be leſs eaſily affected by external accidents. Ship-builders, in ſome places, for the ſame reaſon, burn ſlightly all the timber that is to make the bottom of the veſſel, or ſuch part of it as is to be under water.

Another very familiar inſtance of the blending the two *volatile* ſalts, naturally given to all vegetables, is in the formation of ſoot. When wood is burning, there aſcends from it a ſmoak; in this ſmoak the two *volatile* ſalts of the wood are contained, and they coagulate one another into that body which we call ſoot, and from which they may be again ſeparated by art, and rendered viſible diſtinctly. Theſe ſalts continue aſcending, and forming ſoot, till the wood is reduced to aſhes; and what remain of them toward this concluſion of the operation of the fire, are blended together by it, and make what we call the common fixed alkali, a ſalt eaſily waſhed out by water.

The formation of the fixed ſalt being thus owing to the mixing together of the two *volatile* ones found in the plant, it is eaſy to conceive why we obtain more of it from ſound wood, than from ſuch as is rotten, and more from freſh plants, than from ſuch as have been dried. If the fixed ſalt exiſted as a fixed body in the vegetable, it could not be affected by the evaporation of the water in drying, or by the evaporating of whatever elſe evaporates in the decaying of wood. But as the ſalt itſelf, or its two conſtituent parts, though called fixed by us, and rendered ſo by fire, are really *volatile* while in the plants, it is no wonder that, being reſoluble by the ſalt of the air, they are carried off in the drying, and much more ſo in the decaying of wood; for the air, in this caſe, evidently penetrates all its parts; and hence it is, that as dry plants yield leſs fixed ſalt than freſh ones, ſo the ſame wood, which, while ſound, would have yielded a very large quantity of ſalt, yet being rotten, yields ſcarce any at all, though the ſame proceſs is obſerved in burning it.

We are indebted to the pains of Dr. Cox for a method of procuring a *volatile* ſalt from plants, a thing of conſiderable uſe in medicine, though ſo much out of the common road of the chemical analyſiſes that it was not diſcovered till about eighty years ago, and ſoon after reduced to practice, in a regular manner, by that phyſician.

The method is this: A quantity of the leaves of any plant are to be carefully ſtripped from the ſtalks in ſummer, in dry weather; lay them in a heap, preſſed hard together, and they will ſoon ferment and heat, and will be reduced to a pulpy ſubſtance. This is to be rolled into little balls, and put into a retort, and diſtilled; it will yield a thick liquor, of a ſtrong ſmell, and a large quantity of a black oil, of a balſamic conſiſtence. The liquor is to be ſeparated from the oil, and diſtilled over again in a tall glaſs cucurbit; a *volatile* ſpirit ariſes; this is to be rectified two or three times more, and then is not to be diſtinguiſhed from the ſpirit of harts-horn, urine, or other animal ſubſtances, by any trials. Philoſ. Tranſ. N°. 101. p. 4.

All plants that have ever been tried in this manner, yield this *volatile* ſalt diſſolved into the form of a ſpirit; and the very loweſt claſs of plants, the moſſes, and common graſs, yield it as well as any other. And it is remarkable, that the veſſels in which theſe operations are performed, have afterwards a ſmell like muſk, which all the cleanſing in the world, and even the expoſing them to the air, does not well clear them of. The caput mortuum left in the veſſels is much leſs in quantity than in the common diſtillations of a like quantity of the ſame plant; and if the plants have not been ſufficiently fermented before the diſtillation, there remains, after the firſt rectification of the ſpirituous liquor, a ſour water.

The *volatile* ſalt, thus obtained, is conſiderably more in quantity than the eſſential or the incinerated ſalt would have been in the common ways of preparing them; but thoſe plants which yield moſt fixed ſalt, always yield moſt *volatile* ſalt this way. And theſe volatile ſalts, when well rectified, do not differ from one another, though made from ever ſo different plants; but this is not wonderful, ſince the fixed ſalts alſo, and the vinous ſpirits of all plants are alike, when reduced to the ſame degree of perfection and purity. The herb, as it ferments, affords its natural ſmell at firſt very ſtrongly; after that it yields a mixed ſmell, between its own natural ſcent and an urinous one; and at the end, when it is nearly ready for diſtillation, the ſmell becomes urinous. In this operation, the urinous ſpirit and ſalt come over chiefly toward the end of the diſtillation, and are ſeen in form of white clouds, iſſuing very faſt out of the neck of the retort, and condenſing on the ſides of the receiver into little rivulets, or winding ſtreams of water.

Sage, winter ſavory, and ſome other of the aromatic plants, yield thin *volatile* ſalt, on the firſt diſtillation, in a dry form, coating over the inſide of the receiver on the upper part, and clogging the neck of the retort; and ſaffron, in digeſtion with ſpirit of wine, has been found to yield its ſalt in the ſame dry form.

The oils procured in this manner from fermented plants partake nothing of the nature of the peculiar plant, but are alike from all; they are thick as tar, and fœtid. If the plant be not well fermented, indeed, the oil will be clear, and leave the ſmell and virtues of the plants: But this is an error in the proceſs, and this oil comes at firſt; whereas the proper oil of this proceſs comes not till the laſt, with the ſalt. Thoſe plants which, in the common way of diſtillation, yield moſt eſſential oil, yield alſo moſt of this black thick oil in this proceſs.

The fatty, moiſt, and inſipid herbs, ferment much quicker than the other kinds: They become extremely hot in this fermentation, and loſe their peculiar qualities in it; the ſpurge loſes its milkyneſs, and the celandine its tinging quality; and the juices of thoſe which are naturally the moſt acrid and ſharp, become little more ſo than thoſe of others. The ſtinking plants, ſuch as the atriplex olida, are as ſweet in this proceſs as any other; and it is particular, that the monk's rhubard, and ſome others, which are as inodorous as any plant can be, in their natural ſtate, are as fœtid as human excrements, under this treatment: And it is remarkable, that the very greateſt heat of the fermentation of theſe plants, does not prevent their being ſtored with a ſort of maggots, which ſwarm in great numbers in thoſe parts of the fermented maſs, where the heat is ſo great, that a perſon cannot bear his hand in it.

It is to be conſidered, whether theſe animals may not afford the *volatile* ſalt attributed to the plants. The doctor does not ſeem to have conſidered this; but as they are ſaid to be very numerous in the maſs, it will be very neceſſary to try the effect of a diſtillation of ſome of this fermented matter, without theſe inſects; which might be done by covering the whole from the acceſs of flies: For though the Doctor ſeems to think they are equivocally generated there, it is certain that they owe their origin entirely and only to the eggs of flies. The Doctor ſeems to think they will of themſelves yield no *volatile* ſalt or ſpirit; but this is ſo different from the nature of animal bodies in general, that it may be this opinion was founded on too ſlight a trial. If the external air be excluded from plants, they will not ferment, and if they are put into a long-necked glaſs, and left open, they will, in a few weeks, become of a mucilaginous nature; and after ſtanding a year in this manner, they will yield a large quantity of urinous ſalt or ſpirit, but not a drop of oil.

Some moſſes, and other of the plants uſually called imperfect, yield a *volatile* ſalt on diſtillation, without previous putrefaction; and ſome ſeeds, though in themſelves inſipid to the taſte, have the ſame quality.

All theſe ſpirits and ſalts have the ſame properties and effects with the ſpirits of harts-horn and urine. They change ſyrup of violets, and many other vegetable tinctures green. They are diaphoretic, diuretic, and deobſtruent, and contrary in their nature to acids. They precipitate all metals diſſolved in acids, by breaking the force of thoſe acids, and when highly rectified, and mixed with ſpirit of wine as highly rectified, they make the offa alba of Helmont like all other *volatile* alkali ſpirits; they unite with acids, and thereby become armoniac or neutral ſalts. Phil. Tranſ. N°. 101. p. 7.

Chemical experiments abundantly prove that *volatile* ſalts are obtainable from all kinds of land animals, the amamphibious and ſubterraneous tribes, birds, fiſh, and reptiles, from alkaline vegetables alſo without putrefaction, and from all other vegetables, after putrefaction, as alſo from ſoot, horns, hoofs, and all refuſe animal and vegetable matters, ſuch as the pith of horns, urine, the blood of ſlaughter-houſes, *&c.* and theſe as pure and perfect as from harts-horn; and this affords a hint for the making *volatile* alkalies and ſal armoniac cheap in England. *Shaw*'s Lectures, p. 168.

The ſhootings of *volatile* ſalts are not limited like thoſe of the fixed and common ſalts, to any determinate figures, but, by various accidents are thrown into a great variety of pleaſing forms. Fanciful people have ſuppoſed the ſhootings of ſalt of hartſhorn, in the tops of the veſſels uſed in ſubliming it, to reſemble the horns of the deers; and that of vipers, to aſſume the figure of little crawling ſerpents; but all this is imaginary, and the things from which the ſalts are obtained have no power to determine their forms, which are governed by more vague principles; ſuch as the peculiar degree of heat, the temperature of the external air, and many other the like uncertain principles.

We have, in the Philoſophical Tranſactions, an account of a whole foreſt of moſt elegant trees painted in perſpective, in the head of a veſſel, by theſe bodies. The ſubſtances employed were ſal armoniac and pot-aſhes; theſe were mixed in equal quantities, and put into a tall glaſs body, which being placed in ſand, immediately on the approach of the heat, a large quantity of the ſalt was ſublimed in flowers in the common way; this was a proceſs from which nothing particular could be expected; but after ſome time the ſublimed ſalt began to aſſume a regular form, and the head of the cucurbit, which was very large, was filled with the repreſentations of trees ſo perfect and elegant, that a foreſt, delineated by the ableſt hand, could ſcarce come up to it.

The figures, though externally numerous, yet were very regular, and all reducible to three kinds; the pine, the fir, and one

one other tree. Theſe, though very exact and beautiful, could have no analogy with the ſubſtances out of which the ſalts were formed, the fir and pine kind yielding ſo little fixed ſalt, that they are never employed for this purpoſe, and the ſal armoniac belonging to no vegetable production at all. The ſame proceſs repeated ſeveral times afterward, both with the ſame ſalts, and with others of the ſame nature, never arrived at this perfection; and the whole beauty of this was loſt while the ſpectators were gazing on it, by the ſublimation of more of the ſalt, which filled up all the interſtices, and deſtroyed the figure. Phil. Tranſ. N°. 105.

The curious in theſe reſearches, who would extend the uſe of theſe ſalts to the compoſing ſal armoniac, and many other purpoſes, for the uſe of dyers, braziers, apothecaries, chemiſts, &c. may conſult Boerhaave's hiſtory of vegetable putrefaction, and his account of ſal armoniac, and compare with them the papers of Lemery and Geoffroy, in the memoirs of the Paris academy, on the ſubject of the preparation of ſal armoniac in the Levant, and the imitation of it in other countries.

VOLCANO (*Cycl.*)—Dr. Liſter is of opinion, that all the *Volcanoes* in the world are owing to that inflammable mineral called *pyrites*, or *mundic*, a ſubſtance conſiſting of ſulphur and iron, and found in great plenty in all thoſe mountains where the *Volcanoes* are found to break out.

The quantities of ſulphur continually ſublimed in theſe mountains, in the ſame manner as the common ſulphur is ſeparated by artificial fire from the pyrites in Germany, ſeems to prove this; and what farther evinces it, is, that the black or purple cinders thrown out of theſe *Volcanoes* in their moſt violent eruptions, and wholly differing from the calcined ſtones or pumice, will be attracted by the magnet, and ſhew that the whole is very much the ſame with that caput mortuum of the common pyrites, out of which we have extracted or burnt away the ſulphur.

That theſe *Volcanoes* were all kindled of themſelves, at or near the time of the creation, is probable; becauſe there is at preſent but a certain number of them known, and theſe have all continued burning at all times, from the earlieſt hiſtory, and none of them have ever been extinguiſhed wholly, or probably ever can be, any other way than by the ſubmerſion of the whole into the ſea. That they originally kindled of themſelves, by means of the pyrites they contain, is very probable, becauſe we find that the pyrites will kindle of itſelf, and there is no other apparent cauſe for their kindling; for if we ſuppoſe the ſun to have done it, the mountain Hecla ſhould have been excuſed, as ſtanding in a northerly and colder climate; yet this, by all hiſtory, ſeems to have burnt as long as the others.

That they were at firſt fired my man, is not probable, becauſe it would not be eaſy to conceive how that ſhould be effected, if attempted; and they are in places the leaſt likely ever to have been the habitations of man, being in the tops of the higheſt mountains. If we attribute the kindling them to lightnings, or earthquakes, we favour the Doctor's ſyſtem as much as in his own way; for all theſe he deduces alſo from the breath or exhalations of the ſame mineral, the pyrites, which when fired under ground make earthquakes, when in the air lightnings.

No ſubject in the whole mineral kingdom is ſo proper for the keeping up a fire for the many ages theſe mountains have been burning, as the pyrites. Nothing is ſo laſting a fuel, and, in general, other fuels become more or leſs laſting, as they partake more or leſs of its nature. Scotch coals have more of the bitumen in them, and leſs of the pyrites than others, and therefore they burn away quickly, and leave only white aſhes, without any remains of the pyrites. The common Newcaſtle coal burns more ſlowly away, becauſe it contains a far larger portion of the pyrites mixed with its bitumen, as is found by the ſulphureous ſmell it yields in burning; and the Sunderland coal, which contains moſt of all of this mineral, burns with a more ſulphureous ſmell indeed, but ſo ſlowly, that it is ſaid proverbially to make three fires. This burns to a heavy reddiſh cinder, much reſembling the caput mortuum of the pyrites, or the ſlags caſt out of the burning mountains, and contains ſo much iron, that it is freely attracted by the magnet.

There is, in Ireland, a ſort of coal more rich in the pyrites than all theſe, and ſeeming indeed to conſiſt in great part of it. This, conſequently, keeps up a greatly more durable fire than any of the others, and will remain twenty-four hours red-hot in the fire, without changing its ſhape. The riſe of the breath or effluvia of theſe pyrites into the air, and their taking fire there, may very naturally cauſe lightning and thunder there; and it is remarkable, that even the ſeemingly miraculous accounts of ſtorms of throwing down iron-duſt or iron-ſtones, inſtead of hail or rain, does not wholly diſcredit this ſyſtem; for iron being one part of the conſtituent matter of the pyrites, it is poſſible it may have been raiſed in a vapour with it, and when the ſulphureous part was fired and burnt away, it may have again concreted into a ſolid form, and in that form have falllen to the earth again. Phil. Tranſ. N°. 157.

The neceſſity of a ſubterranean fire is argued from various inſtances, and from various phænomena.

The places to which this fire is brought up to our view, are generally the tops of mountains; where it may have its free courſe through their cavities, and burn a length of time, without doing injury to any body.

The ſubterranean fire could not exiſt without a communication with the external air; and theſe *Volcanoes* in the mountains are the ſpiracles or air holes at which it receives the neceſſary ſupplies of it, and by which it communicates with it as much as is neceſſary for its ſupport. By theſe the neceſſary magazines of fire are kept in a due ſtate, and by theſe they diſcharge the ſmoak and foulneſſes with which they would otherwiſe be choaked up and extinguiſhed.

Europe affords five principal openings of this kind. Of theſe, the chief is Ætna, in the iſland of Sicily, a *Volcano* famous in all hiſtories. The next to this is Veſuvius, near Naples; then the Strongylus, and ſome others of leſs note in the Liparine iſlands; Hecla in the frozen region of Iceland, and the Chimæra in Greece. The *Volcanoes* of Aſia are not leſs numerous; there are ſeveral in the mountains of Perſia, and in the iſland of Ormuz. The pic of Adam, in the iſland of Ceylon, alſo burns at certain times: But the principal *Volcanoes* of this part of the world are in the Philippine and Molucca iſlands. Java and Sumatra alſo furniſh ſome in the center of their largeſt mountains. The iſland of Ternate affords alſo a *Volcano* on the top of a mountain very difficult of acceſs, but opening with a vaſt mouth, and very terrible when it burns.

The ſeveral violent eruptions of this mountain have given it, within the mouth or Crater, the appearance of an amphitheatre, formed for holding people at the time of ſome public ſhew, ſeveral circles appearing in it one above another, found with a ſort of regularity that is ſurpriſing. In Japan there are very numerous inſtances of the uſe that mountains ſerve to on this occaſion, many of the higher mountains of that iſland burning almoſt continually; and the little iſlands which lie ſcattered about in the ſame ſea have alſo many of them ſpiracles of the ſame kind in the tops of the mountains, ſeen principally in the night, when the abſence of the ſun's rays gives their faint fire leave to appear.

Whatever may be the number of theſe *Volcanoes* in Aſia, there is no part of the word that yields ſo many as America. In the kingdom of Chili alone there are fourteen very conſiderable *Volcanoes*, all placed in a regular order one by the other; and not a leſs number in Peru; theſe all burſt forth from the ſummits of thoſe vaſt mountains the Andes. In New Spain there are three very formidable for the fierceneſs of their burning.

The moſt extreme parts of the northern world are not free from theſe ſtore-houſes of fire. Authors tell us of no leſs than four of them in the moſt northern parts of Tartary; and we know that Greenland, and all the neighbouring country, has them. The *Volcanoes* of the Terra del Fuego are very well known, and it is indeed the general opinion, that farther north than we have yet penetrated there may be very many undiſcovered ones; and ſome authors have gone ſo far as to declare, that, were the cold no prevention, we ſhould not be able to come much nearer than we do to the ſouthern pole, for the number and fierceneſs of the burning mountains.

People who ſee but a little way into the œconomy of the univerſe, are apt to blame the author of nature for placing ſo many of theſe *Volcanoes* in the habitable parts of the world, and expoſing ſo many of the human ſpecies to periſh by them; but when the ſyſtem of nature is more clearly ſeen into, we find all the reaſon in the world to admire and adore the goodneſs of providence in the diſpoſition of theſe very things.

When it proved neceſſary to the ends of the creation of the world, that a fire ſhould be kept up within it, where could that be ſo well kept from doing us injury, as deep in the central parts; and when it was neceſſary that this fire ſhould have ſpiracles, or air-vents; where could they be placed more out of our way, than in the tops of the higheſt mountains, as we conſtantly and regularly find they are. The ſmoak, cinders, and other recrements of the fuel that ſupports the ſubterranean fire, are by this means diſcharged far above the heads of the inhabitants, and out of the way of doing them any harm; whereas, had theſe openings been on plain ground, the whole air the neighbouring nations breathed would have been infected with the ſtench, and ſickneſs bred with it, beſide the danger of firing their houſes and towns, and ſpoiling their cultivated lands with the vaſt quantities of cinders, aſhes, and other matters thrown up, which, as it is, falling on the barren ſides of the mountains, do no harm to any thing. The provident placing of theſe mountains near the ſea, either in iſlands, or on the coaſts of continents, is alſo a great benefit to mankind, as the redundant matter diſcharged is thrown into the ſea, and as there are, in general, higher winds nearer the ſea than farther from it, by which the ſmoak, and with it the malignant vapours of the burnt minerals, are diſperſed in the upper region of the air, and never deſcend in ſuch quantities as to do harm to the neighbouring inhabitants.

This giving vent to the ſubterranean pyrophylacia, ſeems one of the great ends of the origin of mountains, and the

other is their ſerving, as hydrophylacia or magazines of water. This is ſeen throughout the world, the rivers that water all the countries inhabited or habitable ariſing from chains of mountains placed in their middle, ſeemingly with this ſole intent; the Rhine, the Rhone, and the Danube, all ariſe from the Alps, the great reſervoirs of waters in Europe. The mountains of the moon, placed in the burning ſands of Africa, give riſe to the Nile and Niger, and other rivers large enough to ſupply that vaſt and ſcorched country; and in the ſame manner the river of the Amazons, and the other immenſe beds of water neceſſary to ſupply the vaſt continent of South America, take their origin from the mountains called the Andes. *Kircher*'s Mund. Subter. p. 75. ſeq. See the article MOUNTAIN.

We have an account of mount Veſuvius, and of the eruption from it in 1737, by the prince of Caſſano, in the Philoſophical Tranſactions, N°. 455. Sect. 1.

The matter thrown out flowed like melted lead, and moved about half a mile in an hour, which was an unuſual velocity. The trees, touched by this matter, immediately took fire, and fell. Glaſs in houſes was melted into a paſte.

The academy of ſciences of Naples made an analyſis of the matter thrown out in this eruption. From which it appears, that this matter contains iron; that it is ſpongy at top, and denſe toward the bottom; and, after growing hard, it retained part of its heat above a month. Damps were afterwards ſeen to ariſe in divers parts of the mountains. An ammoniacal ſalt, which gave an extraordinary coldneſs to water in diſſolving, was alſo found here. Ibid. See alſo Sect. 2. of the ſaid Number.

VOLKAMERIA, in botany, the name of a genus of plants, called by Houſton, *duglaſſia*, and *paliuro affinis* by Sloane. The characters are theſe: The cup is a one-leaved perianthium, of a turbinated form, very ſmall, and lightly indented in four or five places at the end. The flower is one-leaved, and of the gaping kind. The tube is cylindric, and of double the length of the cup. The limb is plain, and divided into five ſegments, which are turned toward each ſide, but gape principally one way. The ſtamina are four very long capillary filaments; the antheræ are ſimple. The germen of the piſtil is quadrangular. The ſtyle is capillary, and of the length of the ſtamina, or nearly ſo; and the ſtigma is bifid. The fruit is a roundiſh bilocular capſule, and in this is incloſed a ſingle bilocular nut. *Linnæi* Gen. Plant. p. 305. *Houſton*, A. A. *Sloan*, Hiſt. vol. 2. f. 23.

VOLONES, among the Romans, the antient name of thoſe afterwards called *evocati*. See the article EVOCATI.

VOLT (*Cycl.*)—VOLT, in the manege. See the article VAULT, or VOLTE, *Cycl.*

VOLTA, in the Italian muſic, ſhews that the part is to be repeated one, two, or more times, according to the numeral adjective joined with it; thus *ſi replica una Volta* intimates to play that part once over again.

VOLTA is alſo a ſort of dance of Italian origin, in which the man turns the woman ſeveral times, and then aſſiſts her to make a leap or jump; it is a ſpecies of *galliard*. *Broſſard*.

VOLTURNALIA, among the Romans, a feſtival kept in honour of the god Volturnus, on the ſixth of the calends of September, or twenty-ſixth of Auguſt. *Pitiſc.* in voc.

VOLVA, among botaniſts, a membranous matter ſurrounding the baſes of many of the fungi; and in many of them, of very ſingular figure and ſtructure.

VOLVA is alſo a word uſed by Scribonius Largus, and ſome other authors, to expreſs the central part, or, as we call it, the core of the apple, in which the ſeeds are placed. He preſcribes this in weakneſſes of the ſtomach, and reachings to vomit.

VOLUBLE *Stalk*. See the article STALK.

VOLVENS *Oculi*, in anatomy, a name given by Spigelius, and ſome others, to one of the muſcles of the eye, called by Cowper and Albinus, *obliquus inferior*.

VOLUNTARY (*Cycl.*)—VOLUNTARY, in muſic, a piece played by a muſician extempore, according to his fancy. This is often uſed before he begins to ſet himſelf to play any particular compoſition, to try the inſtrument, and to lead him into the key of the piece he intends to perform.

In the Philoſophical Tranſactions, N°. 483. Sect. 2. we have a method of writing down extempore *Voluntaries*, or other pieces of muſic, as faſt as any maſter can play them on the organ, or harpſichord; and that in a manner expreſſive of all the varieties thoſe inſtruments are capable of. This is performed by a cylinder, turning equally upon its axis, under the keys of an organ, and by having points under the heads of the keys. Hence, when they are preſſed down, they will make a ſcratch or mark on the cylinder, which may ſhew the duration of the note, and the ſituation of this mark on the cylinder will ſhew what note was touched. For farther particulars we refer the curious to the tranſaction itſelf.

VOLUNTEERS, in the military art, perſons who of their own accord ſerve in the army, and at their own expence.

VOLUTA, the *Volute*, in natural hiſtory, the name of a genus of ſhells, the characters of which are theſe: They are univalve ſhells, and have an oblong mouth, with a clavicle ſometimes erect, ſometimes depreſſed; and they are ſometimes coronated at the top. See Tab. of Shells, N°. 10. This genus of ſhells is generally confounded by authors with that of the cylindri. There is indeed a general external reſemblance between theſe two kinds of ſhells at firſt ſight; but when they are a little examined, they will be found very different. The *Volutæ* are of a conic figure. One of their extremities is of a pyramidal figure, and the other formed into high ribs, which conſtitute a depreſſed clavicle, or a dentated crown; on the contrary, the cylinder is nearly of an equal ſize at both ends. And it is not neceſſary to have recourſe to the form of the mouth of this ſhell, in order to fix its generical character. Its figure, which is lengthened out into a point in the lower end, ſufficiently characteriſes this genus; and to this may be added another very remarkable character, which is, that the head is ſeparated from the body of the ſhell by a high rib.

The *Volutæ* are called by many authors, *rhombi*, which is a very ill choſen name, as the word expreſſes the figure of a lozenge, a figure very different from that of the ſhell. It has been called *Voluta* from the *volute* in architecture, the *volutes* of a capital diminiſhing in diameter all the way to the center, which is called the head or eye of the *volute*. See the article VOLUTE, *Cycl.*

The moſt remarkable ſpecific character in this genus is in the ſhape of the clavicle, ſome ſpecies having it very much elevated, and others very flat or depreſſed. The corona imperialis, which is a ſhell of this genus, is ſingular in the dentated crown, which terminates its head.

The *Volutæ* make the moſt rich and beautiful ſhells of the whole body of ſea productions. Rumphius calls them *eximiæ*; and the admiral and vice-admiral ſhells, ſo famous among the curious, and held at ſo great a price, are both of this genus. The brightneſs of the colours, the perfect white of the enamel, and the elegant ſhape of theſe ſhells, would make them the firſt in eſteem among this claſs of bodies, even were they common; but it happens that their ſcarcity adds immenſely to their value. There is one of theſe ſhells now in Holland, which coſt the poſſeſſor five hundred florins. It is from the bands and faſciæ of theſe ſhells, which reſemble the colours of ſhips, that they have obtained the names of admiral and vice-admiral.

Some of the Hollanders give to another ſhell of this kind the name of extra-admiral; this reſembles the admiral, but has its colours arranged without diviſions of the white enamel. It is a very ſcarce ſhell, but is leſs beautiful than either of the two others.

The family of the *Volutæ* being numerous, the ſpecies may be aptly ranged under three general heads. 1. Thoſe with an exerted clavicle. 2. Thoſe with a depreſſed clavicle. And 3. Thoſe with a coronated clavicle.

Of the firſt kind we have the following ſpecies: 1. The grand *admiral*, or *archithalaſſus primus*. 2. The *archithalaſſus ſecundus*, or the *vice-admiral*. 3. The *archithalaſſus araujicanus*, or the *orange-admiral*. 4. The navel or baſtard *admiral*. 5. The ſpectre-ſhell, or *concha ſpectrorum*. 6. The brown lineated *Volute*. 7. The flame-coloured *Volute*. 8. The Guinea-ſhell, or ſpeculation *Volute*. 9. The reddiſh ſtriated and faſciated *Volute*. 10. The punctulated *Volute*. 11. The Hebrew *Volute*. 12. The brown *Volute*, with two elegant white zones. 13. The Iſabella *Volute*. 14. The *vexillum*. 15. The *Volute*, variegated with two reticulated zones. 16. The bat *Volute*. 17. The white *Volute*, with yellow ſpots and lines.

Of the ſecond kind, or thoſe with depreſſed clavicles, we have the following ſpecies: 1. The black leopard *Volute*. 2. The yellow leopard *Volute*. 3. The reddiſh leopard *Volute*. 4. The chequered *Volute*. 5. The blue ſpotted *Volute*. 6. The faſciated *Volute*, with yellow and white ſpots. 7. The butter-tub *Volute*. 8. The agate-coloured ſtriped *Volute*. 9. The yellow *Volute*, with a white circle. 10. The onyx *volute*. This, when its outer coat is taken off, is of a true onyx colour, and it is in this ſtate that it is uſually met with in the cabinets of collectors. 11. The butterfly-wing *Volute*. 12. The green ſpotted *Volute*, with two variegated faſciæ.

Of the third kind of *Volutæ*, the head of which is coronated, we have the following ſpecies: 1. The *crown imperial*. 2. The leſs faſciated *crown imperial*. 3. The *crown imperial*, variegated with brown. 4. The black marbled *crown imperial*. And 5. The *crown imperial*, called in French the *moire*; this ſeems of the texture of the web of a ſilkworm, only more cloſely woven together. Hiſt. Nat. Eclair. p. 279.

VOLVULA, in natural hiſtory, the name of an extraneous foſſile body, nearly allied to the entrochus, being compoſed of the ſame ſubſtance, and being like that of a cylindric column, made up of ſeveral joints; the commiſſures of the joints are, however, much leſs viſible in the *Volvulæ* than in the entrochi, and they are not ſtriated, as in the entrochus, from the center to the circumference.

The *Volvulæ* are of various figures, ſome reſemble in ſhape a little bottle, and are called *Volvulæ utriculatæ*, and of theſe ſome have, and others have not, a ſtar marked on their bottom; others of them ſwell out in the middle, and taper a little toward each end; and theſe, from their reſemblance in ſhape

to a little barrel, are called *dolioli*, or *Volvulæ doliatæ*. There is great reaſon, from the analogy theſe bear to the entrochi, and other foſſils which owe their form to animal remains, to ſuppoſe theſe of the ſame origin; but we yet know not to what animal it is that they have belonged. *Hill*'s Hiſt. Foſſ. p. 653.

VOLVULUS, in botany, a name given by Daleſchamp, and ſome others, to the upright narrow leaved or toad-flax-leaved bind-weed. See the article CONVOLVULUS.

VOMER (*Cycl.*)—The ſituation of this bone is perpendicular between the two naſal foſſæ backward. It is in figure nearly of an oblique ſquare. Anatomiſts divide it into the right and left ſide, both of which are unequally flat; and four edges, the ſuperior, inferior, anterior, and poſterior; the upper edge is an horizontal groove, which receives the ſharp proceſs or roſtrum of the os ſphenoides. The anterior edge is oblique, and very unequal; its poſterior part is ſmall and thin, and ſupports the perpendicular lamina of the os ethmoides; the anterior is larger, with a pretty deep groove, continued from the canal in the upper edge, which ſuſtains the cartilaginous ſeptum of the nares. The lower edge is likewiſe unequal; and near its anterior extremity is an angle, which divides it into two parts; one anterior, very ſhort, which is ſet in the criſta narium; the other poſterior, and much longer, ſet in the common groove of the oſſa maxillaria and palate. The angle by which this edge is divided, lies in the notch formed by the criſta narium, and the groove of the maxillary bones. The poſterior edge is oblique and ſharp, becoming inſenſibly more obtuſe as it approaches to the larger groove in the edge. This bone has but very little diploe; it is connected with the os ſphenoides, os ethmoides, oſſa maxillaria, and oſſa palati; its uſe is to form the poſterior part of the ſeptum narium. *Winſlow*'s Anatomy, p. 38.

VOMICA (*Cycl.*)—VOMICA, in natural hiſtory, a word uſed by the antients to expreſs one of the blemiſhes to which cryſtals and the precious ſtones are ſubject. This is a duſky foulneſs lying deep in the ſtone, and giving a duſky colour and tinge to the whole. Both the luſtre and tranſparence of the ſtone is much hurt by this accident. When the *Vomica* was of a bluiſh or blackiſh colour, the Romans expreſſed it by the word *plumbago*. See the article PLUMBAGO.

VOMICA *Pulmonum*, in medicine, the name of a diſeaſe which is a ſanious collection of matter, or an apoſtem formed in the lungs, and included in its own proper membrane; this ſometimes ſeizes one lobe, ſometimes the other; and ſometimes lies deep in the ſubſtance, ſometimes near the ſurface. It finally breaks, and then diſcovers itſelf by a diſcharge of purulent matter from the lungs.

The ſigns of this diſeaſe are at firſt very diſtinct; it generally begins from a hard node, which, by ſlow degrees, ripens into a collection of matter. A hectic fever is a conſtant attendant on it, and there is always a dry cough attending it; but this is not very violent. Toward the ripening of the matter, there is a difficulty of breathing, and often the patient complains of a dull heavy pain, ſometimes of a very acute one, in ſome particular part of the breaſt. The face is irregularly red, and a languor grows upon the whole body. The appetite is irregular, and finally a fever comes on; and during this the ſwelling breaks, and the matter is thrown up in ſuch large quantities, as to endanger ſuffocation.

The moſt fatal diſeaſes are uſually the moſt rare, and this is of that number, ſeldom being met with, and when it is, too often fatal. The cauſes of it, are ſtagnation of the blood in plethoric habits, in the veſicles of the lungs; and theſe are uſually owing to the ſuppreſſion of natural habitual evacuations, or the omiſſion of artificial ones, as habitual bleedings and the like; to theſe are to be added, external injuries from falls, blows, or wounds of the breaſt; violent running till out of breath, and a ſudden cooling of the breaſt while the body is hot.

The uſual cauſes of the breaking of a *Vomica*, when formed, are violent ſuccuſſions of the body, loud ſpeaking or calling, violent coughing or ſneezing, and the falling of any ſubſtance in eating into the windpipe.

Prognoſtics in it. The more ſlowly this diſeaſe advances to its height, the more difficultly it is diſcovered; and the deeper it lies in the ſubſtance of the lungs, the greater is the danger of it; though, when moſt ſuperficial, it is of no ſmall danger; for, breaking externally on the lungs, it diſcharges its matter into the cavity of the thorax, and thus makes an empyema, a diſtemper little leſs fatal than the other, unleſs the matter be immediately let out by the paracenteſis. When the matter has lain deep, there is great danger of the perſon's being ſuffocated either at the firſt diſcharge of it, or at the ſucceeding ones, if they are large, and he be already wore down by a hectic, as is uſually the caſe; and even if he eſcapes this, the apoſtem degenerates into an ulcer, and ſo brings on a phthiſis.

In general, the ſmaller the quantity of matter thrown up, the leſs is the danger.

Method of Cure. The ſame general medicines are to be uſed as in a phthiſis. The apoſtem is to be cleanſed and abſterged, which is done by pectorals mixed with diſcutients; ſuch are liquorice, hyſſop, and the ſeeds of carduus mariæ. Then the ſolution of continuity is, if poſſible, to be repaired. This is to be attempted by balſamics, ſuch as comfrey, plantain, ground ivy, and the like. The febrile heat is to be allayed by mixtures of nitre and diaphoretic antimony; and the violence of the cough abated by the uſe of gentle opiates, ſuch as ſtorax pill, and the like, in ſmall doſes.

The bowels are to be kept open by clyſters and gentle purges; revulſion is to be made by bleeding in the foot, and after this, the pectorals, &c. are to be relied on. And during the whole courſe a light diet, and tranquillity of body and mind are to be preſcribed. *Junker*'s Conſp. Med. p. 173. ſeq.

VOMIT. The effects of *Vomits*, on the motion of the blood, appear by the following experiments: By obſerving the pulſe of ſeveral men, after taking a *Vomit*, it has been found, that ſo ſoon as a man begins to grow ſick, his pulſe becomes low, quick, and irregular, and, in the action of *Vomiting*, is often ſo low as not to be felt; that in the intervals, between the *Vomits*, the pulſe is ſtill low and quick, but not near ſo low and quick as in the action of *vomiting*; and that, after the operation is over, the pulſe riſes gradually, and in the ſpace of half an hour, or an hour, becomes fuller than it was before the *Vomit* was taken. Hence we ſee the effects of *Vomits* on the motion of the blood, they leſſen that motion during the whole time of their operation, and almoſt quite ſtop it in the very act of *vomiting*; and after the whole operation is over, they increaſe the motion of the blood, ſo as to make it greater than it was before.

From theſe effects of *Vomits* on the motion of the blood, we diſcover their great uſefulneſs in the cure of many diſeaſes. For inſtance, *Vomits* ſtop hæmorrhages from ſmall veſſels. For when a blood-veſſel is opened, the blood flows faſter thro' that veſſel, and ſlower through all the reſt of the veſſels, than it did before. And therefore, all that is neceſſary to ſtop a hæmorrhage from a ſmall veſſel, is to ſtop the motion of the blood in that veſſel, and increaſe its motion in all the other veſſels; and both theſe are done by *Vomits*, as appears by the foregoing experiments.

The increaſing the motion of the blood in all the other veſſels, will leſſen the motion in the veſſel ſupplying the hæmorrhage, and thereby effectually prevent a return of the diſcharge. For the ſame reaſon, *Vomits* leſſen immoderate diſcharges of the glands, and ulcers; for they leſſen the motion of the blood and humours in the parts affected, by increaſing their motion in all the other parts. By increaſing the blood's motion, repeated *Vomits*, with a proper diet, has been found to be of great ſervice in diſperſing ſcrophulous tumours; which may be allowed, when it is conſidered that theſe tumours are moſt incident to children and young bodies, the motion of whoſe blood is ſlow; and that they often diſappear of themſelves, when bodies are grown up, and their blood has acquired a ſtronger motion.

When obſtructions ariſe from too languid a motion of the blood, *Vomits* are generally of uſe in removing them. And when the motion of the blood is too great, and the obſtructions are formed by cold, *Vomits*, after large bleeding, will be of great ſervice in removing them. In ſhort, *Vomits*, repeated according to the nature and obſtinacy of the diſorder, are generally of ſervice in all irregularities, and diſproportions of the motions of the blood, and other fluids, in different parts of the body. The ſafety, as well as uſefulneſs of frequently repeated *Vomits*, is evidently ſeen in perſons at ſea, and in women with child. Perſons at ſea, who are ſick, and *vomit* much, are commonly the better for it; and frequent *vomiting* in women with child, is of ſervice, and prevents abortion. As all muſcles grow ſtronger by exerciſe, ſo the muſcular coat of the ſtomach grows ſtronger by *vomiting*. Dr. *Br. Robinſon*, of the Food and Diſcharge of Human Bodies. See the article VOMITING, *Cycl.* and *Suppl.*

Some have pretended to give rules for aſcertaining the doſes of *Vomits*. See the article PURGATIVE.

Muſtard VOMIT. See the article MUSTARD.

VOMITING (*Cycl.*)—The cauſes of *Vomiting* are very different, and the treatment of it as a diſeaſe, muſt therefore be alſo various, according to thoſe differences.

Critical *Vomitings*, by which humours of various kinds are diſcharged by the operation of nature alone, are ſalutary, and ſcarce require any care as to their cure; but are, in many caſes, to be promoted: whereas ſymptomatical *Vomitings*, which are leſs ſufficient, or leſs accommodated to the removing the cauſe, are more carefully to be treated, in order to their cure.

The two principal curative indications to be obſerved are, firſt, to quiet and compoſe the convulſive and unruly motion of the ſtomach; and ſecondly, to oppoſe and ſubdue the material cauſes of the diſorder.

The firſt intention is anſwered by corroborating and antiſpaſmodic medicines, ſuch as ſaffron and caſtor, with the teſtaceous powders, as coral, crabs-claws, and oiſter-ſhells; powders compoſed of cinnamon, the leaves of mint, nutmeg, orange-peel, calamus aromaticus, and other ſuch ſimples, are alſo of great ſervice. And if anodynes are found neceſſary, the ſtorax pill, or Sydenham's laudanum, are to be given.

While theſe medicines are taken internally, there may alſo be applied outwardly to the region of the ſtomach, ſuch things as

as have power to repreſs its diſorderly motions; of this kind are the oil of mint, nutmeg, and the like, with balſam of Peru: theſe oils may be reduced to a proper conſiſtence, with this balſam, for the ſpreading on leather, and lying on for ſome time. Hungary-water, and other the like ſpirits, are of great uſe alſo, rubbed on with the hand; and to theſe may be added yeaſt, and the ſtrongeſt wine-vinegar applied hot to the part. Finally, an excellent application is balſam of Peru alone, reduced to the conſiſtence of a cataplaſm, with crumb of bread.

The methods to be uſed to remove the material cauſes of the *Vomiting*, are next to be conſidered: If it be of the pituitous kind, and owing to crudities in the primæ viæ, and a viſcid mucus ſticking to them, it is beſt cured by an emetic: if the *vomiting* of itſelf be found not ſufficient to carry off the ſordes which occaſioned it, and the patient continues, after the fits of *vomiting*, afflicted with a nauſea and heart-burn; in this caſe, a large quantity of warm water, with a little butter, may ſerve the purpoſe; or if this be found inſufficient, a doſe of ipecacuanha is to be given. *Hoffm.* Oper. T. 3.

When infants are afflicted with *vomiting*, from milk coagulated upon their tender ſtomachs, which is a very frequent caſe, the beſt medicine is a mixture of oxymel of ſquills, and ſyrup of rhubarb. See the article INFANT.

In caſes of bilious *Vomitings*, which ariſe from a weakened digeſtion, and have their ſomes in the duodenum, the cure is to be begun with the abſorbent and teſtaceous powders; after theſe, gentle purges of rhubarb and manna are to be given; and finally, the cure is to be perfected by reſtoring the ſtrength of the ſtomach and inteſtines.

In *Vomitings* which ariſe from an acrid matter adhering to the nerves of the ſtomach, from the retropulſion of the gout, an eriſipelas, or other ſuch diſorder, the mild ſedatives are to be given, and with them ſuch medicines as promote the expulſion of the matter; and all means are to be uſed to remove it to the ſurface of the ſkin, or to the extremities again. All ſweating medicines are good in this intention, as they carry the matter to the ſurface. Camphor, taken internally in moderate doſes, is alſo of great ſervice; and warm baths for the feet often prove highly uſeful. In *Vomitings* excited by poiſonous ſubſtances, nothing gives ſuch immediate relief as the taking large quantities of warm milk, and pinguious liquors; for by means of theſe the ſpicula of the poiſon are blunted, and afterwards *vomited* up with the liquors. And hence in contagious and peſtilential caſes, where there is no inflammation of the ſtomach, many phyſicians have very ſucceſsfully given *vomits* of ipecacuanha, and after theſe acid liquors with diaphoretics.

Acrid, acid, and bilious ſordes falling upon the inteſtines, often occaſion a *vomiting*, attended with colic pains; in this caſe, ſmall doſes of oil of ſweet almonds and manna, with large draughts of barley-water between the doſes, are found of great ſervice; and ſmall doſes of laudanum, at proper times, ſerve to compleat the cure. In perſons of hot habits, ſpirit of vitriol, and mild laxatives, are found of moſt certain relief.

The too frequent method of attempting to ſtop a *Vomiting* by aſtringents and anodynes, before the peccant matter is removed, is highly blameable; for when the ſpaſmodic motions are allayed, which nature uſed to free herſelf from this matter, and that yet remains behind, there muſt follow worſe ſymptoms. Theſe remedies which affect the motion only, and not the matter, are only to be uſed when the motion ſubſiſts, after the matter is diſcharged, or when the motion is very violent, and the matter to be thrown off but very ſmall in quantity.

Hence in *Vomitings* exited by the chin-cough in children, ſedatives and anodynes are very proper, ſuch as the ſyrup of red poppies, or diacodium, and a little oil of ſweet almonds.

The *Vomitings* of pregnant women, ariſing from a regurgitation of the blood to the ſtomach, which is alſo obſerved in women afflicted with a retention of the menſes, and in men who have a ſtoppage of habitual hæmorrhoidal diſcharges, are beſt removed by temperating medicines, mild laxatives, emollient clyſters; and beſt of all, by bleeding, or recalling the natural ſecretions of blood, in the two latter caſes. On ſuch occaſions it is highly improper to give emetics, for they ſometimes bring on a *Vomiting* of blood, and ſometimes an inflammation of the ſtomach.

In caſes of efforts to *vomit*, or actual *Vomitings*, in the morning, which frequently happen to thoſe who uſe too much ſtrong liquors over night, the teſtaceous powders are to be given, and all other things which will abſorb acidities; and after theſe the grateful ſtomachics, ſuch as candied orange-peel, and the like.

Chronical *Vomitings* ſometimes affect perſons who have been in a long continued ſtate of grief; in this caſe the beſt relief is found in analeptics, and the uſe of cinnamon-water, impregnated with quinces, and of the generous wines.

In *Vomitings*, which are a ſymptom of fevers coming on, the uſe of a gentle emetic, ſuch as the ipecacuanha is very proper. In the ſmall pox, the *Vomiting* uſually ceaſes ſpontaneouſly after the eruption of the puſtules, and in theſe and many other caſes, great relief is to be obtained in *Vomitings*, by a mixture of ſalt of wormwood and juice of lemons.

In *Vomitings* ariſing from fits of the ſtone, the ſpiritus nitri dulcis often proves of great ſervice; and oily glyſters, and oil of ſweet-almonds, taken internally, are alſo of great ſervice.

The *Vomiting* of perſons in hernias, or the iliaca-paſſio, rarely remits till the cauſe ceaſes. Reſt, and lying in bed, contribute greatly to the ſtopping immoderate *Vomitings*, for all motion of the body excites in theſe caſes a freſh tendency to *vomiting*. In the beginnings of eryſipelas's, and the like diſorders, *Vomitings* often happen, and theſe are by no means to be checked; but the appearance of the diſeaſe externally is to be forwarded by diaphoretics; for as ſoon as the eruptions appear, the *Vomiting* ſtops of itſelf.

The obſtinate *Vomitings* of hyſterical patients are not to be ſtopped by opiates or aſtringents; for the conſequence of this is uſually violent convulſions in the limbs, and anxieties and pain in the præcordia; all which ſymptoms diſappear again, as ſoon as the *Vomiting* returns.

The immoderate and long-continued *Vomitings* of pregnant women, which principally happen in the firſt months of the time, eſpecially in thoſe who indulge themſelves too much in venery, and are plethoric, are by no means to be cured by aſtringents, opiates, or ſpirituous medicines; but are to be removed by repeated bleeding in the ankle, reſt of the body, and tranquillity of the mind. And when *Vomiting* of this kind is ſo violent as to threaten abortion, it is often ſtopped more effectually by the drinking cold water, than by any medicine whatſoever. When an analeptic is neceſſary, one ſpoonful of cinnamon-water, taken after meals, is ſufficient. *Hoffman*, Op. T. 3.

VOMITINGS *in Infants*. See the article INFANT.

VOMITING *of Blood*, *Vomitus Cruentus*, a very dangerous kind of hæmorrhage, conſiſting in a bringing up by *Vomit* of pure and unmixed blood from the ſtomach, and being a method, uſed by nature to throw off a portion of the blood, which moleſts the whole in the vena porta, and by that means to facilitate the circulation of the reſt of the maſs.

This diſtemper ſometimes ariſes from internal cauſes, and is regularly periodical, obſerving the ſtated times of the eruptions of the menſes, or other natural diſcharges; ſometimes it ariſes from accidents, ſuch as the giving of violent purging or emetic medicines, or corroſive ones.

Preceding Signs of it. Among theſe are to be reckoned a ſenſation of ſtraitneſs and anxiety in the præcordia, with tenſion, and involuntary ſighs; with a nauſea or ſickneſs of the ſtomach, and a ſtraining to vomit; which is more violent than in vomiting on any other occaſion; after this the blood is thrown up pure, and the *Vomiting* then ceaſes, till, after a plain ſenſation of more blood being collected in the ſtomach, the efforts to diſcharge it in the ſame manner are again renewed. The quicker the blood is thrown up, after its being diſcharged into the ſtomach, the more fluid and more florid it appears; the longer it is detained there, the blacker and thicker it appears.

Perſons moſt ſubject to it. A *vomiting* of blood is but an uncommon diſorder. It more frequently attacks women than men; among the female ſex it is principally ſeen in thoſe whom the menſes have left too early in life, or who have had violent ſuppreſſions of them for a long time. In men, this diſtemper ſeldom ſeizes any but thoſe who have been uſed to periodical diſcharges from the hæmorrhoidal veſſels, and who have had them ſuddenly ſtopped; and they are then uſually firſt attacked with violent pains in the left hypochondrium. People of ſcorbutic habits, and ſuch as have had quartan agues of long ſtanding, have been ſometimes thus affected. And, beſide theſe natural cauſes, people of all ages and ſexes may vomit blood, from external injuries.

Prognoſtics from it. A *Vomiting* of blood is ever a dangerous diſorder; for tho' the quantity of blood thrown up is ſeldom ſo great as to occaſion immediate death, yet it generally degenerates into a tabes in men, and into a cachectic habit in women. It is leſs dangerous to young women, than to any other perſons; and when it is periodical, eſpecially when it obſerves the times of the menſtrual diſcharges, is much leſs dangerous than under any other circumſtances.

Method of Cure. During the paroxyſm, the proper medicines are powders of nitre, cinnabar, and the abſorbent ſubſtances, ſuch as crab's-eyes, or the like, and afterwards bleeding, cupping, and gentle purges, and diaphoretics are to be given for ſome time. *Junker*'s Conſp. Med. 35.

VORTEX (*Cycl.*)—We have, in the Philoſophical Tranſactions, a phyſico-mathematical demonſtration[a] of the impoſſibility and inſufficiency of *Vortices* to account for the cœleſtial phænomena.—[[a] By Monſ. de *Sigorne*. See N°. 457. Sect. 6. p. 409. ſeq.]

This author endeavours to ſhew, that the mechanical generation of a *Vortex* is impoſſible; that it has only an axifugal, and not a centrifugal and centripetal force; that it is not ſufficient for explaining gravity and its properties; that it deſtroys Kepler's aſtronomical laws; and therefore concludes with Sir

Iſaac Newton, that the hypotheſis of *Vortices* is fitter to diſturb than explain the cœleſtial motions. We muſt refer to the diſſertation itſelf for the proof of theſe aſſertions.

VOTE (*Cycl.*)—In elections of members of the houſe of commons, ſuch *Votes* ſhall be deemed legal, which have been ſo declared by the laſt determination in the houſe of commons; which laſt determination concerning any county, ſhire, city, borough, cinque port, or place, ſhall be final to all intents and purpoſes. Stat. 2. Geo. 2. c. 24.

UPLAND (*Cycl.*)—The *Uplands* lie either on the tops of hills, or on their ſides, or on the ſlopes of riſing grounds. They ſometimes have a ſandy ſoil, ſometimes a rocky, gravelly, or loamy one, and ſometimes they conſiſt of tough clay, or a black mould. They are uſed by the farmers either for grazing or corn, as they happen to be more moiſt or more dry; and this difference depends upon their ſituation and nature.

Thoſe lands which lie flat upon the tops of hills, are uſually the drieſt, and thoſe which form the ſlopes or ſides, are uſually the moiſteſt, becauſe of the wet that is continually ouzing through them. The chalky, and eſpecially the clayey ſoils in theſe places, are moſt of all ſubject to be wet, eſpecially in winter, becauſe they retain the moiſture a long time; though they have alſo the inconveniencies of the ſandy and rocky lands in the ſame ſituations, chapping in ſummer. The black mould, and the hazely loams in theſe places, are the beſt for corn, as well as for paſture, eſpecially if the latter eſcapes the common misfortune of being full of worms. Theſe lands neither are waſhy in winter, nor parched up in ſummer.

The *Upland* meadows have ſome diſadvantages, as they often need mending or feeding, which thoſe that lie lower do not; but then they make amends for this in their hay, which is always much finer and ſweeter than that of the low-lands.

UPLOPER, a name given to one particular ſpecies of pigeon, called by Moore, *columba gutturoſa ſaliens*.

It was firſt brought to England from Holland, and much reſembles that kind of pigeon called the Engliſh Powter, but that it is ſmaller. Its crop is very round, and in this it buries its bill. Its legs are very ſmall and ſlender, and its toes are ſhort, and cloſe together, on which it treads ſo nicely, that, when moving, any ſmall thing might be put under the ball of its foot. The pigeons of this ſpecies are generally all blue, all black, or all white; ſeldom or never pyed. They are very ſcarce in England, and in Holland have been valued at five and twenty guineas a pair.

They have their name from the Dutch word *Oplopen*, which ſignifies to leap up, and it was thus named from its manner of approaching the hen, which is always by leaping upon her. *Moore*'s Columbarium, p. 37.

UPRIGHT (*Cycl.*)—Upright *South Dial.* See the article Prime *Vertical*, *Cycl.*

UPULUS, in botany, the old Latin name for the *lupulus*, or hop. This word *lupulus* is not old Latin, but a more modern name, formed on the word *Upulus*.

The original word *Upulus* alſo was formerly written *opulus*, being a climbing plant. The word was alſo applied to other climbing plants, ſuch as the white and black bryony. Some of the antients called the hop *upulus ſalictarius*, becauſe of its twining about willow-trees. Pliny mentions it under this name. The words indeed ſtand *lupus ſalictarius*; but this is a very plain error, ſince the *ſalictarius* is joined to the word *Upulus* by Cato, Varro, and moſt of the other writers of antiquity; but by no body to the word *lupus*. Cato in one place calls it *ulva*; but this is evidently an error of the copy. The word *ulva* is the name of a ſea-plant growing without ſtalks, compoſed only of tender leaves; and it is here called a tall plant, climbing upon the willows. There is no doubt from this, and from the ſame author's ordering it to be ſtrewed under cattle, by way of litter, that it was the *Upulus* or *lupulus*. See the article Lupulus.

UPUPA, the *Hoopoe*, in the Linnæan ſyſtem of zoology, makes a diſtinct genus of birds, the characteriſtic of which is, the having a double crown of feathers on the head. *Linnæi* Syſtem. Nat. p. 45.

Theſe birds are common in Germany, and ſometimes ſeen in England, though but rarely. Its general weight is about three ounces. The beak is black, ſlender, ſharp, and a little hooked; its head is adorned with an extremely beautiful and elegant creſt, riſing two fingers high, and compoſed of two ſeries of feathers, reaching from the inſertion of the beak to the back part of the head; and theſe can be raiſed or depreſſed by the bird at pleaſure. The tips of theſe feathers are ornamented with black and white, the reſt is of a cheſnut colour. Its neck is of a pale reddiſh brown; its breaſt white, variegated with longitudinal ſtreaks, which diſappear in the middle as the bird grows older; the tail is four fingers breadth long; it is compoſed of ten feathers, and is black; but has a large white ſpot in it, of a lunated figure, the points ſtanding towards the extremity of the tail. Its wings, when folded, do not reach to the end of the tail; and are ſtreaked acroſs with white; it feeds on beetles, worms, ants, &c. and is ſaid alſo to eat berries, and other vegetables. *Ray*'s Ornith. p. 100.

Æſchylus, Ariſtotle, and many of the other old Greek writers tell us, that the cuckow, when it has ſung all the ſummer, acquires a plume of feathers on its head, and loſes its voice for the winter ſeaſon, and is in this ſtate called the *Upupa* or *Hoopoe*; but there is no truth in this ſtory, though the general opinion of thoſe times.

In the ſame manner they ſuppoſed the *ficedula* and *melancoryphos*, or black cap, to change into one another; becauſe the one appeared at that time of the year when the other went away. We have in this bird alſo another proof of the ignorance of thoſe times in natural knowledge: they tell us, that the callais or turquoiſe, which we call the *Turkey-ſtone*, was found in the melancoryphus only, becauſe the eggs of that bird are of the ſame beautiful pale blue colour with that gem.

URACHUS (*Cycl.*—The uſe of the *Urachus* is not yet diſcovered, according to Dr. Trew. Phil. Tranſ. N°. 457. Sect. 7. See the articles Allantois and Foetus.

URANOSCOPUS, in zoology, the name of a fiſh of the cuculus kind, called in Engliſh the *ſtar-gazer*; and by ſome authors, *callyonymus*.

It is uſually caught of about ſeven or eight inches in length, but ſometimes it grows to a foot; its head is very large, bony, and rough, and of a ſort of ſquare figure; its body is long and rounded; its upper part is all of an aſh-colour; its belly white; its ſcales are very ſmall and thin, inſomuch that many have ſuppoſed it had none. Theſe are diſpoſed in oblique ranges acroſs the body of the fiſh, running toward the tail. The ſide-lines are arched, and riſe to the back fin, which is a great ſingularity. Its face is flat, and ſeems turned upwards, and its eyes are ſmall and prominent, and are ſo placed in the upper part of its head, as naturally to look up to the heavens, whence it has its name. Many of the flat fiſh have their eyes placed as thoſe of this fiſh; but the pupils in all theſe look ſideways; in this only they are turned ſtrait upward. Its mouth is very large, and opens perpendicularly downward, being placed in the ſame direction with the eyes in the upper part of the head. It has a beard under its chin, like that of a man, and its jaws are furniſhed with very ſharp teeth, as are alſo the inner parts of its mouth. Its whole head is covered with rough tubercles, and it has two fins on the back, and two on its breaſt. It is frequently caught in the Mediterranean, and is by ſome ſaid to be a well-taſted fiſh. *Geſner*, de Aquat. p. 159.

The reaſon of the ſituation of the eyes of the *Uranoſcopus*, is the providence of nature for a fiſh which, always keeping at the bottom, has no where to look for prey but in the water above it. But if other fiſh had been well examined, this peculiar name would never have been given to this. The eyes of the *rana piſcatrix* are placed in the ſame manner, and thoſe of a great number of other fiſh, whoſe cuſtom it is to keep at the bottom, are more or leſs alſo thus ſituated.

According to the new ſyſtem of Artedi, this is a ſpecies of the *trachinus*, and is diſtinguiſhed from the others of that genus, by the name of the *trachinus* with many beards on the lower jaw. The fiſh deſcribed by Willughby and others under the names of the *ſea-dragon* and *ſea-ſpider*, the *draco-marinus* and *araneus-marinus*, are of this genus. They are properly indeed only the ſame ſpecies in different ſtates, and are diſtinguiſhed from the *ſtar-gazer* by the name of the *trachinus* with the lower jaw longer than the upper, and with no beards hanging from it. *Artedi* Gen. Piſc. 73. See Tab. of Fiſhes, N°. 48. and the article Trachinus.

URCEOLUS, in eccleſiaſtical writers. See the article Aqua *Manilis*.

URCEUS, in antiquity, the name of a meaſure of liquids, which in different places was of different capacity; its moſt uſual ſtandard ſeems to have been between twelve and ſixteen ounces.

URCHIN, a common name given to the hedge-hog. See the article Erinaceus.

Sea-Urchin, in ichthyology. The *echinus marinus* of authors is, in ſome parts of England, called the *ſea-egg*, and in others the *ſea-urchin*, or *hedge-hog*. It is a genus of fiſh, of which there are a great number of ſpecies.

The manner of theſe creatures moving at the bottom of the ſea, has been diſputed among naturaliſts; the general opinion of the world has been, that they did it by means of their ſpines or prickles, which ſerved them by way of legs; but ſome of late, particularly Mr. Gandolphe, pretend that the ſpines of the *Urchins* are of no uſe to them on this occaſion, but that they move by means of certain legs, like the legs of the ſtar-fiſh, which they occaſionally put out when they walk, and at other times retract them into their body. The world was readily falling into this ſyſtem, particularly as Mr. Gandolphe affirmed, that he had been often an eye-witneſs to it; but the indefatigable Mr. Reaumur tried the experiment himſelf, and often made himſelf an eye-witneſs of the contrary fact, having frequently ſeen them walk at the bottom of a ſhallow baſon of ſea-water, with no other aſſiſtance than that of their ſpines, and even having made them perform the ſame motion, by the ſame means, upon his hand.

This curious enquirer into nature did not, however, ſtop here; but took occaſion from hence to enquire accurately into every circumſtance of their progreſſion, which is performed by ſo uncommon means.

It is certain that the *ſea-Urchin* does throw out at the lower

aperture of its ſhell, when it pleaſes, certain bodies which reſemble not a little the legs of ſtar-fiſh; but theſe ſerve not at all to its motion; but, on the contrary, their real uſe is to keep the creature ſtill, and fixed in the ſame poſition; and, to deſcribe them more exactly, they very aptly reſemble the horns of ſnails; whence Mr. Reaumur has choſen rather to call them horns than legs. The uſe the *Urchin* makes of theſe horns, while it is in motion, is to feel about, and try the ground on which it marches; and they ſerve the creature as a ſtaff does a blind man in his walking, to touch and try every thing that lies in the way; and to make them ſerve to this purpoſe, it is continually extending or retracting them during the time it is moving. Theſe horns are not only placed about the orifice of the ſhell, but they are every where diſperſed among the ſpines, all over the ſurface of the ſhell.

To underſtand properly the poſition of theſe horns, it will be neceſſary to conſider the figure of the *ſea-Urchin* ſhell, as we uſually ſee it, that is, ſtripped both of its ſpines and its horns. In this ſtate it appears a very beautiful piece of workmanſhip. It is a hard body, the figure of which approaches to that of a ſegment of a ſphere, or a mould of a button hollowed within; it has an aperture at the very ſummit of the ſhell, and another at the baſe, juſt oppoſite to it; this is the caſe in the common kind; for there are great varieties in the place of theſe holes, in the different ſpecies: at this lower aperture is placed the mouth of the animal; the upper is ſuppoſed to ſerve it to diſcharge the excrements by. The whole external ſurface is covered with protuberances of different ſizes, but all diſpoſed in a beautiful and regular order; they divide the whole ſurface, as it were, into ten ſpheric iſoſceles triangles, all which have their ſummit at the upper aperture, and their baſe at the lower. Of theſe there are five large and five ſmall; but all the large ones, and all the ſmall ones, are regularly of the ſame ſize one with another. There is a ſmall band, which is leſs rough than the other parts, which ſeparates every larger from every ſmaller triangle; theſe bands are alſo in themſelves ſo many triangles; but the calling them by this name, will better ſerve to diſtinguiſh them from the others. As the triangles, both large and ſmall, are all covered with eminences or protuberances, theſe bands are, on the contrary, all pierced with ſmall holes; theſe run quite through the ſhell, and their apertures are more ſenſible on the inſide than on the out. Theſe holes are beautifully diſtinguiſhed, on holding the ſhell againſt the light, and are arranged in a very beautiful order, and in regular ſeries on every band. There are two ſorts of ranges of theſe upon every band, one ſort containing two holes all the way, and the other four; theſe are placed in a regular alternate order; firſt, a range of two, then a range of four, then another of two again, and ſo on to the extreme edge of the band.

The ſpace contained in every triangle is alſo in the ſame manner divided into ſeveral parts by a number of lines, which begin at the upper aperture of the ſhell, and terminate at the lower; but as theſe lines in the bands are marked by little perforations, they are, in the triangles, made of thoſe eminences which render the ſurface of the ſhell rough and uneven; thoſe eminences which are in the middle of every line, are larger than thoſe which come towards one or the other end; and the ſeveral different lines are made up of theſe eminences of different ſizes one from another, ſo that, on the whole, there is every where a great variety of them. Every one of theſe eminences reſembles a ſort of teat or nipple, with a portion of the breaſt; or, to give a more determinate idea of them, each is a portion of a ſphere, the ſummit of the convexity of which is crowned with another portion of a much ſmaller ſphere. Theſe are the parts on which the baſe of every ſpine of the *Urchin* is fixed; and as this baſe is hollow, it naturally envelopes the ſmall portion of a ſphere at the ſummit of each eminence, and is able to move and turn any way upon it, in the manner of the ball and ſocket articulations. The ſmaller eminences ſuſtain the ſmaller ſpines, and the larger the great ones; the number of theſe eminences, or, in other words, the number of the ſpines on one fiſh, is ſurprizing; many of them are ſo ſmall, that it is not eaſy to count them regularly; but Mr. Reaumur found, in general, that there were conſiderably more than two thouſand on every fiſh; nor is the number of the perforations before-mentioned leſs to be wondered at; they take up but a very ſmall ſpace on the ſhell, in proportion to the ſpines, yet Mr. Reaumur obſerves, that their general number in every ſhell cannot be leſs than thirteen hundred. From knowing the number of theſe perforations, we are able to determine that of the horns; for every horn has its origin from one of theſe. The horns are never ſeen all together, they are only viſible when the creature is in the water, and even then it only exerts ſome of them at a time, ſo that it is not to be expected that they ſhould all be ſeen together. When it is in motion, it only ſhews thoſe which are placed on that ſide of the ſhell which is to move forwards in the journey; and when it is at reſt, we only can ſee thoſe which it thruſts out, and faſtens to ſtones or other bodies, to fix itſelf by. Theſe ſerve by way of anchors to the creature, it glews them faſt down to the ſtones, *&c.* and if the creature be forcibly removed, they are generally, in part, if not entirely, broken and deſtroyed by it. When the creature is taken out of the water, they are no more to be diſcerned, they are bent and folded together, and are in a flaccid ſtate, ſo that nothing but their ends can be at all perceived, and theſe no body can tell what to make of, who has not before ſeen them in their exerted ſtate in the water.

The ſpines are all capable of aſſiſting the creature in its motions, but thoſe it principally employs are ſuch as are placed near its mouth, as theſe can turn upon their balls every way with equal facility, the creature finds it equally eaſy to move on any ſide; and when it has determined which way it will move, thoſe ſpines which ſtand directly toward that point, and thoſe which are directly oppoſite, are of equal ſervice to it; it draws itſelf forward by means of the firſt, and puſhes itſelf on with the others; to do this, it firſt thruſts out the foremoſt ones as far as poſſible, and preſſing them againſt the bottom, it draws on its body by them; and this is ſucceeded by its drawing up the hinder ones cloſe to its ſhell, and then fixing them againſt the bottom, it puſhes itſelf forward by them. This is the manner of this little creature's marching in the common way with its mouth downward; but it has this ſtrange ſingularity, that it is not confined to this poſture alone in marching, but can, with equal eaſe, walk with its mouth upwards, or run along ſideways in the manner of a wheel; or in any direction between theſe. The legs and the horns cover all parts of it, and are in every part of it equally able to move it every way. What a prodigious number of muſcles muſt this little creature have to be able to move ſeparately thirteen hundred horns, and more than two thouſand ſpines, which ſerve for legs. Mem. Acad. Par. 1712.

URED0, a word uſed by ſome of the chemical writers to expreſs the virtues of metals communicated to them from the ſun. Pliny uſes the ſame word to expreſs the ſmut affecting fruits; and ſome medical writers have expreſſed by it a very violent and excruciating pain in the head. See the articles SMUT and BLASTS.

URENA, in botany, a name given by Dillenius to a genus of plants, the characters of which, according to Linnæus, are theſe: The cup is a double perianthium; the external one is compoſed only of one leaf, divided ſlightly into five broad ſegments; the inner one is compoſed of five narrow and angular leaves. The flower is compoſed of five oblong petals, which are broadeſt at the apex, and end in an obtuſe point, and at their baſes are narrow and grow together. The ſtamina are numerous filaments, which at their baſes grow together into a cylinder, but ſtand free at the tops. The apices are roundiſh. The germen of the piſtil is roundiſh; but it is formed into five angular prominences. The ſtyle is ſimple, and of the length of the ſtamina, and is crowned with ten ſtigmata, which are headed, reflex, and hairy. The fruit is a roundiſh pentangular echinated capſule, being compoſed of five valves, and containing five cells. The ſeeds are ſingle and roundiſh, and at their ends ſomewhat compreſſed. *Linnæi* Gen. Plant. p. 329. *Dillen.* Hort. Eltham. p. 319.

URETHRA (*Cycl.*)—The hard knots which are ſometimes formed in the corpus cavernoſum *Urethræ*, after venereal virulency, are very difficult to cure. Till the pocky matter is all extirpated, it is in vain to attempt the cure of theſe knots, and even then they do not yield to mercury in any ſhape, but are reſolved by embrocations of the waters of Bareges. See Mem. de l'Acad. de Chirurg. Tom. 1.

Mr. le Cat has given us the figure of the canal of the *Urethra*, determined by ſolid injections. See Phil. Tranſ. N°. 460. Sect. 5. p. 684.

URETHRÆ *Depreſſor*, in anatomy, a name given by Santorini to a muſcle of the pudenda in women, the ſame with that which he calls in men the *elevator Urethræ* and *ejaculator*. Winſlow, and the generality of the French anatomiſts, call it the *proſtatique inferieur*. And Albinus, who has given to the *tranſverſalis penis* the name of the *tranſverſus perinæi*, calls this alſo the *tranſverſus alter perinæi*.

URETHRÆ *Elevator*, in anatomy, a name given by Santorini to a muſcle of the penis, which he calls alſo the *ejaculator*; it is called by Albinus the *tranſverſalis alter perinæi*, to diſtinguiſh it from the muſcle commonly called the *tranſverſus penis*; but which he calls the *tranſverſus perinæi*. The ſame muſcle in women is called the *depreſſor Urethræ* by the ſame Santorini.

URETHRAM *Dilatans*, in anatomy, a name given by De Graef to a muſcle of the penis called the *Urethram trahens* by Spigelius, and by the later writers, the *accelerator penis*. See the article ACCELERATOR.

URETHRAM *Trahens*, in anatomy, a name given by Spigelius and others to a muſcle now generally called the *accelerator*. See the article ACCELERATOR.

URETHRÆ *Triangularis*, in anatomy, the name of a ſuppoſed muſcle of the penis, called alſo *dilatator penis*, and *dilatator Urethræ*; it is properly only a proceſs of the ſphincter ani continued into the perinæum.

URIBACO, in zoology, the name of a Braſilian ſea-fiſh, eſteemed a very well taſted and wholſome one. It is ſomewhat of the figure of the pearch; its back is ridged, and its belly ſomewhat protuberant. It grows to ten or twelve inches long. Its teeth are ſmall and ſharp, and the ends of its gills terminate in a triangular point. Its gill-fins end in a triangular

triangular point; its belly-fins are ſuſtained by a very rigid and ſtrong ſpine. Its long fin, behind the anus, is all the way ſupported by flexile and ſhort ſpines, and has one very ſtrong and rigid one before it; and it has only one fin on the back, which reaches nearly to the tail, and is all the way of an equal breadth, and ſupported by rigid and prickly rays. Its tail is very deeply forked. Its ſcales are all of a fine ſilvery white, with ſome faint caſt of a pale but bright red; its belly-fins are white, and its back-fin and tail are reddiſh. Its ſide-lines are broad, and of a fine red; and over theſe, and under them, near the tail, there is on each ſide a large black ſpot. *Marggrave*'s Hiſt. Braſil. *Ray*'s Ichthyogr. p. 338.

URINARIA, in botany, a name given by ſome authors to the common dandelion. *Ger.* Emac. Ind. 2.

URINE (*Cycl.*)—The ſecretion of *Urine*, as alſo that of perſpiration, is conſiderably influenced by the paſſions. See the article PERSPIRATION.

Dr. Rega mentions the opinion of ſome modern authors, who imagine that our drink paſſes through the coats of the ſtomach and bladder, *&c.* when it is ſo quickly evacuated by *Urine*, as it is obſerved to be after drinking ſeveral mineral waters and other liquors. He endeavours to prove, by an eaſy calculation of the quantity of *Urine* ſecreted in the kidneys, that they are capable of furniſhing all the quantity obſerved at any time. And laſtly, he mentions the fullneſs and great frequency of the pulſe, after drinking theſe liquors, as a proof of their being mixed with the blood. Med. Eſſ. Edinb.

The ſpecific gravity of the human *Urine*, made in the night-time, has been found greater than that made in the day. Hence Dr. Bryan Robinſon [b] infers, that *Urine* draws off more contents from the blood in ſleep, than when bodies are awake; and conſequently that natural ſleep is a very good ſign in fevers, in which the blood abounds more with contents than it does in health.—[[b] Of the Food and diſcharges of Human Bodies, p. 85.]

The *Urine* of phthiſical people is ſaid to be always ſpecifically heavier than that of people in health, or in any other diſeaſe.

We have frequent inſtances of peoples voiding by *Urine* much greater quantities of liquids than they take into the ſtomach in the time; but this, though a ſeeming paradox, is eaſily explained, by conſidering how very ſmall a part only of what we call ſolids, is really ſolid. Chemiſtry ſhews us that the far greater part of our food may be procured in a fluid form by diſtillation; and on this principle alone, ſo long as the quantity of *Urine* voided is not more than that of the meat and drink together, the miracle ceaſes. There are, however, inſtances of the quantity of *Urine* greatly exceeding that of both. Dr. Wittie, in this caſe, ſuppoſes the converting of air into water to make up the over-proportion; but it is more rationally accounted for by the decreaſe of the patient's fleſh all the time. Our own bodies, as well as the foods we take in for their ſupport, are compoſed of a greater proportion of fluids; and the real ſolid matter is ſo very little, that when, by the courſe of a diſeaſe, thoſe fluids, which ſhould remain locked up in the texture of the ſolids, and increaſe their bulk, are drained and ſeparated from them, it is no wonder that the diſcharge be vaſtly diſproportioned to the ſupplies, when the body itſelf goes off with them. We have indeed accounts not eaſily ſoluble on theſe principles, nor any way but by the ſcheme of converting air into water before-mentioned; but till we are certain that the quantities and proportions are accurately noted in them, it will be raſh to conclude any thing from them.

Among accounts of this kind, we have theſe recorded in the Philoſophical Tranſactions from Dr. Wittie and others. A perſon at Hull, in a diabetes, voided twenty-four pints of *Urine* every eight and forty hours, for many weeks together, during which time his muſcular parts were all in a manner diſſolved into *Urine*; and the weight of the *Urine*, voided in theſe weeks, according to the Doctor's computation, greatly exceeded the whole weight of his body, and of all that he had eaten or drank in the time. Sir Kenelm Digby tells us a thing, which, if we may credit it, calls for a ſupply greater than any thing but the converting a great part of the air taken in in reſpiration could give: This is of a nun, who voided two hundred pints of water as from her bladder every twenty-four hours, for ſome weeks together. There is another relation of a ſick maid in Italy, who voided thirty-ſix pints of *Urine* every twenty-four hours, for the ſpace of ſixty days, till at the length the whole quantity voided amounted to one thouſand ſeven hundred and forty pounds; a weight greatly ſuperior to that of her own body, and all that had been received into it in the time. The whole credit of theſe relations lies on the character of their authors; and we are to remember, that the ſtrongeſt of them comes from an author who, in another part of his works, has given a receipt for creation; a method, as he expreſſes it, of making live crawfiſh. Philoſ. Tranſ. N°. 52. See the articles SOLID and FLUID.

In order to the preparing the phoſphorus, and indeed moſt of the other preparations of *Urine*, the firſt ſtep is to reduce that liquor to the conſiſtence of a rob or thick extract; thoſe who have worked on this ſubject ſufficiently know, how abominably naſeous and diſagreeable a taſk this is. The operator alone is not the perſon who is almoſt poiſoned by it, but the whole neighbourhood is affected; and it is well known, that our Godfrey, who uſed to prepare large quantities of this ſubſtance, was always obliged to keep a houſe in the fields to perform this part of the proceſs in.

There is an eaſy and excellent method propoſed by Stahl for the performing this troubleſome buſineſs, by means of condenſation by cold or freezing. There needs no more than to expoſe the proper quantity of *Urine* to ſome froſty nights in winter; or at any time of the year to our Ice-houſes, or other places where ice is preſerved all the year round. The froſt will, in this caſe, affect a large part of the *Urine*, but not the whole; and the liquid part being ſeparated from the ſolid ice, it will be found that the watery parts alone have ſuffered the freezing, and that all the unctuous and ſaline ones are left behind in the unfrozen part, which is, by repeated freezings of its yet remaining aqueous part, at length reduced to that ſort of rob which is required for all the purpoſes of diſtillation, and that without any trouble or offenſiveneſs, either to the operator or any body elſe. The power of condenſation by freezing in this manner, extends to wine, vinegar, and all fermented liquors; but it operates differently on the ſeveral different ones, and is to be regulated according to their natures. The natural cold of our climate is ſeldom too great for any of the liquors we deſire to condenſe; that is, it is never ſo great as to condenſe the whole into ice. It often is not ſufficiently great to condenſe the aqueous part, even after ever ſo many repetitions. In this caſe, it may be proper to bring in the uſe of the common freezing mixtures, made with ice, or ſnow and ſalt. To ſuit the artificial degree of cold, in theſe caſes, requires care and experience, and is almoſt as nice a point as the ſuiting the degrees of heat in the operations of chemiſtry. *Stahl* de Concentr. Vin. *Shaw*'s Chemical Eſſays.

When *Urine* has been reduced to a rob by condenſation by freezing, it is found to vary very remarkably, according as it was taken, either freſh, or half putrified, to make the operation. That which was made freſh remains in this ſtate tolerably clear, and of a dull yellow colour, and almoſt without ſmell; but that which was taken half putrified, remains of a colour between brown and red, or ſomewhat deeper, like the brown ſtrong beer, and becomes intolerably fœtid, if ſet for any time in a warm place; but that which was condenſed freſh, is not liable to this accident, but may be kept two or three years in the ſtate of rob, and will never grow fœtid, nor ſmell much like *Urine*. *Stahl* de Concentration.

Glauber has taught the world to believe, that there is nothing ſo deſtructive to vegetables of all kinds as *Urine*, which, he ſays, by means of the ſal armoniac that it contains, burns up all the roots. This is certainly true of *Urine*, and of dung too, when laid on in too great quantities; but it is certain that *Urine* is as ſafe as dung, and as profitable, when laid on in a ſparing and proper manner. Dung is of no uſe to land, but by its fermentation; but the beſt of all things to haſten and perfect that fermentation is *Urine*. The Dutch are perfectly ſenſible of this, and are as careful to preſerve the *Urine* of their cattle as the dung. *Mortimer*'s Huſbandry.

Bloody URINE, *Mictus Cruentus*, in medicine, the name of a very troubleſome and often dangerous diſeaſe; it is a voiding of pure blood by the urinary paſſages, and takes its origin from a congeſtion of blood in the emulgents, and is the method (tho' an unhappy one) taken by nature to diſcharge the load of a plethora, and give the maſs of blood freer room to circulate. This is the natural or ſimple *Mictus Cruentus*; but, beſide this, there is another accidental one, ariſing from an injury of the veſſels from a rough ſtone in the kidney. This, however, is a much leſs frequent caſe than is vulgarly imagined; for there are great numbers of nephritic patients who have very large ſtones in the kidneys, yet void no blood, and in many caſes, where this is a ſymptom, it will be more juſt to attribute it to the effect of the ſharp nephritic medicines, than to the action of the ſtone.

Signs of it. When a *Mictus Cruentus* is natural, it uſually comes on tacitly, and without any previous ſymptoms, or if there be any, they are only ſome ſenſations of a weight and preſſure upon the loins: but when this is brought on by accidents, as by the rubbing of a ſtone, or the like, it is always preceded by violent pains. The blood voided with the *Urine* is florid, and, after a time, ſubſides perfectly from among it; but when there is an exulceration of the kidneys, the blood is altered in its texture and appearance, and ſhews itſelf like worms.

Perſons moſt ſubject to it. Theſe are old men of plethoric habits; but even with theſe it is a rare diſtemper. When young men, or even middle-aged ones, are affected with it, we are to ſeek for its origin in violent and preternatural cauſes. Men are alſo, in general, more ſubject to it than women; but theſe are not wholly free from it.

Cauſes of it. Theſe are uſually a plethora, and an unnatural derivation of the hæmorrhoidal blood to the kidneys, where the veſſels burſt; for it is very rarely, and never but from ſome preternatural cauſes, that they burſt in the bladder. The common violent and preternatural cauſes of this diſeaſe, are the uſe of the hot diuretics, of balſam of ſulphur, of oil of amber, and, above all, of cantharides. Long riding on horſe-

horſeback, or blows on the region of the loins. In old men, an over uſe of venery may alſo bring it on, as alſo violent paſſions of the mind, a ſpirituous diet, an exulceration of, or a ſtone in, the kidneys; and finally, an omiſſion of habitual diſcharges of blood, whether they have been artificial by bleeding, or natural by the hæmorrhoids, or the like.

Prognoſtics from it. It is a diſtemperature that never can prove of benefit in any caſe, but is often very dangerous. Old men who are afflicted with it, rarely live long after it, eſpecially if the diſcharges are not regularly made; and if it be raſhly ſuppreſſed by the uſe of aſtringents, in any caſe, it brings on inflammations, fevers, and often dropſies. Ulcers in the kidneys are another very frequent effect of this; and under theſe, blood and purulent matter are voided together, and appear like clouds in the *Urine*.

Method of Cure. In the time of the fit, the violent emotion of the blood is to be reſtrained by nitre, cinnabar, and ſome of the abſorbent powders, and if theſe are found inſufficient, the milder aſtringents are to be joined with them; coral, crocus martis, and vitriol of iron; and if theſe fail, the aſtringent tinctures of ſteel, and the terra Japonica, are to be given. Some alſo recommend as ſpecifics, the juice of nettles, a decoction of the equiſetum or horſe-tail, and a tea made of aſparagus-roots. The bowels muſt be kept gently open by clyſters, or the milder purgatives; and after the fit the ſame methods are to be continued, to prevent a return. After this, bleeding in the foot is of great ſervice, and old perſons are not to be excuſed from it on account of their age. It is finally to be conſidered, whether an obſtruction of the menſes, or of the hæmorrhoidal diſcharges, have occaſioned the diſeaſe; and if ſo, they are to be regulated with all due care for the future; and for the firſt the proper medicines are to be given; for the latter, leeches are to be applied to the hæmorrhoidal veſſels. *Junker's* Conſp. Med. p. 39—44.

In caſes of *bloody Urine*, ſpirit of vitriol, mixed with the patients drink, has been found ſerviceable. See Medic. Eſſ. Edinb. abrig. vol. 1. p. 68.

Incontinence of URINE. This is a term uſed by medical writers to expreſs an involuntary excretion of this liquor, whether it be inceſſantly, or in larger quantities at different intervals.

This is of two kinds; in the one it is only in the night, in the time of ſleep; and this ariſes merely from careleſsneſs, and a bad habit; in the other, it depends on a paralytic affection of the ſphincter of the bladder; and in this caſe it drops away continually from the patient; and this is therefore called by ſome a *ſtillicidium*.

Authors alſo divide an *incontinence of Urine* into the idiopathic and ſymptomatic: The idiopathic is a diſeaſe in itſelf, and depends upon the preceding cauſes; the ſymptomatic happens to different perſons on different occaſions, as a ſymptom of other complaints. It is common to dying perſons; it is alſo very frequent to women who are very big with child, and ſometimes happens from violent ſneezing, coughing, or laughing.

Perſons ſubject to it. The voiding of the *Urine* involuntarily, and in the ſleep, in infants, is not to be accounted a diſeaſe; but when this cuſtom continues with them as they grow up, from idleneſs, or ill habit, it is at length to be conſidered as a diſeaſe, as they are by no means able to help it. Women who have ſuffered much in child-birth are often ſubject to an *incontinence of Urine* afterwards, eſpecially perſons who have had their firſt child at an advanced age. People in years, who are ſubject to paralytic complaints, are alſo often afflicted with this troubleſome complaint; and many who have been cut for the ſtone by perſons not ſufficiently ſkilled in the operation. Perſons ſubject to the piles alſo ſometimes fall into it, from the ſuppreſſions of their uſual diſcharges, and ſometimes from the tumors becoming fiſtulous, and reaching to the neck of the bladder. Impoſthumes of the bladder will alſo occaſion it, and violent external injuries.

Prognoſtics in it. An *incontinence of Urine*, which happens only in the night, and is merely cauſed by a bad habit, and not of long ſtanding, uſually admits of a cure; but the ſtillicidiums of *Urine*, from paralytic diſorders of the ſphincter of the bladder, are very rarely cured, eſpecially when they have been fixed ſome time upon the perſon.

Method of Cure. The involuntary voiding the *Urine* in the night, in children, is to be cured, in a great meaſure, with puniſhment for the neglect, and by denying them much liquids after dinner-time; by a proper diet; the avoiding all diuretics, and the making water immediately before going to bed; and when it has gone ſo far, that the tone of the parts is injured, the uſual ſtrengthening medicines are to be given, as in the following caſes.

When the *incontinence of Urine* is occaſioned by a paralytic weakneſs of the ſphincter, nervous and ſtrengthening medicines are the proper method of curing; in this caſe, maſtic, amber, nutmeg, and cinnabar, are found to be of great ſervice, and pills or powders compounded of them, are an excellent general remedy to be given in ſmall doſes, two or three times a day. Externally, it is very proper to uſe by way of fomentation, decoctions of roſemary, ſage, ſerpyllum, marjoram, and the like warm herbs in red wine.

When the diſeaſe is occaſioned by an impoſthume or ulcer in the neck of the bladder, balſamics are to be given, as maſtic, gum juniper, and boiled turpentine; but when it is owing to injuries received in child-birth, the manual operation of the ſurgeon is uſually to be preferred to all internal medicines. *Junker's* Conſp. Med. p. 538.

Suppreſſion of URINE. See the article SUPPRESSION *of Urine*.

URINE *of a Cow.* This diſagreeable potion having been much recommended as a medicine both in England and France, Mr. Lemery was at the pains of inquiring how far it might reaſonably be ſuppoſed to poſſeſs the virtues aſcribed to it.

He obſerves, that *Urine* in general is a ſerous liquor, impregnated with a volatile ſalt and oil, both which it has taken up from the blood, in the courſe of its circulation with it. It is eaſy to conceive, that principles ſo active as theſe may give it virtues, and thoſe very great ones. We find that recent human *Urine* purges, when taken in a proper quantity; but for all medicinal purpoſes, it muſt be much more proper to take the *Urine* of ſome animal which feeds only on vegetables, that being a ſort of extract of the more ſubtle ſaline parts of the herbs on which the creature feeds.

Tho' the *Urine* of any of theſe animals ſeems equally to be recommended; yet that of the cow has, in all times, been preferred to others, from the quantities of it eaſily obtained, and the tame and pacific nature of the animal, which has been ſuppoſed ſo far to influence it, as to occaſion its *Urine* to be leſs acrid than in other beaſts.

The ſpring ſeaſon is the propereſt for the uſe of this remedy, and the method of taking it is to drink two or three large glaſſes in a morning faſting, a quarter of an hour after one another: Thus taken, it purges both by ſtool and *Urine*; the perſon is to walk about, after taking it; and it has been found, in this manner, to do great ſervice in jaundices, dropſies, rheumatiſms, and aſthmas, as alſo in ſciaticas, and vapours.

Mr. Lemery gives ſeveral inſtances of cures performed by it, under his own direction, and afterwards proceeds to give its analyſis.

This *Urine* is uſually ſomewhat turbid, and when it has been ſuffered to ſtand by a little, depoſits a ſediment; it is of a pale yellow colour, and of a faint ſmell, greatly different from the *Urine* of the generality of other animals, and reſembling the ſmell of the dung of the ſame creature, only leſs ſtrong, and with ſome mixture of the ſmell of new milk.

The taſte is ſaline, acrid, and bitter; cows kept in cities often have their *Urine* very acrid; but thoſe in the fields frequently have it with only a ſlight bitterneſs at firſt, and not ſhewing its ſaline or acrid properties till after it has been made ſome hours. It always readily ferments with acids.

Mr. Lemery put into a cucurbit ſixteen pounds of *Urine of a cow*, kept in the country, and which had been made two days; This being diſtilled in a cucurbit, purged with leſs violence than before. The purging virtue plainly conſiſts in a volatile ſalt, which the *Urine* carries up with it in vapour; for it taſtes ſomewhat acrid and ſaline after diſtillation.

The diſtillation being continued in the ordinary way, there ariſes a large quantity of volatile ſalt and oil, in nothing differing from thoſe of the human *Urine*; and the remainder, in the bottom of the veſſel is a black, light, and ſpongy coal, weighing four ounces: this, being calcined in an unglazed earthen veſſel, over an open fire, and treated in the common way of elixiviation, affords three ounces two drams and a half of a fixed acrid and highly alkaline ſalt, white, and without ſmell. Mem. Acad. Par. 1707.

URN (*Cycl.*)—*Roman* URNS. Theſe veſſels are frequent in many parts of this kingdom, where there have been Roman ſtations, and are of very various kinds and manner of workmanſhip.

Dr. Liſter, who was very fortunate in his reſearches into the ſtructure and differences of theſe remains of antiquity, obſerved, that in Yorkſhire, where there are great numbers found, there were met with three very different kinds, as to their matter and tempers.

1. A bluiſh-grey ſort, which had a great quantity of coarſe ſand wrought in among the clay. 2. A ſort of the ſame bluiſh colour, but containing a ſand of a much finer kind, and full of mica, and probably made of a clay naturally ſandy, or a fine ſmooth and ſtiff loam. And 3. A red ſort, made of a fine pure clay, with little or no mixture of ſand. Theſe are throughout of a fine red colour like bole, and many of them are elegantly adorned with figures in *baſſo relievo*; and uſually theſe have on the bottom, or elſe on the cover, the name of the workman, which ſome have miſtaken for the name of the perſon whoſe aſhes they incloſe; but this muſt be an error, ſince great number of pots and urns are found with the ſame name. Theſe are varniſhed all over, both inſide and out, with a varniſh of a bright red colour.

The ſeveral matters of theſe *Urns* informed this ingenious inquirer of the place where they were made; which he found

to be in the ſame county on ſand-hills, now never uſed as potteries; but, as he well obſerves, the difference is very great between the potteries of thoſe days and of ours, ſince we, who uſe great quantities of clay, and but little ſand, erect theſe works where there is much clay, and bring the ſmall quantity of ſand we uſe to it; whereas the Romans, on the other hand, who uſed much ſand and but little clay, naturally eſtabliſhed their works where there was plenty of ſand, and brought their clay to it.

The *Roman Urns* differ from the earthen-ware made at this time in ſeveral particulars: 1. They have no lead-glazing, which ſeems a modern invention, and is, in many reſpects a very bad one. See the article GLAZING. 2. They are compoſed of a far larger quantity of ſand than clay. And 3. they are baked not in an open fire, as our common earthen-ware, but have been incloſed in large earthen veſſels, to defend them from the immediate contact of the flames; and hence it is, that the natural colour of the clay they are made of is not altered in them.

The red *Urns* ſeem to have been the maſter-piece of the workmen, and to have employed their greateſt art; the emboſſed work upon them is often very beautiful, and their coral-like glazing is more beautiful than any thing of the modern times, and ſeems to have been done by dipping them all over in ſome appropriated liquor, and afterwards baking them in the cloſe manner before deſcribed. This has certainly been the method they uſed, ſince the fragments of theſe large coffins, or caſes, are found near all the Roman potteries. *Hook*'s Philoſophical Collections, p. 87.

The Romans, and moſt other nations, contented themſelves to make their funeral *Urns* of potters ware, or baked earth; but we find there have been ſome people who have made them of gold, on particular occaſions. In the year 1685, as a peaſant of the iſland of Funen was ploughing a piece of land, which had before lain barren, he turned up no leſs than ſix golden ſepulchral *Urns*. They were all full of a greyiſh ſubſtance, which ſome took to be a grey earth; but it was much more probably aſhes.

Theſe are all preſerved at this time in the muſæum of the king of Denmark at Copenhagen; the largeſt of them weighs two ounces and a half, and the others about two ounces and one dram each. Wormius, and ſome others, give accounts, that it was an antient cuſtom among the northern nations to burn their dead, and when they were great perſons, to collect their aſhes and bury them in golden *Urns*; and the finding theſe ſeems an evident proof of the truth of that account.

Theſe *Urns* were very thin, and each had three rings of gold about their necks, and ſeveral circles, one within another, with one common center carved on the outſide round the body of the *Urn*. They held about five ounces of liquids apiece, or a little more than that; one near ſix ounces.

Sepulchral *Urns* of cryſtal were alſo not uncommon; the ſame muſæum has ſome of theſe: they are of a conic figure, and have uſually a gold wire wound round them. *Urns* of this kind have been found buried in ſome parts of Norway. Another kind of *Urns* were thoſe which they called *lachrymales*, or the *tear-Urns*: Theſe were contrived to receive the tears of the friends of the deceaſed, which were afterwards mingled with the aſhes of the burnt corpſe: Theſe were made of various materials, and of various ſhapes and ſizes, according to the fancy of particular people. Phil. Tranſ. N°. 285.

UROGALLUS, in zoology, the name of a bird of the gallinaceous kind, called alſo *tetrao*, and in Engliſh the *cock of the wood* or *mountain*. See Tab. of Birds, N°. 25.

In ſhape it reſembles the turkey, and approaches to it in ſize. Its legs are feathered down to the toes before, and naked behind. Its breaſt is of a pale reddiſh brown; the ends of the feathers white; and the whole variegated with tranſverſe black ſtreaks. Its belly is greyiſh, and its back elegantly variegated with black, reddiſh-brown, and grey. The ends of the feathers are all ſpotted with ſmall ſpecks, unleſs on the head, where they are of a fine plain black; but with a glow of purple intermixed. The tail is of a reddiſh brown, variegated with tranſverſe black ſtreaks, and is white at the tip or end. It is common on the Alps, and in ſome parts of Italy, and is ſaid to be found alſo in the mountainous parts of Ireland. Its fleſh is very delicate.

UROGALLUS *Minor*, in zoology, the name of a large bird common in ſome counties of England, and called the *black game*, or *grouſe*, and by ſome authors, *tetrao minor*. *Ray*'s Ornithology, p. 123. See Tab. of Birds, N°. 26. and the article GROUSE.

UROMASTIX, in zoology, a name uſed by ſome authors for that ſort of lizzard called *cordylus*. *Grew*'s Muſ. p. 45. See the article CORDYLUS.

VROW-*Fiſh*, in zoology, the name of a freſh-water fiſh of the malacoſtomous kind, or, as we call it, the leather-mouthed kind, caught in the lakes and rivers of Germany, and eſteemed a very delicate fiſh.

It is ſomething like the Engliſh rudd or finſcale, but its body is ſomewhat longer, in proportion to its breadth; its back is brown, and its belly yellow; the belly-fins near the anus are a little reddiſh, but all the reſt are brown; the ſcales are large and ſilvery, and the iriſes of the eyes have each, in their lower part, a blood-coloured ſpot; the tail is forked; and its uſual ſize is about ſeven or eight inches, though it is ſometimes caught conſiderably larger. *Willughby*'s Hiſt. Piſc. p. 253.

URRY, in natural hiſtory, a name given by the people of Cheſhire, and ſome other counties of England, to a black fat earth found in coal pits, lying immediately over the ſtratum of coal. It is found to be an excellent manure for land, particularly in cold clayey ſoils. *Mortimer*'s Huſbandry.

URSUB, a name by which ſome of the chemical writers have called lead.

URTICA, *Nettle*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the apetalous kind, being compoſed only of a number of ſtamina placed in a cup. Theſe are barren, and the ſeeds grow on other plants of the ſame ſpecies, which have no flowers, and are contained either in round globules, or bivalve capſules, or in long tufts.

The ſpecies of *Nettle*, enumerated by Mr. Tournefort, are theſe: 1. The great ſtinging *Nettle*. 2. The great ſtinging *Nettle*, with red ſtalks. 3. The common leſs ſharp *Nettle*. 4. The common ſmall *Nettle*. 5. The ſtinging *Nettle*, with round balls, and ſeeds ſhaped like linſeed. 6. The pellitory-leaved *Nettle*, with round balls. 7. The great Canada racemoſe *Nettle*. 8. The Canada *Nettle*, with leaves like the myrrhis. And 9. The racemoſe American *Nettle*, with large hazel-like leaves. *Tourn.* Inſt. p. 334.

The roots of the common *Nettle* are much recommended in medicine; they are powerful diuretics, and are ſaid to have great virtues againſt the ſtone and gravel. They cleanſe the blood, and are ſaid to be of great ſervice in hæmorrhages of all kinds, particularly in ſpittings of blood, and overflowings of the menſes. Authors add to this, that they are ſpecifics, by way of antidote againſt the poiſon of henbane and hemlock; but this we are not ſo well aſſured of. The young ſhoots of the plant are eaten in the ſpring, as good againſt ſcorbutic complaints. *Dale*, Pharm.

The antients ſeem to have deſpiſed this plant, from its being common, and, though poſſeſſed of great virtues in medicine, neither the Greeks nor Latins have ſaid much about it; nor have the Arabians, who abound in the imaginary virtues of plants, thought the real ones of this herb worth their conſideration.

It has, however, been more honoured lately, and notwithſtanding its being now the moſt vile and abject plant among us, as well as the leaſt regarded by the antients, Johannes Francus, an author of conſiderable fame, has publiſhed a treatiſe ſolely upon it; in this he has treated at large on its hiſtory and virtues. He deſcribes its ſtings in a very judicious manner, according to the preſent doctrine of the microſcope, and gives the hiſtory of certain worms of ſingular kinds which feed upon it; and adds its uſe in our own foods as a wholeſome and agreeable pot-herb; in our drink as a ſubſtitute for hops, being as well capable of preſerving it as thoſe, and its great ſervice to the farmer in fattening hens.

John Melchiore Dreſchler, in the year 1717, ſuſtained alſo a theſis on the virtues and uſes of this plant, which has been ſince printed, ornamented with ſeveral cuts. In theſe two authors we find the whole account of the ſeveral uſes this common plant has been put to, and may be put to in our manufactures, our domeſtick and medicinal uſes; and, if what they ſay be true, we muſt wonder to ſee ſo much value overlooked in an herb, only becauſe it is common.

URTICA *Errans*, in zoology, the name of a ſea-animal, of the nature of the common *Urtica marina* in many particulars; but as that is always fixed down to the rocks, this ſpecies is always found looſe.

It has been ſuppoſed that theſe creatures affected the ſkin with a pain like that of the ſtinging of nettles on touching them, and even the eyes of thoſe who only look attentively on them; but Mr. Reaumur, who ſaw prodigious numbers of them on the coaſts of Poictou, declares that he found no ſuch property in any of them, any more than in thoſe fixed to the rocks.

Theſe in ſubſtance ſo much reſemble a ſtiff jelly, that if they were called ſea-jellies, there would want but a ſhort additional deſcription to make them underſtood. Their fleſh, if it may be ſo called, appears of the colour as well as the conſiſtence of a common jelly; and if a piece of one of them be taken up, the mere heat of the hand is ſufficient to make it melt away into plain water. Theſe are notwithſtanding true and perfect animals; and thoſe who have been of a contrary opinion, have not examined them with ſufficient attention. There are very different figures among them; but this is owing to their being of different ſpecies, for all thoſe of the ſame ſpecies are ever exactly of the ſame figure. One great reaſon of people's ſuppoſing them unorganized bodies, is, that what is ſeen of them about the ſhores is very often a fragment of a dead animal, not the whole of a living one; and no wonder if all the

neceſſary

neceſſary parts of an animal could not be found in ſuch a piece of one.

Though the generality of theſe animals are of the ſimple colour of a jelly, there are ſome of a greeniſh caſt, and others which have a broad band of a beautiful purple round their extremity; and ſome are beautifully ſpotted with brown. Their figure is very well expreſſed by that of the head of a large muſhroom; their upper ſurface is convex in the ſame manner, and this convexity is greater or leſs in the different kinds, as it is in the different ſpecies of muſhrooms; all that is to be obſerved on this convex ſurface, is, that it has ſeveral little protuberances on it, ſhaped like ſo many nipples, and placed in an irregular manner: theſe are of the ſame colour with the reſt of the body; but though there is nothing more to be ſeen on this ſurface, the under, or concave one, gives proof enough of a regularly organized body. The edge is very thin, and cut in ſeveral places; and juſt within that there appears a great number of concentric circles, which cover the reſt of the ſurface. Theſe are not all complete; however, thoſe which are near the center, are divided into ſixteen arcs, and thoſe more diſtant into eight. Theſe ſeparations in the circles are made by certain tubes, which are always full of water, which they can, at pleaſure of the animal, communicate to other very ſmall and fine tubes, placed between the circumferences of ſome two of the circles. Theſe ſmall tubes are of great conſequence to the well-being of the animal, and they are known to be tubes by their figure, when full, and are eaſily proved to have communication with theſe other reſervoirs, by the preſſing the larger, which always ſends the water into theſe ſmaller ones. The large veſſels, which go from the center to the circumference, and theſe ſmall circular ones ſeem, in ſome meaſure, to reſemble in their office the veſſels of larger animal bodies; and this water contained within them, to be a liquor elaborated there, and analogous to blood, which fills out and diſtends the very fine and ſmall ſolid parts, of which this animal's body is compoſed. If one of theſe animals be dried in the ſun in hot weather, there remains nothing of it but a ſubſtance like a thin parchment; but if one of them be boiled in water, it does not diſſolve away as might have been expected, but only regularly decreaſes in ſize; and when it has become of about one fourth of its natural bigneſs, it there ſtops the decreaſe, and continues nearly of that ſize, and after that will not melt away upon the hand.

Near the end of the ſtrait tubes, all the animals of this ſpecies are divided into four parts, by four bands or columns, for they are round in ſome, and flat in others. Theſe are ſometimes raiſed almoſt perpendicularly on the baſe; ſometimes they make an acute angle, and they all join at length to a round trunk of about their own length; this trunk is of a cylindric figure, and is divided into eight branches. In the ſpace contained under the four columns, there is a large canal formed by a thick membrane, which ſeems the only ſolid ſubſtance in the animal; this membrane is folded into a ſort of purſe, and forms a ſort of canal, which becoming round near the baſe of the columns, takes the ſame figure which a ribband would have, if turned round the four arms of a large and regularly ſhaped croſs. This large canal is full of a yellowiſh glutinous liquor, and it uſually gives one or two branches to each of the columns. Theſe four colums terminate, as before obſerved, in a trunk, which then divides into eight branches, and their route may be further traced through the whole body of the animal, as they contain the ſame yellowiſh liquor with this large veſſel, which is every where diſtinctly ſeen, as being very different from the reſt of the body in colour.

All the creatures of this ſpecies, which we ſee thrown upon the ſhores, are found lifeleſs and without motion; but there is nothing wonderful in that, becauſe the violent ſhocks and blows which they muſt have received, in being daſhed againſt the rocks or ſands by the waves, are enough to kill ſo tender an animal. One proof that theſe animals once lived, is, that all thoſe which we find about the ſhores are heavier than the water, and ſink to the bottom, whereas all thoſe ſeen out at ſea, ſwim upon the ſurface; and this could not be the caſe in regard to any ſubſtance heavier than water, unleſs kept up by ſome voluntary motion. This motion Mr. Reaumur has obſerved to be a reciprocal contraction and dilatation of the whole body, in the manner of a ſyſtole and diaſtole. In the contraction it elevates the convexity of the body, and in the dilatation it makes it more flat, and by continually repeating theſe motions, it keeps above water as a man does by ſwimming. Mem. Acad. Par. 1710.

URTICA *Marina*, the *Sea-Nettle*, in botany. See the articles LAMIUM and ARCHANGEL.

URTICA *Marina*, in zoology, the name of a remarkable genus of fiſhes, ſo called from their affecting the ſkin on touching them, with a painful ſenſation like that of the ſtinging of nettles. Theſe are an animal of the loweſt claſs, and have by many been reckoned among thoſe creatures called *zoophytes*, or plant animals, as ſuppoſed to partake of the nature of vegetables and of animals. Some of the ſpecies of this fiſh are found looſe upon the ſmooth ſhores, and ſome fixed to the rocks which are always covered with water. This has given birth to a diſtinction of them into two claſſes, which is as old as Ariſtotle; thoſe of the one being ſuch as move in the open ſea, and thoſe of the others ſuch as are fixed to rocks, and were ſuppoſed always to remain immoveably in the ſame place. The accurate Mr. Reaumur has obſerved, however, that even theſe laſt have a power of a progreſſive motion, and are not doomed to an eternal reſidence on the ſame ſpot. The motion of theſe creatures is ſo ſlow, that it might eaſily paſs unobſerved by leſs accurate obſervers; this gentleman comparing it to that of the hour-hand of a clock, and adding, that a journey of an inch takes them up commonly between one and two hours. He obſerves alſo, that many of the ſpecies have no property of ſtinging, or cauſing any painful ſenſation on the fleſh. Ariſtotle and Pliny, who were both inclined to make theſe creatures of a middle nature between plants and animals, yet differ in their accounts of them; the former affirming that they have no anus or exit for their excrements, and the other allowing them an extremely fine tube or pipe for that purpoſe. What Pliny ſeems to mean by this pipe, muſt be one of the horns of the creature; but the matter it diſcharges from that, has nothing of the appearance of excrements, being mere clean water. Senſation, a power of eating and digeſting food, and locomotion, being certainly ſufficient characters of animal life, and this creature being evidently poſſeſſed of them all, there is no room to doubt its being as truly and properly an animal, as a whale or an elephant.

Theſe creatures occaſionally change their bodies into ſo many different forms, that there is no giving any deſcription of their figure. The moſt natural and general ſhape, ſeems that of a truncated cone, the baſe of which is applied to the rock; but this baſe is often round, often elliptic, and often of a perfectly irregular figure. This baſe is alſo ſometimes perpendicular to the ſummit; but very often it is oblique; and in changing the figure and extenſion of this, the animal alters its own whole ſhape at pleaſure; for the ſmaller this baſe is, the more elevated is the top; and, on the contrary, the broader it is, the flatter and lower is the whole fiſh. The ſurface of the top of the cone is not flat, but convex, and has in its center an aperture, which the creature makes larger or ſmaller at pleaſure. In ſome poſitions the whole fiſh not unaptly reſembles a purſe, only with this difference, that the body is not drawn up into any folds or wrinkles by the cloſing the aperture or mouth. In the middle of this purſe, as we call it, is placed the body of the fiſh, touching this outer covering at the bottom on every ſide, and of a conic figure, as that is. At its top, however, it is looſe, and ſtands every way free from its covering; the ſides are more or leſs diſtant from this free or looſe part of the body, as the aperture at the top of the cone is more or leſs open; when it is nearly ſhut up, very little of the body of the animal can be ſeen; but when it opens it to different widths, more or leſs of the body becomes viſible, and when it is at the wideſt, every part of it, and all the horns, are ſeen perfectly diſtinct. Theſe horns reſemble in appearance thoſe of the common ſnail; but in their uſe they ſeem much more allied to the pipes or proboſcides of the chamæ kind, the fiſh generally throwing out water at them on being touched. They are placed in three ranges on the internal ſurface of the covering, and are very numerous, their whole number not being leſs than 150.

The creature very often not only opens the outer covering or purſe to the utmoſt width it is capable of, but at the ſame time turns back its extremities; in this caſe the internal part, or body of the fiſh, becomes viſible on the ſurface, and at the ſame time all the horns being, by this bending back of the ſkin on which they grow, thrown into the poſture of ſo many rays; the whole makes a very remarkable figure, and not unaptly reſembles an anemony, or ſome other ſuch flower, when fully open. Very often alſo there is a great addition to the beauty of this appearance, by ſeveral round veſicles of water, which appear blue, or of ſome other lively colour. The general colour of the different ſpecies of this fiſh, or indeed of the ſame ſpecies in different circumſtances, is as variable as the ſhape; ſometimes they are ſeen pellucid and colourleſs, ſometimes white, often yellowiſh, ſometimes of a roſe colour; at other times they are of a beautiful green, and often of various ſhades of brown. In ſome theſe colours are equally diffuſed through every part; in others they are only ſeen in form of ſpots and clouds or variegations; ſometimes theſe are irregularly diſpoſed, ſometimes more regularly; but always with great beauty. The green ones have uſually a broad line of blue all round their baſe. The colours nor ſhapes of theſe animals can be no marks of different ſpecies; but the firmneſs of their fleſh may; in this they remarkably differ one from another, and this is a difference the more obvious, as their fleſh is always open to the touch, there being no ſhell, nor any other hard ſubſtance to cover it.

However ſlow the progreſſive motion of this fiſh is, when examined it is found to depend on a very remarkable mechaniſm, to underſtand which we muſt attentively conſider what is obvious to the eye in the ſtructure of the creature, and remember the compariſon of the whole fiſh to a purſe. We find that what reſembles the bottom of that purſe is flat, and is fixed to the rock, while the body of the fiſh is

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contained in the reſt of the purſe, but never fills it, unleſs when the mouth of the purſe or covering is cloſe drawn together. The whole covering is a collection of muſcles which are all tubular. The baſe of the fiſh never appears to us, becauſe always fixed down to the rock; but when the creature is raiſed from that poſition, and the baſe examined, it appears compoſed of a vaſt number of tubes placed one behind another, and running from the center to the circumference. Theſe tubes are often filled with an aqueous liquor, which may be forced out on preſſing them. Beſides theſe tubes, there are alſo to be ſeen many circular ones, which ſurround one another, and have for their common center that of the baſe. The conic part of the covering is in the ſame manner compoſed of a number of circular tubes, which are placed very cloſe to one another, and all run parallel with the round verge of the baſe, and terminate at the upper circle or rim of the cone. Under theſe there is another ſeries of ſtrait tubes, which all run from the baſe to the top of the cone. It is remarkable that the circular and ſtrait muſcles are never ſeen together in the ſame place; whether it be that the extending of the one ſet makes the others flaccid, or only that the leſs extended ones are hid by thoſe which are more ſo. Sometimes there are only the circular ones viſible, ſometimes only the ſtrait ones, and often only a few of the circular ones appear, reſembling ſo many bands, between which it is eaſy to ſee the parts of the ſtrait ones which lie under them. The creature ſeems capable of making all theſe changes at pleaſure, filling ſuch as it will with an aqueous liquor, which is the cauſe of their becoming more viſible, and which is let out, if they are pricked with the point of a pin. The inflation of different parts of theſe ranges of ſtrait and circular tubes, is what makes all the differences in the ſhape of the fiſh, and ſerves alſo to the purpoſe of its progreſſive motion; and it ſeems probable that the aqueous liquor which ſerves to diſtend them, is, at the pleaſure of the creature, conveyed to them from the horns, and from them back to the horns again. The progreſſive motion ſeems thus performed: When the creature has determined which way it will march, it diſtends all thoſe longitudinal tubes which are on that ſide of its body which is placed toward the point it would move to; this, from its round ſhape at the baſe, gives it an oblong one; that is, it throws the fore-part ſomewhat forward upon the rock; and, at the ſame time, if the longitudinal tubes on the oppoſite ſide of the body be all left empty, and the circular ones diſtended, theſe naturally draw the whole body toward the fore-part, and thus a ſmall advance is made and preſerved, and this, often repeated, is the ſlow progreſſion of this animal. All this is, however, performed ſo very ſlowly, that though there is a continual change going on in the creature, both as to ſhape and place, yet if the eye is kept continually on the object, neither is perceived; but, if taken off for ſome time, and the place and figure both kept in mind, both will be found to be altered on viewing again.

There is a ſpecies of this fiſh alſo which moves by means of its horns; this is known from the reſt by the length of the horns, and their being covered with a glutinous moiſture. This ſpecies lives in the cavities and holes of rocks; and when it has a mind to move, it turns itſelf bottom upwards, and crawls ſlowly on by means of its horns, which then touch the rock.

The food of the *Urtica-marina* is not leſs wonderful than its ſtructure and motions. It ſhould ſeem very ſtrange that an animal, ſoft like this creature, with no feet, no inſtrument of that kind to help itſelf with, ſhould be able to feed on the fleſh of muſcles, ſea-ſnails, and other ſhell-fiſh; yet theſe are its conſtant food. They find means to take in the ſhell-fiſh whole into the body, and then cloſe the aperture faſt upon it, ſo that it is not to be ſeen that they have any ſuch thing within them; they keep them here as long as they pleaſe, and afterwards throw out the empty ſhells by the ſame aperture, which they can, as before obſerved, widen and contract at pleaſure. By what means the *Urtica* is able to get out the body of theſe fiſh, is not known, as it all paſſes in the body; but it very often fails, and the creature is obliged to throw out the ſhell fiſh alive again; and ſometimes, when it has greedily gorged too large a morſel, and it is got into a wrong poſition to be thrown out the ſame way, it is obliged to let it through the baſe, where there is no natural aperture, and where its paſſage muſt be attended with a terrible wound. The manner in which the larger ſhells are thrown out by the mouth, is by opening it extremely wide, and turning it back, ſo that the inſide appears outward for a little way down; and this motion is alſo uſed on another very neceſſary occaſion, the excluding the young ones, for theſe animals are viviparous. Mem. Acad. Par. 1710.

It has been found that this creature has the remarkable property of the polype, in re-producing ſuch parts as it had loſt. Mr. Reaumur tried many experiments on the various ſpecies of this, and of the ſtar-fiſh kind, and found that whatever parts were cut off, the wound ſoon healed; and Mr. de Villars had opportunities of watching the whole progreſs of the growth of the animals afterwards, and found that they not only ſeemed alive and well after cutting, their wounds ſoon cicatriſing, but that they, in a very little time, regained what had been cut off, and became as perfect as before.

URUS, in natural hiſtory, the name of a ſpecies of wild bull, of a very remarkable ſize and ſtrength. Cæſar, in his commentaries, has deſcribed them as little inferior to elephants in ſize, and reſembling the bull in ſhape, figure, and colour. He adds, that they were very ſwift and fierce, and had horns very much larger, and very different from thoſe of the common bull. And Mentzelius tells us, that it is a vaſt and terrible ſpecies of wild bull, common in Livonia, *&c.* and that when killed, its brain is found ſcented like muſk. Mr. Ray wiſhes very much, that ſome one, who has an opportunity of ſeeing this creature, would give a more accurate and perfect account than thoſe we already have of it. *Ray*'s Syn. Quad p. 70.

USNEA, (*Cycl.*) in botany, the name of a genus of moſſes, the characters of which are theſe: They are wholly deſtitute of leaves, and are compoſed only of long ſlender filaments or ſtalks, which are uſually ſolid, rigid, and of a cylindric figure. The extremities, or other parts of theſe, are at times furniſhed with a ſort of orbicular bodies, dry and deſtitute of uſe, but ſeeming to ſupply the place of flowers. Theſe are hollow, in form of cups, but have no rim. The whole plants are fixed in the manner of miſletoe to the barks of trees. Micheli has given accounts of flowers and ſeeds in theſe plants; but Dillenius ſuſpects the accuracy of the obſervation, and adds, that if there are ſuch, they are too minute to be of any ſervice in the general diſtinctions of the plants. *Dillen.* Hiſt. Muſc. p. 68. Of this genus of plants there are nineteen known ſpecies. 1. The ſtringy-tree moſs, or common *Uſnea* of the ſhops. This conſiſts of long and variouſly implicated threads, which are branched out into ſeveral diviſions; this grows on old oaks, and other trees, in thick woods. 2. The wide-forked tree *Uſnea*, with finer points, deſcribed by Micheli, and in its ſeveral varieties, by him called of three ſpecies. It is compoſed of thicker branches than the former, and they are only dichotomouſly divided, having no ſmall branches but at the points or ends. 3. The wide forked *Uſnea*, with thicker points; this and the two former are of a grey colour, and this compoſed of rough ruſhy branches. It grows on old fir-trees. 4. The capillaceous knotty tree *Uſnea*, called the *long headed Uſnea*, or *necklace moſs*. This is of a bluiſh-grey colour, and hangs down from the branches of old trees. 5. The flat Alpine *Uſnea*. This is ſofter than the others, and has long and flatted branches, and commonly is found on the larch-tree. 6. The beard *Uſnea*. This is compoſed of thin and fibrous branches, and is uſually more or leſs knotty. It is of a pale grey colour, and grows on old beech, and other trees. 7. The black mane *Uſnea*. This grows in great plenty in the Hartz Foreſt, and in ſome parts of England. It is rigid, and of a ruſty black. 8. The black, hard, woolly *Uſnea*. This grows on rocks and ſtones, and reſembles flocks of black wool, but is more rigid. 9. The black tufted *Uſnea*. This alſo grows on ſtones; it is ſmall and ſlender, but uſually ſtands in thick tufts. 10. The hard and rigid tree *Uſnea*, with branches expanded every way. This is of a greeniſh grey, and grows on oaks, and ſometimes on rotten poſts and old boards. 11. The horſehair *Uſnea*. This is black, and compoſed of ſlender filaments, ſcarce at all branched, reſembling horſe-hairs. It is common on the barks of trees in Patagonia. 12. The common ſmall *Uſnea*, without rundles or cups. This is a very common moſs on old trees and boards; it is very much branched, and does not hang in long ſtrings, like the others, but is of a ſomewhat ſhrubby appearance. 13. The common ſmaller *Uſnea* with rundles. This is not leſs common than the former, and much reſembles it; but the lateral branches are more rigid. 14. The true *Uſnea* of the Arabian phyſicians. This is of a whitiſh colour and ſmooth ſurface, and is divided in the manner of a ſtag's horns, and of a very agreeable ſmell. The branches are partly cylindric, but a little compreſſed, and are uſually crooked, and divided into many filaments. It is not a native of England, but is very common in the Eaſt Indies, and in many other parts of the world. Bellonius ſays, that it is commonly ſold in Conſtantinople. 15. The orange-coloured forked *Uſnea*. This is of a deep yellow, and conſiſts of flatted branches, dichotomouſly divided, and terminating in fine ſlender filaments. It is often found of a foot in length, and is common in the Canaries. 16. The braſs wire *Uſnea*. This is of a fine gold yellow; its branches are cylindric and rigid, and it grows up in the form of a ſmall ſhrub. 17. The ſmaller yellowiſh tree *Uſnea*, with coronated rundles. This is ſmaller, and of a paler yellow than the other, and its branches are thicker. 18. The ſmall hairy black *Uſnea*. This grows on ſtones and rocks, and is very ſhort and rigid. 19. The ſmalleſt of all the *Uſneas*. This is of a black colour, and grows on the barks of old trees, but is ſo ſmall as to be ſcarce viſible. *Dillen.* Hiſt. Muſc. p. 70.

USNEN, in botany, a name given by Aviſenna and Serapion to the plant Kali, of which the alkali ſalt called *pot-aſhes*, and uſed in the compounding our ſoap, is made. There are alſo ſeveral other things called by this name, and, in general, all that were

were uſed in the ſcouring or cleaning of clothes. The dung of ſparrows was uſed by ſome people for this purpoſe, as the dung of hogs is at this time, and this was therefore called by ſome *Uſnen*. Hyſſop, a plant famous for its cleanſing virtue, was alſo called by the ſame name; and ſome have alſo applied it to the ſoldanella, or ſea bind-weed.

Wherever, in the Arabian writers, the word *Uſnen* is uſed in any of theſe latter ſenſes, there is ſomething added to diſtinguiſh which of the things before expreſſed is meant by it; but whenever it ſtands alone and unexplained, it is to be underſtood as meaning the *kali*.

USSAC, in the materia medica of the Arabians, a name given by Serapio to the gum ammoniacum of the Greek writers. It ſeems no other than a falſe ſpelling of the word *aſſac*, which is the common name of the gum in Aviſenna, and other of the writers of that nation; but this does not ſeem to be the ſame drug which we call gum ammoniacum at this time.

USTRINA, among the Romans, the place where they burnt the bodies of the dead. It was commonly in the Campus Martius, or ſome other place in the ſuburbs, and ſometimes in the city for perſons of quality; and for the common people on the Eſquiline mount. *Danet.* in voc. See the article BUSTUM.

USTULATION, *Uſtulatio*, a word uſed by pharmaceutic writers to expreſs the roaſting or torrefying of humid or moiſt ſubſtances over a gentle fire, ſo as to render them fit for powdering. The ſame word is alſo uſed by ſome for what we call burning of wine.

UTAMANIA, in zoology, the name of a bird of the web-footed kind, wanting the hinder toe. It is common about the iſland of Crete, and is very expert at diving. It is of the ſize of a teal, and has its head and back black, and its belly white. Its feathers are ſoft and ſlender, and rather reſemble down than plumage; but they are very firmly affixed to the ſkin. Its beak is ſharp at the edges, and is covered in a great part with down. Bellonius, who deſcribes the bird, ſuppoſes it to be the only web-footed one that wants the hinder toe; but in this he is miſtaken: his deſcription and figure comes alſo ſo near the common beak or razor-bill, that it is pretty certain the bird is nearly allied to that, if at all eſſentially different. *Bellonius* de Avib. *Aldrovand.* de Avib. T. 3. p. 240.

UTAS, *Octava*, in our ſtatutes, the eighth day following any feaſt or term; as the *Utas of St. Michael*, &c. And any day between the feaſt and the octave is ſaid to be within the *Utas*. The uſe of this is in the return of writs, as appears by Stat 51 Hen 3. *Blount*, *Cowel.*

UTERINE (*Cycl.*)—UTERINE *Hæmorrhages*. In this dangerous diſorder the ſtyptic powder of Helvetius is much recommended: and the ſtybium ceratum has alſo been tried with great ſucceſs. See the articles STYPTIC *Powders* and VITRUM *Antimonii Ceratum*.

UTERINUS *Lapis*, in natural hiſtory, a name given by ſome authors to a ſtone found in New Spain, and in ſome other parts of America; it is very hard and heavy, of a beautiful black, and capable of a very elegant poliſh. The natives cut it into various ſhapes, and apply it to the navel in diſeaſes of the womb, and pretend that it poſſeſſes very great virtues.

UTERUS (*Cycl.*)—Authors have differed as to the thickneſs of the *Uterus* of a woman with child. In an account of a diſſection of a woman dead in labour, mentioned in the Medical Eſſays, vol. 4. art. 33, it is ſaid, the *Uterus* was found at leaſt half an inch thick in the thinneſt part, and a good deal more at the fundus.

UTERUS *of Fiſhes*.—Among the fiſh kinds, all thoſe which are oviparous have no *Uterus*; but, on the contrary, all the viviparous fiſhes have this part. The whales, and all the cetaceous kinds, as alſo many of the cartilaginous ones, have the *Uterus* very fair. It is probable that the eel kind alſo have it; but this is leſs certain, the generation of thoſe fiſhes being yet ſomewhat obſcure. The *Uterus* in the cetaceous fiſhes is always divided into two proceſſes or horns; but in the cartilaginous ones it is divided into two glandulous bodies, which are pervious, and, according to the opinion of Needham, diſcharge a whitiſh liquor into the womb, and are of great uſe in gravidation.

UTFANGTHEF, in our old law-books. See the article OUTFANGTHEF, *Cycl.*

UT QUEANT LAXIS, *&c.* in antient modern muſic, a hymn to *St. John the Baptiſt*, compoſed about the year 770, in the time of Charlemagne, according to Poſſevin, by Paulus Diaconus of Aquileia. It is very famous in muſic, becauſe the ſyllables whereby the muſical ſounds are diſtinguiſhed, were taken by Guido Aretine from the firſt ſtrophe thereof.

UTRAQUISTÆ, in church hiſtory, an appellation given by way of reproach, to thoſe in Bohemia who communicate under both ſpecies, bread and wine. *Hofm.* Lex Univ. in voc.

UTRICULARIA, in botany, the name of a plant uſed by Linnæus for what other authors have called *lentibularia*, or hooded water milfoil. This, in his ſyſtem of botany, is alſo a diſtinct genus of plants, the characters of which are, that the cup is a two-leaved perianthium; its leaves being very ſmall, of an oval figure, hollow, and falling with the flower. The flower is labiated, and conſiſts of one petal; the upper lip is plain, obtuſe, and erect; the lower is large, plain, and undivided; between the two there is a heart-faſhioned palate, ſtanding a little out; the nectarium is corniculated, is ſhorter than the petal, and is produced from its baſe. The ſtamina are two ſhort and crooked filaments; the antheræ are ſmall, and cohere together; the piſtillum has a round germen, a thread-like ſtyle of the length of the cup, and a conic ſtigma. The fruit is a large conic capſule, containing only one cavity. The ſeeds are very numerous.

UTRICULI *Foliorum*, a name given by the writers on the anatomy of plants to a number of ſmall and fine veſſels, which fill up the interſtices between the ſeveral ramifications of the ſurculi, or minuteſt diviſions of the branches of the middle rib.

Theſe are to be examined by good microſcopes, in order to obtain any idea of their ſtructure. This is found to be compoſed of a reticular plexus of fine white and flat filaments, whoſe interſtices are again filled up with other ſmaller *Utriculi*; ſo that nature ſeems but forming new bodies, by making congeries of the ſame, but in a more minute ſtate. When the largeſt of theſe are opened by a fine inſtrument, they are found to conſiſt only of a white ſkin, containing a greeniſh matter, compoſed of particles ſo fine, that the beſt glaſſes are uſed in vain to diſtinguiſh their figure.

Accident ſometimes offers what all the art in the world would attempt in vain; and the leaves of trees, whoſe cuticle has been eat off on one ſide by ſmall inſects, ſometimes afford views of theſe *Utriculi*, which no art could have laid open in ſo nice a manner, or in ſuch various views. Act. Erudit. Ann. 1722. p. 28.

UVA, *Grape*. See the article GRAPE.

UVA *Gruina*, in the materia medica, the name of the fruit of the great American *vitis idæa*, or crane-berries. *Dale*, Pharm. p. 173.

UVA *Lupina*, *Wolf-Berries*, in botany, a name given by ſome authors to the common water-elder, and by others to the *herba Paris*, or herb true-love. *Ger.* Emac. Ind. 2.

UVA *Marina*, in botany, the name given by many authors to the *ephedra*, the ſea-grape, or ſhrub ſea horſe-tail. *J. Bauhin.* vol. 1. p. 406.

UVA *Quercus*, in natural hiſtory, a name given to certain accidental productions of the oak, a tree famous for producing many ſuch, beſide its common fruit: The beſt account we have of this in particular, is from Mr. Marchant. He obſerved a vaſt quantity of this production upon an oak of about twelve foot high; this tree had no acorns, but there hung from almoſt all the branches a great number of greyiſh threads, of two inches or more in length, and of a ſilky flexible matter; to ſeveral parts of theſe there were fixed certain round red berries, ſometimes two or three, ſometimes ten or twelve on a thread; theſe were of the ſize of a half-ripe red gooſeberry, but they had no umbilicus, nor any appearance of fibres; they were hard, and not hollow, but filled with a cottony matter, very cloſely compacted. The threads on which theſe berries were produced all grew out of the alæ of the leaves, in the very places where the beds for the rudiments of young branches ſhould have come; and over theſe filaments there were often a few ſmall leaves, of the regular ſhape of the oak-leaf.

It is generally aſſerted, that there are eggs of inſects lodged in all theſe extraordinary productions of the oak, which are ſuppoſed to be produced by a wrong derivation of the juices, occaſioned by the puncture of the fly which leaves thoſe eggs; but the moſt accurate ſearch could not diſcover the leaſt appearance of any animal remains in any part of theſe productions, neither in the berries, nor in the threads that ſupport them.

There is another ſpecies of this remarkable production, differing from the former, by not having the long threads on which the berries of that are ſupported; this, however, has been confounded by the generality of naturaliſts under the ſame name, and of this Mr. Marchant has given an equally accurate deſcription. In the month of October he obſerved a young oak of about ſix foot high, in a coppice-wood, in a very flouriſhing condition, very full of branches and leaves, but without fruit. The young branches of this oak were loaded with cluſters of red berries, of the ſhape and ſize of common red gooſeberries; they ſtood principally at or near the extremities of the branches, and were of a very poliſhed and ſhining ſurface, and of a ſpongy and tender ſubſtance. They ſtood in cluſters of three, four, and five together, and each grew immediately to the branch, without any pedicle; they had ſome appearance of fibres, but not the leaſt mark of an umbilicus, as in the regular fruits. On opening theſe berries, they were found full of a mucilaginous and viſcous juice, of a red colour, tolerably fluid, and having ſome fibres intermingled with it; the taſte of this juice was acrid, and its ſmell diſagreeable, and like that of rotten wood; but there appeared not in theſe, any more than in the other ſpecies,

any the leaſt appearance of any thing belonging to an animal, no egg, no worm, no fly, nor indeed any foreign body of any ſort whatever.

Theſe berries, though ſo large and ſucculent, are but of a very ſhort duration, for Mr. Marchant going three days after he had ſeen them in the greateſt perfection, to gather ſome of them, with intent to try their juice on different liquors, found they were all become flaccid and withered; and returning again three days after this, they were ſo entirely periſhed and gone, that there remained only a few veſtiges of thin ſkins on the places where they had been fixed to the tree, and ſome few fallen ones among the buſhes, that grew under the tree; and upon inquiring of the people who lived thereabout, to know whether theſe berries were a regular annual production of the tree, they told him that they never remembered to have ſeen any thing of the kind before.

It may not be eaſy perhaps to account regularly for theſe fortuitous productions; for they ſeem merely of the nature of monſters among animals, and it may be allowed no improbable conjecture in regard to them, that the root of theſe ſmall trees having taken in more nouriſhment than they could circulate, when it came to load the tender extremities of the young branches, may have made its way through their laxer texture, and being retained yet in ſome of their membranes, may have ſwelled out more and more, by the addition of freſh matter, and finally have been maturated by the ſun's heat into theſe ſeemingly regular productions. Mem. Acad. Par. 1692.

UVA *Urſi*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the globoſe bell-ſhaped kind, conſiſting only of one leaf. The piſtil ariſes from the cup, and is fixed in the manner of a nail into the hinder part of the flower. This finally becomes a round ſoft fruit or berry, containing little ſtony ſeeds, which are gibboſe on one ſide, and flat on the other.

There is only one known ſpecies of the *Uva Urſi*, which is the plant called by ſome *idæa radix*, and by others the *whortle-berry*, with thick, fleſhy, and, as it were, punctated leaves. *Tourn.* Inſt. p. 599.

UVA *Vulpis*, a name given by ſome authors to the common nightſhade. *Ger.* Emac. Ind. 2.

VUBARANA, in zoology, the name of a harengiform fiſh, caught in the American ſeas.

It reſembles in figure our river trout. Its body is very nearly of the ſame thickneſs all the way, but is elevated a little on the back, and ſomewhat ſlender juſt near the tail. It grows to a foot in length, and to ſix inches in thickneſs. Its head is ſmall, and pointed; its mouth not large, and having no teeth; and its tongue long. It has but one fin on the back, and its tail is long and forked. Its ſcales are very ſmall, and are diſpoſed ſo evenly, and laid ſo cloſely down, that it ſeems ſmooth to the touch. Its back is of a bluiſh white, and the reſt of its body appears either of an olive colour, or of a ſilvery white, according to the light in which it is viewed. The belly is ſomewhat flat, and perfectly white, and the coverings of the gills ſeem plates of ſilver, their whiteneſs and luſtre are ſo elegant. It is a very well taſted fiſh, and is generally dreſſed with the ſcales on, they being not offenſive in eating. *Marggrave*'s Hiſtory of Braſil.

UVEA (*Cycl.*) — Mr. Ferren demonſtrated to the academy of ſciences at Paris, the lymphatic veſſels of the *Uvea* of the human eye. Hiſt. de l'Acad. des Sciences, 1738.

VULCANALIA, among the Romans, a feſtival in honour of Vulcan, which was kept from the twenty-third to the twenty-ninth of Auguſt. On this occaſion the people uſed to throw animals into the fire. *Pitiſc.* in voc.

VULGAGO, a name given by ſome botanical authors to the aſarum or aſarabacca, whoſe leaves and root are uſed in medicine. *Ger.* Emac. Ind. 2.

VULNERARIA, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the papilionaceous kind, and from its cup, which is of a tubular form and turgid, there ariſes a piſtil, which finally becomes a ſhort pod, containing roundiſh ſeeds; and being contained in a membranaceous bladder, which was before the cup of the flower.

The ſpecies of *Vulneraria*, enumerated by Mr. Tournefort, are theſe: 1. The common yellow-flowered *Vulneraria*, called *kidney-vetch*, and *ladies finger*. 2. The white-flowered *Vulneraria*. 3. The purple-flowered *Vulneraria*. 4. The five-leaved *Vulneraria*, called by many the *bladder lotus*. *Tourn.* Inſt. p. 391.

VULPANSER, in zoology, a name given by ſome authors to the ſhell-drake, or burrow-duck, a very beautiful ſpecies of duck, common on ſome of our coaſts, and called by the generality of authors *tadoma*. See the article TADOMA.

VULPECULA, in ichthyology, a name given by Bellonius and Geſner to the fiſh called by the generality of authors *centrine*.

It is a ſpecies of the ſqualus, diſtinguiſhed by Artedi under the name of the *triangular-bodied ſqualus, with no pinna ani*. The Italians call this *peſce porco*. See the article SQUALUS.

VULPES, the *Fox*. This creature has been long famed for its cunning, and is plainly of the dog-kind.

It differs, however, from the common dog in the length, denſe diſpoſition, and ſoftneſs of its hairs, eſpecially thoſe about its tail, and in its ſmell, which is peculiarly rank and diſagreeable. Its uſual colour is a reddiſh tawney, though it is ſometimes found white, and ſometimes black. Its manner of digging itſelf a hole in the earth, is alſo a cuſtom wholly different from all the dog kind, and it is far from the tameneſs of that animal, being with difficulty made to loſe its fierceneſs. Its internal parts, in general, are very like thoſe of a dog. *Ray*'s Syn. Quad. p. 177.

VULPES *Marina*, or *Alopecias*, in natural hiſtory, the name given by authors to a large fiſh, called the *ſea-fox* by us.

It is ſaid by many authors to have naturally the rank ſmell of the fox, and to be one of the worſt-taſted fiſhes in the world; but this does not appear to be true, on a ſtrict inquiry; for its ſmell ſeems very little different from that of other fiſhes, and its fleſh is well-taſted; ſo that theſe things ſeem only to have been ſaid, in order to ſtrengthen the reſemblance with the fox; a name which ſeems, upon the whole, to have been given it only from the length of its tail; and even that, though very long for a fiſh of this kind, has no reſemblance with the tail of a fox. The length of this fiſh is about nine foot, and its breadth, in the broadeſt part of the belly, fourteen inches. Its tail is nearly as long as the whole body beſide, and is of the ſhape of a ſcythe, and is bent downwards. Near the origin of the tail, it has a ſingle fin below, and the ſpine is more moveable up and down in this part, than in any other; ſo that the tail is, by this means, eaſily elevated or depreſſed. It has two eminences on the back, one large one near the middle, and the other a ſmall one near the tail: And it has three fins on each ſide; the pair that ſtand near the head are large, and reſemble the wings of a bird; the others are ſmaller. The ſkin is ſmooth, and without ſcales; and the fins and eminences on the back are compoſed of a ſort of ribs, held together by a tough and ſtrong membrane. The tongue adheres inſeparably to the lower jaw, and is compoſed of a great number of bones, articulated together by a fleſhy ſubſtance of a fibroſe texture, and covered with a membrane beſet with ſeveral prominences, which make it feel very ſmooth when the hand is drawn from the point towards the root; but very rough when it is drawn the contrary way. Theſe prominences, when viewed by the microſcope, appear as pellucid as the fineſt cryſtal. Its throat and ſtomach are remarkably large; and authors ſay, that when in a fright it will ſwallow its young ones into its ſtomach, and afterwards caſt them up again when the danger is over. Others who ſpeak largely of its cunning, ſay, that when it has ſwallowed a bait at a hook, it will take in the whole line, till it comes to a weak place, where it can bite it aſunder. This is a tale very well calculated for the carrying on a reſemblance with the fox in cunning; but it is very ill adapted to this fiſh, which has no teeth with which it can bite any thing aſunder. The heart of this fiſh is remarkably ſmall, nothing larger than a hen's egg; it is alſo much of the ſame ſhape, and has no pericardium; but the aorta for a little way is covered with a membrane analogous to a pericardium. The head ſeems a mere lump of fleſh, being covered with muſcles, of which ſome are four inches thick; and though the head is ſo large, the ſkull is not bigger than a man's fiſt; it is thick, and is divided within into three cavities, each of which contains a ſmall quantity of a mucous matter mixed with blood; ſo that the fiſh ſeems ſcarce to have any brain at all, what little matter of it there is being quite ſoft, and having very few windings. The eyes are as large as thoſe of an ox, and are only hemiſpheric in figure, being flat before, ſo that they appear of a very ſingular ſhape. Mem. pour Hiſt. Anim. p. 114.

The guts of this fiſh have a very peculiar ſtructure. In the upper part of them, inſtead of the ordinary circumvolutions of the guts of animals, the cavity is diſtinguiſhed by many tranſverſe ſeparations compoſed of the membranes of the inteſtine turned inwards: Theſe ſeparations ſtand at about half an inch diſtance from one another, and turn helically like a ſnail-ſhell. The conſequence of this is, that the food is detained a long time in its paſſage, though the way it has to go be very ſhort. This creature feeds both on other fiſh, and on ſea-plants; and it is very remarkable, that the fiſh it has devoured are ſometimes found in its ſtomach without the head, ſcales, ſkin, and bowels, the muſcular fleſh remaining entire, while all theſe harder and tougher parts are diſſolved. Ouvrage adopté de l'Acad. Par. vol. 1.

VULTURIUS, among the Romans, a throw of the *tali*, otherwiſe called *canis*. *Pitiſc.* in voc. See the articles CANIS and TALARIUS *Ludus*.

VULTURIUS *Lapis*, a name given by many to the ſtone called *quandros*. See the article QUANDROS.

VULTURNALIA. See the article VOLTURNALIA.

VUNENA, a name given by the people of Guinea to a kind of catch-fly, or lychnis, common in that part of the world, and much uſed by them in a decoction to cure ſwellings of the legs. Petiver has called it *lychnis Guineenſis fructu caryophylloide foliis roris marini, hirſutis, anguſtioribus*. Phil. Tranſ. N°. 232.

UVULA, (*Cycl.*) in anatomy, is alſo called *columella*, *gargareon*, γαργαρ, *gurgulio*, *uva*, *uvigena*, *uvigera*, *epiglottis*, and *cion*. *Blancard* in voc. *Cion*.

The cutting out of the *Uvula*, when ſwelled and hanging down, is commonly practiſed in Scotland, and no other remedy applied than a piece of bread and cheeſe. The ſurgeon, who is ſome neighbouring peaſant, uſes alſo no other inſtrument than his knife; and yet all ſucceeds very well.

UVULÆ *Prolapſus*. See the article PROLAPSUS.

UVULARIA, in the materia medica, the name given by authors to the plant called *hypogloſſum*, or double-tongue. *Dale*, Pharmac. p. 169.

UXOR, in the language of the chemiſts, the mercury of metals. This is the wife they ſay, and ſulphur is the huſband. See the article MARITUS.



W.

WADD (*Cycl.*)—WADD-*Hook*, or WORM, a ſmall iron turned ſerpent-wiſe like a ſcrew, and put upon the end of a long ſtaff, to draw out the *Wad* of a gun, when it is to be unloaded.

WAGE, in the law of England, is uſed for the giving ſecurity for the performance of any thing. Terms de Ley. in voc.

Thus we ſay, to *wage law*, to *wage deliverance*. See the article GAGE.

None *wages* law againſt the king. *Brook*, Abr. Tit. choſe en Action. 6.

WAGGEL, in zoology, a name given by the people of Cornwall to a ſpecies of the *larus*, or ſea-gull, known among authors by the name of *martinozzo*. See the article MARTINOZZO.

WAGGON (*Cycl.*)—WAGGON-*Maſter-General*, in the military art, is he who has the ordering and marching of the baggage of the army. On a day of march he meets the baggage at the place appointed in the orders, and marſhals it according to the rank of the brigade or regiment each *Waggon* belongs to, which is ſometimes in one column, ſometimes in two; ſometimes after the artillery; and ſometimes the baggage of each column follows their reſpective column.

WAIN, a vehicle or carriage drawn by oxen. See the article CART.

WAKE-*Robin*, *Arum*, a medicinal plant. See the article ARUM.

WALDRAPP, in zoology, a name given by ſome to the wood-raven, or *corvus ſylvaticus* of Geſner, a bird of the ſize of a hen, of a gloſſy black, and adorned with a creſt on its head. See the article CORVUS.

WALE, or WAIL, in a ſhip, thoſe outermoſt timbers in a ſhip's ſide, on which men ſet their feet when they clamber up a ſhip's ſide. They are reckoned from the water, and called her *firſt*, *ſecond*, or *third Wale*, or *berd*.

WALE-*Knot*, aboard a ſhip, a round knot or knob made with three ſtrands of a rope, ſo that it cannot ſlip, by which the *tacks*, *top-ſail-ſheets*, and *ſtoppers*, are made faſt, as alſo ſome other ropes.

WALE-*reared*, on board a ſhip, a name the ſeamen give to a ſhip, which, after ſhe comes to her bearing, is not narrow in her upper work, nor *houſed in*, as their word is, but is built ſtrait up; which way of building, though it does not look well, nor is, as they ſay, *ſhip-ſhapen*, yet it hath this advantage, that a ſhip is thereby more roomy within board, that is, ſhe is larger within, and alſo becomes thereby a wholſome ſhip in the ſea, eſpecially if her bearing be well laid out.

WALINGHURU, in botany, a name by which ſome authors have called the plant, of which the medicinal zerumbeth is the root. *Herm.* Muſ. Zeylon, p. 51.

WALK (*Cycl.*)—WALK, in the manege, is the ſloweſt and leaſt raiſed of all a horſe's goings. The Duke of Newcaſtle ſays, that this motion is performed with two legs, diametrically oppoſite in the air, and two upon the ground at the ſame time, in form of a ſaint Andrew's croſs: but this, in reality, is the motion of a trot; and accordingly all the later writers agree, that this author is miſtaken, and that the *Walk* is performed, as any one may obſerve, by the horſe's lifting up its two legs on a ſide, the one after the other, beginning with the hind-leg firſt. Thus, if he leads with the legs of the right ſide, then the firſt foot he lifts is the far hind-foot, and in the time he is ſetting it down (which in a ſtep is always ſhort of the tread of his fore-foot on the ſame ſide) he lifts his far fore-foot, and ſets it down before his near fore-foot. Again, juſt as he is ſetting down his far fore-foot, he lifts up his near hind-foot, and ſets it down again juſt ſhort of his near fore-foot, and juſt as he is ſetting it down, he lifts his near fore-foot, and ſets it down beyond his far fore-foot.

This is the true motion of a horſe's legs in a *Walk*; and this is the pace in which many things are beſt taught. For inſtance, when the horſe is to be taught to turn to the right and left, or from one hand to another, he is firſt to be taught it on the *Walk*, then on the trot, and finally on the gallop.

Graſs WALKS. See the article GRASS.

Gravel WALKS. See the article GRAVEL.

WALKÆPETHIGA, in botany, a name by which ſome authors have called the tree, on which the gum lacca of the ſhops is uſually found. *Herm.* Muſ. Zeyl. p. 34.

WALL (*Cycl.*)—Of all the materials for building *Walls* for ripening fruit, brick is generally the beſt, as it reflects a great deal of heat, retains its warmth a great while, and affords, by the ſmallneſs of the joints, the convenience of faſtening up the trees with ſmall nails. If theſe *Walls* are coped with free-ſtone, and have ſtone pillaſters at proper diſtances, to break the force of the winds, and ſhelter the fruit-trees, they make the moſt advantageous, as well as the moſt beautiful of all *Walls*.

It is ſometimes an advantageous thing to build theſe *Walls* upon arches, that the roots of the trees may have room to ſpread under, and to the other ſide of them. This is neceſſary when the ſoil is a hard gravel; for without this, when the roots of peaches, &c. have reached the gravel, they find not ſufficient nouriſhment, and the trees canker and die. But though Mr. Fairchild had found great advantages from this way of building *Walls*, Mr. Miller diſapproves it. Some alſo have propoſed the building ſlanting *Walls*; but the ſame author gives many reaſons why the perpendicular are preferable, and ſeems to think that if *Walls* could be eaſily contrived to ſlope a little forward, they would be even preferable to theſe. *Miller*'s Gardener's Dict.

WALL *of Severus*. See the article AGGER.

WALL-*Flower*, in botany. See the article LEUCOIUM.

WALL-*Moſs*, *Bryum*, in botany, the name of a genus of moſſes, the characters of which are theſe: They produce membranaceous capſules, covered with a calyptra or hood, and ſtanding on pedicles more or leſs long. In all this they agree with the hypnums; but they differ from them in that this pedicle has no covering round its baſe, but in the place of it has a node or tubercle. Theſe pedicles alſo uſually ariſe from the tops of the branches, or from thoſe of the laſt years, which were then the talleſt, though now nearer the roots. To this it is to be added, that the ſtalks are uſually erect, leſs branched than in the hypnums, and not creeping. The calyptræ in ſome ſpecies ſtand ſtrait, in others obliquely on the capſules; and the opercula, when the duſty matter within the head has arrived at its maturity, fall off tranſverſely, ſometimes with a ſmooth, ſometimes with a jagged eye.

The family of the *bryums* being very numerous, they are divided into ſeveral orders and ſeries. The firſt order comprehends thoſe which have erect heads, and of theſe thoſe of the firſt ſeries have rounded, bellied, and turbinated heads.

Of this ſeries the following are the know ſpecies: 1. The hair-leaved globe *Bryum*. This is called by ſome the *apple-headed moſs*; it is a very beautiful ſpecies; the ſtalks are about an inch long, and ſtand in tufts, and the heads are round and placed on long pedicles; the leaves are of a dark green. It is common on ditch-banks. 2. The ſlender ſtar-topped marſh *Bryum*, with round heads. This is another very beautiful kind. The leaves compoſing the ſtarry tops of the branches are more rigid and ſtiff than the reſt. It is common in wet places. 3. The narrow-leaved *Bryum*, with tranſparent thyme-like leaves, and heads ſhaped like cruets. This alſo is a beautiful ſpecies. It grows in wet moſſy places, but is not very common. 4. the wide-necked cruet *Bryum*, with tranſparent mother-of-thyme leaves. This is found in boggy places in the weſt of England. 5. The narrow-leaved ſlender cruet *Bryum*. This is a beautiful plant, it grows to four inches in height, and is uſually found on heaths about cow-dung. 6. The pear-headed *Bryum*, with tranſparent mother-of-thyme leaves. This is very common in February about hedges, and in ſhady places. *Dillen.* Hiſt. Muſc. p. 336.

The ſecond ſeries of this order of *Bryums* contains thoſe which have oblong, oval, and rounded heads. Of theſe the firſt diviſion comprehends thoſe which have broad leaves. Of theſe the following are the known ſpecies: 1. The ſmall thyme-leaved *Bryum*, with thick-ſet ruſty heads. This is very common on ditch-banks, and by way-ſides, and produces a great number of heads. 2. The leſſer extinguiſher *Bryum*. The calyptra of this ſpecies exactly reſembles an extinguiſher. It grows in thick tufts, and its leaves are pellucid, and ſomewhat like thoſe of the ſerpyllum. 3. The larger extinguiſher *Bryum*. This is larger than the former, and ſomewhat branched; it grows alſo in thick tufts. 4. The awl-headed *Bryum*. The leaves of this are of a pale green, oblong, and hollowed in the middle; the pedicles of the heads are long, and moderately thick. It is common on ditch-banks in January and February. 5. The tranſparent *Bryum*, with leaves leaning all one way. The leaves are obtuſe and pellucid;

lucid; the pedicles of the heads about an inch long, and the heads themſelves ſlender. It grows in ſandy places in Virginia. 6. The hoary branched country *Bryum*, with coloured heads. This grows in thick tufts, and is very common in country villages on the trunks of trees, walls, and houſes. 7. The ſmooth *Bryum*, reſembling the former kind. The leaves of theſe are ſmaller than thoſe of the other, and ſmooth, and the whole plant leſs. It grows in Patagonia. 8. The common dwarf hoary wall *Bryum*. This is a very ſmall ſpecies, extremely common on old walls, and the tiles of houſes. 9. The common dwarf tranſparent *Bryum*, with green, not hoary leaves. This reſembles the former in figure, but its leaves are broader, thinner, and more pellucid. It grows in many places on ditch-banks. *Dillen.* Hiſt. Muſc. p. 354.

The ſecond diviſion of this order of the *Bryums*, comprehends thoſe with narrower leaves, of which ſome are remarkably longer than others: Of theſe the following are the known ſpecies: 1. The ſickle-leaved bending beſom *Bryum*. This is a large and erect ſpecies, very common in thick tufts about hedges. 2. The red-ſtalked, tranſparent, graſſy-leaved *Bryum*. The ſtalks are ſlender; the leaves of a pale green; it grows in many parts of Germany, but has not yet been obſerved in England. 3. The tranſparent, hart's-tongue-leaved curled *Bryum*, with crooked heads. This is a very common ſpecies. It grows to two or three inches high, and its leaves are long, narrow, and alated. 4. The juniper-leaved curled *Bryum*, with ſtraiter heads. The leaves of this are narrower than thoſe of the former, and leſs curled; it is very common in Virginia. 5. The larger brittle whitiſh *Bryum*, with ſtrait leaves, and ſhort pedicles. This is a very common ſpecies in wet places on heaths. It grows in very thick tufts, and imbibes and retains a great quantity of water. 6. The dwarf white larix-leaved *Bryum*. This grows in ſmall and ſhort tufts, and is a native of North America. *Dillen.* Hiſt. Muſc. p. 360.

The ſecond ſubdiviſion of the narrow-leaved *Bryums* contains thoſe of the ſhort-leaved kind; of theſe the following are the known ſpecies: 1. The white brittle *Bryum*, with crooked leaves. This is much like the common white heath *Bryum*; but the leaves are bent, and the pedicles of the capſules grow out of the ſame parts of the ſtalks, whereas in that they grow from the tops. 2. The tranſparent bog *Bryum*, with crooked ſhort leaves and heads. This is common in marſhy places; it grows to two or three inches high, and uſually in very thick tufts. 3. The ſhort-headed *Bryum*, with drooping leaves. This is of a yellowiſh-green, and grows on wet places in the Welch mountains. 4. The ſharp-headed *Bryum*, with leaves leaning one way. This grows to two inches high, and is not uncommon in the northern parts of England. The hypnum-like water *Bryum*, with pointed black calyptræ. 5. This is a very ſingular ſpecies; it grows in water, and lies upon ſtones; but does not properly creep or root itſelf on them. It is found in rivulets in mountainous places. *Dillen.* Hiſt. Muſc. p. 366.

The third diviſion of the firſt order of *Bryums* comprehends thoſe with extremely narrow, or capillaceous leaves. Of theſe ſome reſemble the hypnums, and many of theſe have their leaves terminated by long hairs. Of theſe the following are the known ſpecies: 1. The common hoary hypnum-like *Bryum*. This is of a yellowiſh green, and when dry becomes whitiſh. It is conſiderably branched, and is found on Hampſtead-Heath, and in the like places. 2. The green cluſtery Alpine *Bryum*. This is of a greeniſh yellow colour, but wants the hairs which terminate the leaves of the former kind. It is common in the mountainous parts of Wales and Yorkſhire. 3. The ſmall-headed hypnum-like Alpine *Bryum*. This is a ſmall moſs, but much branched; the leaves are very narrow. It grows in the mountains of Wales and Yorkſhire, and is ſometimes found quite black, both in leaves and ſtalks. 4. The hypnum-like Alpine *Bryum*, with obtuſe calyptræ. The branches of this are hairy, the leaves very numerous and very ſmall, and of an obſcure browniſh green. It grows on the hills in Wales and Yorkſhire. 5. The heath-like Alpine *Bryum*, with bearded heads. The ſtalks of this are leſs branched than in the former, and the leaves ſhorter; it grows in mountainous places in Yorkſhire. 6. The many-headed, hoary, hypnum-like mountain *Bryum*. The ſtalks of this are rigid, and are four or five inches long, ſometimes ſingle, ſometimes branched. The leaves are narrow, and end in fine ſmall hairs. It is found in the mountainous parts of Yorkſhire. *Dillen.* Hiſt. Muſc. p. 370.

The ſecond ſubdiviſion of theſe *Bryums* contains ſuch as are hairy, and have capillaceous leaves; but differ from the hypnums in their proper figure, and general appearance. Of theſe the following are the known ſpecies: 1. The ſoft-hair pencil *Bryum*, with crooked ſhanks. This is a very minute moſs, but very beautiful; its leaves terminate in fine hairs, and its heads are ſmall. It is not unfrequent in the woods of Germany, but is not common in England. 2. The bright green, pointed ſphagnum-like *Bryum*. This grows an inch or two high, and its branches are uſually divided into two or three at the ends. It grows on the mountains of Yorkſhire. 3. The whorled-hair *Bryum*. This grows in very thick tufts. The ſtalks are ſlender, and about an inch long. The leaves are capillaceous, and the heads ſmall and roundiſh. It is found on the trunks of trees, and on the ground in the northern parts of England not unfrequently. 4. The conferva-like bog *Bryum*. This is very ſmall, and compoſed of extremely ſlender branches, which entangle with one another, and are furniſhed with ſmall leaves placed alternately, and not ſet very cloſe; it grows in wet places. 5. The bending hair-pencil *Bryum*. This is a very elegant little moſs. It grows in thick tufts on ditch-banks, and is not above half an inch in height. The leaves are long and capillaceous; the heads very ſmall and reddiſh. 6. The cluſtery crooked-leaved hair *Bryum*. This is a ſmall moſs, the ſtalks ſometimes ſimple, ſometimes branched; the capſules are very ſlender, and their pedicles reddiſh. This grows on the mountains of Wales. 7. The black-headed bog *Bryum*, with ſhort leaves. The ſtalks of this are ſlender, and ſeldom branched; the heads are ſmall and of a blackiſh brown, and the pedicles ſhort. It is common in Yorkſhire. *Dillen.* Hiſt. Muſc. p. 376.

The third ſubdiviſion comprehends ſuch of theſe *Bryums* as have curled leaves, or leaves that become variouſly undulated as they dry. Of theſe the following are the known ſpecies: 1. The long-ſhanked frizzled *Bryum*. The ſtalks of this grow to near two inches high; the leaves ſtand very thick, and always curl up in the drying. It is found in mountainous places. 2. The ſhort-ſhanked, many-headed frizzled *Bryum*. This has ſhorter ſtalks than the former, and the leaves ſtand in cluſters on the tops; it is found on the mountains of Wales and Yorkſhire. 3. The fine ſtar-topped *Bryum*, which curls up its leaves in drying. This grows in thick tufts, and its leaves are of a beautiful green; it is common on heaths, and under hedges. 4. The ſhort pale green hair *Bryum*, with oval heads. This is a very ſmall moſs, but it grows in thick tufts; the leaves, while freſh and vigorous, are expanded, and form ſtellar tops to the branches; but, in drying, they curl up and wither. It is very common on ditch-banks. 5. The neat pale green *Bryum*, with ſtarry tops, and ſlender heads. This is a very ſmall ſpecies; but its ſtalks are divided into ſome branches. Its leaves form ſtarry tops to the branches, while freſh; but they curl up and loſe their figure in drying. 7. The ſmall red ſtar-topped bog *Bryum*. The ſtalks of this are moderately long and branched; the leaves alſo are long. It is found in the mountains of Wales. 8. The ſmooth and ſlender pale-ſhanked *Bryum*, with thick-ſet leaves. This is frequent at the bottoms of old walls. *Dillen.* Hiſt. Muſc. p. 379.

The fourth ſubdiviſion of theſe *Bryums* comprehends thoſe which have roſtrated calyptræ and pointed capſules, afterwards becoming of the ſhape of bottles, from the rim of which there grow up ſeveral oblong bodies, in form of a beard. Of this kind are the following ſpecies: 1. The thick-topped bearded birds-claw *Bryum*. The ſtalks of this are ſhort, ſometimes branched, ſometimes not; the leaves ſmall, ſtrait, carinated, and of a lively green. It is common on old walls. 2. The ſmall ſtar-topped *Bryum*, with clawed and bearded heads. The ſtalks of this are ſhort; the leaves ſtellate at the tops; the pedicles of the heads grow not from the ſummits, but from the laſt year's top of the ſtalk. It grows on the ground, and is found in Germany, and in ſome parts of England. 3. The ſlender-bearded *Bryum*, with narrow and thin-ſet leaves. The ſtalks of this are very ſlender, and ſend up their pedicles from the ſummit. It is common on the earth in dry places, and ſometimes on old *Walls*. *Dillen.* Hiſt. Muſc. p. 381.

The fifth ſubdiviſion of theſe *Bryums* comprehends thoſe which have a ſhorter operculum, and whoſe capſules appear ſtriated when fully ripe. Of this kind are the following ſpecies: 1. The ſmall forked *Bryum* with twin heads. The ſtalks of this are ſhort, and uſually ſend up two pedicles from each ſummit, each carrying its capſule. The leaves are ſmall, and of a dark green. 2. The ſtarry-topped red-ſhanked *Bryum*. This grows in cluſters or tufts; the ſtalks are divided ſometimes into two, ſometimes into three branches. It is very common by way-ſides, and is eaſily known by the redneſs of the pedicles. 3. The fine-leaved bog-*Bryum*, with long and ſhining-red pedicles. This grows in the manner of the former; but the leaves are longer, and more pointed, and the pedicles are long, and grow ſeveral together from one ſtalk. It is common in Wales. *Dillen.* Hiſt. Muſc. p. 387.

The ſixth ſubdiviſion of theſe *Bryums* takes in thoſe which have either no ſtalks, or at the utmoſt only very ſhort ones. Of this kind are the following ſpecies: 1. The leaſt dwarf hair *Bryum*, with ſhort heads and pedicles. This has extremely narrow leaves, of a deep green; it grows in marſhy places. 2. The ſmall black, hair *Bryum*, with longiſh heads and pedicles. The heads of this are large, and their pedicles are conſiderably long. 3. The dwarf fine-leaved heath-like *Bryum*. The leaves of this ſpecies are very rigid, and greatly reſemble thoſe of the fine-leaved heath. It grows on rocks and ſtones in the weſtern parts of England. 4. The dwarf tufted *Bryum*, with fine ſoft leaves, and conic heads. The leaves of this are very narrow and carinated, and of a deep green. It grows by the ſides of rivers in Virginia, Penſylvania, and other parts of America. 5. The dwarf long-ſhanked *Bryum*, with hairy leaves, all leaning one way.

This alſo is common in Virginia. 6. The golden long-ſhanked hair *Bryum*, with upright crooked heads. The ſtalks of this are very ſhort, and ſometimes a little branched. It is a ſummer-moſs, and is frequent in Germany.

The ſecond order of the *Bryums* comprehends thoſe which have capſules, hanging downward from the bending of the pedicles. The calyptræ in theſe ſpecies quickly fall off; and the opercula are uſually obtuſe.

The firſt ſeries of theſe comprehends thoſe which have extremely narrow leaves. Of this ſeries the following are the known ſpecies. 1. The ſhort-ſhanked hair *Bryum*, with red ſtooping heads. The capſules of this ſeem in a middle ſtate between the erect and pendent ones. It grows in moiſt graſſy places, but is not very common. 2. The golden-hair *Bryum*, with pear-like bowing heads. The ſtalks of this are low, and rather may be called creeping fibres; the leaves of a pleaſant green, and very narrow; the pedicles are an inch high, and the heads yellow when ripe. It is found in many parts of England in moiſt places. 3. The lovely green hair *Bryum*, with pendulous heads. The capſules of this are oblong and drooping, the leaves are extremely narrow. It grows in wet places on Woolwich-Heath. *Dillen.* Hiſt. Muſc. p. 386.

The ſecond ſeries of theſe *Bryums* contains thoſe which have leaves a little broader, and though narrow, not capillaceous. The firſt diviſion of theſe contains thoſe which have equal and cylindric branches. Of theſe the following are the known ſpecies: 1. The catkin-ſtemmed ſilver *Bryum*. This is a very ſmall moſs; but it grows in extremely large tufts, and is very common on the tiles of houſes; its ſilvery look diſtinguiſhes it from all the others at firſt ſight. 2. The round-ſtemmed green *Bryum*, with pendulous heads. The capſules of this are of an oval figure; it grows on walls. 3. The hypnum-like *Bryum*, with elegant blackiſh-red heads. This is found on the Welch mountains. *Dillen.* Hiſt. Muſc. p. 393.

The ſecond diviſion of theſe comprehends thoſe which have unequal and irregularly-ſhaped branches. Of theſe the following are the known ſpecies: 1. The hoary round-tufted tile *Bryum*, with pendulous heads. This is an extremely ſmall moſs, and grows uſually on little round tufts; the heads are not ſeen till the plant is cloſely examined; they ſtand on very ſhort ſtalks. This is one of the moſt frequent of all the moſſes on old *Walls* and the tiles of houſes. 2. The tufted red and yellow-ſhanked *Bryum*. The leaves of this are broader, membranaceous, and of a pleaſant green. It is common on old walls. 3. The tranſparent and larger tufted *Bryum*, with long pendulous heads. This is common on heaths; it is of a pleaſant green, and grows to two inches high. 4. The tranſparent-leaved *Bryum*, with long pendulous heads. This is common in moiſt ſhady places. 5. The lancet-leaved *Bryum*, with round fleſh-coloured pendulous heads. This is found in the ſummer months on Black-Heath, and in many other places about London. 6. The tender, lancet, and graſs-leaved pendulous *Bryum*. The ſtalks of this are red; they do not exceed half an inch in height, and are not branched; the pedicles are of a pale red, and grow from the ſummits of the ſtalks. It grows in tufts in Wales. 7. The ſwans-neck *Bryum*. This is a very elegant ſpecies, it grows in woods, in ſomewhat moiſt places, and is an inch or two, ſometimes more, in height. The leaves are large, and of a beautiful green, and the pedicle bends with the capſule, ſo as to repreſent the head and neck of a ſwan. It is common in our woods. 8. The pendulous and ſwoln-headed bog *Bryum*. This grows to three or four inches high; the leaves are like thoſe of ſerpyllum, and are pellucid, and of a lively green. It grows in boggy places on heaths, *&c.* 9. The long-ſhanked bog *Bryum*, with long pendulous heads. This is not unfrequent with us in damp places, in woods, and under ſhady hedges. 10. The red bog *Bryum*, with plated leaves, and pear-ſhaped pendulous heads. This is found in many parts of England on mountainous boggy grounds. *Dillen.* Hiſt. Muſc. p. 397.

The third ſeries of theſe *Bryums* comprehends ſuch as have broad leaves. Of this kind the following are the known ſpecies: 1. The golden bulbed *Bryum*, with pear-faſhioned bowing heads. This is called by ſome *little goldilocks*, or *golden maidenhair*. It is a very common moſs, and grows on the ground. 2. The many-headed pendulous ſhrub *Bryum*, with pellucid leaves, reſembling thoſe of the hart's-tongue. This is a very common moſs; it creeps at the root, and ſpreads very faſt; it grows in woods, and under hedges. 3. The larger ſtarry roſe *Bryum*, with pendulous oval heads. The ſtalks of this are naked near the ground; but on their upper part they have many ſmall leaves. It grows in moiſt and ſhady places. 4. The leſſer ſtarry roſe *Bryum*, with long pedicles, and long heads. The leaves of this are very ſhort. It is not uncommon under ſhady hedges. 5. The pendulous oval headed *Bryum*, with various tranſparent leaves. The ſtalks of this are about half an inch high, and the leaves obtuſe, and ſhort toward the bottom, and longer and narrower at the top. It is very common in wet places on heaths and woods. 6. The long tranſparent ſerpyllum-leaved *Bryum*, with ſharp ſtooping heads. This grows in marſhy places. 7. The round tranſparent mother-of-thyme-leaved *Bryum*, with pendulous oval heads. This has but ſmall leaves, and grows always in boggy places; the heads are of a pale green while young, and of a pale yellow when ripe. *Dillen.* Hiſt. Muſc. p. 415.

WALLA, the name of an officer in the eaſtern nations. The Arabs have the care of the country round about the city of Cairo in Egypt, and a *Walla* is obliged to patrole continually about there, eſpecially in the night.

His buſineſs is to take up all perſons who are committing any diſorders, or who cannot give an account of themſelves, or are found abroad at irregular hours; and he often has their heads cut off upon the ſpot. As this officer is naturally the terror of rogues, ſo for preſents made to him he often becomes their protector. Without this they are ſure, one time or other, to fall a ſacrifice to his reſentment; and to him the great people ſend for any villains who have rendered themſelves obnoxious to them, and are ſure to have them delivered up. *Pōcock's* Egypt. p. 165.

WALLING *of Brick*. See the article BRICK.

WALNUT, in botany. See the article NUX.

The effluvia of *Walnut-trees* are ſaid to be hurtful to the head. Mr. Boyle aſſures us they cauſed the head-ach in himſelf. Works abr. vol. 1. p. 436.

WALRUS, in zoology, the name by which ſome authors call the morſe, or ſea-horſe, called alſo by others, *roſmarus*, a creature very different from the *hippopotamus*, or river-horſe. See the article MORSE.

WALT, at ſea, is applied to a ſhip, when ſhe hath not her due ballaſt, *i. e.* not enough to enable her to bear her ſails.

WALTHERIA, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium conſiſts of one leaf, and is of the ſhape of a cup, lightly divided into five ſegments, and remains after the flower is fallen. The flower conſiſts of five petals, which are cordated at the top, and ſtand expanded. The ſtamina are five filaments, growing together into a cylinder. The antheræ are ſimple, and ſtand free. The germen of the piſtil is oval. The ſtyle is ſimple, ſomewhat longer than the ſtamina; and the ſtigma is bifid. The fruit is a capſule of an oval figure at the top, compoſed of two valves, but containing only one cell. The ſeed is ſingle, obtuſe, and broad. *Linnæi* Gen. Plant. p. 327.

WAMPUM, a ſort of ſhells, ſeveral of which being ſtrung upon threads, are uſed as money among the Indians.

It is made of a ſhell, formed into ſmall cylinders, of about one quarter of an inch long, and a fifth of an inch over, and being bored as beads, is ſtrung in great numbers upon long ſtrings. In this ſtate it paſſes among the Indians in their uſual commerce, as ſilver and gold among us; but being looſe, it is not ſo current.

It is both white and black; and the meaneſt is in ſingle ſtrings, of which the white goes at five ſhillings a fathom, and the black at ten; or by number, the white at ſix a penny, the black at three. The next in value to the ſingle ſtrings, is that which is wove into bracelets of about three quarters of a yard long, black and white, in ſtripes, and ſix pieces in a row, the warp conſiſting of leather thongs, and the woof of thread; theſe the gentlewomen among them wear, wound twice or oftener about their wriſts.

The moſt valuable of all is that woven into girdles. Theſe are compoſed of many rows, and the black and white pieces woven into ſquares or other figures. Theſe girdles are ſometimes worn as their richeſt ornaments; but they are oftener uſed in their great payments, and make their nobleſt preſents, and are laid up as their treaſure. *Grew's* Muſæum, p. 370.

WANDSU, in zoology, the name of a ſpecies of monkey found in the iſland of Ceylon. It is all over of a fine deep black; but has a long white beard hanging from its chin.

WANHOM, in the materia medica, a name by which Kæmpfer has called the plant, of which the great galangal of the ſhops is the root. *Kæmpf.* Amæn. Exot. p. 901.

WANT, in zoology, a name given by many to the mole. See the article TALPA.

WANTI. See the article GLOVE.

WAPP, in a ſhip, that rope wherewith the ſhrowds are ſet taught with wale-knots, one end is made faſt to the ſhrowds, and to the other are brought the lanniards.

WAPPER, in zoology, a name given by ſome to the ſmaller ſpecies of the river-gudgeon. *Ray's* Ichthyogr. p. 264. See the article GOBIO *Fluviatilis*.

WAR (*Cycl.*)—WAR-*Horſe*. The proper rules for the chooſing a horſe for ſervice in *War*, are theſe: He ſhould be tall in ſtature, with a comely head, and out-ſwelling forehead. His eye ſhould be bright and ſparkling, and the white part of it covered by the eye-brow. The ears ſhould be ſmall, thin, ſhort, and pricking; or, if long, they ſhould be moveable with eaſe, and well carried. The neck ſhould be deep, and the breaſt large and ſwelling. The ribs bending, the chine broad and ſtrait, and the buttocks round and full. The tail ſhould be high and broad, neither too thick, nor too thin; the thigh ſwelling; the leg broad and flat, and the paſtern ſhort. When ſuch a horſe is choſen, he muſt be kept high during the time of his teaching, that he may be full of vigour. His food muſt be ſweet hay, and good clean oats, or two parts of oats, and one part of beans or peas, well dried and hardened. The quantity ſhould be half a peck in the morning,

ing, and the ſame quantity at noon, and in the evening. Upon his reſting-days he is to be dreſſed between five and ſix in the morning, and watered at ſeven or eight. In the evening he is to be dreſſed at four, and watered about five, and he muſt always have provender given him after watering; he muſt be littered about eight, and then muſt have food given him for all night.

The night before he is ridden, all his hay is to be taken away about nine o'clock, and he muſt have a handful or two of oats about four in the morning, when he has eaten theſe, he is to be turned upon the ſnaffle, and rubbed very well with dry cloths; then ſaddled, and made fit for his exerciſe. When he has performed this, he is to be brought ſweating into the ſtable, and rubbed down with dry wiſps. When this has been done, the ſaddle is to be taken off, and he is to be rubbed down with dry cloths; the houſing cloth is then to be laid on, and the ſaddle being again laid on, he is to be walked gently about till thoroughly cool. After this, he muſt ſtand without meat two or three hours, then he muſt be fed; and in the afternoon he is to be rubbed and dreſſed as before, and watered in the uſual manner.

WARD's *Pill.* Some have conjectured that this medicine, which had ſo great a run, and to which a diminution of the numbers in the bills of Mortality, one year after it happened to come in vogue, was ſaid in a public advertiſement to be owing; it has been conjectured, I ſay, that this medicine was made of butter of antimony; others think it the glaſs of antimony, and cinnabar of Antimony amaſſed with gum tragacanth. See *Ward's Pill* diſſected, and Med. Eſſ. Edinb. abr. vol. 2. p. 434 and 470.

Mr. Clutton mentions ſome caſes where they did ſervice; but relates the hiſtories of fifty caſes where they did great miſchief.

To diſcover the compoſition of theſe pills, he diſſolved the ſeveral ſorts of them, and then viewing with a microſcope the powder which precipitated, he ſaw three different coloured powders remaining of the blue pill; to wit, a yellow, red, and white powder; the yellow and red agreed exactly with the glaſs of antimony, and the white one appeared to be common arſenic. *Ward's Pill* being incloſed in copper, and expoſed to a ſtrong heat, made the copper white, and as hard as iron, which arſenic always does. He alſo obſerved in this blue pill another powder, which he judged to be zaffre, that is, calcined cobalt, incorporated with flints. He thinks the proportion of the ingredients in this blue pill to be, one third glaſs of antimony, near two thirds of arſenic, and a very ſmall part of cobalt, or zaffre, with ſome powder of blue.

The red pill appeared to be much the ſame compoſition as the blue, only red arſenic was made uſe of inſtead of the white, and that the colouring of blue powder was left out.

The purple pills tinged glaſs blue, which cobalt or zaffre does, and therefore Mr. Clutton thinks them principally compoſed of cobalt, with a little glaſs of antimony, which left a yellowiſh border upon the glaſs. See *True and candid Relation of the good and bad Effects of* Ward's *Pill and Drop*, and Med. Eſſ. Edinb. abr. vol. 2. p. 470, 471.

WARNAS, a name by which ſome of the chemical writers expreſs what others of them call the *acetum philoſophorum*, or vinegar of the philoſophers.

WARNING (*Cycl.*)—WARNING-*Piece*, in the military art, is the gun which is fired every night about ſun-ſet, to give notice to the drums and trumpets of the army to beat and ſound a retreat or tattou, which is likewiſe called, ſetting the watch. See the article RETREAT.

WARNOTH, in our old writers, an antient cuſtom by which if a tenant, holding of the caſtle of Dover, failed in paying his rent at the day, he was to forfeit double; and for the ſecond failure, treble: and the lands ſo held were called *terris cultis*, and *terris de Warnoth. Blount.*

WARPS (*Cycl.*)—WARP, in a ſhip, a rope uſed to hale a ſhip into, or out of a harbour.

WARRANT, (*Cycl.*) in the manege. A jocky that ſells a horſe is, by cuſtom, in ſome countries, obliged to *warrant* him, that is, to refund the money that was given for him, and re-deliver the horſe in nine days after the firſt delivery, in caſe he ſold him when under ſuch infirmities as may eſcape the view of the buyer, and as are not obviouſly diſcovered. Theſe infirmities are purſiveneſs, the glanders, and unſoundneſs, hot and cold: But he does not *warrant* him clear of ſuch infirmities as may be diſcerned. Not only jockeys or horſe-merchants, but alſo perſons of what quality or condition ſoever, are obliged to take back the horſe, and repay the money, if he is affected with the ſaid diſorders. But the rule of the law of England is, *caveat emptor*, unleſs the ſeller expreſsly *warrants*.

Dividend WARRANTS. See the article DIVIDEND.

WARREN (*Cycl.*)—The word *Warren* is now generally applied to a piece of ground ſet apart for the breeding and preſerving of rabbets.

In the ſetting up a *Warren*, great caution is to be uſed for the fixing upon a proper place, and a right ſituation. It ſhould always be upon a ſmall aſcent, and expoſed to the eaſt or the ſouth. The ſoil that is moſt ſuitable, is that which is ſandy; for when the ſoil is clayey or tough, the rabbets find vaſtly more difficulty in making their burrows, and never do it ſo well; and if the ſoil be boggy or mooriſh, there would be very little advantage from the *Warren*, for wet is very deſtructive of theſe animals.

All due precautions muſt be taken, that the *Warren* be ſo contrived, that the rabbets may habituate themſelves to it with eaſe. Many would have it that *Warrens* ſhould be encloſed with walls; but this is a very expenſive method, and ſeems not neceſſary nor adviſeable; for we find but very few that are ſo, and thoſe do not ſucceed at all the better for it.

Mr. Chomel's opinion is, that it ought to be ſurrounded with a ditch. This indeed is no fence to prevent the rabbets from going out, unleſs there be water in it; but it marks the intended bounds of the *Warren*, and the rabbets generally confine themſelves within its circumference, though not neceſſarily compelled to do ſo. The ſpace proper for a *Warren* has no limits but the owner's pleaſure; but, in general, the larger it is, the more profitable it alſo proves: and the rabbets, when once accuſtomed to the place, will keep within its bounds, though they are neither hemmed in with walls nor ditches, nor any other fence whatever.

Some have preſcribed the making deep ditches, and conſtantly keeping them ſupplied with water in the ſummer as well as winter ſeaſon, that they may ſerve as fences to the rabbets; but as it is not found neceſſary to fence them in at all, it is extremely injudicious to do it, by means of a thing known to be ſo very prejudicial to theſe creatures, as water is. If the perſon who has ſet up a *Warren* has but few rabbets to ſtock it with, the more patience he muſt have as to the profit of it; but the beſt method of getting quickly into the ſcheme of profit in it, is the buying at firſt a large number of doe-rabbets, all big with young. Theſe being unweildy and heavy, will naturally ſtay in the place, and the young ones will be habituated to it as their native place, and will never run from it. Theſe young ones will ſoon breed again, and the *Warren* will begin quickly to be ſtocked with inhabitants, almoſt all natives of the place. They ſhould not he hunted at all the two firſt years, and but very moderately the third. After this they will increaſe ſo faſt, that ſcarce any body can conceive the numbers that may be taken, and the profit that may be annually made without hurting it.

The *Warren* is the next franchiſe in degree to the park, and when ſpoken of in law, the terms uſed are, the liberty and franchiſe of a free *Warren*.

The beaſts and fowls of a *Warren* are underſtood to be four, the rabbet, the hare, the partridge, and the pheaſant, and no other. Theſe were eſteemed the proper game to be taken by the long-winged hawk.

A foreſt, which is in dignity the higheſt and greateſt franchiſe, comprehends in it a chace, a park, and a free *Warren*; for which reaſon the beaſts of the park, and the beaſts and fowls of the free *Warren*, are as much privileged within the foreſt, as the beaſts of the foreſt itſelf are.

WARTS (*Cycl.*)—There are a thouſand ſuperſtitious remedies for *Warts*, but none of them are of the leaſt conſequence. The ſurgeon's aſſiſtance is the only true method of getting rid of them. There are ſeveral ways of deſtroying them in his hands, as by ligature, extirpation, evulſion, the cauſtic, and the actual cautery. The cure by ligature, is by means of a looſe hair, or a piece of fine and ſtrong ſilk, tied very tight about the root of the *Wart*; and by this means the nutricious veſſels being compreſſed, the excreſcence withers and decays.

The method by extirpation, is to take them up with a pair of plyers, and cut them cloſe off with ſciſſars, dreſſing the wound with the common cauſtic, to remove the roots, if there be any, which would give riſe to a new tubercle.

The cure by cauſtics is beſt performed by cutting off the hard upper part of the *Wart* with a razor or ſciſſars, and then ſurrounding its bottom with a circle of wax, to prevent the ſpreading of the remedies, to touch it daily with oil of tartar, ſpirit of ſalt, aqua-fortis, or butter of antimony.

The cure by cautery is performed by chooſing a cautery of a proper ſize, and with that burning down to the root of the *Wart*. This is the moſt painful of all the methods of extirpating theſe excreſcences; but the pain is but for a moment, and the *Warts* extirpated this way never return again.

The cure by evulſion is performed by anointing them with ſoftening ointment, and then ſeizing them artfully between the thumb and the fore-finger, and forcibly wrenching them out. This is a mountebank method, and a bad one; for it is not only very painful, but the *Warts* commonly grow up again.

Cancerous WARTS. It is no uncommon thing to find on the face, lips, and about the eyes, *Warts* which look blue and livid; theſe are always to be let alone entirely; for when irritated, they frequently degenerate into a cancer, and miſerably torment the parts where they are ſituated. *Heiſter*'s Surgery, p. 32.

WART, in the manege, is an excreſcence, or ſuperfluity of ſpongy fleſh, that riſes in the hinder paſterns of coach-horſes, almoſt as big as a walnut. It ſuppurates, and voids red ſtinking matter, and does not cure but for a time, for it returns again.

WARTH, in our old writers, ſeems to be the ſame with *ward-peny*, being a cuſtomary payment for ſome caſtle-guard. *Blount*'s Tenur. 60. *Blount*.

WASH, the diſtillers name for the fermentable liquor, made by diſſolving the proper ſubject for fermentation and diſtillation in common water.

With reſpect to the proper workings of this liquor, great regard is to be had to the containing veſſel. Its purity, and the proviſion for its occaſional cloſeneſs, are the things to be principally conſidered. Though it is neceſſary that the veſſel be perfectly clean, yet in the cleanſing it great care muſt be taken that no ſoap, or other unctuous body, be uſed, for this would check the fermentation in it; and for the ſame reaſon all ſtrong alkaline lixiviums are to be avoided. Lime-water, or even the turbid ſolution of quick lime, however, may be ſafely uſed for this purpoſe; and this is indeed particularly proper to deſtroy a prevailing acid, which is very apt to be generated about the ſides and bottoms of theſe veſſels, if the warm air has acceſs to them, and thus prevents the order of the fermentation. All ſtrong alkaline lixiviums have as bad an effect on the contrary, and a ſpecial care muſt be had that no corrupt or putrified yeaſt, nor any remains of former fermented matters, hang about the ſides of the veſſels, for this would infect whatever ſhould be afterwards put into them. Foulneſſes of this kind, when of long ſtanding, are of all others the moſt difficult to be cured, and often are of great damage to the diſtiller.

The occaſional cloſeneſs of the veſſel may be provided for by having covers very well adapted to it, in the large way of buſineſs, and by the uſe of valves in the ſmaller, where common light caſks will ſerve the purpoſe, while the valve occaſionally gives the neceſſary vent to preſerve the veſſel, and otherwiſe it remains perfectly cloſe, and impervious to the air but at diſcretion.

It is a very prejudicial miſtake, in the buſineſs of fermenting the *Waſh*, to ſuppoſe that the free concourſe or admiſſion of the external air is neceſſary to the operation. The expreſs contrary is the truth, and a great advantage will be found in practiſing upon this ſuppoſition. A conſtant influx of the open air, if it does not carry off ſome part of the already formed ſpirit; yet it certainly catches up and diſſipates the fine ſubtle oleaginous and ſaline particles, of which the ſpirit is formed, and thus conſiderably leſſens the quantity to be procured. This inconvenience is wholly avoided by the way of cloſe fermentation, by which all air, except that which is contained in the veſſel, is kept out. The great ſecret, in this proceſs, is to have a proper ſpace for the reception of this air, at the top of the veſſel, over the ſurface of the liquor; and when ſuch a ſpace is left, as ſoon as the fermentation is fairly ſet on foot, the veſſel is to be cloſe bunged down, and left to itſelf, no more freſh air being left in but what is admitted by the valve. No new air is neceſſary, when the ſpace unoccupied by the liquor is more than one tenth part of the gage, the artificial air generated in the operation being very ſeldom of force, to endanger the burſting of the caſk, or any other miſchief.

This method of cloſe fermentation is practicable to good advantage in the ſmall way of buſineſs; but it requires ſuch a conſiderable time, that it will never be liked by the large dealers, who are in a manner forced to admit the free air, and thus ſuſtain a very conſiderable loſs in the ſpirit, only to get the operation over in a proper time. Excepting for the neceſſity of expedition of this kind among the large dealers, it is certain that this ſlow and imperceptible vinous fermentation is greatly preferable, on all accounts, to the other. During the whole courſe of this operation, the veſſel is to be kept from all external cold and external heat that is conſiderable, it being neceſſary that it ſhould be kept in an equable uniform and temperate ſtate, ſo as not to be cognizable to the ſenſes, either as heat or cold. In the winter a ſtove-room, ſuch as are common in Germany, would be fitteſt for this purpoſe, the veſſel being placed at a proper diſtance from the ſtove; but at other ſeaſons no particlar cautions are neceſſary with us, provided that the place be well ſheltered from the violent heat of the ſun, and from the bleak northerly winds.

The operation is known to be over in this cloſe way of fermentation, as ſoon as the hiſſing noiſe ceaſes, and can no longer be heard on applying the ear to the veſſel; and when, on opening it, the liquor is found to be clear, and of a vinous pungent taſte; when it is arrived at this ſtate, it ſhould be ſet by for a time in a cooler place than that in which it was fermented; in this manner it will thoroughly purge itſelf of its lees, and will become perfectly clear, vinous, and pungent; in this ſtate it ſhould be drawn clear off from the lee, and immediately committed to the ſtill; and by this method a perfectly pure vinous ſpirit will be procured, greatly better than that which can be obtained by the common way, which thoſe who work large quantities fall into for the ſake of expedition.

The action of fermentation works ſuch a change in the body of the tincture or ſolution, called the *Waſh*, as to render it ſeparable by the action of fire, into parcels of matter that are ſpecifically different, and of a nature entirely foreign to what the ſame liquor would have yielded without the fermentation. The ſtill being charged and luted, and brought to work with a ſoft boiling heat, there firſt comes over a quantity of intenſely pungent aromatic and nidorous liquor, which, if received into a large quantity of cold water, throws off a copious eſſential acrid or aromatic oil, though the original ſubject, before the fermentation, were ever ſo cooling, mild, or contrary to a ſpicy nature. This eſſential oil is found to be the principal thing that gives the predominant or peculiar taſte to the ſpirits, according to the ſeveral ſubſtances from which they are made; and the ſpirits are, from the flavour they receive from this, diſtinguiſhed into malt ſpirit, melaſſes ſpirit, cyder ſpirit, wine ſpirit, arrac, and the like. The fineſt, moſt ſubtle, and moſt efficacious part of this eſſential oil is what comes firſt, the portions that come after being gradually more and more viſcous and nauſeous, and the ſpirit running in a continued thread from the end of the worm, will be found to change its nature oftener than could be imagined, if taſted at different intervals. Beſide this eſſential oil, the ſpirit of the firſt running contains only an acid, more or leſs in quantity, and more or leſs pungent and volatile, or ſenſible to the noſe, in proportion as the fermentation has been more or leſs continued; or according to the degree of acidity acquired in the operation. This acid, and the aqueous part that riſes with it, may be kept back by a proper rectification; though where the acid is very volatile, ſome part of it is apt always to riſe along with the totally inflammable ſpirit, ſo as to give it a flavour like that of a very much diluted ſpiritus nitri dulcis. *Shaw*'s Eſſay on Diſtillery.

The *Waſh* of the malt diſtiller ought to be about the ſtrength of the ten-ſhilling ſmall-beer; and if the ſpirit be expected fine, it had better be too thin than too thick. It is only made by mixing the water hot with the malt ground into meal. If the water be too hot, the mixture will become gluey; and if too cool, a part of the virtue of the malt will be loſt. Under the right application of the water is to be conſidered the proper manner of agitating the maſs, ſo that all the parts of the aqueous fluid may come fully and freely in contact with the ſoluble particles of the ſubject. When once the water is well ſaturated by ſtanding on the malt a proper time, it muſt be drawn off, and freſh poured on, till at length the whole virtue, or all the ſugary ſweetneſs of the malt is extracted, and nothing but a fixed huſky matter remains behind, uncapable of being farther diſſolved by the action of hot or boiling water, or of being advantageouſly waſhed or rinſed out by the bare affuſion of cold. This artificial and external agitation or ſtirring about of the maſs, is neceſſary not only in the common way of brewing for the malt diſtillery, but alſo in that more expeditious way, now in uſe with ſome, of reducing the operations of brewing and fermenting to one, and grinding the malt to a fine meal, which is to be kept in the *Waſh* during the whole time, and even put into the ſtill with it, and worked together. The ſtirring may be repeated to great advantage more than once in each operation, as at the affuſion of every parcel of freſh water, in the common way, and at any ſhortly diſtant times in the ſhort way, in which it is of greater ſervice. *Shaw*'s Eſſay on Diſtillery.

The difference of ſeaſons is found to require ſome alteration in the direction and management of the buſineſs of brewing for the malt-diſtillery. The water muſt always be uſed colder in ſummer than in winter, and the tincture muſt be cooled ſuddenly in cloſe ſultry weather, to prevent it from becoming eager or ſour. The ſummer ſeaſon alſo gives malt an over-forward diſpoſition to ferment, and this impairs the quantity of ſpirit, and is to be checked by the addition of a quantity of unmalted meal, which being much leſs diſpoſed to ferment than the malted meal, will reſtrain and moderate its impetuoſity, ſo as to render the operation ſuitable and effectual to the production of ſpirit, a great quantity of which would be otherwiſe diſſipated, and thrown off by a too haſty fermentation, and that eſpecially when the warm air is ſuffered freely to come at the fermenting liquor. Some of our malt-diſtillers have a cuſtom of uſing rye-meal for this purpoſe; but though this anſwers the end in moderating the fermentation, as well as the other, yet it gives the ſpirit a nauſeous flavour, which is not eaſy to be got off or altered to advantage by any known method of rectification. Some of the malt-diſtillers, the better to prepare their malt, ſprinkle it before the grinding with a ſolution of nitre, or common ſalt, in fair water, and ſome, inſtead of theſe ſolutions, uſe lime-water; but this is not ſo well adapted to the deſign of the thing, which, beſide the preventing the flying away of the finer part of the flowers in the grinding, is to promote the fermentation, and to increaſe the quantity of ſpirit, or add to its pungent acid vinoſity.

It has alſo been judged by ſome to be of ſervice either in general, or eſpecially at ſome particular ſeaſons, to acidulate the water employed in brewing, with a ſmall proportion of ſome vegetable or light mineral, and which is ſuppoſed to curb and regulate the fermentation of the tincture, improve the acid vinoſity of the ſpirit, and occaſion ſome ſmall increaſe of its quantity; and with the ſame view, tartar, as well as common ſalt and nitre, have been uſed in the ſame manner.

The particular intention of the operator may render alſo various other additions neceſſary; thus ſome, to diſpoſe the *Waſh* to yield more ſpirit, or to give the ſpirit a greater degree of pungency, and a better flavour, add to it the ſtrong

and pungent aromatics: the cheapeſt choſen for this purpoſe, and the moſt uſed, are, the cortex winteranus, ginger, and grains of paradiſe. *Shaw*'s Eſſay on Diſtilling.

In the common way, theſe additions, however, do very little, though by a proper artifice in the management they may be made of conſiderable uſe. Upon this foundation, ſtands a very inſtructive method uſed abroad, of making geneva *ab origine*, by mixing the bruiſed juniper berries among the malt, and brewing the whole together; by this means a compound tincture, or *Waſh*, is prepared, which, by fermentation and diſtillation, affords a ſpirit much more intimately and homogeneouſly impregnated with the eſſence of the berry, than that prepared by our diſtillers, in the common way of adding the berry to the malt ſpirit, and diſtilling it from them again. The inconveniencies that attend the brewing directly with malt, are very conſiderable, the malt being of a very large bulk, in proportion to the ſaccharine part, which it can alone impart to the water, and in which its virtues, as yielding a ſpirit, wholly conſiſt. On this account numerous large veſſels, much labour, and great expence, are required to conduct and manage ſuch a buſineſs in the large way. The remedy in this, as in many other caſes, may be much more eaſily ſtarted, than effectually applied; however the foundation for it ſeems to conſiſt in the practically reducing the perplexed buſineſs of the malt diſtiller, to the ſimple buſineſs of the fine ſtiller, or, in other words, in the reducing malt to treacle.

It is very certain, that the thing here propoſed, may be effected to perfection by the common proceſſes of infuſion and evaporation: but the people concerned in this branch of trade are the only proper perſons to try it in the large way, and calculate that advantage and expence, and by that means regularly find whether or not it will be worth while to introduce it as a common method of buſineſs.

The experiment may be tried in this manner: When a parcel of wort is brewed in the common manner, and is become fine by ſtanding, let it be decanted clear off, and immediately boiled away in a common copper, till it begins to inſpiſſate, and acquires a duſky brown colour: at this time it muſt be taken out of the copper, and poured into a balneum mariæ, where the remainder of the evaporation may be made without any danger of burning, and the whole may be reduced to the conſiſtence of treacle; in which form it will keep a long time, and be always ready for uſe, when occaſion requires it. The continuing the evaporation to the end, in the copper over a naked fire, would not only be liable to give it an empyreumatic taſte, from the burning, which would remain ſo ſtrongly in the ſpirit, as to ſpoil it; but the violence of the heat acting immediately upon it, would diſſipate much of its active part, and there would be a much ſmaller quantity of ſpirit procured from it; but if the operation be dexterouſly and carefully performed, as here directed, the extract, or ſaccharine matter, though of as full a body, will be abundantly paler than treacle, a little more glutinous, very ſweet, and pleaſant to the taſte, and will have a fine agreeable bitterneſs, as the flavour goes off, though no hops are uſed in the preparation. In this manner it may be kept, or tranſported to other countries, and will always be reducible to the ſtate of wort again, only by mixing common water with it; and this wort will ferment as freely and as fully as that made in the common way, and will yield its ſpirit in the manner of treacle. *Shaw*'s Eſſay on Diſtilling.

Glauber and Becher were both convinced of the utility of this ſcheme, and both laboured hard at the bringing it to bear: Glauber ſeems to have ſucceeded tolerably in it; but Becher, who had it in his thoughts to extend the practice to the wines as well as the malt liquors, after a whole year ſpent in the attempt, declares, that he can ſcarce believe what Glauber ſays of it, and ſo candidly owns himſelf not poſſeſſed of the ſecret of doing it, that he offers a handſome reward to any body that will inform him of it. What theſe chemiſts ſeem not to have hit on, the way or the beſt way of doing, ſeems however, from experiments in ſmall quantities, perfectly practicable; and if it may be brought to bear in the large way, plentiful years, convenient ſituations, and other helps may be pitched upon, for ſetting up a new trade of treacle, making at leaſt enough for the diſtillers uſe, if it ſhall not be found practicable to convert this new ſort of treacle into potable liquors, or into ſugars.

It is poſſible, that on this plan ſomething may be ſet on foot at home of the nature of the ſugar-worts in our American plantations, which may turn to as good account, and yet be managed with much leſs labour and expence than we find it poſſible to do that. When malting in particular caſes could not be practiſed, ſubſtitutes of various kinds might be invented to ſupply its place on this plan: thus, ſuch grain or pulſe as cannot be made into malt in the common way, may be boiled in water, inſtead of being brewed, and an extract made of their clear decoctions, evaporated into a treacle in the ſame way as the other. The Indians in this manner diſſolve their rice into a thin pap, or jelly, by boiling it in water; and afterwards they ferment this into a potable liquor, or a ſort of wine, which they preſerve under-ground for many years ſucceſſively. And it may be tried whether this method of malting the Indian corn or maize, or that by putting it in the ground till it ſprouts, will be the moſt ſerviceable in the article of diſtillery. Moſt of the Engliſh grains may be eaſily malted in the common way, and their extract thus made into a ſort of treacle, with little trouble, and to very great advantage. It remains to try whether the buck-wheat may be malted in the common way, and put to this uſe? and whether, by ſome variation introduced in the way of malting, the nauſeous flavour of our rye may not be taken off? All the other vegetable ſubſtances intended for brewing, ſhould as much as poſſible have their fermentable parts reduced to the ſtate of a treacle, ſugar, or inſpiſſated juice, not only for the ſake of preſerving them perfect, but for the greater eaſe and convenience of working them. Thus the juices of the birch, the ſycamore, and many other trees, which bleed freely on being tapped in ſpring, are readily boiled up to this ſort of conſiſtence; and in the ſame manner, wherever it is worth while, the juices of canes, fruits, and ſweet roots may be thickened and preſerved.

When once the fermentable parts of vegetables are thus concentrated, and brought together into a ſmall compaſs, the buſineſs of brewing, whether, for the diſtillers uſe, or for the making potable liquors, will be very eaſy and ſhort, the whole being no more than mixing or diſſolving the inſpiſſated juice in a ſufficient quantity of warm water; and this ſolution, either alone, or with ſome trifling additions, will be perfectly fitted for fermentation. *Shaw*'s Eſſay on Diſtillery.

Waſh being of a mucilaginous, or ſomewhat glutinous nature, requires a particular management to prevent its ſcorching, and make it work kindly in the ſtill: If it ſhould happen to be burnt in the operation, the ſpirit will have a moſt diſagreeable flavour, and ſuch as can never be got off again, without very great labour, and a particular treatment, not known to every body. To prevent this ill effect, there muſt be three things obſerved; the liquor, or *Waſh*, muſt be made dilute, the fire muſt be well regulated, and the whole kept in a conſtant agitation. The manner of making the *Waſh* dilute, has been long known among the more judicious diſtillers in this branch, and they have always found their ſpirit the purer for it. The fire is eaſily kept regular, by a conſtant attendance, and avoiding haſty ſtirring it, or throwing on new fuel; and the ſtirring the liquor in the ſtill is to be effected by means of a paddle, or bar kept in the liquor, till it juſt begins to boil, which is the time for luting on the head; and after which there is no great danger, but from the improper management of the fire: this is the common way, but it is hard to hit the exact time, when to lute down the head; and the doing it either too ſoon, or too late, is attended with great inconvenience, ſo that many have found out the other methods, of either putting ſome moveable ſolid bodies into the ſtill with the *Waſh*, or placing ſome proper matter at the bottom and ſides of the ſtill, which are the places where the fire acts ſtrongeſt.

The uſe of the paddle would be better than either of theſe ways, could it be continued while the ſtill is working; and this it may be by the following method: Let a ſhort tube of iron or copper be ſoldered in the center of the ſtill-head, and let a croſs-bar be placed below in the ſame head, with a hole in the middle, correſponding to that at the top; through both theſe let an iron pipe be carried deep down into the ſtill, and let an iron rod be paſſed through this with wooden ſweeps at its end; this rod may be continually worked by a winch at the ſtill-head, and the ſweeps will continually keep the bottom and ſides ſcraped clean, the interſtices of the tubes being all the time well crammed with tow, to prevent any evaporation of the ſpirit at them. *Shaw*'s Eſſay on Chemiſtry.

The ſame effect, may, in a great meaſure, be produced a leſs laborious way, that is, by placing a parcel of cylindrical ſticks lengthwiſe, ſo as to cover the whole bottom of the ſtill, or elſe by throwing in a parcel of looſe faggot ſticks at a venture; for thus the action of the fire below moving the liquor, at the ſame time gives motion to the ſticks, and makes them act continually like a parcel of ſtirrers upon the bottom and ſides of the ſtill, which might, if neceſſary, be furniſhed with buttons, or loops, to prevent them from ſtarting. Some alſo uſe a parcel of fine hay laid upon the looſe ſticks, and ſecured down by two croſs poles, laid from ſide to ſide, and in the ſame manner faſtened down with loops. Care is to be taken in this caſe not to preſs the hay againſt the ſides of the ſtill; for that would ſcorch almoſt as ſoon as the *Waſh* itſelf; but the ſticks never will: theſe are ſimple but effectual contrivances, and, in point of elegance, they may be improved at pleaſure.

There is another inconvenience attending the diſtilling of malt ſpirit, which is, when all the bottoms, or groſs mealy fæculence is put into the ſtill along with the liquor, the thinner part of the *Waſh* going off in form of ſpirit, the mealy maſs grows by degrees more and more ſtiff, ſo as to ſcorch toward the latter part of the operation. The method to remedy this, is to have a pipe with a ſtop-cock, leading from the upper part of the worm-tub into the ſtill; ſo that, upon a half, or quarter turn, it may continually ſupply a little ſtream of hot water, in the ſame proportion as the ſpirit runs off, by which means the fear of ſcorching is taken away, and the operation at the ſame time not at all retarded. In Holland, the malt diſtillers work all their *Waſh* thick, with the whole body of the meal among it; yet they are ſo careful in the keeping their ſtills clean, and ſo regular and nice in the management of their fires, that, tho' they uſe no artifice at all on this head, only to charge the ſtill

while it is hot and moiſt, they very rarely have the misfortune to ſcorch, except now and then in the depth of winter. When ſuch an accident has once happened in a ſtill, they are extremely ſolicitous and careful to ſcrape, ſcrub, and ſcour off the remains of the burnt matter, otherwiſe they find the ſame accident very liable to happen again in the ſame place. But beyond all the other methods in uſe on this occaſion, would be the working the ſtills not by a dry heat, but in a balneum mariæ, which might poſſibly be ſo contrived by the baſon being large, and capable of working a great many ſtills at once, as to be extremely worth the proprietor's while in all reſpects. *Shaw*'s Eſſay on Diſtillery. See the article MALT-*Diſtillery*.

WASH is alſo uſed for the ſhallow part of a river, or arm of the ſea, as the *Waſhes* in Lincolnſhire. *Blount*.

WASHING (*Cycl.*) WASHING *of Ores*, the purifying an ore of any metal by means of water, from earths and ſtones, which would otherwiſe render it difficult of fuſion.

The method of doing it is this: Break the ore to a coarſe powder in an iron mortar, weigh twenty or thirty docimaſtical centners of it, put them into the *Waſhing*-trough, and pour ſome water upon them, that the ore may be thoroughly moiſt; then have a veſſel full of water, the diameter of which muſt be a little larger than the length of the trough; take the trough with the left-hand by the top of the hinder part, and dipping it horizontally into the water, move it gently with the right-hand from the fore part of the trough, which is always to be made the ſhallower part of it, toward the hinder part, which is deeper, then take out the trough, and incline it a little on the fore-part that the water may run out, and the heavier metallic part remain at the bottom; repeat this ſeveral times till the remains at the bottom of the trough are quite pure. If the ſtone in which ore is lodged be too hard for powdering in its natural ſtate, as the flinty and debaſed cryſtalline ones commonly are; the whole muſt be calcined, and quenched in cold water ſeveral times over, and afterwards powdered and waſhed in this manner: when it is thus waſhed, aſſay a centner of it, and from the bead of metal this yields, it will be eaſy to eſtimate the value of the ore. *Cramer*'s Art of Aſſaying, p. 244.

WASP. The *Waſp* has four wings and ſix feet; his body is yellow, with black triangular ſpots: the common *Waſp* breeds in the ground. There is another kind much more fierce, but very rare: theſe breed in woods and mountains; they are larger, and have broader bodies, and much more black about them; their ſting is ſo large, that it ſeems diſproportioned to the ſize of their bodies.

To theſe are to be added the *Ichneumon-waſps*, which are ſmaller than the others, and have very ſlender bodies, but of the ſame colours with the common kind: theſe uſually live in the holes of mud-walls, and make a ſort of porch of mud before the doors of their habitations.

There is alſo another *Waſp* common about Vienna; this is three times as large as the common kind, and ſeems of two different ſpecies, the one having rough antennæ, and the other ſmooth: they are both variegated with black and a bright yellow. *Mouffet*'s Hiſt. Inſect. p. 6.

The *Waſps* conſtruct regular combs, and rear their young in the cells of theſe combs in the manner of bees: wherever there is a young worm in a cell, the old *Waſps* frequently thruſt their heads into it, and caſt up the food for the young one out of their mouths: their cells are hexagonal; and when they have a mind to enlarge their habitation, and make more or bigger combs in them, they are ſeen very buſily coming out of the mouth of the hole, every one loaded with a parcel of earth, till they have carried out as much as is neceſſary for the intended enlargement.

They ſupport their combs one over another by croſs pieces of about an inch long, ſo that there is ample room for the *Waſps* to paſs in their ſeveral buſineſſes. Thoſe cells which ſtand in the center of a comb, are always perpendicular; the others all ſtand more or leſs obliquely; and in the center, the comb is ſomewhat hollowed and depreſſed on the face, and convex on the back; and in this part is inſerted the principal croſs piece that ſerves for a ſupport. *Ray*'s Hiſt. of Inſects, p. 250.

The eggs of the *Waſp* are of an oblong form, and reſemble thoſe of the common fly, but they are larger; they are always faſtened to the angles of a cell, never to the ſides of it. They are uſually placed ſingle; it is very rare to find two in one cell; and if they are laid ſo, it ſeems that one only ſucceeds; for there is never found more than one worm in a cell. The egg is always fixed to that angle of the cell which is neareſt the center of the comb, and always near the bottom, not in the middle of the cell; and when there are two eggs in one cell, they are never fixed to the ſame angle, but ſtand at the ſame height from the bottom, in the two neareſt angles to the center of the comb. The heads of the nymphs are at firſt round and pellucid; but ſoon afterwards the ſkull and the forcipes become reddiſh. The heads of all the nymphs are turned toward the center of the comb, and their tails go obliquely downward towards the baſe of the cell. They are continually ſeen opening their mouths, and moving their forcipes, ſeeming ever hungry, and impatiently waiting for food from their parents. The cells are left open, till the nymph is at its full growth; then the *Waſps* cover it over with a thin lid, under which the worm undergoes its transformation; and as ſoon as it is arrived at the *Waſp* ſtate, it eats its way through this thin cover, and comes to work with the reſt. Mr. Ray mentions a peculiar ſpecies of *Waſp*, which builds a much ſmaller neſt. This is uſually fixed to a beam of ſome old building, and has only one aperture, which is about half an inch wide, and ſerves for the *Waſps* to go in and out at. This aperture is always exactly oppoſite to that part of the hive, where it adheres to the beam. The hive or neſt is covered with a thin membranaceous ſubſtance reſembling paper, of a brown colour, with ſtreaks of white, diſpoſed in regular circles. The whole neſt is about three inches in diameter, and is uſually compoſed of about nine cruſts; when theſe are cut away, there appears a round comb in the center, and a ſmaller above it, fixed up by a pedicle ariſing from the center of each. In every one of theſe cells, which are hexagonal as thoſe of the common *Waſp*, is reared one worm, which, in fine, becomes a *Waſp*.

The ſpecies of *Waſp* which builds in this manner, differs from the common *Waſp*, in that it is ſomewhat larger; it is ſmoother alſo, and has rings of a deeper yellow on the back: the black ſpots are not ſo regular in this, as in the common *Waſp*; and the forehead in this is of a perfect yellow, without any ſpots. Theſe marks, with the difference of hanging a ſmall neſt againſt a beam, and building a large one in the ground, are ſufficient to diſtinguiſh this as an abſolutely different ſpecies. Beſide theſe two, Mr. Ray mentions four other ſpecies of *Waſps*: 1. The long and narrow-winged *Waſp*, with long antennæ, and a broad line of black in the middle of the belly. 2. The long and ſlender black *Waſp*, with three yelloviſh-white ſtreaks on the belly. 3. The broad and ſhort-bodied *Waſp*, with rings of yellow and red. This much reſembles the common *Waſp* in ſhape. 4. The ſharp-tailed *Waſp*, with a black body, variegated with yellow rings. This ſpecies is found about old walls, and is furniſhed with but a very weak ſting. All the others are found wild in our fields. *Ray*'s Hiſt. Inſect. p. 251.

We have an account in the Philoſophical Tranſactions, N°. 476, of ſome *Waſp*-neſts made of clay in Penſilvania. Theſe are of two kinds, one plain, fabricated by a ſmall black *Waſp*, the figure of which is delineated in tab. 3, of that number. The other is a wreathed tubulated clay neſt; and theſe are built by a purpliſh black *Waſp*, of the figure there repreſented. When theſe *Waſps* have laid their eggs, it is ſaid they go and catch ſpiders, and cram the cells full of them; and what is remarkable, they do not kill the ſpiders, but only diſable them, as if they intended to prevent their crawling away, and yet keep them alive.

Mr. Reaumur, in his hiſtory of inſects, vol. 6. mentions clay neſts from St. Domingo, ſomewhat different from theſe.

Ichneumon-WASP. See the article ICHNEUMON.

WASP-*Fly*, in natural hiſtory, a ſpecies of fly having very much the external figure of a *Waſp*, but harmleſs, without a ſting, and with only two wings.

It is black and yellow on the body, and marked exactly as the *Waſp*, and is produced from a ſpecies of the rat-tailed fly-worms. See the article DRONE-*Fly*.

But beſide theſe there is another ſmall fly produced of the puceron-eaters, which has extremely the appearance of a ſmall *Waſp*; but it is perfectly harmleſs, and has only two wings. *Reaumur*, Hiſt. Inſ. vol. 4. p. 486.

WASP-*Tipula*, in natural hiſtory, the name of an inſect deſcribed by Mr. Reaumur, and being properly a tipula, or long-legs, though greatly reſembling a *Waſp*.

This is produced of a worm found in the earth, lodged in the cavities of old trees; the worm has no legs, but has a regularly figured ſcaly head. The fly produced from it has the long legs and the mouth of the tipula, with the remarkable double beard which covers it, and which makes the great character of this claſs of inſects; but then the body is ſhort and thick, whereas the bodies of the common kinds are very bony and thin. This, as alſo the breaſt, is variegated with ſtreaks of black and yellow, in the manner of the *Waſp*; and its antennæ are very beautifully feathered, and bearded like thoſe of the males of many of the gnat-kind. The head is black, and the legs are yelloviſh. The wings have a yelloviſh caſt, and near their end have each a large ſpot of brown. The body of the female of this ſpecies is always much thicker than that of the male; and the ſexes are eaſily diſtinguiſhed by this. *Reaumur*'s Hiſt. Inſ. vol. 9. p. 19.

WASTE-*Cloths*, in a ſhip of war, the cloths hung up on the uppermoſt work of a ſhip's hull, to ſhade the men from an enemy in the fight; and therefore by ſome are called *fights*.

WASTE-*Trees*, in a ſhip, are thoſe timbers which lie in her *Waſte*.

WASTORS, in our ſtatutes, a kind of thieves ſo called, and mentioned among robbers, draw-latches, &c. Stat. 4. c. 27. *Blount*, *Cowel*.

WATCH (*Cycl.*)—The movement of theſe machines will be ſtopped with great cold; and therefore in very cold climates, it is proper to keep them in one's fob by day, and in the bed by night. See Phil. Tranſ. N°. 465. Sect. 2.

WATCH-*Glaſs*. Mr. Boyle informs us, that to faſhion glaſſes for *Watches*, or the like purpoſe, into a convex or concave figure,

figure, there is no neceſſity for grinding: For, a ſmooth and flat piece of glaſs, of a competent thickneſs, being carefully laid upon a ſhallow concave cylinder of iron, ſo that the edges of both touch, the heat of a fire, warily applied, will ſoften the glaſs, and ſuffer it to ſink into the form required. See Works abr. vol. 1. p. 135.

WATCH-*Glaſs*, aboard a ſhip, runs four hours, and is uſed to ſhift or change their *Watches* by. There are alſo *half-watches*, *hour-glaſſes*, *minute*, and *half-minute-glaſſes*; by which laſt they count the knots when they heave the log, in order to find the ſhip's way.

WATER, (*Cycl.*) in natural hiſtory. See the Appendix.

WATER-*Bomb*, a name given by our chemiſt Godfrey to a machine he invented on the plan of Greyl's diſcovery, for the extinguiſhing accidental fires in houſes. He conſidered firſt, that the unmanageable ſize of Greyl's engine was a very great objection; and on this plan contrived a medicated liquor, which was ſuch an enemy to fire, that a very ſmall quantity would extinguiſh as much as a greatly larger of common water; and this liquor had the farther advantage, that it might be kept ever ſo long without corrupting, and by that means the veſſels containing it would remain always fit for uſe; whereas in Greyl's method they muſt have been rotted by the corrupting and fermenting of the water, after a few years.

The author of this invention tried it twice in public with us, and both times with all the ſucceſs that could be wiſhed: but the ſtructure of the veſſel was ſo much the ſame with that of Greyl's, that Godfrey cannot be allowed any farther merit, as an inventor, than that of contriving the medicated liquor inſtead of common water. The machine is a wooden veſſel, made very firm and ſtrong, that the liquor, when once put in, cannot leak out any where; in the center of this is an oblong cylindric veſſel, which is filled with gun-powder; a tube is brought from this to the head of the barrel, and this being filled with combuſtible matter, and the inner caſe with powder, and both made of plate-iron, that no water may get in, the veſſel is then filled with the medicated liquor. The top of the tube is then covered, and the thing ſet by for uſe.

When there is occaſion for it, it is only neceſſary to uncover the tube, and ſetting fire to the matter in it, it is conveyed to the veſſel containing the powder, and the whole machine being thrown into the place where the fire is, is torn to pieces by the exploſion, and the extinguiſhing liquor ſcattered every way about, on which the fire is quenched in an inſtant.

The contriver of theſe things propoſed the making three kinds of them, the one containing five gallons of the liquor; this was the largeſt ſize, and contrived for the largeſt rooms, and moſt urgent neceſſities. The ſecond kind contained three gallons; and the ſmalleſt, which was meant for a cloſet, or other little room, contained only two gallons. The ſmaller kind alſo had ſometimes a peculiar difference in their ſtructure, the powder-veſſel being placed not in the center, but at the bottom: the intent of this was to fit them for chimneys, when on fire, as by this means the liquor, not being wanted to be ſcattered on all ſides, was carried moſtly upwards. Theſe were fixed on the end of a long pole, and by this means thruſt to a proper height up the chimney; and the tube that communicated the fire was placed downward.

The manner of uſing the machines for rooms on fire, is this: the perſon who has the care of them is to throw them as nearly as may be into the middle of the room, and then to retire to a little diſtance: As ſoon as he hears the exploſion, he may ſafely enter the room, and with a cloth, or any thing of that kind, put out any remaining ſparks of fire that there may be in particular places. If the room be ſo large that one of the machines cannot diſperſe the liquor to every part of it, two are to be uſed, one being laid at each end; and if ſeveral rooms are on fire at once, as many of the machines are to be uſed, one being thrown into each room. If a whole houſe is on fire, the lower rooms are firſt to be taken care of, and after theſe the upper, as they aſcend.

Our Godfrey had ſcarce better ſucceſs than his predeceſſor Greyl; for while he was making his public experiments, one Povey, collecting ſome of the fragments of his broken veſſels, found out the ingredient uſed in the medicated liquor, and made and ſold the things in the ſame place where he had proved his right to them. It is probable that the medicated liquor was no other than common water, with a large quantity of ſal armoniac, that ſalt having this virtue of extinguiſhing fire in a very remarkable degree: But it is greatly to be wondered at, that while all the world were convinced by experiments of the uſe of the machine, the author made but little advantage of it, and it is now diſuſed. Act. Erudit. Ann. 1724. p. 183.

WATER-*Dog*. The ſportſmen generally eſteem the black *Water*-ſpaniels above thoſe of any other colour, they being generally the moſt hardy. If there be any farther judgment to be made from the colour, it is, that the ſpotted or pied are generally the quickeſt at ſcent, and the ſimple liver-coloured the quickeſt at ſwimming. Theſe, however, are but very uncertain rules to judge by, and the things principally to be regarded are the dogs being of a good breed, and well taught. As to the ſhape, the head of a good *Water*-dog is generally round, and the hair curling, the ears large and broad, and hanging down; the eyes full and lively, the noſe ſhort, and the lips like a hound's. The neck ſhould be thick and ſhort, the ſhoulders broad, the legs ſtrait, and the chine ſquare. The buttocks ſhould be round, and the thighs brawney. The paſterns ſtrong, and the fore-feet round. The hair in general ſhould be long and curled, not looſe and ſhaggy.

As to the training up a dog for ſporting, the maſter of him cannot begin when he is too young, the principal thing to be taught being obedience, and that being beſt taught while the creature is young. As ſoon as he can lap, he ſhould be taught to couch and lie cloſe at command, and not to dare to ſtir from that poſture till he is ordered; he will ſoon be brought to this by beating when he diſobeys, and encouraging him when he does right. He ſhould always be taught before the times of his eating, and never have his food given him, but when he has done ſomething to deſerve it. This will teach him always to do well, for the ſake of the expected victuals. No perſon ſhould ever interfere in the teaching, for two maſters breed a confuſion, and the creature never will learn well from them.

The teacher muſt be careful always to uſe the ſame words in his leſſons; thoſe words are to be choſen which are the moſt plain in their ſounds, and the moſt diſtinct from one another; and when theſe are once fixed upon, they muſt never be altered; for the dog, being guided wholly by the ſound, not at all by the ſenſe, any alteration of them, though the change be into words of the ſame ſenſe, quite confounds the creature. The word *down* is ſhort and expreſſive, and no other need be uſed when he is ordered to couch; but this being once given him, is never to be varied afterwards. The next ſound he ſhould be taught after this, is the word of correction, for no leſſon can be given but faults will be committed, and no fault ſhould paſs without correction or blame; in this caſe the word *ſirrah*, ſpoke angrily, will always be underſtood: This, at firſt, ſhould be uſed with a laſh or a blow, and after a time he will know it as a word of diſpleaſure, and it will do for ſmall faults without the blow. Certain words of cheriſhing and encouragement muſt alſo be taught him at the ſame time, as *good boy*, or the like, uſing always with them actions and looks of chearfulneſs and pleaſure, as clapping him on the back, and the like. After theſe, he muſt be taught the meaning of ſome words of advice, to put him in mind of his buſineſs, when he is out upon the ſport, ſuch as *take heed*, or the like. Theſe will not only ſet him upon the watch, and make him diligent; but he will alſo be careful and cunning, and at the ſame time chearful and pleaſed in himſelf, at knowing that he is doing his maſter a pleaſure.

When the young dog is thus far inſtructed, and knows the meaning of the words of inſtruction, correction, encouragement, and advice, and will couch and lie down at his maſter's feet, how and when he pleaſes, and that with the ſignal of a word, or a look only; he is then to be taught to follow cloſe at his maſter's heels, by leading him by a line tied to his collar; he is to be carefully taught this, ſo that when taken out to the ſport, he muſt neither run under the legs, nor hang too far back; this alſo will tend to the making him the more obedient. When he has been thus taught to follow with a line, he muſt be taught to follow in the ſame manner, looſe, and without a line, and always to be at his maſter's heels.

The next leſſon he is to be taught, is to fetch and carry any thing he is commanded; this muſt be taught him by way of ſport, as a diverſion, by ſhaking a glove at his head, and teaching him to ſnatch it, and afterwards to catch it when thrown from the hand, and bring it back again; this he is to be encouraged in with cheriſhing words, and all other means.

The beſt method of perfecting the creature in this, is by letting him have no food, but what he earns by doing well, always feeding him when he does as he ſhould do. If he carry the glove away, or play wantonly with it, and refuſe to bring it back, his maſter is to uſe the word of inſtruction, as *take heed*: If this does not bring him to, he is to uſe the word of correction; and if he does not bring it back at this, he muſt proceed to blows; and on many other trials he muſt have nothing given him to eat, till he has done as he ought, and has it by way of reward. When by this means he is taught ſo well, that he will bring back the glove, wherever it is thrown, and carry it only to his maſter, though he is in company with other perſons, who all call him, he is then to be cheriſhed and encouraged, and taught to bring back any thing elſe that is thrown, whether ſticks, ſtones, or any thing whatever. After this, he is to be taught to carry dead fowl, and finally live ones, and this with ſo tender a mouth, as not to hurt them: thus he will be taught at length to bring the fowl that his maſter ſhoots, without tearing them or hurting a feather.

The next leſſon is to be taught by taking him out in the field, and dropping ſomething unknown to him; after he is come to ſome diſtance from the place, he is to be ſent back to ſeek for it, and if he bring it back, he is to be encouraged. If he bring back a wrong thing, he is to be encouraged for the attempt, and ſent back again: By repeating this at different diſtances

diſtances, he will be taught to go back ever ſo far in ſearch of any thing; and if he fails in the leſſons, he is to be chid, beaten, or kept faſting, for it, according to the offence.

When he has been perfected in all theſe leſſons, he muſt be taught his buſineſs of hunting; he is to be firſt taught with tame fowl, which his maſter is to aſſiſt him in taking, and reward and encourage him when he has done. After this, he is to be ſent in without aſſiſtance to take the fowl alone, and if he ſucceeds, he is to be encouraged and rewarded, and corrected if he fails. By this practice he will ſoon become maſter of his game; but great care is to be taken in the teaching him, when he has caught it, to bring it back to the ſhore, without biting or hurting it.

The next thing to this, is the training him to the gun; to this purpoſe he muſt be taught to follow ſtep by ſtep behind his maſter, and under covert of his ſhadow, till he has ſhot, or, when there is occaſion, to couch and lie cloſe, never daring to ſtir till the gun has gone off; and then, upon the leaſt notice or beckoning, to come and do what he is commanded.

Many of theſe dogs are ſo expert, that they will have their eye upon the game as ſoon as their maſter, and the moment the gun is gone off, they will, without bidding, go and fetch it; but this is being too forward, and if he is uſed afterwards with nets or lime-twigs, he will do great miſchief, by ruſhing on the birds as ſoon as they are taken, and tearing the nets, or ſpoiling the twigs. Obedience is the beſt quality in this ſort of dog, and it is better he ſhould wait for command, than know his buſineſs without it.

The ſportſmen, who know the time of birds moulting, make a very great uſe of this ſort of dog, taking him with them without gun, net, or any other aſſiſtance. The common moulting-time of *Water*-fowl is from June to Auguſt; in this time they are not able to fly well, and in ſome part of it, when their old wing-feathers are off, and the new ones are grown ſcarce at all, the dog is then to be taken to the ſides of rivers, and other waters, and ſet to hunt about the cloſe places, among which they hide themſelves at this time; the dog, being ſet to hunt, will eaſily find them in theſe retreats, and will take them either by leaping ſuddenly upon them, or fairly purſuing ſuch of them as have not the uſe of their wings.

There is alſo another great uſe of the dog in driving them without catching them. This is practiſed only in mooriſh and fenny countries, where they are very numerous. In theſe countries a proper place is to be ſought for, where the birds retire to, and theſe are planted with nets; then the dog is ſent into the *Waters* and places of covert, where they are ſuppoſed to be, and this at the moulting-time, when they cannot fly away from him. The alarm he puts them into which he firſt attacks, ſoon calls many others together, and there is a large body of them formed, which the dog drives before him like a flock of ſheep, and being directed by the ſportſmen, frightens directly into the places of their retreat, where the nets are placed before-hand to receive them.

WATER-*Fowl*. We are apt to ſuppoſe that theſe birds have ſomething more peculiar in their ſtructure than they really have, to enable them to live without the benefit of reſpiration a conſiderable time. It was ſuppoſed that they could ſubſiſt without air a long time, till Mr. Boyle found by his experiments with the air pump, that they could not bear the exhauſted receiver any longer than other birds, a full grown duck being killed in two minutes in it. But what is more obſervable is, that their power of remaining under *Water* is for a much more limited time than is imagined. On tying a weight to the legs of a duck, and ſinking her in a tub of water, it was found that two minutes immerſion proved very troubleſome to her, and occaſioned great efforts for riſing; that after this the air-bubbles were diſcharged in plenty from the mouth and noſtrils, and finally the beak was wide opened, the *Water* admitted, and the creature abſolutely drowned, ſo as to be irrecoverably dead in ſix minutes. A young duckling put into the *Water* in the ſame manner, died at the end of the fourth minute, after diſcharging many air-bubbles both from the noſtrils and mouth, and yet more from the upper part of the head, a little behind the eyes. Phil. Tranſ. N°. 62.

Water-fowl may be taken in great abundance by nets properly managed. The net for this purpoſe ſhould be always made of the ſmalleſt and ſtrongeſt packthread that can be got. The meſhes may be large, but the nets ſhould be lined on both ſides with other ſmaller nets, every meſh of which is to be about an inch and half ſquare each way, that as the fowl ſtrike either through them or againſt them, the ſmaller may paſs through the great meſhes, and ſo ſtreighten and entangle the fowl.

Theſe nets are to be pitched for every evening flight of fowl, about an hour before ſun-ſet, ſtaking them on each ſide of the river, about half a foot within the water, the lower ſide of the net being ſo plummed, that it may ſink ſo far and no farther; place the upper ſide of the net ſlantwiſe, ſhoaling againſt the *Water*, but not touching it by near two foot; and let the ſtrings which ſupport this upper ſide of the net be faſtened to ſmall yielding ſticks ſet in the bank; theſe, as the fowl ſtrikes, will give the net liberty to play, and to entangle them. Several of theſe nets ſhould be placed at once over different parts of the river, at about twelve-ſcore fathom diſtance one from another; and if any fowl come that way, the ſportſman will have a ſhare of them. It is a good method, when the nets are ſet to go to places ſufficiently diſtant from them with a gun, to fright them toward the places where the nets are; and wherever any of the fowl are ſtarted from, it may not be amiſs to plant ſome nets alſo there to take them as they return. The nets are to be left thus placed all night, and in the morning the ſportſman is to go and ſee what is caught; he ſhould viſit the river firſt, and take up what are caught there, and, frightening the reſt away to the other places where his nets are, he is next to viſit them, and take what are there ſecured.

WATER-*Gavel*, in our old writers, a rent paid for fiſhing in, or other benefits received from, ſome river. *Blount*.

WATER-*Horehound*. See the article LYCOPUS.

WATER-*Salamander*. See the article SALAMANDRA.

High WATER is when the tide is at the higheſt. See the article TIDE, *Cycl*.

Low WATER is when the tide is at the loweſt.

WATERING, (*Cycl*.)—WATERING *of Horſes*. All the while that a perſon is on a journey, the horſe ſhould always be ſuffered to drink of the firſt good water he comes to after ſeven o' clock in the morning in ſummer, and after nine or ten in the winter. Moderately pure water is to be preferred, that being beſt of all which is neither too clear and penetrating, nor muddy and ſtinking.

Though it is the cuſtom in England to run and gallop horſes after drinking, which we call *Watering*-courſes, and which we ſuppoſe brings them into wind, yet Sollyſel, and many other of the beſt judges of horſes, tell us, that it is one of the worſt and moſt pernicious practices that we can be guilty of; there can no good accrue from it, and many horſes are rendered purſy by it.

While a horſe is drinking, the rider ſhould draw up his head five or ſix times, making him move a little between every draught. The rider need not be afraid of giving him water, with proper moderation, even in almoſt any circumſtances. If he be warm and ſweat very much, yet if he is not quite out of breath, and there are four or five miles to ride, he will be better after drinking a little, than if he had drank none at all; only obſerving, that if the horſe were very warm at his going into the water, his pace muſt not be leſs than a moderate trot when he comes out, that he may not be chilled.

In the time of a journey the horſe ought to be ſuffered to drink in this manner, of the waters that come in the way, as often as may be; for if the rider happens to bait when he is hot and ſweaty, he muſt not be ſuffered to drink of a long time, as it would endanger his life; and if he has not been *watered* in this manner on the road, his exceſſive thirſt will often prevent his eating, and he will not be able to touch any ſort of food of an hour or two, which is uſually more time than the rider can ſtay, and yet without eating at baiting-times he will not have ſtrength to go on. The giving him water on the road will, on the contrary, keep him ready for food whenever it is offered him, and the rider need ſtay no longer than his own refreſhment requires, the horſe eating immediately, and being readily qualified to go on again.

If there be any ſhallow water in the way, a little before the coming to the inn where the horſe is to reſt all night, it is always proper to ride him in, and not only give him a little drink, but ride him about ſeveral times, not quite up to the belly; this will clean his legs, and prevent humours from falling down into them. If the horſe be very warm, and there has been no convenience of *Watering* him upon the road, the oats that are given him ſhould be firſt ſteeped a while in ale; this will induce him to eat, though he could not have touched any that were wholly dry.

Many are of opinion, that horſes are ſometimes ſpoiled by giving them oats before their water; but Mr. Sollyſel affirms, that though it be not the cuſtom to give oats till afterwards, yet it never does any harm to feed the horſe with them both before and after drinking; and that it is often proper and neceſſary, eſpecially when the horſe has been hard rid, and is warm.

WATRY *Sores*, in the manege, called in French *mauvaiſes eaux*, are a ſuppuration of ſtinking and malignant humours, which iſſue from the paſtern and fetlock joints of a horſe, and that from the hinder rather than the fore-legs.

WAVE (*Cycl*.)—This motion of the ſea-water depends greatly on the winds, and on the ſituation of mountains, in regard to the ſea; for the winds are driven back from theſe with great impetuoſity; and in ſome places this occaſions a great and very irregular undulation, beſide that which is produced by the immediate action of the winds on the ſurface of the water, in their own direct courſe.

Waves are to be conſidered as of two kinds, and theſe may be diſtinguiſhed from one another by the names of natural and accidental *Waves*.

The natural *Waves* are thoſe which are regularly proportioned in ſize to the ſtrength of the wind, whoſe blowing gives origin to them. The accidental *Waves* are thoſe occaſioned by the wind's reacting upon itſelf by repercuſſion from hills and mountains, or high ſhores, and by the waſhing of the *Waves* themſelves, otherwiſe of the natural kind, againſt rocks and ſhoals;

ſhoals; all theſe caſes give the *Waves* an elevation, which they can never have in their natural ſtate.

The great Mr. Boyle has proved by numerous experiments, that the moſt violent wind never penetrates deeper than ſix foot into the water; and it ſhould ſeem a natural conſequence of this, that the water moved by it can only be elevated to the ſame height of ſix foot from the level of the ſurface in a calm; and this ſix feet of elevation being added to the ſix of excavation, in the part whence that water ſo elevated was raiſed, ſhould give twelve foot for the utmoſt elevation of a *Wave*. This is a calculation that does great honour to its author; for Count Marſigli meaſured carefully the elevations of the *Waves* near Provence, and found that, in a very violent tempeſt, they aroſe only to ſeven foot above the natural level of the ſea, and this additional foot in height he eaſily reſolved into the accidental ſhocks of the water againſt the bottom, which was, in the place he meaſured them in, not ſo deep as to be out of the way of affecting the *Waves*; and he allows that the addition of one ſixth of the height of a *Wave*, from ſuch a diſturbance from the bottom, is a very moderate alteration from what would have been its height in a deep ſea, and concludes, that Mr. Boyle's calculation holds perfectly right in deep ſeas, where the *Waves* are purely natural, and have no accidental cauſes to render them larger than their juſt proportion

In deep water, under the high ſhores of the ſame part of France, this author found the natural elevation of the *Waves* to be only five foot; but he found alſo that their breaking againſt rocks, and other accidents to which they were liable in this place, often raiſed them to eight foot high.

We are not to ſuppoſe, from this calculation, that no *Wave* of the ſea can riſe more than ſix foot above its natural level in open and deep water, for *Waves* immenſely higher than theſe are formed in violent tempeſts in the great ſeas. Theſe, however, are not to be accounted *Waves* in their natural ſtate, but they are ſingle *Waves* formed of many others; for in theſe wide plains of water, when one *Wave* is raiſed by the wind, and would elevate itſelf up to the exact height of ſix foot, and no more, the motion of the water is ſo great, and the ſucceſſion of *Waves* ſo quick, that, during the time this is riſing, it receives into it ſeveral other *Waves*, each of which would have been at the ſame height with itſelf; theſe run into the firſt *Wave* one after another, as it is riſing; by this means its riſe is continued much longer than it naturally would have been, and it becomes terribly great. A number of theſe complex *Waves* ariſing together, and being continued in a long ſucceſſion by the continuation of the ſtorm, make the *Waves* ſo dangerous to ſhips, which the ſailors in their phraſe call mountains high. *Marſigli*, Hiſt. Phyſ. de la Mer.

WAVE-*Offering*, among the Jews, a ſacrifice offered by agitation or *waving* towards the four cardinal points. See the article AGITATION.

WAVED, or WAVEY, (*Cycl.*) in heraldry, denotes that the firſt of the family in whoſe arms it ſtands, acquired his honours for ſea ſervices, and has this peculiar commemoration of it ordered in his arms. *Niſbet*'s Heraldry.

WAX (*Cycl.*)—Before it is poſſible to underſtand the accounts authors give of the manner in which the bee collects its *Wax* and honey, and forms the cells to depoſit the laſt fluid in, it is neceſſary to underſtand the true ſtructure, and know the ſeveral parts of this little creature.

The anterior part of the head of a bee is triangular, and ſomewhat flat; it goes tapering from the baſe to the extremity, and the reticular eyes are placed at the ſides; theſe are of an oval figure, one point or end being much larger than the other. The narrower end of each eye is on the lower part of the head, and reaches almoſt to the origin of the teeth; there is a large ſpace between the eyes, and this is full of little irregularities. The antennæ are placed at the two ſides of an eminence in this part, coming near the eyes; they are of no very ſingular ſtructure, but are compoſed of ſeveral joints, and ſeem of the nature of horn; they are ſo made that they may be eaſily folded in two, and they are always found to be ſo in dead bees. The head is not very thick, but appears ſomewhat broad; and at the upper part there are placed three ſmall ſhining eyes in a triangular ſituation, as is the caſe in many other of the winged inſects.

The bee has a trunk and teeth, and the ſituation of theſe, at the extremity of the head, has a great ſhare in giving that part a triangular figure. The teeth, when they are not in action, meet in a point at their extremities, and form an angle which projects out from the cruſtaceous lips. Theſe teeth are a very eſſential part of the creature, and are not only intended for the common purpoſes of eating, but ſerve alſo to the great purpoſes of erecting the works within the hive. Theſe teeth are properly a ſort of grinders, one of which has its origin on one ſide of the head, and the other at the ſame height on the other; they are ſmaller near their origin than in any other part, and thence grow larger to the extremity, where they are cut off obliquely in ſuch a manner, that when their two ends are applied one againſt the other, they make a ſort of angular pair of pincers, which are able to lay very faſt hold of any thing; they are not only capable of meeting in this manner, but they can, upon occaſion, croſs one over the other; and this is the poſition they are uſually found in when the bee is dead. The truncated ends of the teeth have each a ſemicircular cavity, ſurrounded with hairs; theſe meeting, when the teeth are cloſed, form a regular cavity, capable of receiving whatever is ground to pieces by the ſides of the teeth. *Reaumur*'s Hiſt. Inſ. vol. 9. p. 357.

The head of the bee is faſtened by a ſhort, flexile, and fleſhy neck to the breaſt; the hinder part of the head receives the end of the neck, and near the inſertion of this is placed the origin of the trunk; this goes ſtrait forward from this place as far as the angle made by the teeth, and thence returns in a curved form to fall over the breaſt. On the ſides and upper part of the breaſt are the origin of the four wings, and on its under part the four legs are inſerted. There are alſo on the breaſt the four principal ſtigmata, which are ſituated as in other flies. In the ordinary poſition of the parts, the poſterior end of the corcelet is placed cloſely upon the firſt ring of the body, ſo that they ſeem joined together by their whole ſurfaces. But the true ſtate of theſe parts is, that they are only joined by a ligament; this ligament is placed on the lower part of the corcelet and body, and, being very ſhort, is often not at all ſeen. The poſterior part of the corcelet alſo has a convexity, and the anterior part of the firſt ring of the body a cavity that receives it; whence theſe parts, in their common ſtate, appear joined together in a great extent, in which they really only touch. The body is compoſed of ſix rings, which are covered with very ſtrong ſcales; theſe are very neceſſary to them, for they often fight, and were it not that there was ſuch a defence againſt one anothers ſtings, they would unqueſtionably often periſh.

The body of the bee appears in ſeveral places ſpotted with a reddiſh colour; all theſe parts are ſo many hairy ſpots, and owe their colour to the reddiſh hue of the hair. The body, breaſt, and head of the bee, are alſo covered in many places with longer and more diſtinguiſhable hairs. In examining the creature in this view, it is proper to uſe a microſcope, for tho' the naked eye ſhews many hairs, this inſtrument ſhews vaſt numbers more, and thoſe in places where they could not have been ſuſpected to grow; the very eyes are not exempt from them, the large reticulated ones being as thick ſet with ſhort and fine hairs, as almoſt any other part of the body.

Theſe hairs, when ſeen through the microſcope, do not appear in form of ſingle filaments, but they repreſent ſo many buſhes or beds of moſs, every filament, or as it appears to the naked eye, ſingle hair, being thus ſeen to be branched and beſet with ſhort prominences reſembling leaves of a plant. *Reaumur*'s Hiſt. Inſ. vol. 9. p. 361.

Many have ſuſpected what are called the reticulated eyes of flies not to be real eyes, and theſe growing hairs upon them has ſeemed a convincing proof of their not being ſo, ſince it has been ſuppoſed that they could ſerve to no other purpoſe than to impede viſion. Mr. Hook and others have ſaid a great many things in favour of the opinion of their being eyes; but Mr. Reaumur has proved it beyond all doubt; he choſe to this purpoſe the eyes of the bee for his experiment, as they were the moſt hairy of thoſe of any known inſect, and therefore the leaſt qualified to act as eyes, according to the common opinion. The bee is known to ſee very well; and this author determined to try whether ſhe would do ſo without the aſſiſtance of theſe reticulated ſubſtances; he to this purpoſe covered over the reticulated parts of the head of three or four bees of the common kind, and then incloſed them with twenty others in a wooden box. When they had been there ſome time, he opened the lid of the box; thoſe which were not varniſhed immediately flew out, and went directly to their hive; the others, whoſe eyes were thus cloſed up, continued in the box a long time, and when diſturbed, in order to ſend them out, flew in various directions againſt the ſides of the box; and in fine, when in the air, ſeemed to know nothing of their way to the hive, but flew up into the air till out of ſight.

This experiment ſeems to have wholly determined the point, ſince if the creature be rendered blind by the covering the reticulated ſubſtances on the head, it muſt be allowed that thoſe reticulated ſubſtances are the eyes. The hairs which grow on them do not take their origin from the pupils or lenſes, of which they are compoſed, but from the ſubſtance which ſeparates or makes cells for them; and though theſe hairs appear to ſome to be greatly injurious to viſion, it may very poſſibly be, that they ſerve only as our eye-laſhes, to break the too violent light to which the eyes are ſometimes expoſed. It is to be obſerved, that the hairs which grow upon the reticular eyes of the bee are not branched or foliated in the manner of thoſe of the body, but are only ſingle, ſhort, and ſtrait filaments, perfectly reſembling the hairs of large animals. When Mr. Reaumur had thus proved the uſe of the reticulated eyes of the bee, he was determined to try the uſe alſo of the three ſmall and ſhining eyes, which ſtand on a triangle on the back part of the head; to this purpoſe he covered theſe eyes with the ſame varniſh with which he had before covered the reticulated ones, but leaving theſe bare: he did this with ſeveral bees, and afterwards placing them at a few yards diſtance from the hive, he left them at liberty. Not one of them found the way to the hive, or even ſeemed able to direct its flight towards it; but they all flew directly to the flowers that were

nearest them, to which they perfectly saw the way. These did not fly upwards, as all the others did.

The hairs of the bee are of different use from that of the hairs of other animals, and therefore all this varied structure was necessary. See the article HONEY.

The legs of the bee are six; the two anterior pairs are of the same length; but the two hinder legs, or posterior pair, are considerably longer than the others. Each leg is composed of five principal pieces; of these, that next the origin is thicker and shorter than any of the others. This is a sort of conic button, to the end of which the second piece is articulated; this is much longer and thicker in the middle, and thinner at each end; the third piece of the leg in the hinder pair is different from that of the others; it is flat and of a triangular figure, and is called by Reaumur and other French authors, *palette triangulaire*. This is articulated with the second piece by its point, and with the fourth by its broad part. This third piece in the second pair of legs is much less flat and triangular than in the hinder pair; and in the first pair it is scarce at all so. The fourth piece in the two hinder pairs of legs is also broad and flat; but it is not triangular, but of a square figure. The French writers call this the *brosse*. This is much larger and broader on the hinder pair of legs than on the second, and in the first it is not at all of this flatted or square figure, but is cylindric and slender. The fifth piece of each leg is what may be called the foot. It is an extremely fine part, and is composed of fine joints, placed close to one another. The four anterior pieces are a sort of truncated cones, a little flatted, and are joined by the base of the first to the head of the second, and so on. The last piece is long, slender, and cylindric, and is terminated by two hooks resembling the claws of a bird. One of these is twice as long as the other, and between these two claws there is placed a fleshy protuberance covered with hairs, of the nature of that of the feet of the flies; by means of which they are able to climb upon glass, or other smooth bodies. *Reaumur*'s Hist. Inf. vol. 9. p. 368.

The first joint of all the legs of the bee is covered with the foliated hairs before-mentioned; the second piece has strait hairs, and the third piece, or palette on the hinder pair, is so beset with large and stiff hairs all round its edges, and so hollowed in its anterior part near the bottom, that it resembles a sort of basket, and it is made for that very purpose, serving the creature as a sort of basket to carry home its *Wax* in.

The third joint of the first and second pair of legs has no structure like this; and we find that it is not in those legs used to the same purposes, it being only on the last pair of legs that the lumps of *Wax* are seen, when the bee is loaded with them. The fourth piece of the two hinder pair of legs, which the French call the *brosse*, or the brush, and which is of a square figure, serves the creature in the place of a brush, and is in reality formed somewhat like one. The outer surface of this is convex and smooth, the inner is concave and hairy, and the hairs on this part do not stand singly, but are placed in little tufts, wider at the extremity than at their origin, and exactly resembling the tufts of hair in our clothes-brushes. *Reaumur*, Hist. Inf. vol. 9. p. 369.

The several authors who have treated ever so largely on the arts and industry of bees, and described the manner of forming their waxen structures or combs for the reception of their honey, have yet omitted to clear up the material point of what that *Wax* is, what it is originally composed of, and by what artifice the bee works it out of its rough state, in the plant in which it is found, into the substance which we call *Wax*.

It is very certain that the farina fœcundans of the flowers of plants, contained in their apices, is the matter of which the bees form their *Wax*; they either dislodge this from its cells with their teeth, or else merely by rubbing their bodies among the stamina and apices, load themselves with the globules of it, which their hairs keep sticking upon their body, and which they afterwards brush off with their legs, and, by degrees, collect into balls or lumps, which they deposit upon the flat and triangular piece, which makes the third joint of the hinder pair of their legs.

The lumps of *Wax* with which we see them loaded in this part, and carrying to their hives, is only the farina of flowers worked up and compressed into a mass or sort of cake. The stamina of the flowers therefore sustain certain cases, containing a powder, which is the matter of bees *Wax*. This powder, thus collected into lumps on the legs of the bees, is called rough *Wax*, and is probably *Wax* to all intents and purposes, only wanting a little beating together. *Wax*, therefore, so long esteemed an animal substance, will appear to be a native vegetable production. We know very well, that different species of trees yield us the several gums and resins used in medicine and mechanics, in the same perfect form in which we see and use them; and there is a species of shrub, very well known in America, and called the *candle-berry-tree*, the berries of which yield a *Wax* perfect in all respects, and fit for the making candles, &c. without having passed through the manufacture of the bee at all.

In the same manner it seems that all our common plants produce *Wax* in their flowers, but that this is in such very small quantities, that these little animals alone are able to collect and work it into a state fit for our use: but this does not absolutely hold good; for if we examine what we call rough *Wax*, that is, the balls of *waxey* matter on the legs of the bees, we shall find that it is not yet bees *Wax*. It is an easy matter to catch a few bees as they return in a morning loaded to the hive, and on separating the *waxey* matter from their legs, and pressing it between the thumb and a finger, it will be found to differ greatly from perfect *Wax*. This would, in a like case, soften of itself, and form a regular and uniform flat cake; whereas, on the contrary, the matter from the bees legs is friable, not ductile, will not soften itself between the fingers; and when pressed a little to a flatness, it is seen to be still composed of regular globules, which all retain their pristine form, not mixing or blending among one another, and hanging together only by means of some humidity which hangs about their surfaces. If it be tried by a greater warmth, it will be found in the same manner to differ from *Wax*, in the want of some of its essential qualities. If a piece of it be put into a silver spoon, and held over lighted charcoal, it will not melt as *Wax* would do, but will take fire and burn regularly into a cinder: and finally, if it be carefully worked into a long thread, and the end of it put to the flame of a candle, it will take fire as readily as *Wax* would do, but it will not run or melt like it, but burn like a piece of dry wood. Water also gives as evident a proof of the difference between the rough *Wax* and the perfect, as fire. If a piece of this rough *Wax*, as taken from the legs of the bee, be thrown into water, it sinks to the bottom; whereas perfect *Wax* will always swim upon the top: This might seem owing to the great humidity of the rough *Wax*, while loaded with the juices of the plant; but it is proved by experiment that this is not the case; for if the rough *Wax* be kept till ever so perfectly dry, it still preserves its own nature, and will sink in water as readily as at first. *Reaumur*'s Hist. Inf. vol. 10. p. 39.

From the whole then it is evident, that the bee does something to the matter of which *Wax* is made, in order to the reducing it into perfect *Wax*. It might be supposed that the several globules of this matter were so many sacks containing the true *Wax*; and that the bee need only break or open those sacks, to get at the true and genuine *Wax* within; but this does not appear to be the case upon experiment, since if this matter be ever so nicely and carefully pounded and broke to pieces, it does not become any more *Wax* for this treatment, nor is any more fusible or ductile than before. The opinion of Swammerdam and Maraldi was, that the bee added some other matter to the rough *Wax*, in order to reduce it to this proper state. And as there is no substance so ready for the bee as honey, they supposed that she mixed honey with this matter, and so made *Wax* of the compound; but experiment is also wholly against this, since if honey, and this matter collected from the bees, be mixed in any proportions, the compound has no more the properties of *Wax* than it had before, but still remains a quite different substance. Swammerdam afterwards fell into another opinion, in regard to the matter mixed with the rough *Wax*, in order to render it perfect; this was, that the bee mixed with it the venomous liquor, of which she has a bag full near the tail, in order to poison the wounds made by her sting. He made some experiments on this plan, which he thought favoured his system, and endeavours to strengthen the probability, by observing, that as the sting of a bee comes but very little into use, it would not have been necessary that the creature should have been thus constantly supplied with a large bag of this matter, if nature had not allotted to it some other use beside that regarding the sting. This opinion prevailed among the learned, till Mr. Reaumur of late proved by experiments, that this liquor had no effect on the matter found on the thighs of the bee, as to the turning it into *Wax*; and also, that several creatures which make no true genuine *Wax*, such as the humble bee, the wasp, and the hornet, whose combs are made of a sort of paper, yet have all this bag of liquor near their sting.

It is most probable, that the method in which the bees turn the farina of flowers into *Wax*, is a very simple one; and most likely it consists only in a sort of beating the quantities of them, which they collect, till they are very thoroughly united. We have never been able yet to discover their manner of doing it; but this appears most like the course of nature, in the operations of other insects; if this be the case, it would be possible, perhaps, for us to imitate their method, and procure for ourselves *Wax* out of the stamina of flowers; this would be a discovery of the utmost importance: For though at present the bees which work it for us cost us nothing in keeping, yet it is to be observed, that they are too few in number to collect so much as we might wish. Doubtless it is not one thousandth part of the waxey matter, produced only by a few plants, that the bees of a whole province collect, while the rest all falls to the ground, and is lost. If we could arrive at the way of converting the farina of flowers into *Wax*, without the assistance of the bee, we might have it in infinitely larger quantities; since children might be taught to beat off, or shake down, the farina from numbers of plants, which, when in full flower, would yield a much greater quantity than could be expected by those who are not conversant in these studies.

The

The probability of ſucceſs in an attempt of this kind, has engaged the French naturaliſts in the following trials.

Mr. Geoffroy, in his account of the farina of plants, obſerves, that they preſerve their figure a long time when immerſed in ſeveral liquors, but that they impart a tincture to thoſe liquors. This induced Mr. Reaumur, to try the experiment of what different fluids were able to extract from them. For this purpoſe he collected a conſiderable quantity of the rough matter from the legs of the bees of one of his hives, and dividing it into three parts, he poured upon one ſome common water, upon the other ſpirit of wine, and upon the third oil of turpentine.

When theſe had all ſtood three months, often renewing the liquors, he evaporated the water, which was coloured of a deep and duſky brown, to a perfect dryneſs. When this was done, there remained at the bottom of the ſpoon in which the evaporation was made, a ſmall quantity of a perfect gum, which had all the properties of the common vegetable gums, and was as eaſily ſoluble in water as any other of them.

The impregnated ſpirit of turpentine was next evaporated; but the reſiduum was not great in quantity, and was in ſo much owing to the liquor itſelf, that little could be judged from it. In trials made after this, by boiling the rough *Wax* in freſh oil of turpentine, this appeared to be but a very poor menſtruum for it, the *Wax* rather hardening than ſoftening in it.

The ſpirit of wine impregnated with the tincture of the farina was next evaporated; as the liquor grew thick toward the end of the evaporation, it ſent out a ſtrong ſmell of *Wax*, and, when wholly evaporated, it left on the ſpoon a cake of yelloviſh matter, having perfectly the ſmell and external appearance of *Wax*. We may learn from this, that the ſubſtance of *Wax* is in the farina of flowers, and that this menſtruum is capable of extracting its finer parts. The quantity of extract remaining from this operation was a ſcruple. This carried all the external appearances of *Wax*, and ſome of its properties. It was of the ſame colour and conſiſtence with the common yellow *Wax*; its ſmell was wholly the ſame, and it would fuſe or run into a liquid matter at the fire, and might be moulded between the fingers, being as ductile as common *Wax*.

With all theſe properties there was great reaſon to ſuppoſe it to be perfect *Wax*; but this appeared not to be the caſe when it was held a little time in the mouth, for it there broke to pieces, and diſſolved in the manner of the common lozenges, which have ſugar for their baſis. The evident reſult of this experiment was, that the matter of *Wax* was contained in this ſubſtance, collected on the legs of the bees, and owing its origin to the farina of flowers; but that it was as yet mixed with ſome other ſubſtance, and the ſpirit of wine had extracted them both together.

The moſt likely extraneous matter to be mixed with the *waxey* ſubſtance, was ſome ſalt; this was eaſily proved to be the caſe by another operation; for if this reſiduum was dried to a perfect hardneſs over the fire, it would become ſo moiſt again, on being expoſed to the air, that in an hour's time the fingers would ſtick to it; this imbibing humidity from the air is ſo known a property of ſalts, and ſo uncommon in other things, that there is little room to doubt but that this was the caſe in this reſiduum.

It is evident, however, from this experiment, that a part, at leaſt, of the matter of which *Wax* is made, is contained in the ſtamineous powder, or farina of plants, and that the ſpirit of wine extracts this, and with it ſome portion of heterogene matters. It is probable, that if we knew the proper diſſolvent of *Wax* in its perfect ſtate, which is a thing not yet known, we ſhould be able, by means of that, to extract the *Wax* pure and alone, either from the ſtamina of flowers, or from the matter lodged on the legs of the bees; but that till we are acquainted with ſuch a diſſolvent, we are not to wonder that we cannot extract pure and perfect *Wax*, either from the farina in its natural ſtate on the plant, or when lodged on the legs of the bee.

Laſtly, ſpirit of wine digeſted upon real *Wax*, and the tincture evaporated, does not diſſolve the whole ſubſtance of the *Wax*, but the reſiduum of the evaporation is the ſame with that from the farina itſelf; a ſubſtance of the conſiſtence of butter, of a yellow colour, having the ſmell of *Wax*, and ſome of its properties, but being ſoluble in water. *Reaumur*, Hiſt. Inſ. vol. 10. p. 48.

The ſalt which is extracted from perfect *Wax*, as well as from the farina of plants, by digeſtion in ſpirits of wine, is of the nature of ſugar or honey, being the eſſential ſalt of ſome peculiar juices of the plant. This is contained in much larger quantity in the virgin *Wax*, of which the firſt combs of bees are made, than in ſuch common *Wax* as has been melted and run into cakes; this is proved by extracting a tincture from ſuch virgin *Wax*, which always has a plainly ſaccharine or honey-like taſte.

The difficulty in the way of the making *Wax* from the ſubſtance from which the bees make it, is the poſſibility of its being converted into *Wax* within the body of the animal: If this is the caſe, notwithſtanding that we perfectly know the matter of which *Wax* is made, we are not to wonder that we are not able to make it, any more than that we are not able to make chyle or blood out of the ſeveral ſubſtances uſed by us as food, and out of which we well know that it is made within our bodies.

Crude or rough WAX, called by the French *cire brute*, in natural hiſtory, a name given to a ſubſtance called by the antients *erithace*, *ſandarac*, and *ambroſia*.

We ſeem to have no name for it in Engliſh, but may call it after the name of the French, *rough-Wax*.

The Dutch call it the food of the bees, and that perhaps very properly, there appearing many reaſons to think that the bees eat it.

It is the yellow ſubſtance found on the hinder legs of bees in ſmall lumps, and is the ſubſtance of which *Wax* is made by this inſect. See the article WAX, *ſupra*.

Manner of collecting the crude WAX. If we examine a bee juſt entering a flower, which is well opened, and in its perfect ſtate, we ſhall uſually ſee her body very clean and neat; but if we examine her when ſhe comes out, ſhe is uſually found covered over with a fine duſt: It is very eaſy to determine that the creature has got this duſt from ſome part of the flower; and obſervations equally eaſy will alſo prove, that this powder is the matter of which the bee makes its *Wax*.

People who have not examined flowers as botaniſts have, yet often obſerve, that in a tulip or a lilly there are certain filaments which duſt over the fingers in touching them. Theſe filaments are by authors called the ſtamina or threads of flowers, and they always contain a large quantity of this duſt. Tournefort, and many other great writers, have ſuppoſed this duſt to be only a ſort of excrement ſecreted from the abundant juices of the plant by theſe filaments, which they have ſuppoſed to be organs deſtined only for that purpoſe; but later obſervers have allotted a more noble uſe to this duſt; they have called it the *farina fæcundans*, and have proved that all the fæcundity of plants is owing to it, the ſeeds never growing if they are not properly impregnated with the particles of this duſt, any more than the eggs of animals will be hatched into young ones, if not impregnated by the male ſemen. This farina is not to be ſuppoſed an irregular duſt, in the manner of our common powders; but the farina of the ſame plant is always compoſed of particles of the ſame ſhape, and that different from the ſhape of the globules of the farina of other plants. *Reaumur*, Hiſt. Inſ. vol. 9. p. 371.

It is of this powder or farina that the bees prepare their *Wax*. When one of theſe inſects goes into a flower, ſhe always ſhakes theſe ſtamina, and diſcharges all their globules or duſt upon her body, while ſhe is ſucking the honey with her trunk. It is on this occaſion that the hairs, with which the bee is covered, are of ſervice to her. Theſe round globules would all roll off from her ſmooth body and legs; but they are entangled in great numbers among this foreſt of branched and foliated hairs, and the creature carries them off for her ſervice. Thus when the bee comes out of a flower, ſhe is always ſeen to be duſted over with a yellow, a red, or a white powder, according to the colour of the farina of that ſpecies of plant. In ſome places the bees return to their hives, at certain ſeaſons, ſo covered with theſe powders, that the owners have thought they were, at certain times of the year, poſſeſſed of yellow or white bees.

Some bees carry their duſt thus on their body to the hive; others take the pains to clean themſelves firſt, by bruſhing their bodies, and collecting the whole together into a body, or ſmall lump: This is done by means of the ſquare bruſhes, which make the fourth pieces of the four hinder legs; theſe are beſet with tufts of hairs, in the manner of a common bruſh uſed for cloaths, and theſe they are able to move to every part of the body. The hairy parts of the anterior pair of legs ſerve to bruſh the head, and parts about it, as clean as the bruſhes on the other legs do the body; and the duſt, which is to them a very precious matter, is by this means collected into two parcels or lumps, one of which they place in the triangular baſket, with which nature has furniſhed them on the third joint of the hinder legs. See the article BEE. *Reaumur*, Hiſt. Inſ. vol. 9. p. 374.

This lump on each leg is formed into a ſort of round figure, and they fix it down in the cavity of this triangular piece, and the ſtrong and large hairs with which all the edges of this piece are furniſhed, very well keep it in till the creature gets to the hive.

The quantity of powder received from a ſingle flower, when thus collected into two lumps, ſeldom forms them ſo large as a ſmall pin's head; but as the creature inceſſantly flies into freſh flowers, the new matter collected from each, and added to the reſt, ſtill increaſes the heap, till, when the bee is ready to return to the hive, each ball often is as large as a pepper-corn, and reſembles it in ſhape, only that it is ſomewhat flatted. Many perſons have obſerved the bees thus buſying themſelves, and forming the powder with which they are covered into balls; but the motion of their limbs, on this occaſion, is ſo ſwift, that we can only ſee the bruſhing, and the effect of it in the balls; but our eye can never trace the manner of the operation. There are ſome circumſtances alſo in which the bee may be ſeen to make an immediate collection of *Wax* from the flowers, to the place on the hinder legs, where it is

received

received in a lump, without ever going on the body at all. This is very happily obſerved in the flowers of the apple and pear-tree in the ſpring-ſeaſon.

It is but of a very late time that men have found out that the little buttons on the ſummits of the filaments of the flowers of plants contained this powder or farina fæcundans; but the bees ſeem to have known it from all time; and before theſe little buttons or caſes of the farina burſt open, is the time when the bee can furniſh herſelf the moſt completely with the farina from them. If the bloſſoms of an apple-tree be obſerved when juſt opened, and the apices or buttons of the ſtamina ripe, but not yet burſt, a bee that comes into ſuch a flower, tries one of theſe apices with her teeth; if ſhe finds it is not ripe, ſhe goes to another; but if it be, ſhe burſts it open with her teeth, and wiping all the duſt clean out of it with her fore-leg on this ſide, ſhe paſſes the powder, thus received, to the ſecond leg, and thence to the third, where it is immediately lodged in a lump in the proper receptacle on the triangular piece, which makes the third joint of that leg. This being at a ſeaſon of the year when the weather is cold, and the bees not very briſk, their operations are ſeen better than at other times; but even here it is but imperfectly that they are traced, the motion of the legs, in delivering the treaſure from one to another, is too quick to be ſeen.

There is, however, another occaſion in which theſe motions are to be ſeen much more diſtinctly than in any other of theſe operations; this is when the bees are employed, as they ſometimes are, in collecting a reddiſh glutinous matter inſtead of *Wax*: This matter is of the conſiſtence of a reſin while ſoft; it is pliable, and ſticks to whatever it touches, ſo that the creature is troubled enough to deliver it from part to part, and the motions by which it performs this are conſequently much ſlower than thoſe by which it manages its *Wax*. The method of this proceſs is thus: the bee bites off a ſmall piece of the reſinous matter from the vegetable, with its teeth; it then holds this piece between the teeth, till it has faſhiond it into a ſmall round globule; as ſoon as this is done, the laſt joint of the anterior leg, which may be called the foot, receives it from the teeth; this foot is compoſed of five joints, and has a power of bending and cloſing in the manner of our fingers; this ſeizes upon the little globule while it is held between the teeth, and with ſome difficulty diſengages it. It then delivers it to the foot of the ſecond leg of the ſame ſide, which ſeizes it, and ſlowly delivers it from its adherences to the foot of the firſt leg; when perfectly freed, this places it on the triangular joint of the third leg, and then beats it down into the cavity by repeated ſtrokes, at once working it into a proper conſiſtence, and driving it into the mould, as the labourers uſe the ſoft clay of which they make bricks. This is doubtleſs the proceſs in the depoſiting and working the common *Wax* into form; but that being a leſs viſcid and tenacious ſubſtance, the whole motion is performed too quick to be obſerved diſtinctly; whereas in this, the tenacity of the ſubſtance making the parts ſtick to it, the motions are ſlower, and conſequently are more eaſily ſeen. *Reaumur*'s Hiſt. Inſ. vol. 9. p. 378.

All the bees do not return loaded in the ſame degree with *Wax* to the hive; ſome perhaps are better workers than others, and probably ſome have the happineſs to meet with flowers that yield more honey than others. When the lump is ſmall, it is contained within the verge of the palette, or flat part of the leg; but when it is larger, it hangs over the ſides, and entangling among the hairs, forces them outward; but theſe hairs are at the ſame time greatly aſſiſtant in retaining it in its place. When the bee meets with a flower whoſe apices are not ſo ripe as to burſt open on the touch, ſhe is obliged to bite every one of them with her teeth, and then collects the matter of the *Wax*, as in the inſtance of the apple-bloſſoms; but when the apices are ſo perfectly ripe as to burſt of themſelves on being touched, ſhe has nothing to do but to introduce herſelf among them, and then ſhaking them thoroughly about, their powder is diſcharged all over her body, and is to be bruſhed off, and collected into lumps by a more tedious proceſs, every particle of it being probably obliged to come into the reach of the feet of the anterior legs, and when worked into lumps in them, to be delivered to the feet of the next pair, and by them depoſited on and preſſed down into the palette or third joint of the laſt pair of legs.

If the bees are obſerved when returning to the hive loaded with their lumps of *Wax* on their thighs, theſe lumps on ſome will be found to be white, on others yellow, on others red, and on ſome greeniſh: This is owing to the different colours of the farina, yielded by the different plants they have been at work upon. The manufacture of the bee in moulding this into a lump, has not yet been able to alter the colour of the farina, nor even its figure; for if the lumps be examined by the microſcope, they will all be found to conſiſt of globules of a rounded or oval figure, or of whatever other ſhape they had when on the plant. The bees returning to their hives after their morning excurſions in the ſpring, are always found to contain in the cells of their palettes large lumps of *Wax*; but thoſe which go out in the heat of the day, return with little or none; the reaſon of this is, that the humidity of the farina, by means of the dew, makes it eaſily formed into a lump or maſs, its particles naturally ſticking together; whereas in the heat of the day this powder is too dry to be formed thus into a compact maſs, and therefore cannot be carried home by the bee. *Reaumur*, Hiſt. Inſ. vol. 9. p. 382.

Chemical Analyſis of WAX. Tho' bees-*Wax* be of ſo firm and ſolid a ſubſtance as we ſee, yet it is very remarkable that it contains no earth, but riſes wholly in the fire in the common way of diſtillation by the retort, without leaving a reſiduum. Another ſingular obſervation in this proceſs, is, that the more fluid matter there comes over into the receiver, the thinner the remaining matter in the retort becomes, not as might naturally be expected the thicker.

When the ſpirit of *Wax* (which is a phlegm with ſome acid particles ſuſpended in it) is all driven over by the fire, the reſiduum is a ſoft fatty ſubſtance, commonly called the butter of *Wax*; and if this butter be rectified, that is, if more acid and more phlegm be driven from it by the force of fire, the reſiduum of this proceſs is yet thinner than before, remaining in form of a clear liquor like oil, It appears therefore, on this analyſis, that *Wax* is compoſed of two parts, an aqueous ſubſtance, with ſome acid particles blended in it, and an oil; theſe two liquors have, by their union, formed this concrete, and acquired a hardneſs; but in the ſeparating them from one another, they become fluid again.

The proportion of the ingredients in this ſubſtance is alſo a very ſingular thing, for all the care in the world cannot ſeparate quite one fourth part of the weight of the *Wax* in form of oil, the remainder then is all phlegm and acid. Mr. Homberg advanced, that oils only became inflammable by means of the acid they contained, and this ſeems a proof of it; but when we conſider that *Wax* all burns away, it is an odd obſervation, though a very certain one, that three fourths of what is burning is water. Mem. Acad. Par. 1708.

To imitate Fruit in WAX. Take the fruit, and bury it half-way in clay; oil its edges, and the extant half of the fruit, then nimbly throw on it tempered alabaſter, or plaſter of Paris, to a conſiderable thickneſs. When this is concreted, it makes the half mould, the ſecond half of which may be obtained in the ſame way. The two parts of the mould being joined together, a little coloured *Wax*, melted, and brought to a due heat, being poured through a hole made in any convenient part of the mould, and preſently ſhook every way therein, will repreſent the original fruit. *Boyle*'s Works abr. vol. 1. p. 136.

WAY (*Cycl.*)—WAY *aftward on*, or *foreward on*, in a ſhip, is the ſame with her run or rake. See the article RAKE and RUN.

WAYED *Horſe*, in the manege, is one that is already backed, ſuppled and broken, and ſhews a diſpoſition to the manege.

WEACHIN, in botany, the name given by the Indians of America to the maiz, or Indian corn, which they cultivated for bread before we knew them.

WEAK (*Cycl.*)—WEAK, or *eaſy branch*, in the manege. See the articles BANQUET and BANQUET-*Line*.

WEALD (*Cycl.*)—WEALD, or WALD, in the beginning of names of places, ſignifies a ſituation near woods; and the woody parts of the counties of Kent and Suſſex are called the *Wealds*, though miſprinted *wildes*, in the ſtatute 14 Car. 2. c. 6.

The word *Weald* in Saxon ſignifying a wood.

WEALREAF, in our old writers, ſignifies the robbing of a dead man in his grave. *Leg. Ethelred.* c. 21. *Blount.*

The word comes from the Saxon *Weal*, ſtrages, and *reaf*, ſpoliatio.

WEASEL, in zoology. See the article MUSTELA.

WEATHER (*Cycl.*)—We have ſeveral ſchemes for keeping journals or diaries of the weather, extant in the Philoſophical Tranſactions, the medical Eſſays of Edinburgh, and in other books. The *Ephemerides Ultrajectinæ* may alſo be conſulted.

The inſtruments requiſite for ſuch a journal, are a barometer, thermometer, hygrometer, anemoſcope, and ombrometer, which ſee in their proper places in the Cyclopædia or Supplement.

WEATHER-*Cord*, is an hygrometer of a very antient invention, and, if properly conſtrued, may be uſed with good ſucceſs, to ſhew the alterations of the atmoſphere, with reſpect to moiſture and drineſs; but as commonly made, [a] it never riſes or falls ſufficiently to point out ſuch changes as the curious would be deſirous to know. But theſe riſings and fallings may be made very ſenſible, by means of a long index, moveable round a center, and pointing to a divided arch. We have a conſtruction and figure of an improved *Weather-cord* in the Philoſophical Tranſactions. N°. 479. p. 170. fig. 5.

WEATHER-*Quoil*, or *Coile*, in the ſea language, is the turning the ſhip's head about, ſo as to lie that way which her ſtern did before, without looſing any ſail, but only by bearing up the helm.

WEAVER's *Alarm*. This contrivance is only a weight faſtened to a packthread, which is placed horizontally, ſo that in a certain time a candle may burn down to it. Then the flame of the candle ſetting fire to the thread, the weight falls, and awakens the ſleeping perſon. See Phil. Tranſ. N°. 477. Sect. 14. where we have a figure to explain the invention, which got its name from being in frequent uſe among the *Weavers*.

WEEDS (*Cycl.*)—This term is uſed by our huſbandmen to expreſs ſuch plants as come up in their lands, and are different from the crop ſown there.

No plants are uſeleſs in themſelves; but in reſpect to the farmer they are both uſeleſs and hurtful, when they come in this manner, and devour the nouriſhment deſtined for the crop of what was ſown.

All *Weeds* are pernicious; but ſome much more ſo than others: Some are very miſchievous, but eaſily killed; ſome leſs hurtful, but more difficultly rooted out; and ſome have both qualities together. The hardeſt to kill are thoſe which grow readily from ſeed, and have roots, every part of which is qualified for the becoming a ſtout plant in a ſmall time; the worſt are couch-graſs, colts-foot, melilot, fern, and ſome others of the like kind.

Some of theſe pernicious plants only affect the crop by ſtarving, and leſſening its increaſe; but there are others which add to this miſchief, that of ſpoiling what they leave; theſe infect the crop with their own nauſeous ſmell, ſuch as melilot, garlic, and ſome others. It is ſuppoſed by ſome, that *Weeds* ſtarve the ſown plants, by taking up the room they ſhould poſſeſs; hut this is an error, and the real way in which they prejudice them, is, the devouring the nouriſhment that they ſhould imbibe.

This is eaſily proved by the following experiment. Let three beds of the ſame ſoil, equal in ſize, and equally prepared, be ſown with the ſame corn; let the firſt of theſe be kept clear from *Weeds*; in the ſecond, let the *Weeds* be ſuffered to grow up among the corn; and in the third, ſtick up a quantity of dead ſticks, greater in bulk than the *Weeds*. It will be found that the produce in the third bed will be equal to that of the firſt, though as much and even more room is taken up by the ſticks, than by the *Weeds* in the ſecond; but the quantity in the ſecond bed will be leſs, in proportion to the *Weeds*, than in any other. The quantity of nouriſhment loſt, is not proportioned to the quantity of the *Weeds* that exhauſt it; for theſe being of different ſpecies, ſome are greatly more miſchievous and devouring than others.

The farmer finds it impoſſible ever wholly to deſtroy the *Weeds* in his lands; and the reaſon ſeems to be, that in many kinds the ſeeds will lie many years in the ground, and ſucceſſively grow, ſome one year, ſome another; ſo that the deſtroying the crop entirely for one year, does not kill them for ſucceeding ones. The ſeed of red poppy will lie twenty years in the ground, in a land all that time occupied by ſaintfoin; and if it be, after that, ploughed for corn, they will all grow, and fill the field.

The ſeeds of theſe plants will never all come up in one year, becauſe they muſt have their exact degrees of depth, moiſture, and covering; the ſeeds which want any of theſe one year, lie to grow up another. The beſt defence the farmer has hitherto found againſt theſe enemies, is to endeavour their deſtruction by a ſummer fallow. This, if the weather be propitious, does make ſome havock among them, but it never deſtroys them entirely. If the ſeeds lie ſo high that the ſummer's heat parches them up, or ſo deep that it cannot reach them, they do not germinate, and are by that means ſaved for another year. And another thing, which ſaves a very great number of them, is their being able to bear the heat and moiſture of a whole year without growing. Wild oats, and many other ſeeds of *Weeds* are of this kind. If you gather theſe when ripe, and ſow them in the moſt careful manner, watering them at times, and taking all the care of them that is neceſſary to the moſt tender plants, they will not grow till the ſpring come twelve-month after they were ſowed, and ſometimes not till the ſpring after that; that is, two years and a half after the time of putting them into the ground. It is plain from this, that no art can deſtroy theſe by fallowing, or other means, in one year.

The common way of *weeding* among the young corn, turns out to very little good; if this is done while the *Weeds* are young, the greateſt part of them are only cut or broken off near the ground; this, inſtead of deſtroying them, gives them new vigour, and they ſhoot up with many heads in the place of one, and draw more nouriſhment than at firſt: if, on the other hand, it is done when they are grown up, the relief comes after the diſeaſe; for by that time they have robbed the corn of all the nouriſhment, or nearly all, they could. Hand-*weeders* alſo frequently do more harm in the corn, by treading it down, than they do good by taking out the *Weeds*. This operation ſometimes coſts the farmer twelve ſhillings an acre, beſide the miſchief done, and yet there remain *Weeds* enough for a crop the next year from ſeeds.

The method of horſe-hoeing is a very excellent way of curing lands of this diſeaſe, ſo long as it is carefully practiſed; one of the greateſt advantages it will bring the farmer, is, that no *Weeds* will grow up but thoſe whoſe ſeeds are brought in the air, and theſe are but very few in compariſon of the other kinds.

WEEDS, in mining, a term uſed by our Engliſh diggers to expreſs any ſort of unprofitable ſubſtance found among the ores of metals. They ſeem to have borrowed the phraſe from the gardeners; and as every thing with them is a *Weed*, except what they have planted, and expect to gather, ſo every thing is a *Weed* with the miners, except the thing they are ſinking for. See the articles DIGGING and MINING.

The principal ſubſtances known in our mines under the names of *Weeds*, are mundic or marcaſite; this is of three ſorts, white, yellow, and green; daze, a kind of glittering talcy ſtone, of the telaugium kind, which endures the fire, and is of various colours and hardneſſes; iron-moulds, or pyritæ; caul, which is browniſh and ſpongy; and gliſter, which is a ſort of talc. Phil. Tranſ. N°. 69.

Hair-WEED. See the article HAIR.

WEEK (*Cycl.*)—WEEK-*Fiſh*, in zoology, a name given by ſome to a very delicate fiſh, caught on the Eaſt Indian ſhores, and called by the Dutch there the *wit viſch*. *Ray*'s Ichthyography, append. p. 6. See the article WIT-*Fiſh*.

WEEVER, in ichthyology, the Engliſh name for the fiſh called by Willughby and other authors, the *draco-marinus*, or ſea-dragon, and the *araneus-marinus*, or ſea-ſpider. Some alſo have called it *trachurus*.

It is properly, according to the Artedian ſyſtem, a ſpecies of the *trachinus*, and is diſtinguiſhed by that author by the name of the *trachinus* without beards, and with the lower jaw longeſt. See the articles DRACO-*Marinus* and TRACHINUS.

It is to be obſerved that Willughby and Geſner have deſcribed what they call two other ſpecies of this fiſh; but theſe are all found, on a cloſe obſervation, to be the ſame fiſh, differing only in reſpect of age and ſize, or other accidental variations, owing to the like natural cauſes.

WEEVIL, in natural hiſtory, the name of a ſmall inſect which does great damage in magazines of corn, by eating into the ſeveral grains, and deſtroying their whole ſubſtance.

This creature is ſomewhat bigger than a large louſe, and is of the ſcarab kind, having two pretty, jointed, tufted horns, and a trunk or piercer, projecting from the forepart of its head: at the end of this trunk, which is very long in proportion to its body, there are a ſort of forceps, or ſharp teeth, with which it gnaws its way into the heart of the grain, either to ſeek its food, or to depoſit its eggs there.

By keeping theſe creatures alive in glaſs tubes, with a few grains of wheat, their copulation and manner of generation have been diſcovered. The female perforates a grain of wheat, and therein depoſits a ſingle egg, or, at the utmoſt, two eggs; and this ſhe does to five or ſix grains every day for ſeveral days together. Theſe eggs, which are not larger than a grain of ſand, in about a week produce as odd a ſort of white maggot, which wriggles its body very much about, but is very little able to move from place to place: this, in about a fortnight, turns to an aurelia, from which is produced the perfect *Weevil*. This deſtructive creature is itſelf very ſubject to be deſtroyed, and when in the egg or aurelia ſtate, is very ſubject to be eaten by mites. *Baker*'s Microſ. p. 221. *Lewenhoeck*.

WEIGHT (*Cycl.*)—In the Philoſophical Tranſactions [a] we have an account of the analogy betwixt Engliſh *Weights* and meaſures by Mr. Barlow. He advances that antiently a cubic foot of water was aſſumed as a general ſtandard for liquids, and weighed 62 pounds and a half. And, in effect, we find [b] the *Weight* of a foot of pump-water to be 62 pounds 8 oz. —[[a] N°. 458. Sect. 1. [b] Phil. Tranſ. N°. 169.]

This cubic foot multiplied by 32, gives two thouſand, the *Weight* of a ton. And hence 8 cubic feet of water made a hogſhead, and four hogſheads a ton, in capacity and denomination, as well as *Weight*.

Dry meaſures were raiſed on the ſame model. A buſhel of wheat, aſſumed as a general ſtandard for all ſorts of grain, alſo weighed 62 pounds and a half. Eight of theſe buſhels made a quarter, and 4 quarters a ton weight. See the article BUSHEL.

Coals were ſold by the chaldron, ſuppoſed to weigh a ton, or 2000 pounds. See the article CHALDRON, *Cycl.*

Hence a ton in *Weight* is the common ſtandard for liquids, wheat, and coals. Had this analogy been kept up, it would have prevented the confuſion now complained of.

It may be reaſonably ſuppoſed that corn and other commodities, both dry and liquid, were firſt ſold by *Weight*, and that meaſures, for convenience, were afterwards introduced, bearing ſome analogy to the weight before uſed.

Mr. Barlow's ſcheme ſhews the reaſon why the word *ton* is applied both to *Weight* and liquid meaſure, *viz.* becauſe the ſame quantity of liquor is a ton both in *Weight* and meaſure. Hence the word *quarter* may alſo be explained. Biſhop Fleetwood [a] gueſſed that it ſignified the fourth part of ſome *Weight*, and not of any meaſure. And it ſeems plainly to ſignify the fourth part of a ton, or 2000 pounds [b].—[[a] Chron. Pret. p. 72. [b] Phil. Tranſ. ibid.]

WEIGHT *of the Human Body*. It is to be obſerved, that the heat and dryneſs of the air both leſſen the *Weight* of the body, and the cold and moiſtneſs of the air both increaſe this *Weight*. See the article MOISTURE *of the Air*.

Much ſleep, much food, and little exerciſe, are the principal things which increaſe the *Weight* of the body, and make animals grow fat. Conſequently, if the weight of the body be too great for good and uninterrupted health, it may be leſſened by diminiſhing ſleep and food, and by increaſing exerciſe.

ciſe. On the contrary, if the *Weight* of the body be too little for good health, it may be increaſed by adding to food and ſleep, and by leſſening exerciſe; and the food muſt be increaſed chiefly by increaſing drink and liquid nouriſhment. For the diſcharges are commonly leſs from drink and liquid nouriſhment, than from dry and ſolid food. Dr. *Bryan Robinſon* of the Food and Diſcharge of Hum. Bod. p. 89, 90.

There is but one *Weight* under which a body can enjoy the beſt and uninterrupted health, and that *Weight* muſt be ſuch, that perſpiration and urine may be nearly equal at all ſeaſons of the year; for by this means the body will be uniformly drained of its moiſture: the inward parts by urine, and the more ſuperficial parts by perſpiration, without any irregular and unnatural diſcharges, and its moving *Weight* will continue nearly the ſame at all ſeaſons of the year. Dr. Bryan Robinſon thinks this *Weight* may be ſettled, by his obſervations in his treatiſe on the food and diſcharges of human bodies.

A quick increaſe of *Weight* in human bodies often produces diſtempers; the beſt way to prevent this increaſe is either by faſting or exerciſe. But amidſt a variety of diſturbing cauſes, nothing ſo effectually prevents ſuch an increaſe of *Weight* as a very exact and regular diet, which may prevent the diſcharges from running into irregularities and diſproportions to one another. See Dr. *Bryan Robinſon* of the Food and Diſcharges of Human Bodies, p. 82. ſeq.

Men and other animals of extraordinary *Weight*, are often recorded in the writings of the learned. We have lately had two inſtances of uncommon bulk and *Weight* in men near Halifax in Yorkſhire. One weighed 35 ſtone and ſome odd pounds, which is about 500 lb. And his brother weighed 34 ſtone odd pounds; between them they make 70 ſtone, or 980 pounds. Phil. Tranſ. N°. 479. p. 102.

Athletic WEIGHT, in the animal œconomy, that *Weight* of the body under which an animal has the greateſt ſtrength and activity. Dr. Robinſon thinks this happens when the *Weight* of the heart, and the proportion of the *Weight* of the heart to the *Weight* of the body, are greateſt. For the ſtrength of an animal is meaſured by the ſtrength of its muſcles, and the ſtrength of the muſcles is meaſured by the ſtrength of the heart. Alſo the activity of an animal is meaſured by the *Weight* of the heart, in proportion to the *Weight* of the body. See Diſſert. on the Food and Diſcharges of Human Bodies. p. 117, 118.

If the *Weight* of the body of an animal be greater than its athletic *Weight*, it may be reduced to that *Weight* by evacuations, dry food, and exerciſe. Theſe leſſen the *Weight* of the body by waſting its fat, and leſſening its liver, and they increaſe the *Weight* of the heart, by increaſing the quantity and motion of the blood; ſo that by leſſening the *Weight* of the body, and by increaſing that of the heart, they will ſoon reduce the animal to its *athletic Weight*. Thus a game cock, in ten days, is reduced to its *athletic Weight*, and prepared for fighting. If the food which, with the evacuations and exerciſe, reduced the cock to his *athletic Weight* in ten days, be continued any longer, the cock will loſe his ſtrength and activity.

It is known by experience, that a cock cannot ſtand above 24 hours at his *athletic Weight*, and that he has even changed for the worſe in 12 hours. When he is at the top of his condition, his head is of a glowing red colour, his neck thick, and his thigh thick and firm; the day after, his complexion is leſs glowing, his neck thinner, and his thigh ſofter; and the third day his thigh will be very ſoft and flaccid. Four game cocks, reduced to their *athletic Weight*, were killed, and found to be very full of blood, with large hearts, large muſcles, and no fat.

It is to be obſerved, that the *athletic Weight* of an animal is a very dangerous *Weight*. Fevers and apoplexies are the diſorders which commonly happen to animals under or near their *athletic Weights*. Hence, horſes fed upon dry food are much more ſubject to fevers and apoplexies, than horſes fed upon graſs. Dr. *Robinſon*, ibid.

WELD, (*Cycl.*) the name by which our farmers commonly call the *luteola*, or dyers weed.

This is a very rich commodity among the dyers, and is the more advantageous to the farmer, as it may be raiſed on very poor land, and at a very ſmall expence. Moderately fertile land does beſt for it; but it will grow upon the moſt barren; and if this be but dry and warm, it will require no tillage. The ſeed may be ſown with barley or oats, and only harrowed in with bruſh or furze, or rolled down with a wooden roller. It is a very ſmall ſeed, and the greateſt difficulty about it is the ſowing it even. It is a ſlow grower; a gallon of ſeed is ſufficient for an acre; and though it makes but little progreſs the firſt ſummer, it begins to grow after the corn is cut, and the next year yields a good crop.

There is a great nicety required in the time for gathering it; for this ſhould be when the ſtalk is full ripe, and the ſeeds not ſo ripe as to fall out; it is to be pulled up by the hand, and made up into little bundles to dry. The ſeed may be either thraſhed out as ſoon as it is houſed, or in the ſpring following; but the plant muſt be carefully kept dry.

The ſeed ſells at about ten ſhillings the buſhel, and the dyers uſe it for deep lemon colour, and bright yellows. It is more cultivated in Kent than in any other part of England, and it there yields the farmer from forty ſhillings to ten pound an acre. *Mortimer*'s Huſbandry, p. 165.

WELL (*Cycl.*)—In Scotland they have a *Well*, which Sibbald has mentioned as foretelling ſtorms. It is a deep and large *Well* near Edinburgh, and from the noiſes heard in it at certain times, is called by the people the *routing Well*. They go to this to liſten after the preſages of weather, and it is ſaid that ſtorms are particularly foretold by it; and that noiſes are not only heard in it before ſtorms happen, but that they are always heard determinately and diſtinctly on that ſide whence the ſtorm will come. *Sibbald*'s Prod. Hiſt. Scot.

In the Philoſophical Tranſactions we have an account of a boiling *Well*. See the article SPRING.

WELLE *Coronde*, *ſandy cinnamon*, a name given by the Ceyloneſe to a ſpecies of cinnamon which feels hard and gritty between the teeth, as if it were full of particles of ſand, tho' in reality there is no ſand among it.

The bark of this tree comes off very eaſily; but it is not ſo fit to roll up into quills as the right cinnamon, for it is more rigid and ſtubborn, and apt to burſt open. It is of a ſharp but bitteriſh taſte. The roots of all the cinnamon-trees yield more or leſs camphor, but this as ſmall a quantity as any of them. Philoſ. Tranſ. N°. 409.

WENDING, at ſea, a term for bringing a ſhip's head about, and ſeems only to be a corruption from *winding*. They ſay, *how wends the ſhip?*

WEPOLON, in zoology, the Ceyloneſe name of an Eaſt Indian ſerpent, of a very long and ſlender body, and in ſome degree reſembling a piece of cane.

WERST, or WURST, a Ruſſian meaſure equal to 3500 Engliſh feet. A degree of a great circle of the earth contains about 104 *Werſts* and a half. Phil. Tranſ. N°. 445. Sect. 7.

WEST-ASHTON *Water* is a chalybeat water, reſembling that of Holt. See Phil. Tranſ. N°. 461. Sect. 20.

WESTERWALD *Earth*, a kind of earth mentioned by Agricola, of a whitiſh yellow colour, of a like nature to the terra Sileſiaca, but preferable to it, as yielding more ſalt. He tells us that it diſſolves ſilver ſo much better than other menſtrua, as to render it potable, and parable into a uſeful medicine in cephalic caſes. *Boyle*'s Works, vol. 1. p. 501.

WESTING, in navigation, the ſame with departure. See the article DEPARTURE, *Cycl.*

WET (*Cycl.*)—WET *Air*. See the article MOISTURE *of the Air*.

WET *Couch*, a term uſed by the maltſters for one of the principal articles of malt-making.

In the making malt, the uſual way is to ſoak the grain in water two or three days, till it becomes plump and ſwelled, and the water is brown; the water is then drained away, and the barley is removed to a floor, where it is thrown into a *wet couch*, that is, an even heap of about two foot thick.

In this heap the barley ſpontaneouſly heats, and begins to grow, ſhooting out firſt the radicle, and, if ſuffered to continue growing, ſoon after the blade; but at the eruption of the radicle, the proceſs is to be ſtopped ſhort, by ſpreading the *wet couch* thin over the floor, and turning it once every four or five hours for two days, laying it thicker each time; after this it is thrown into a large heap, and there ſuffered to grow hot of itſelf, and afterwards ſpread abroad again and cooled, and then thrown upon the kiln to be dried criſp without ſcorching. *Shaw*'s Lectures, p. 186.

WHALE (*Cycl.*)—The *Whale*-fiſhery of the Caroline iſlands is the moſt eaſy and agreeable of that of all other places, and, beſide the great profit, affords a pleaſant ſpectacle to multitudes of people on the ſhores.

There are ten or twelve of theſe iſles diſpoſed in form of a circle, ſo that they make a ſort of port, in which the ſea is perpetually calm and pleaſant.

When a *Whale* appears in this gulf, the people all get into their canoes, and rowing toward the ſea, keep between the creature and its retreat, and drive him forwards towards the iſles at the bottom of the port. They drive him in this manner before them into the ſhallows, where they plunge into the water themſelves, and ſome get ropes and chains about him, while others dart him with their ſpears. Their agility and addreſs is wonderful in this. The creature can never get away when they have once got him faſtened, but is ſoon killed, and got to the ſhore.

The anatomy of the bones of the *Whale* has been ſo little underſtood, that there have been many very great errors in regard to ſuch of them as have been at times found foſſile, or buried in the earth among the teeth of elephants, and the remains of teſtaceous and other animals. The moſt frequent and moſt ridiculous of all the wrong opinions about theſe, is their having originally belonged to creatures of the human ſpecies; yet many, even among the more intelligent part of the world, have taken them for the remains of giants. The vertebræ of a *Whale* have been miſtaken for thoſe of a giant, and a part of its fins for a hand, and ſo of the reſt. While the world, more ready to ſpread the marvel, than to inquire into the truth, have made computations of the height of the man to whom bones of that ſize muſt have belonged, and from their proportion

tion in regard to those of the common human size, have found the giant who possessed them must have been ninety or an hundred foot high; while much less pains in comparative anatomy would have taught them, that they never could have belonged to any human body at all. Mem. Acad. Par. 1727.

Toothed WHALE, *Cetus Dentatus*, a name given to a peculiar kind of *Whale*, called by Johnston, and many other writers, by the too general name of *balæna*.

This is distinguished from the common *Whale* which yields the *Whale*-bone, by having white and strong teeth in the lower jaw, which that fish has not. This is the species of *Whale* from which the sperma ceti was originally taken. It was first of all discovered on the coast of New England, being thrown on the shore there, and sperma ceti formed by the sun and air out of the oil of its head; but it is far from being peculiar to that place; the northern seas afford it, and it is not unfrequently taken on the western coasts of Ireland. One caught there about fifty years since, measured seventy-one foot in length, which is nineteen foot more than the length Clusius allows to this fish.

The sperma ceti originally used in medicine was only a part of the oil or liquid fat of this species of *Whale*. This, in its first confused appearance, as drawn from the animal, appears of a whitish colour like milk, and in this state is put into large vessels, in which a clear yellowish oil separates itself to the bottom; the sperma ceti, as it is called, swims at top in white flakes or scales; these soon after precipitatate themselves to the bottom of the vessel, where they candy together, and form large lumps of sperma ceti; there requires some care and trouble to separate and purify this thoroughly from the stinking oil that is apt to stick to it, but the price of the drug very well allows it.

The fat of the body affords the same substance, but it is obtained in larger quantities from that about the head. Several hundred weight of this may be got from one *Whale*: But our common practice at present is to make it from the lees and settlements of common train oil. Philos. Trans. N°. 227. p. 508.

WHAME; in natural history, the name given by the people of some parts of England to the burrel-fly or wringle-tail, a species of bee-fly very troublesome to horses. See the article WRINGLE-*Tail*.

WHEAT (*Cycl.*)—It has been very justly observed by the antients, as well as moderns, that *Wheat* will grow in almost any part of the world, and that, as it is the plant most necessary to mankind, so it is the most general and the most fruitful. It grows well not only in the temperate climates, but in the very hot and very cold ones; and when sown in places where it never grew spontaneously, succeeds as well as where it has been always common.

The success of our crops of *Wheat* in America plainly prove this: And in Peru and Chili in particular, where those countries were very well inhabited, it never was known till the Europeans brought it in, it produces as large crops as in any part of England. *Deslandes*, Trait. Phys.

When *Wheat* is planted early, less seed is required to an acre than when it is planted late, because less of it will die; and poor land should always be allowed more seed than rich, because a greater number of the plants will perish on this land than on the other. The least quantity of all of seed is necessary for rich land, that is planted early, for in this case very few of the seeds will fail to produce a plant that will live and flourish. The use of the hoe causes every plant to send out a great number of stalks from the same root, and in these, more than in the number of plants, consists the richness of a crop, as the ears on these are always largest and fullest.

Another thing to be considered, in order to find the proper quantity of seed to plant, is, that some *Wheat* of the same species has its grains twice as large as others: in this case a bushel, containing but half the number of grains that it does in the small-grained *Wheat*, one bushel of the small-grained will plant just as much as two bushels of this; not the measure of the seeds, but the number of the grains being the thing to be considered in regard to the sowing. *Tull*'s Horsehoeing Husbandry.

It is a very natural thing to suppose that a large-grained *Wheat* will produce larger and finer plants, and larger grain than a small-grained one; but experiments have proved, that there is nothing in this; for the smallest-grained *Wheat* produces fully as large plants as the largest, and those with as great ears, and as big seeds; but the young plants appear smaller and poorer.

Six gallons of middle-sized seed is the usual quantity drilled upon an acre; but on rich lands, planted early, four gallons will suffice; because then the *Wheat* will have roots at the top of the ground before winter, and tiller very much, without danger of the worms, and many other accidents, which the late planted *Wheat* is liable to.

If it be drilled too thin, it will be in danger of falling, and if too thick, it may happen to tiller so late in the spring, that some of the ears may be blighted; a medium therefore is best.

The depth to plant it at is from half an inch to three inches; for if planted too deep, there is more danger of its being eaten off by worms between the grain and the blade. A *Wheat*-plant that was not sown early, sends out no root above the grain, before the spring, and is nourished all the winter by a single thread, proceeding from the grain up to the surface of the ground: this is the thread of life to the plant during the winter, and the longer that is, the greater danger there is of the worm, that creature much more easily finding a thread that extends by its length to five or six inches deep, than one which reaches but one inch; beside, the worms in winter do not inhabit very near the surface of the ground, and therefore they never naturally come in the way of the short threads, though the long ones are always in their reach.

It is very necessary to take care against the rooks, just at the time when the *Wheat* is shooting up. These mischievous birds perceive it beginning to sprout, before the farmer can see any thing of it, and are led by the shoot to pick it up; they must be carefully kept off the ground for a week or ten days at this season; for at the end of that time the blade will be grown up, and the grain so exhausted of its flour, that it will be of no value to them, nor will they give themselves any trouble about stealing it.

The rooks never molest such *Wheat* as is sown about Michaelmas time; for at this season there is so much grain of the late harvest scattered about the fields where it has grown, that they find it much more worth their while to pick it up there, than to search under ground for it in the sown crops, which therefore escape till too far grown for this animal. *Tull*'s Horsehoeing Husbandry.

Many experiments have been tried to the great purpose of multiplying grain, some of which are commemorated, with an account of their different success, in the Philosophical Transactions. Digby mentions a plant of barley, all rising from one corn, which, by steeping in water in which was a small quantity of salt-petre, and afterwards being watered every day with the same water, brought forth two hundred and forty-six stalks, and above eighteen thousand grains: And the last edition of Cambden mentions a thing very observable of this kind, though from another cause; which is, that the corn sown in a field in Cornwall, where a battle had a little time before been fought in the civil wars, brought forth four or five ears upon every stalk.

Mr. de da Primce has fairly tried the common and many other methods, which though they have not had such immense products for their success as these related above, yet may set the world right as to what they have to expect from the different ingredients generally used, and which of them promise most fairly for success.

The experiments are these: On the 22d of March there were laid to steep a pea, a barley-corn, a *Wheat*-corn, and an oat-corn, in brimstone-water. These were also steeped in alum-water, in a solution of salt of tartar, in the solution of the caput mortuum of sal armoniac, in common urine, in a solution of the common nitrum murale or salt of old walls, in a solution of salt-petre in water; and, finally, in the nostoc or star-jelly.

When these had all stood steeping in this manner in their several liquors five days and five nights, they were set in a good soil, in a garden, under a wall, directly facing the sun. They were set in the morning after a rainy night, and there were set with them a pea, a *Wheat*-corn, a barley-corn, and an oat-corn, unsteeped, and in the common way. This was on the twenty-seventh of March, and on the tenth of April following, some of them were come up, others did not appear. Those which had been steeped in the brimstone-water, all came up together. Of those steeped in alum-water, the three grains were sprouted; but the pea, though very much swelled, had made no attempt to shoot. Of those made in the solution of salt of tartar, the barley and oat were above-ground, and the pea had sprouted a little, and the barley scarce at all. Those steeped in the solution of the caput mortuum of sal armoniac, in urine, as also those in the solution of the salt of walls, were all come up. Of those steeped in the solution of salt-petre, the oat and barley were quite up, the others had sprouted a little. Those which were steeped in the nostoc or star-jelly, were none of them come up, and scarce had made any attempt to sprout. The barley and oat steeped in urine had just come up; but the *Wheat* and pea had scarce so much as sprouted; and finally, those which had not been steeped at all, were all come up as soon, and appeared as vigorous as these, except the *Wheat*, which appeared a little less forward than the rest.

All these shoots or young plants were set about a finger deep in the ground, and they had a fine favourable season to grow in.

It appears from the whole, that alum-water is particularly bad for peas, tho' it agrees well enough with *Wheat* and barley, and with oats. That salt of tartar does very well with oats and barley, but is hurtful to peas, and to *Wheat*. That salt-petre does not appear to have that virtue which has been so long given it, of promoting the growth of plants; and in fine, that all these steepings did no visible service to the grain; but that many of them evidently hurt the several kinds.

All these young plants were digged up, except three of the shoots of barley; and these increased so very much, on stand-

ing in a good ſoil and aſpect, and at the diſtance of two foot aſunder, that they had ſixty, ſixty-four, and ſixty-ſeven ſtalks, from their ſingle grain and root. Each of theſe ſtalks had an ear, and, one with another, there were about forty corns in each ear. New ſhoots were continually iſſuing from the roots; and as the Eaſt Indian trees afford leaves, bloſſoms, and ripe fruit at the ſame time, ſo if the ſun's heat had continued, there would have been young ſhoots, young ears, and ripe ears on the ſame plant, at the ſame time, all the year round.

It ſeems very plain, from the whole of theſe experiments, that the multiplying of *Wheat* and other grain is rather to be expected from the ſowing it on a good ſoil, and at a proper diſtance, than from any of theſe liquors contrived to ſteep the ſeed-grain in. As moſt of the liquors contrived for this purpoſe are, however, harmleſs, it will be worth the farmers while to try them at times, and in a regular manner, ſowing the different parts of the ſame field with ſteeped and unſteeped grain, in the ſame proportion.

The experiment of the ſteeping the grain in the offals of animal ſubſtances, carries with it evident ſucceſs; but we are to remember, that only a third part of the quantity of ſeed is to be uſed to the ſame quantity of ground in that method, as is in the common way; and it is more than poſſible that the increaſe which attends this method, may be owing to this diſtance of the plants, rather than to the good done by the water. Philoſ. Tranſ. N°. 281. p. 1212.

It is evident from experience, that the multiplication of *Wheat*, that is, the quantity of *Wheat* produced from every grain, is very different in different places, and according to various accidents. It has been often attempted to arrive at the art of cauſing every grain of *Wheat* to yield its utmoſt poſſible increaſe; and if this could be brought about on eaſy terms in the large way, ſo as to affect whole fields, it is evident that the advantage would be very conſiderable. This has been attempted by Vallemont in ſeveral different ways, but with moſt ſucceſs in theſe following: Let there be collected together as large a quantity as may be of the bones, ſkins, feathers, and other parts of animals, which are thrown away as refuſe, together with the refuſe of foods and wearing apparel, ſuch as old ſhoes, gloves, or whatever elſe of this kind comes in the way, though horns and hoofs of all animals are excellent; and, in ſhort, let every thing be collected that abounds with ſalts: when a large parcel of theſe things is got together, let them be ſeparated into two or three heaps, according to their different natures; the hardeſt kinds into one heap, the ſofteſt into another, and ſo on. Let each of theſe parcels be put into a large wooden veſſel, and a ſufficient quantity of rain or river-water be poured on them, that they may ſwim at liberty in it. When the water has ſtood ſo long, that it ſtinks very much; ſtrain it off, and keep it in veſſels for uſe. The ſofteſt bodies will give the water this ſtink in five days; the moderately hard ones in ſeven days; and the hardeſt of all in nine days. Theſe laſt are to be broken to pieces before they are put into the water. The liquor prepared from theſe is called the *prepared water*.

Let a quantity of plants of any kind, no matter what, be burnt with their flowers and ſeeds, and let a lixivial ſalt be made from the aſhes in the common way. Then take as many pounds of ſalt-petre as there are acres of land to be employed, and let each pound be diſſolved in twelve quarts of water, and to this ſolution add a ſmall quantity of the lixivial ſalt of the plant. This liquor the author calls the *univerſal matter of vegetation*. When both the liquors are thus made, mix together an equal quantity of each of them; that is, of the prepared water, and of the univerſal matter; and let the whole quantity be ſo much as will ſerve thoroughly to wet and ſoak the quantity of corn that is to be ſown; this is to be ſo much, that it ſtands two fingers breadth above the grain. When the grain and the liquor are thus mixed, the light grains, which will not grow, will ſwim at the top, and may be ſkimmed off and ſeparated from the reſt. The grain at the bottom of the veſſel is to be ſtirred up and turned every two hours: in this manner, the grain is to be ſoaked twelve hours, and after this the water is to be poured off, and the grain dried, by laying on a ſieve, or thin ſpread on the floor; and after two or three hours it is to be ſown in the common way.

The quantity of ſeed neceſſary for an acre of ground, when thus ſteeped, is only one third of the quantity commonly uſed, and this will produce infinitely more grain, and is as much as the land can bear. The liquor poured off from the ſoaking of this quantity of grain, is not to be thrown away, but muſt be ſaved, for it will ſerve as well for ſeveral more parcels as it did for this.

This was tried in the year 1706, which was the year after the book came out, in ſeveral parts of France, and that with ſo much ſucceſs, that the author got great reputation, and his book was tranſlated into the German, and ſome other languages. Whether the method was found afterwards not to ſucceed ſo well, or whether it was dropped through mere inadvertence, the thing has not been regarded ſince that time; but the proceſs is at once ſo cheap and ſo eaſy, that it ſhould ſeem extremely worth while to bring it into trial again. *Vallemont*. Curioſ. de Vegetat.

There are four ways of augmenting the crops of *Wheat*, not in the number of the plants, but in the ſtalks, ears, and grains.

The firſt is by increaſing the number of ſtalks from one, two, or three, to thirty or forty in each plant, in ordinary field land; and the crop is augmented by bringing up all theſe ſtalks into ear, which is the ſecond way; for if it be diligently obſerved, it will be found that not one half of the ſtalks of *Wheat* ſown in the common way, ever come to ear at all: Nay, if a ſquare yard of ſown *Wheat* be marked out, and the ſtalks thereon numbered in the ſpring, it will be found that no leſs than nine parts in ten of them are wanting at the harveſt-time.

An experiment of the advantage of this augmentation was made by Mr. Tull in rows of *Wheat* that were equally poor; one of theſe rows was increaſed ſo much, as to produce more grains than ten of the other, by bringing up more of its ſtalks into ears, and alſo by augmenting the ears to a much greater bigneſs, which is the third way; for it is very certain that the ears will be much larger or much ſmaller, according to the quantity of nouriſhment that is given them.

The fourth and laſt way of increaſing the crops of *Wheat*, is by cauſing the grain to be much larger in the ears. This can no way be done ſo effectually as by late hoeing, eſpecially if it be done juſt after the *Wheat* is gone out of the bloſſom; by this means the grains will weigh twice as much as thoſe produced in the ſame ſort of *Wheat*, when this late hoeing has been omitted; their number, at the ſame time, is the ſame in the ear; and as the *Wheat* is ſold not by tale, but by meaſure, the farmers gain is double in this caſe, the *Wheat* meaſuring juſt twice as much as it would otherwiſe have done.

Thus by increaſing the number of the ſtalks, bringing more of them up into the ear, making the ears larger, and the grains larger, plumper, and fuller in every ear; the method of horſe-hoeing, by which alone this can be effected, makes a larger crop out of the tenth part of the number of plants, than in the common way: but all theſe advantages will be loſt by thoſe who, though they give into the horſe-hoeing way, yet will not allow the ſix foot intervals between the rows; for it is owing to this great ſpace of ground alone, that as much nouriſhment may be given to the *Wheat* as the farmer pleaſes.

In the method by theſe wide intervals, we can raiſe a larger crop of *Wheat* with leſs labour, leſs ſeed, no dung, and no fallowing; but not without a competent quantity of earth, which is the cheapeſt thing given to corn. The earth of a whole good acre being but about the tenth part of the expence, and of indifferent land but about a twentieth.

The crop enjoys all the earth, for between the laſt hoeing and the harveſt, there remains nothing but a ſpace of empty mould in the middle of the intervals. Farmers do not grudge the price of three or four pounds in the buying and carriage of dung for an acre; but they think themſelves undone if they afford an extraordinary eighteen-pennyworth of earth to the wide intervals of an acre, not conſidering that earth is at once the beſt and the cheapeſt entertainment that can be given to plants; for at five and ſixpence rent, which is common to ſome land in many parts of the kingdom, the whole earth belonging to each of the rows coſts only ſixpence; that is, a penny for a foot broad and ſix hundred and ſixty foot long, that being the ſixty-ſixth part of an acre. But the vulgar count this expence of a foot breadth of ground not as they ought, only as part of the rent, but as an eleventh part of their own uſual charges added to the rent.

If the intervals are narrower in deep land, there might be earth enough in them; but there would not be room enough to pulverize it.

The horſe-hoe, well applied, ſupplies the uſe of dung and fallow; but it cannot ſupply the uſe of the earth, though it can infinitely increaſe the virtue of it, where there is any reaſonable quantity.

The mean price of *Wheat*, between dear and cheap, is reckoned five ſhillings a buſhel; and therefore an acre of land that ſhould produce every year eight buſhels, without any expence, would be accounted a very profitable one. Now an acre of land drilled with *Wheat*, and horſe-hoed, will produce ſixteen buſhels of *Wheat* eaſily, with the expence only of ten or fifteen ſhillings, and this is a third part more profitable.

It is commonly computed that the farmer cannot live, if the *Wheat* he ſold under five ſhillings a buſhel; he muſt therefore keep his *Wheat* when it is ſold cheaper than that in the markets; and the common method is to keep it in the ſtraw, taking care to keep away the mice. The ſecureſt method of all is to dry the *Wheat* in the grain; but this many are afraid to practiſe.

Some people, who have known this ſecret, have made great profit by buying up the *Wheat*, when under three ſhillings a buſhel in the markets, and then preſerving it in this manner till a dearer time. The method is to dry it in a malt-kiln, but with no other fuel than *Wheat*-ſtraw, never ſuffering it to have any ſtronger heat than that of the ſun. The longeſt time the *Wheat* need lie in this heat, is twelve hours; but ſometimes four hours is ſufficient; according to its dampneſs when bought, and the time it is intended to be kept, it requires a longer or ſhorter drying. The only thing that cauſes

the decay of *Wheat*, and gives way to that devouring animal the weevil in it, is its too great dampneſs; this is carried off in this manner, by a heat no greater than that which the ſun might have given to the grain. The vegetating power therefore is not deſtroyed by this; and the bakers have acknowledged that the flour of this *Wheat* does rather better for the working into bread, than that of freſh *Wheat*.

Though all ſorts of vegetables may have great benefit from the hoe, becauſe it ſupplies them with plenty of food at the time of their greateſt need; yet they do not all equally require hoeing; but the plant that lives longeſt ſhould always have the greateſt ſtock of nouriſhment provided for it, and ſhould therefore be moſt frequently hoed of any plant. *Wheat* generally lives, or ought to live, longer than any other corn; for if it be not ſown before ſpring, its grain will be thin, and will have but little flour in it; and when it is ſown late in the winter, it is in great danger of being killed by the froſts, while weak and tender.

To prevent theſe inconveniencies, *Wheat* is generally ſown in autumn; and by this means, having thrice the time to be maintained that ſpring corn hath, it requires a larger ſupply of nouriſhment, in proportion to that longer time; not that the *Wheat* in its infancy conſumes the ſtock of food that it afterwards does, but becauſe, during that long interval between winter and the ſpring ſeed-times, moſt of the artificial paſture or benefit from former tillage, is loſt both in light and ſtrong lands.

This is the reaſon why all that extraordinary pains in fallowing and dunging of the ſoil is neceſſary for *Wheat*; and yet all this trouble and expence is ſo far loſt, that if a part of the ſame field unfallowed and undunged be ſown in April, after good plowing, it will raiſe as fair a crop in all reſpects as the other, only that the flour will be in leſs quantity, by wanting time in the ground for filling the grains.

Poor light land, in the common way of huſbandry, muſt be extremely well manured, in order to the maintaining *Wheat* a year, which is the uſual time that it is in it; and if it be ſown late, the greater part of it uſually periſhes, not being able to ſurvive the winter while ſo poor, and on ſuch land; and if it be ſown very early on ſtrong land, though rich, well tilled, and dunged, the crop will be worſe than on poor light land ſown early. The new method of horſe hoeing gives both to ſtrong and to light land all the advantages neceſſary, and takes off all the diſadvantages of both. By this method the ſtrong land may be planted with *Wheat* as early as the light, if plowed dry; and the hoe-plough, if rightly applied, will be able to give it nouriſhment equal to that of dung in both ſorts of land.

The tops of the ridges for the drilling of *Wheat* muſt not be left quite ſo narrow and ſharp as they are for drilling of turneps, *Wheat* being generally to be ſowed in treble rows, and the turnep only in ſingle ones. In reaping the *Wheat* thus ſown, it is to be cut as near to the ground as poſſible, and this is eaſier done in this than in *Wheat* ſown in the common way, becauſe in this drilled method the ſtalks all ſtand cloſe together. When the *Wheat* is cut thus low in the reaping, the ſtubble is no great impediment to the preparing the land for the ſucceeding crops.

As ſoon as conveniently may be, after the carrying off a crop of *Wheat*, if the trench in the middle of each wide interval be left deep enough by the laſt hoeing, the farmer is to go as near as he can to the ſtubble with a common plough, and turn two large furrows into the middle of the intervals, which will make a ridge over the place where the trench was; but if the trench be not deep enough, it is beſt to go firſt in the middle of it with one furrow, this, with two more taken from the ridges, will be three furrows in each interval; this plowing is to be continued as long as the dry weather laſts, and then the whole is to be finiſhed by turning the partitions on which the laſt *Wheat* grew up to new ridges, which is uſually done at two great furrows; theſe laſt furrows, which complete the ridges, may be plowed in wet weather. By this ſort of management, the *Wheat* being planted in rows, at ſix foot intervals, the ſame piece of ground will produce every year a new crop of *Wheat* in the intervals, without any fallowing or manure, only by means of the ſufficiently breaking the ſurface with plowing and horſe-hoeing.

It is a general rule, that all ſorts of grain proſper beſt where they are ſown at a time when the ground is ſo dry that it is broken to a ſort of powder by the plough. *Wheat* alone is an exception to this rule; and the reaſon of this is, that as *Wheat* is to endure the ſeverities of a whole winter, after it is ſown, it therefore ſucceeds beſt by being ſown in wetter weather, when the ground is not to be broken ſo very ſmall, and is preſſed down cloſe upon the ſeeds, and covers them better. If *Wheat* were as hardy as rye, and its roots were as hardy and patient of the cold, it might be ſown in as dry a ſeaſon as the rye, and would profit as much by it; but, on the contrary, it requires ſo much covering, that it is a very good practice of ſome farmers to turn on their ſheep over very light land, as ſoon as it is ſown with *Wheat*, in order to tread the ſurface of it hard, and then the cold of winter cannot ſo eaſily kill or penetrate the roots. And as *Wheat* requires to have the earth lie harder on and about it in the winter, ſo it alſo requires more dung, or ſomewhat elſe, to diſſolve the earth about its roots, after the cold weather is paſt, than the rye does, whoſe roots were not ſo confined by the preſſing of the earth about them.

It is another general rule, that all vegetables thrive beſt when ſown on freſh tilled ground, immediately after it is plowed; but *Wheat* is alſo an exception to this rule, for the beſt way for it is to plow the ground when very dry, and then to let it lie even, though it be many weeks till ſome rain come to moiſten it, and then drill the *Wheat*. The harrows and the drill, in this caſe, will move a ſufficient part of the ground, which will ſtick together for the defence of the ſmall roots during the winter, the reſt of the mould lying open, and divided underneath until ſpring, to moiſten them and nouriſh them.

There is a ſort of binding ſand, which requires not only to be plowed dry, but to be ſowed dry alſo, or elſe the *Wheat* will dwindle in the ſpring, and fail of being a good crop. What is meant here by dry plowing, is not, however, that the ground ſhould be ſo dry that the duſt ſhould fly; but it muſt not be ſo wet as to ſtick together in lumps; neither ſhould the ground be drilled when it is as wet as pap: it ſuffices that it is moiſt; only the lighter lands ought to be more moiſt than the ſtrong.

Strong land plowed wet in November, will be harder in the ſpring than if plowed dry in Auguſt, though it would then have three months longer to lie. *Tull*'s Horſe-hoeing Huſbandry.

Buck-WHEAT. This is a plant very advantageous to the farmers of England, who have barren lands in poſſeſſion. It is to be ſown in May. One buſhel of ſeed will ſow an acre, and it will grow on any ſoil. It ripens late in autumn, and, when mowed, it muſt lie upon the ground till the ſtalks, which are naturally hard, grow ſoft; it will not ſhed the ſeed in lying, nor will it get any damage by the rain. It yields a very conſiderable increaſe, and if the land be tolerable, ſometimes no leſs than fifty or ſixty buſhels from an acre.

It is excellent food for hogs, poultry, and other animals. The flour of it is very white, and, mixed with *Wheat*-flour, is uſed for food by the country people in ſome places. The ſtraw is good fodder for cattle, and the grain is good to give to horſes among their oats; but it muſt be broken in a mill, otherwiſe it will paſs through them whole.

Buck-Wheat makes a very good lay for *Wheat* or rye, eſpecially if not mowed, but plowed in; but the beſt way is, juſt before it bloſſoms, to feed it with cattle, eſpecially with milch cows, which it cauſes to yield a great deal of milk, aud that ſuch as yields very good cheeſe and butter. It is food for the cattle in the very dryeſt time, when all the common graſs in paſtures is burnt up; and proves a very great improvement for the land. For this purpoſe they ſow it thicker than for others, ſometimes three or four buſhels on an acre. *Mortimer*'s Huſbandry, p. 137.

White-Cone-WHEAT, a term uſed by our huſbandmen to expreſs a peculiar kind of *Wheat*, which is very ſtrong, and has a large ear.

It is the beſt kind for ſowing in fields ſubject to the blight; for the ſtalks of it being, for the moſt part, ſolid or full of pith like a ruſh, not hollow like thoſe of common *Wheat*; the inſects that cauſe the blight ſiezing on the ſtalks of other *Wheat*, does this no injury, even though they ſhould attack it; the ſtalks of this kind being often found full of the black ſpecks, which are always the marks of that inſect having been there, and yet the ear full, and the grain good.

This *Wheat* makes very good bread, if the miller does not grind it too ſmall, or the baker make his dough too hard, it requiring to be ſomewhat larger than other *Wheat*-flour, and ſomewhat ſofter in the dough. A buſhel of *white-cone-Wheat* will make conſiderably more bread than a buſhel of Lammas *Wheat*; but it gives it a ſomewhat yelloviſh caſt. *Tull*'s Horſe-hoeing Huſhandry.

Smyrna WHEAT, a peculiar kind of *Wheat* that has an extremely large ear, with many leſſer or collateral ears coming all round the bottom of the great one.

As this is the largeſt of all ſorts of *Wheat*, ſo it will diſpenſe with the nouriſhment of a garden, without being overfed, and requires more nouriſhment than common huſbandry in the large way can give it. In the common way its ears grow not much larger than thoſe of our common *Wheat*.

This ſort of *Wheat* ſeems, of all others, the moſt proper for the new method of horſe-hoeing huſbandry, as that method ſeems capable of giving as much nouriſhment as the farmer pleaſes, by often repeating the hoieng. Next to this, the *white-cone-Wheat* is beſt for this ſort of huſbandry; then the grey-cone-*Wheat*..

WHEAT-*Bird*, a name given by the people of Virginia to a ſpecies of bird, which, after the time of the ſowing the *Wheat* in that country, made its appearance annually at the ſeaſon of its beginning to ripen, and was never ſeen there before. See the article *Birds of* PASSAGE.

WHEAT-*Ear*, in zoology, the Engliſh name of the common œnanthe, called alſo the *white-tail*, and the *fallow-finch*. See Tab. of Birds, N°. 33.

It is ſomething larger than the common ſparrow; its head and back are of a greyiſh colour, with ſome admixture of red-

redneſs; and the female has ſometimes a conſiderable caſt of green; the rump is white, whence the bird has its name of the *white-tail*; tho' this is ſometimes not the caſe, the rump being of the ſame colour with the reſt of the back. The belly is whitiſh, with a glow of red; the breaſt and throat are redder than the belly: And in the male birds the belly is ſometimes yellowiſh. There is on each ſide of the head a long white line running above the eyes, and under them a ſhorter of black, which laſt is wanting alſo in the female. The wing-feathers are black, except their extremities, which are edged with a reddiſh brown, with a caſt of whitiſh; the tail is very beautifully variegated with black and white. Its beak is black, ſlender, and ſtrait. Its mouth black within, and opening very wide. It feeds on beetles, and other inſects, and builds in the deſerted burrows of rabbits, *&c.* They are extremely plentiful in Suſſex, and ſome other counties of England, after harveſt-time, when they are extremely fat, and very much eſteemed at table. *Ray*'s Ornithol. p. 168.

WHEEL (*Cycl.*)—WHEEL-*Animal*, a name given by the writers on microſcopical diſcoveries, to a ſpecies of minute animalcule, which appears in a ſort of ſheath or caſe, the end of which it faſtens to the roots of water-plants, or whatever elſe is in its way. See Tab. of Microſcopical Objects, Claſs 1.

This little creature has two ſeeming *Wheels*, with a great many teeth or notches coming from its head, and turning round, as it were, upon an axis. This little creature, on the leaſt touch, draws in its *Wheel* into its body, and its body into the ſheath; but as ſoon as all is quiet, it throws them out, and works them again.

In order to find theſe animalcules, chooſe ſuch roots of duck-weed as are long, and proceed from ſtrong old plants, for the young roots ſeldom afford any; they ſhould not be covered with that rough matter which is frequently found about them, nor any way tending to decay, as they will often be.

In the water found remaining in the leaden pipes, or gutters, on the tops of houſes, there are alſo found great numbers of theſe *Wheel-Animals*. Theſe are of a different ſpecies from the former; and when the water dries away they contract their bodies into a globular or oval figure, and are then of a reddiſh colour, and remain mixed with the dirt, growing together into a lump as hard as clay. This, whenever it is put in water, in half an hour's time diſcovers the animals living again, and as briſk as ever; and they have been found to be living in this manner, after the matter had been kept dry twenty months.

It ſhould ſeem from this, that as the water dries up, their pores become ſhut in the manner of thoſe of ſuch animals as remain torpid for the winter; and that when they find water come on again from rain, they then unfold themſelves, and live and feed as long as it laſts. *Baker*'s Microſcope, p. 91.

WHEELER, among brick-makers. See the article BRICK.

WHEEZING, a name given by our farriers to a diſtemperature in horſes, in which they draw their breath with difficulty and noiſe.

The generality of people make this and purſineſs, in horſes, the ſame diſtemper; but the more judicious always diſtinguiſh it, as wholly different from that. Purſineſs proceeds always from a ſtuffing or oppreſſion of the lungs; but this *Wheezing* is only owing to the narrowneſs of the paſſages between the bones and griſtles of the noſe.

The horſes that are moſt of all afflicted with this diſtemper, do not want wind; for notwithſtanding that they *wheeze* exceſſively when they are exerciſed, yet all the time their flanks are not moved, but keep in the ſame condition that they were while the creature ſtood ſtill. The dealers call theſe ſort of horſes *blowers*, and though there is no real harm in the thing, it is a diſagreeable quality, and few people will chooſe them, that have much ſervice for them.

There are ſome horſes that have a natural defect in their breathing, which makes it at all times attended with ſome difficulty, but not with the *Wheezing* before-mentioned; theſe are called thick-winded horſes.

People who are careful in the buying horſes, will purchaſe neither of theſe kinds; but there is this caution to be obſerved in regard to this defect, that it often ſeems to be in horſes where it really is not. When a horſe has been kept a long time in the ſtable without exerciſe, he will at the firſt riding be out of breath, and fetch it in a difficult and painful manner, though he be neither a blower nor thick-winded; but all this will go off with a little exerciſe.

There are ſome temporary *Wheezers* and *blowers* among horſes: theſe at times rattle, and make a great noiſe through their noſes in taking breath; but the complaint goes off and returns. This is only occaſioned by a great quantity of phlegm, for their flanks do not redouble with it at the worſt of times, nor have they any cough with it; ſo that there is no danger of their being purſy.

WHELPS. Nothing is more eſſential to the having a good pack of hounds, than a proper care of the *Whelps*, and of the parents from which they are to be bred.

The bitches, in particular, ſhould be careſully choſen, and ſhould be ſuch as are the ſtrongeſt and beſt proportioned; they muſt alſo have large ribs and flanks.

The beſt ſeaſon for the coupling of hounds is in January, February, or March, for then they will litter in a good time of the year, that is, in ſpring; ſo that they will be fit to enter in due courſe, without loſs of time, or of the ſeaſon; for if bitches litter in winter, it is very difficult to bring up the *Whelps*, the cold killing them if there is not great care taken of them.

The dogs that line the bitches muſt not be above five years old; for if they are older than this, the young ones will be dull and heavy. Care ſhould be taken to have a proper dog ready the firſt time of the bitches going proud; for it is affirmed by many, who ſay they have experience for it, that whatever kind of dog lines a bitch the firſt time, there will be one puppy at leaſt in all her ſucceeding litters that will have ſome reſemblance of him.

The firſt litter of puppies that a bitch brings, are never eſteemed ſo good as the ſecond or third. When a bitch has been lined, and grows big with *Whelps*, ſhe is not to be ſuffered to hunt among the pack, nor to take any other violent exerciſe; for that would endanger her caſting her *Whelps*; ſhe ſhould be kept up, and fed well, and a good place ſhould be provided for her to litter in.

As ſoon as ſhe has littered, thoſe which are intended to be kept ſhould be ſelected out, and the reſt immediately drowned. There is great difficulty in chooſing the beſt at this early time; but the general opinion gives it for thoſe which are the lighteſt, that they will be the ſwifteſt and beſt as they grow up.

Others take all the *Whelps* away, and having determined what number they will keep, they ſettle the choice on thoſe which the bitch carries back firſt to the place where ſhe littered; but all this ſeems very uncertain.

The *Whelps* muſt have good freſh ſtraw to lie in, and it muſt be often changed. They are to be kept in a place where neither the rain nor ſun-ſhine can be troubleſome to them, and once a week it will be proper to anoint them all over with a little nut-oil, with ſome ſaffron infuſed in it. This will prevent the flies from annoying them ſo much as they otherwiſe would, and will kill worms of all kinds. When they are fifteen days old, it is the cuſtom to worm them, and a week after one joint of their ſtern ſhould be twiſted off. As ſoon as they can ſee, they ſhould have milk given them to lap, and at two months old they muſt be weaned, keeping them wholly from the bitch. They muſt at this time be well kept, but not too high fed: And it is proper to put ſome cummin ſeed into their food, to keep the wind out of their bellies.

Many let the *Whelps* of their hounds ſuck three months, and then ſend them away to villages to be bred up till they are ten months old, cautioning thoſe people who have the care of them, not to let them eat carrion, nor frequent warrens.

Rye bread is a very common food for young hounds, and is particularly recommended by many, but wrongly, for it ſoon paſſes through them, and gives them very little nouriſhment. When they are fed conſtantly with this, in the time of their growing up, they always become narrow backed; and this is a great fault in this ſort of dog, a broad back being one of the greateſt recommendations in a hound. *Wheat* bread is greatly preferable on all accounts for the food of the young hound, giving him ſtrength and firmneſs.

At ten months old they are to be taken home, and put into the company of the others, to live as they do: and after a few weeks keeping company with the reſt, they are to be coupled, and to go out to hunt. Five or ſix days practice will, at this time, do a great deal toward the inſtructing them; and, if they are apt to run aſtray, or to open unſeaſonably, they muſt be made to feel the ſmart of the whip: This, and the example of the reſt, will ſoon learn them to run and open in a proper and regular manner.

WHELPS, in a ſhip, the ſeamens term for thoſe brackets which are ſet up on the capſtan, cloſe under the bars; they give the ſweep to it; and are ſo contrived, that the cable, winding about them, may not ſurge ſo much as it might otherwiſe do, if the body of the capſtan were quite round and ſmooth.

WHERN, in natural hiſtory, a name given by ſome of our miners to a kind of ſtone found in ſtrata; but of the hardneſs and fineneſs of flint. It is called alſo *chert* and *nicomia*.

WHEWER, a name uſed in ſome parts of England for the common wigeon. See the article PENELOPE.

WHEY (*Cycl.*)—In many diſorders of the human body, where the ſtomach will not bear milk; or when it is not proper, for other reaſons, *Whey* may be given with great ſucceſs.

We have a diſſertation of Fred. Hoffman on this ſubject. *De ſaluberrima ſeri lactis virtute.* Oper. Tom. 6. p. 9. This author recommends a particular kind of ſerum or *Whey*, made by evaporating milk to a dryneſs, and mixing the reſiduum with water. See the article MILK.

There are various methods of making *Whey* vulgarly known. That with oranges is very agreeable, and much recommended by Dr. Cheyne in his *Nat. Meth. of curing Diſeaſes.*

Alum WHEY, *Serum Aluminoſum*, a *Whey* made with alum. Two drams of alum to one pint of cow's milk boiled. See Lond. Diſp. It is a good aſtringent.

WHINCHAT, in zoology, the Engliſh name of a ſpecies of *œnanthe*, or fallow-finch, called by Aldrovand and ſome other authors, *anthus* and *florus*.

It is of the ſize of the common water-wagtail. Its head, neck and back, are of a reddiſh brown, with regular rows of black ſpots. Each feather has a black ſtreak along its middle, and a browniſh one on each ſide. The belly is whitiſh, with a ſlight tinge of a reddiſh brown. The upper part of the breaſt and the ſides are of a browniſh yellow. Its wing-feathers are brown, with yellowiſh edges. The tail is part black and part white. The beak is ſtrait, ſlender, and black. The male has much of a white variegation on his wings, which the female has not. It lives about ditch banks, and the like places, and feeds on beetles and other inſects.

The colours are very uncertain in this bird, and it often much reſembles the ſtone-chatter; but may always, by an accurate obſerver, be diſtinguiſhed from that bird by the white ſpots in its wings, by the whiteneſs of the under part of its tail, and the white lines on its head. *Ray*'s Ornithol. p. 169.

WHIPLADE, in huſbandry, a term uſed by the farmers in ſome places for a particular ſort of cart, whoſe hinder part is made up of boards, after the manner of a dung-cart, having alſo a head of boards, and ſhambles over the thills; this head being made ſo as either to be taken out or left in. The cart may be indifferently uſed to carry dung or other things; dung when the head is in, and corn, *&c.* when it is taken out. *Plot*'s Oxfordſhire, p. 262.

WHIRL-*Pool* (*Cycl.*)—Theſe in rivers are very common, from various accidents, and are uſually very trivial, and of little conſequence. In the ſea they are more rare, but more dangerous. Sibbald has related the effects of a very remarkable marine *Whirlpool* among the Orcades, which would prove very dangerous to ſtrangers, though it is of no conſequence to the people who are uſed to it. This is not fixed to any particular place, but appears in various parts of the limits of the ſea among thoſe iſlands. Wherever it appears it is very furious, and boats, *&c.* would inevitably be drawn in and periſh with it; but the people who navigate them are prepared for it, and always carry an empty veſſel, a log of wood, or large bundle of ſtraw, or ſome ſuch thing, in the boat with them; as ſoon as they perceive the *Whirlpool*, they toſs this within its vortex, keeping themſelves out; this ſubſtance, whatever it be, is immediately received into the center, and carried under water; and as ſoon as this is done, the ſurface of the place where the *Whirlpool* was, becomes ſmooth, and they row over it with ſafety; and in about an hour they ſee the vortex begin again in ſome other place, uſually at about a mile diſtance from the firſt. *Sibbald*'s Prodr. Hiſt. Scot.

WHISTLE *Fiſh*, a name given by the people of Cornwall to a ſpecies of gadus, with only two fins on the back, otherwiſe called *muſtela fluviatilis*. See the articles GADUS and MUSTELA.

WHITE (*Cycl.*)—WHITE-*Face*, or BLAZE, in the manege, is a *white* mark upon a horſe, deſcending from the forehead almoſt to the noſe. It is called in French *chanfrin blanc*. See the article CHANFRIN.

WHITE-*Foot*, in the manege, called in French *Balzane*, is a *white* mark that happens in the feet of a great many horſes, both before and behind, from the fetlock to the coffin. The horſes thus marked are either tramelled, croſs-tramelled, or *white* all four. Some horſemen place an unlucky fatality in the white of the far foot behind. See the articles CHAUSSE *trop haut*, and TRAMELLED.

WHITE-*Hart-Silver*, in our old cuſtoms, a mulct on certain lands in or near the foreſt of *White-hart*, paid yearly into the exchequer, impoſed by King Hen. 3. upon Thomas de la Linde for killing a beautiful *White-hart*, which the King before had ſpared in hunting. *Cambd. Brit.* 150. *Blount*, *Cowel.*

WHITE-*Horſe-Fiſh*, a common Engliſh name for a thorn-back, called by Willughby the *raia aſpera noſtras*, and ſuppoſed by moſt authors to be the *fullonica* of Rondeletius.

It has a long and pointed noſe, and is covered with prickles upon the back. When it is of a yellowiſh colour, its belly is perfectly white, without ſpot or ſtain, whence it has its name. *Willughby*'s Hiſt. Piſc. p. 78.

WHITE *Land*, in agriculture, a tough clayey ſoil, naturally of a ſomewhat whitiſh hue when dry, eſpecially when it has lain ſome time untilled, but becoming blackiſh after rain; this appears of a light greyiſh colour, when turned up by the plough, and ſlides off from the plough-ſhare with eaſe, and with a ſmooth gloſſy ſurface.

It has often a yellowiſh hue with the grey, and is often veined with large parcels of a blue marly earth. *Moreton*'s North. p. 43.

WHITE *Swelling*. We have ſeveral examples of ſucceſsful cures of *White Swellings* of the joints, or tumors from inſpiſſated lymph, by a ſmall ſtream of warm water falling from a height on them.

When the water is impregnated with penetrating medicines, or natural minerals, its virtues are greater. The application of bladders, containing warm water, to the parts affected, is alſo recommended. See *Le Dran*, Obſ. Chirurg. Tom. 2. Obſ. 93, 94.

WHITE-*Tail*, in zoology, an Engliſh name for the common œnanthe, more frequently called the *fallow-finch*, or wheat-ear. See the article WHEAT-*Ear*.

WHITE-*Throat*, in zoology, the name of a ſmall bird, very common in our gardens and hedges, and ſeeming to have been deſcribed under the name of *ſpipola* by Aldrovandus and ſome others, though moſt approaching to the *ficedula* claſs.

Its beak is black above, and whitiſh below; its feet of a yellowiſh brown; its neck and back are of a browniſh-grey; its head more grey than either, and upper part of the throat *white*, the reſt reddiſh; its breaſt and belly are alſo a little reddiſh; but in the female the breaſt is perfectly white. The edges of the long-wing feathers are ſome whitiſh and others browniſh, and the tail is variegated with black and white, and ſome grey or aſh-colour intermixed. It is extremely common in our gardens and orchards, and feeds on flies, ſpiders, and other inſects. It builds in buſhes, at a ſmall height from the ground, with ſtubble and horſe-hair, and lays five browniſh-green eggs, with black ſpots. *Ray*'s Ornithology, p. 171.

WHITE *upon White*, in the porcelain manufactory, a name given by the Engliſh merchants to a particular China-ware, which is formed of three different *white* ſubſtances, the body being of one, the flowers of another, and the varniſh which covers theſe of a third.

The principal art in the making this ſort of China, is the finding the proper degree of dryneſs in the veſſels for receiving the pencilling or upper coats. It is a fine art, and the principal colour is made of an earth called *hoache*, which is much of the nature of our *ſteatites*. See the articles HOACHE and STEATITES.

WHITES, the popular name of a diſorder incident to women. See the article FLUOR-*Albus*.

WHITENING *of Bones*, for a ſkeleton. See the article BONE.

WHITING, in zoology, the Engliſh name of a common fiſh of the aſellus kind, commonly diſtinguiſhed by the writers in ichthyography by the name of *aſellus mollis*, though by ſome called *aſellus albus* and *merlangus*.

The *Whiting* is diſtinguiſhed from the other ſpecies of the cod kind by theſe characters: It is of a ſmall ſize, ſeldom much exceeding a foot in length, and is thin and ſlender in proportion to its length, particularly about the tail. Its ſcales are very ſmall, and its colour much more pale and whitiſh than in any other fiſh of the cod kind, whence it has its Engliſh name. The belly is white, and the belly-fins behind the tail are ſpotted with ſmall black dots. It has no beard. Its eyes are large, and its upper jaw longer than its under; ſo that its teeth, which are large and crooked, fall over, and are uncovered when the mouth is ſhut; and the inner part of this jaw is armed alſo with very ſmall teeth. Its belly, or rather its breaſt-fins, are nearer the head than in any other ſpecies. It is common in the Engliſh ſeas and elſewhere. *Willughby*'s Hiſt. Piſc. p. 170.

According to the Artedian ſyſtem of ichthyology, the *Whiting* is one of the *gadi*, diſtinguiſhed by that author by the name of the *gadus* with three fins on the back, without beards, with a white body, and with the upper jaw longer than the under. See its deſcription and hiſtory under the article ASELLUS. See alſo the articles GADUS and MERLANGUS.

WHITING-*Pollack*, a fiſh of the cod kind. See the article HUITINGO *Pollachius*.

WHITLOW-*Graſs*, in botany, the Engliſh name of a genus of plants. See the article PARONYCHIA.

WHOLSOME *Ship*, in the ſea language, one that will try, hull, and ride well, without rolling, or labouring in the ſea. A long ſhip that draws much water, may try, hull, and ride well; but if ſhe draws little water, ſhe may try and ride well, but never hull well; and a ſhort ſhip, that draws much water, may hull well, but neither ride nor try well; and ſuch is called an *unwholſome* ſhip.

WICKER *Tree*, a name given by the Engliſh to a tree common in China, and deſcribed by Kircher and others. It is, as it were, a rope twiſted by nature, about an inch thick, and creeps along the earth often for above a hundred paces together, much embarraſſing the way, but ſerving for cables of ſhips, ſeats, hurdles, beds, mats, and various other neceſſary uſes. It endures no vermin, and is much valued for being cool and refreſhing in the hot ſeaſons. *Kircher*'s China illuſt.

WICRANGLE, in zoology, an Engliſh name for the mattageſs, or greater butcher-bird, the *lanius cinereus major* of authors. *Ray*'s Ornithol. p. 53. See the articles LANIUS and MATTAGESS.

WICRANTUM, in natural hiſtory, a name given by the people of the Eaſt-Indies to certain foſſile bodies, of the nature of the pyrites, of the ſize of peas, and formed into variouſly angular figures.

They look black and gloſſy, and much of the nature of blende, or mock lead; but when put into the fire, they ſhew us by their ſmell that they contain ſulphur. They are found in the diamond mines.

The natives firſt powder them; and then mixing them with the juices of certain plants, they dry them, and then calcine them again. Theſe proceſſes they repeat at leaſt ſixty times; but the firſt calcinations are made with a mixture of divers urines, as that of the horſe, the camel, the cow, and the like.

After

After this tedious preparation, they are given in coughs and colds, and are ſaid to be a remedy even in conſumptions.

WIDE-*eared* in the manege, is applied to a horſe, when the root, or lower part of his ear is placed too low, and the ear itſelf is too large. The French uſe the term *Oreillard* for ſuch a horſe.

WIDOW (*Cycl.*)—Mr. Kerſeboom has given us a table, ſhewing how long 432 *Widows* lived, and finds, that, at a medium, each lived fourteen years. Phil. Tranſ. N°. 468. ſect. 3.

Among the antient Greeks, *Widows* had the Care of the eternal fire of *Veſta* committed to them; which charge, among the Romans, could be performed by virgins only, who from their office were called veſtals. *Hofm.* Lex. Univ. in voc. *Vidua*. See the article VESTAL, *Cycl.*

King's WIDOW. See the article DOTE.

WIDURIS, in natural hiſtory, the name of a ſtone found in Java, Malabar, and ſome other places, and deſcribed by Rumphius. Some ſpecies of this are all over of a fine white; others are of a duſky colour, with ſtreaks of white; the ſimply white ones are ſemi-pellucid, and look very like the white of an egg. Some alſo have called this the *Hyalops*, or *Achates vitreæ perſpicuitatis*.

WILD *Oat*. See the article OAT.

WILD-*Gooſe Chace*. See the article CHACE.

WILDERNESS, (*Cycl.*) in gardening. There is nothing ſo great an ornament to a large garden as a *Wilderneſs*, when properly contrived, and judiciouſly planted.

The *Wilderneſs* ſhould always be proportioned to the ſize of the garden, and ſhould never be ſituated too near the houſe; becauſe the trees perſpire ſo large a quantity of watery vapours, as make the air very unwholſome. The *Wilderneſs* ſhould never be ſo placed as to block up a good proſpect; but where the view naturally ends with the verge of the garden, or little more, nothing terminates it ſo well as a fine plantation of trees. The ſize of the trees ſhould be conſidered, and tall growing ones ſhould be planted in larger places; ſmaller, in leſs extenſive; ever-greens alſo ſhould be kept by themſelves, and placed moſt in ſight, not mingled confuſedly among the trees which caſt their leaves. The walks ſhould be large and not numerous; the large walk is beſt made ſerpentine, and this ſhould not be entered upon the grand walks of the garden, but by ſome private walk.

It is too common a method to diſpoſe the trees in *Wilderneſſes* in form of regular ſquares, triangles, *&c.* but this is faulty; for as nature ſhould be ſtudied in theſe works of fancy, the moſt irregular is the moſt pleaſing plantation. The walks for the ſame reaſon are much more pleaſing when they run in wild meanders, than when they interſect one another in ſtudied and regular angles. The winding walks ſhould be made to lead to an open circular piece of graſs, with a ſtatue, an obeliſk, or a fountain; or, if an opening large enough for a banquetting-houſe be contrived in the middle, it will afford a very pleaſing ſcene. The trees ſhould gradually riſe from the ſides of the walks and openings, one above another to the middle of the quarters, where the largeſt trees ſhould ſtand, by which means the heads of all the trees will appear in view, but their ſtems will not appear in ſight.

Not only the growth of trees is to be conſidered in the planting of a *Wilderneſs*, but their nakedneſſes are to be conſidered and hid. The larger growing trees are allowed a proportionable diſtance, and their ſtems hid by honeyſuckles, roſes, ſpireas, and other low flowering ſhrubs. Theſe may alſo be planted next all the walks and openings; and at the foot of theſe, near the walks, may be ſet rows of primroſes, violets, and daffodils, with other the like flowers; behind the firſt rank of lower flowering ſhrubs ſhould be planted thoſe of a ſomewhat higher ſtature, as the *althæa frutices*, the cytiſuſes and gelder-roſes; and behind theſe may be rows of the talleſt flowering ſhrubs, as the lilacs, laburnums, and the like; and behind theſe, the heads only of the lower growing trees will appear, which ſhould be backed gradually with thoſe of higher growth, to the center of the quarter; from whence the heads of the trees ſhoold deſcend every way to the walks, or openings. The grand walks and openings ſhould always be laid with turff, and kept well mowed; but, beſide theſe, there ought to be ſmaller ſerpentine walks through the ſeveral quarters, where perſons may retire for privacy: theſe ſhould be left with the bare earth, only kept clear of weeds, and laid ſmooth.

Theſe walks ſhould be made as winding as poſſible, and a few wood-flowers planted along their ſides will have a very good effect. The ever-greens ſhould be allotted a peculiar part of the *Wilderneſs*, and ſuch as fronts the houſe; and, in the planting theſe, the ſame regard is to be had to their growth, that the talleſt trees be planted hindmoſt, and their ſtems hid by ſhorter ones, and ſo on, down to the verge: as in the firſt row may be planted lauruſtines, boxes, ſpurge laurels, junipers, and ſavins; behind theſe, laurels, hollies, and arbutuſſes; next behind theſe, yews, alaternuſſes, phillereys, cypreſſes, and Virginian cedars; behind theſe, Norway and ſilver firs, and the true pine; and finally, behind theſe, the Scotch pine and pinaſter. Theſe will have a very beautiful appearance, as their tops will only be ſeen, and make a ſheet of green, which may alſo be very beautifully varied, from the artful admixtures of the ſeveral ſhades of green which the various plants have.

In all theſe plantations, the trees, however, ſhould not be ſet in formal ſtiff rows, but in a looſe variety, proportioned to their manner of growth. *Miller*'s Gardener's Dict.

WILDS, a term uſed by our farmers to expreſs that part of a plough by which the whole is drawn forwards.

The *Wilds* are of iron, and are of the form of a gallows, whence they are by ſome called the *Gallows* of the plough, but improperly, the gallows of the plough being properly that part formed by the crow-ſtaves, and the tranſverſe piece into which they are mortiſed at the top.

The *Wilds* conſiſt of two legs, and a tranſverſe top-piece: one of the legs, and the top-piece, are all of one piece of iron, and the other leg, which is looſe, has a hole in the top, into which the end of the tranſverſe piece is received; both theſe legs paſs through the box of the plough, which is that tranſverſe timber through which the ſpindles of the wheels run: theſe legs are pinned in behind the box with iron pins: the holes through the box at which theſe legs paſs, are not made at right angles, but ſlanting upwards, ſo that the fore-part of the *Wilds* is higher than the hinder part; were it not for this, the upper part of the crow-ſtaves would lean quite back when the plough is drawn.

The uſe of the notches in the *Wilds* is to give the plough a broader or narrower furrow; if the links are moved to the notches on the right-hand, it brings the wheels toward the left, which gives a greater furrow; and, on the contrary, a ſmaller furrow is made when the links are moved to the notches on the left. The legs of the *Wilds* ſhould be nineteen inches, and their diſtance eight inches and a half; they muſt be made ſtrong, and the links muſt be placed in different notches, that the front of the plough may be kept ſteady, and the wheels not be drawn one before the other. Theſe links are of iron alſo, and are each ſix inches and a half long, and to theſe are faſtened the chains of the harneſs, by which the whole plough is drawn along. *Tull*'s Huſbandry. See the articles PLOUGH and GALLOWS.

WILLOW, in botany. See the article SALIX.

Our common *Willows*, in the ſpring ſeaſon, when they are in flower, produce a quantity of cottony matter, which might be put to ſome uſe.

The Chineſe are induſtrious enough to collect this cotton as it falls from their *Willows*; and the women and children, among the poorer people, card it, and pick out the ſeeds, and render it fit for many uſes in the place of cotton.

The poor people, in ſome parts of the Indies, make a ſort of liquor of the flowers of the *Willow* before they are opened, which intoxicates them very ſuddenly; and the dry huſks of the ſame tree, remaining after the flowers and ſeeds are fallen, are wholſome as food, people in times of famine having lived upon them, boiled in water.

The ignorance of the Chineſe in natural hiſtory, has occaſioned two very ſtrange ſtories, about the downy or cottony matter of the *Willow*, to be recorded in their books, and firmly believed among them.

The one is, that if this down fall upon the water, it is in one night's time converted into the plant called duck-weed, and if it falls upon any of their fur garments, it becomes a ſort of moth, or worm, that eats them to pieces. The common people are ſo fully perſuaded of this, that they will never let any garment of this kind he expoſed to the air at this time of the year. There is ſome probability, that the down of this tree may contain the eggs of certain inſects, but then it does not change into them; and theſe can only be the eggs of thoſe butterflies which frequent that tree; the conſequence of which muſt be, that they will produce caterpillars whoſe food is the *Willow* leaves, not any other ſubſtance.

The other error may probably be owing to the water-plant uſually making its firſt appearance at the ſame ſeaſon when the *Willows* are in flower, ſo that it ſeems produced of them.

A like error we have among the common people of England, in regard to the yellow *rattle*, or *criſta galli lutea*. This plant appears in our meadows juſt at the time when the cowſlips have done flowering, and is thence vulgarly ſuppoſed to be the ſame plant in a different ſtate, or that the cowſlip at a certain time changes into this plant.

The wood of the *Willow*, though in itſelf very light and ſpongy, is yet of a nature to bear the injuries of wet better than almoſt any other kind. It is uſed by the Chineſe on this occaſion, in the making their wells, and on all other occaſions where wood is to ſtand under water, and ſucceeds perfectly well. Obſerv. ſur les Coutumes de l'Aſie.

WILLOW-*Galls*, in natural hiſtory, the name given by authors to certain protuberances found very frequently on the leaves of the ſeveral ſpecies of *Willow*, which are properly galls, each containing the worm of a fly, and owing its exiſtence to that inſect.

The galls are uſually of a roundiſh or oblong figure, and are equally protuberant on each ſide of the leaf: They are of a pale green at firſt; but they afterwards become yellowiſh, and finally reddiſh. The ſurface of theſe is ſeldom perfectly even, but uſually has ſeveral little prominences and cavities in it. When this gall is opened, there is found in it a worm much reſembling a caterpillar in figure, having a ſmooth annulated

nulated body, and a hard brown head. This, however, is not a caterpillar, the utmoſt number of legs in that genus of animals being found to be ſixteen, and this worm having twenty.

It is one of thoſe creatures which Reaumur, from their reſemblance to the caterpillar kinds, has called falſe or baſtard-caterpillars. This creature, when the gall is young, is blue; it afterwards becomes greeniſh; and finally, when the gall becomes red, it is white. It is in this ſtate that Redi has figured and deſcribed the gall, and he therefore naturally deſcribes the worm as white. This inſect ſeems to eat in its priſon more voraciouſly than any other gall-inſect whatever; for while the gall grows in ſize, it becomes alſo thinner in every part; ſo that the creature, at the proper time, has but little difficulty to get out. *Reaumur*'s Hiſt. Inſect. vol. 6. p. 211.

Theſe galls ſometimes ſtand ſingly on the leaves; but more frequently there are three or four on a leaf; not unfrequently there are great numbers, and particularly on the leaves of the ozier: theſe being very narrow, the galls are beautifully arranged on them, ſtanding uſually in two rows, one on each ſide the middle rib; and theſe ſo cloſely ſet together, that they reſemble the beads of a lady's necklace. The inner ſurface of moſt other galls is ſmooth, and the animal lodged in a poliſhed cavern; but that is not the caſe in theſe galls, the animal eats too faſt to eat with ſo much regularity; and, in fine, before it arrives at its full growth, it uſually eats its way through the ſides of it, and feeds on the ſubſtance of the leaf in other parts, retiring at pleaſure again into its cell. This is a very ſingular thing, no other inſect of this kind being known to do it. Vallinſieri is the perſon who affirms it of this, and ſays, that he has ſeen the fact.

When the time of the laſt change of this inſect draws nigh, it leaves the tree, and deſcending to the earth, makes its way into it in a proper place, and then becomes a nymph, out of which, at a proper time, iſſues a four-winged fly. This is alſo the laſt ſtate of all the baſtard-caterpillars that have yet been traced through their ſeveral changes.

The obſervation of this change, however, is not ſo eaſy as that of ſeveral other ſpecies, ſince the creature does not undergo it in the gall, but under the earth, and there can be no certainty in expecting the inſect out of the ground.

Redi, who was very curious in theſe particulars, could never arrive at the ſight of the winged animal. His method of attempting it was by putting a great number of the galls into boxes, and expecting their changes there; but theſe creatures all died for want of the proper nidus for the chryſalis. Vallinſieri ſucceeded better, by means of putting a large quantity of a moiſt friable earth, of the ſandy kind, into the boxes with the galls. The conſequence of this was, that he ſoon ſaw ſuch of the inſects as were arrived at a ſtate proper for their change, creep out of the galls, and bury themſelves in the earth at the bottom of the boxes. On tracing them farther, he found that each of them ſpun itſelf a caſe of ſilk, like the ſilk-worm's web, under the cover of which it lay in the earth all the winter, and in the ſpring following, about the middle of April, it came up in the form of a ſmall four-winged fly, of no very ſingular beauty. This is alſo obſerved of all the other baſtard-caterpillars, none of them producing flies of any beauty, though ſome of very ſingular figures. *Reaumur*, Hiſt. Inſ. vol. 6. p. 213.

The flies which are thus produced in April, copulate almoſt as ſoon as freed from their exuviæ of the chryſalis ſtate, and the females ſoon after lodge their eggs in the leaves of the *Willows*. This is all done before the end of April, and the young ones hatched of theſe eggs, live but a ſhort time before they paſs into the chryſalis ſtate, and living flies are hatched from theſe in June. It is this brood whoſe young ones paſs their chryſalis ſtate in the earth, and appear not during the whole winter, till the ſpring ſun enlivens them again. There are, beſide theſe, another kind of galls of the *Willow* leaves, which are of the claſs of thoſe, each of which contains ſeveral cells; in each cell of theſe there is found a ſmall white maggot, the offſpring of the egg of a two-winged fly, which, after paſſing the chryſalis ſtate in the earth, alſo comes out in the form of its winged parent. The cells in the galls are different in number in the ſeveral galls, and are from four or five to twenty: They have no communication with one another, but each worm lives in its own cell.

Beſide theſe there is alſo ſometimes found in theſe galls a worm of a browniſh white colour, having two hooks in its head, and no legs at all. This has all the appearance of a carnivorous animal, and probably was depoſited there in the egg-ſtate by its parent, not to feed on the gall, but on its defenceleſs inhabitant. This worm finally becomes a ſmall bluiſh beetle, and is often found alone in the cavity of the gall, often in company with its proper inhabitant, ſucking its juices as it feeds on thoſe of the plant. There ſeem to be ſeveral ſpecies of theſe devourers common to theſe galls; ſince Vallinſieri obſerved, in the boxes where he kept theſe galls to produce the animals from thence, many ſpecies of ſmall beetles, and ſeveral diſtinct kinds of flies, which were probably the laſt ſtate of ſeveral kinds of carnivorous worms, which had preyed upon the proper inhabitant of the galls. *Vallinſieri*, Dialog. des Inſect.

WILLOW *Herb*, in botany, the Engliſh name of the *lyſimachia*. See the article LYSIMACHIA.

WIMBREL, in zoology, the Engliſh name of a bird of the curlew-kind, and known among authors by the name of *arquata minor*, or the leſſer curlew, and called in the Venetian markets *taraniola*.

It is very much of the ſhape of the common curlew, but is not more than half its ſize. Its beak is about three fingers breadth long. Its feet are greeniſh, and its wings ſpotted with large ſemicircular ſpots; and its general colour is a duſky brown.

WINCRANTUM, in natural hiſtory, a name given by the people of the Eaſt Indies to a foſſile ſubſtance reſembling, in ſome degree, the plated lead ores of Europe, but containing very little of that metal; it is properly a ſpecies of blende, or mock lead, of a talcy appearance; it is conſiderably hard, and is uſualy found in other ſtones. It is given in medicine in the Indies as a provocative to venery, being firſt calcined and beat to powder.

WIND (*Cycl.*)—*Wind* has been, by many authors, made the baſis of many different diſeaſes: among others, Dr. Reyn has given it as his opinion, in a treatiſe on the gout, that flatuſes, or *Wind* incloſed between the perioſteum and the bone, are the true cauſe of that diſeaſe; and accordingly, that all the method of cure ought to tend to the expelling that *Wind*. He ſuppoſes this *Wind* to be of a dry, cold, and malignant nature, conveyed by the arteries to the place affected, where forcibly ſeparating that ſenſible membrane the perioſteum, and diſtending it, the pain muſt needs be very great.

He is alſo of opinion, that head-achs, palpitations of the heart, tooth-ach, pleuriſy, convulſions, colics, and many other diſeaſes, are originally owing to the ſame cauſe, and only differ in regard to the place affected, and to the various motions and determinations of the *Wind*. The moveableneſs of the pain in gouty perſons from one part to another, he looks on as a proof of this, and thinks that the curing the gout by burning moxa, or the cotton of the mugwort leaves, upon it, is owing to its giving way to the *Wind* in the part to evaporate itſelf.

That theſe *Winds* are cold, appears from the ſhivering fits which generally precede a paroxyſm of the gout, and the ſhiverings in the beginnings of fevers, and before all fits of agues, are owing to the ſame cauſe, is ſuppoſed by this author a natural concluſion from the former obſervations.

The *Winds*, according to this author and Fienus, are a ſort of halituous ſpirits, raiſed by the improper degree of our native heat, or out of our meat and drink; or, finally, out of an abundance of black choler.

Their differences, he ſays, principally proceed from the various ferments producing in us a variety of humours; which acting upon one another, do in their efferveſcences create *Winds* of various effects, and denominate diſeaſes from the places which are the ſcenes of their action. It is on this account that the acupunctura, or pricking with long needles, among the Chineſe, is of uſe. The Japoneſe, and other neighbouring nations, having no other cure for moſt diſeaſes than the pricking with the needle, and the burning the moxa on the part. *Reyn* de Arthritid.

The huſbandman often ſuffers extremely by high *Winds*, in many different reſpects. Plantations of trees at a ſmall diſtance from the barns and houſes, are the beſt ſafeguard againſt their ſuffering by *Winds*; but they muſt not be planted ſo near as that their fall, if it ſhould happen, would endanger them. Yews grow very ſlowly, otherwiſe they are the beſt of all trees for this defenſive plantation. Trees ſuffer by *Winds*, being either broken or blown down by them; but this may be in a great meaſure prevented by cutting off great part of the heads and branches of them, in places where they ſtand moſt expoſed.

Hops are the moſt ſubject to be injured by *Winds* of any crop; but this may be in a great meaſure prevented by a high pale, or very thick thorn hedge; this will both keep off the ſpring *Wind*, which nips the young buds, and be a great ſafeguard againſt other *Winds* that would tear the plants from their poles. The poles ſhould always be very firm in the ground; and the beſt ſecurity to be added to this, is a row of tall trees all round the ground.

Winds, attended with rain, do vaſt injury to the corn, by laying it flat to the ground. The beſt method of preventing this, is to keep up good incloſures; and if the accident happens, the corn ſhould be cut immediately, for it never grows at all afterwards. It ſhould be left on the ground, in this caſe, ſome time after the cutting, to harden the grain in the ear. *Mortimer*'s Huſbandry, p. 302.

Large WIND, in the ſea-language; to ſail with a *large Wind*, is the ſame as with a *fair Wind*.

Quarter WIND, at ſea. See the article QUARTER.

Tropic WINDS. See the article TROPIC.

Side WIND, at ſea, that which blows on the ſide of the ſhip.

WIND, in the manege. A horſe that carries in the *Wind*, is one that toſſes his noſe as high as his ears, and does not carry handſomely.

The difference between carrying in the *Wind*, and beating upon the hand, is, that a horſe who beats upon the hand, ſhakes his head, and reſiſts the bridle; but he who carries in the *Wind*, puts up his head without ſhaking, and only ſometimes beats upon the hand. The oppoſite to carrying in the *Wind*, is arming and carrying low.

WIND-*Flower*, in botany, the Engliſh name of the *anemone*. See the article ANEMONE.

The proper ſoil and culture of the many varieties of this beautiful flower are theſe: For the ſoil, take a quantity of freſh light ſandy loam, or hazel earth from a common, or dry paſture, not dug above eight or ten inches deep; mix this with a third part its quantity of rotton cow-dung, and lay it up in a heap; turn this over at leaſt once a month, and every time pick out the ſtones, and break the clods. After this mixture has been twelve months made, it will be fit for uſe.

The beds of this earth muſt be prepared in September, and ſhould be made eight inches deep, if it be in a wet ſoil; but if in a dry one, three or four inches will be ſufficient; three weeks after this has been laid in, ſtir it for ſix inches deep with a ſpade, and then with a ſtick draw lines each way of the bed, at four inches diſtance, ſo that the whole may be in ſquares; then make a hole three inches deep in the center of each ſquare, and plant a root in each; and when all are planted, rake the earth of the whole bed ſmooth, ſo as to cover the roots two inches thick. The ſeaſon of planting theſe roots for forward flowers, is the middle of September, and for the later in October: this is beſt done at a time when there are gentle rains. Some roots ſhould alſo be ſaved to be planted after Chriſtmas, for fear of accidents to the former from very hard weather.

Theſe uſually flower three weeks after thoſe planted in autumn. In the beginning of April the early planted roots will begin to flower, and they will keep in flower near a month, if the weather prove favourable, and they are properly ſhaded with matts, laid over hoops in the greateſt heat of the day: the ſecond, and laſt planted ones, will follow theſe; and, in the whole, there will be at leaſt two months fine flowering.

Toward the latter end of May the firſt planted roots will loſe all their leaves, and they muſt be then taken up and waſhed clean, and laid to dry on mats in the ſhade; after which they are to be put up in paper bags, and hung up till the time of planting them comes on again. The later planted ones are to be taken up alſo as ſoon as their leaves are decayed, and not ſuffered to remain to make new ſhoots; for then it is too late to remove them.

They are propagated two ways, either by dividing the roots, or by ſowing. The roots are to be divided as ſoon as they are taken up out of the ground: they will ſucceed if broken into as many parts as there are eyes or buds in them; but they flower moſt ſtrongly, if not parted too ſmall.

The way, by ſowing, is this: Chooſe firſt ſome good kinds of *Anemones*, plant theſe early, and they will produce ripe ſeed three weeks after the flower firſt blows. This muſt be carefully gathered, and in Auguſt it ſhould be ſowed in pots or tubs, or a very well prepared bed of light earth, rubbing it between the hands with a little dry ſand, to prevent ſeveral of the ſeeds from clinging together, and ſpreading them as even as poſſible all over the bed; after this a light hair bruſh ſhould be drawn many times over the ſurface of the bed, to pull aſunder any lumps of ſeed that may yet have fallen together; obſerving not to bruſh off the ſeed, and as much as poſſible not to bruſh it into heaps. When this is done, ſome light earth, about a quarter of an inch deep, ſhould be ſifted over the bed. If the weather be hot, the bed muſt be at times covered with mats laid hollow, and gently watered.

In about two months after ſowing, the plants will appear, if the ſeaſon has been favourable, and they are to be carefully defended from the hard froſts by proper covering, and from the heat of the ſun afterwards by a moveable reed fence. As the ſpring advances, if the weather be dry, they muſt be gently watered, and when their green leaves decay, there muſt be a quarter of an inch more earth ſifted over them, and the like again at Michaelmas; and the bed muſt be kept clear from weeds, and the following ſpring they will flower. *Miller*'s Gardener's Dict.

WIND-*Gall*, a name given by our farriers to a diſtemperature of horſes. In this caſe there are bladders full of a corrupt jelly, which, when let out, is thick, and of the colour of the yolk of an egg.

They vary in ſize, but are more uſually ſmall than large. Their place is about the fetloc-joint, and they grow indifferently on all four legs, and are often ſo painful, eſpecially in the ſummer-ſeaſon, when the weather is hot, and the ground dry and hard, that they make the creature frequently ſtumble, or fall abſolutely down.

The general method of cure is to open the ſwelling about the length of a bean, and to preſs out the jelly: when this is done, they apply a mixture of the oil of bays, and the white of an egg, covering it with tow.

Another method is, after the jelly is all ſqueezed out, to wrap round the part a wet woollen cloath, and then applying a taylor's hot iron, this is to be rubbed over till all the moiſture is carried away; it is then to be daubed all over with pitch, maſtic, and reſin, boiled together, laying tow in plenty over all.

The *Wind-galls* that are ſituated near the ſinews, are much the moſt painful of all, and ſooneſt make the horſe lame.

The general cauſe of *Wind-galls* is ſuppoſed to be extreme work or exerciſe in very hot weather; but it is to be obſerved, that thoſe horſes, which have long joints, will be *Wind-galled* if they work never ſo little. The worſt *Wind-galls* are thoſe of the hinder legs; all the above-mentioned will frequently miſs of ſucceſs in theſe, and nothing but fire will cure them.

WIND-*Hatch*, in mining, a term uſed to expreſs the place at which the ore is taken out of the mines.

The word *hatch* is the general term uſed by the miners to expreſs an opening from the ſurface into the mine, or in the attempting to find a mine.

Thus the word *eſſay-hatches* ſignifies the openings made in ſearch of the trains of ſhoad-ſtones; and the *tin-hatch* in Cornwall is the name of the opening by which they deſcend into a tin-mine.

The word *Wind-hatch* ſeems to be a corruption of *winder-hatch*; for at theſe places they have a *winder* conveying two buckets, the one conſtantly up, the other conſtantly down; the man below fills the bucket that deſcends; and when that which aſcends full is emptied at the mouth of the hatch, the perſon who has the care of that part of the work, delivers it empty to go down again. Phil. Tranſ. N°. 69.

WIND-*Sails*, in a ſhip, are made of the common ſail-cloth, and are uſually between twenty-five and thirty foot long, according to the ſize of the ſhip, and are of the form of a cone ending obtuſely: when they are made uſe of, they are hoiſed by ropes to about two thirds or more of their height, with their baſis diſtended circularly by hoops, and their apex hanging downwards in the hatch-ways of the ſhip; above each of theſe, one of the common ſails is ſo diſpoſed, that the greateſt part of the air, ruſhing againſt it, is directed into the *Wind-ſail*, and conveyed, as through a funnel, into the upper parts of the body of the ſhip. Phil. Tranſ. N°. 463. p. 65.

WIND-*Shock*, a name given by our farmers to a diſtemperature to which fruit-trees, and ſometimes timber-trees, are ſubject.

It is a ſort of bruiſe and ſhiver throughout the whole ſubſtance of the tree; but the bark being often not affected by it, it is not ſeen on the outſide, while the inſide is twiſted round, and greatly injured.

It is by ſome ſuppoſed to be occaſioned by high *Winds*; but others attribute it to lightening. Thoſe trees are moſt uſually affected by it, whoſe boughs grow more out on one ſide than on the other.

The beſt way of preventing this in valuable trees, is to take care, in the plantation, that they are ſheltered well, and to cut them frequently in a regular manner, while young.

The *Winds* not only twiſt trees in this manner; but they often throw them wholly down: in this caſe, the common method is to cut up the tree for firing, or other uſes; but if it be a tree that is worth preſerving, and it be not broken, but only torn up by the roots, it may be proper to raiſe it again by the following method: Let a hole be dug deep enough to receive its roots, in the place where they before were; let the ſtraggling roots be cut off, and ſome of the branches, and part of the head of the tree; then let it be raiſed; and when the torn-up roots are replaced in the earth in their natural ſituation, let them be well covered, and the hole filled up with rammed earth; the tree will, in this caſe, grow as well, and perhaps better, than before. If nature be left to herſelf, and the tree be not very large, the pulling off the roots will raiſe it. *Mortimer*'s Huſbandry, vol. 2. p. 79.

WIND-*Thruſh*, in zoology, a name given by ſome to the redwing, and ſuppoſed to be given from their generally firſt appearing with us in windy ſeaſons; but it appears more probably to be derived from the German name *wint-troſſel*, or vine-thruſh, from its doing great miſchief there in the vineyards, by eating and deſtroying the grapes. *Ray*'s Ornithology, p. 139. See the article RED-*Wing*.

WIND-*Hover*, in zoology, the name of a ſpecies of hawk, called alſo by ſome the *ſtannel*, but more uſually the *keſtrel*, and known among authors by the names of the *tinnunculus* and *cenchris*. *Ray*'s Ornithol. p. 50. See the article TINNUNCULUS.

WIND-*Ward*, (*Cycl.*) in the ſea language, denotes any thing towards that point from whence the wind blows, in reſpect of a ſhip.

WINDAGE *of a Gun* is the difference between the diameter of the bore, and the diameter of the ball.

WINDER-*Meb*, in zoology, the name of a bird of the larus or gull-kind, moderately large, and deſcribed by Aldrovand under the name of *larus major*.

Its head is remarkably large and thick, and is of a mottled colour of white and grey; its breaſt and belly are alſo variegated with the ſame colour, but they are ſomewhat paler. Its beak is thick and ſtrong, of a yellow colour, and very ſharp; and the opening of its mouth very wide. Its wings are variegated with white, grey, and cheſnut-colour; and both theſe

and the tail have much black in them. The feet are webbed and yellow, the claws are ſharp, and the hinder toe larger than in moſt birds of this kind. *Ray*'s Zoology, p. 267.

WINDING-*Tackle*, in a ſhip. See the article TACKLE.

WINDOW (*Cycl.*)—Before glaſs *Windows* came into uſe, the *Window* caſements were commonly made of a tranſparent ſtone called *ſpecularis lapis*, and thence called *ſpecularia*; and before the *ſpecularia*, veils were the only defence they had againſt the weather. *Pitiſc.* Lex. Antiq. in voc. *Specularia*.

WINDY *Tumors*. See the article *Windy* TUMORS.

WINE (*Cycl.*)—The method of converting white *Wines* into red, ſo much practiſed by the modern *Wine*-coopers, is this: Put four ounces of turneſole rags into an earthen veſſel, and pour upon them a pint of boiling water; cover the veſſel cloſe, and leave it to cool; ſtrain off the liquor, which will be of a fine deep red, inclining to purple. A ſmall proportion of this colours a large quantity of *Wine*. This tincture might be either made in brandy, or mixed with it, or elſe made into a ſyrup with ſugar for keeping. A common way with the *Wine*-coopers is to infuſe the rags cold in *Wine* for a night or more, and then wring them out with their hands; but the inconveniency of this method is, that it gives the *Wine* a diſagreeable taſte; or, what is commonly called the taſte of the rag; whence the *Wines*, thus coloured, uſually paſs among judges, for preſſed *Wines*, which have all this taſte from the canvas rags in which the lees are preſſed.

The way of extracting the tincture, as here directed, is not attended with this inconvenience; but it loads the *Wine* with water; and if made into a ſyrup, or mixed in brandy, it would load the *Wine* with things not wanted, ſince the colour alone is required. Hence the colouring of *Wines* has always its inconveniencies. In thoſe countries which do not afford the tinging grape, which affords a blood-red juice, wherewith the *Wines* of France are often ſtained, in defect of this, the juice of elder-berries is uſed, and ſometimes log-wood is uſed at Oporto.

The colour afforded by the method here propoſed, gives *Wine* the tinge of the Bourdeaux red, not the Port; whence the foreign coopers are often diſtreſſed for want of a proper colouring for red *Wines* in bad years. This might perhaps be ſupplied by an extract made by boiling ſtick-lack in water. The ſkins of tinging grapes might alſo be uſed, and the matter of the turneſole procured in a ſolid form, not imbibed in rags. *Shaw*'s Lectures, p. 211.

Any conſiderable heat, or even a degree of ſimmering, or tepidity, will, by its inteſtine and ſubtile agitation, that barely diſturbs the fine ſaline and ſpirituous parts, which are very ſuſceptible of heat, thereby disjoin them from the reſt, and occaſion an alteration in the taſte, tranſparency and durability of the *Wine*, as much as if the ſpirit had been drawn off by diſtillation, and afterwards poured in again, in which caſe the whole ceaſes to be *Wine*, though it is poſſible to bring it to *Wine* again, by bringing on a new fermentation.

It is a common accident, and a diſeaſe in *Wines*, to be kept too hot, and is not eaſy to cure when it has been of any long continuance, otherwiſe it may be cured by introducing a ſmall artificial fermentation, that new ranges the parts of the *Wine*, or rather recovers their former texture: but the actual expoſing of *Wine* to the fire, or the ſun, preſently diſpoſes it to turn eager; and the making it boiling hot, is one of the quickeſt ways of expediting the proceſs of making of vinegar.

On the other hand, *Wine* kept in a cool vault, and well ſecured from the external air, will preſerve its texture entire in all the conſtituent parts, and ſufficiently ſtrong for many years, as appears not only from old *Wines*, but other foreign fermented liquors, particularly thoſe of China, prepared from a decoction of rice, which being well cloſed down in the veſſel, and buried deep under ground, will continue, for a long ſeries of years, rich, generous, and good, as the hiſtories of that country univerſally agree in aſſuring us.

The ſame is to be underſtood of vinegar which has once thrown off the ſuper-abundant earthy parts, and many of the oily ones which preſided in it while it was *Wine*; whence the ſaline ones now get the aſcendant, and as it were ſubdue and preſide over the ſpirituous ones. In this ſtate it will continue perfect a long time; good and ſtrong vinegar, well ſtopped down, and placed in a cool place, preſerving itſelf unaltered for a long ſeries of years: but if it be left open, ſo that its fine vapour exhales, or its ſubtile part be drawn from it, and again poured back; in either caſe it loſes its uniform conſiſtence, and particularly its durability, and immediately hurries into vapidity and corruption.

If either by fraud or accident a larger portion of water is mixed with *Wine* than is proper for its conſiſtence, and no way neceſſary or eſſential, this ſuperfluous water does not only deprave the taſte, and ſpoil the excellence of the *Wine*, but alſo renders it leſs durable; for humidity in general, and much more a ſuperfluous aqueous humidity, is the primary and reſtleſs inſtrument of all the changes that are brought on by fermentation. It may doubtleſs therefore be uſeful, and ſometimes abſolutely neceſſary, to take away this ſuperfluous water from the other part which ſtrictly and properly conſtitutes the *Wine*. This has been agreed upon on all hands as a thing proper; but the manner of doing it has not been well agreed on; ſome have propoſed the effecting it by means of heat and evaporation, others by percolation, and others by various other methods, all found unſucceſsful when brought to the trial; but the way propoſed by Dr. Shaw from Stahl, is the moſt certain and commodious; this is done by a concentration of the *Wine*, not by means of heat, but of cold. *Stahl*'s Schediaſm. de Concentratione Vini. See the next article.

Condenſing of WINES; a phraſe uſed by Stahl, and ſome other writers, to expreſs what is more uſually called the concentrating them, that is, the freeing them from what ſuperfluous humidity they contain, and by that means rendering them more rich and noble, freeing them from their taſteleſs part, reducing them to a ſmaller bulk, and by that means making them fitter for tranſportation, and finally rendering them more durable in their perfect ſtate, and much leſs ſubject to the various accidents that make them decay.

Various methods have been attempted for the effecting of this, and great objections found in the way of all of them, except the lateſt, brought into uſe by *Stahl*, and ſince recommended greatly to the world by Dr. Shaw in his chemical eſſays.

If any kind of *Wine*, but particularly ſuch as has never been adulterated, be in a ſufficient quantity, as that of a gallon or more, expoſed to a ſufficient degree of cold in froſty weather, or be put into any place where ice continues all the year, as in our ice-houſes, and there ſuffered to freeze, the ſuperfluous water that was originally contained in the *Wine*, will be frozen into ice, and will leave the proper and truly eſſential part of the *Wine* unfrozen, unleſs the degree of cold ſhould be very intenſe, or the *Wine* but weak and poor. This is the principle on which Stahl founds his whole ſyſtem of condenſing *Wines* by cold.

When the froſt is moderate, the experiment has no difficulty, becauſe not above a third or a fourth part of the ſuperfluous water will be froze in a whole night; but if the cold be very intenſe, the beſt way is, at the end of a few hours, when a tolerable quantity of ice is formed, to pour out the remaining fluid liquor, and ſet it in another veſſel to freeze again by itſelf: this is proper, for two reaſons; firſt, becauſe the quantity of ice growing large, more of the concentrated *Wine* will be apt to lodge in it than ſhould, and it will require a longer time to drain and clear away from the ice. The making the experiment will ſufficiently explain this to any body; for, without breaking the ice, the unfrozen part will, barely by inclining the veſſel, find its own way out, and drain clear from the watery part, which is now converted into ice; ſo that if the draining be perfect, the ice of the moſt perfectly red Bourdeaux claret will become nearly as clear and pale as water, and will reſolve by heat into an almoſt entirely colourleſs phlegm. This is no ſmall curioſity attending this experiment, and at the ſame time affords a criterion of its exact performance.

If the veſſel, that thus by degrees receives the ſeveral parcels of the condenſed *Wine* be ſuffered to ſtand in the cold freezing place where the operation is performed, the quantity lying thin in the pouring out, or otherwiſe, will be very apt to freeze anew; and if it be ſet in a warm place, ſome of this aqueous part thaws again, and ſo weakens the reſt. The condenſed *Wine* therefore ſhould be emptied in ſome place of a moderate degree as to cold or heat, where neither the ice may diſſolve, nor the vinous ſubſtance mixed among it be congealed. But the beſt expedient of all is to perform the operation with a large quantity of *Wine*, or that of ſeveral gallons, where the utmoſt exactneſs, or the danger of a trifling waſte, needs not be regarded.

By this method, when properly performed, there firſt freezes about one third part of the whole liquor, and this is properly the more purely aqueous part of it, inſomuch that when all the vinous fluid is poured off, to be again expoſed to a concentration, the ice remaining behind, from this firſt freezing, being ſet to thaw in a warm place, diſſolves into a pure and taſteleſs water.

If the *Wine*, now once concentrated, ſhould, by a long continuance in the freezing cold, be again congealed to the utmoſt (unleſs the cold were very ſevere indeed) and then again be drained from its ice, there, ſoon after this, falls to the bottom of the veſſel, a pure white powder or tartar, and even the icy part afterwards depoſits alſo a little of the ſame ſubſtance after thawing; and after the ſtanding two or three days, there is always more and more of this tartar precipitated, and that conſtantly the more in proportion as the *Wine* was more auſtere, or leſs adulterated with ſugar brandy, or the like, for theſe things contain no tartar.

The ice of the ſecond operation on a quantity of *Wine*, differs in nothing from that of the firſt, provided only that the *Wine* was poured clear off from it, before the ice is ſet to melt, by which means it diſſolves into a clear phlegm. This ſhews the excellency of the operation, as it loſes not its efficacy upon repetition, but brings away mere water as well at laſt as at firſt, without robbing the *Wine* of any of its genuine or truly valuable parts. The remaining liquor, which has eſcaped being

ing frozen in these two operations, is a real concentrated *Wine*, as appears by its colour, consistence, taste, and smell; for it now has all these properties in a much larger degree, than while it contained so much superfluous moisture of a merely aqueous kind. It therefore becomes a nobler and richer *Wine*, than could any way be procured without such a contrivance. For as, by this means, two thirds of the quantity are taken away in the better sorts of *Wine*, and three fourths in the weaker, what remains must needs possess three or four times the strength and virtues of the same quantity of the crude *Wine*.

This operation, though it be perfect in regard to *Wines*, yet does not succeed so well in regard to the malt liquors. The experiment has been fairly tried by Stahl on a gallon of strong malt drink, and the success was as follows: The ice separated in the first operation, when thawed by heat, resolved into a liquor of the colour and taste of small beer; and the second concentration afforded an ice of much the same kind, which might have passed for ordinary small beer, but for a flashy watery taste that manifestly predominated in it. The liquor unfrozen was but a pint and half by measure, but it was extremely rich and thick, and seemed very strong and spirituous, and perfectly aromatic, or highly flavoured. The consistence was somewhat like that of a thin syrup, and it had a pleasing softness that sheathed the acrimony of the spirit, and covered the bitter taste of the hop.

The mucilaginous nature which is predominant in all malt liquors, occasions a great inaccuracy in this experiment, as not suffering the water to run clear, or be separated from the richer tincture of the malt, nor letting the condensed liquor be obtained clean from the ice; but as the loss occasioned by this is not great, and the liquor is much cheaper than *Wine*, if this should ever come into use in the large way, the thawed liquor of the ice might be used again in a new brewing, and so the loss of that part of the strength which was carried away by the freezing be recovered.

The phlegm of *Wine*, separated by this operation, when it has not succeeded perfectly well, carries off something also of the flavour and taste of the *Wine*; and this need not be supposed all lost, for this liquor alone will, if strong enough, serve excellently to make vinegar, or if not so much impregnated as to do for that purpose, it will serve the vinegar-makers instead of other water, and be of so much advantage in the process, as fully to make up for the quantity of *Wine* lost.

The frozen part, or ice, consists only of the watery part of the *Wine*, and may be thrown away, and the liquid part retains all the strength, and is to be preserved. This will never grow sour, musty, or mouldy afterwards, and may at any time be reduced to *Wine* of the common kind again, by adding to it as much water as will make it up to the quantity that it was before.

Wines in general may by this method be reduced to any degree of vinosity or perfection. Thus, for example, if a *Wine* of a moderate strength have a third part of its water taken away, in form of ice by congelation, the remaining part will thereby be doubled in strength and goodness: for if we allow, in the better sorts of *Wine*, that one third part, which is near the truth, is truly good or vinous, and two third parts are nothing but water, one third part of the good *Wine* being blended among the two third parts of water, of no strength nor value; it follows, that if one of these third parts of water be taken away, and all the *Wine* left, that which was before but one third *Wine*, is now one half *Wine*, no way reduced in its strength, and therefore the whole must be stronger in that proportion.

But if this operation of congelation be carried to the utmost, and be practised on a large quantity of *Wine*, and with a very intense cold, and the ice taken away several times, and the *Wine*, thus freed from a part of its water, again and again exposed, it will be found that good *Wines* will be reduced to one sixth part of their original quantity; and the vintner will easily find out the use of this remaining sixth part, which is a true quintessence of *Wine*, and will be of the utmost benefit, by mixing in small quantities with poor and low-flavoured *Wines*, to meliorate and improve them; and even to convert the low-flavoured and least valuable ones into those very *Wines* from which this condensed part was procured.

Glauber laboured hard at bringing this sort of thing to bear, and attempted it with what he called the quintessence or essential oil of *Wine*; but this, though prepared ever so curiously from the very finest *Wines*, was never found to answer well on the trial, but retained a nidorous and disagreeable flavour, different from that of the *Wine*. Glauber's method, therefore, which was excellent in theory, is by this method of congelation reduced to practice, and that with little trouble, and the greatest advantage.

The benefit and advantage of this method of congelation, if reduced to practice in the large way, in the *Wine* countries, must be evident to every body. Concentrated *Wines*, in this manner, might be sent into foreign countries, instead of *Wine* and water, which is what is usually now sent, the *Wines* they export being loaded, and in danger of being spoiled by three or four times their own quantity of unnecessary, superfluous, and prejudicial water.

The business is, how to perform the operation, for *Wine*-countries being in general hot countries, the business of freezing will not be so easily carried on there as in the cold ones: but this is an objection easily solved by observing, that in most of the *Wine* countries that we are acquainted with, there are hills and mountains, the tops of which are covered with snow all the year round; and all who are acquainted with natural philosophy, very well know, that where there is snow to be had, there will be no difficulty about freezing.

The difficulty rests therefore not in the matter of freezing, but in the reducing the *Wines*, when thus concentrated, to their due and natural state again; for though the addition of water alone does this in a tolerable manner, yet better means may certainly be found on farther trials. The way of using poor *Wines*, and such as in themselves are of little use or value, is always a good one, and is sufficiently advantageous; because what there is in the price of these above water, is made up to the proprietor in the quantity of the final produce; water could only give the same quantity of the *Wine* that there was originally, and before the condensation; but these *Wines* will bear to be mixed in so much larger a quantity, that the produce will warrant the gaining by the practice.

This method is not practicable to advantage in the *Wine* countries alone. Dr. Shaw assures us, that he has himself experimented it here, and with the use of proper freezing mixtures, has reduced *Wines* in England to a much smaller quantity, in proportion to the whole, than in the strongest of Stahl's experiments. It is evident that, by how much the quantity is smaller, by so much it is richer and stronger, provided that the operation has been properly performed. The Doctor assures us, the noble essence or rob, thus prepared, is capable of working almost miracles, by turning water into *Wine*, and the like; but that, in order to its succeeding well, there requires great care in the operator, when the congelation is repeated the last times. *Shaw*'s Chemical Essays. *Stahl*'s Concentrat. Vin.

Diseases of WINES. All *Wines*, malt liquors, and vinegars, which are well made, and perfect in their kind, will grow fine of themselves, barely by standing; so that if they do not thus grow fine in a reasonable time, it is a sign that they labour under some disease; that is, they are too aqueous, too acid, too alkaline, or they tend to putrefaction, or the like. In all these cases, which may properly enough be called the *diseases of Wines*, suitable remedies are required before the *Wines* will grow fine. The most general remedy hitherto known for all the diseases of *Wines*, is a prudent use of tartarized spirit of *Wine*, which not only enriches, but disposes all ordinary *Wines* to grow fine. *Shaw*'s Lectures, p. 209.

Extemporaneous WINE. A hundred weight of good treacle will produce, according to the art of the distiller, from four to seven gallons of pure alcohol; that is, from eight to fourteen gallons of the common-proof melasses spirit. The still-bottoms have many uses. The distillers scald and recover their musty casks with them, and they may be used for all those purposes of cleansing where argol is required. Mr. Boyle's acid spirit of *Wine*, or a spirit very like it, may also be procured from them, and a matter analogous to what Beccher calls the *media substantia vini*. This liquor gives a durable *extemporaneous Wine*.

Fining of WINES. See the article FINING.

Low WINES, in the distillery, the term for the spirituous liquor distilled immediately from the fermented matter, and continued running so long, that the last of it was not at all inflammable. This liquor is afterwards rectified to a proof-spirit of the strength of brandy, and thence to a rectified spirit, called *alcohol*, or spirit of *Wine*. *Shaw*'s Lectures, p. 216.

WINE *Lees*. The distillation of *Wine lees* into spirit is conducted very much in the same manner with that of the malt-wash, when distilled with the mealy part in it: The principal difference is on this account, that the oil of the malt being very nauseous and disagreeable, the utmost care is to be used to keep it back in all the processes of primary distillation, and of rectification; whereas, on the other hand, the oil of the *Wine* lees being a very agreeable and pleasant one, as much care as possible is to be taken to bring it over with the spirit. Glauber has written a peculiar treatise on this subject, in which, without touching upon the most advantageous production of all, he has proved the work to be so very profitable, that the whole usually passes for one of his wild flights, rather than a solid business.

The method of distilling a liquid lee for its spirit, is a thing very universally known; but the advantageous thing, on this basis, is the distilling a dry lee pressed and preserved, and the managing the business in such a manner as at first or last to procure and separate all its valuable parts. The solid lee, here mentioned, is that usually sold to the hatters in England, and is the same thing that in France and other *Wine* countries the vinegar-makers dispose of in cakes, after they have pressed out all the *Wine*, and which is afterwards burnt, and makes what Lemery and others call *cineres clavellati*; and the English, *gravelled ashes*, a fixed alkali salt-like pot-ash.

This lee, when to be used for distilling, should be that of the French *Wines*, and either such as is newly pressed, or has been well secured by packing in a close manner in tight casks, with some proper contrivance of dry sand, or the like, to keep its

its external ſurface from the contact of the air, which is very apt to corrupt or putrify it.

If this lee is intended to be kept many months, it will be very proper to ſecure it by ſprinkling the layers as they are packed up with a little brandy. The expence of this is nothing, for the brandy is recovered again in the operation.

The eſſential oil of any fermented ſubſtance is always found preſerved in great quantity in the lee or ſediment of the fermented liquor, and in regard to the diſtilling of theſe dry *Wine* lees, the great article is the ſeparating this oil to advantage.

In order to this, the ſolid lee muſt be ſet to ſteep in ſix or eight times its own weight of water, ſtirring the whole well together at times; in this manner the liquor will take up all the lighter and better part of the lee, and will become thick and muddy, the coarſer part of the cakes, which is of leſs value, ſubſiding to the bottom. The thick liquor, without theſe lumps, is to be put into the common ſtill, and the liquor worked off, as in the common way, by the chemiſts, to obtain the eſſential oils of plants. The ſtill muſt be made hot and dewy before the liquor is put in, and the fire afterwards kept well regulated, otherwiſe there will be danger of burning; but the better way to ſecure it is to put ſome looſe ſticks at the bottom of the ſtill.

The oil is thus brought over with the liquor, and is to be ſeparated in the common way, by means of a ſeparating pot placed under the noſe of the worm; but if this oil is deſired to be obtained fine, the pot muſt be ſhifted ſoon, for, after a time, a groſs, reſinous, and much leſs agreeable oil, will mix itſelf with it, and cannot be ſeparated again without great trouble, and a ſecond diſtillation, and that will not ſucceed without great care. *Shaw*'s Eſſay on Diſtillery.

Philoſophic Spirit of WINE, in the writings of ſome chemiſts and phyſicians, a phraſe that often occurs as the name of a liquid prepared from *Wine*, and endued with very remarkable properties.

It is generally ſuppoſed that this was the ſame ſort of liquor which we at this time call by the name of *Spirit of Wine*; but this is a very erroneous opinion, and has led many into errors, about the operations in which it was concerned. It was truly no diſtilled liquor, but the ſpirituous parts of *Wine* condenſed and concentrated by the freezing of the more aqueous part. See the article *Concentrating of* WINE, ſupra.

Pricked WINES. An eaſy method of recovering *pricked Wines* may be learned from the following experiment: Take a bottle of red port that is pricked, add to it half an ounce of tartarized ſpirit of *Wine*, ſhake the liquor well together, and ſet it by for a few days, and it will be found very remarkably altered for the better.

This experiment depends upon the uſeful doctrine of acids and alkalies. All perfect *Wines* have naturally ſome acidity, and when this acidity prevails too much, the *Wine* is ſaid to be pricked, which is truly a ſtate of the *Wine*, tending to vinegar: But the introduction of a fine alkaline ſalt, ſuch as that of tartar, imbibed by ſpirit of *Wine*, has a direct power of taking off the acidity, and the ſpirit of *Wine* alſo contributes to this, as a great preſervative in general of *Wines*. If this operation be dexterouſly performed, pricked *Wines* may be abſolutely recovered by it, and remain ſaleable for ſome time: And the ſame method may be uſed to malt liquors juſt turned ſour. *Shaw*'s Lectures, p. 214.

Saffron WINE, *Vinum Crocatum*. See the article SAFFRON.

WINE-*Spirit*, a term uſed by our diſtillers, and which may ſeem to mean the ſame thing with the phraſe *ſpirit of Wine*; but they are taken in very different ſenſes in the trade.

Spirit of Wine is the name given to the common malt ſpirit, when reduced to an alcohol, or totally inflammable ſtate; but the phraſe *Wine-ſpirit* is uſed to expreſs a very clean and fine ſpirit, of the ordinary proof ſtrength, and made in England from *Wines* of foreign growth.

The way of producing it is by ſimple diſtillation, and it is never rectified any higher than common bubble proof. The ſeveral *Wines* of different natures, yield very different proportions of ſpirit; but, in general, the ſtrongeſt yield one fourth, the weakeſt in ſpirits one eighth part of proof-ſpirit; that is, they contain from a ſixteenth to an eighth part of their quantity of pure alcohol.

Wines that are a little ſour, ſerve not at all the worſe for the purpoſes of the diſtiller, they rather give a greater vinoſity to the produce. This vinoſity is a thing of great uſe in the *Wine-ſpirit*, whoſe principal uſe is to mix with another that is tartarized, or with a malt-ſpirit, rendered alkaline by the common method of rectification. All the *Wine-ſpirits* made in England, even thoſe from the French *Wines*, appear very greatly different from the common French brandy; and this has given our diſtillers a notion that there is ſome ſecret art practiſed in France, for the giving the agreeable flavour to that ſpirit; but this is without foundation. See the article SPIRIT.

When we diſtil Sicilian or Spaniſh *Wines*, we do not produce Sicilian or Spaniſh brandies; and the true reaſon of this is, that the *Wines* which they diſtil on the ſpot into brandy, are very different from thoſe which they export as *Wines*.

Thoſe they diſtil are ſo poor and thin, that they will not keep many months, nor can poſſibly bear exportation. If we had in England thoſe poor *Wines* they diſtil into brandy near Bourdeaux, Cognac, or up the Loire, there is no doubt but the ſpirit we made from them would be univerſally allowed to be French brandy. We have proof of this from ſome of the Scotch diſtilleries, where they, with no peculiar art, or ſecret method, procure from ſome of the poor pricked and damaged *Wines* received there, brandy ſo nearly reſembling that of France, that a good judge will ſcarce be able to make the diſtinction. *Wine-ſpirits* and brandies therefore are the ſame thing, only with this difference, that the former is the product of a rich *Wine*, and the latter of a poor one; or, at the utmoſt, they differ only as our two home products, the cyder-ſpirit and the crab-ſpirit do.

The *Wine-ſpirit*, diſtilled in England, is not eaſy to be had pure and unmixed at our diſtillers, nor under a price almoſt equal to that of French brandy; ſo that if it ever be required out of the trade, it is as well to uſe the French brandy, which will, in all caſes, ſerve the ſame purpoſes, unleſs where a high flavour or a copious eſſential oil are required. All other ſpirits are carefully diveſted of their oil in the rectifications; but the *Wine-ſpirit* is coveted only for its oil, and all that can be obtained is preſerved in this, its principal uſe being to give a flavour to a worſe ſpirit, and to cover the taſte of a diſagreeable oil in it.

When a caſk of *Wine* chances to turn ſour in private hands, it is worth while to diſtil it for the ſpirit. The lees alſo, if in any conſiderable quantity, will yield ſuch a proportion of the ſame ſort of ſpirit, as to render it worth while; and as the high flavour is not required in this intent, it will be beſt to draw off the ſpirit very gently, either by the cold or hot ſtill, and afterwards it may be rectified without any addition, and reduced to the ſtandard ſtrength of proof. It thus makes a very clean and pleaſant ſpirit, though very different from the brandy from the ſame country whence the *Wine* came. *Shaw*'s Eſſay on Diſtillery. See the article SPIRIT.

WINE-*Fly*, in natural hiſtory, the name of a ſmall black fly, found in empty *Wine*-caſks, and about *Wine*-lees, and called by the Latins, *bibio*.

It is produced of a ſmall red worm, very common in the ſediment of *Wine*. See the article BIBIO.

The drippings of *Wine* or beer-veſſels, the preſſings of the *Wine* or cyder-preſs, the pots in which honey has been kept, and in which a little remains ſticking to the ſides, and turning ſour, all afford vaſt numbers of a ſmall ſpecies of worm or maggot. This is of a white colour, and has two hooks placed near the head; in ſhort, it reſembles, in all the parts, the maggot of the common fleſh-fly. Multitudes of theſe ſmall creatures live and move very briſky about in theſe ſubſtances for ſeveral weeks together; but at the end of that time, when they have arrived at their full growth, they enter into the nymph ſtate under a covering or caſe made of their own ſkin, which dries, and becomes of a brown colour. After eight or nine days in this ſtate, the caſe is opened by the falling off of a ſmall piece at the end, and the fly makes its way out. The fly is extremely ſmall when its wings are not extended.

It does not exceed the ſize of the head of a middling pin; it is however very beautiful; the breaſt and body are yellow, the reticulated eyes are red, and the wings have all the rainbow-colours. The beſt way of procuring theſe little flies, which make a very beautiful microſcopic object, is to keep the matter, in which the worms are placed, in a glaſs, covered down with a paper; as ſoon as the cover is taken off, at the time of their being in the fly-ſtate, they riſe up at once in the form of a cloud; enough of them for obſervation will however remain about the ſides of the veſſel. When examined, they are found to have all the regular parts of the larger flies; their antennæ are oval and flatted, and their legs, and every other part, are as elegantly perfect, as they are ſeen to be in the moſt elegant large fly.

It is not known whether they are oviparous or viviparous; but this is to be obſerved, that they give us great light into the origin of animalcules in different fluids. Theſe are a ſpecies of winged inſect, ſo ſmall as ſcarce to be viſible as they fly, and to theſe we owe the worms in the four ſubſtances before-deſcribed, though we know not how or when they depoſit them there. Theſe maggots or worms are of the number of thoſe animals, ſuppoſed by the vulgar to be produced of corruption. Snce we ſee in theſe the evident courſe of nature in their origin, what prevents but that there may be numbers of flies yet ſmaller than theſe, whoſe eggs may be depoſited in the fluids in which we find our microſcopic animalcules. *Reaumur*'s Hiſt. Inſ. vol. 9. p. 81.

WING, (*Cycl.*)—*Wings*, among the fly-claſs, afford ſeveral ſubordinate diſtinctions of the genera of thoſe animals, under the antient general claſſes.

Several ſpecies of flies, while they are in a ſtate of reſt, or only walking, ſhew ſeveral regularly diſtinct manners of carrying their *Wings*. The much greater number, however, carry them in a parallel or plain poſition. Among thoſe who carry them thus, ſome have them in form of a ſort of oars, their direction being perpendicular to the length of the body, which is not at all covered by them. This is the caſe in many of the libellæ, and of the tipulæ.

Others carry their *Wings* in this manner, ſo as that they cover a part of the body, without at all covering one another.

Among the two-winged flies, the great blue fleſh-fly, and the common fly about houſes, give us inſtances of this.

The *Wings* of others croſs one another on the body of the creature, and the degrees in which they cover one another, give occaſion to ſeveral other ſub-diſtinctions; for ſome of them over-hang on each ſide the body of the animal, while others croſs one another, in ſuch a manner as not to cover the body of the fly entirely, but leave a rim of it viſible and uncovered on each ſide of them. Some of the flies bred of water-worms have their *Wings* in this manner.

Others have their *Wings* thus diſpoſed, but croſſing one another only in a part of their ſurface, and that at their extremities; ſo that though they there cover the body of the fly, they leave a portion of the anterior part of the body naked.

The *Wings* of other flies not only croſs one another on the body of the animal, but they round themſelves there; theſe are not exactly parallel in their ſituation, but the upper *Wing* is more elevated on the middle of the body than on the ſides.

Some flies have their *Wings* placed upon their backs, and applied againſt one another. Theſe are in a perpendicular poſition; and ſeveral of the ſmaller ſpecies of libellæ, and winged pucerons, are of this ſort; as are alſo the ephemerous, or day-flies.

The *Wings* of other flies are applied obliquely againſt their ſides, and meet above the body by their inner edges; theſe form, by their junction above, a kind of hollow roof, under which the body is placed. The flies produced from the puceron-eater, and the formica-leo, are of this kind. *Reaumur*'s Hiſt. Inſ. Tom. 4. p. 136.

Other flies have their *Wings* thus applied to their ſides, and, inſtead of riſing erect, bending themſelves at their meeting upon the creature's back, and forming a flat depreſſed roof over the body. Of this kind are the *Wings* of many of the flies produced from water-worms. Ibid. p. 137.

And finally, there are ſome of the flies which carry their *Wings* in an oblique direction, but have them meeting under their bellies. Theſe are placed exactly contrary to thoſe which form a kind of high roof over the creature's back; and of this kind are the *Wings* of that elegant fly which is produced from the cherry-worm.

The ſtructure of the *Wings* of different flies might alſo furniſh matter of farther diſtinctions. The greater part of them are of a fine ſtructure, and repreſent the fineſt gauſe, and are equally tranſparent, or nearly ſo in all parts. Some flies, however, have *Wings* of a leſs degree of tranſparence, and ſome even opake ones [a]. Others of the four-winged flies have obſcure ſpots alſo diſtributed near their very tranſparent texture; ſuch are the wings of the ſcorpion-fly; and ſome of the two-winged flies have *Wings* partly opake, partly pellucid, the opake ſpots being ſeparated by tranſparent lines [b].—[[a] Ibid. p. 137. [b] Ibid. p. 138.]

WINGS *of Butterflies*. The beautiful *Wings* of this genus of inſects, are diſtinguiſhed from thoſe of the fly-kind, by their not being thin and tranſparent, like them, but thicker and opake. This opacity in them is owing only to the duſt which comes off of them, and ſticks to the fingers in handling them, and it is alſo to this duſt that they owe all their beautiful variety of colours. The earlier naturaliſts, for this reaſon, diſtinguiſhed theſe inſects by the appellation of ſuch as had farinaceous *Wings*. *Reaumur*'s Hiſt. Inſ. vol. 1. P. 1. p. 282.

The uſe of the microſcope has taught us, that this duſt is not the reſult of ſome other ſubſtance broken into fragments; but every particle of it is a regularly figured body, made for the place and order it has in the covering of the *Wing*.

The ſeveral ſpecies of butterflies, and even the different parts of the ſame *Wing*, afford theſe bodies of different ſhapes and figures. Moſt of the authors who have written of microſcopic objects, have given the figures of the principal varieties of theſe; but no one has given ſo many as Bonani in his Micrographia, in which work the figures of the various kinds take up four quarto plates.

It has been the general cuſtom of authors to call theſe feathers; but they are by Mr. Reaumur, with much greater juſtice, called ſcales. Their ſtructure has no reſemblance to that of feathers, for they are little flat and thin bodies, of more or leſs length, and always having a ſhort pedicle which enters into the ſubſtance of the *Wing*. That part of the ſcale from which this pedicle is propagated, is rounded in moſt caſes, and very frequently the other end is rounded alſo. The whole ſcale therefore in theſe becomes of an oval figure. Others have a little dent in the middle of the end, oppoſite to the pedicle, by which they are made to reſemble the ſhape of a heart at cards, and many of them are not abſolutely flat, but are more or leſs hollowed on the under ſide: And the ends, which are in ſome plain and ſtrait at the edges, are in others indented or jagged, and in ſome cut into ſmall and elegant ſegments.

The indentings of ſome are but few in number, and theſe reſemble the fingers of a hand ſpread open, the body of the ſcale repreſenting the palm; in ſome, theſe fingers terminate in ſharp points, in others they are more obtuſe, and in ſome there are only three of theſe to each ſcale; in others there are as far as eight; ſome are regular triangular blades, and have their baſe very ſhort, in compariſon to the length of the ſides; but this is variouſly cut and indented in all the manners before ſpoken of. In ſome theſe jags at the end ſeem propagated all along the ſcale, and form in it ſo many ridges, elevated above the reſt of the ſurface on the upper ſide, and hollowed on the under. Thoſe which have theſe elongated ridges, have uſually alſo a rib running down the middle through their whole length, as the leaves of plants have, and the pedicle is in theſe ſcales as in the leaves of vegetables, only an elongation of this middle rib.

Beſide theſe, which are the more uſual figures of the feathers or ſcales of the *Wings* of butterflies, there are ſome others extremely different, and which neither Bonani, nor any other author has given the figures of till Reaumur. Theſe have leſs title to the appellation of ſcales than any of the others, and at firſt ſight might ſeem indeed to have none at all. Their pedicle is ſo long and ſlender, that they might be miſtaken for hairs; but that each of them is terminated by a ſmall flat plate, which is ſplit a little way down the middle, and in all reſpects reſembles the ſcales before deſcribed, which adhere to their ſhort pedicles. There are, however, ſome of this laſt kind, which can by no means be called ſcales. What, in thoſe deſcribed above, is a flat plate placed at the end of a very long and ſlender pedicle, is, in theſe, only a diviſion of the extremity of the long capillary pedicle, into four or five parts, which have not breadth enough to entitle them to the name of ſcales. *Reaumur*'s Hiſt. Inſ. vol. 1. P. 1. p. 255.

The diſtinction in names in theſe matters, is abſolutely neceſſary, and the calling theſe bodies, uſually termed feathers, ſcales, cannot well be avoided by an accurate obſerver, becauſe there are, in ſome of the butterflies, ſome parts which are covered with real feathers, ſome other parts have only hairs, and ſome others ſcales; all theſe have been called feathers by ſome; but they are ſo different in themſelves, that they well deſerve different denominations. Beſide all theſe, ſome parts of ſome of theſe creatures are beſet with real prickles, and ſometimes even the ſame part, in the ſame animal, is jointly covered with all theſe ſeveral ſorts of inveſtures. When the *Wing* of a butterfly is viewed by a microſcope, the arrangement of theſe ſeveral bodies in it is ſeen to be extremely beautiful and regular. The ſcales lie as regularly and evenly one over another, as the tiles on a houſe, or the ſcales on the fiſh-kind, every ſeries of them covering a ſmall part of that ſeries which runs below it. The upper and under part of the *Wing* are equally furniſhed with theſe, and there is no ſpecies of this creature, in every *Wing* of which there are not ſeveral figures of theſe ſcales in ſeveral parts: But the greater part of the ſurface, a little diſtant from the edges, has only one ſort in moſt ſpecies. But this kind is different in the ſeveral ſpecies; in ſome we only find the plain oval ones, in others the cordated, and in others thoſe which are divided at the end, in the manner of the fingers of a hand. In other ſpecies the *Wings* make a leſs elegant appearance, though more loaded with theſe ſcales; for the ſeveral ſeries of the beautiful ſorts of ſcales which have been before deſcribed, are in theſe buried under other very thick ſeries of thoſe which have long capillary ſtems, and appear only like ſo many hairs. The extremities of the *Wings* of theſe inſects appear to the naked eye as if bordered with a ſort of fringe; but, when examined by the microſcope, this fringe appears to be compoſed of a number of oblong ſcales, of the nature of thoſe triangular ones before-deſcribed, which have very narrow ends, in proportion to the length of the ſides, and theſe ends are variouſly fingered.

The ſtructure of the *Wing* itſelf, which ſupports theſe ſeveral ſcales, hairs, *&c.* is very worthy our attention. In order to examine this, it is neceſſary to rub off all the duſt or ſcales. We then find that the *Wing* itſelf is framed of ſeveral large and ſtrong ribs, which all take their origin at that part where the *Wing* is fixed to the body, and thence extend themſelves along the ſeveral ſides of the *Wing*. The largeſt and thickeſt of theſe ſurrounds the outer edge of the *Wing*, the largeſt next to this extends itſelf round the interior edge, and the others direct their courſe along the middle of the *Wing*, and then divaricate and become ramified in the manner of the ribs in the leaves of plants. The ſubſtance which connects and fills up the ſpaces between theſe ribs, is of ſo peculiar a nature, that it is not eaſy to find any name to deſign it by, at leaſt there is no ſubſtance that enters the compoſition of the bodies of the larger animals, that is at all analogous to it: It is a white ſubſtance, tranſparent and friable, and ſeems indeed to differ in nothing from that of the large and thick ribs, but in that it is extended into thin plates; but this is ſaying but little toward the determining what it really is, ſince we are as much at a loſs to know by what name to call the ſubſtance they are compoſed of. Malpighi indeed calls them bones; but though they do ſerve in the place of bones, rendering the *Wing* firm and ſtrong, without making it heavy, and are, when cut tranſverſely, found to be hollow; yet, when ſtrictly examined, they do not appear to have any thing of the ſtructure of bones, but appear rather of the ſubſtance of ſcales, or of that ſort of imperfect ſcales, of which the covering of thoſe inſects which we call cruſtaceous is compoſed. *Reaumur*'s Hiſt. Inſ. vol. 1. P. 1. p. 259.

Be this ſubſtance however what it will, it admirably ſerves the office nature ſeems to have intended it for, making the *Wings* at once very light and very firm; and the millions of ſmall

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and flat ſcales which cover them, ſcarce at all increaſe the weight, and yet make an admirable defence for the middle part, where it is extended into thin plates between the ribs. In examining this part more narrowly, we find that it is traverſed in all parts by a number of furrows or lines running from rib to rib, each marked with a vaſt number of duſky-coloured points or ſpots. Mr. Reaumur compares theſe to the ridges and holes in the common papers on which pins are kept, and obſerves, that theſe little duſky ſpots are the holes which receive the ſtems or pedicles of the ſeveral ſeries of ſcales. This is diſtinctly ſeen by the microſcope, as the *Wing* is never wholly cleared of the ſcales; and the few which remain ſingly in their places, always fill up ſome of the holes or obſcure points in theſe ſeveral ſeries.

The *Wings* of butterflies, thus large, and thus light, are very well able to ſuſtain them a long time in the air, and thus might be expected to fly better than moſt other inſects; but many people have obſerved the irregular manner in which theſe inſects uſually fly, which is not ſtrait forward, but up and down, and to one ſide and the other: this has been ſuppoſed owing to ſome imperfection of the *Wings*; but, in reality, it is their great perfection that enables the creature to do this, and this manner of flying is abſolutely neceſſary to the preſerving their life, as birds of many kinds are continually after them while they are on the *Wing*; and it is a pleaſant ſight to obſerve, in what manner this ſort of dodging motion in the butterfly diſappoints the bird that flies ſtrait at it, and often preſerves it ſafely for a long way together.

All the beautiful variety of colours, which we ſee on the *Wings* of theſe inſects, is owing to the ſcales and feathers. The ſubſtance of the *Wing* is tranſparent, and of one uniform and duſky-whitiſh colour; this however is wholly hid by the ſcales planted on it, and is like the earth in a meadow, covered with a profuſion of flowers of various ſorts and colours. Certain parts of the *Wings* of ſome ſpecies have only blue ſcales, other parts only purple, and others only yellow, and ſo on, in the different ſpecies of different colours, a fine deep black and a pearly white being two very common colours in them, and capable of producing a fine variety in the ſhadowing: And as theſe arrangements of coloured ſcales are diſpoſed with a beautiful regularity, they give us all the appearances of clouded veins and eyes that we ſee. *Reaumur*'s Hiſt. Inſ. vol. 1. P. 1. p. 260.

WINGS *of Gnats*. Theſe are of a very curious ſtructure, and well worthy the uſe of the microſcope, to ſee them diſtinctly.

It is well known, that on touching the *Wings* of butterflies, a coloured powder is left on the fingers, which, though to the naked eye it appear a mere ſhapeleſs duſt, yet when examined by the microſcope, it is found to be very regularly figured beautiful bodies, in form of feathers and ſcales: Theſe are of various figures, and all of them very elegant. The generality of flies have nothing of this kind; but the cloſe examination of the *Wings* of the gnat will ſhew, that they are not wholly deſtitute of them; they are much more ſparingly beſtowed indeed upon the gnat than on the butterfly; but then they are arranged with great regularity. *Reaumur*'s Hiſt. Inſ. vol. 4. p. 577.

The *Wings* of the gnat, like thoſe of moſt other inſects, are of a cartilaginous ſubſtance; friable, and tranſparent as a flake of talc, and the circumference, and many parts of the inner ſtructure of the *Wing* are ſtrengthened by ſlender but firm ribs, which are divaricated into ſeveral ramifications. Theſe appear to us to be mere ſtrait fibres; but they are probably hollow, and perform the office of veſſels, for carrying the fluids or air neceſſary to the ſupport of the *Wing*, as well as to ſtrengthen it. In the *Wings* of butterflies there are ſimilar ribs, but they are there all hid by the ſcales; but it is not ſo in the gnat, for in its *Wings*, as in thoſe of the other flies, theſe ribs ſeem naked.

The aſſiſtance of the microſcope ſhews, however, that they are not abſolutely ſo in the *Wings* of gnats; but theſe nerves or ribs, with their ſeveral ramifications, look like ſo many ſtalks of a plant covered with ſmall oblong leaves. The ſeveral ſcales that are attached to theſe ribs, make acute angles with them, and are directed toward the end of the *Wing*.

The number of theſe ſcales is very ſmall in compariſon with that of the butterfly-claſs; but they make a ſlighter and more elegant ornament. There are ſome ſpecies which have the intermediate ſpaces of the *Wing* adorned alſo with theſe ſcales; but they are in theſe but thinly ſcattered. The intermediate ſpaces of the *Wings*, when they have no ſcales, are finely wrought and pointed, and the innner edge of the *Wings* is always bordered with a row of ſcales in form of a fringe, which, in ſome ſpecies, is compoſed of ſcales all of the ſame equal ſize, and in others is made up of many of very various lengths; and the exterior edge of the *Wing*, which is ſurrounded by a rib much thicker and ſtronger than the interior, is not fringed with a ſeries of ſcales, but is beſet, at certain diſtances, with a ſort of long prickles. Ibid. p. 578.

The ordinary ſhape of the ſcales of the gnats *Wings*, is that of an oblong battledoor, one end of which is broader, and the other more pointed. The narrower end is that from which goes the ſtalk by which it adheres to the rib. The other end is ſometimes more, ſometimes leſs round, and is ſometimes a little hollowed in the middle. Some of theſe ſcales are much longer in proportion to their breadth than others, and ſome of them have their extremity formed into an open creſcent. All have a number of fine lines running longitudinally through the whole ſcale. Ibid. p. 579.

Gooſe-WING, at ſea. See the article GOOSE-*Wing*.

WINTER (*Cycl.*)—WINTER-*Heyning*, in our ſtatutes, a ſeaſon between the eleventh day of November, and the three-and twentieth of April, which is excepted from the liberty of commoning in the foreſt of Dean, *&c.* Stat. 20 Car. 2. c. 3. *Blount*.

WINTERANUS *Cortex*, in botany, a name given to the wild cinnamon-tree, the characters of which are theſe: The trunk is about the thickneſs of one's thigh, riſing to about twenty or thirty foot high, having many branches and twigs hanging downwards, making a very comely top. The bark conſiſts of two parts, *viz.* outward and inward. The outward bark is thin as a milled ſhilling, of a whitiſh-aſh or grey colour, with ſome white ſpots here and there on it, and ſeveral ſhallow furrows of a darker colour, running variouſly through it, and making it rough; its taſte is aromatic. The inward bark is much thicker than cinnamon, being equal in thickneſs to a milled crown-piece, ſmooth, of a whiter colour than the outward, of a much more biting and aromatic taſte, ſomething like that of cloves, and not glutinous like cinnamon, but dry and crumbling between the teeth. The leaves come out near the ends of the twigs, without any order, ſtanding on inch-long foot-ſtalks; they are each of them two inches long, and one inch broad near the end where broadeſt, and roundiſh, being narrow at the beginning, and thence increaſing in breadth to near its end, of a yellowiſh green colour, ſhining and ſmooth, without any inciſſures about its edges, and ſomewhat reſembling the leaves of bay or *laurocerafus*. The ends of the twigs are branched into bunches of flowers, ſtanding ſomething like umbels, each of which has a foot-ſtalk, on the top of which is a calyx made up of ſome foliola, within which ſtand five ſcarlet or purple petala, and within them is a large ſtylus. To theſe follow ſo many cauliculated berries, of the bigneſs of a large pea, roundiſh, green, and containing within a mucilaginous pale green, thin pulp, four black ſhining ſeeds, or acini, of an irregular figure.

All the parts of this tree, when freſh, are very hot, aromatic, and biting to the taſte, which is ſo troubleſome as ſometimes to need a remedy from fair water. It grows in the low-land, or Savanna-woods in Jamaica, Antigua, and the other Caribbee Iſlands.

The bark of this tree is what is chiefly in uſe, both in the plantations of the Engliſh between the tropics, in the Weſt Indies, and in Europe, and is, without any difficulty, cured by only cutting off the bark, and letting it dry in the ſhade.

The people of the Weſt Indies uſe it inſtead of all other ſpices, being thought very good to conſume the immoderate humidities of the ſtomach, help digeſtion, expel wind, *&c.*

It is likewiſe, as well there as in Europe, thought a very good remedy againſt the ſcurvy, and to cleanſe and invigorate the blood, being, among the apothecaries and druggiſts of London, uſed for thoſe purpoſes under this name, though differing from the true *Cortex Winteranus*, as may appear from the deſcriptions of both; but may very well ſupply its place. Phil. Tranſ. N°. 192. See the article CORTEX, *Cycl.*

WIOCHIST, among the Indian natives of Virginia, is their prieſt, who is alſo generally their phyſician; and is the perſon in the greateſt honour amongſt them, next to their king, or great war captain. Phil. Tranſ. N°. 454. Sect. 1.

WIRE (*Cycl.*)—Iron *Wire* is made from ſmall bars of iron, which are called *oſleom iron*, which are firſt drawn out to a greater length, and to about the thickneſs of ones little finger, at a furnace, with a hammer gently moved by water. Theſe thinner pieces are bored round, and put into a furnace to aneal for twelve hours. A pretty ſtrong fire is uſed in this operation.

After this they are laid under water for three or four months, the longer the better; then they are delivered to the workmen, called *rippers*, who draw them into *Wire* through two or three holes. After this they aneal them again for ſix hours, and water them a ſecond time for about a week, and they are then delivered again to the rippers, who draw them into *Wire* of the thickneſs of a large packthread. They are then anealed a third time, and then watered for a week longer, and delivered to the ſmall *Wire*-drawers, called *overhouſe-men*.

In the mill where this work is performed, there are ſeveral barrels hooped with iron, which have two hooks on their upper ſides, on each whereof hang two links, which ſtand acroſs, and are faſtened to the two ends of the tongs, which catch hold of the *Wire*, and draw it through the hole. The axis on which the barrel moves does not run through the center, but is placed on one ſide, which is that on which the hooks are placed, and underneath there is faſtened to the barrel a ſpoke of wood, which they call a *ſwingle*, which is drawn back a good way by the cogs in the axis of the wheel, and draws back the barrel, which falls to again by its own weight. The tongs hanging on the hooks of the barrel are by the workmen faſtened to the end of the *Wire*, and by the force of the wheel,

the hooks being pulled back, draw the *Wire* through the holes.

The plate in which the holes are is iron on the outſide, and ſteel on the inſide; and the *Wire* is anointed with train oil, to make it run the eaſier. *Ray*'s Engliſh Words, p. 133.

WIRES *of Aſteriæ*, in natural hiſtory, a name given by authors to a ſort of extraneous foſſil belonging to the Aſteriæ, and being a ſort of branches from the body of that column. See the article ASTERIA.

WIRE *of Lapland*. The ſavage inhabitants of Lapland have a ſort of ſhining ſlender ſubſtance in uſe among them on ſeveral occaſions, which is much of the thickneſs and appearance of our ſilver *Wire*, and is therefore called by thoſe who do not examine its ſtructure or ſubſtance, *Lapland-wire*.

The people of this miſerable country find many uſes in every thing nature has afforded them, and, among the reſt, that ſpecies of ſtag called the rein-deer, which is the moſt frequent animal among them, is not only ſerviceable in furniſhing them with meat, cloaths, houſes, and the means of carriage and travelling; but its bones make many of their moſt neceſſary utenſils; and the ſinews, which are all carefully ſeparated in the eating, are, by the women, after ſoaking in water, and beating, ſpun into a ſort of thread, which is of admirable fineneſs and ſtrength, when wrought to the ſmalleſt filaments; but when larger, is very ſtrong, and fit for the purpoſes of ſtrength and force. Their *Wire*, as it is called, is made of the fineſt of theſe threads, covered with tin. The women do this buſineſs, and the way they take is to melt a piece of tin, and placing at the edge of it a horn with a hole through it, they draw theſe ſinewy threads, covered with the tin, through the hole, which prevents their coming out too thick covered. This drawing is performed with their teeth, and there is a ſmall piece of bone placed at the top of the hole, where the *Wire* is made flat, ſo that we always find it rounded on all ſides but one, where it is flat.

This *Wire* they uſe in embroidering their cloaths as we do with gold and ſilver; and they often ſell it to ſtrangers, under the notion of its having certain magical virtues. *Scheffer*, Hiſt. Lapland.

WIT-*Fiſh*, in zoology, a name given by the Dutch in the Eaſt Indies to a fiſh common on thoſe coaſts, and ſeeming to be of the tænia kind. It is of the ſize of our common whiting. Its back is ſtrait and even, and its belly prominent. Its ſnout is pointed ſomewhat upwards, and its tail forked. It has one ſingle ſpine or prickle on its back, and has a long belly-fin reaching from the head to near the tail. Its whole body is ſtriated, and it has two long filaments or beards hanging from its ſnout, and is a very fine and delicate fiſh. *Ray*'s Ichthyography, Append. p. 6.

WIT-*Fiſh* is alſo the name given by the Dutch to an Eaſt Indian fiſh, of the herring kind, caught in great plenty near the ſhores in many places, and called by Mr. Ray, *albula-Indica*. *Ray*'s Ichthyogr. Append. p. 3. See the article ALBULA-*Indica*.

WITCHES *Butter*, a name given by the common people of England to a ſort of tremella growing on the bark of old trees, in form of a corrugated membrane. See the article TREMELLA.

WITCH-*Craft* (*Cycl.*)—The old laws made in England and Scotland againſt conjuration and *Witch-craft* are repealed by a late ſtatute, and no perſon is to be proſecuted for any ſuch crime, 9 Geo. 2. c. 5. Sect. 1, 2, & 3.

But pretenders to *Witch-craft*, or to tell fortunes, or to any crafty or occult ſcience to diſcover ſtolen goods, may be impriſoned for a year, put in the pillory, and bound over to their good behaviour. Ibid. Sect. 4.

WITHERS, (*Cycl.*) that part of a horſe where the mane ends, being joined to and ending at the tip of the ſhoulder-blades.

Theſe parts ſhould be well raiſed and pretty ſtrong, for this is a ſign of ſtrength and goodneſs in the horſe. They keep the ſaddle from coming forward upon the horſes ſhoulders and neck, which immediately galls and ſpoils him. A hurt in this part is very difficult to cure, and, for this reaſon, they ſhould be lean rather than fleſhy, as they are then leſs ſubject to be bruiſed and hurt by the ſaddle.

When there are ſores on the *Withers*, the cauſe muſt be looked to, in order to determine a proper cure, and prevent a return.

If the hurt be cauſed by the largeneſs of the ſaddle-bands, provided that it be not too great, it may eaſily be cured by the following remedy: Take the whites of ſix eggs, beat them with a piece of alum as big as an egg for a quarter of an hour, or till the whole is reduced to a thick ſcum or froth; let the ſwelling be rubbed well with this mixture, and then covered over with more of the froth; this is to be left to dry on, and the application is to be repeated every ten or twelve hours; notwithſtanding that the heat and ſwelling remains, this, by degrees, will take place, though not at firſt.

If the hurt be great, recourſe muſt be had to bleeding; and this may be repeated after two days, if the ſwelling and inflammation continue.

If a tumour, with great inflammation, follow a bruiſe with the ſaddle-bows, the part affected is to be rubbed with lime-water, and covered with a lamb's ſkin, the woolly part next the back: after the waſhing, the ointment, well known among our farriers by the name of the *Duke's ointment*, is to be applied; and if the tumour inclines to ſuppurate, the ointment muſt be waſhed off with a mixture of vinegar and water warmed, mixed with a handful of ſalt to every quart of it: an ointment is then to be made of half a pound of populeon, and a quarter of a pound of black ſoap, and as much honey: theſe are to be thinned with a large glaſs of ſpirit of wine, and the part is to be well rubbed with ſome of this three or four times a day, covering it afterwards with a lamb's-ſkin. Some uſe, inſtead of this ointment, a pultice made of powder of cummin-ſeed, linſeed-oil, and pigeons-dung, which does as well.

WITHERS *of the Bow of a Saddle*, in the manege. See the article BOW.

WITHER-*Band*, in the manege, a band or piece of iron laid underneath a ſaddle, about four fingers above the withers of the horſe, to keep tight the two pieces of wood that form the bow.

WITHER-*Wrung*, in the manege. A horſe is ſaid to be *Wither-wrung*, when he has got a hurt in the *Withers*; which ſort of hurts are very hard to cure. See the article WITHERS, *ſupra*.

WITTENA-*Gemot* (*Cycl.*)—In the Saxon times this was the chief court of the kingdom, where all matters, both civil and criminal, and thoſe relating to the revenue, were determined. In civil and criminal matters, it was a court, in the firſt inſtance only, for facts ariſing in the county where it ſat; but it heard and determined cauſes from all other counties, by way of appeal. *Lambard*, Archaionom. 57, 239, 245. Mirror, c. 5. Sect. 1.

To this court were ſummoned the earls of each county, and the lords of each leet, as alſo the repreſentatives of towns, who were choſen by their burgeſſes. *Lambard*, Archaionom. 239.

WITWALL, a common Engliſh name for the great ſpotted wood-pecker, the *picus varius major* of authors. See the article PICUS.

WOAD, *Iſatis*, in botany. See the article ISATIS.

This uſeful plant makes a very conſiderable article in trade, and is in many parts of the kingdom propagated to very great advantage.

It requires a dry and warm ſoil, which ſhould have lain quiet for ſome time before. The land it is ſown on muſt be laid very even, and all the clods and large ſtones taken away. It is to be ſown in the latter end of July, ſoon after the ſeed is ripe. It will come up in Auguſt, and muſt then be houghed, leaving the plants about ten or twelve inches aſunder, that they may be ſtrong, and produce the larger leaves. It is never ſown more than two years upon the ſame land, becauſe it robs it greatly. It is ripe for the cutting at different ſeaſons, according to the dryneſs or moiſture of the weather; but when the leaf is full grown, and of a fine green colour, it is known to be fit for uſe, and is to be cut immediately, leſt it ſhould turn pale by ſtanding.

Good *Woad* will yield five or ſix crops in a plentiful year, and very ſeldom gives leſs than three or four. The two crops firſt cut are always the beſt, and theſe are not to be mixed among the after-cuttings.

An acre of ground uſually yields, one year with another, about a ton, which ſells, according to its goodneſs, for from ſix pounds to thirty. *Miller*'s Gardeners Dict.

According to Mortimer, the proper ſoil for this uſeful plant is a warm and rich land, and the longer it has lain unploughed the better, for the *Woad* requires a great deal of nouriſhment. It will do very well on ſandy and gravelly ſoils, if they are of a good depth, and have rich mould among them.

When land is too rank for corn, nothing can prepare it for this crop better than *Woad*, abating the too great fertility of it. The land where it is to be ſowed muſt be laid very level, and the clods all broken. The time of ſowing it is from the beginning to the middle of February. It muſt be kept conſtantly weeded; but if it come up ſtrong, it will need the leſs trouble of this kind, as it will kill the weeds of itſelf. The plant muſt be gathered when the leaves are fully grown, and have not yet loſt their colour. What grows in winter is of no uſe as *Woad* for the dyers, but it is an excellent food for ſheep. If the ground be dry, it muſt be watered for a day or two before the ſeed is ſown, otherwiſe it does not ſucceed well.

It is remarkable of *Woad*, that it requires a peculiarity of climate to bring it to its perfection, and make it fit for the dyers uſe; and that in many places where it ſeems to grow vigorouſly, it yet never ripens this juice, which is its only value, to any degree of colour.

The French cultivate this herb in as large quantities as we do in England, and have tried in many provinces; but they find it fail in ſeveral of them. In upper Languedoc it arrives at a very great degree of perfection, and its leaves are very large and ſucculent, and furniſh a blue colour, very uſeful in dying ſtuffs of all kinds; but in Normandy, where there is much land proper to cultivate it on, it has been often tried with all the advantages of manure and huſbandry; but the want of a ſufficient degree of heat will not ſuffer it to arrive at perfection. Its leaves, tho' as large as thoſe of the Languedoc *Woad*, are never ſo thick or ſucculent, and the colour they afford is

ſmall

ſmall in quantity, and of a duſky-browniſh hue, that renders it little regarded. Trait. Phyſ. de *Deſlandes*.

Though *Woad* gives a blue dye, yet it is uſed to prepare cloth for green and many other colours, when they are deſigned to be permanent, and not to fade. *Boyle*'s Works abr. vol. 1. p. 169.

Beſide the plant properly ſignified by the name *Woad*, which dyes a blue colour, we have two others known in our Engliſh herbals under this name, as alſo that of *wold* or *weld*. Theſe are both called by the common people *dyer's weed*, and are the *luteola* and the *geniſta tinctoria*.

The antients confounded all theſe three plants alſo under the ſame names. Paulus Ægineta ſeems to make them all the ſame plant; and Neophytus, ſpeaking of the *iſatis*, or our *Woad*, properly ſo called, ſays, that it was called by the Latins, *lutum*. This *lutum* has been by ſome underſtood to mean the *luteola*, and by others the *geniſta tinctoria*; but the latter opinion only is right, for it is deſcribed to us by the antients as having leaves like the *linum*, or flax, and flowers like the broom.

WOLF, *Lupus*, in zoology. See the article LUPUS.

WOLF, in the hiſtory of inſects, the name of a ſmall white worm or maggot, which infeſts granaries, and does very great damage there.

It is in this ſtate of the worm that it does the miſchief; but this is not its perfect form, for it is afterwards transformed into a ſmall moth, with white wings ſpotted with black.

This little maggot has ſix legs, and as it creeps along, there iſſues from its mouth an extremely fine thread or web, by which it faſtens itſelf to every thing it touches, ſo that it cannot fall. Its mouth is furniſhed with a pair of reddiſh forceps, or biting inſtruments, by means of which it gnaws its way not only into wheat and other grain, but perforates even beams of wood, boxes, books, and every thing it meets with.

Toward the end of ſummer this pernicious inſect may be ſeen crawling up the walls of corn-chambers, infeſted with them, in great numbers; they are then ſearching a proper place where they may abide in ſafety during their aurelia-ſtate; for when the time of their undergoing this change approaches, they forſake their food, and the little cells they had formed of hollowed grains of corn clotted together, by means of the web coming from their mouths. They now wander about till they find ſome wood, or other ſubſtance, to their mind, into which they gnaw holes with their phangs, capable of concealing them; and there enveloping themſelves in a covering of their own ſpinning, they ſoon become a dark coloured ſort of aurelia. They remain in this ſtate all the winter; but in April or May they come forth in their moth-ſhape, and are then ſeen in vaſt numbers taking ſhort flights, and creeping up the walls. In this ſtate they eat nothing; but they ſoon copulate and lay eggs, which are in the ſhape of a hen's egg, but no larger than a grain of ſand. Each female lays ſixty or ſeventy eggs, which ſhe depoſits in the little wrinkles of the grains of corn, where in about ſixteen days they hatch, and the minute maggots immediately perforate the grain, and eat out all its ſubſtance, and with the threads which come from their mouths cement other grains to it, which they, in the ſame manner, ſcoop out and deſtroy.

The watchful obſerver has two opportunities of deſtroying theſe devourers from among his corn. One is, when they forſake their food, and aſcend the walls, which they will ſometimes almoſt cover. The other, when they appear in the moth-ſtate. At both theſe times they may be cruſhed to death againſt the walls in great numbers, by clapping ſacks upon them: but they may be exterminated more effectually by cloſing up all the windows and doors, and burning brimſtone on a pan of charcoal, letting the room be full of the fumes of it for twenty-four hours. This certainly deſtroys the animals, and does no ſort of injury to the grain, not communicating the ſlighteſt ſcent to it. *Baker*'s Microſcope, p. 222.

WOLF-*Fly*. See the article LUPUS.

WOLF-*Spider*. See the article LUPUS.

WOLF-*Net*, a term uſed by the ſportſmen for a kind of net uſed in fiſhing, which takes great numbers, and has its name from the deſtruction it cauſes.

It is uſed both in rivers and ponds, and is of the nature of the rattle, excepting only the wanting the four *Wings*. The trunk or coffer conſiſts of ſeven feet, beſide the two gullets. It is ſupported by hoops, and is to be placed in ſome part where there is an abundance of ſedges, ruſhes, and water-graſs. There is to be a place made for the net here, by the uſe of a paring-knife, cutting away all the weeds and other matter, for the ſpace that will contain it; and when the net is placed, there are to be two allies cut or cleared in the ſame manner, one on each ſide of the net, that the fiſh may be invited into them, and by them into the net. There muſt be ſome ſtones or leaden weights uſed to ſink the net, and a long pole faſtened to the upper part of the mouth of it, by means of which, when it is well filled with fiſh, it may be lifted up and taken to the ſhore.

WOLF-*Tooth*, a term uſed by our dealers in horſes to expreſs an inconvenience that creature is ſubject to, in regard to its teeth.

There are uſually two of theſe *Wolves*-teeth, which are ſmall, and grow in the upper jaw, next to the great grinding teeth: theſe are ſo tender and painful, that the horſe cannot chew its meat, but is forced to let a great part of it fall out of his mouth, or to ſwallow it half chewed.

The remedy, in this caſe, is to tie up the horſe's head to ſome part of the rafter, and open his mouth with a cord, then with an inſtrument like a carpenter's gouge, and a mallet, the teeth that are thus troubleſome are to be knocked out, and the holes filled up with ſalt.

If the upper-jaw teeth hang over thoſe of the under jaw, and by that means cut the mouth, the ſame inſtrument is to be uſed, and the teeth are to be pared ſhorter by little and little. When they are ſufficiently pared down, they muſt be filed ſmooth, and the mouth waſhed with vinegar and ſalt, and the whole complaint will be thus removed.

WOLF's-*Grapes*. See the article LYCOSTAPHYLÆ.

WOLF's-*Peach*. See the article LYCOPERSICON.

WOMB (*Cycl.*)—It is the opinion of Boyle, that as in the earth, which is the fruitful *Womb* of all the ſeeds of plants, ſo in the *Wombs* of all animals, while in a fit and proper ſtate for conception, there muſt concur three things; a benign heat to cheriſh, a due fermentation to agitate and dilate, and a due proportion of moiſture, ready to enter with eaſe into the pores opened by the fermentation.

To theſe qualities is owing, in all probability, the menſtrual diſcharge of women, the blood being agitated and rarified, in a part deſtined to theſe offices, for the uſe of an included fœtus; and when that is not there, this fluid ſwells, and opens the veſſels, ſo as to burſt out into a profluvium. It is remarkable that the *Womb* in the human, and one more ſpecies of animal beſide, that is, the monkey, diſcharges this blood regularly; all other animals, at the time of the efferveſcence in that part, which is at intervals of longer periods, diſcharging only a ſmall quantity of an aqueous matter, as is ſeen in mares, cows, &c. It is obſerved by the medical writers, that there is an evident conſent of many parts of the body with the *Womb*, that is, ſeveral parts which are always affected with it, and owe their being affected to ſome diſorder in that part, which it propagates and continues to them.

The antients had an opinion of ſympathy on this occaſion; but ſuch obſcure and unmeaning ſolutions are now thrown aſide; and we find that this joint affection of the ſeveral parts to the *Womb*, is owing only to the vicinity of the parts, or the communication and ſtructure of the veſſels, by which the vitiated liquors of the body being conveyed from one part to another, may there excite the ſame or different affections: but becauſe this way of ſympathiſing by veſſels has many conſiderable and unobvious varieties, theſe muſt be examined at large, in order to a perfect underſtanding of the effects they produce. The diverſity and various uſes of the veſſels in the bodies of the perfecter animals muſt be underſtood; and the neceſſity of motion and ſenſe depending from the brain, the animal ſpirits, and the ſyſtem of the nerves, conſidered: the nature and office of theſe being well underſtood, it will appear plainly, that they, being thus diſperſed through the whole body, cannot but produce a conſent of parts through the whole; but that this will be moſt ſenſible where the connections are greateſt, and leaſt ſo where leaſt. *Boyle*'s Diſſertationes Medicæ.

The *Womb* has been generally ſuppoſed ſo extremely tender a part, that the leaſt ſcratch or injury offered it, muſt cauſe an inflammation, of which death itſelf would be the conſequence. But the Paris academy affords, in their memoirs, an inſtance ſomething very different from this. A waſher-woman, of a robuſt habit of body, and about thirty years old, who was then ſix or ſeven months gone with child, accidentally fell down upon a ſtake of an old pale, which wounded her to two or three fingers breadth, and a conſiderable depth, a little below the navel: from that time ſhe never felt the child ſtir; but eight days after, ſhe voided, by the vagina, a large quantity of putrid blood, and this continued eight or ten days.

The external wound was healed in the common way, and the woman went to her uſual work, and continued well to her nine months end; ſhe now expected delivery, but no pains came on, and ſhe thus continued to the fifteenth month without much uneaſineſs; but then ſhe perceived a tumor to ariſe in that part of the belly where ſhe had been hurt. This, in fine, opened of itſelf, and after diſcharging a laudable matter for forty days, at the end of that time it healed up.

In the twenty-ſeventh month this tumor returned again, and became then much larger than before; in three days it became vehemently enraged, and, on opening it, there was diſcharged a quart of ſtinking matter, which greatly relieved her; after three more days dreſſing, there began to appear ſome bones, and, in fine, day by day ſome were diſcharged, till, on the whole, the compleat ſkeleton of a fœtus of between ſix and ſeven months was diſcharged.

In this caſe, there is no doubt but that the *Womb* itſelf was pierced through by the point of the ſtake, at the time of the fall, and the fœtus killed by the wound, and afterwards becoming putrid in the matrix, its parts were diſcharged one by one through the wound in that organ.

This ſeems wholly contradictory to that great tenderneſs ſuppoſed

poſed in the uterus; and ſhews that, as no part is by anatomiſts allowed more delicate, ſo there is ſcarce any caſe in which nature and good conſtitution cannot make a cure.

It is to be obſerved alſo, in regard to this woman, that in the fourteenth month after her fall, ſhe found herſelf again with child; but this ended in a miſcarriage.

Several bundles of muſcular fibres enter the ſtructure of the *Womb*. Ruyſch mentions an orbicular muſcle at its fundus; which, Mr. Monro ſays, he has alſo ſeen. Vide Med. Eſſ. Edinb. vol. 2. p. 128. and *Ruyſch*, Epiſtolæ de muſcul. in fund. Uteri.

The human uterus has numerous orifices of veſſels opening into its cavities, to pour out liquors there.

Towards the fundus of the *Womb* eſpecially, theſe orifices are found to be the extremities of canals that come out from larger cavities, lodged within the ſubſtance of the *Womb*. Theſe cavities are commonly called ſinuſes. See the article SINUSES *of the Womb*.

It is a queſtion among anatomiſts and phyſiologiſts, whence the cavity in the *Womb* is formed, which in the laſt months contains the infant, the greateſt part of the waters, and all the ſecundines, except the placentia? As to which, the curious may conſult the learned Dr. *Thomas Simpſon*'s Diſſertation in the Medic. Eſſ. Edinb. vol. 4. art. 13.

WOMEN (*Cycl.*)—*Lying-in* WOMEN. See the articles LYING-*In*, DELIVERY, LOCHIA, and MOLA.

Pregnant WOMEN. See the articles PREGNANCY and GRAVIDITAS.

WOOD (*Cycl.*)—The ſtructure and organization of *Wood* is a ſubject on which many have employed their thoughts; but perhaps none with greater ſucceſs than the celebrated Monſieur Buffon, of the Royal Academy of Sciences at Paris.

This gentleman obſerves that the organization of *Wood* is yet unknown in all its parts; and that though the world is greatly indebted to the obſervations of Grew, Malpighi, and Hales, yet, when he entered on the ſubject, he found there was much more unknown than known, and determined to obſerve, from its firſt ſtate, the growth of trees, and the formation of their woody part.

The ſeed of a tree, ſuppoſe an acorn, if put into the earth in the ſpring ſeaſon, produces, after a few weeks, a tender ſhoot, of an herbaceous ſtructure, which enlarges, extends itſelf, and hardens by degrees, and in the firſt year's growth, has in it a ſlender filament of a *woody* ſubſtance. At the extremity of this young tree there is a little button formed, which opens the next year into leaves, and from which there is propagated a ſecond ſhoot, in all reſpects like that of the firſt year, except that it is more vigorous, grows faſter, and hardens much more conſiderably. This is alſo terminated by a button like that of the precedent year, and in this is contained the ſhoot of the third year; and in this manner is the growth of the tree carried on, till it has acquired its whole height.

Each of theſe buttons is a ſort of ſeed, which contains the ſhoot of the ſucceeding year, juſt as the ſeed itſelf did that of the firſt: and the growth of a tree in height is carried on therefore by a ſeries of annual productions, exactly like one another, and the full-grown tree is, though perhaps a hundred foot high, compoſed only of a number of ſhort trees, joined end to end, the longeſt of which is not above two foot in length. Theſe little trees of the ſeveral years never at all alter their height or length, or even their thickneſs; they remain even in a tree of a hundred years old, of their original length and diameter, and ſuffer no change, but in becoming harder. This then is the manner in which trees grow in height; how they grow in thickneſs is next to be inquired into.

The button, which makes the ſummit of the tree of the firſt year, draws it nouriſhment through the very ſubſtance of that little tree; but the principal tubes or veſſels which ſerve to convey the ſap, are placed between the bark and the *woody* filament.

The action of this ſap in moving, dilates and enlarges theſe veſſels, while the button, in raiſing itſelf up in growth, elongates them; the ſap alſo, in continually paſſing them, leaves behind it certain fixed parts, which augment the ſolidity. Thus the ſecond year's little tree contains in its middle a *woody* filament in form of an elongated cone, which is the production of the *Wood* of a former year, and a *woody* bed for it, which is alſo of a conic ſhape, and which ſurrounds the firſt filament, and reaches beyond it in length; and this is the production of the ſecond year. The third bed forms itſelf altogether like the ſecond, and all the ſucceeding ones are formed by the ſame law, and in the ſame order, and envelope one another in a continued ſucceſſion or ſeries, ſo that a large tree is compoſed of a number of *woody* cones, which enfold, cover, and envelop one another, as the tree increaſes in thickneſs.

When the tree comes to be cut down, one eaſily counts, in a tranſverſe ſection of the trunk, the number of theſe cones, the ſections of which make ſo many concentric circles; and the age of the tree is known by the number of theſe circles, for they are diſtinctly ſeparate from one another; in a vigorous and well-grown oak, theſe lines are each of a ſixth of an inch or more in thickneſs, and the ſubſtance of theſe lines or circles is very hard and firm, but the ſubſtance of the *Wood*, which lies between, and unites theſe to each other, is much leſs ſo. This intermediate matter is always the weak part of the *Wood*, and its ſtructure and organization is perfectly different from that of the *woody* cones, and depends entirely on the manner in which thoſe cones are united to one another. This is thus explained:

The veſſels, which are longitudinally diſpoſed in the *Wood*, and convey the nouriſhment to the button, not only are extended and hardened by the action of the ſap in motion, and by the firm particles it depoſits; but they are ever attempting alſo an extenſion of another kind; they are ramified all along as they go, and break into numberleſs extremely minute filaments, which iſſue from them like ſo many branches; theſe, on the one part, are deſtined to the production of the bark of the tree; and on the other, are connected to the *Wood* of the preceding year, and form between the two *woody* beds a ſort of ſpungy reticular work, which, when cut tranſverſely, even to a great thickneſs, ſhews numberleſs little cavities and holes, reſembling a ſort of lace-work. The *woody* beds are therefore united to one another by a ſort of net-work; this net-work, however, does not occupy nearly the ſpace of the *woody* circles which it ſeparated, and is uſually indeed but about a ſixth part of their thickneſs. This thickneſs is much the ſame in all the trees of the ſame ſpecies, whereas the *woody* beds vary in them very conſiderably in thickneſs; in the oak they are found from a ſixth to a four and twentieth part of an inch in thickneſs.

By this eaſy expoſition of the texture of *Wood*, it is eaſy to diſcover that the longitudinal coherence of the particles of it muſt needs be vaſtly greater than the tranſverſe: one ſees alſo that, in little pieces of *Wood*, as in a bar of an inch thickneſs, if there are fourteen or fifteen of theſe *woody* beds, there will alſo be thirteen or fourteen of theſe intermediate ſpaces; and conſequently it will be much weaker than if there were but five or ſix of theſe *woody* beds in it, and conſequently but four or five of theſe intermediate ſpaces.

It may alſo be obſerved, that in thoſe little bars of *Wood* there are two or three of the *woody* beds wounded, which is often the caſe; the ſtrength of the bar muſt be thence greatly impaired: but the greateſt fault theſe ſmall pieces of *Wood* are ſubject to, is the different diſpoſition of theſe beds in the different parts of the ſame tree; and this difference is ſo great, that the force or ſtrength of a large beam of any *Wood*, cannot be computed by proportion, from that of a ſmall piece of the ſame *Wood*; which, were it poſſible, would make calculations of this kind extremely eaſy. The ingenious author of this paper has from hence calculated the force and ſtrength of timber uſed in building. Memoirs Acad. Par. 1740. See the article TIMBER.

All kinds of *Wood* are to be preſerved from the worm, and from many other occaſions of decay, by oily ſubſtances, particularly the eſſential oils of vegetables. Oil of ſpike is excellent, and oil of juniper, turpentine, or any other of this kind, will ſerve the purpoſe; theſe will preſerve tables, inſtruments, *&c.* from being eaten to pieces by theſe vermin, and linſeed oil will ſerve, in many caſes, to the ſame purpoſe; probably nut-oil will do alſo, and this is a ſweeter oil, and a better varniſh for *Wood*. *Mortimer*'s Huſbandy, vol. 2. p. 105. See the article TIMBER.

Some of the Weſt-Indian trees afford a ſort of timber which, if it would anſwer in point of ſize, would have great advantages over any of the European *Wood* in ſhip-building for the merchant-ſervice, no worm ever touching this timber. The acajou, or tree which produces the caſhew-nut, is of this kind; and there is a tree of Jamaica, known by the name of the *white-wood*, which has exactly the ſame property, and ſo have many other of their trees. Phil. Tranſ. N°. 36.

To ſeaſon *Wood* expeditiouſly for ſea-ſervice, it has been uſual to bake it in ovens. *Boyle*'s Works abr. vol. 1. p. 135.

The art of moulding *Wood* is mentioned by Mr. Boyle [b] as a deſideratum in the art of carving. He ſays, he had been credibly informed of its having been practiſed at the Hague; and ſuſpects that it might have been performed by ſome menſtruum that ſoftens the *Wood*, and afterwards allows it to harden again, in the manner that tortoiſe-ſhell is moulded. Or, perhaps, by reducing the *Wood* into a powder, and then uniting it into a maſs with ſtrong but thin glue. And he adds, that, having mixed ſaw-duſt with a fine glue made of iſing-glaſs [c], ſlightly ſtraining out what was ſuperfluous through a piece of linnen, the remainder formed into a ball and dried, became ſo hard as to rebound when thrown againſt the floor.—[[b] Works abridged, vol. 1. p. 130. [c] See the article GLUE.]

The people who work much in *Wood*, and that about ſmall works, find a very ſurpriſing difference in it, according to the different ſeaſons at which the tree was cut down, and that not regularly the ſame in regard to all ſpecies, but different in regard to each. The button-mould-makers find that the *Wood* of the pear-tree, cut in ſummer, works toughеſt; holly, on the contrary, works toughеſt when cut in winter; box is melloweſt when it has been cut in ſummer, but hardeſt when cut about Eaſter; hawthorn works mellow when cut about October, and the ſervice is always tough if cut in ſummer. *Merret*'s Notes on Neri, p. 263.

It is a very well known quality of metals, to be longer and larger when

when hot, and ſhorter and ſmaller when cold: A thouſand experiments prove this, and the books of experimental philoſophy have ſufficiently expatiated upon it; on the contrary, it is found to be the property of *Wood*, that it is longeſt in cold weather and ſhorteſt in hot; this change is owing to the remains of the ſap yet in the *Wood*, which being condenſed by cold is enlarged in its ſurface, as all liquors are when frozen into ice; and ſhrinks into a leſs ſpace or bulk again, when liquated by heat.

It follows from this, that all *Wood* muſt change its ſurface more or leſs, according as it contains more or leſs ſap, and this may be made a teſt of great uſe for the determining what kinds of *Wood* have moſt, and what leaſt ſap. This would be a very valuable piece of knowledge, ſince there are many uſes for which that ſort of *Wood* muſt always ſerve beſt, which has the ſmalleſt quantity of ſap remaining in it. See the article HYGROSCOPE, *Cycl.* and *Suppl.*

Thus, in the great article of preſerving of flour, no barrels are at preſent uſed, but thoſe of ſeaſoned dry oak; the whole advantage of this *Wood* is, that it contains leſs ſap than others; for the ſap in the *Wood* makes the flour damp, and it then becomes rancid, and breeds worms. So that if any other *Wood* can by this means be found out to contain leſs ſap when dried in the common way than oak does, it will be ſo much the better for this purpoſe; or if a cheaper *Wood* ſhould be found only to contain as little ſap as the oak, it would do as well, and the price of oak would be ſaved in theſe veſſels.

A proper way of trying when the ſap was ſufficiently exhaled out of trees, might alſo be found by this experiment, and much benefit would accrue from it; for our ſhips, when made of timber not ſufficiently dried, prove injurious to the healths of the people on board; and it has been remarked both by the French and ourſelves, that many more men in general die in the firſt voyage of a new ſhip, than in the ſame time in an old one; and indeed the firſt ſix months are uſually obſerved in this caſe to be moſt fatal. The exhalation of the ſap from the *Wood* of the veſſel, is certainly the occaſion of this, and if it could be contrived to have this ſap properly exhaled before the timber was uſed, it would not only prevent this mortality among the men, but the veſſel itſelf would be the ſounder, and the better for it. *Deſlands*, Trait. de Phyſ.

Wood uſed for fuel is required of various kinds, in regard to the various works to be performed by it.

Neri every where commends oak for the *Wood* to be burnt in the glaſs-houſes, as the propereſt *Wood* for making a ſtrong and durable fire with a good flame.

Imperato, on the contrary, commends aſh on the ſame occaſion; becauſe, as he ſays, it gives a ſubſtantial, rather than a great flame: And Camerarius deſervedly commends juniper *Wood*, as affording a laſting ſtrong and ſweet fire, could plenty of it be had. Among the antients, Pliny commends light dry *Wood*; and Plutarch, the tameriſk in particular, for making the glaſs-houſe fires; but glaſs-making requires ſo great a fire, as cannot be eaſily made from ſuch *Wood*. Nor can aſh be proper, becauſe though it gives a good fire, it ſoon decays. *Merret*'s Notes on Neri, p. 275.

Foſſile WOOD. *Foſſile Wood*, or whole trees or parts of them, are very frequently found buried in the earth, and that in different ſtrata; ſometimes in ſtone, but more uſually in earth; and ſometimes in ſmall pieces looſe among gravel. Theſe, according to the time they have lain in the earth, or the matter they have lain among and in the way of, are found differently altered from their original ſtate; ſome of them having ſuffered very little change, and others being ſo highly impregnated with cryſtalline, ſparry, pyritical, or other extraneous matter, as to appear mere maſſes of ſtone or lumps of the common matter of the pyrites, *&c.* of the dimenſions, and more or leſs of the internal figure of the vegetable bodies into the pores of which they have made their way.

The *foſſile Wood*, which we find at this day, may, according to theſe differences, be arranged into three kinds: 1. The leſs altered. 2. The pyritical. And, 3. the petrified.

Of the trees or parts of them leſs altered from their original ſtate, the greateſt ſtore is found in digging to ſmall depths in bogs, and among what is called peat or turf-earth, a ſubſtance uſed in many parts of the kingdom for fuel. In digging among this, uſually very near the ſurface, they find immenſe quantities of vegetable matter buried, and that of various kinds: In ſome places there are whole trees ſcarce altered, except in colour; the oaks in particular, being uſually turned to a jetty black; the pines and firs, which are alſo very frequent, are leſs altered, and are as inflammable as ever, and often contain between the bark and wood a plain reſin. Large parts of trees have alſo been not unfrequently met with unaltered in beds of another kind, and at much greater depths, as in the ſtrata of clay and loam, among gravel, and ſometimes even in ſolid ſtone. *Hill*'s Hiſt. of Foſſ. p. 638.

Beſide theſe harder parts of trees, there are frequently found alſo in the peat-earth vaſt quantities of the leaves and fruits and catkins of the hazel, and the like trees; theſe are uſually intermixed among the ſedge and roots of graſs, and are ſcarce at all altered from their uſual texture. The moſt common of theſe are hazel nuts; but there are frequently found alſo the twigs and leaves of the white poplar; and a little deeper uſually there lies a cracked and ſhattered *Wood*, the crevices of which are full of a bituminous black matter; and among this the ſtones of plumbs and other ſtone-fruits are ſometimes found, but that more rarely.

In places where the fir and pine kinds are buried, the ſmaller twigs, and the cones or fruit are frequently met with near the ſurface, the bodies of the trees being lodged deeper. The oaks are in many places ſo found, that the *Wood* is little inferior in hardneſs to that cut out of the moſt ſolid freſh tree. The foſſile trees in our peat-earth and moors are often found entire, with their roots remaining fixed to them; but more frequently the bodies of the trees are broken off near the roots, and that and the tops of the branches with the fruit, which are often ſeparated alſo, are found at ſmall diſtances in the ſame moor: Many of the larger branches are alſo found ſevered from theſe trees, and lying at ſome diſtance; when the roots are torn up and lie in irregular directions, the extremities of theſe are alſo broken off. But very frequently the roots of trees remain in their natural poſition, and their larger roots and tap-root run ſtrait down into the clay, or other ſolid ſtratum which is the bottom of the bog; the ſtump remaining above the ſurface, and the tree lying horizontally at a ſmall diſtance, buried at a greater or ſmaller depth.

It is idle to imagine, that theſe have been thus buried either at the creation, or, as many are fond of believing, at the univerſal deluge: at the firſt of theſe times the ſtrata muſt have been formed before trees were yet in being, and the peat *Wood* is ſo far from being of antediluvian date, that much of it is well known to have been growing within theſe three hundred years, in the very places where it is now found buried.

In this ſtate, that is little altered from their original condition, it is, that the fruits, and larger parts of trees are uſually found; what we find of them more altered, are ſometimes large and long, ſometimes ſmaller and ſhorter branches of trees; ſometimes ſmall fragments of branches, and more frequently ſmall ſhapeleſs pieces of *Wood*. The larger and longer branches are uſually found bedded in the ſtrata of ſtone, and are more or leſs altered into the nature of the ſtratum they lie in: The ſhorter and ſmaller branches are found in vaſt variety in the ſtrata of blue clay, uſed for making tiles in the neighbourhood of London; theſe are prodigiouſly plentiful in all the clay-pits of this kind, and uſually carry the whole external reſemblance of what they once were, but nothing of the inner ſtructure; their pores being wholly filled, and undiſtinguiſhably cloſed by the matter of the common vitriolic pyrites, ſo as to appear mere ſimple maſſes of that matter. Theſe fall to pieces, on being long expoſed to a moiſture, and are ſo pregnant in vitriol that they are what are principally uſed for making the green vitriol or copperas, at Deptford, and other places.

The irregular maſſes or fragments of *Wood*, are principally of oak, and are moſt uſually found among gravel; though ſometimes in other ſtrata. Theſe are variouſly altered by the inſinuation of cryſtalline and ſtony particles, and make a very beautiful figure when cut and poliſhed, as they uſually keep the regular grain of the *Wood*, and ſhew exactly the ſeveral circles which mark the different years growth. Theſe, according to the different matter which has filled their pores, aſſume various colours, and the appearance of the various foſſils that have impregnated them; ſome are perfectly white, and but moderately hard; others of a brownish black, or perfectly black, and much harder; others of a reddiſh black, others yellowiſh, and others greyiſh, and ſome of a ferrugineous colour. They are of different weights alſo and hardneſſes, according to the nature and quantity of the ſtony particles they contain: Of theſe ſome pieces have been found with every pore filled with pure pellucid cryſtal; and others in large maſſes part of which is wholly petrified and ſeems mere ſtone, while the reſt is crumbly and is unaltered *Wood*.

That this alteration is made in *Wood* even at this time, is alſo abundantly proved by the inſtances of *Wood* being put into the hollows of mines, as props and ſupports to the roofs, which is found after a number of years as truly petrified as that which is dug up from the natural ſtrata of the earth. In the pieces of petrified *Wood* found in Germany, there are frequently veins of ſpar or of pure cryſtal, ſometimes of earthy ſubſtances, and often of the matter of the common pebbles: Theſe fragments of *Wood* ſometimes have the appearance of parts of branches of trees in their natural ſtate; but more frequently they reſemble pieces of broken boards; theſe are uſually capable of a high and elegant poliſh.

Many ſubſtances, it is certain, have been preſerved in the cabinets of collectors, under the title of petrified *Wood*, which have very little right to that name. But where the whole outer figure of the *Wood*, the exact lineaments of the bark, or the fibroſe and fiſtular texture of the ſtriæ, and the veſtiges

veſtiges of the utriculi and tracheæ or air-veſſels are yet remaining, and the ſeveral circles yet viſible, which denoted the ſeveral years growth of the tree, none can deny ſuch ſubſtances to be real *foſſile Wood*. *Hill*'s Hiſt. of Foſſ. p. 639. See the article *Foſſile* PLANTS.

One of the moſt ſingular inſtances we have of the matter in which *foſſile Wood* may be preſerved, is in Razynſki's hiſtory of Poland; he tells us, that when one of the kings of Poland went to viſit the great ſalt-mines in that kingdom, the ſuperintendant of the works ſhewed him by way of curioſity a vaſt maſs of the hardeſt kind of the ſalt, in which was buried a piece of an arm of a tree; the ſalt was broken with proper inſtruments, and the *Wood* taken out; it proved to be beech, with the texture ſo plainly remaining that it was eaſily known, but its pores all filled with the matter of the ſalt in which it lay. It was of the thickneſs of the bone of a man's arm, and was as perfect and entire as when growing on the tree. It is the only inſtance we have of *Wood* preſerved in this manner; and it would be well if we could by any means aſcertain the time when it was depoſited there. *Razynſki*'s Hiſt. of Poland.

Another remarkable inſtance of the change wrought on *Wood* by lying under the earth, is that of its having been found as it were converted into iron; that is, that the *Wood* has been as thoroughly impregnated with the particles of iron, as that which we uſually call petrified *Wood* is with the particles of ſtone.

Mr. Liebknecht, profeſſor of the mathematics at Giſſen, was the firſt who ever obſerved this ſingular proceſs of nature in the foſſile world: He found in a mine, where there were many iron ores, a piece of aſh-*Wood*, eaſily diſcoverable to be ſuch by the courſe of its fibres; the cortical part or bark of which was petrified or turned into ſtone, as we uſually expreſs it in the common way, and its inner ſubſtance plainly turned into abſolute iron. This part of the ſubſtance was of the colour of iron, and took a like poliſh; it gave the ſame ſound with a piece of iron when ſtruck, and bore the ſtrokes of a hammer in the ſame manner without breaking.

Its ſpecific gravity was alſo greater than that of any ore of iron. All theſe circumſtances gave great probability of its being abſolute iron, but there were others which gave abſolute certainty of that. A piece of this and a piece of a rich iron ore were beaten to pieces ſeparately, and waſhed in ſeveral waters; the iron ore was at firſt evidently lighter, and fouled the water, but the iron in the *Wood* ſunk at once without throwing off any adventitious matter. After ſeveral waſhings, however, the ore being cleared of its earth, *&c.* became heavier than the iron of the *Wood*.

After roaſting both in the fire, the iron in the *Wood* made a violent ebullition with oil of vitriol, and ſent up a thick vapour; but the ore made very little ebullition, and ſent up ſcarce any vapour. This is the more wonderful, as the finding native iron even in the richeſt pieces, is very uncommon; nor does it amount to certainty, from all theſe experiments, that this ſubſtance was really perfect iron. The author obſerves, that after melting with ſalt of tartar it was attracted by the magnet. Act. Erudit. Ann. 1710. See the article *Bog*-WOOD, *infra*.

Jamaica WOOD. See the article BRAZIL, *Cycl.*

Petrified WOOD, the opinions of the judicious part of the world have been very different in regard to the bodies preſerved in the cabinets of the curious, under the name of *petrified Wood*; ſome affirming theſe bodies to have been only pebbles, or flints accidentally formed in this ſhape, and with veins reſembling thoſe of *Wood*; and others affirming, with equal warmth, that they have been really *Wood*, into which ſtony matter has been brought by water.

Many good arguments have been produced on both ſides the queſtion, but Mr. De la Hire has attempted to bring the diſpute to a certain concluſion, by means of ſome peculiarly happy ſpecimens, which were of the palm-tree petrified, found in the deſerts of Africa: theſe on comparing them with pieces of the palm-tree cut out of the recent *Wood*, appeared to have every where the beautiful and regular veins of that *Wood*, and left no room to doubt, but that they certainly had been once the vegetating *Wood* of that tree, though now converted into hard ſtone; the petrified pieces were perfect ſtone, in all its qualities; they had its hardneſs, its ſound when ſtruck upon, and were, as many other ſtones are, opake in ſome places, and tranſparent in others; they were found on weighing them to be often of the ſpecific gravity of recent pieces of the palm *Wood*, of the ſame dimenſions. One of theſe pieces was two foot long, and four or five inches broad; this was part of the trunk of the tree ſtripped of its bark; in this all the fibres ran longitudinally, and wholly reſembled thoſe of the recent *Wood*; a certain portion of them being forked at their ends, as they are in the *Wood*; the fibres were all hollow, even in the ſtone as in the *Wood*, and the interſtitial matter which had joined them together in the tree, appeared in the ſtone to have formed a very ſtrong ſort of cement, approaching to flint. The cavities in the once woody fibres appearing very large, Mr. De la Hire gave the following account of that phænomenon: He obſerved, that long ſoft and maſſy bodies, in drying, very often had their internal parts all drawn toward the circumference, and conſequently from the center; and that the conſequence of this often was, that when the body was perfectly dried, there appeared a more or leſs regular variety in the middle, in form of an empty pipe or canal. The ſmaller branches of many trees, he obſerves, uſually dry ſo, and ſometimes their larger arms and trunks; and this eſpecially when the *Wood* has been of a ſofter nature; this he imagines to have been the caſe in the trunk of this palm-tree, and that its ſeveral fibres, being all long and ſoft, might in drying have had their ſeveral parts recede in this manner from the center to the circumference, ſo as to have at length formed every one of them a ſort of long tube or pipe; and that if this happened to them while woody, it could not but be regularly preſerved in them in their petrified ſtate.

The other ſpecimen was of the bottom of the trunk with a part of the roots: this was not only compoſed like the former of longitudinal fibres perfectly analogous to thoſe of the recent *Wood*, but from its under part there grew ſeveral roots of the thickneſs of a finger, and three inches or more in length: theſe, which were covered with a thin bark, and had within them ſeveral fibres of an inconceivable fineneſs; compoſed the body of each root, as the longitudinal fibres of larger diameters had the *Wood* of the trunk and within theſe there was contained a firm ſubſtance of the nature of the heart in the roots of trees, which had within it a yet different ſubſtance reſembling the pith of the inner part of the ſmall roots of this tree. This being all exactly the ſtate of the ſmall recent roots of the palm-tree, it does not ſeem at all to be ſuppoſed that nature, though ſhe might have imitated barely the longitudinal fibres of a plain piece of *Wood*, accidentally in ſtone, ſhould imitate all the ſeveral parts of which theſe laſt roots are compoſed, all ſo different in themſelves, and all diſpoſed in ſuch exact and nice order. The very colours of the ſeveral parts of theſe roots were different in the ſtone, ſome kind of ſtony matter having probably been fitter to enter the pores of the one part, and ſome other kind of the other. The ſeveral fine fibres which compoſe the body of each root being of a black gloſſy ſtone, of the nature of the common black flint; and the internal part or pith being ſupplied by a white and more ſoft ſtone. The pith having in drying obſerved the ſame law as was before mentioned, in regard to the fibres of the *Wood*, had become hollow like them in the drying, and conſequently this white ſtone appears hollow, and in form of a tube or pipe in many places. The compariſon of this petrifaction in this manner, with the recent *Wood* of the ſame tree, left not the leaſt room to doubt of its true origin.

Father Duchat alſo, an author of unqueſtioned credit, affirms from his own perſonal knowledge, that in the kingdom of Ava there is a river, whoſe waters petrify recent *Wood* into flint; and that he has often ſeen trees ſtanding in it, whoſe bottom part ſo far as covered with the water, has been true flint, while all above was mere dry *Wood*, and fit for firing. Mem. Acad. Par. 1692.

Shining WOOD. There are a great many things in which a piece of rotten *Wood* that ſhines in the dark, agrees with a burning coal; and there are alſo many things, in which they differ. They agree in theſe particulars: 1. They are both of them proper and true luminaries, having light reſiding in them, and are not like looking-glaſſes or white bodies, which are only luminous according to the quantity of light which falls upon them from other bodies, and which they reflect. 2. Both ſhining *Wood* and burning coals require the preſence of the air to keep them ſhining, and both require alſo an air of a conſiderable denſity; and both having been deprived of their ſhining quality by the pumping out of the air, will recover it again on the admitting freſh air to them. 3. Both of them will eaſily be quenched by putting them into water, and many other liquors. And 4. As a live coal will not be extinguiſhed by any coldneſs of the air, neither will the *ſhining Wood* be deprived of its light on any additional coldneſs in that element. Philoſ. Tranſ. N°. 32.

Theſe are the things in which they agree; thoſe they differ in are the following: 1. A burning coal is eaſily put out by compreſſion, the treading on it and ſqueezing it together readily diveſting it of its light; on the other hand, compreſſion or cruſhing of any kind ſeems not to have any effect upon the *ſhining Wood*; its bruiſed parts ſhining as brightly as its entire ones. If a piece of this *ſhining Wood* be ſqueezed between two glaſſes, this experiment will be moſt fairly tried; and in this caſe, though the contexture of the whole be evidently broken, and the parts ſeparated, the light is as ſtrong in them as while the piece was entire. 2. A burning coal extinguiſhed by the drawing out the air, will, after a few minutes be irrecoverable, on the admiſſion of air in any manner; but, on the contrary, the *ſhining Wood*, when thus extinguiſhed and kept extinct for half an hour, will be immediately re-kindled on admitting the air to it. 3. A live coal included in a ſmall glaſs, will con-

tinue ſhining but a few minutes; but a piece of *ſhining Wood*, in the ſame circumſtances, will continue bright for ſeveral days. 4. The coal, while it burns, ſends forth ſmoke and other exhalations; the rotten *Wood* ſends out none, and conſequently a coal all the while that it is ſhining waſtes itſelf at a great rate; but the rotten *Wood* does not waſte itſelf at all. And, finally, the burning coal is actually and vehemently hot; the rotten *Wood*, though it ſhines, is not ſo much as warm. Phil. Tranſ. N°. 32.

The light that is obſerved to proceed from rotten *Wood* under ſome particular circumſtances, is found by experiment to require air to feed and keep it up: on putting a piece of this *ſhining Wood* into an exhauſted receiver, the light ſoon goes wholly off, and the *Wood* remains as dark as a piece of a common ſtick; but immediately on letting in the air again the light is re-kindled, and a ſudden flaſh of lightening ſeems to illuminate the *Wood*, and it continues bright as before.

In experiments of this kind, the effect of the air-pump is often much more ſtrongly perceived a minute or two after it is worked, than during the time of the pumping; and that very degree of exhauſtion which leaves theſe luminous bodies ſome light at firſt, will by degrees deſtroy it; thus, if the pumping be ſtopped ſoon after the light begins to grow faint, and the body examined to find its changes afterwards, it will be ſeen to grow every minute more and more faint, till it wholly diſappears.

The light of ſhining fleſh and fiſh when putrified, is wholly of the ſame nature with that of rotten *Wood*, as to its dependance on the air for its ſplendor; and in the ſame manner loſes its light in the exhauſted receiver, and regains it on the admiſſion of the air into it again, in the ſame ſudden manner. Phil. Tranſ. N°. 31.

Bog-WOOD, or *Subterraneous* WOOD, a name given by the inhabitants of many parts of this kingdom to ſuch *Wood* as is found buried in the earth in boggy places, and which is found hard and ſtrong at this time. See the article *Foſſile* WOOD, *ſupra*.

We have in the Philoſophical Tranſactions an account of vaſt quantities of this ſort of *Wood* found under ground in Hatfield chace. Infinite millions of the roots and bodies of trees are found there; they are of all growths, and are moſtly ſuch trees as are the growth of our own ſoil, ſuch as oaks, firs, birch, beech, yew, holly, willow, aſh, and the like. The roots of all theſe trees ſtand in their natural poſitions as when growing, and ſtand as thick together as they could grow in a foreſt. The bodies are uſually broken off, and laid all along juſt by them.

The large trees are uſually found fallen in a north-eaſt direction, and the ſmaller ones lying always; the fir-tree or pitch-tree is more common than any other kind, and is found ſometimes of twenty, thirty, and thirty-five yards long, and ſo ſound and firm that many of them have been ſold to make maſts for ſhips. Oaks have been found of the ſame length, though wanting ſome yards of their natural tops; theſe have been ſold at ten or fifteen pounds a-piece, and are as black as ebony, and very ſound and laſting in whatever ſervice they are put to. The aſh-trees do not preſerve their firmneſs in this manner, many of them are ſo ſoft that the workman's ſpade cuts through them; and when expoſed to the air, they uſually fall to pieces; but the willows, though a much ſofter wood than the aſhes, preſerve their texture, and are found very ſtrong and firm. In ſome of the fir-trees it is very obſervable, that they have ſhot out ſide-branches after they were fallen, which have grown into large trees. Many of theſe foſſile trees appear plainly to have been burnt; the fir-trees are particularly very common in this ſtate; and of theſe ſome are burnt quite through, and others only on one ſide. Some of theſe alſo have been found with the plain marks of human work upon them; many with their branches chopt off, and their trunks cut into two or three pieces. Some ſquared, and others in part cleft, and the *wooden* wedges uſed in cleaving them are ſtill found remaining in the cracks. Stones are found in ſome of them in the place of wooden wedges, but in none iron ones. The heads of axes are alſo ſometimes found, they are of a ſtrange form, and ſomewhat repreſent the ſacrificing axes of the antients. Theſe are found at ſuch depths, that it is impoſſible they ſhould have ever been lodged there ſince the time of this place's being a foreſt; nor ever could have been found, but by means of the ground's being drained by a late invention. The general opinion as to theſe trees is, that they were buried in this manner at the time of the univerſal deluge; but they are plainly of later origin, as foſſils. The coins of ſome of the Roman emperors having been found buried under them. Phil. Tranſ. N°. 275. p. 983.

The earth of bogs is not the only ſoil that preſerves theſe trees; for in the low parts of Lincolnſhire between the towns of Burningham and Brumley, there are ſeveral large hills compoſed only of looſe ſand, and as this blows away there are continually diſcovered whole trees, or parts of trees, and particularly the roots and ſtumps of firs, and ſome other kinds, all with the marks of the ax upon them, and looking as freſh as if done but yeſterday. Under theſe hills and in the bogs before-mentioned, not only the *Wood* of the fir-tree, but its cones are found in immenſe number; many buſhels being often laid in a heap together. In cutting a drain for a river of a conſiderable depth, there were found at the very bottom ſeveral parcels of cut *Wood*, in poles, beams, and the like; the head of an ax was alſo found ſomewhat reſembling the antient battle-ax, and a coin of the Roman emperor Veſpaſian; but what was yet more remarkable, was, that what they were now ſunk to ſeemed to be the original ſurface, the ground not being looſe like all above it, but ſound and firm, and lying in ridges and furrows, with the evident marks of having formerly been ploughed. So that all the bog-earth above ſeems plainly to have been added ſince; and that the foſſile *Wood*, ſuppoſed of antediluvian origin, is but of the time of the antient Romans, or leſs than that.

All the bogs in this kingdom afford in like manner foſſile-trees; and not only thoſe, but other places, have at all times accidentally diſcovered them. Giraldus Cambrenſis tells us, that ſo long ſince as in king Henry the ſecond's time, the ſands on the ſhores of Pembrokeſhire were driven off by peculiar ſtorms and tempeſts, and that deep under thoſe ſands there were then diſcovered great numbers of the roots and bodies of trees in their natural poſtures; and many of theſe had the ſtrokes of the ax upon them, the marks at that time remaining as plain as when firſt made. Some of theſe reſembled ebony; and many other ſuch trees were diſcovered at Neugall in the ſame county, in the year 1590. Cambden tells us of ſuch *Wood* found in the bogs in Somerſetſhire, Cheſhire, Lancaſhire, Weſtmoreland, Yorkſhire, Staffordſhire, and Lincolnſhire; and ſince his time, many other counties have been found to be as fruitful in it. Dr. Plot mentions them in many parts of his hiſtory of Staffordſhire, and by their ſtanding in their natural poſtures, as to the roots at leaſt; and prudently concludes, that they certainly once grew there, and were not brought from elſewhere.

Dr. Leigh, in his hiſtory of Lancaſhire, gives an account of the ſame ſort of trees found in the draining the boggy lands at Martin-Meer; and prudently determines them not to have been of the antient date many pretend, in referring them to the deluge.

He obſerves, that they are plainly of no older date than the time of the ſavage inhabitants of England, about the time of the Roman conqueſts; for in this place, beſide the roots and bodies of trees and their fruit, there were found eight canoes, or ſmall boats, ſuch as the wild inhabitants uſed at that time. And in another moor, in the ſame county, a braſs kettle, with a ſmall mill-ſtone, and ſome beads of wrought amber. In the ſame place were alſo found ſeveral human bodies whole and entire, at leaſt to outward appearance, and the whole head of a hippopotamus or river-horſe. This is perhaps the hardeſt thing to be accounted for of the whole ſet, as to its coming there. The boggy places in Angleſea and the iſle of Man, are all full of buried trees of the ſame kind; and the bogs of Ireland abound no leſs with them.

England, and its adjacent iſlands, are not the only places where this buried *Wood* is found; for Verſtegan tells us, that the moors in the Netherlands abound with them; they all lie North-eaſt, as ours do. Helmont alſo mentions the Peel there, a moraſs of eight or nine miles broad, which is full of them. The French naturaliſts tell us of foſſile trees alſo, in their country; and in Swiſſerland and Savoy; but all in the low-grounds.

Ramazzini tells us, that in the territories of Modena, which are now a dry and fruitful country, yet in the time of the Cæſars were only a great lake, there are found at the depth of thirty, forty, and even fifty foot, the ſoil of a low marſhy country, with ſedges, water-graſs, and other marſh-weeds; and under this there lie the trunks of trees, and their roots ſtand near them in a natural poſture as when growing. Many old coins of the Roman emperors are alſo found there; as alſo ſeveral buſts, wrought marble, and ſquared ſtones, evidently ſhewing the work of ſuch tools as the Romans have been known to uſe. Some of the trees in theſe places ſtand upright. Phil. Tranſ. N°. 275. p. 986.

Gilding on WOOD. See the article GILDING *on Wood*.

WOOD-*Coppices*. In the firſt raiſing of *Coppices* two things are to be conſidered; firſt, the nature of the ſoil, that ſuch trees may be planted in it as will thrive well there; and ſecondly, the uſes that the *Wood* is intended to be ſold for, that ſuch kinds may be planted as will be moſt proper for thoſe uſes.

If the principal vent for *Wood* be for the fire, the beſt trees for *Fire-wood* muſt be planted, ſuch as the oak, beech, hornbeam or other hard woods. Theſe are the moſt profitable for ſelling as *Fire-wood*, and one or more of theſe will grow in any ſoil.

If there be a demand in the country where the *Coppice* is to be planted for hoops and hop-poles, then the aſh, the cheſnut, the oak, alder and hazel, are to be planted.

According to the profits of the *Underwood*, the thickneſs of the ſtandard-trees are to be regulated, for as they ſtand more or leſs thick, they more or leſs injure the *Underwood*. It is alſo to be conſidered at what growth the *Underwood* is to be ſold. The taller and larger the *Underwood* of a coppice in general is, the more profitable will it be for firing, and all other uſes, and the ſtandards will be the better for its being left to grow to a proper height, for their bodies will be always, unleſs very great accidents occur, carried up ſtrait as far as they are ſhaded by the coppice-*Wood*.

A deep ſoil makes the ſhrubs as well as trees grow more vigorouſly than any other, and they will be ſooner fit for cutting in ſuch places. The perſon who owns theſe *Woods* muſt contrive to cut down only a certain quantity of them every year, and regulate this ſo that he may have a conſtant ſucceſſion of a like quantity; that part of the *Wood*, which was firſt felled, may be grown up to its ſize for felling again by that time the laſt is cut. This is, in different places, to be calculated to all the various numbers between eight years and twenty or thirty.

The cutting *Wood* ſeldom yields the more and the better timber; but the cutting it oftener has greater advantages, in that it makes it grow thicker, and gives the ſeedlings time to come up. If many timber-trees grow in the coppice, and are to be cut down, they and the *Underwood* ſhould be felled together, cutting off the ſtumps as cloſe to the ground as may be, in the trees, and in the ſhrubs and *Underwood* the ſtumps ſhould be left about half a foot high, and cut ſlanting and very ſmooth.

Sawing is the beſt method of felling timber-trees; but it ſometimes kills the root; and if this is obſerved to be the caſe in the coppice, no new ſhoots ariſing from the root, then it is proper to ſtub up the root, that it may not unneceſſarily encumber the ground, that the other young plants may have the benefit of it.

In the firſt raiſing of coppices from ſeed, the ground muſt be prepared by good tillage, as much as if it were intended for corn. The ſeeds of the ſeveral trees are to he ſown in February, and if the ſoil be ſhallow, the ground ſhould be plowed into great ridges: this will make the ſoil lie the thicker upon the top of each ridge, by which means the roots will have more depth to run to for nouriſhment, and in a few years the furrows will be filled up to the level of the reſt with the dead leaves, and theſe, as they rot at the bottom, will make a kind of ſoil, through which the young roots will ſpread, and be conducted from one ridge to another, and ſo the whole ground will be occupied by them. If the coppice be to be raiſed on the ſide of a hill, plow the ridges croſs-way of the deſcent of the hill, that the water may be detained among them, and not ſuffered to run off, as it otherwiſe would, by the furrows; but if it happen that the ground be over-wet, which is more rarely the caſe, then the contrary method is to be obſerved, and the furrows plowed deep and ſtrait downards, that all the water may be carried off by them, as by ſo many trenches or drains.

Some ſow a crop of corn along with the ſeeds of the *Underwood*, for the advantage of the firſt year; but as the ſeaſon of ſowing the ſeeds of the trees, is too late for the ſowing the corn, it ſeldom turns to much advantage. It is better to ſow the trees alone, and keep them well weeded the two firſt years; after which they are ſtrong enough to take care of themſelves againſt ſuch enemies.

In very barren ground, where the young trees can hardly ſtand the heat in ſummer, it is proper, after ſowing them, to ſcatter a quantity of furze-ſeed over the land; the furze will grow quick, and over-top the trees at firſt, but it will ſerve as a guard to them at this time, defending them from injuries, and keeping the ground moiſt about their roots. In a few years the trees will grow up beyond theſe buſhes, and they will then ſoon deſtroy them by their dropping.

In the raiſing of coppices, the neareſt diſtance for the plantations ought to be five foot for the *Underwood*; but as to what number, and ſcantlings of timber are to be left on each acre, the ſtatutes in this caſe direct; but it is an ordinary coppice, which will not afford three or four firſts, fourteen ſeconds, twelve thirds, and eight wavers, according to which proportion the ſizes of young trees in coppices are to ſucceed one another. In coppice or *Underwood* felled at twenty-four years growth, there are to be left twelve ſtore-oaks upon every acre, or, in defect of them, the ſame number of elms, beech, or aſh; theſe are to be ſtrait-bodied trees, and are to be left till they are ten inches in diameter, at a yard from the ground; but it is better for the owner to have a much greater number of timber-trees, eſpecially in places where *Underwood* is cheap; and as to the felling, it is always neceſſary to begin regularly with one ſide, that the carriages, neceſſary to the taking off the *Wood*, may come on without injury to the reſt: and in large *Woods*, a cart-way ſhould always be left in the middle, quite through the *Wood*. The timber of the *Underwood* may be cut from the month of October to February; but the laſt month is greatly the beſt, in places where there is but a ſmall quantity to be felled, and it can all be got down before the ſpring is too much advanced. All the *Wood* ſhould be carried out by midſummer, and made up by April at the lateſt; for when the rows and bruſh lie longer than this unmade up, and unbound, many of the ſhoots and ſeedlings are ſpoiled by them. It is always worth the owners while to incloſe the coppice well the winter before felling, to keep out the cattle, which would elſe greatly damage the ſupply from the ſeedlings and young ſhoots.

New-weaned calves are the leaſt prejudicial to newly-cut *Woods* of any creatures, and may be put in where there is much graſs; the next in harmleſsneſs to theſe are young colts, which, at about a year old, may be put in to feed in the ſame manner; but about May they muſt all be put out.

If the *Woods* happen to be cropped by cattle, it is beſt to cut them up, and they will make new ſhoots; for that which has been bitten by the cattle, will not grow for ſeveral years in any degree.

If coppice-*Woods* are too thin, this is to be remedied by laying down the longeſt and ſmalleſt ſhoots of thoſe ſhrubs or trees which are the moſt advantageous, in the place, or of ſuch as are neareſt the bare place; theſe will each ſend forth a great number of ſuckers, and the whole *Wood* will be thickened as much as deſired in a very little time. *Mortimer*'s Huſbandry, vol. 2. p. 64.

WOOD-*Caterpillars*, in natural hiſtory, the name of a genus of caterpillars which does not live in the manner of others on leaves of trees or plants, or open to our obſervation, but is, as it were, buried alive under the bark, in the trunk and branches, and in the roots of trees, and ſometimes in the body of fruits.

Theſe are eaſily diſtinguiſhed from thoſe worms and maggots which are found in roots and fruits, and owe their origin to flies of another kind; but they are ſubject to be confounded with another ſort of animals, called by Mr. Reaumur, *falſe* or *baſtard caterpillars*, which carry a great reſemblance in their figure to the real caterpillars, but which have more legs than any of the true ones have, and are finally transformed into four-winged flies, which are not true butterflies.

The butterflies, which are the parents of thoſe caterpillars which live immured in trees or fruits, lay their eggs on the ſurface, and the young caterpillars, when hatched, eat their way in; and doubtleſs inſtinct directs the parent to depoſit its eggs only on ſuch ſubſtances as will ſupply a proper nutriment to the young. It is no wonder that we do not find, on the outſide of a fruit, the hole by which this creature has made its way in; it enters while ſo ſmall, that the orifice that admits it is ſcarce viſible, and this probably afterwards cloſes up.

What appears ſomewhat ſurpriſing, however, in this, is, that there uſually is only one caterpillar in a fruit, which is large enough to afford food to a large number; and if there are ſometimes found two creatures within, one is uſually a caterpillar, the other a worm of ſome other kind. The whole occaſion of which is, that the operation of penetrating into the fruit, is ſo difficult to the young animal, that it ſeldom ſucceeds in it; and though the butterfly depoſits many eggs on each fruit, and theſe all hatch, yet it is only here and there one on a fruit that can find the way into it.

Theſe creatures, when once lodged in their priſon, have nothing to do but to eat up the ſubſtances which incloſe them, leaving the outer hard ſhell unhurt, which ſtill ſerves as a caſe for them; this is a very frequent caſe in the grains of corn, where the farinaceous ſubſtance ſerves as aliment, and the hard outer ſkin becomes a firm hollow caſe afterwards for the animal. The farinaceous ſubſtance in this caſe uſually proves enough for the animal in its caterpillar ſtate; but if it does not, the creature has recourſe to a very ſingular expedient; it eats again its own excrements, and finds its now ſtronger ſtomach able to ſeparate nouriſhment from that very matter, which had before paſſed off from its weaker ſtomach undigeſted.

Of theſe ſpecies of caterpillars, ſome go out of their priſon in order to change into their chryſalis, and thence into their butterfly-ſtate; but the greater number remain there, and paſs through all their changes within.

The little caterpillar, which has eaten all the farinaceous ſubſtance of a grain of barley, and is to remain in the ſhell to change into a chryſalis, covers over the whole inner cavity of the ſeed with a web of her own ſilk, and then ſeparates it by a diviſion, made of the ſame matter, into two cells of different ſizes; the longeſt of theſe is for itſelf in the chryſalis-ſtate, and the ſmaller for its excrements, which it takes great care to keep out of its own habitation: when it enters into the butterfly-ſtate, it makes its way out of the priſon through a round hole, which is made through the rind of the grain, and is, till that time, ſtopped with a nice valve.

This is a precaution the caterpillar takes while it is growing, that it may not die a priſoner when it arrives at its winged-ſtate, in which it has no inſtruments for making its way out.

It is always the deſtruction of a grain of corn to have one of theſe creatures in it; and it fares not much better with the larger fruits: in theſe, though the caterpillar eats only a ſmall part of the fruit, yet it deſtroys the organization of the whole, and frequently ſo entirely ſpoils the courſe of its growth, that it falls off the tree.

Theſe caterpillars, like all the other kinds, have certain fleſh-eating worms, whoſe parents are of the fly-kind, for their terrible enemies and deſtroyers; and it is not unfrequent, on opening one of theſe ſpoiled fruits, inſtead of the expected caterpillar,

terpillar, to find a fly juſt ready to come out; this has been produced from the chryſalis of a worm, which had before found its way into the fruit, and eat up the caterpillar, which was the original poſſeſſor of the place. Memoirs Acad. Scienc. 1736.

WOOD-*Cock*, in zoology. See the article SCOLOPAX.

This is a bird of paſſage, and comes into England about the middle of October, and goes away again in March.

During their ſtay with us, they ramble about from place to place, never remaining above eight or ten days together in the ſame *Wood* or meadow. They ſeldom or never fly in the day-time, unleſs diſturbed by men, or by ſome beaſt. In whatever places they are put up, they always fly to the thickeſt *Wood* that lies near, and there hide themſelves under the ſturdieſt and thickeſt trees, where they remain all day ſearching for earthworms, and other food, under the fallen leaves.

When night comes, they go out of the *Woods*, and generally reſort to watery places, where they may waſh their bills, fouled with the taking their prey, and thruſting into the earth; here they remain all the night, and if there is tolerable ſhelter, they ſtay alſo all the day under it; but when there wants this, they fly away to the *Woods* in the morning. In their flight, they chooſe the ſhadieſt places, and will coaſt it away to a great diſtance in ſearch of the higheſt *Woods* to retire to, that they may be the better ſecured, and the more defended from the annoyance of the *Wind*. While they travel under ſhelter, they always fly low; but when they come to any glade to croſs, they mount to a conſiderable height; but as ſoon as they have paſſed this, they ſink again.

They hate flying high, and they are afraid to fly among trees, becauſe, like the hare, they ſee but very badly ſtrait before them; and it is owing to this imperfection in their ſight, that they are ſo eaſily taken in nets ſpread in their places of reſort.

The draw-net, in countries which are very *woody*, is extremely profitable in this ſport, it being no uncommon thing to take ten or a dozen *Wood-cocks* at a time in it.

The method of uſing it to advantage is this: There muſt be choſen a proper place in ſome thick *Wood*, where theſe birds are found to reſort, and a place muſt be cleared for them, and for the net. Suppoſing the *Wood* about three hundred paces long, in this caſe, toward the middle there muſt be cut a walk through it eight fathoms wide: near the end of this, two oppoſite trees are to be pitched upon, proper to ſupport the two ſides of the net; the boughs of theſe are to be all cleared away, and the nets faſtened by logs and pullies.

When the net is thus placed, the ſportſman muſt provide ſome covert in which he may ſtand concealed. This is eaſily made by half a dozen boughs of trees with their leaves on; and the ſportſman, when he has ſtuck theſe down in the ground, and interwoven their boughs together, may either ſtand behind it, or ſit down on a bundle of dry fern, or any other ſuch matter.

At three or four foot diſtance from this ſtand, toward the net, there is to be a ſtrong ſtake faſtened into the ground, and on this the lines of the net are to be faſtened when it is drawn up.

When there comes a *Woodcock*, the net is to be let down as ſoon as ever he is taken, to entangle him the more, for, otherwiſe, in the ſtruggling he may chance to make his eſcape. The ſportſman is then to run up, and break a wing, and cruſh his head. The net is then to be refitted again as quick as poſſible, for when one is caught, there is great reaſon to ſuſpect that many more are coming the ſame way, which will be all loſt if the ſportſman is ſlow at his work.

If a hare, or any other creature worth the taking, come along the walk, the net is not to be immediately let down upon it, for in that caſe it would certainly ſtart back, or run forwards, and in either caſe would probably make its eſcape: the net is to be drawn up five or ſix foot, that he may paſs quietly under it without ſuſpicion: as ſoon as he is gone by, the ſportſman is to make a great ſhout, and let go the net; the creature will, on this noiſe, ſtart back, and will thus be certainly taken in the net.

There are, in many places, great thoroughfares through ſome open piece of ground, by which *Woodcocks* paſs in great numbers from one *Wood* to another. If there be in theſe two trees, naturally planted, ſo as to ſuſtain the nets, they are by all means to be uſed; but if not, the ſportſman will find it worth his while to be at the expence of planting two trees deep in the earth, at proper diſtances, that they may ſtand all weathers. Nets ſpread between theſe, are the moſt fatal of all others to theſe birds, for all that inhabit either one or the other of the *Woods* come this way at times, without ſuſpicion of any danger or diſturbance. See the article DRAW-*Net*.

There is another method of taking theſe birds in high *Woods*, with thoſe nets called *hays*, of the nature of the rabbets-hays, only with ſmaller meſhes. The *Woodcocks* are to be driven into theſe, and there ſhould always be at leaſt two or three of them planted together. When the ſportſman has provided himſelf with nets, he is to take five or ſix perſons into the *Wood* with him. The proper *Woods* for this purpoſe are thoſe of ſeven or eight years growth; and the people are to go into ſome part of them, near the middle. The nets or hays are to be placed in the ſame manner as they are for taking of rabbets, but two or three joining together at the end, and hanging over ſlopewiſe that way which the *Wood-cocks* are intended to be driven.

The nets being thus fixed, let the company go to the end of the *Wood*, placing themſelves at about ten rods diſtance from one another; they muſt all have ſticks in their hands, and they are to move forward ſlowly toward the nets, making a noiſe by ſtriking the ſticks againſt the trees and branches, and by hollooing with their voices: in this manner they are to move up to the net; and the *Wood-cocks* in that part of the *Wood* will all be terrified before them, but will not take wing, but run along upon the ground, and thus be driven along like a drove of beaſts, ſo that when the company come up, they will find almoſt all of them in the net. When that part of the *Wood* is thus drove, the nets are to be turned the other way, and placed ſlopewiſe in the contrary direction, and the company retiring to the other end of the *Wood*, are to drive the *Wood-cocks* that are in that part with the ſame noiſe, till they have ſent them into the nets in the ſame manner.

Thus all the *Wood-cocks* in the *Wood* may be taken with very little trouble, and this may be done equally at any time of the day.

Another way of taking this bird is by means of nooſes or ſprings. See the article NOOSE.

The *Wood-cock* and the ſnipe are both eaſily taken alſo with bird-lime, when their places of reſort are known, but they are not ſo eaſily found as many other birds.

The cuſtom of the *Woodcock* is uſually to be upon the banks under hedges, and by the ſides of ditches toward the ſun; and and they will ſuffer the ſportſman to come nearer them in the day-time after a moon-ſhiny night, than after a dark one. The reaſon of which is, that having fed well by moon-light, they are only fit for reſt in the day following; but when the night has been dark, they are ſeeking food all day long.

The ſnipes naturally lie by the ſides of rivers, when the plaſhes and ponds are frozen, and they always lie with their heads up or down the ſtream, never tranſverſely.

In order to take either of theſe birds by bird-lime, the ſportſman muſt be provided with a large number of ſmall and ſmooth twigs, neatly and evenly covered with good bird-lime. Theſe muſt be placed ſloping, ſome one way, ſome another, and the whole place about where they reſort muſt be covered with them. The ſportſman then muſt conceal himſelf very carefully, that the ſight of him may not frighten away the game.

WOOD-*Cock-Shell*, a name given by the Engliſh naturaliſts to a peculiar kind of the purpura. It is called in French, *becaſſe*. See the article BECASSE.

WOOD-*Land*, in agriculture, a term uſed by the farmers of many counties of England, for a ſort of ſoil, from its conſtant humidity and dark colour, reſembling the ſoil in *Woods*, which, of whatever nature it originally is, will always be made to appear thus from the continual dropping of trees, and the want of a free air and ſun, together with the fall of leaves, deſtroyed and waſhed to pieces by the wet.

This ſoil in the open countries has a conſiderable quantity of clay in it, and holds the water a long time that once falls upon it: in wet weather it ſticks firmly to the plough-ſhare, and in dry is very apt to crack. In uncultivated places it uſually produces ruſhes and ruſh-graſs. A moiſt and dripping year is extremely detrimental to this ſort of land. *Moreton*'s North. p. 38.

WOOD-*Lark*, in ornithology. See the article ALAUDA.

This is one of the ſweeteſt of our ſinging-birds, and is indeed very little inferior to the nightingale, when in good health, for we are not to judge by ſuch as are made feeble by improper food, or want of cleanlineſs in their cages.

It is one of the tendereſt birds we have, and yet it breeds the ſooneſt of any that we know of. They principally frequent gravelly grounds, and the ſides of hills, that are expoſed full to the ſun, and if there be any ſtumps of oaks in theſe places, they always reſort to them. The females couple with the males in the beginning of February, at which time, and never before, they part with their laſt year's brood; immediately after coupling, they betake themſelves to building their neſt.

They generally build in lay, or grounds, where the graſs is rank, and is grown brown. The princpal material they uſe is dry graſs, and they always chooſe ſome place ſheltered by a good tuft for their neſt, to defend themſelves from the cold winds, which are very ſevere at that ſeaſon. They feed their young principally with a ſmall red worm; but it is very difficult to find this kind, to feed a neſt of them under our care, and they will not do well without it; ſo that they ſcarce ever come to any thing this way.

The young branchers are taken in June, July, and Auguſt. After this they may be taken in large numbers at the latter end of September, which is their general flight-ſeaſon, and then from the beginning of January to the beginning of February, at which time they get together to couple for breeding. Thoſe that are taken in the ſummer-months, are uſually taken in nets, by the help of a hawk.

The ſportſman is to go out in a dewy morning, and fixing on ſome hill, he is to go to that ſide of it which faces the riſing

riſing ſun, for this place they are ſure to frequent. He is to take out a hawk and a ſmall net at the end of a ſtick; when he eſpies a bird he is to ſhew the hawk, on which it will ſquat down, and on his approaching nearer and making the hawk flutter over the place the bird will only lie ſo much the cloſer, ſo that he may go up and lay the net over it, and thus take it without hurting it.

The beſt *Wood-larks* that are kept in cages have been caught in this manner. A better way of taking numbers of them is to prepare a net made in the ſame manner as the common net for taking partridges, only with the meſhes much ſmaller; three or four perſons are to go out with this, and one of them is to take out a hawk, which ſerves in the ſame manner for the larks as the ſetting-dog does for the partridges.

Where-ever a flock of theſe larks is ſeen together, as is very common, the whole flight keeping with the female till the next coupling ſeaſon, the hawk is to be ſhewn, and on his hovering, they will all lie ſtill, and the net may be eaſily drawn ſo compleatly over them, that not one can eſcape. The beſt time for taking this bird for the cage, is in July, or the preceding or following month; thoſe that are put into the cage at this time ſing preſently, but their ſong time is not laſting, for they ſoon fall to moulting, in which ſtate many die; but if they get over it, they commonly prove very healthful afterwards, and become very tame and familiar, and ſing ſweetly. Thoſe which are taken in the latter end of September, are generally very ſtrong and ſprightly; but they do not ſing till after Chriſtmas. Thoſe taken in January and February finally prove the beſt of all; they generally begin ſinging in two or three days, or at the utmoſt in a week after they are taken.

The method of keeping them in health in the cage, is this, there muſt be two pans of food, the one containing meat, the other oatmeal and hempſeed. A very good food is the following; boil an egg very hard to the crumb of a half-penny loaf, and as much hempſeed; let the egg be chopped very ſmall, and the hempſeed bruiſed in a mortar; when theſe are mixed, the bread is to be crumbled in among the reſt, and the whole is to be rolled together with a common rolling-pin, and kept for uſe.

There muſt be ſome fine ſmall gravel ſtrewed at the bottom of the cage, and renewed at fartheſt once in a week. This will prevent his feet from getting hurt by being clogged with the dung; and his baſking in this will keep him alſo from growing louſy, after which few come to good. There muſt be a perch in the cage, and it muſt be either lined with green bays, or made of fine matting, which the lark is very fond of.

When the bird is firſt taken, ſome meat muſt be ſtrewed upon the ſand in the bottom of the cage, for the bird will be ſometimes almoſt famiſhed before he finds the meat in the pan.

The cock-bird of this kind is known from the hen by the loudneſs and length of his call, by his tallneſs as he walks about the cage, and by his doubling his notes in the evening, as if he was going with his mate to rooſt. A better rule than all others, however, is his ſinging ſtrong; for the hen *Wood-lark* ſings but very weakly.

Both the cock and hen of this kind are tender, and ſubject to many diſorders; the principal of theſe are cramps, giddineſs of the head, and breeding lice. Cleanlineſs is the beſt cure for the firſt and the laſt of theſe complaints, but we know of no cure for the other. A good ſtrong bird however, will often laſt very well five or ſix years, and often improve all the time.

WOOD-*Louſe*. See the article MILLEPEDES.

WOOD-*Mite*, in natural hiſtory, the name of a little animal frequently made the ſubject of microſcopical obſervations, and by ſome called the *Wood-louſe*; though that leſs properly, as there is another larger animal generally known by that name.

The *Wood-mite* is in ſhape and colour very like a louſe, and is frequently found running very nimbly, but always by ſtarts and jumps, on old books and rotten wood. The eyes of this creature are of a fine gold colour, and can be thruſt out or drawn in at pleaſure; and when examined by the microſcope the periſtaltic motion of the guts is ſeen very diſtinctly, and beautifully; and what is more wonderful, there is obſerved a very diſtinct and regular motion in the brain.

This probably is the ſame animal with the pediculus pulſatorius, deſcribed by Mr. Derham, as one of the death-watches. *Baker*'s Microſcope, p. 185.

WOOD-*Pecker*, in zoology, the Engliſh name of a ſpecies of *Picus*. See the article PICUS.

WOOD-*Pucerons*, in natural hiſtory, a name given by Mr. Reaumur, to a ſmall ſpecies of inſect of the puceron kind, of a greyiſh colour, and diſtinguiſhed by its two hollow horns on the hinder part of its body.

Theſe animals very much reſemble, both in ſhape and ſize, the pucerons of the alder; but as thoſe live always on the ſurface of the ſtalk, theſe make their way deep into the wood of a tree.

Mr. Reaumur found large quantities of theſe lodged at a conſiderable depth in the wood of ſome elms, after they were cut down; the paſſages by which they had made their way in, were not to be found; but they were lodged in large and long holes, of the diameter of a gooſe-quil, and running many inches along the tree in a longitudinal direction.

All the pucerons found in theſe places, appear to be females, and none have wings; they all have vaſt numbers of young ones of different degrees of maturity within them, and theſe may be forced out by preſſing their bodies. *Reaumur*'s Hiſt. Inſ. V. 6. p. 61.

WOOD-*Ruffe*, in botany. See the article ASPERULA.

WOOD-*Sorrel*, in botany, the name of a ſmall plant, common in our woods, and having the ſame ſharp ſour taſte with ſorrel; but agreeing with that plant in no other particulars. See the articles OXYS, and SORREL.

WOOD-*Spite*, in zoology, an Engliſh name given by many to the common green *Wood-pecker*, the *picus viridis* of authors. See the article PICUS.

WOOFF, (*Cycl.*) a name given in ſome parts of England to the ſea-wolf, or *lupus piſcis*, called by Geſner *anarrhicas*. *Willughby*'s Hiſt. Piſc. p. 130. See the article LUPUS *Marinus*.

WOOL (*Cycl.*)—WOOL-*Balls*, in natural hiſtory, maſſes of *Wool* compacted into firm and hard balls, and found in the ſtomachs of ſheep, as the hair-balls are in oxen and other animals.

Theſe are doubtleſs formed in the ſame manner as thoſe hair-balls, of the outer covering of the animal, but they are much more uncommon; they are found in numbers, three, four or five in the ſtomach of the ſame animal.

Their outſide has commonly much of the appearance of a puff-ball, and is uſually either in part or wholly covered with a very thin and ſoft blackiſh ſmooth ſkin; the inner ſubſtance is entirely *Wool*, but that wrought together as cloſely as the hatter does his furs in the making them into hats.

They are uſually ſoft, ſmooth, and ſomewhat elaſtic, of a pale buff-colour, very light, and of irregular figures rather cubic than globular, and ſeldom of any great ſize, an inch in diameter being their common ſtandard. *Moreton*'s Northampt. p. 451.

WOOLLY-*Paſhnum*, in natural hiſtory, a name given by the Eaſt-Indians to a ſpecies of native red arſenic, or orpiment, found in that part of the world.

It is of a paler colour than the red orpiment of Germany. *Woodw.* Cat. Foſſ. V. 2. p. 23.

WORK (*Cycl.*)—WORK, in the manege. To *work* a horſe, is to exerciſe him at pace, trot, or gallop, and ride him at the manege.

To *work* a horſe upon volts, or head and haunches in or between two heels, is to paſſage him, or make him go ſide-ways upon two parallel lines.

WORMS (*Cycl.*) in the Linnæan ſyſtem of nature, a claſs of animals, whoſe diſtinguiſhing character is, that they have the muſcles of their body in one part affixed to a ſolid baſis. *Linnæi* Syſt. Nat. p. 33.

WORMS, in huſbandry, are very prejudicial to corn-fields, eating up the roots of the young corn, and deſtroying great quantities of the crop.

Sea-ſalt is the beſt of all things for the deſtroying them. Sea-water is proper to ſprinkle on the land where it can be had; where the ſalt-ſprings are, their water does as well; and where neither are at hand, a little common or bay ſalt melted in water does as well.

Soot will deſtroy them in ſome lands, but it is not to be depended upon, for it does not always ſucceed. Some farmers ſtrew on their lands a mixture of chalk and lime; and others truſt wholly to their winter fallowing to do it, if this is done in a wet ſeaſon, when they come up to the ſurface of the ground, and ſome nails with ſharp heads be driven into the bottom of the plough.

If they are troubleſome in gardens, the refuſe brine of ſalted meat will ſerve the purpoſe, or ſome wallnut leaves ſteeped in a ciſtern of water for a fortnight or three weeks, will give it ſuch a bitterneſs that it will be a certain poiſon to them.

A decoction of wood-aſhes, ſprinkled on the ground, will anſwer the ſame purpoſe; and any particular plant may be ſecured both from worms and ſnails by ſtrewing a mixture of lime and aſhes about its roots. It is a general caution among the farmers to ſow their corn as ſhallow as they can, where the field is very ſubject to worms. *Mortimer*'s Huſbandry, p. 328.

Generation of WORMS. See the article GENERATION.

Aquatic WORMS. Of theſe there are ſome which transform themſelves into flies, but which depart much from the manner in which the generality of the fly-worms effect this change.

Theſe are of the third claſs of fly *Worms*, and have an invariable head, and have no teeth or hooks meeting one another. They are uſually found in ponds, or in waters that have but a ſlow current. Their head is ſmall, long, and ſcaly;

ſcaly; their body long, and ſomewhat flatted, and is compoſed of eleven rings; the laſt of which is leſs flatted, and longer than any of the reſt, and in one ſpecies of theſe *Worms* is as long as five or ſix of the other rings, though it is not ſo in others. *Reaumur*'s Hiſt. Inſ. Vol. 4. pag. 310.

The firſt ring in theſe *Worms* is of a ſomewhat ſmaller diameter than the ſecond; this is of a ſmaller than the ſucceeding one; and the three laſt, or next the tail, are of a ſmaller diameter, but more length than the others. The ſkin of this *Worm* is conſiderably tough and ſtrong, though not cruſtaceous but pliable and flexile like a piece of parchment; and at the commiſſure of the rings, the anterior has a ſort of appendix which falls over that it joins to.

They ſomething differ from one another in colour, ſome are of a greeniſh brown, others of a clearer brown, and others of the greener kind are veined with brown, and of the browner with yellow; they have no legs, but have ſome cruſtaceous hooks in their places under their belly, and theſe ſo ſmall as not to be diſtinguiſhable unleſs carefully looked for, and then only at the junctions of the three laſt rings. Ibid. p. 311.

As one finds theſe *Worms* in the ſame ſtate and ſame readineſs to undergo their metamorphoſis, ſome only of ſeven or eight lines long, and others of three inches, there can be no doubt but theſe are of different ſpecies. Theſe are ſeldom extended to their full length in the water, nor have they much power of contracting themſelves, or making one ring enter into another; but they can bend their bodies upward and downward at the junctions of all the rings.

This is of the kind of *Worms* which have no teeth, properly ſo called, but many of its ſpecies have a conſiderable number of fleſhy hooks. Others have but a few, and beſide theſe they have a ſort of beards. The end of this beard is larger than any other part; and the inſect throws them out from the under part of its head, and draws them in again at pleaſure, with great ſwiftneſs; and when they are out, it moves them backward and forward with great ſwiftneſs: The ends of theſe examined by the microſcope, ſhew themſelves to be covered with cluſters of hairs. Ibid. p. 112.

There are in this ſpecies two ſpots, a little browner and more poliſhed than the reſt of the ſkin, placed one on each ſide the head, which have ſomewhat the appearance of eyes, at leaſt the creature does not appear to have any if theſe are not ſo. Ibid. p. 313.

At the extremity of the head there is a little fleſhy protuberance, which is probably either a mouth, or ſucker, by which it takes in its nouriſhment.

Notwithſtanding that this is naturally an aquatic animal, it is however neceſſary to its life, that it ſhould breathe. For this purpoſe, the laſt ring of the body of theſe *Worms* is open at the end, and ſerves them in the place of the poſterior ſtigmata, in others of the *Fly-worms*. The extremity of this ring is frequently to be ſeen on the ſurface of the water; and about it there is always ſeen a ſort of funnel made of a vaſt number of hairs that grow there, and diverge on this occaſion into this form.

Each of the hairs that forms this ſort of funnel, is itſelf a ſort of beard, furniſhed with numbers of ſhort hairs on each ſide; and the uſe of the whole is to prevent the water from getting in at the aperture made to admit the air. If any doubt could be had of the creature's reſpiring by this means, it would be extremely eaſily cleared by a ſimple and eaſy diſſection of the creature, ſeparating its belly from its back; for one then diſcovers two large veſſels running the whole length of the body, and filling up a great part of its ſpace; theſe are the two great tracheæ; they are inſerted near the head, where probably the anterior ſtigmata are placed, and running through the body join and are inſerted again at the tail. Ibid. p. 314.

It is ſtrange, that a creature like this, an inhabitant of the water, ſhould be deſtined in its ſucceeding ſtate to be an inhabitant of the air; but it is evidently ſo, this *Worm* transforming itſelf into a two-winged fly. When one knew however that this was to be the caſe, one would naturally imagine that ſome long-bodied fly of the libella kind, or ſome other ſuch ſhould be the laſt change of our long *Worm*; but, on the contrary, the production is a very ſhort-bodied fly; nor is this at all more wonderful than the caſe of thoſe libellæ, ſome of the longeſt bodied of which are immediately before their egreſs into that ſtate in the form of very ſhort *Worms*. Ibid. p. 317.

What is farther a great ſingularity in this creature, is that when it changes into the fly, and at any time before that ſtate, it undergoes no change in its exterior form, nor can the time of the change be at all foreſeen; and what is yet more ſingular, the creature when it has undergone its change, and is no more living but in the ſtate of a ſhell to the encloſed fly, is no way diſtinguiſhable by the eye from the living *Worms*, nor can be diſcovered but by the touch. The difference then indeed is eaſily perceived, as the living *Worms* are ſoft and flexile, theſe ſtiff and rigid, and incapable of moving themſelves. It is no uncommon thing for the laſt ring of the body to be turned up, and make an angle with the reſt, even in this ſtate; and often the ninth ring in the ſame ſtate makes an angle with the eighth, but in a contrary direction to the other. The *Worm* while living frequently makes alſo theſe angles, but then it changes them as it pleaſes; whereas, in this ſtate, they are become immoveable. Ibid. p. 318.

When therefore we find, among a number of theſe *Worms*, ſome that are ſtiff and rigid, we may determine that theſe have loſt their original form, and that their ſkin now only ſerves them as a ſhell for their tranſformation. When this is the caſe, there is no inſect which ſo ſoon accompliſhes its changes. Theſe *Worms* frequently within five or ſix days from the time of their firſt becoming ſtiff and rigid, are transformed into flies.

The nymphs of this fly takes up only a ſmall part of the ſhell made by the ſkin of the *Worm*, all the laſt rings, and part of the firſt remaining empty, the middle ones only being occupied by the nymph. It is not impoſſible, however, but that theſe vacant ſpaces may have their uſe, and may be neceſſary to give paſſage to the air, without which the embryo fly would periſh. Ibid. p. 319

WORMS, called *Aſcarides*. The name *Aſcarides* is given by Mr. Reaumur, to a ſort of ſmall *Worms* or maggots, bred from the eggs of winged animals; which bury themſelves between the membranes of the leaves of plants, and there eat away the parenchymatous ſubſtance.

Theſe are a very minute ſpecies of animals, and the ſmall ſpace of the inſide of a leaf allotted for the place of their reſidence, is to them a vaſt extent of country; and they eat it away at various times, and in different manners; ſome eat very ſlowly, and only burrow themſelves a way in contorted holes or cells; theſe he calls *foſſores parvi*: Others eat more variouſly, devouring all that lies before and round about them, and not burrowing in different directions; theſe laſt are called *foſſores magni*.

Theſe differ greatly one from another, and indeed are the *Worms* of different animals; ſome afterwards changing into ſmall butterflies, others into ſmall flies of the common kind; but the manner of life is the ſame in all. The butterflies whoſe eggs produce theſe, are extremely beautiful, glittering with a multitude of gaudy colours, and with ſilver and gold among the reſt; but they are too minute to ſhew their beauties to the naked eye. Thoſe of the *Aſcarides*, which do not in fine become butterflies, are two-winged flies, or ſmall beetles, in their ultimate ſtate. As ſmall as theſe *Aſcarides* in general are, they do not fail to ſhew the proper characters, by which they may be reduced to regular claſſes: Thoſe which have had their origin from the eggs of butterflies, are truly and properly caterpillars in miniature; the others are maggots, from flies; and if from beetles, they are hexapode *Worms*. Of the little caterpillars, ſome have ſixteen feet, ſome only fourteen; and ſome of them are perfectly ſmooth and equal all over the body; others have a number of rings or annular diviſions, like the larger caterpillars, their ſeveral changes for the arriving at the fly-ſtate are the ſame with thoſe of the common ſilk *Worm*, and other ſpecies of large caterpillars.

The ovula of the parent butterfly are depoſited ſingly, only one being placed on a leaf; for the little caterpillar is of the nature of the ſolitary, not the gregarious animals. Theſe eggs are ſo ſmall, as to be ſcarce viſible, except to an obſerver ſo accurate as Mr. Reaumur; but he not only diſcovered them lying upon the leaves of plants, but traced them to the time of their hatching; and obſerved this curious particular, that the caterpillar never enjoys the light or free air, but as ſoon as ever it is hatched eats its way through the integument of the leaf; and, under the cover of its ſhell, buries itſelf among the parenchymatous matter, whence it never comes out again till it arrives at the fly ſtate.

The *Worms* which are hatched of the eggs of flies, make their way as ſpeedily into the ſubſtance of the leaf; but with this difference in the manner of doing it, that as the caterpillar eats its way through with its teeth, the *Worm* ſtrikes its head forcibly againſt it ſeveral times, and by repated blows at length breaks a hole in it, large enough to admit its little body; and then feeds on the parenchyma of the leaf, in the ſame manner with the caterpillar. Theſe finally change into their chryſalis ſtate, within the covert of the membrane of the leaf.

The laſt kind of *Aſcarides* which are to become beetles, make their way into the ſubſtance of the leaf in the ſame manner; and when they have fed their deſtined time upon its parenchyma and juices, they ſometimes change in the covering of the membrane, and ſometimes come out of their holes and chooſe the ſurface of the leaf for the ſcene of this great cataſtrophe. *Reaumur*'s Hiſt. Inſ. Tom. 1..

Bee-WORM, the name given by naturaliſts to the ſmall white *Worm*, found in the cells of the honey-comb, and afterwards changing into a bee, in the manner of the white maggots, found in meat, *&c.* which, after a certain change, into a ſtate of reſt, become transformed into flies, like thoſe to which their eggs owe their origin.

To trace theſe *Worms* of the bee to their origin, we are to obſerve that the female bee lays an egg at the bottom of each cell, and that this is not ſimply dropped into this place, but that the bee fixes it to a certain part; that is, either to the baſe of the cell, or to one of the angles, by its ſmaller end. The egg is of an oblong figure, and is larger at one end than at the other; it is covered with a thin flexible membrane inſtead of a ſhell, ſo that it may be bent double, and will, on taking off the force, return to its own ſhape again. *Reaumur*, Hiſt. Inſ. vol. 10. p. 239.

Theſe eggs appear perfectly ſmooth and gloſſy to the naked eye; but when viewed with powerful glaſſes, there is a ſcaly ſtructure obſerved in them; though Mr. Reaumur ſuſpects that this is not on the outſide, but is ſeen through the tranſparent covering, and is, in reality, the ſtructure of the *Worm* within.

Though it be the regular courſe of nature, that only one egg ſhould be depoſited in each cell, yet there are ſometimes found two, three, or even four, in one place: the occaſion of this uſually is a female bee's being engaged in a ſmall ſwarm, in which the working bees cannot erect combs faſt enough, ſo that as ſhe is under a neceſſity of depoſiting her eggs from day to day, ſhe is compelled to put them two or three together: theſe, however, ſeldom come to any thing, ſuch ſmall ſwarms uſually diſperſing after a while, the female ſeeking admittance into ſome other hive, in which ſhe may lay at her leiſure. When the bees work in the common way, and the female is ſo preſſed to depoſit her eggs, that ſhe cannot ſtay the neceſſary time, ſhe often, in this caſe, places two or three eggs in a cell; but as the number of cells every day increaſes, the hive is not deſerted on this occaſion; but the ſwarm continues in it, and the female continues her laying as the workers make the cells; as it is impoſſible, however, for two or three *Worms* to live in one cell, the worm, when at full growth, and when in the nymph-ſtate, entirely filling up the whole cavity, the bees foreſee the event, and take care to remove the ſupernumerary eggs out of the cells, leaving only one in each. *Reaumur*'s Hiſt. Inſect. vol. 10. p. 244.

It has been a common opinion among authors, that after the eggs of the bees are thus depoſited in the cells, they are ſet upon, in order to be hatched in the manner of thoſe of birds. The generality of writers have given this office of ſitting to the drones or male bees; but others, who have obſerved the ſwarms more narrowly, and found that there are no drones in the hives, except for about three months of the year, and that the eggs remain in the cells at times when they are not there, have declared, that the common working-bees do this neceſſary office; nay, ſome, who have written expreſsly on this ſubject, have gone ſo far as to give directions what ſhould be done with ſuch bees as were found ſitting on the eggs, when the ſwarms were removed from one hive to another.

Mr. Maraldi, who could not give into this opinion of the bees ſitting on the eggs, yet was for giving them ſome office in regard to their hatching, and conſequently obſerves that the bees got on the tops of the cells which contains the eggs, and there fluttering their wings with great rapidity, excite a heat which occaſions the young ones to be hatched. This, however, is not leſs erroneous than the other; for a ſtrict obſervation always ſhews that the cells in which the eggs are, are wholly left and abandoned by the bees, and they never go near them, except when their road lies by them on their other neceſſary occaſions. It is very probable indeed that the heat of the hive is a great agent in the hatching of the eggs; but the ſingle bees never attempt to add to this, in regard to any particular cell, and without this the heat within is often equal to that of the eggs ſat upon by a hen, and ſometimes ſuperior to it.

The eggs are hatched about three days after the bee depoſits them, and all their changes are afterwards ſo ſwift, that it is neceſſary to watch them very attentively, in order to ſee them. In almoſt two days after the hatching, the *Worm* is found grown to ſo large a ſize, that it is ſcarce to be believed the ſame animal. The whole period of the life and changes of the *Worm* is contained in about ſeventeen days; for if a cell be obſerved in which an egg is juſt laid, and the ſame cell be examined twenty days afterwards, the young bee will be found juſt ready to appear out of the nymph of the *Worm*, and take its flight from the cell. The labouring ſeaſon of the bees, in this reſpect, is when they are newly hived, and their induſtry, and the efforts of it at that time, are ſcarce credible.

Mr. Reaumur obſerved the whole proceſs in a ſwarm which he put into a new hive on the twenty-fifth of May. They all immediately began to work upon their combs, and on the twenty-ſeventh, which was only two days after, there were a vaſt number of cells erected, in each of which the female, or queen, had depoſited an egg; and on the ſeventeenth of June, theſe cells all furniſhed the hive with a new ſwarm, each producing its bee.

From the time that the *Worm* is hatched out of the egg, to its paſſing into the nymph-ſtate, it always remains at the bottom of the cell, and lies rolled up in form of a ring, its head coming very near the tail. In this manner it lies very comfortably, there being under it a ſort of bed of a ſoft and glutinous white matter, which prevents the hard matter of the cell from preſſing againſt it. This matter has alſo another uſe yet more materially neceſſary to the animal, as it ſerves for its food.

The common working bees are deſtined to take care of the young brood, and the care they take to keep them ſupplied is ſurpriſing. The *Worm* is a feeble animal, not able to go out of its cell in ſearch of food, nor is it by any means proper that it ſhould, as the combs would be deſtroyed by the continual paſſing of a number of ſuch creatures. When the bees are obſerved by means of a glaſs-hive, it is eaſily ſeen in what manner they prevent the neceſſity of this all the time that the *Worms* are alive in the cells: their chief buſineſs is their ſupport, and there are numbers of them every moment ſeen plunging their heads into the cells, and depoſiting there a ſupply of this matter, which ſerves for the nouriſhment of the young brood. It is a pleaſing ſight to obſerve how carefully they come one after another to the ſame cell, till there is a ſufficient quantity in it, and, after this, how others that come in on the ſame ſervice, looking into that cell, and, finding it ſupplied, paſs over it to others which want their help. *Reaumur*'s Hiſt. Inſ. vol. 10. p. 246.

When we ſee the bee in this employment, after plunging its head into the cell, remain in that poſture ſome time before it draws it out again; it is eaſily conceived, that it is there diſgorging what we find afterwards left in the cell. It is to be obſerved, that ſome have ſuppoſed this white matter which ſurrounds the *Worms* to be their excrements, not their food; but there are many reaſons againſt this opinion. The *Worms* of winged inſects in this ſtate void little or no excrement; and if this matter of the bees cells was the excrement of the *Worms*, it muſt neceſſarily follow that it muſt be found in ſmalleſt quantity when the *Worm* was firſt hatched, and daily increaſing afterwards; but juſt the contrary of this is the caſe, for the quantity of it is greateſt of all while the *Worm* is very young, and there is none of it found by that time when the creature is full grown, and is ready to paſs into the nymph-ſtate.

Swammerdam, and other curious inquirers into the œconomy of bees, have wondered where the creatures produced this liquid ſubſtance, which is of a whitiſh colour, of the thickneſs of cream, and of an inſipid taſte like flour and water. Some have ſuppoſed it the extravaſated juices of trees and plants, collected by the bees for this uſe; but it is much more probable, that it is the matter of the common food of theſe animals. The honey and rough wax which, after having paſſed their digeſtion, is reduced to a ſubſtance of this kind, analogous to the milk of animals, is in this ſtate voided by the mouth by theſe animals, for the ſupport of their young, while in a condition in which they cannot help themſelves.

The bees ſeem yet farther careful of their offſpring, and take the pains to bring them up by degrees from more inſipid to leſs inſipid food; for as they are to live on honey in their fly-ſtate, they are to be by degrees brought to this diet while *Worms*. This will be found to be the caſe, on examining the cells in which they live at their different ſtages. In the firſt ſtage, or while the *Worms* are very young, the matter of their nouriſhment is found perfectly inſipid, as before obſerved; but as they advance in growth, if it be taſted at different times, it becomes more and more ſweet; and, in fine, what is brought for the nouriſhment of the *Worm*, when nearly arrived at the time of its change into the nymph-ſtate, is little different from honey.

The bees therefore ſeem able to give this matter what ſort of preparation they pleaſe, and it is evidently different at theſe different times, not only in taſte but colour. At firſt it is white, but it afterwards becomes tranſparent and colourleſs, and after this greeniſh or yellowiſh, very often reſembling in colour diluted honey. *Reaumur*'s Hiſt. Inſ. vol. 10. p. 247.

The *Worm* has no legs, as indeed it has no need of any, its whole life, in that ſtate, being deſtined to be ſpent in that cell where it is firſt hatched: it is not eaſy to get one of them out of the cell without hurting it; but when it is carefully taken out, and laid on a paper, it is found to have no power of crawling, but only gives ſigns of life by turning its head a little about. There is very little difference in the growth; its colour only changes from a ſomewhat bluiſh-white, which it is at firſt, to a purer white, and the inciſures between the rings become leſs deep, and in fine, almoſt wholly diſappear when the creature is at its full growth.

The head of this *Worm* is ſomewhat harder than the reſt of the body, and is of a regular figure, being flatted, and compoſed like the head of the caterpillar, of two lips, the under one divided into three parts, and the upper one being furniſhed with two hard ſubſtances in form of teeth, though much leſs ſolid and ſtrong than thoſe of the caterpillar, as this creature has nothing to do with ſolid food. In the full grown *Worms* there is always ſeen a yellow line or ſtreak running directly along the middle of the back. This ſeems to be a ſtreak on the ſurface of the ſkin, but it is, in reality, no other than the great canal of the inteſtines, which is eaſily ſeen through the tranſparent ſkin, as it is full of a yellowiſh matter, very much reſembling honey.

Under the belly of this creature there is an appearance of cer-

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tain folds more white than the reſt; theſe are diſpoſed parallel one to another, and all run in a tranſverſe direction. It is natural to ſuppoſe that theſe are the folds at which the *Worm* has a power of bending itſelf; but, when examined ſtrictly, this does not appear to be the caſe, for they are found to be in reality ſo many round veſſels of a bright ſilvery whiteneſs, placed under the ſkin, and viſible through it, on account of that ſuperior whiteneſs. They may be eaſily raiſed with the point of a needle, and taken out of the body, and they are then found to be of the ſame ſtructure with the tracheæ of all other animals of this ſmall kind; namely, they are extremely fine and ſmall cartilaginous filaments, hollow within, and rolled into a cloſe ſpiral wreath.

The ſtigmata of this *Worm* are eaſily diſtinguiſhed, though they are extremely ſmall. If one of the tranſverſe tracheæ of the belly be traced to its extremity at each end, it will be found to terminate at each in a ſtigma. Thus all the reſt of them may be found out, and they will be found to lie in a regular line along each ſide, running along the two great tracheæ, which paſs longitudinally from the head to the tail on each ſide of the *Worm*. From theſe there part ſome ſhort but thick tracheæ, which paſs toward the back, and there become divided into many branches; and on the under part of the body, near the head, there may be diſtinguiſhed ſeveral others beautifully undulated, which paſs from ſide to ſide, though not in a regular manner. The anus of the *Worm* is placed in the laſt ring of the body, and is very ſmall; it is deſtined to give paſſage but to a very ſmall quantity of excrements. *Reaumur*, Hiſt. Inſ. vol. 10. p. 257.

If the progreſs of the growth of the *Worm* be examined, it will be found that two days after the egg is laid it is hatched, and in ſix days more it arrives at its full growth. When it is firſt hatched it rolls itſelf up into a ſort of circle, which is then however ſo ſmall, that it does not reach quite round the cell, and leaves a conſiderable ſpace within its center: this, however is ſoon filled up by the growth of the creature; as it becomes longer, its head is brought to meet the tail, and is forced beyond it as far as the laſt ring but one of the body: in this time the body alſo ſwells ſo much in thickneſs, that there can no more be any ſpace left in the center of the ring, nor any room for the head to be thruſt farther forwards; as the *Worm* has much of its growth yet to come in this uncomfortable ſituation, it naturally happens that the body loſes its round ſhape, and becomes flatted, and in this manner riſes up ſo high in the cell, as almoſt to fill it up: when the cell is examined in this ſtate, it ſeems to contain two *Worms* rolled up, and laid in it, one upon another, ſince it is hard to conceive the body of one ſo faſhioned as to fill it in this manner: when the *Worm* is however taken out, its ſhape plainly ſhews how it has filled it, and in what manner it has conformed itſelf to the place of its abode: when at liberty, it ſoon recovers the natural rounded ſhape of its body.

It is very plain, that the *Worm* muſt be very little at eaſe in this ſituation, and that it will be neceſſary for it to change it, in order to its own neceſſary transformations. When therefore the time of its firſt change approaches, it ceaſes to eat, and begins to unrol the circle its body makes, and to lay itſelf at its length in the cell. When this happens, the bees become ſenſible that it has no occaſion to eat any longer, and therefore they bring it no more food; but nature only requiring for this change a ſtate of reſt, and the excluſion of the external air, they perform their laſt office to it in what might appear a very ſtrange operation, if it were not known to be neceſſary to the *Worm* in this ſtate; this is the faſtening up the top of the cell with a covering or lid of wax, ſo that the *Worm* now finds itſelf ſhut cloſe up in a ſort of box, hermetically ſealed. The manner in which the bees make this covering, is by beginning a circle within the mouth of the cell with new wax, and ſucceeding this by ſeveral others, each within the laſt, till they leave only a vacant point in the center, which they fill with a lump of the ſame wax, ſo that the cover is compoſed of a great number of concentric circles.

When this cover is finiſhed, the *Worm* compleatly extends itſelf at length within, and as it is now to paſs into the ſtate of a nymph, and the outer integument of that will be too thin and tender to bear the immediate contact of the wax of which the cell is compoſed, it begins a new work, which is the ſpinning a ſort of ſilk in the manner of the ſilk-worm; with this it forms a web, completely covering all its parts, and in this ſafe caſe it becomes a nymph. The web of ſilk which the *Worm* ſpins, on this occaſion is extremely fine, and is by degrees carried all round the cell, ſo as to line it regularly throughout in the manner of a linnen hanging. This is not only applied thus cloſely to the ſides and bottom of the cell, but in the ſame manner to the lid or top; and theſe are eaſily ſeen on breaking open a cell which encloſes a nymph; for when the wax of one ſide of the cell is broke, the *Worm* is then only ſeen through a thin and tranſparent reddiſh web, which is this lining of the cell, and is found to be very flexile, yet very tough. The time when this is beſt of all ſeen, is, however, when the combs of an old hive are broken; for, in this caſe, the webs within the cells which have been deſtined to the raiſing of young ones, are ſo thick that they will not break; but may be eaſily examined and pulled to pieces, and they are then found to be made of a great number of cruſts, one within another. *Reaumur*, Hiſt. Inſ. vol. 10. p. 261.

It is not to be ſuppoſed that one *Worm* could have formed theſe complex webs, as they are neither neceſſary to it, nor to be faſhioned in the time that animal has to work in. It is very certain that one of theſe cells deſtined to the breeding up of the young offſpring, is not only allotted to one *Worm*, but to ſeveral ſucceſſively; and each of theſe having in its turn ſpun its web, by this means the whole web is found compoſed of ſo many cruſts or doubles, or is, in reality, a collection of ſo many webs as there have been *Worms*.

As ſoon as ever one of theſe nymphs iſſues out of the cell, in the bee-ſtate, the working bees clean out the cell, and render it perfectly fit for the office of educating another young one; and as ſoon as that is done, the female bee lays another egg in it, and ſo on; ſo that almoſt as long as the comb laſts, every three weeks there is a new *Worm* to inhabit it, and a new web ſpun, and added to the former number. By ſeparating the cruſts of one of theſe complex webs one from another, it becomes eaſy to reckon how many bees have been hatched in each. The ſeveral cruſts are ſo very thin, that there may be a great number of them applied one over another, before they will ſenſibly fill up or ſtraiten the cavity within the cell, and, in other reſpects, the cell is the better for it, every coat of this matter adding a lining to it, which is at leaſt as ſtrong as the ſides of the cell.

The web that this *Worm* ſpins is remarkably fine and delicate. Its threads are of a ſmalneſs ſcarce conceivable, and its workmanſhip worthy the materials; for they are wove in ſo compact a manner, that it is not eaſy to ſee the ſtructure; inſomuch that Mr. Maraldi, a very accurate obſerver of the bees in other reſpects, ſuppoſes this lining of the cell to be formed of the ſkin of the *Worm*, thrown off at its entering into the nymph-ſtate. He is a little embarraſſed to conceive in what manner the ſkin becomes ſo regularly and nicely applied to all the angles of the cell; but a cloſer obſervation ſhews the truth; for if the cells be opened when newly covered by the bees, the *Worm* within will be found to be yet in its own form, and will be detected in the act of ſpinning its web; or if glaſſes be called in to our aſſiſtance afterwards, the web, whoſe ſtructure is imperceptible to the naked eye, will be ſeen to be compoſed of fine threads regularly woven together like thoſe of other ſpinning animals.

The female bees are treated with a peculiar diſtinction, even in this ſtate of the *Worm*, as well as afterwards. We ſee that the common cells ſerve ſucceſſively to the hatching of ſeveral of the common *Worms*, and bringing them to perfection in the bee-ſtate; but this is not the caſe in the females, each cell only ſerves to raiſe one bee of this kind, and is never found covered within with any more than one web or ſilky lining. Indeed the bees always deſtroy theſe royal cells as ſoon as ever the bee is hatched from them, or, at the moſt they only leave the bottoms of them, to ſerve as the baſe of other cells; and this indeed is wholly neceſſary, in order to their carrying on their common work, and enlarging their combs. *Reaumur*, Hiſt. Inſ. vol. 10. p. 263.

The ſucceſſive hatching of ſeveral bees in the ſame common cell, is of great uſe to it, as the web left by every one within it, greatly ſtrenghens the cell; but this is by no means neceſſary, in regard to the royal cells, or thoſe deſtined to the producing the female bees, as the ſides of thoſe are always made ſo thick, that they can require no additional ſtrengthening.

When the common *Worm* of the bee has arrived at its growth, the labouring bees bring it no more food, ſo that it eats up the whole of what remains, and the cell becomes dry and clean. It then extends itſelf at full length under the cover of the lid of the cell, and by giving itſelf ſeveral motions, it cauſes the ſkin of its back to ſplit open with a ſmall longitudinal fiſſure. The internal motion of the creature ſoon enlarges this ſlit, and at length the body of the nymph appears in the fiſſure, and by degrees makes its way compleatly out. The ſkin left behind is then only a dry membrane, and this nymph is to be looked on as the animal: this is an oblong body of a delicate ſtructure, but without any power of motion.

In this, if nicely examined, there may, however, be diſcovered all the parts of the future bee, and it ſeems indeed no other than the perfect bee, with its limbs as yet all ſoft and tender, and concealed under a thin membrane, till they acquire a due ſtrength and firmneſs. The rings of the back may be eaſily traced on the back of the nymph, and when its belly is examined, the legs and horns, or antennæ, and the trunk, are all diſtinctly ſeen extended lengthwiſe, and the wings are folded in ſmall knobs, which are afterwards to be unfolded in a wonderful manner.

The drones, or male bees, which the common working bees ſo unmercifully maſſacre and deſtroy in the month of July, or thereabouts, are not leſs taken care of in their worm-ſtate, than thoſe of the common kind. The *Worms* of theſe drones do not differ in any particular from thoſe of the common working kind, except that they are larger, and are placed in larger cells.

The bees bring food to theſe *Worms* in the ſame manner as to the others, and when the time of their change into the nymph-ſtate approaches, they as regularly and carefully cover their

cells

cells with a wax lid. It ſometimes happens, that the *Worms* of theſe drones are lodged in cells no larger than thoſe in which the *Worms* of the common bees are placed. The bees who have the care of the young brood always are able to diſtinguiſh theſe however, and when they come to make the cover of the cell they always give them room by making it of a different form; they do not extend a flat cruſt over the mouth of the cell in this caſe, but raiſe a hollowed and elevated covering. The cells of the drones are eaſily diſtinguiſhed from the reſt, by this; and a whole ſide of a comb is by this means often found to be the lodging of the drones only.

The eggs out of which the male bees are to be hatched, differ in nothing from the others, except that they are a little larger; and the bees produced of the *Worms* hatched from them, are proportionably larger, as are alſo the *Worms* themſelves when at their full growth. It ſometimes happens, however, that the male bees are no larger than the others; ſeveral hives having been found with the males of this ſmall kind. It ſometimes happens that the female bee is obliged to depoſit two, three, or even four eggs in one cell, through a ſcarcity of cells at the time when it is neceſſary for her to lay; but as theſe can never grow to their full ſize in a third or fourth part of the room they ſhould have, Mr. Reaumur is of opinion, that this is the cauſe of the ſmallneſs of theſe male bees; and that in whatever hives they are found, the eggs have been left three or four in a cell.

The love that the working bees have for the young *Worms* hatched in the combs of their own hives appears very great, and their care of them the moſt perfect in all their ſtages that could be conceived; but this love and tenderneſs does not extend to the young ones of another hive. Mr. Reaumur tried the experiment, by putting into one of his glaſs hives part of the comb from another hive, in which there were ſome eggs and ſome young *Worms*; but while the bees of this hive were perfectly careful of their own young, they were cruel in the greateſt degree to theſe, tearing them out of their cells, and carrying them out of the hive, there leaving them to periſh. *Reaumur*'s Hiſt. Inſ. V. 10. p. 267.

There are certain circumſtances alſo, under which the bees are not leſs cruel, even to their own young: If it happen that a comb break, and a piece of it fall to the bottom of the hive, the bees immediately gather about this fallen piece, and kill all the *Worms* that are in the cells of it, in the ſame manner as they did the ſtrangers, carrying them out of the hive. It ſhould ſeem, that the creatures knew, that the want of the neceſſary heat which is found in the center of the hive would be the occaſion of the death of theſe *Worms* before they could arrive at the bee ſtate, and that in mercy to the creatures themſelves they at once put a period to a life, that could only be miſerable, and prevented a great deal of unneceſſary trouble to themſelves, in feeding a number of creatures which never could come to perfection. It ſometimes happens alſo, that the bees kill and carry out of the hive the bodies of many of the *Worms*, while the combs all remain in their place, and no accident has happened to them. There are however very plain reaſons which may juſtify this cruelty, ſo very different from the general care and tenderneſs they have for them. One of theſe may be, the neceſſity of making a proviſion for themſelves againſt the winter.

If the fœcundity of the female bee continue ſo long, and be ſo great, that all the cells are filled with young ones, at a time when many of them muſt of neceſſity be filled with honey, for the ſuſtenance and ſupport of the hive in winter, it will be found abſolutely neceſſary that many of the cells muſt be cleared of the *Worms*, in order to their being filled with the honey. The preſervation of the republic being the firſt of all cares, this cruelty will be found juſtifiable, rather than by a fooliſh tenderneſs all ſhould be left to periſh with hunger. This ſlaughter is plainly very often owing to this cauſe, as it is ſeen to be made at ſuch time as the winter is coming on; and when there is preſent a ſeaſon admirably adapted to provide a ſupply for it, by affording great opportunities of collecting a great deal of honey in a little time.

There is alſo another occaſion, on which a maſſacre of this kind may be juſtified on the principles of reaſon. If a female prove very prolific, and by any accident do not lay any eggs for the producing another female, or the egg or eggs of this kind which ſhe does lay do not come to good, the young brood in this caſe cannot anſwer the general purpoſe of nature in their production, that is the forming a new ſwarm and taking care of a new offſpring; and in this caſe, as they would live to no purpoſe, it is not wrong in the bees who have the care of the young to deſtroy all theſe, and make room by that means for a new brood born with happier circumſtances.

It is very poſſible alſo, that the *Worms* may be liable to certain diſorders, which we can have no knowledge of; but in conſequence of which they could only produce very feeble and uſeleſs bees: in this caſe, which the bees who have the care of the young may eaſily perceive, it would be no improper method in them to deſtroy in the *Worm*-ſtate what they foreſaw would be of no uſe to the commonwealth in the bee-ſtate. *Reaumur*'s Hiſt. Inſ. V. 10. p. 273.

Though the common bees refuſe the care of ſuch young ones as are taken out of other hives, and put into theirs, their rules however are not ſo ſtrict as to the breeding no other young but thoſe of their own hive; for it has been found by experiments, that if all the bees of two hives be forced to make a change, and each ſwarm to enter into the hive belonging to the other, they will in this caſe take as much care of the young *Worms* they find in the combs, as they would have done of their own.

If the common bees take all this care of the *Worms* which are to become working bees like themſelves, and even of thoſe which are to become drones which after a time they are to deſtroy, there is no wonder that they take greater pains to ſecure and bring up thoſe *Worms* which are to become female bees; of which they are ſo very watchful and obſervant, that they feed theſe *Worms* with the utmoſt care; and when they have brought them up to that ſtate when they are to eat no longer but are to paſs their laſt change into the chryſalis or nymph-ſtate, they cloſe up the aperture of the cell with a lid of wax; in the making of which, they are not leſs prodigal of that choice and precious ſubſtance the wax, than they had before been in the conſtructing the cell. It takes as much wax to make one of the cells in which theſe females are to be brought up, as to make an hundred and fifty of the common cells; this may be found by weighing them againſt one another, and the cover or lid of the cell put on at the time of the transformation of the *Worm* bears the ſame proportion to the covers of the other cells. Every thing that regards theſe creatures is managed with profuſion: In the common cells there is never found a drop of that liquid matter deſtined for the food of the *Worm*, when it is arrived to the nymph ſtate, the bees never furniſhing it with a drop more than is abſolutely neceſſary; but they give ſo profuſely to the *Worm* that is to become a female bee, that when it is changed into the nymph-ſtate there is uſually found in the cell with it a quantity of this food equal to its own bulk.

This food ſeems alſo more nicely prepared, than that which is intended for the nouriſhment of the other worms; for if it be taſted, it is found very ſweet and luſcious, but attempered with a ſharpneſs like that of vinegar, and with a warmth like that of pepper, or ſome other ſpice.

It might be ſuppoſed from this food always found in the cell with the royal or female nymph, that the creature in that ſtate took in nouriſhment; but this is not the caſe, the nymph of the female bee can no more eat than any of the others; but this maſs of food is of no injury to it in that ſtate, as it does not fill up the whole cell as the others do, but has a great deal of room, and there is always a void ſpace between it and the maſs of food. *Reaumur*'s Hiſt. Inſ. V. 10. p. 278.

The progreſs of the young bee from its *Worm*-ſtate, is this: When the cover is fitted to the cell, the nymph makes its way out of the back of the ſkin of the *Worm*; it is at firſt perfectly white, but by degrees its eyes acquire a reddiſh colour, and afterwards the ſeveral parts of the body become more and more brown; by degrees they all acquire their due ſtrength and ſolidity; and when that is done, the bee appears out of its caſe, by burſting the thin membrane that covered it. The next office then, is the getting out of the cloſe cell, which is a priſon to it; in order to render this eaſy, the head of the bee is always fixed by the poſition of the nymph juſt under the center of the lid or cover of the cell.

The firſt buſineſs of the new-hatched bee is therefore with its teeth to eat a way through this covering; this it does by ſlow degrees, firſt forcing a ſmall aperture, and afterwards by degrees enlarging that to a proper ſize to let its head, and in fine its whole body, appear. This is, in favourable circumſtances, that is when the day is favourable and the young bee vigorous and ſtrong, the work of about three hours; but at other times, it is half a day's work; and in ſome caſes is never perfected at all, the creature dying by that time it has made an aperture large enough to get its head out at, and periſhing with the head out and the body within the cell.

Swammerdam ſuppoſed, that the bees which placed the covers upon the cells, took them off again at a proper time; but this is not at all conſonant to reaſon and experience, ſince, were it ſo, we could never find bees dead in the poſition juſt deſcribed. But Swammerdam living before the invention of glaſs-hives, could only gueſs at what we can now ſee diſtinctly performed under our eyes.

As ſoon as the head and the fore-pair of legs are out, the diſengaging the reſt of the body is very eaſy, as theſe legs being fixed on the outſide of the cell have ſufficient force to pull up the reſt.

When the creature is completely out, it ſtands on the ſurface of the comb near the cell out of which it is come, and its parts, which are yet very ſoft and moiſt, become hardened and dried by degrees.

While it ſtands thus, the reſt of the bees which are about the ſpot gather round it, and give evident marks of joy at its being produced; they ſtroke and make much of it, and often offer it honey out of their own mouths. While it ſtands in the midſt of theſe careſſes, its wings by degrees unfold themſelves, while ſome of the bees are thus welcoming the new inhabitant, others immediately ſet themſelves about clearing away the matters left in the cell, and fitting it for the reception of a new inhabitant.

The bee produced out of it, has neceſſarily left behind it two exuviæ; the ſkin of the *Worm* when it transformed itſelf into the nymph ſtate; and finally that of the nymph, out of which it is juſt come in form of a bee.

One of the working bees immediately enters this cell, head foremoſt, and taking up one of theſe exuviæ carries it out of the hive, and the moment ſhe has left the cell another enters it, and in the ſame manner carries out the other exuviæ; after her there enter ſeveral others, which carry out the fragments of wax that had fallen in while the *Worm* was gnawing its cover to pieces; and others, finally, put it perfectly in order, and render it fit for the reception of a new egg, which the female bee ſoon depoſits in it; inſomuch that Mr. Maraldi ſays, he has ſeen five bees produced in the ſame cell, in the ſpace of three months.

The young bees are eaſily diſtinguiſhed from the others, by their colour; they are grey, inſtead of the yelloviſh brown of the common bees. The reaſon of this is, that their body is black, and the hairs that grow upon it are white, from the mixture of which ſeen together reſults a grey; but this colour forms itſelf into a browniſh yellow by degrees, the rings of the body becoming by degrees more brown, and the hairs more and more yellow. The bee is no ſooner produced from the nymph, than it knows the whole buſineſs of its future life; it immediately goes out, and gathers wax and honey for the common ſtores. At the time that one bee hatches in this manner, as many others are alſo hatched as there were eggs depoſited by the female in the ſame day; this is often many hundreds: So that a few days of this kind render the hive too full of inhabitants, and the new-born brood are forced to go out in form of a ſwarm to find ſome other habitation, where they may employ themſelves in the ſame manner with thoſe to which they owed their origin. *Reaumur*'s Hiſt. Inſ. V. 10. p. 280. See the article SWARM.

Canker-WORM. See the article SCARABÆUS.

Churr-WORM. See the article GRYLLOTALPA.

Connough, or *Connaught*-WORM, in natural hiſtory, a name given by the common people of Ireland, to a kind of caterpillar found in many parts of that kingdom; and, from its ugly aſpect, reputed to be poiſonous.

It is ſaid to be the only poiſonous creature of that kingdom, and many miſchievous effects are attributed to its ſting, and to its poiſonous quality, when eaten by cattle.

As to the firſt of theſe opinions, it is evidently erroneous; the creature having no power to ſting at all. The other is not ſo eaſily proved falſe, but is much to be ſuſpected. The reaſons on which it is founded, are theſe: The cattle in Ireland are ſubject to a very terrible diſeaſe, which is moſt frequent in Autumn; about the time when theſe animals are in the greateſt plenty.

It is moſt frequent alſo among thoſe cattle which feed in low and marſhy grounds, where this creature lives and feeds; cows and hogs which feed in theſe places, are the only creatures ſubject to the diſtemper, and this is imputed to the cows eating by large mouthfuls, becauſe ſhe chews the cud a ſecond time; and the hogs feeding ſo foul and greedily, as to eat things which other creatures refuſe. Finally, the great cauſe of the aſſigning this diſeaſe to this creature is, that the *Worm* only appears in great numbers about once in ſeven years; and in theſe, and theſe years only it is, that the diſtemper among the cattle is common.

The ſymptoms by which this diſeaſe is diſtinguiſhed from all others, are, a great ſwelling of the head, and a falling down of the anus; the gut often hanging out to the length of ſix or ſeven inches. The common cure among the more intelligent people is a ſtrong decoction of the plant called bearsfoot, or great black hellebore, with ſome rue and garlic given with butter and beer; this is found to have great ſucceſs with the cows. The hogs are cured only by mixing reddle, or the common red ochre powdered, with buttermilk, and making them eat a large quantity of it.

The Iriſh peaſants have recourſe to many idle remedies; but theſe are found often of real ſervice. The caterpillar, ſuppoſed to occaſion this diſeaſe, feeds on the common ragwort, and is larger than moſt other creatures of this kind, being of the length and thickneſs of a man's finger; it is marked with two large ſpots behind the head, which are ſuppoſed by the vulgar to be the eyes, but are only round variegations, of the nature of thoſe common on other caterpillars; and what they take to be a ſting in the tail, is no other than a horn in that part, which is not peculiar to this caterpillar, but found on many others. That the common people are deceived in regard to the external parts of this creature, is evident; but experiments are required yet to prove, whether or not they are ſo, in regard to its poiſonous quality.

One trial is remarked by Mr. Molyneux to have been made on a dog, who eating the ſkin of only one of the creatures was found dead about three days after; another dog, which eat the juices expreſſed from that ſkin, received no hurt. The inſect is deſcribed in Liſter's edition, under the name of the elephant caterpillar. Phil. Tranſ. N°. 168. p. 880.

Flower-root-WORM. See the article FLOWER.

Fly-WORMS, in natural hiſtory, the *Worm* or maggot produced of the egg of a fly, and afterwards to be transformed into one.

Theſe *Worms* are to the fly, what the caterpillar is to the butterfly it produces. The cuſtom of the world has appropriated the term caterpillar to that one ſpecies of the flying inſects firſt ſtate; but we have unfortunately no term of diſtinction yet eſtabliſhed for any of the firſt ſtate of any of the other flying inſects, the creature produced by the egg of the fly ſcarce being indeterminately called *Worm*. Till more expreſſive names ſhall be invented for theſe, it may not be improper to diſtinguiſh thoſe of the different claſſes by the additional name of the inſect they are to be changed into, and to call that which is to become a beetle, the *Scarab-worm*, that which is to be hereafter a fly, the *Fly-worm*; and ſo of the reſt. *Reaumur*'s Hiſt. Inſ. V. 4. p. 161.

Thoſe which are to be hereafter winged creatures of the fly-claſs, are extremely different one from another in form and figure, and may very properly be arranged into ſeveral claſſes.

The moſt remarkable and ſtriking differences between the claſſes of theſe creatures, are thoſe of the form and ſhape of their heads. Many of them have heads which it is not eaſy to diſtinguiſh to be ſuch, as they carry no one mark of the head of an animal viſibly about them. We are accuſtomed to ſee in other animals a conſtant and regular form of the head, which is no way alterable during the life of the animal; but among theſe *Fly-worms* there are many, whoſe heads are variable at the pleaſure of the creature; and which at times are ſeen to be more or leſs long, more or leſs thick, more or leſs flat, more or leſs ſhortened at pleaſure by the animal, and eaſily bent and turned about in any direction.

The heads of theſe creatures are not only fleſhy, but compoſed of a very ſoft and flexible fleſh; as theſe creatures have no ſhell, it may occur to ſome to think they have no brain; but this would be a greater wonder than all the reſt. Be it as it will, the naturaliſt need make no heſitation to pronounce that the head of an animal, which is the anterior extremity of the creature, and is furniſhed with neceſſary organs for taking in the food, and conveying it into the body. Ibid. p. 162.

Though there are among the *Fly-worms* many whoſe heads are of this variable conſtruction, there are alſo others whoſe heads are hard, like thoſe of other animals; and which, like thoſe, always retain the ſame regular figure.

This grand diſtinction among theſe *Worms* may furniſh us with the firſt general arrangement of them, which may be into thoſe which have a variable, and thoſe which have an unchangeable head. Ibid. p. 163.

If we after this attend to the number, arrangement, diſpoſition, ſtructure, and form of the other parts of theſe little animals, we ſhall find ample matter for a ſufficient number of ſubordinate diſtinctions, which will alſo prove very extenſive.

Some *Worms* of this kind we ſhall find, which have not the leaſt appearance of legs; others we ſhall find, that have legs, but theſe merely membranous ones; others which have them merely ſcaly, or ſhelly; and others, which, like the caterpillars, have legs of two kinds, ſome ſhelly, and others membranous; but which have always more of the latter kind than the caterpillars have.

Other ſub-diſtinctions there will alſo be found, in the variable and unchangeable heads of divers of theſe *Worms*; and the whole form of the body in others will be found to be totally different. Some of them have a power of altering the figures of their bodies at pleaſure, being able to lengthen or ſhorten them, or to make them thicker or thinner at pleaſure. Some can alſo at the ſame time inflate, as it were, and ſwell out ſome particular parts of their body, while they make other parts thin and flat. And others have their body ſo rigid, as to be wholly incapable of theſe changes, and indeed of bending or turning otherwiſe than all together.

The external coat of ſome of them is alſo very thin, tender and membranous; whereas that of others is ſtrong, firm and ſcaly, or cruſtaceous. And finally, the different ſpecies themſelves will afford us ſufficient ultimate diſtinctions, by the poſition, number and figure of their organs of reſpiration. *Reaumur*'s Hiſt. Inſ. V. 4. p. 163.

Genera of Fly-WORMS. The diſpoſition of the ſtigmata, or air-holes, at which the tracheæ of theſe animals terminate, will help us to the occaſions of ſeveral diſtinctions of genera among the *fly-Worms* of variable heads.

The *Worm* of the common fleſh-fly has in its ſtigmata ſix apertures, three in each, of an oblong figure, and reſembling button-holes; but, inſtead of theſe, the *Worms* of many other flies have them in the ſame part of their bodies, but have, inſtead of the three button-holes, only one ſmall eminence, reſembling a little button in each: Others have them cylindric and hollow, and ſtanding out from the hinder part of their bodies in form of horns. Some genera have only two of theſe horns, and others have three: The two in ſome are placed to a conſiderable diſtance from one another, and in others they are in a manner joined together. Some alſo carry theſe pipes or horns in an elevated poſition, others having them placed flat on their bodies; and beſide theſe varieties in the number, form, and ſituations of the ſtigmata, ſome diſtinctions of genera may be drawn from the parts which ſurround them, and are deſtined by nature for their defence.

The number, diſpoſition, and figure of the hooks, which ſerve theſe creatures in the place of teeth, may alſo ſerve for matter of diſtinction, as may alſo the differences of their legs. *Reaumur*, Hiſt. Inſ. vol. 4. p. 173.

The common *Worm* of the fleſh fly has two hooks, placed at a diſtance, in a parallel direction, and a dart between them. Others have theſe hooks, but have no dart; others have theſe hooks of very different ſize one from the other, and placed one over the other; others have only one ſingle hook; and others there are, which have nothing of this kind at all, or, at leaſt, which we can never make to ſhew any. Ibid.

The figure of the body in others, will alſo give matter of diſtinction. The hinder part of ſome is, as it were, cut off, and repreſents the truncated end of a cylinder. Some there are of a much ſhorter body than others; ſome have their anterior part as thick as the poſterior: ſome are more flat, and others more round. Ibid. p. 174.

Notwithſtanding that the *fly-Worms* of the firſt claſs have, properly ſpeaking, no legs, yet ſeveral of them are able, at pleaſure, to inflate themſelves, and to ſend out from the under part of the rings of their body, in that ſtate, certain membranaceous portions analogous to, and ſupplying the place of legs, and much variety is to be obſerved in the placing of theſe. Some have them arranged orderly as legs, two and two, one on each ſide of each ring; others have a ſingle range of them all along their belly, in a row down the middle. Each of theſe is ſometimes furcated or divided into two; and others have the under part of their bodies, at or near the junction of the rings, furniſhed with a ſort of hooks, very ſhort and fine, and commonly of a red colour; theſe are of great uſe to the creature in laying hold of the ſurface on which it moves itſelf. Ibid.

The differences of ſize and colour in theſe creatures, may alſo be made the baſis of farther diſtinctions; among other things, the nature and quality of the ſkins of the different kinds may alſo be conſidered, ſome being thin and tranſparent, others thick, rigid, and opake; ſome alſo being ſmooth, others rough and wrinkled, others adorned with long hairs, and finally others, as it were, armed with prickles.

Theſe are the marks and characters of the genera of the firſt claſs. Thoſe of the ſecond, which have variable heads, and differ from the former in that they have legs like thoſe of the caterpillar-claſs, have frequently a ſort of thorns or hooks faſtened to them, and though the head of the *Worms* of this claſs is truly of a variable figure, and is fleſhy, the mouth is ever ſo viſible in all its changes, that the head is eaſily known to be ſuch.

Another very obvious character there alſo is of the generality of the *Worms* of this claſs, which is, that they have a long fleſhy tail, which they can lengthen or ſhorten as their occaſions require; the reſemblance of this to the tail of a rat may probably give this genus the name of the *rat-tailed Worms*.

This tail is the principal organ of reſpiration in theſe *Worms*; its end is always open, and ſupplies the office of the ſtigmata of the other genera. Ibid.

The *fly-Worms* of the third claſs, which have their heads of a conſtant and invariable figure, and, like thoſe of other animals, have no moveable jaws, or any thing analogous to that organization; but ſuch of them as have any teeth or hooks, have all a power of drawing them into their heads on occaſion, and only throw them out when they would uſe them.

The *Worms* of this claſs have pointed heads, or ſuch as ſeem truncated, or with the end of the rays part cut off, they have no ſhelly or ſcaly legs. Theſe are a very numerous family both in the terreſtrial and aquatic kingdom, and all, as far as is hitherto known, furniſh two-winged flies.

The firſt genus of theſe may be eſtabliſhed of the ſcaly ſpecies, which have, as it were, ſcaly rings, and are rigid, and not incapable of flexion, though wholly ſo of contraction or dilatation; theſe *Worms* can turn about nimbly enough, but cannot at all lengthen or ſhorten their bodies, and thence may be properly enough called the *ſerpentine genus*.

The former genus are naturally inhabitants of the earth; thoſe of the waters give us a ſecond genus. Theſe have a merely membranaceous ſkin, and always an oblong head, and their poſterior extremity is terminated by a ſort of pipe, open at the end for reſpiration. The bodies of theſe are round, or approaching to that figure. Ibid. p. 178.

Another genus may well be eſtabliſhed of the *Worms* with heads like the former, but with flatter bodies. There are two ſpecies of this frequently found, the one in cow-dung, the other in the agarics of the ſycamore, and other trees. Theſe have their organs of reſpiration, like the reſt, in the hinder part of their bodies, and they might in many be miſtaken for the arms of the creature, by thoſe not converſant among the creatures of this claſs.

A fourth genus may be eſtabliſhed of the *Worms* of long and rounded bodies, which are ſmaller at each end than in the middle; theſe may be called the *tipulæ-Worms*, becauſe they all are transformed into flies of that claſs. The head of theſe *Worms* is ſcaly, and ſmall in proportion to the ſize of their body, and their ſtigmata are placed in the hinder part of their bodies, and ſurrounded with a fleſhy appendix. Ibid. p. 179.

There is another genus of *Worms* which transform themſelves into tipulæ, and perhaps merit a ſeparate claſs, rather than a ſubordinate genus. Theſe are altogether red, and of a bright lively colour: they have near their head two ſhort legs, which reſemble two ſtumps of arms; but the thing that, above all others, characteriſes theſe, is, that they have, near their hinder extremity, and on the under part of their bodies, four long fleſhy ſtrings, which having ſome reſemblance to the polype-fiſh, may well enough give theſe the name of the *polype-Worm*. Theſe have alſo, at the hinder part of their bodies, two cylindric pipes, which have much of the appearance of organs of reſpiration. Ibid. p. 180.

A ſixth genus may alſo be eſtabliſhed of the *water-Worms*, which are transformed into gnats. Theſe reſpire like the reſt, by means of the hinder extremity of their body, which is an open pipe; they have alſo, beſide this, another pipe, deſtined to give paſſage to the excrements, and placed under their body. Ibid.

A ſeventh genus may be eſtabliſhed of thoſe long *Worms*, reſembling the *Worms* of the tipulæ, and having a ſmall ſcaly head: Theſe live in the earth, and in cow-dung, and are covered with hairs, which give them much the appearance of caterpillars. Theſe have two ſtigmata placed in their hinder part, ſurrounded with fleſhy appendages.

An eighth genus may be eſtabliſhed of the long, white, and ſhining, but not ſcaly *Worms*, frequently found in and among muſhrooms. Theſe have their ſtigmata not placed behind, as the reſt of the *fly-Worms* have; but, like thoſe of the caterpillars, in every ring of their body.

The *Worms* of the fifth claſs, which uſually produce four-winged flies, have heads of a conſtant and invariable figure, and have two teeth, or two moveable jaws, always open and expoſed, and which are placed near the middle of the aperture of the mouth; they have no ſcaly legs. Ibid.

The ſtigmata of theſe *Worms* are placed on their ſides, and never on the hinder parts of their bodies. The flies produced from theſe are of very numerous genera, the bees, waſps, ichneumons, gall-flies, *&c.* are all of this ſort. Ibid. p. 182.

The ſixth claſs of theſe *Worms* is that of the hexapode, or ſix-legged kind, which are transformed into ſome ſpecies of the libellæ. Theſe have no mouth, but inſtead of one, have, in a manner, two, if the openings through which their aliments paſs, may be ſo called. Theſe are at the top of their antennæ, which are placed in the fore-part of their head.

The *fly-Worms* of this ſingular claſs, are but very few in number. The formica-leo, in the ſtate in which it is known by that name, is one, and the puceron-eaters are ſo many others. Ibid. p. 183.

The ſeventh claſs is of the *Worms* which have bodies long like the caterpillar-claſs, and have ſix legs; but their ſingular character is, that they have two other ſhort legs, or properly two hooks of a particular kind, placed near their hinder part, and aſſiſting them in fixing themſelves, and moving. The water-*Worms*, which make themſelves caſes of different materials, and are afterwards transformed into papilionaceous flies, are of this claſs.

Several ſmall green and yellow *Worms*, which feed on the apricock and pear-tree, and fold up the leaves of thoſe trees, tho' they much reſemble caterpillars, are alſo truly and properly of this claſs.

The eighth claſs is of thoſe *Worms* called *falſe* or *baſtard caterpillars*, becauſe the figure of their body might make them be miſtaken for caterpillars, rather than known for fly-*Worms*, by leſs curious obſervers.

Theſe have ſix cruſtaceous legs, like the caterpillars; but they have a greater number of the membranaceous ones than thoſe inſects; they have ſcarce ever leſs than ten, and often fourteen. Theſe alſo are not edged round with hooks, as thoſe of the caterpillars are; and they differ from the true caterpillars in this alſo, that their head is more round, and has only two eyes, one on each ſide; whereas the caterpillars have on each ſide five or ſix, diſpoſed in form of an arch. Ibid. p. 185.

All this claſs of *Worms*, ſo far as is yet known, change into four-winged flies; the females of which are armed with a ſaw behind. The number of the membranaceous legs being dif-

ferent in different ſpecies of the falſe caterpillars, will very properly furniſh matter for the ſubordinate diſtinctions of the genera.

A firſt genus may be very properly eſtabliſhed of thoſe which have no more than eighteen legs in all; that is, ſix cruſtaceous, and twelve membranaceous.

A ſecond may be of thoſe which have in all twenty legs; and a third thoſe which have twenty-two legs.

The ſpecies may be ſufficiently diſtinguiſhed by their colours, and by their attitudes, which are very different in the different ſpecies, and very conſtant in the ſame: Some of them always carry the hinder part of their body elevated, others are continually rolled together; and finally, others always extended.

The greater part of the falſe caterpillars are ſmooth; but there are, however, ſome which have a very ſingular ſort of thorns, arranged with great ſymmetry.

It might perhaps not be improper to arrange the thorny ones into a diſtinct claſs, which, according to the figure and order of the thorns might be again ſubdivided into ſeveral genera. Ibid. p. 186.

Gally-WORM.	See the article	GALLY-*Worm.*
Glow-WORM.		GLOW-*Worm.*
Gnat-WORM.		GNAT.
Gooſeberry-WORM.		GOOSEBERRY.
Hay-WORMS.		HAY.
Horſe-WORMS.		HORSE.
Lyſimachia-WORMS.		LYSIMACHIA.
Muſhroom-WORM.		MUSHROOM.
Oyſter-WORM.		OYSTER.
Pile-WORMS.		PILE.
Sheep-Noſe-WORMS.		SHEEP.
Silk-WORM.		SILK.
Truffle-WORMS.		TRUFFLE.

Meal-WORM. There are two very different inſects found in our meal or flour; the one is ſo ſmall, that it is only to be ſeen by the microſcope; all that the naked eye can diſcover of it is, that ſomething is alive in the place, from the whole ſubſtance of the flour being in motion. See the article FLOUR.

The other *meal-Worm* is larger, and more frequently offers itſelf to our obſervation; it conſiſts of eleven rings, and has three pairs of legs. The mouth of this *Worm* is made into a kind of forceps, and from this ariſe, on each ſide, a great number of ſmall ſpinulæ; theſe ſerve inſtead of teeth, and the animal feeds by means of them. They are found ſometimes very ſoft and tender, ſometimes hard and firm, and at other ſeaſons they are very briſk and lively; at others they have ſcarce any life in them.

The moſt remarkable thing in regard to theſe *Worms*, is, that they are always exactly of the colour of the flour which they live among. Ray has obſerved, that the white flour breeds white ones; the coarſer flour breeds larger and greyer ones; and that flour which has the bran among it, breeds brown ones, of the ſame colour with itſelf. This is a proviſion of nature for the ſafety of the animal, ſince were it of a colour different from that of the flour, it muſt be eaſily diſcovered among it, and would be picked out and thrown away. The caterpillar tribe are thus preſerved, by being of the colour of the leaves they feed on; their green, uſually ſuiting itſelf exactly to that of the tree or plant. *Deſlandes*, Trait. Phyſ.

WORMS *of the Sea*. The ſea-*Worms* are of the number of thoſe animals, which with the oyſter, and ſeveral other ſhell-fiſh, furniſh us an inſtance of animals which remain all their lives fixed in the manner of plants to one ſpot, whence there is no probability of their moving themſelves.

Theſe *Worms* are included in a ſort of caſes or pipes, and may be divided into two claſſes, according to the nature of thoſe caſes. In the one ſpecies theſe are only made of grains of ſand, fragments of ſhells, and the like, faſtened together by a viſcous humour; and in the other they are compoſed of a true ſhelly matter.

Thoſe *Worms* which have ſhelly caſes, are fixed ſometimes to the ſand at the bottom of the ſea, ſometimes to ſtones, or ſea plants, and ſometimes to the ſhells of other fiſhes; their ſhells are rounded, and, in ſome degree, conic, as they always gradually grow wider from their point or apex to the mouth; as to the reſt their ſhape is different in almoſt every individual, forming divers irregular curves, and often reſembling the ſhapes into which a common earth-*Worm* curls and twiſts itſelf in its various motions.

In order to know how theſe ſhells become ſo exactly faſtened to the bodies on which we find them, it will be neceſſary to conſider the manner in which they are formed.

The creature, when juſt produced, is covered with a ſhell; but this ſhell no longer covers its whole body; as it grows, a new ſhell is formed over this, from the condenſation of its own juices, and this fixes it down as it grows to the body, be that what it will, on which it is formed; and as the *Worm*, in its growth, twiſts itſelf variouſly about, it will be fixed down in that poſture by the new-formed ſhell which covers it, and which adheres as well to the body on which the *Worm* lies, as to the old ſhell.

The marine-*Worms* of the other kind, which are not regular ſhells, but whoſe caſes are made up of fragments of different bodies, and of grains of ſand, live in the ſame manner with the others, their whole lives in the ſame hole. Theſe creatures bury themſelves in the ſand of the ſea, as the common earth-*Worms* do in the earth; and the glutinous matter which eſcapes continually from their pores, not being either ſufficient in quantity, or of a nature to harden into a perfect ſhell of itſelf, yet ſerves to faſten together the ſeveral ſmall bodies that come into contact with it all about the body of the creature; and ſerve as a ſort of mortar to cement together a multitude of little ſtones, *&c.* and of this connected maſs to form a coarſe ſort of covering for the animal, which defends it from the common injuries.

The force of this viſcous or glutinous humour flowing from the bodies of theſe *Worms*, is very evidently ſeen in places inhabited by them, when left dry by the ebbing of the tide; the ſurface of the ſands, in theſe places, appears rough and ragged in a very ſingular manner. The pipes in which theſe *Worms* are lodged, are uſually placed in great numbers near one another, and their ends all ſtand out about an eighth of an inch above the ſurface of the ſand; and the reaſon of this is, that the whole ſand-bank was, when covered with the water, of a level with the mouths of theſe pipes; the ſea, in its receſs, has carried off about an eighth of an inch of the ſurface of the ſand with it; but though it has done this every where, where the ſand was looſe and free, it has not been able to do it where it was glued together by the viſcous juices of this animal, but has left ſuch part of it ſtanding out in form of pipes or caſes to the animal.

The ſtrength of this glue is alſo ſeen in the common accident of the ſeas waſhing off a piece of a ſand-bank, in which they dwell; in this caſe the fragment is found at ſome diſtance, with the interſticial ſand every where waſhed deep away from the ſurface, but with the caſes of the *Worms* remaining prominent, and being perfect and unhurt at full length, with all their convolutions.

Sometimes alſo theſe pipes or caſes are found perfectly detached from all ſandy matter, and lying looſe on the bottom of the ſea; in this caſe the glutinous juice, cementing the outer ſurface, being much weaker than that which keeps together the more internal part, much of the ſuperficial coat is often worn away; nay, ſometimes the caſes are not thicker than a piece of writing-paper, yet ſtill preſerving their whole figure. The internal ſurface of theſe pipes is always perfectly ſmooth, even, and poliſhed, which is wonderful, as they are compoſed of ſuch rugged particles as, one would think, could not eaſily furniſh a ſmooth ſurface; but doubtleſs the mucous or viſcous humour of the animal fills up the interſtices between the particles, and, by degrees, hardens ſo far as to make one even ſurface with their prominent ends.

The *Worm* which inhabits theſe caſes is of a very ſingular figure; it is about an inch long, and of the thickneſs of a large wheat ſtraw; its head is of a very odd ſtructure; it is rounded and flat, and is much broader than any other part of the body. At certain times the extremity of the head is of this round figure, and is divided into three parts; that in the middle is of an oval figure, and hollow; the next to this is a circular zone or band which ſurrounds this oval part; and the third part is another circular zone, extended behind this laſt; on both theſe zones there are a great number of lines marked, which ſeem a ſort of rays, running from the center to the circumference.

Though this is at ſome times the figure of the head; yet at others it is of a very different form, reſembling a creſcent or a horſe-ſhoe; for there is a certain part in the middle of the head, which the creature can open when it pleaſes.

A little below the head, it has three oblong ſlender bodies, which ſerve as oars on each ſide; its body approaches to a conic figure, and is terminated by a long tail; all along the body there are placed, at different diſtances, little fleſhy protuberances ſhaped like hooks, which bend toward the tail.

Theſe are placed in three ranges, and ſeem intended to ſerve the creature in the place of legs or arms, when it has a mind to move upward or downward in the ſhell.

When we conſider the effects of this glutinous juice iſſuing from the body of this animal, in faſtening together any looſe ſubſtances it meets with, ſo as to form a caſe for it, it may be eaſily ſuppoſed that the adheſion of the *balani-marini*, and other the like ſhells, which remain all their lives fixed to ſome one ſpot, is performed in the ſame manner. Mem. Acad. Par. 1711.

Water-WORMS. There is a ſingular ſpecies of theſe creatures, which is found to be capable of reproduction or multiplication from cuttings, in the manner of the polype.

The diſcovery Mr. Trembley made of this ſtrange property in the polype, gave occaſion to the trying the experiment in regard to ſome other inſects. *Worms* were the moſt natural object of theſe experiments; and though they failed in many ſpecies, they yet ſucceeded in ſome, and proved, that nature has not given that amazing property of re-production of its moſt eſſential parts, to one only ſpecies of animals.

Mr. Bonet tried the experiment on a very nimble kind of *water-Worm*, by cutting it in two in the middle, and the ſucceſs perfectly anſwered the expectation; for the two pieces continued alive and vigorous, and in a little time became two complete *Worms*. The ſtructure of theſe *Worms*, though it appear ſimple to the naked eye, is very worthy the examination

tion of the microſcope, and when viewed with this aſſiſtance there are diſcovered in it parts extremely deſerving our attention. Phil. Tranſ. N°. 469. p. 470.

They are of a reddiſh brown colour, and of about two or three inches in length; their thickneſs is that of a common wire; they are compoſed of a ſeries of membranous rings, which continually decreaſe in thickneſs as they approach the extremities. Each of theſe rings has on its under part four, five, or ſix whitiſh ſpines, ſupplying the place of legs; and the clearneſs of the ſkin gives a happy opportunity of ſeeing the muſcular ſtructure of the body, every ring being compoſed of a great number of annular or circular muſcles, placed cloſe by one another.

The head is of no determinate figure, but the creature ſtretches or contracts it in length and breadth at pleaſure; and ſometimes it ſhews two ſmall round elevations, placed one on each ſide the head, which might be very eaſily taken for eyes; the extremity terminates in a point, that the creature may be the more eaſily able to pierce into the mud. The mouth is placed in that part where the head is largeſt, between the two elevations before-mentioned; this is terminated by two brown ſtrokes, and is of the figure of a creſcent. But when the mouth is opened, it appears an aperture of a circular figure, and is ſurrounded by a thick and ſtrong muſcle. This muſcle is of great ſervice to the animal alſo in its progreſſive motion, as it lays firmly hold of any ſmooth ſubſtance, and the animal is then able by means of its annular muſcles to draw up its whole body to that place: At the other extremity of the body, there is an oblong opening which ſerves as an anus.

There is nothing, however, more remarkable in this creature, than the great artery. This veſſel in caterpillars, and in many other inſects, runs all along the back; and is, by Malpighi, called a chain of hearts: But in this *Worm* it is folded in different degrees, in the different parts; and is in a manner only a long ſeries of folds, or doublings from one end to the other. Through theſe crooked paſſages there creeps along a liquor analogous to blood, and every moment a drop of it may be traced running up from the tail, and loſing itſelf in the brain; and it is eaſy to trace this moſt part of its way, by reaſon of the contraction and dilatation of the rings which follow one another ſucceſſively as it paſſes. Phil. Tranſ. N°. 469. p. 471.

It ſeems indeed that every portion of this artery, contained in the compaſs of one of the rings, is a true heart, which puſhes on to the next heart that drop of liquor which it had juſt before received from the preceding one; and the continual repetition of the ſyſtoles and diaſtoles in ſuch a ſucceſſive train of hearts, is an object that may be viewed a long time with pleaſure. It is beſt of all perceived in the middle of the body, where both the rings and the hearts are largeſt, and conſequently the motions moſt eaſily diſcernible. About the fifth or ſixth ring from the head this artery or chain of hearts becomes a ſmall and delicate filament, and from thence to the head diminiſhes in thickneſs, till it is wholly loſt near the mouth; but what is very obſervable, is the ſwiftneſs with which the blood is driven on in this part. Toward the tail the artery is alſo ſmall, and the alternate motion of the ſeveral portions of it confound themſelves together, ſo that the regular contractions and dilatations are not ſeen here, but only a ſort of undulatory motion of certain clouds of a fluid as it were ſucceſſively rolling one over another, but this with great regularity.

Under every junction of the rings there are to be ſeen ſmall veſſels dividing themſelves into numerous ramifications, all theſe ſeem to be branches propagated from the principal artery.

All along, and immediately under this artery, is extended the channel of the inteſtines; this would not be very viſible in itſelf, but the terreſtrial matter with which it is filled, uſually makes it eaſily diſtinguiſhable: This is furniſhed like the inteſtines of larger animals with different orders of muſcular fibres, which ſerve to protrude the remainder of the food; and this operation is alſo by means of the great tranſparency of the creature's ſkin, eaſily ſeen as it paſſes within the body.

It appears very evidently, from the contents of the ſtomach, and bowels of this animal, that it receives earth or mud into its body, and has its nouriſhment from it. Together with this earth it alſo ſometimes neceſſarily receives ſome bubbles of air; and as the air in the body of fiſhes ſerves them very greatly in raiſing and ſinking their bodies at pleaſure, ſo in the bodies of theſe *Worms* the air is not without its effect, but this is generally too powerful for the creature.

The bubbles of air are eaſily diſcerned in the body of the creature, and when they are in any great quantity they bring up the animal againſt its will, and all its ſtrength will not ſerve to carry it to the bottom; but it floats on the ſurface, till it has diſcharged a part of this troubleſome matter. This appears no eaſy thing for the creature to do, but there is often a great ſtruggle ſeen within its body, as it lies upon the ſurface of the water; the bubbles being driven toward the anus, and again forcing their way up to the head ſeveral times together.

Upon theſe *Worms* Mr. Bonet tried the experiment of cuting, in the manner of the operation on the polype, with ſucceſs. He divided one of them into two halves, and puting the ſeparated pieces into a glaſs of water; that half which had the head on it moved about, and ſeemed in all reſpects as well as before; but what was much more remarkable was, that the other half which had no head moved about and reſted occaſionally, and ſeemed to perform all its operations in the ſame manner as if it had one. It is obſerved of the pieces into which an eel is cut, or the tail of a ſerpent or lizzard, that they all move about a long time afterward; but their motion may always be ſeen to be irregular and convulſive; on the contrary, the motion of this part of the *Worm* ſeemed as regular as ever, and it made its way with tolerable ſwiftneſs, and that in a voluntary manner; the principle of life and motion ſeeming not to have been deſtroyed in it. If it met with any obſtacle in its way, it would ſtop and turn; and if ſet in the ſunſhine, it was plainly affected by the heat, and became more vigorous and moved more briſkly; and if a piece of ſtick was brought near it while it lay quiet, it would immediately ſtart and make its way as faſt as it could from it. Phil. Tranſ. N°. 469. p. 474.

On the third day ſome weeds and mud being added to the water, the half which had the head immediately plunged itſelf into the mud, but the other half only hid itſelf among the weeds; and at the cut end of this there was at this time very diſtinctly ſeen a tubercle, which looked like the knot of a branch of a tree; and at the end of a week each end was become perfect, and the two halves were two abſolutely perfect *Worms*. The new head of the one, and the new tail of the other, were perfectly the ſame with the old ones; and the ſtomach, the grand artery, and other parts had prolonged themſelves in a neceſſary manner.

After this experiment, the ſame obſerver cut other *Worms* of this ſpecies into four, eight, and as far as fourteen pieces; and moſt of theſe in a few days got new heads and tails, and became perfect animals. The ſeaſon of the year in which theſe experiments are made is of great conſequence, in regard to their ſucceſs; for in ſummer very few of the pieces fail of becoming perfect animals, even though one *Worm* be cut into near thirty pieces; but in winter many fail. Ibid. p. 475.

The ſecond or third day after the cutting produces the new heads and tails in ſummer, and in winter it is often ten or twelve days before they appear: The head always ſhews itſelf firſt, and lengthens itſelf continually for the firſt or ſecond week after its firſt appearance, and then it ceaſes to grow, having by that time arrived at a ninth part of an inch or thereabouts; this however is not, properly ſpeaking, the length of the head alone, but compriſes the rudiments of five or ſix rings which are annexed to it.

The tail does not begin to grow ſo ſoon as the head, nor does it ſtop its growth ſo ſoon, but continues increaſing in length from day to day for a long time; and in a few weeks the pieces of the middle part of a *Worm*, which were not originally above a ſixth part of an inch in length, will become perfect *Worms* of two inches.

Some of the pieces of the ſame *Worm* will grow longer and faſter than others; and, in general, the ſmalleſt or ſhorteſt pieces of the *Worm* do not grow ſo quick as the longer ones.

The ſeveral pieces cut from different parts of the ſame *Worm* alſo make a very different progreſs in their growth; but, in general it appears, that thoſe pieces which were cut off near the tail grow more ſlowly than thoſe from any other part. The laſt fragment, or that which contains the tail of the animal, grows the moſt ſlowly of all; and the head-end, which might be expected to grow as remarkably quick as this does ſlowly, does indeed exceed many of the parts in this particular, but is not always the very quickeſt of all.

There are ſeveral neceſſary circumſtances to be obſerved, in the progreſs of theſe operations; the moſt neceſſary of all is, the allowing the creatures food; as it appears plainly that they feed on mud, there ſhould always be a proper quantity of this added to the water in which the pieces are preſerved, for otherwiſe thoſe which ſeem to promiſe the faireſt for becoming perfect *Worms*, will often very ſoon periſh, merely for want of nouriſhment to ſubſiſt on, before they can grow to perfection.

Dr. Hales, in his vegetable ſtatics, relates a curious experiment, by which it is proved, that the bones of animals when they are oſſified to a certain degree, do not grow any longer, except at their extremities; and the caſe is the ſame, in regard to theſe *Worms*; for the old piece, which is the middle of the animal never lengthens itſelf, but the addition of new rings to each end make the increaſe of length in the *Worm*.

In all theſe pieces the liquor, which ſerves as blood to the animal, is found circulating from the tail-part towards the head, in the uſual way; and by this motion of the blood it

it is always eaſy to know, even in the ſmalleſt pieces, which is the head and which the tail-end, and the new head and tail are always ſeen to come regularly from the proper ends. Phil. Tranſ. N°. 469. p. 479.

Generation of WORMS. See the article GENERATION.

WORMS, in phyſiology. Many effects have been by the ignorant attributed to *Worms*, in which they have had no ſhare; and many things called *Worms*, have no right to that name.

We to this day vulgarly call the little black prominent ſpots in people's faces, *Worms*; but they are not ſo, nor any thing living. We owe the true knowledge of theſe to the ſagacious Mr. Lewenhoek, who, examining them by the microſcope after taken out of the face, found them only to be bundles of hairs or imperfect hairs in ſmall portions enveloped in thin films; in ſome, the fragments of hairs are evident, being ſtrong and rigid; but in others, they ſeem ſoft and pulpy.

Theſe *Worms*, as they are called, uſually appear as black ſpecks, ſometimes lying even with the reſt of the ſurface of the ſkin, ſometimes riſing above it; the hairs in each of theſe are from twenty to forty, in number. Their roots uſually lie irregularly, one deeper than another; but their extremities uſually are even. The deeper the *Worms* lie, the more difficult they are to be got out, and the fewer hairs they contain; ſo that they are beſt obſerved when taken from near the ſurface of the ſkin, and when taken from people who have the blackeſt hair, as they are moſt diſtinctly diſcernible in theſe, from their ſtrength and the difference of colour between them and their inveſtient membranes.

It may always be known alſo when there are hairs in one of theſe *Worms* fit to be examined, for if there are, the *Worm* is rigid, and comes out ſtrait; but if not, it comes out bent.

The make and conformation of theſe *Worms*, as they are called, is probably in this manner. When the root of a hair being deep in the ſkin ſupplies ſo much nouriſhment as to make the hair grow out and appear on the face, the upper part of the hair by rubbing, or ſome other violence, comes to be broken off, the lower part of the trunk of it ſtill remaining in the ſkin, the nouriſhment afterwards ſupplied to this part for hairs does not tend to lengthen out the broken one, the ſummit of that being ſtill liable to the ſame continual accidents; but new ones are propagated by its ſide, which being alſo broke off when they come to the ſurface, new ones are again formed and grow to the ſame length, till from the baſis of what nature intended for one hair we ſee thirty or forty; but this is probably not ſoon effected, but is the buſineſs of ſeveral years, in all which time the cluſter of hairs is ſuppoſed to be an animal, and the *Worm* is ſaid to be growing. The hairs growing on all parts of the body are ſharp-pointed at their natural ends, but thoſe ſhort ones which make up theſe *Worms* are always blunt at the end.

WORMS, in medicine. There are a great variety of medicines given for deſtroying the *Worms*, which breed in human bodies; but as they are of very different kinds, there is great caution required in ſelecting ſuch as are moſt proper for each peculiar caſe.

Acids, in general, are eſteemed good in theſe caſes; and lemon-juice, vinegar, and other vegetable acids, ſuch as pomgranate and currant-juice, and the like, are given; and ſometimes the mineral ones, as the ſpirit of vitriol, ſulphur, and the like. All theſe are properly given when there is a preternatural heat, and feveriſh diſpoſition; for they not only allay the heat, but reſiſt putrefaction.

Bitters in general are alſo reckoned among the medicines good againſt *Worms*; of this kind are wormwood, ſmall centaury, rue, and the like; and to theſe are to be added the purging bitters, ſuch as rhubarb, aloes, and coloquintida. Theſe medicines do not act merely as bitters; for it is well known, that many inſects will endure the bittereſt ſubſtances unhurt, and *Worms* will breed in the gall bladder; but they correct and alter the crude and viſcid matter in the inteſtines by which theſe animals are nouriſhed, and by ſtimulating the fibres of the inteſtines they often diſcharge the noxious matter, and *Worms* themſelves with it. They alſo correct the inactivity of the bile, which in children and perſons of moiſt habits is the general cauſe of the breeding and living of theſe inſects.

Oily medicines of all kinds are by ſome greatly extolled in caſes of *Worms*; and there ſeems this reaſon for it, that all inſects are deſtroyed by being put into oil, and that flies and many other ſmall animals, which, after ſeeming dead, on the being immerſed in other liquors, would come to life again, on being expoſed to the ſolar rays, never revived again after being drowned in oil. To this it is to be added, that very good effects always follow the giving oils, in caſes of the greateſt torment from *Worms*. It is not to be ſuppoſed however, that the oil acts by covering and drowning the *Worms*, ſince to this purpoſe there muſt be as much ſwallowed as would fill the whole inteſtinal canal; but this cannot be. Oils therefore plainly act in this caſe on the ſymptoms, not on the cauſe; and relax the ſpaſmodically contracted coats of the inteſtines, and as it were defend and line them with a ſort of mucilage, in ſuch a manner that the more acrid purging medicines neceſſary to the utter deſtruction of the animals themſelves, may be given with more ſafety. Thus it is a very good method to give a child over night half an ounce or more of oil of ſweet almonds, and in the morning following a briſk purge of the reſin of jalap, mercurius dulcis, or any thing elſe of this kind.

Saline ſubſtances in general are alſo greatly celebrated by many in caſes of *Worms*, and they are indeed capable of acting in a double capacity againſt them, at once deſtroying the tender ſtructure of many of them, and vellicating the inteſtines ſo as to promote the diſcharging them. The common bitter purging ſalts, as the glaubers ſalt, and the natural ſalt contained in the purging waters of different places, which is indeed glaubers ſalt alſo in its origin as well as qualities, are the beſt of all others for this purpoſe; if the natural waters are drank, it ſhould be in conſiderable quantities; and if the factitious ſalt be taken, it ſhould be diſſolved in large portions of water.

Many people who live on the ſea-coaſts give their children ſea-water, for the ſame purpoſe; and ſome uſe the broth of recent oyſters with pepper and other ſpices, and lemon-juice.

Salts of the vitriolic kind have alſo long been celebrated as remedies for *Worms*; and the common ſalt of ſteel, as alſo the Pyrmont waters, which are highly impregnated with particles of that metal, are found very uſeful in all caſes of this kind.

But if any diſorder admits of ſpecific remedies we might expect that this malady would; for theſe purpoſes many extol ſome of the gums, as aſſa-fœtida, galbanum, and myrrh, and the leaves of ſome plants, as wormwood and tanſey. Onions and garlick are alſo greatly commended; and bitter almonds and wormſeed, have long been famous. All theſe are found peculiarly deſtructive of *Worms*, and no method of cure ſucceeds well in which one or other of theſe has not a ſhare.

Among the minerals, we find alſo one remedy greater than all theſe, that is quickſilver; this has been given in many various forms, and found more or leſs ſucceſsful in all. Water, in which crude quickſilver had been boiled, was firſt given by Helmont, and that with great ſucceſs; after this Meiboom infuſed crude mercury in rheniſh wine, and found this more effectual than the former. But the moſt ſucceſsful method ſeems the giving proper doſes of mercurius dulcis, with ſome purging medicines, as the reſin of jalap.

Æthiops mineral, which is a mixture of quickſilver and ſulphur, is found alſo of great uſe; and quickſilver rubbed to a mixture with ſugar-candy, is preferred by Hoffman to all the other preparations. After a cure by theſe means, the patient ſhould be prevented from a relapſe, by abſtaining for a time from fleſh and fiſh; and, after this, from milk and cheeſe. Acrid purgatives, or hot remedies are never to be given, where there is any febrile heat; and when there is cauſe to ſuſpect that the duodenum is full of an acrid bile, then mercurials are to be avoided; as are all the draſtic purges; for theſe medicines, in theſe circumſtances, often bring on inflammations of the bowels.

Before the expelling the *Worms* from the ſmall inteſtines, it is proper to give glyſters of milk and honey, to allure all the worms together to that part. In caſes of the aſcarides lodged in the inteſtines, glyſters of milk with tanſey, garlick, and ſcordium boiled in it, have great effects; and glyſters of brine, or ſalt and water with aloes added to it, are alſo found of great benefit; as theſe troubleſome *Worms* are uſually lodged in the rectum, theſe glyſters take immediate effect.

It is proper alſo to give a vomit during the courſe of cure, to diſlodge ſuch *Worms* as may have got into the inteſtinum cæcum, ſince purging medicines cannot reach them while they remain there. External applications alſo of bulls gall, aloes, and coloquintida, are of ſervice laid in form of a cataplaſm to the belly. *Hoffman.* Oper. T. 4.

Tin is often recommended as a good remedy againſt *Worms*, particularly of the flat kind. Dr. Alſton, in the Med. Eſſ. Edinb. Vol. 5. Art. 7. directs an ounce and an half of the powder of pewter-metal to be mixed in half a Scotch mutchin, or about half a pint Engliſh meaſure of treacle, for children; but to grown perſons, he gives two ounces of the powder of pure tin, put through the fineſt hair-ſieve, and mixed with eight ounces of treacle. As to the adminiſtration of this midicine, the original receipt directs half of it to be taken the Friday before the change of the moon; the day after, half of the remainder; and the reſt on Sunday. On the monday a purge is to be taken. The doctor thinks there is probably nothing in the particularities of the day; but ſays, the medicine ſucceeds well in ſeveral ſpecies of *Worms*.

The Memoirs of the French Academy give a very remarkable account of an obſtinate pain cauſed by a *Worm*, in a place where few perſon, would have ſuſpected ſuch an animal for the cauſe of it.

A woman of thirty-ſix years old, who had not in any part of her life been ſubject to the head-ach in any particular de-

gree, found at this time a very violent and intolerable pain ſeize her on the lower part of her forehead toward the right ſide, and very near the top of the noſe. This held her a long time, and in the ſpace of two years extended itſelf to the temples on the ſame ſide. It now became continual alſo, whereas before it had had intermiſſions, and grew more and more violent; ſo that, in fine, it was attended with convulſions, and with a great diſordering of the patient's ſenſes during its more terrible agonies.

Many medicines were tried, but all in vain; and after four years ſpent in fruitleſs attempts for a cure, ſhe left off all medicines, and only kept to a regular courſe of life, and to the taking much ſnuff; from which ſhe uſually found eaſe. One morning, after taking ſome ſnuff, ſhe ſneezed violently, and threw out of her noſe a *Worm* wrapped up in a maſs of a pituitous matter, tinged with a little blood. She was frighted at the ſight, but ſhe found herſelf cured in a moment. The noſtril on that ſide bled a little for two or three days, and in that time her reaſon which had been much diſturbed, became perfectly calm and ſettled as before.

The ſize of this *Worm* was very extraordinary; it was thin, its utmoſt breadth or thickneſs not being ſo much as half a quarter of an inch: It uſually curled itſelf into ſeveral bendings; for it was diſcharged alive, and ſeemingly hearty, and in this ſtate was uſually about two inches long; but when it extended its body to its full length, it was not leſs than ſix inches. It was ſomething thicker in the middle than at either end, and was of a clear deep brown; its back was rounded or convex, and its belly flat; and it was covered all over, except on the head, with large and regular ſcales; theſe were evenly diſpoſed, and from between theſe there grew on each ſide fifty-ſix legs; theſe were as fine as a hair, and about one twelfth of an inch long.

The creature ſeemed therefore of the centipes kind, and in examining the head there were eaſily diſcovered the two eyes, two horns, and a pair of forceps made up of four arms; and the tail was armed with two points, longer, thicker and ſharper pointed than the legs. After examination it was put into an empty phial, where it remained alive eighteen hours; at the end of which time they poured ſome ſpirit upon it to preſerve it, and it lived and crauled about in this two hours.

The ſeat of the pain ſhews very plainly, that the *Worm* muſt have lived in the cavity of the frontal ſinus. This ſinus is about two inches long, and three quarters of an inch broad, and therefore might very well contain a *Worm* of this ſort in a bended poſture; and this ſeemed to have been accuſtomed to that poſture, by its naturally bending and folding itſelf up, when at its liberty. There is between this ſinus and the noſtril naturally a ſmall hole, by which they communicate and by which the ſinus admits the air at every inſpiration; and it is not impoſſible, but that a ſtrong ſnuffing in the air at ſome time might have carried into this ſinus with it the egg in which this little animal was incloſed.

It is poſſible indeed, that the egg might be lodged here by the round of circulation, but this ſeems much leſs probable; and it ſeems very certain that, however it got in, it was by this paſſage that it finally got out: It is true, that the cavity is naturally too ſmall to have given ſo large a creature paſſage, but it is eaſy to conceive that the creature might have gnawed it larger.

It is plain, that the egg when once received into the frontal ſinus, muſt find there every requiſite for its coming to perfection; warmth and humidity, there was very ſufficient; and when the creature was hatched, the juices excreted there might ſerve it abundantly for nouriſhment, inſomuch that it plainly grew much larger than it would have done if hatched on the earth in the common way, and lived a longer time than its fellows on earth uſually do, a life of four years free from accidents, and finely cheriſhed.

This was its ſtate; but what, alas! muſt have been that of the patient? The membrane of the ſinus being continually wounded by the forceps; the points at the tail, and no leſs than an hundred and twelve legs probably almoſt always in motion; every particular fibre of this membrane muſt have had its wound, and the complaint could not but grow worſe as the creature increaſed in ſize, and as it was irritated by the frequent uſe of the ſnuff; tobacco being a ſmell hateful to almoſt all animals.

From the ſymptoms of this patient, it will be eaſy to know any like accident that may hereafter happen, in which caſe it would be adviſeable to uſe ſnuff or tobacco in any ſhape; to take internally ſuch medicines as are known to deſtroy *Worms*, and to ſnuff ſtrongly up the noſe ſuch acrid and acid liquors as the patient could bear, and as might incommode the animal. Oil is a perfectly innocent medicine to us, yet is deſtructive of moſt animals; this therefore ſnuffed up alone, might work a cure; but if all theſe means fail, it would be very eaſy and very ſafe for a ſurgeon to make an inciſion into the part, and remove the noxious inſect. Mem. Acad. Par. 1708.

We have accounts in the Acta Leipſienſia, of *Worms* not only voided by urine, but let out of the veins in blood-letting; but there want more teſtimonies of ſuch marvellous things to procure them a general belief.

WORM, in gunnery, is a ſcrew of iron to be fixed on the end of a rammer, to pull out the wad of a firelock, carabine, or piſtol; it is the ſame with *wad-hook*, only the one is more proper for ſmall fire-arms, and the other for cannon.

WORM-*Seed-green*, a name given by authors to a ſeed of the ſantonicum kind, little known among us, but called by the generality of authors *chouan*.

WORM-*Tincture*, in chemiſtry, a name given by many to a medicine prepared by Hoffman, from earth-*Worms*; and in many parts of Germany eſteemed one of the greateſt medicines in the world, though leſs known in other places.

The preparation is this: the *Worms* are to be collected in the ſpring or ſummer months, and the larger ſort are the beſt. They are to be carefully dried, and reduced to a fine powder; this powder is to be mixed up into the conſiſtence of a pultice, with oil of tartar per deliquium, and this is to ſtand twenty-four hours; then ſpirit of wine is to be poured on it, ſo as to reach three fingers breadth above it, and a dram of ſaffron and half a dram of caſtor, are to be added, and the whole is to ſtand three days in infuſion, and after this be filtred off for uſe. Some add a ſmall quantity of opium to the tincture, but as it is often wanted in caſes where opium is not proper, it is better to keep it ſeparate thus made; and when there is occaſion to have it opiated, to add as many drops of laudanum as is judged neceſſary.

The oil of tartar in this caſe penetrates the very innermoſt ſtructure of the *Worms*, and is a means of the extracting ſuch a tincture from them, as no art could otherwiſe contrive to make; and the medicine becomes, according to Hoffman, much more an anodyne, from the admixture of the ſalt of tartar in the tincture.

When it is intended to be made with opium, it is always proper to add alſo ſome of the hound's-tongue-root, which is found as an anodyne to emulate the virtues of opium.

This tincture, which ever way prepared, is excellent in abating the pains of diſeaſes, that do not admit a cure. The fits of the gout are rendered eaſier by every doſe of it; and even in cancers, the pain is quieted in a wonderful manner by it, and life rendered much more ſupportable. *Hoffman*'s Act. Labarator. Chym.

WORM-*wood*, *Abſynthium*, in botany, the name of a genus of plants, the characters of which are theſe: The flowers are ſmall, but of the floſculous kind, being compoſed of ſeveral floſcules divided into many ſegments at the edges, and ſtanding upon the embryo-ſeeds, and contained in a ſcaly cup. The embryos ripen finally into ſeeds, not winged with down.

The ſpecies of *Wormwood*, enumerated by Mr. Tournefort, are theſe: 1. The broad-leaved tree *Wormwood*. 2. The Pontic *Wormwood*, or the Roman *Wormwood* of Dioſcorides. 3. The mountain-Pontic *Wormwood*. 4. The Cretic *Wormwood*, of a pleaſing ſmell. 5. The fine-leaved hoary Pontic *Wormwood*. 6. The Pontic *Wormwood*, with purple ſtalks, and finely divided leaves, green underneath. 7. The Auſtrian fine-leaved Pontic *Wormwood*. 8. The procumbent or creeping Pontic *Wormwood*. 9. The inſipid taſted *Wormwood*, reſembling the common kind. 10. The ſea *Wormwood*, with lavender leaves. 11. The ſea *Wormwood*, with the upper leaves divided into ſegments. 12. The German ſea *Wormwood*. 13. The Dutch ſea *Wormwood*. 14. The broad-leaved ſea *Wormwood*, of an agreeable ſmell. 15. The French ſea *Wormwood*. 16. The French wormſeed *Wormwood*. 17. The white mountain *Wormwood*. 18. The hoary Alpine *Wormwood*. 19. The dwarf white Alpine *Wormwood*. 20. The annual corymbiferous *Wormwood*. 21. The long-flowered Spaniſh white *Wormwood*. 22. The Spaniſh ſea *Wormwood*, with a rounder flower, and with the ſmell of wormſeed. 23. The ſweet-ſmelling *Wormwood*, with an elegant ſpike of flowers. 24. The African-tree *Wormwood*, with hoary vermiculated leaves. *Tournef.* Inſt. Botan. p. 457.

The common *Wormwood* is one of the fineſt medicines we know, as a ſtomachic and hepatic. It greatly ſtrengthens the ſtomach, opens obſtructions of the liver or ſpleen, promotes an appetite, and deſtroys worms.

The leaves and tops before the plant is in flower, are the parts of it moſt uſed; they are to be dried and given in powder, or in a light infuſion. Their virtues in the jaundice and dropſy, are very great. They are alſo given by ſome in putrid fevers. Many nauſeous inſects are deſtroyed, or driven away by the ſmell of this plant; and it is no uncommon practice among the good women in the country, to preſerve their cloaths from moths, by laying bundles of dried *Wormwood* among them.

The Roman and ſea *Wormwood* have much the ſame virtues with the common kind; but they are leſs nauſeous to the taſte, and therefore are generally uſed inſtead of it. The true Roman *Wormwood* is very ſcarce among us. What we buy under its name, is uſually *abſynthium ſeriphium*, or common ſea *Wormwood*.

Our brewers have ſome of them a method of uſing *Wormwood* inſtead of the hops, to give the bitter taſte to their malt-liquors, and to preſerve them: It is found to anſwer the latter purpoſe very well; but the taſte is ſo diſagreeable,

that

that it is much complained of. The reaſon of this is, that the people who uſe it do not underſtand the time of gathering it.

All plants are fulleſt of juice while in the ſhoot, but fulleſt of virtue when they have their ſeeds on them. This is the caſe with *Wormwood*, as well as a thouſand others; and though it in the ſeeding-time produces much more flavour than when younger, yet it is without that nauſeous bitter of the crude juice, which gives us the diſtaſte to the plant.

Some people have found the proper way of managing *Wormwood*, and have given a flavour with it to their malt-liquors, even preferable in the opinion of all palates to that given in the common way by hops.

The method is this: The plant is to be gathered when fully ripe and the ſeeds upon it, and in this ſtate hung up in ſmall bunches to dry. When thoroughly dried, a certain quantity of good ſtrong malt-liquor is to be impregnated with it, to the utmoſt ſtrength that it can poſſibly give it. This is to be ſet by for uſe, to add to all the reſt.

When the hops ſhould in the common way be added to the beer, this liquor is to be added in a proper quantity, making the taſte the judge when there is enough of it.

By this means juſt what degree of bitter is required may be given to the liquor, and the bitter of this common plant thus managed, is as perfectly agreeable as that of any vegetable in the world.

The *Wormwood* for this purpoſe ſhould have its ſeeds carefully preſerved in the drying, and it is beſt if not uſed till the year after it was gathered. Phil. Tranſ. N°. 124.

Many people who have been fond of the virtues of *Wormwood*, but diſguſted at its nauſeous bitter taſte, have attempted the diveſting it of its taſte, and yet preſerving its qualities; but it being as a bitter that this plant acts in many caſes, it is an evidently abſurd ſcheme to take away that quality on which its virtues depend, in order to the rendering them leſs diſagreeable to the palate.

The eſſential ſalt of *Wormwood* is afforded in great quantity, and poſſeſſes in many reſpects the virtues of the plant; this is a form in which it were to be wiſhed, that not only this, but many other medicinal plants were more often given.

Wormwood ſhares with all other bitters the virtues of an abſterſive deobſtruent, and is in ſome degree purgative as all bitters are. *Wormwood* is one of thoſe plants which the chemiſts have generally choſen for their proceſſes of the reſuſcitation of plants from their aſhes; and though the pretended principles of this art are falſe, yet there have been ſome of the artiſts ſo cunning to form repreſentations of this plant, that have deceived and puzzled the greateſt unbelievers, though they have not convinced them. Phil. Tranſ. N°. 74.

WORMS *Wood-fly*, in natural hiſtory, a very ſmall black fly, found on the ſtalks of the common *Wormwood* in June and July.

WORRALL, in zoology, an animal of the lizzard kind, of about four feet long and eight inches broad, with a forked tongue, which it puts out like a ſerpent, but without teeth.

It is a harmleſs animal, and feeds only on large flies, and the ſmaller ſpecies of lizzards. It is found in Ægypt only during the hotteſt months, and principally frequents the grottos and caverns in the mountains on the weſt of the Nile, where it ſleeps during the winter ſeaſon.

It is ſaid to be greatly affected by muſic; but experiment ſhews this to be an erroneous opinion. *Pocock*'s Ægypt. Vol. 1. p. 208.

WOUGHS, in mines, are the walls or ſides ſometimes of hard ſtone, and ſometimes ſoft; when ſoft, the miners ſay they are rotten: Theſe are the bounds of an entry. Betwixt them all ſorts of earth, ſtones, and ore lie; or, as philoſophers ſay, grow. *Houghton*'s compl. Miner, in the Explan. of the Terms.

WOUND (*Cycl.*)—There is nothing will give a truer light into the nature and conſequence of a deep *Wound*, than a due conſideration of what natural actions of the body are impeded thereby. For inſtance, in *Wounds* of the breaſt, when the patient draws his breath with ſhortneſs and difficulty, and is at the ſame time attended with an hæmoptyſis and hiccough, we may rationally conjecture that the lungs, or the diaphragm are wounded; ſo in *Wounds* of the abdomen, when chyle is voided, it is a plain indication that the ſtomach, ſmall guts, or lacteals, are wounded: When excrements paſs by the *Wound*, the great guts are wounded. In the ſame manner, bilious blood ſhews the liver or gall-bladder to be divided: If urine paſſes by the *Wound*, the urinary bladder or elſe the ureters are wounded; but bloody urine denotes a blow on the kidneys, or a *Wound* of the bladder. But when there are large profuſions of blood this way, it is a ſign that ſome of the larger blood-veſſels are wounded: Vomiting of blood, declares the ſtomach to be the injured organ: Violent pains, attended with convulſive twitches, ſhew that a nerve is wounded, or elſe that ſome foreign ſubſtance is left in the *Wound*. Whenever the ſenſes are diſordered after a *Wound* received on the head, a concuſſion of the brain is much to be feared. Difficulty of breathing, pains in the breaſt, and hiccoughing, are ſymptoms of a *Wound* in the diaphragm. It is of bad conſequence for a *Wound* to be attended with a large tumour; but it is of the laſt conſequence if it is attended with no degree of tumour at all; the firſt is an indication of great inflammation; the laſt of mortification; ſome degree of tumour is always therefore beſt in *Wounds*.

WOUNDS *naturally, and neceſſarily mortal*. We properly ſtyle thoſe *Wounds* mortal which are not to be remedied by all the art and induſtry of man. Thus *Wounds* are of this kind which are attended with ſo violent an hæmorrhage, as to produce inſtant death: of this ſort are reckoned *Wounds* that penetrate the cavities of the heart, and all thoſe *Wounds* of the viſcera, where the large blood-veſſels are opened; ſuch are large *Wounds* of the lungs, liver, ſpleen, kidneys, ſtomach, inteſtines, meſentery, pancreas, uterus; of the aorta, of the iliac, cœliac, renal, meſenteric, and carotid arteries, eſpecially if they are wounded near their origin; of the ſubclavian alſo, or vertebral; of the vena cava, the iliac vein, the internal jugular, vertebral; renal, meſenteric of the vena porta, and of the larger veins that lie deep in the body, becauſe their ſituation will not admit of proper applications to reſtrain the flux of blood. Heiſter therefore reckons, very juſtly, theſe among the *Wounds* that are abſolutely incurable, ſince they are not remediable either by aſtringents, ligature, or fire.

Thoſe *Wounds* alſo are not leſs mortal than the former, which obſtruct, or entirely cut off the paſſage of the animal ſpirits to the heart; ſuch are *Wounds* of the cerebellum, of the medulla oblongata, and ſome violent ſtrokes of the brain itſelf.

There is reaſon to apprehend very great danger, when the ſmall veins or arteries, which are contained in the cranium, are injured; for the blood flowing from them into the internal ſinuſes of the brain, either produces too great a preſſure upon thoſe very tender parts of the brain, and ſo obſtructs the courſe of the blood and ſpirits; or elſe, being corrupted, it putrifies the brain itſelf, if it cannot be evacuated by the aſſiſtance of the trepan, which is the caſe when this accident happens at the lower part of the cranium, or in the ſinuſes of the brain; nor is there leſs danger where the nerves, which tend to the heart, are wounded, or entirely divided; for, after this, it is impoſſible for the heart to continue its motion.

To this claſs are to be referred alſo all *Wounds* which entirely deprive the animal of the faculty of breathing: there is therefore great danger where the aſpera arteria is intirely divided; for where it is only divided in part, it may be healed again by the aſſiſtance of an expert ſurgeon: to this place alſo belong violent ſhocks of the bronchia, mediaſtinum, and diaphragm, eſpecially the tendinous part of it.

Thoſe *Wounds* alſo which interrupt the courſe of the chyle to the heart, are no leſs incurable than the former; ſuch are *Wounds* of the ſtomach, inteſtines, receptacle of the chyle, thoracic duct, and larger lacteals; to which may be alſo added *Wounds* of the œſophagus, if they are large; though death is not ſo ſudden an attendant on theſe *Wounds*; but, for want of nouriſhment, the perſons afflicted by them are weakened by degrees, and at length die conſumptive.

In this account thoſe *Wounds* alſo are not to be omitted, which are inflicted upon membranous parts, that are ſituated in the abdomen, and contain ſome ſecreted fluid, as on the bladder, either of the bile or urine, the ſtomach, inteſtines, receptacle of chyle, and lacteal veſſels. The fluids contained in theſe parts, when once they are let looſe into the cavity of the abdomen, cannot be properly diſcharged, and therefore eaſily corrode the internal parts of the body; and the membranes that contained them are generally ſo fine, that they will not admit of agglutination, eſpecially ſince no medicine from without can be applied. A few indeed have recovered after ſlight *Wounds* in theſe parts; but ſince the number of theſe inſtances is but few, and the cure in them has been accidental, and not performed by the ſurgeon's art, theſe may very juſtly be added to the liſt of mortal *Wounds*.

WOUNDS *mortal by Neglect*. Many *Wounds* there are which, though the experienced ſurgeon could remedy, yet prove fatal, if neglected, or left to nature: Of this number are thoſe which produce inſtant death, unleſs relieved by preſent aſſiſtance; ſuch are *Wounds* of the larger external blood-veſſels, which might be remedied by ligature, by the application of aſtringent medicines, or the actual cautery. Of this kind are *Wounds* of the brachial, or crural artery, unleſs they are too near the trunk of the body; *Wounds* in the large arteries of the cubit, or tibia; of the branches of the external carotid, or temporal artery; to theſe alſo may be added *Wounds* of the jugular and other veins, ſituated upon the external parts of the body; but in theſe caſes no help can be given, unleſs the ſurgeon be brought before there has been a vaſt profuſion of blood. *Heiſt.* Surg. p. 30.

WOUNDS *mortal by Accident*. *Wounds* are properly ſaid to become mortal by accident, where the patient's death, from them, is occaſioned either by the ill conduct of the patient himſelf, or by the neglect or ignorance of his ſurgeon, the *Wound* itſelf being of the number of thoſe deemed curable by the judicious practiſer. Under this head are to be reckoned thoſe *Wounds* which the ſurgeon has neglected to cleanſe ſufficiently, though he had it in his power to do it; as when ſome foreign body, which might eaſily have been extracted,

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is left in the *Wound* by the careleſſneſs of the ſurgeon, and produces inflammatios, hæmorrhages, convulſions, and finally death itſelf. So in *Wounds* of the thorax and abdomen; if the ſurgeon does not uſe his utmoſt diligence to evacuate the grumous blood, it will corrupt there, and by drawing the neighbouring parts into conſent, will expoſe the patient to death: great care muſt therefore be taken that the lips of the *Wound* do not cloſe, till the blood, which is collected in the cavity of the body, be all evacuated, if poſſible, which will be perceived by the difficulty of breathing, and other bad ſymptoms going off; but if any of the larger internal veſſels are wounded, then all attempts to diſcharge the blood are vain; for the violence of the hæmorrhage takes off the patient.

Wounds are alſo to be accounted mortal by accident, which are treated or ſearched in too rough a manner by the ſurgeon; for if *Wounds* are handled roughly which are full of nervous parts, or of large blood-veſſels, there is great danger of bringing on hæmorrhages, convulſions, inflammations, gangrenes, and finally death itſelf.

The caſe is alſo the ſame in external *Wounds*, which are ſlight of themſelves, but under which the patient is loſt by the inflammation which is brought on, and increaſed by the ſurgeon's injudicious treatment; or when any one is taken off by the violence of the hæmorrhage, from a *Wound* of the hand or foot; for, in this caſe, the ſurgeon might eaſily have ſtopped the blood, by the application of proper remedies, or by ligature: Or, when the patient is guilty of any intemperance, either in eating or drinking; or of any exceſs of paſſion; of expoſing himſelf to the cold air, or of uſing violent exerciſe; for by theſe means *Wounds*, more eſpecially thoſe of the head, by being liable to freſh hæmorrhages, and other dangerous accidents, frequently become mortal, nowithſtanding that they naturally would not prove ſo, and that though the ſurgeon uſes his utmoſt care and ſkill.

Among theſe alſo are to be accounted thoſe *Wounds* of the head, where the patient is loſt by the vaſt quantity of blood, which is extravaſated in the cavity of the cranium, and is confined there; but where he might have been relieved, if the trepan had been applied in time; for though *Wounds* of this kind generally prove incurable, yet as there is, at leaſt, a poſſibility of ſaving a perſon in theſe circumſtances, by the uſe of the trepan, this may properly be reckoned among the doubtful caſes, and not deemed abſolutely mortal: And laſtly, a bad habit of body frequently prevents the cure of *Wounds*, which would admit of an eaſy cure in a healthful ſubject; ſo we frequently ſee the ſlighteſt puncture in the hand or foot of an hydropical, conſumptive, or ſcorbutic perſon, ſhall produce a gangrene, and prove mortal, though the ſurgeon ſpares no care nor application to prevent it. *Heiſter*'s Surg. p. 29, 31.

Cure of ſlight WOUNDS. This is generally performed with great eaſe, by applying to the part a ſmall portion of ſcraped lint, well ſaturated with ſpirit of wine, oil of turpentine, or St. John's wort, liniment of Arcæus, or balſam of capivi, Gilead, or Peru, and ſecuring the dreſſing with a plaſter; this dreſſing ſhould be renewed once in a day or two, and the lips of the *Wound* will preſently agglutinate. *Heiſter*, p. 34.

WOUNDS *dangerous, how to be healed.* *Wounds* of this kind are firſt to be cleanſed from the extravaſated blood, ſordes, &c. In the next place, if a bullet, the point of a ſword, or any part of the cloathing, a piece of glaſs, or any other foreign body, remains in the *Wound*, it is to be removed either with the fingers, or a pair of forceps, or other proper inſtruments. The hæmorrhage is to be ſtopped at the firſt dreſſing; the divided parts are to be brought as near to each other as poſſible, and their ſituation ſhould be ſo maintained, that the cicatrix which is left may appear even.

Where there are no extraneous bodies to be removed, the grumous blood is to be wiped away with a ſoft ſpunge, or a parcel of fine lint wrung out of hot wine or brandy; and when this is done, the next ſtep is to ſtop the hæmorrhage; but before the ſurgeon attempts the removal of extraneous bodies, it behoves him well to conſider whether it be more proper to do it inſtantly, or to wait a more convenient time; for if the patient is become extremely faint, from the loſs of blood he has already ſuſtained, it will be neceſſary, in this caſe, to ſtop the hæmorrhage, and then, in ſome meaſure, to endeavour to revive him by moderate draughts of warm broths, white-wine whey, or ſome cordial medicine; for if theſe precautions are neglected, the patient may not unlikely die in the operation: So alſo where you have reaſon to fear, that in the extracting the broken point of a ſword, or other weapon, you are in danger of wounding a large blood-veſſel or nerve, it will be better to wait a little, either till the patient is ſomewhat come to himſelf, or till the *Wound* is enlarged by ſuppuration. *Heiſter*'s Surg. p. 35.

Gun-Shot-WOUNDS. See the article GUN-*Shot*.

WOUNDS *of the Neck*. See the article NECK.

WOUNDS *of the Eyes*. See the article EYE.

Loſs of Subſtance in WOUNDS. When this happens in *Wounds*, they will not unite either by the help of plaſters, or the ſuture, or by any other method, till filled up with new fleſh. To bring on this, lint dipped in oil, or ſpread over with ſome vulnerary balſam or ointment, and applied to the bottom of the *Wound*, is very ſerviceable, covering with a plaſter compreſs, and the proper bandages; and this dreſſing is to be repeated daily. There ought to be a balſamic and emollient quality in theſe ſarcotic medicines, that they may not only reſiſt putrefaction, but may alſo ſoften the new fleſh; ſo that it may eaſily receive additions from the blood, and ſuffer itſelf to be elongated. *Heiſter*'s Surg. p. 41.

WOUNDS *in Horſes*. The moſt terrible *Wounds* theſe creatures are ſubject to, are thoſe got in the field of battle. The farriers that attend camps have a coarſe way of curing theſe; but it is a very expeditious and effectual one.

If the bullet be within reach, they take it out with a pair of forceps; but if it lie too deep to be come at, they leave it behind, and dreſs up the *Wound* in the ſame manner as if it were not there.

They firſt drop in ſome varniſh from the end of a feather, and when the bottom is thus wetted with it, they dip a pledget of tow in the ſame varniſh, which they put into the *Wound*, and then cover the whole with the following charge: Take a quarter of a pound of powder of bole armenic, half a pound of linſeed oil, and three eggs, ſhells and all; add to theſe four ounces of bean-flour, a quart of vinegar, and five ounces of turpentine; this is all to be mixed over the fire, and the *Wound* covered with it. This application is to be continued four or five days, then the tent put into the *Wound* is to be dipped in a mixture of turpentine and hogs-lard; by this means a laudable matter will be diſcharged, inſtead of the thin ſharp water that was at firſt. Then the cure is to be compleated by dreſſing it with an ointment made of turpentine, firſt well waſhed, and then diſſolved in yolks of eggs, and a little ſaffron added to it.

This is the practice in deep *Wounds* that do not go through the part; but in caſes where the bullet has gone quite through, they take a few weavers linnen thrumbs, made very knotty; theſe they make up into a kind of link, and dipping it in varniſh, they draw it through the *Wound*, leaving the ends hanging out at each ſide; by means of theſe they move the link or ſkain three or four times a day, always wetting the new part that is to be drawn into the *Wound* with freſh varniſh. They put on a charge of the bole armenic, &c. as before deſcribed, on each ſide of the wounded part, and continue this as long as the *Wound* diſcharges thin watery matter, or the ſides continue ſwelled. After this they dreſs it with the ointment of turpentine, yolks of eggs, and ſaffron, till it is perfectly cured.

The other methods are the dreſſing the *Wound* with an ointment made of wax, turpentine, and lard, and covering it with linnen rags wetted with cream; or the dreſſing, with a mixture of yolks of egg, honey, and ſaffron, and covering it up with cream and baum-leaves beaten together.

When the *Wound* is ſo dangerous as to require the aſſiſtance of internal medicines, they give the following pills: Take aſſa-fœtida, bay-berries, and native cinnabar, of each a pound; beat up the whole into a maſs with brandy, and roll it into pills of fourteen drams weight each. Theſe are to be laid in a ſhady place to dry, after which they will keep ever ſo long without any damage. The horſe is to take two of theſe every other day, or, if neceſſary, every day, till he has taken eight or ten of them, and he is to ſtand bridled two hours before and after the taking them.

When the *Wound* ſeems at a ſtand; not appearing foul, and yet not gathering new fleſh, there muſt be recourſe had to the following powder, whoſe effect in bringing new fleſh is wonderful: Take dragon's blood and bole-armenic, of each two ounces; maſtic, olibanum, and ſarcocolla, of each three drams; aloes, round birth-wort, and common iris-root, of each one dram and a half; make the whole into a fine powder. This is ſometimes uſed dry, ſprinkling it on the *Wound*; but ſometimes it is mixed with turpentine, ſometimes with juice of wormwood, and ſometimes with honey of roſes, and either way does very well.

When the *Wound* grows foul, and requires a detergent to cleanſe it, the common liquor for this purpoſe is a phagedenic water, which they make of lime-water, and ſublimate in this manner:

Take two pounds and a half of newly made and unſlacked lime, put it into a pewter veſſel, and pour on it five quarts of boiling water. When the bubbling is over, let it ſtand to reſt two or three days, ſtirring it often with a ſtick; then pour it clear off after a due time for the lime to ſettle, and filter it through ſome whited brown paper, made for the lining of funnels, on this occaſion. To a quart of the clear lime-water, thus prepared, add eight ounces of ſpirit of wine, and one ounce of ſpirit of vitriol; when theſe are well mixed, by ſhaking them together; then add an ounce of corroſive ſublimate in fine powder; mix all well together, and keep the whole in a bottle, to be uſed for the cleanſing theſe foul *Wounds*, and on any other occaſions, where there may be a detergent of this powerful kind neceſſary. It will keep good many years.

If this water will not thoroughly cleanſe the *Wound*, but there ſtill will remain a quantity of foul matter in it, and there is danger of a gangrene, they add to it as much arſenic, in fine powder, as there was of the corroſive ſublimate; that is, at the rate of an ounce to a quart and half a pint.

Theſe

Theſe are all the medicines that the farrier need carry with him on account of *Wounds*; and they are all ſuch as may be prepared at home, and will continue good ſo long as he has occaſion to keep them, or much longer; and what is left of one year will ſerve for others.

When the neceſſary applications are thus ſettled, it may not be improper to add the general rules by which they conduct themſelves in the cure.

1. The *Wound* muſt be probed at firſt, but very gently, and afterwards as gently and as ſeldom as may be, for the horſes fleſh is the moſt eaſy of all others to be contuſed in wounded parts, and to fall into a gangrene from the hurt. 2. The *Wound* muſt be kept continually as clean as poſſible, and free from proud fleſh. 3. The neceſſary revulſion muſt always be made by bleeding, as ſoon as the *Wound* is dreſſed the firſt time; this prevents inflammation, and a great many other bad accidents. 4. If the *Wound* be in ſuch a place, that the horſe can get at it with his tongue to lick it, great care muſt be taken to prevent his doing ſo, as it will greatly retard the cure. 5. The farrier is never to proceed to ſuppuration in any caſe in which the humours can be either diſſolved or repelled, and eſpecially in parts that are full of ſinews and ligaments, or that are near the bones. 6. If a *Wound* be accompanied with a great contuſion, or if it be of a round or circular figure, inciſions are often neceſſary about its edges, and ſometimes the application of cauſtics. 7. The *Wound* muſt be always carefully covered, for the acceſs of the air retards the cure. 8. The callous lips of a *Wound* muſt always be cut to the quick, before theſe can be united together. Theſe may ſerve for general rules, that hold good in all caſes; and to theſe may be added ſome that are principally applicable to peculiar circumſtances of the *Wounds*.

Wounds of the breaſt are to be cured with tents and folds of ſoft linnen laid over them, ſteeped in the following mixture: Take verdegreaſe, vitriol, and alum, of each one ounce; vinegar eight ounces, honey a pound; let all theſe be boiled together till they become red. *Wounds* in the belly can only be cured by ſowing up the peritonæum with ſtrong woollen thread, not ſilk, leaving the extremities without the ſkin. The ſkin is to be ſowed together with a ſtrong hempen thread waxed, joining the lips of the *Wound* together, by this means, in form of a buckle. This is to be covered with the common ointment for *Wounds*; and if an inflammation comes on, chalk diſſolved in vinegar is to be added.

If the *Wound* be ſuch that the guts come out at it, the horſe may ſtill be recovered, if proper caution be uſed: the guts are to be immediately returned into their place; but they muſt not in this be touched with the hand, but with a ſponge dipped in warm water. And, in order to the making them more readily get into their places, it is proper to make the creature vomit, by thruſting down his throat a feather dipped in oil. If the *Wound* through which they fell is not big enough to return them eaſily by, it muſt be enlarged by cutting; but if the guts are found to be bruiſed or wounded, it is in vain to attempt any thing, for death muſt follow.

There is alſo a certainty of death when, after a *Wound* of any kind in the belly, the horſe voids blood at the fundament.

When a horſe is wounded near the groin, he eaſily falls into convulſions; in this caſe he is to be kept from drinking as much as poſſible: he is alſo to be covered well up, and kept quiet, and to have green things given him to eat. *Wounds* on the knees are very difficult of cure, becauſe the part is in motion almoſt continually, and there is very little fleſh to work upon. When the *Wounds* are but ſlight, and in the muſcular parts of the body, a mixture of honey and tallow, boiled together, will often prove a cure; when the *Wound* is more conſiderable, turpentine melted in a little common oil, and applied hot, is the general remedy. If a wound happen between the ſhoe and the hoof, care muſt be taken that no foreign matter be left in it, and it muſt be dreſſed with any of the ointments that have verdegreaſe in them; and a charge of bruiſed elder-leaves is very proper to be applied over all. If the *Wound* be deep and narrow, it muſt be enlarged at the orifice, and turpentine and wax, melted in lard, muſt be poured into it. The ſame rule of opening the orifice holds good in all deep and narrow *Wounds*.

If a nerve happens to be cut, it muſt be cloſed, and a defenſative muſt be applied, to prevent a concourſe of humours to the part; a fomentation made of oil, wine, and honey, mixed together, is alſo very proper, wherever a nerve is hurt, and a pultice may be applied over all, made of marſhmallow-roots boiled ſoft, with bread and milk.

If the horſe happens to be wounded by a piece of wood, bone, or any other hard ſubſtance, part of which remains in the *Wound*, this muſt be carefully taken out, whatever pain it may coſt the creature to do it, and the *Wound* muſt then be dreſſed with the common *Wound*-ointments. In this, or any other caſe of a freſh *Wound*, the waſhing it with oil of turpentine, is an excellent method of preventing ill conſequences.

WRASSE, in zoology, the name of a fiſh called by authors, *turdus vulgaris*, and by ſome *tinca-marina*, the ſea-tench.

It very much reſembles the common freſh-water tench in figure, and is covered with large ſcales. Its uſual ſize is about five or ſix inches in length. Its colour is very variable; red, yellow, and browniſh, being very frequently mixed in the ſcales; and it has five or ſix longitudinal lines, alternately of a pale yellow, an olive-colour, and a duſky red. Its noſe is long, and bent upwards, and it has thick and fleſhy lips extended over the jaws. Its mouth is ſmall, and its teeth not very ſharp; its tail is not forked. The membranes of the fins and tail are variegated with red and blue ſpots, and the anterior rays of the back-fin are prickly. It is caught in plenty on the Engliſh ſhores, and is ſold among the poorer ſort of people in Wales and Cornwall; but is not eſteemed a very delicate fiſh. *Willughby*'s Hiſt. Piſc. p. 320.

WRECK (*Cycl.*)—*Wreck*, in metallurgy, a veſſel in which the third waſhing is given to the ores of metals.

In Cornwall, when the tin ore has been twice waſhed, they take the head tin, or that part of the tin ore that lies uppermoſt, out of the buddle, and throwing it into this veſſel, they pour water on it, and work it about with wooden rakes, till it is cleared from whatever other extraneous matter there may ſtill have remained mixed with it, and is, after this, fit for the blowing-houſe to be run into metal. *Ray*'s Engliſh Words, p. 122.

WREN. See the article JENNY-*Wren*.

Creſted WREN. See the article REGULUS *Criſtatus*.

WRINGLE-*Tail*, a name given by the people of ſeveral parts of England, to the *curvicauda*, a ſpecies of bee-fly, very much reſembling the bee in ſhape, but having only two wings and no ſting.

It is very troubleſome to horſes, but does not ſuck their blood, but only lays its eggs in their ſkins; it is called in other counties the *whame* and the *barrel-fly*.

WRIST (*Cycl.*)—The *carpus* or *wriſt* conſiſts of eight ſmall, unequal, and irregular bones, all of which, taken together, repreſent a ſort of grotto, of an irregular quadrangular figure, and connected principally with the baſis of the radius.

Conſidered in this manner, the whole connection of them has two ſides and four edges: One of the ſides is convex and external, the other concave and internal. The convexity of the outſide is pretty regular and even; but the concavity of the inſide has four eminencies, one at each corner. One of the four edges touches the fore-arm, and is as it were the head of the carpus; another of the edges touches the metacarpus, and may be called the baſis; the third is toward the point of the radius, and the fourth toward the point of the ulna; the firſt of theſe latter two may be called the ſmall edge, the latter the larger.

The bones of the carpus are divided into four rows, the firſt of which lies next the fore-arm, the ſecond next the metacarpus; each row conſiſts of four bones; but the fourth of the firſt row lies in a manner out of its rank. Each bone has ſeveral cartilaginous ſurfaces for their mutual articulations, and, in ſome of them, for their articulations with the radius, and bones of the metacarpus and thumb.

It is to no purpoſe to diſtinguiſh the three ordinary dimenſions in any of theſe bones, except one; but in moſt of them we may conſider ſix ſides, one external, turned towards the convex ſurface of the carpus; one internal toward the concave ſurface; one toward the fore-arm, which may properly be called the brachial ſide; one toward the fingers, to be called the digital ſide; one toward the point of the radius, or the radial ſide, and one toward the point of the ulna, or the cubical ſide.

Of theſe ſides ſome are bony, others are cartilaginous or articular; theſe laſt I call ſides, the others ſurfaces, as being portions of the carpus's ſurface in its natural ſituation: to diſtinguiſh theſe bones from each other, they have been called the firſt, ſecond, third, and fourth, bones, of the firſt or ſecond row, beginning to count from the radius or thumb. But Lycerus has been at the pains of giving a particular name to each of them.

He calls the firſt of the firſt row the *os ſcaphoides*, the ſecond the *os lunare*, the third the *os cuneiforme*, the fourth the *os piſiforme*; the firſt bone of the ſecond row the *os trapezium*, the ſecond *os trapezoides*, the third *os magnum*, and the fourth *os unciforme*; all which ſee in their proper places. *Winſlow*'s Anatomy, p. 82.

The bones of the carpus are articulated with one another by arthrodia; but the firſt row forms a ſort of ginglymus with the ſecond; becauſe the head of the os magnum may turn in the cotyloide cavity of the firſt row, while the two firſt bones of the ſecond row ſlide upon the digital ſide of the os ſcaphoides, and the os unciforme in the ſame manner on the os cuneiforme.

When all theſe bones are in their natural ſituation, a tranſverſe depreſſion is formed in the convex ſide of the carpus, by which the two rows are diſtinguiſhed. This depreſſion appears moſt between the os ſcaphoides, and the three laſt bones of the ſecond row, and looks like a fold, by which the ſecond row is thrown back upon the firſt. The four eminencies on the concave ſide of the carpus, are for the inſertion of a ſtrong tranſverſe ligament. The inner ſubſtance of all theſe bones is ſpongy, and their ſufaces are not very compact. *Winſlow*'s Anatomy, p. 85.

WRIST *Fractured.* The bones of the *Wriſt* are very ſeldom ſubject to fracture, on account of their ſmallneſs. And when they are fractured, there is but little hopes of a cure; for the ligaments and tendons are here ſo numerous, and the bones ſo very ſmall, that it is ſcarce poſſible to reduce them to their places, or to make them grow together again.

On this account the joint of the hand generally becomes ſtiff and immoveable after theſe accidents, or elſe abſceſſes, ſuppurations, fiſtulæ, and caries of the bones follow them; and theſe, on account of the ſoftneſs of the bones, and the difficulty of diſcharging the matter, are ſeldom remedied, but by amputating the hand. What can be done, however, toward the curing a fracture in this part, is this; the aſſiſtant muſt lay hold of the hand above the *Wriſt* and below it, and extend them as far as is neceſſary in oppoſite directions; the ſurgeon is, while this is doing, to replace the bones with his fingers, and when they are all replaced, to bind the hand up with a proper bandage. *Heiſter.* Surg. p. 129.

WRIST, in the manege. The bridle *Wriſt*, is that of the cavalier's left hand. A horſeman's *Wriſt* and his elbow ſhould be equally raiſed, and the *Wriſt* ſhould be two or three fingers above the pummel of the ſaddle. To ride a horſe from hand to hand, *i. e.* to change hands upon one tread, you need only to turn your *Wriſt* to that ſide you would have the horſe to turn to, without advancing your hand. But if your horſe ſtops, you muſt make uſe of both your legs. See the article HAND and LEG.

WRIT (*Cycl.*)—WRIT *of Inquiry of Damages*, a judicial *Writ* that iſſues out to the ſheriff upon a judgment by default, in action of the caſe, covenant, treſpaſs, trover, &c. commanding him to ſummon a jury to enquire what damages the plaintiff hath ſuſtained, *occaſione præmiſſorum*; and when this is returned with the inquiſition, the rule for judgment is given upon it; and if nothing be ſaid to the contrary, judgment is thereupon entered. 2 Lill. Abr. 721.

WRITING, (*Cycl.*)—To *write* without blacking the fingers: Prepare the paper with a fine powder, made of three parts of calcined copperas, two of galls, and one of gum arabic, thoſe being freſh mixed, rub them with a hare's foot into the pores of the paper; and then *write* with fair water, and the black letters will immediately appear. *Boyle*'s Works abr. Vol. 1. p. 114, 115.

To make new *Writing* appear old, moiſten it with oil of tartar per deliquium, more or leſs diluted with water, as you deſire the ink to appear more or leſs decayed. *Boyle*, ib. p. 115.

We may *write* without ink, or its materials: For this purpoſe, take a fine powder of calcined hartſhorn, of clean tobacco-pipes, or rather of mutton-bones burnt to a perfect whiteneſs, and rub it upon the paper, and then *write* with a ſilver bodkin, or the like. Ibid.

The diſcharging of ink out of parchment, paper, &c. is commonly done by aqua fortis diluted ſufficiently with water, that it may not deſtroy the paper. The like may be done with oil, or ſpirit of vitriol diluted. The juice of lemons, or ſtrong vinegar, will take ink out of linnen more ſafely, as the mineral acids are apt to deſtroy the linnen, unleſs great care be uſed in diluting them.

We may *write* on iron with corroſive ſublimate wetted with common water: For this purpoſe, the parts of metal we would preſerve untouched ſhould be covered with wax, and that taken off in the proper places to make way for the corroding ſubſtance. *Boyle*'s Works abr. Vol. 1. p. 528.

The like may be practiſed by means of aqua fortis.

Mr. Boyle mentions a method he had of copying a whole page of *Writing* at once. But we do not find his deſcription of it any where. See Works abr. Vol. 1. p. 136.

The ſame author informs us of a method of imitating *Writing*, on copper-plates. The copy to be engraved is to be wrote with a peculiar kind of ink, and the copper-plate being moderately warmed, is rubbed over with a white varniſh, and ſuffered to cool; then the paper being gently moiſtened, that it may readily communicate its ink, the *Writing* is applied to the prepared ſurface of the plate, and paſſed through a rolling-preſs; by which means the ink adhering to the varniſh, leaves the letters very conſpicuous. And hence it is eaſy with a needle to trace the ſtrokes, through the varniſh upon the plate, which being afterwards cleaned, the letters are finiſhed with the graver, and the work printed off in a rolling-preſs, as common cuts.

Mr. Boyle does not mention what the varniſh nor ink, uſed by the artificer from whom he received this method, was; but he tells us, that he himſelf uſed the purer ſort of virgin-wax, for a varniſh; and for his ink he took fine Frankfort black carefully ground, with water, till it obtained the conſiſtence of common ink; but no gum was added, leſt it ſhould hinder the ink from coming off. He alſo obſerves, that *written* characters may be taken off without the help of a preſs, by laying the moiſtened paper ſmooth upon the varniſhed copper, and rubbing it on hard with a convex piece of glaſs. Ibid.

WRONG-*Lands*, in our old writers, ſeem to denote trees that will never prove timber; ſuch as *wrong* the ground they grow in. Kitch. 169. *Cowel.*

WRY-*Necked*, a term applied to perſons affected with a diſtortion of the neck, and conſequently of the head alſo; which is pulled more to one ſide than the other.

This is a deformity uſually brought into the world with people; but ſometimes it is occaſioned by accidents afterwards. When it is from the birth, there is very little reaſon to imagine it curable, becauſe the vertebræ of the neck are rendered crooked by that poſture, while the bones are in a ſoft and pliable ſtate.

There are however, in the writings of ſurgeons, ſome inſtances of this diſorder, even in theſe circumſtances, being cured after twelve, ſixteen, or eighteen years.

When this diſorder comes on adults, it is occaſioned generally either by the contraction of the ſkin from a burn on one ſide, or from a ſtrong ſpaſmodic contraction of one of the maſtoide muſcles; which will at length become ſhorter and indurated, by continuing in that poſture; or it may proceed from a relaxation of one or more of thoſe muſcles, in conſequence of which the neck will be contracted by the ſtronger antagoniſt muſcle on the oppoſite ſide; or laſtly, it may proceed from a preternatural ligament drawing down the head. And when either of theſe is the occaſion of the diſorder, there is hopes of a cure; eſpecially if the ſubject be young, and the diſorder not of long ſtanding.

If this diſorder be recent, and cauſed by a defluxion of humours, evacuating medicines with mild ſudorifics, and heat, may be of ſervice. But when it ariſes from a contraction of the ſkin or muſcles by burning, the repeated uſe of oils, ointments, and fomentations, may relax ſo far as to make a cure. A proper firm bandage muſt be applied to pull the head toward the natural poſture, and a ſteel collar may be contrived by which the patient ſhall be ſuſpended very frequently till the neck recover its proper poſition. But when all theſe fail, the manual aſſiſtance of the ſurgeon is to be called in. If the ſkin is contracted by a burn, it muſt be carefully incided tranſverſely in ſeveral places, and the inciſions dreſſed ſo as to keep them open and dilated, and the head pulled to its proper poſition by a bandage, till the new fleſh filling up theſe inciſions gives room for the head to ſtand even. But if the *Wry-neck* proceeds from a contraction of one of the maſtoide muſcles, or from ſome ligament, they are to be divided by a tranſverſe inciſion in their lower part, near the clavicle or ſternum. *Heiſter*'s Surgery, V. 2. p. 4. *Tulpius*, V. 4. c. 58.

WRY-*Neck*, in zoology, the Engliſh name of a bird, known in Latin by the names *torquilla* and *jynx*. *Ray*'s Ornithol. p. 95. See the article JYNX.

WURST, a Ruſſian meaſure. See the article WERST.

WYCH-*Houſe* (*Cycl.*)—In the places where there are ſalt-ſprings, and ſalt-works are carried on at them, the work-houſe where the ſalt is made is always called the *Wych-houſe*; and hence we may naturally conclude, that *Wych* was an old Britiſh word for ſalt, which is the more probable in that all the towns in which ſalt is made end in *Wych*; as *Namptwych*, *Droitwych*, *Middlewych*, &c. *Ray*'s Engliſh Words, p. 175.

X.

X. We often meet with the Greek letters X and P joined in this manner ☧, on antient medals. The firſt we find are on ſome large braſs coins of the Ptolemies, kings of Ægypt, where it was placed on a civil account.

Some writers have taken it for a date, and others for the initial letters of a proper name; but as no reaſons are aſſigned for either of thoſe conjectures, Mr. Ward rather ſuppoſes it an abbreviation of the word XPHMA, *money*, impreſſed on thoſe pieces, to denote their currency as money; which might be thought proper, as they have not the heads of kings ſtamped upon them, like their ſilver and gold coins; but always that of a Jupiter on the front, and an eagle perched on a thunderbolt on the reverſe.

This character ☧ was afterwards applied to a very different purpoſe by Conſtantine the Great, who made uſe of it to denote XPICTOC, both in his coins and military enſigns; wherein he was followed not only by ſome ſucceeding emperors, but alſo by private perſons, who out of devotion put it on their lamps and other utenſils.

It afterwards came to be uſed merely as a critical note, to point out remarkable paſſages in manuſcripts; and then it ſtood for the initials of XPHCIMON, *uſeful*; as we learn from Iſidore, Orig. Lib. 1. cap. 20. See Philoſ. Tranſ. N°. 474. §. 1.

XAMDELLILAH, an Arabian term, uſed as a grace or thankſgiving after meat.

The greateſt men of that nation will often call in the meaneſt, even the beggars, to eat with them; who, as ſoon as they have done, always riſe and pronounce this word, which ſignifies God be praiſed. *Pocock*'s Egypt. p. 183.

XAMI, a name given by ſome of the old writers to the *ceration* of the Greeks, or carob-tree.

The Arabians uſe this name, and expreſs by it the ſame tree which we call by this name: They mention another kind of charnub, which is their general name for the ceration; this other kind was an aſtringent, and wholly different from any thing which we know under that name.

It is poſſible they might mean by it the acacia, which is alſo a tree that bears pods, and is of an aſtringent quality.

XANTHICA, Ξανθικα, in antiquity, a Macedonian feſtival, ſo called becauſe it was obſerved in the month Xanthus, at which time the whole royal family with the army were purified. See the article LUSTRATION.

After which the army was divided into two parts, one of which being ſet in array againſt the other, there followed a ſhort rencounter, in imitation of a fight. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 417.

XANTHIUM, in botany, the name of a genus of plants; the characters of which are theſe: The flower is of the floſculous kind, being compoſed of a number of floſcules, each having one ſtamen. The ſeeds are produced on other parts of the plant, and finally become oblong and uſually prickly fruits, divided into two cells, and containing each ſeveral oblong ſeeds.

The ſpecies of *Xanthium*, enumerated by Mr. Tournefort, are theſe: 1. The common *Xanthium*, called the ſmaller burdock. 2. The greater Canada *Xanthium*, with fruit armed with crooked prickles. 3. The jagged-leaved Portugal *Xanthium*, with fruit armed with very ſtrong prickles. *Tourn.* Inſt. p. 139.

The roots of this plant are of a bitter and acrid taſte, and are recommended as of great ſervice in ſcrophulous caſes, taken in decoction. Matthiolus gives great praiſes to the root dried and powdered, and given in mixture with rhubarb for the leproſy. *Matthiol.* in Dioſcor.

XANTHON, a name given by ſome of the antients, to a ſpecies of marble of a yelloviſh green colour, much uſed in ornamenting the inner parts of houſes; and from its equal hardneſs with the Tænarian marble, and the equal high poliſh it was capable of, ſuppoſed by the workmen to be of the ſame ſpecies.

The word *Xanthon* is of very dubious meaning, but is ſuppoſed as the name of this marble to have expreſſed a green colour, as this was otherwiſe called *marmor herboſum*. See the articles TÆNARIUM, and HERBOSUM *Marmor*.

XANTHURUS *Indicus*, in zoology, the name of a fiſh, called by the Dutch *Geel-ſtardt*.

It is of the ſize and ſhape of the bream; its jaws are armed with ſtrait and very ſharp teeth, which ſtand almoſt ſtrait out; its back is yellow, and its tail very ſtrongly tinged with that colour; its belly is of a bluiſh white; its head brown, and its fins of a fine red. It is caught with hooks among the rocks on the ſhores of the Eaſt-Indies; and is a very wholeſome and well-taſted fiſh. *Ray*'s Ichthyograph. Append. p. 2.

XANTHUS, in the natural hiſtory of the antients, the name of an iron ore of the hæmatites or blood-ſtone kind, and uſually accounted a ſpecies of it, and called by others *elatites*.

It was of a pale yelloviſh white, or the colour of the French pale yellow ochre, uſed by our painters; but like all other ferrugineous bodies it became red by burning.

Theophraſtus gives us expreſly the etymology of the name, obſerving that it was called ſo from its colour; the Dorians calling a yelloviſh white ξανθος, *Xanthus*. *Hill*'s Theoph. p. 97.

XANXUS, in zoology, a name given by ſome authors to a large ſpecies of ſea-ſhell, ſomewhat like that with which the tritons of old were painted. It is found in great abundance near Ceylon, and is uſed there in medicine as an alkali and abſorbent, in the ſame caſes in which we give the teſtaceous powders.

XATHOS, in ichthyology, a name given by Appian, to the fiſh, called by the generality of authors the *erythrinus*, or *rubellio*. See the article ERYTHRINUS.

It is of the ſparus kind, and is deſcribed by Artedi under the name of the ſilver-eyed, red-bodied *ſparus*.

XEL, in the materia medica of the antients, a name given to the fruit *ſel*. See the article SEL.

XENEXTON, a word uſed by Paracelſus, to expreſs a ſort of amulet to be worn about the neck, to preſerve people from infection in the plague.

XENINEPHIDEI, a word uſed to expreſs a ſort of imaginary ſpirits, mentioned by the adepts, as delighting to diſcover the occult qualities of bodies to men.

XENISMI, Ξενισμοι, in antiquity, ſacrifices offered at the Athenian feſtival *Anacæa*. *Potter*, T. 1. p. 366. See the article ANACÆA.

XENOPAROCHUS, among the Romans, an officer who provided embaſſadors with all kind of neceſſaries, at the public expence. *Pitiſc.* Lex. Antiq. in voc.

XERANTHEMUM, in botany, the name of a genus of plants, the characters of which are theſe: The flower is radiated; its diſk is compoſed of floſcules ſtanding upon the embryo-ſeeds; but the outer circle is compoſed of plane flat petals, which are not affixed to embryos, but are contained in the ſame cup with the floſcules which make up the diſk. The embryos finally ripen into ſeeds, which are furniſhed with a foliaceous head.

The ſpecies of *Xeranthemum*, enumerated by Mr. Tournefort, are theſe: 1. The *Xeranthemum*, with large ſingle purple flowers. 2. The *Xeranthemum*, with large double purple flowers. 3. The *Xeranthemum*, with ſingle white flowers. 4. The double white-flowered *Xeranthemum*. 5. The ſingle flowered *Xeranthemum*, with flowers mixed of white and red. 6. The double-flowered *Xeranthemum*, with flowers mixed of a duſky red and white. 7. The white-flowered hoary *Xeranthemum*. 8. The *Xeranthemum*, with ſmall ſingle purple flowers. 9. The *Xeranthemum*, with ſmall ſingle pale purple flowers. *Tourn.* Inſt. p. 499.

We have ſeveral ſpecies of this plant cultivated in our gardens, and known in Engliſh by the name of *everlaſting flowers*; a name common to all the ſpecies of this plant, and of the amaranthoides.

Theſe flowers are of ſo dry and durable a ſtructure, that if gathered juſt when they are ripe, they will laſt many years in perfection, and appear as freſh as while growing; they are alſo capable of ſeveral tinges, and hence are often ſeen of fine blues and greens, colours not natural to them.

They are all propagated by ſowing their ſeeds in Auguſt, in a warm border, obſerving to water and ſhade them till they are come up, if the weather proves very dry. When the young plants are two inches high, they ſhould be removed to another warm border under the ſhelter of a wall, and there planted at five inches diſtance from each other. They will here ſtand the winter very well, and in ſpring will be ready to grow up for flowering without any farther tranſplanting; they are only to be kept clear of weeds, and in June they will flower; the flowers ſhould be gathered in July for drying, and ſome of the fineſt ſhould be ſuffered to ſtand for ſeed; for the plants periſh as ſoon as they have perfected their ſeeds, and muſt be renewed by ſowing every year. *Miller*'s Gardener's Dict.

XERASIA, in medicine, the name of a diſeaſe, a ſpecies of alopecia, in which the hair falls off through a dryneſs of the part, and want of due nouriſhment.

XEROMYRON, a word uſed by the antients to expreſs what they do at other times call in expreſs words a dry ointment. It was a compoſition of warm and aromatic drugs, or of other things fit for external uſe, but without the fatty ingredients, by which they were uſually reduced into the form of ointments.

XEROPHAGY, Ξηροφαγια, among the antients, the feeding only on dry victuals, which was the practice of the Athletæ. *Pitiſc.* in voc. *ſaginatio.* See ATHLETA.

XEROTRIBIA, a term uſed by authors to expreſs a dry friction, a rubbing of ſome affected part with the hand or otherwiſe, to recall the warmth and circulation.

XIFINUS, a name given by ſome writers to the ſaphire.

XIMENIA, in botany, the name of a genus of plants deſcribed by Plumier, the characters of which are theſe: The cup is a ſmall three-leav'd perianthium; the leaves of it are cordated, and fall with the flower; the flower is monopetalous, of a bell ſhape, and divided into three ſegments, which ſtand erect, and are oblong, ſomewhat convoluted and obtuſe at the ends. The germen of the piſtil is ſmall, and of an oval figure. The fruit is an oval drupa containing only one cell, in which is an oval nut. *Plum.* p. 21. *Linnæi* Gen. Plant. p. 521.

XINKÆPPETHIJA, in botany, a name given by ſome authors to that ſpecies of the jujube tree, on the branches of which the gum lacca of the ſhops is uſually found. *Herm.* Muſ. Zeyl. p. 40.

XIPHIAS, (*Cycl.*) in the Linnæan ſyſtem of zoology, the name of a genus of fiſhes of the general order of the acanthopterygii or prickly-finned kind.

The characters of this genus are, that the membrane of the gills has eight bones, and the point or extremity of the noſe or ſnout of the fiſh, is ſhaped like a ſword, and that it has no belly fins. *Linnæi* Syſt. Nat. p. 54.

According to the Artedian ſyſtem of ichthyology, the characters of this genus of fiſhes are theſe: The branchioſtege membrane on each ſide contains about eight bones, the ſnout is extended into a very long and depreſſed point, imitating the figure of a ſword, and of a bony ſubſtance; the body is oblong and roundiſh, the back fin is ſmall, and is very low in the middle; there are no belly fins at all. The air bladder in this fiſh is remarkably long, and the anus very near the tail. *Artedi* Gen. Piſc. p. 24.

The *Swordfiſh* is ſo remarkable for the ſhape of its ſnout, which is extended in form of a ſword, that it has been called by all nations by a name expreſſive of that character. Its common name *Xiphias* is from the Greek ξιφός, a ſword, and it is called *gladius* in Latin, and in Engliſh the *Swordfiſh*.

It grows to a very conſiderable ſize, ſo as ſometimes to weigh an hundred pounds. It is of a long and rounded body, largeſt near the head, and tapering by degrees toward the tail; its ſkin is conſiderably rough, its back black, and its belly of a ſilvery white; its mouth is of a moderate ſize, and has no teeth; its ſnout runs out into the figure of a ſword in the upper jaw, the under is much ſhorter, and terminates in a very ſharp point; it has one only fin on the back, running almoſt the whole length of it; its tail is very remarkably forked; it has only one pair of fins at the gills, having none on the belly. It is common in the Mediterranean, and ſome other ſeas, and is eſteemed by many a very delicate fiſh for the table. The Manner of fiſhing for it is the ſame at this time, that the old writers have deſcribed it to be in theirs, by the harping-iron. *Willughby*'s Hiſt. Piſc. p. 161.

XIPHION, in botany, the name of a genus of plants, the characters of which are theſe: The flower is liliaceous, conſiſting only of one petal, and much reſembling the iris flower. The piſtil is in the manner of the iris alſo, ornamented with three petals, and the cup becomes a fruit of the ſhape of that of the iris; but the root wholly differs from that of the iris, being bulbous, and compoſed of a number of coats.

The ſpecies of *Xiphion* enumerated by Mr. Tournefort are theſe: 1. The broad-leav'd blue-flower'd ſweet-ſcented ſtalkleſs *Xiphion*. 2. The broad-leav'd ſtalkleſs *Xiphion*, with purple ſweet-ſcented flowers. 3. The broad-leav'd ſtalkleſs *Xiphion*, with ſweet-ſcented milk-white flowers. 4. The white-flower'd *Xiphion*, with blue edges. 5. The Perſian early *Xiphion*, with variegated flowers. 6. The porcelain *Xiphion*. 7. The lavender *Xiphion*. 8. The lavender *Xiphion*, with blue changeable flowers. 9. The purple-flower'd changeable lavender *Xiphion*. 10. The broad-leav'd blue-flower'd *Xiphion*, with ſtalks. 11. The cauliferous broad-leav'd *Xiphion*, with blackiſh purple flowers. 12. The cauliferous broad-leav'd *Xiphion*, with blue flowers variegated with purple, or with violet-colour'd lines. 13. The broad-leav'd cauliferous *Xiphion*, with greyiſh flowers ſtreak'd with violet colour. 14. The broad-leav'd cauliferous white-flower'd *Xiphion*. 15. The *Xiphion* with large ſpotted leaves, and purple flowers. 16. The violet-flower'd *Xiphion*, with large ſpotted leaves. 17. The broad-ſpotted leav'd *Xiphion*, with blackiſh purple flowers, white at the top. 18. The broad and ſpotted leav'd *Xiphion*, with ſnow-white flowers. 19. The narrow-leav'd *Xiphion*, with variegated flowers. 20. The narrow-leav'd *Xiphion*, with three-colour'd flowers. 21. The greater yellow *Xiphion*, with ſcentleſs flowers. 22. The great *Xiphion*, with a pale yellow flower. 23. The great yellow *Xiphion*, with mixt flowers. 24. The many-flower'd changeable colour'd *Xiphion*. 25. The leſſer *Xiphion*, with yellow-ſcented flowers. 26. The large tall *Xiphion*, with changeable yellow flowers. 27. The great but low *Xiphion*, with yellow changeable flowers. 28. The tall narrow-leav'd changeable flower'd *Xiphion*. 29. The low changeable *Xiphion*, with ſmaller flowers. 30. The middle-ſiz'd changeable flower'd yellow *Xiphion*. 31. The narrow-leav'd *Xiphion*, with blue ſweet-ſcented flowers. 32. The narrow-leav'd *Xiphion*, with variegated purpliſh blue flowers. 33. The leſſer blue-flower'd *Xiphion*. 34. The violet blue-flowered *Xiphion*. 35. The narrow-leav'd *Xiphion*, with violet-blue flowers. 36. The narrow-leav'd *Xiphion*, with flowers of a mix'd blue. 37. The white-flower'd narrow-leav'd *Xiphion*. 38. The American *Xiphion*, with blackiſh-yellow flowers. *Tourn.* Inſt. p. 362, ſeq.

We have ſeveral ſpecies of this beautiful plant cultivated in our gardens, where they are called *bulbous Iris's*; and beſides theſe, a vaſt number of varieties or new flowers, as the floriſts call them, are frequently raiſed by thoſe who propagate them from ſeeds. The culture of theſe being the ſame with that of ſeveral other plants of the ſame ſort, which are much valued for their flowers, it may not be amiſs to give it at large.

There ſhould be great care to ſave the ſeeds of the fineſt and ſtrongeſt flowers, and in September ſome ſhallow pans or boxes muſt be placed with holes at their bottom to let out the moiſture, and then filled with light and fine earth. On this the ſeeds muſt be ſown pretty thick, and as evenly as may be; half an inch of the ſame earth muſt be ſifted on theſe, and the boxes muſt then be ſet where they may have the morning ſun; and if the weather proves very dry, they muſt be gently watered at times. They muſt remain in this ſituation till October, and then muſt be removed to a place where they may have the benefit of the ſun as great a part of the day as may be; here they muſt ſtand the winter, keeping the boxes very carefully clear from weeds.

In the ſpring the young plants will appear, and they ſhould then be removed to their firſt ſituation, where they may have only the morning ſun; and if the weather be dry, they muſt be watered at times. In June their leaves will decay, and they muſt then have half an inch of freſh earth ſifted over them, and be left in their ſituation till October, when they muſt be removed to the ſame place as before for the winter.

In the ſpring the leaves will appear again, and when they are again periſhed, the earth muſt be taken out of the boxes, and ſifted to ſeparate the roots, which muſt then be planted at three inches diſtance on a bed of the ſame light earth; they muſt be buried three inches deep, and in the ſpring following muſt have about half an inch of freſh earth ſifted over them; the leaves will this year appear and decay as before; and the following year, in June, they will moſt of them flower, when the fineſt flowers ſhould be marked, that their roots may be taken particular care of. The following year the remainder, which did not flower at firſt, will produce their flowers; ſuch of theſe as are finer than the reſt, ſhould be marked in the ſame manner, and the roots of theſe choice kinds be preſerved with particular care. Whatever fine or new flower is thus raiſed from ſeed, may be afterwards propagated by off-ſets from the roots, which being planted out, will flower the ſecond year, and often produce even finer flowers than the mother root.

The roots of theſe flowers ſhould be taken out of the earth only every other year; this ſhould be done juſt when the leaves are decayed, and they ſhould not be kept out of the earth above a fortnight.

The earth in which theſe flowers thrive beſt, is a light ſandy loam; and if it be taken up with the turf and the graſs rotted among it before it is uſed, it will be ſo much the better. They do not delight in a rich dunged ſoil, nor ſhould they be placed where they are too much expoſed to the ſun; for beſides that the flowers ſoon fade in theſe places, the roots are alſo always found to decay; but in an eaſt border, where they may have the ſun till eleven o'clock, and where the ground is not too moiſt nor over dry, they will ſtand a long time in flower, and thrive extremely well. *Miller*'s Gard. Dict.

XIR, a word uſed by the chemiſts to expreſs mercury.

XISINUM, a word uſed by ſome of the chemical writers to expreſs vinegar.

XOCHIOCOTZO, in botany, a name uſed by ſome authors for the tree which produces the liquid amber, and is called the ſweet gum by the inhabitants of the Weſt-Indies. *Hernandez*, p. 96.

XOCHITENACATL, in zoology, a name given by ſome to the toucan, or American great beaked magpy. *Ray*'s Ornithology. See the article TOUCAN.

XOCHITENACATL *Alia*, in zoology, the name of a bird deſcribed by Nieremberg of the nature of the toucan or Braſilian magpy.

It is of the ſize of a pigeon, its beak is large and thick, and is black and pointed; its wings and tail are variegated with black and white; it has a large black mark reaching from its back to the breaſt; the anterior part of the wings is yellow, the

reſt of its body of a pale colour, and the legs and feet brown. It always is found among the ſweet-flowering trees, and is not uncommon in many parts of South America. *Ray*'s Ornithol. p. 298.

XOCOXOCHITL, the Indian name of the clove-berry-tree, or the *caſſia-caryophyllata*, the bark of which is uſed in medicine. *De Laet.* p. 277.

XOMOTL, in zoology, the name of an American bird, of which the Indians are very fond, making a part of their garments of its feathers.

Nieremberg has given this ſhort account of it. It is a web-footed fowl; its back and the upper part of its wings are black; and its breaſt is brown. When it is angry, it raiſes up the feathers of its head in form of a creſt. *Ray*'s Ornithol. p. 305.

XOXOUHQUITICPATLI, an American name of a ſtone of the jaſper kind, and of a beautiful green; but uſually pale, and ſometimes with a mixture of grey, and variegated in ſeveral places with ſpots of a deeper green.

It is found among the ſeveral kinds of *lapis nephriticus*, with which that country abounds, and moſt of which the Indians celebrate for their virtues againſt diſeaſes: they are not however acquainted with any medicinal virtues of this ſpecies.

XUCAHA, or XUCAAHI, in botany, the name of a plant much famed for its virtues among the antient Arabians, but unknown at this time.

It was called alſo *amgaila*, and by the Greeks, *leucacantha* and *acantha arabica*, and by many other of the names of the gum-arabic-tree. The uſe of theſe ſynonymous terms has led ſome to ſuppoſe that the gum-arabic-tree, and the *Xucaha* or *amgaila*, which is another of the Arabian names of that plant, were the ſame thing; but this is a great error.

The plant *Xucaha* had a root compoſed of ſeveral knobs, or ſeparate pieces, which when ſeparated and dried, became of a yelloviſh colour, a very light and ſpongy ſubſtance, and of an agreeable aromatic ſmell, but bitter taſte. The antients compared theſe to the cyperus-roots in ſhape, and uſed them as cordials and ſtomachics.

They called the prepared roots *bunk*, and the ſimilitude of this name in ſound with the word *buna*, the fruit of the Ægyptian tree *bon*, that is, coffee, have led ſome to ſuppoſe that it was our coffee which they called by theſe names of *bunk* and *xucaha*; but theſe are all idle conjectures, and the *bunk* being a root, and the coffee a fruit, is ſufficient alone to overthrow this opinion, were there none of the many other reaſons againſt it.

XYLAGIUM, a name given by ſome authors to the lignum ſanctum or guaiacum.

XYLOCARACTA, or XYLOCARACTE, in the materia medica, a name by which ſome authors have called the carob, or ſiliqua dulcis, the ſweet pipe-tree. *Ger.* Emac. Ind. 2.

This was called by ſome of the Greek writers *xyloceraton*, the tree bearing pods, and from a corruption of this name the other has been formed.

XYLOCARPASUM, in natural hiſtory, a name given by ſome authors to a poiſonous kind of wood.

It was the wood of that tree whoſe gum was called *carpaſum* and *apocarpaſum*. This was a much more terrible poiſon than the wood, and as it very much reſembled myrrh in colour, and came from the ſame country from whence the myrrh came, it was often found mixed with it, and many people loſt their lives by taking it.

XYLOCASIA, a term uſed by ſome modern writers on the materia medica, to expreſs what we call *caſſia lignea*, a bark ſomewhat reſembling cinnamon, but leſs aromatic, and of a mucilaginous taſte.

The antients, however, did not mean exactly what we do by this term *caſſia lignea*; they ſometimes pealed off the bark of this tree, and kept it ſeparate; and in this caſe they called it κασια Συριγξ, a term we have applied to a very different ſenſe, *caſſia fiſtula* with us ſignifying the fruit of the pudding pipe-tree; and when they cut the bark with the wood of the young branches, they then called it *hylocaſia* or *caſſia lignea*.

XYLOCOCCUM, in the materia medica, a name given by ſome of the later Greek writers to the carob-tree, or *ſiliqua-dulcis*.

This is alſo called *xyloceraton* by Ægineta, and by ſome of the latin writers of the barbarous ages, *hylocaracte*, a word plainly formed of the others.

XYLOCOLLA, a word uſed by ſome of the antient writers to expreſs what was more uſually called *taurocolla*, glue made of the ears and genitals of a bull.

XYLOCOPIA, Ξυλοκοπια, among the Greeks, a puniſhment with a cudgel. See the article FUSTIGATIO.

XYLOGLYCON, in botany, a name given to the carob, or ſiliqua dulcis, by ſome of the old Greek writers.

The word expreſſes a ſweet, or ſweet-fruited tree, and was ſufficiently expreſſive of the thing; but it was afterwards degraded into a Latin name, ſcarce intelligible, *ſililicon*; this Iſidore writes *ſilicon*, and ſuppoſes to be a falſe ſpelling of the word *ſiliqua*; but it is evidently formed of the word *Xyloglycon*.

Iſidore ſays, the acacia of the ſhops is the juice of the fruit of this tree; but this is an error formed on the expoſitions of the Arabians; they call by the common name *charnub* both the carob-tree and the acacia-tree; and what they have ſaid of the latter he has given to the former.

XYLOIDES, or HYLODES, in botany, a term uſed by many of the antient writers to diſtinguiſh thoſe plants which had woody ſtalks, though they never grew up to any conſiderable ſize; ſuch as the garden-thyme, marjoram, and the like.

XYLON, the *cotton-tree*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is of the bell-ſhape, very wide at the mouth, and divided into many ſegments. From its bottom there ariſes a pyramidal tube, uſually loaded with ſtamina; and from the bottom of the cup there ariſes a piſtil, which is inſixed in the manner of a nail both to the hinder part of the flower, and to the tube. This ripens into a roundiſh fruit, divided into four or more cells, opening at the top, and containing numerous ſeeds wrapped up in a ſtringy white ſubſtance, which is called *cotton*.

The ſpecies of this genus, enumerated by Mr. Tourneſort, are theſe: 1. The tree or woody-*Cotton*, with a ſmooth ſtalk, and a blackiſh purple flower. 2. The woody *Cotton*, with yellow flowers. 3. The woody *Cotton* with prickly ſtalks. 4. The herbaceous *Cotton*. 5. The American *Cotton*, with a long pointed fruit: And 6. The fineſt American *Cotton*, with green ſeeds. *Tourn.* Inſt. p. 101.

There are ſeveral varieties, and not a few diſtinct ſpecies of this plant, propagated in the gardens of the curious with us. The moſt common ſpecies, which is the *Xylon herbaceum*, or herby *Cotton*, is cultivated very plentifully in Candia, Lemnos, Cyprus, Malta, Sicily, Naples, and alſo between Jeruſalem and Damaſcus, from whence the *Cotton* is annually brought in large quantities to us in the northern parts of Europe. It is ſown on plowed lands in ſpring, and is cut down as our corn in harveſt-time, being an annual plant.

The *Cotton* is a woolly or downy ſubſtance, which incloſes the ſeed, and which is contained in a brown huſk or ſeed-veſſel. It is from this plant that moſt of the *Cotton* we uſe is produced, the difference of the ſeveral ſorts of it being owing to the different ſoil and climates it has grown in, and the different culture it has received.

The *Cotton* in the wooll, as it is uſually called, is what we have from Cyprus. Damaſcus *Cotton* is called *Cotton* in the yarn; and the Jeruſalem *Cottons*, which are called *bazaes*, are the fineſt kinds of all.

All the kinds of *Cotton* plants are propagated with us from ſeeds, which muſt be ſown on a hot bed early in the ſpring; and when the young plants are come up, they ſhould be tranſplanted each into a ſeparate pot of light earth, which is to be plunged into a moderate hot bed of tanners bark, obſerving to water and ſhade them till they have taken root; after this they ſhould be watered at times, and have as much air as the ſeaſon will permit. As they enlarge in ſize, they muſt be ſhifted into larger pots; but they muſt be kept in the ſtove, where the herbaceous kinds will annually flower in autumn; but they will ſeldom bring their pods to any perfection. *Miller*'s Gard. Dict.

XYLON, Ξυλον, among the Athenians, a puniſhment inflicted by putting the offender into the ſtocks. See the articles PODOCACE and PUNISHMENT.

XYLOSTEON, in botany, a name by which ſome authors have called the ſmall red-berried double-fruited *chamecerafus*.

XYLOSTEUM, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is placed on a cup, and always diſpoſed two on each pedicle: it is tubular in ſhape, and divided into ſeveral ſegments at the edge. The cup finally becomes a fruit, compoſed of two berries, which are ſoft, and contain a roundiſh but flatted ſeed. See Tab. 1. of Botany, Claſs 20.

There is only one known ſpecies of this genus, which is the Pyreenan *Xyloſteum*. *Tourn.* Inſt. p. 609.

XYLOSTROTON, among the antients, an appellation given to moſaic or chequered work. *Pitiſc.* Lex. Ant. in voc.

XYMPATHESIS, a word uſed by ſome of the old medical writers for ſympathy.

XYNERESIS, a word uſed by Hippocrates and others of the antients, to expreſs a firm coheſion or connection of any two things: ſome uſe it to expreſs that firm ſhutting together or clenching the teeth, which happens in convulſions.

XYPHION, in botany, a name uſed by ſome authors for the gladiolus or corn-flag, a plant kept in our gardens for the beauty of its flower. *J. Bauhin.* vol. 2. p. 701.

XYRIS, in the Linnæan ſyſtem of botany, the name of a genus of plants, whoſe characters are, that the flower-cup is a ſort of roundiſh ſpike, made up of roundiſh, hollowed, imbricated ſcales, which divide the flowers; the huſk is ſmall and bivalve, each of the valves being compreſſed, arched, and in the ſhape of a little boat; they are alſo acute, and naturally incline toward one another. The flower conſiſts of three petals, which are large, flat, expanded, with notched edges, and narrow ends, of the length of the cup they are immerſed in. The ſtamina are three ſlender filaments, which are ſhorter than the flower. The antheræ are oblong and erect. The germen of the piſtil is roundiſh; the ſtyle is ſingle and thread-like, and the ſtigma divided into three parts. The fruit is a roundiſh capſule,

capſule, contained within the cup, with three cells and three valves. The ſeeds are very numerous, and extremely ſmall. *Linnæi* Gen. Plantarum. p. 11.

XYSTICI, among the antients, a deſignation given to the Athletæ, becauſe they performed their exerciſes in the *Xyſtus*. See the article XYSTUS, *Cycl.*

Y.

YARD (*Cycl.*)—YARD-*fallen*, a term uſed among our farriers to expreſs a malady to which horſes are ſometimes ſubject, which is the hanging down of the penis from its ſheath between the legs, the creature not being able to draw it up again.

This is cauſed by weakneſs of the peculiar muſcles, which ſhould act in the drawing up; and proceeds ſometimes from a violent ſlip or ſtrain; ſometimes from a blow on the back, and ſometimes from extreme wearineſs in long journeys.

The method of curing this, is firſt to waſh it with oil of roſes, after this with warm white-wine, and finally, to anoint it with a mixture of oil of roſes and honey: it is then to be returned into its place, and kept from falling down again by a little canvas bolſter. It is to be thus dreſſed once in twenty-four hours, till the cure is perfected.

There are ſome other diſtemperatures to which this part is ſubject, in a horſe, as the being foul at the end, ſo that the creature voids his urine in the ſheath; in this caſe the method of cure is to draw out the penis, and cleanſe the end of it from any foulneſs that may be found there; then it is to be waſhed with butter and white-wine vinegar melted together: ſometimes there is a diſcharge of a yellow ſtinking matter from the penis: this is peculiar to ſtone-horſes, and principally affects them after the time of their covering of mares.

This running is attended with a ſwelling of the penis, and with a pain in voiding the urine; the creature alſo finds a difficulty in drawing up the penis into the ſheath. The method of cure is, to diſſolve in a pint of white-wine an ounce of roach-alum by boiling, and four or five times a day this is to be uſed, injecting it up into the *Yard* with a ſyringe blood-warm. This will prove a certain cure.

YARIN, a word uſed by ſome of the chemical writers to expreſs the flos æris.

YARN (*Cycl.*)—*Spun* YARN, on board a ſhip. See the article SPUN, *Cycl.*

YGROPISSOS, in the materia medica, a word uſed by ſome writers to expreſs tar.

YARROW, in botany. See the article MILLEFOLIUM.

YARWHELP, or YARWIP, an Engliſh name uſed in ſome places for the *godwit*, the *ægocephalus* of authors. See the artidle ÆGOCEPHALUS.

YAWS (*Cycl.*)—This is a diſtemper epidemical, or rather endemical to Guinea, and the hotter climates in Africa, ſeldom failing to attack each individual one time or other of their lives, but moſt commonly in childhood or youth: It makes its firſt appearance in little ſpots on the cuticle, level with the ſkin, no larger than the point of a pin, which increaſe daily, and become protuberant like pimples: ſoon after the cuticle frets off, and then, inſtead of pus or ichor in this ſmall tumour, white ſloughs or ſordes are only found, under which is a ſmall fungus growing out of the cuticle, increaſing gradually to different magnitudes, ſome leſs than the ſmalleſt wood-ſtrawberry, ſome as big as a raſpberry, and others even exceeding in bigneſs the largeſt mulberries, which they very much reſemble. While they are coming to this height, the black hair, which grows out of the part now covered with the *Yaws*, changes gradually white.

It is impoſſible to calculate the exact time which this diſtemper requires, to go through theſe different ſtages. Some negroes, who were in good plight, and had full nouriſhment, in a month after diſcovering the white ſpots, have had ſeveral *Yaws* as big as a mulberry; and in other negroes, that were low in fleſh, and had but a poor ſcanty diet, in three months time none of the *Yaws* have exceeded a common ſtrawberry.

The *Yaws* appear on all the parts of the body; but the moſt and biggeſt are generally on the groins, about the privities and anus, in the arm-pits and face. When they are very large, they are few in number; and when they are many in number, they are ſmall in ſize. All this time the patient is in good health, does not loſe his appetite, and ſeems to have no other uneaſineſs than what the naſtineſs of the ſores occaſion; for they are not painful, except touched too roughly. This is the natural appearance of the diſtemper, when left to itſelf, and in this ſtate it will continue a long time without any ſenſible evacuation.

The *Yaws* do not prove often dangerous, if the cure is undertaken ſkilfully at a proper time, and the patient has not undergone any courſe of phyſic for them before; but if the patient has been once ſalivated, or taken any quantity of mercury, and the ſkin once cleared, and they appear again, they are always very difficult, and often impoſſible, to cure. Medic. Eſſ. vol. 5. art. 76.

The chief part of the cure is by gentle ſalivation with calomel, in ſmall doſes, that it may neither vomit nor purge. The patient's drink is the decoction of guaiacum and ſaſſafras, fermented with melaſſes. See Medic. Eſſ. ibid. or the Abridg. vol. 2. p. 305.

Sometimes one large *Yaw*, high-knobbed, red and moiſt, called the *maſter-Yaw*, remains after the reſt are fallen off, and the ſalivation is over. And to ſubdue this, ſome have thought new ſalivations neceſſary; but it requires only to be deſtroyed by a gentle cauſtic, or mild eſcharotic, as equal parts of red precipitate and burnt alum.

The ſalivation ſhould not be begun befor the *Yaws* are at the height, which is diſcovered by their being at a ſtand, neither increaſing in ſize or number. Their coming to the height ſhould be accelerated by proper medicines. If the patient be ſalivated before this time, the diſtemper will return ſoon after the ſalivation. Ibid. p. 304.

YAYAUHQUITOTOTL, in zoology, the name of an Indian bird, deſcribed by Nieremberg, remarkable for having two feathers of its tail much longer than the reſt, and naked for a great way; but at the end ornamented with black and blue hairs. The bird is of the ſize of the ſtarling, and is beautifully variegated with green, blue, yellow, and grey.

Mr. Ray is of opinion, that this is the bird deſcribed by Marggrave under the name *guaira guainumbi*. *Ray*'s Ornithol. app. vol. 298. See the article GUAIRA-*Guainumbi*.

YDRINUS, or HYDRINUS, a name given by ſome to the *ophites*, or ſerpent-ſtone.

YEAR (*Cycl.*)—YEAR is alſo a word uſed by ſome of the chemical writers to expreſs any product of their operations, which may ſerve as a medicine, whether internally or externally.

YEAST. Common ale-*Yeaſt* may be kept freſh and fit for uſe ſeveral months, by the following method: Put a quantity of it into a cloſe canvas bag, and gently ſqueeze out the moiſture in a ſcrew-preſs, till the remaining matter be as firm and ſtiff as clay.

In this ſtate it may be cloſe packed up in a tight caſk, for ſecuring of it from the air; and will keep freſh, ſound, and fit for uſe for a long time.

This is a ſecret that might be of great uſe to the brewers and diſtillers here, who, though they employ very large quantities of *Yeaſt*, ſeem to know no method of preſerving it, or raiſing nurſeries of it; for want of which they ſuſtain a very conſiderable loſs; whereas the brewers in Flanders make a very great advantage of ſupplying the malt-diſtillers of Holland with *Yeaſt*, which is rendered laſting, and fit for carriage, by this eaſy expedient. *Shaw*'s Lectures, p. 195.

YELION, a word uſed by ſome of the barbarous writers to expreſs glaſs.

YELLOW (*Cycl.*)—Mr. Boyle tells us a moſt beautiful *Yellow* may be procured by taking good quick-ſilver, and three or four times its weight of oil of vitriol, drawing off, in a glaſs retort, the ſaline menſtruum from the metalline liquor, till there remains a dry ſnow-white calx at the bottom: On pouring a large quantity of fair water on this, the colour changes to an excellent light *yellow*.

He ſays he fears this colour is too coſtly to be uſed by painters, and he does not know how it would agree with every pigment, eſpecially oil-colours. Works abr. vol. 2. p. 91.

The Chineſe are famous for their *Yellows* in dying, which never change with waſhing. They make this dye of the flowers of the acacia, in a manner in which we might uſe ſeveral of our own productions to great advantage.

It is thus: They gather the flowers before they are perfectly ripe, and dry them in an earthen veſſel over a gentle heat, till they criſp up in the manner of tea-leaves; they then add to them the ripe ſeeds of the ſame tree in different proportions; and then boiling them in river-water with alum, they give the *Yellow* in any degree that they pleaſe.

They have three kinds of *Yellow*, which they diſtinguiſh by the names of *Ngo-hoang*, *King-hoang*, and *hoang* alone.

The firſt of theſe is the brighteſt *Yellow*; to dye five or ſix ells of ſilk of this colour, they uſe a pound of the flowers of the acacia, about two ounces of the ſeeds, and four ounces of alum.

The *King-hoang* is a ſomewhat deeper *Yellow*; to dye this, they uſe the ſame ingredient in the ſame proportion as in the former caſe; and when the ſilk is dry from the dipping in this, they give it a ſecond dipping in a ſlight tincture of Braſil-wood, this brings it to the fine ſtrong *Yellow* we ſee.

The *hoang* or pale *Yellow*, is made of the ſame ingredients as the firſt, only inſtead of four ounces of alum they put in but three ounces: River-water is found to be greatly preferable to any other, for the extracting theſe colours; but even in that there is great difference, ſome doing the buſineſs much better than others.

The Chineſe are ſo expert in judging on this occaſion, that they can tell by the taſte of water whether it will or will not do; and if it taſte faint, they know it is faulty; but they dip the pieces twice into it inſtead of once, and then the colour ſucceeds well.

The flowers of the acacia, when they have been prepared by roaſting in this manner, may be kept all the year round, and employed in dying as occaſion requires, only there is to be longer boiling for the dryed flowers than the freſh ones; and it is always found, that the freſh flowers give the brighteſt colour. Obſerv. ſur les Coutum. de l'Aſie, p. 254.

YELLOW *Flower-de-luce*, in botany. See the article IRIS *Paluſtris*.

YELLOW-*Hammer*, in zoology, the name of a very common Engliſh bird, called by authors *emberiza lutea*; and by ſome *hortulanus*, by others *luteus*, and by others *chloreus*.

It is a little larger than the chaffinch, and is very beautifully variegated with a greeniſh or greyiſh brown and a fine bright yellow.

There is beſide this another kind, which is much ſmaller and of a browner colour on the back; this is called by ſome authors *zivolo*. *Ray*'s Ornithol. p. 196. See the article ZIVOLO.

YELLOWNESS *of Infants*. See the article INFANT.

YELLOWS, a name given by farriers to the jaundice in horſes. See the article JAUNDICE.

YERK, in the manege. See the article YERKING, *Cycl.*

YETTUS, in natural hiſtory, a name given by the writers of the middle ages, to a ſpecies of marble, of a deep red; which was uſed by ſome as a touch-ſtone.

YEVA *Charrum*, in natural hiſtory, a name given by the people of the Eaſt-Indies to a kind of litharge; which is very common in that part of the world, and is ſaid to be made partly from lead and partly from zink.

It is leſs heavy than our yellow litharge, and of a paler colour. It is uſed as a cauſtic in all the occaſions of ſurgery there.

YEW, *Taxus*, in botany, the Engliſh name of a genus of plants. See the article TAXUS.

YEW is alſo a term uſed by the ſalt-workers of Limington, and ſome other parts of England, to expreſs the firſt riſing of a ſkum upon the brine in boiling.

In the places where they uſe this term, they add no clarifying mixtures to the brine, for it ferments in the ciſterns, and all its foulneſs ſinks to the bottom, in form of a thin mud; they admit only the clear liquor into the pan, and boil this briſkly till it *yews*, that is, till a thin ſkin of ſalt appears upon its ſurface; they then damp the fire, and carefully ſkim off this film, and clear only the ſcratch or calcarious earth, which ſeparates to the bottom.

They do not collect this into ſcratch-pans, as at many of the other works, but they rake it up to one ſide of the pan, and take it out; they there add a piece of butter, and continue the fire moderately ſtrong till the ſalt is granulated. They keep a briſker fire on this occaſion at Limington, than in moſt of the other works; ſo that they will work three pans in twenty-four hours. See the article SALT.

YIELD, or SLACK *the Hand*, in the manege, is to ſlack the bridle, and give the horſe head. See the article SLACK.

YIN, a word uſed by ſome of the chemical writers, to expreſs verdigreaſe.

YOKE (*Cycl.*)—YOKE, in the ſea-language. See the article SEA-*Yoke*, *Cycl.*

YOMO, a word uſed by ſome of the chemical writers to expreſs verdigreaſe.

YOS, a word uſed by ſome of the chemical writers to expreſs verdigreaſe.

YOUNG *Animals*. It is commonly thought that the fleſh of *young* animals is ſooner digeſted, than the fleſh of the ſame kind of animals arrived at full growth; and Dr. Cheyne is alſo of this opinion. But Dr. Bryan Robinſon ſhews this to be a miſtake, in ſome inſtances; and alledges, that veal and lamb are not ſo ſoon digeſted, as beef and mutton. He mentions the caſe of a man, who took a vomit every ſecond night for ſome months, who obſerved, that when he had taken chicken for dinner, he always threw it up undigeſted; but never threw up any of his food undigeſted, when he dined on beef and mutton.

YOUTH. The renovation of *Youth* has been much ſought after by chemical adepts; and many of them pretended to various ſecrets, for this purpoſe: But unluckily, the death of the pretenders proved a ſufficient refutation of their doctrine. Paracelſus talks of the mighty things he could do with his *ens primum*; and even Mr. Boyle tells us ſome ſtrange things about the *ens primum* of balm. *Boyle*'s Works abr. Vol. 1. p. 75. but Mr. Boyle gives theſe wonderful ſtories on the credit of a French chemiſt, and not on his own. See the article ENS *Primum*, *Cycl.*

YOUTH, *Juventus*, in the Pagan theology, a goddeſs worſhipped among the Romans, who, together with the gods Mars and Terminus, kept her place in the capitol along with Jupiter, when the other deities were turned out. Whence the Romans drew a lucky omen for the durableneſs of their empire. Mem. Acad. Inſcrip. Vol. 1. p. 71. *ſeq.*

This ſtate of life was, by the antients, compared to Autumn. In which ſenſe, Horace ſpeaking of one approaching to Puberty, ſays,

Jam tibi lividos
Diſtinguet Autumnus racemos,
Purpureo varius colore.

The moderns, on the contrary, when they ſpeak of one in the autumn of his age, mean one that is upon the decline; and chooſe rather to uſe the compariſon of the ſpring, to denote *Youth*.

YS, in ichthyology, a name given by Athæneus, and ſome other of the Greek writers, to the fiſh called *Mus* and *Sus* by others. It is the capriſcus of later writers. See the article GOAT-*Fiſh*.

YSAMBRA, a word uſed by ſome as a name for hellebore, and by others to expreſs a ſpecies of poiſon prepared in Spain, of which hellebore is an ingredient.

YSOPUS, a term uſed by ſome, to expreſs the chemical art of ſeparation.

YSPAR, a name by which ſome of the chemical writers call iron.

YTIC, in natural hiſtory, the name of a ſpecies of duck, common in the Philippine-iſlands, and in China.

It is of the ſize of our tame duck, and is that ſpecies which the Chineſe hatch from the egg by heat, as the Ægyptians do chickens.

YTZAIMPATLI, in the materia medica, a name given by ſome to the cevadilla, or *hordeum cauſticum*, the cauſtic Indian barley. *Hernand.* p. 307.

YUCCA, or MANIHOT, in botany, the name of the Indian corn. See the article MANIHOT.

We have three or four ſpecies of this plant preſerved in the gardens of the curious; and the common kind, when grown ſtrong and hardy, will endure the cold of our climate in the open air, and produce its flowers with us.

All the ſpecies may be propagated either from ſeeds ſent from abroad, or from off-ſets or heads taken from the old plants, in the manner of the aloe. When they are to be raiſed from ſeeds, theſe are to be ſown in a pot of light freſh earth, which being plunged into a moderate hot bed the young plants will appear in five or ſix weeks; and when they are two or three inches high they are to be removed, each into a ſeparate pot, which is to be plunged again into the ſame hot bed, where they are to be watered and ſhaded, and to have air given them, as the ſeaſon and the heat of the bed will permit. In July they muſt be hardened by degrees to the open air, into which they muſt be removed ſoon after to harden them againſt winter. They muſt be placed in a defended ſituation, and remain abroad till October, when they are to be removed into the green-houſe, and placed among the hardier ſorts of aloes. They are here to be treated exactly as thoſe plants; and when they are grown ſufficiently ſtrong, they may be removed into common borders, where they will remain through our winters, and flower very beautifully.

When they are to be raiſed from the off-ſets, theſe muſt be laid in a dry place for a week or ten days before they are planted, that the wound where they where taken off from the old plant may heal; elſe, like the other ſucculent plants, they are apt to rot in the earth, and miſcarry. *Miller*'s Gardener's Dict.

YUCCA-*Bread*, or CASSADA-*Bread*, a ſort of bread made in many parts of the Weſt-Indies, and eaten there; and ſometimes brought over as a curioſity to us.

It is made of the root of this plant, known among the botaniſts by the name of *manihot*. This grows to five or ſix feet high, the ſtalk is woody and full of knots, and has a large pith in it; the leaves are digitated or divided into a number of ſegments, like ſo many fingers; the flowers are compoſed of one leaf, and are as large as our narciſſus, and are ſucceeded by a fruit of the ſize of a hazel-nut.

The root is very large and thick, and of a dark colour without, but very white within. It grows wild, common enough in ſome places; but it is generally cultivated for uſe, ſetting it in large furrows. Its juice is poiſonous, though the dry powder of the root is perfectly innocent and wholeſome; but there is a kind of it which may be eaten raw, and which is now getting into uſe; inſtead of the other, which is a ſpeedy poiſon, if eaten with its juice.

The manner of making the bread from theſe roots, is this; they peel them, raſp them, and putting them into bags ſqueeze out the juice; they then dry the remaining matter over the fire, and when it is ſufficiently dreſſed, they make it into cakes, which being dried either in the ſun, or by artificial heat, are the *Caſſada-bread*; which is very nouriſhing, and will keep without moulding, as well as biſcuit.

The uſe of it is apt to contract the throat, if eaten dry, and ſometimes brings on a danger of choaking; the beſt method is to moiſten it in broth, or otherwiſe. before it is eaten, or elſe to have a bottle of water at hand to waſh down every mouthful.

The juice expreſſed in preparing this root for bread, will kill any animal that drinks it crude; but it may be boiled over the fire till a great part is evaporated, and the remainder if it be far evaporated will be ſweet, and ſerve in the place of honey; if leſs evaporated, and ſet by to ferment, it will make a very good and wholeſome vinegar. The juice of the roucou is ſaid to be a counter-poiſon for the juice of *Yucca*. *Lemery*. Dict. des Drog.

The thicker cakes of *Yucca-bread* are called caſſavi, or caſſada, and are eaten by the poorer ſort. The thinner are called *ſciam*, and are eaten by the rich. *Grew*'s Muſæum, p. 371.

YXIR, a word uſed by ſome of the old chemiſts, to expreſs any thing good in medicine.

YZQUANHTH, in zoology, the Indian name for a bird deſcribed by Nieremberg, and called the creſted eagle. See the article AQUILA *Criſtata*.

YZQUIEPATL, in zoology, the name of an American animal of the fox-kind, and much reſembling a common fox when young.

It is a low animal, its body long, and its legs ſhort. Its noſe is ſharp, its ears ſmall, and its body very thick, covered with hair, particularly about the tail, which is long, and covered with the ſame ſort of hair with the reſt of the body, which is black and white. Its claws are very ſharp; it lives in the caves and in the hollows of rocks, where it breeds, and brings up its offspring. It feeds on worms, beetles, and other inſects, and ſmall animals: When purſued, it breaks wind backward with an inſupportable ſtench.

Its whole body is, indeed, of a very ill ſmell; and its urine and dung are ſo horribly ſtinking, that we have no ſtench that can compare with them. It is a mild and harmleſs animal; but when provoked, its only power of hurting is by violently diſcharging its excrements, which it will throw to ſix or eight foot diſtance, and which ſtain people's cloaths with indelible yellow ſpots, and leave a horrible ſtink which remains a long time on them.

The creature in many reſpects reſembles the rackoon, but differs in its offenſive ſmell, and in this remarkable manner of diſcharging its excrements.

Hernandez mentions two other ſpecies of it; the one variegated with numerous white ſtreaks, but this is called by no diſtinct name among the inhabitants; the other they name the *conepatl*, this has only one longitudinal ſtreak on each ſide the back, which run into the tail. *Ray*'s Syn. Quad. p. 184.

Z.

Z. This letter formerly ſtood as a mark for ſeveral ſorts of weights. Sometimes it ſignified an ounce and half, and very frequently it ſtood for half an ounce; ſometimes for the eighth part of an ounce, that is a dram Troy-weight; and it has in earlier times been uſed to expreſs the third part of an ounce, or eight ſcruples.

ZZ, theſe letters were uſed by ſome of the antient phyſicians, to expreſs myrrh. At preſent they are often uſed to ſignify *zinziber*, or ginger.

ZAARA, a word uſed by the Arabian phyſicians, to expreſs the *vigilia morboſa*, or continual watchings of perſons in many illneſſes.

ZACINTHA, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the ſemifloſcular kind, the ſemifloſcules are placed on the embryo-fruit, and are all contained in a general ſcaly cup. This cup finally becomes a ſtriated head, compoſed of ſeveral capſules, each of which contains one ſeed winged with down.

There is only one known ſpecies of this plant, which is what has uſually been called by authors *chicorium verrucoſum*, the wart gum-ſuccory. *Tourn.* Inſt. p. 476.

ZACYNTHUS, an epithet uſed by the antients to a liquid bitumen, from the iſland Zant.

ZADURA, in the materia medica of the antients, a name given to a foreign root, which was round and ſmooth, and of the colour of ginger.

It was at that time imported from the Indies, and greatly eſteemed in peſtilential caſes.

ZAFFABEN, a word uſed by ſome of the chemical writers, to expreſs putty.

ZAFFER, or ZAFFRE, in chemiſtry, the name of a blue ſubſtance, of the hardneſs and form of a ſtone; and generally ſuppoſed to be a native foſſil.

It is in reality, however, a preparation of cobalt; the calx of that mineral being mixed with powdered flints and wetted with water to bring it into this form. *Hill*'s Hiſt. of Foſſ. p. 625. See the article COBALT.

To prepare this for uſe in the glaſs-trade, put it in groſs pieces into earthen pans, and let it ſtand half a day in the furnace; then put it into an iron ladle to be heated red hot in the furnace; take it out while thus hot, and ſprinkle it with ſtrong vinegar; and when cold, grind it on a porphyry to an impalpable powder, then throw this into water in glazed earthen pans; and when it has been well ſtirred about, let it ſettle, and pour off the water: Repeat this waſhing often, and the foulneſs of the *Zaffre* will be thus wholly ſeparated: Dry the powder and keep it for uſe.

ZAFFRAMEN, a word uſed by ſome medical writers, to expreſs ſaffron.

ZAFFRAN, a word uſed often in authors to expreſs ſaffron, but ſometimes as the name of other things of a yellow colour; thus ochre was called by this name.

ZAFRANIA, in colours, a term uſed by the Greeks, to expreſs the yellow of ſaffron. The barbarous writers of the after-ages tranſlated it into the Latin *crocietas*, or ſaffron-colour.

The later Greek writers only uſe it, and they have taken it literally from the Arabians Aviſenna and Serapio. This was a term uſed by them to expreſs the colour of the fine bole-armenic of Galen, which they tell us ſtained paper to a fine and beautiful gold colour.

ZAGI. See the article ZEGI.

ZAGU, in the materia medica, the name given by ſome authors to the ſago-tree, the *todda pauna*, or *palma fructu pruniforme*. *Jonſ.* Dendr. p. 144.

ZAHIA, a word uſed by the Arabian phyſicians, to expreſs a ſort of dyſentery, in which there was a very large diſcharge of blood from the rectum, attended with an evident ſenſation of abraſion, or pain in the bowels.

ZAIBAC, one of the many names by which the antient chemiſts have called mercury.

ZAIDIR, a name by which ſome of the chemical writers have called verdigreaſe, or the ruſt of copper; and others, the metal itſelf; and ſome braſs.

ZAIN, in the manege. A horſe is called in French *Zain*, that is of a dark colour, neither grey nor white, and without any white ſpot or mark upon him.

ZAMECH, a name given by ſome writers to the lapis lazuli.

ZAMPOGNA, in the Italian muſic, is uſed to denote any inſtrument that ſounds like a flute; and particularly a bag-pipe, being an aſſemblage of divers pipes of different ſizes. It is alſo taken for a common flute.

ZANNA, the name of a medicinal earth, deſcribed by Oribaſius; he ſays, it is found in Armenia, in that part which borders on Cappadocia; and that it is very drying and of a pale colour, and eaſily diſunited by water, falling into a fine powder like lime.

It is called by the natives *Zarina*, and the mountain from which it is taken is near the city Baganona. It is of a drying and aſtringent nature.

ZANNICHELLIA, in botany, a name given by Micheli, to a genus of plants, called by others *algoides*, *aponogeton*, and *gramine folia*.

The characters are theſe: It produces diſtinct male and female flowers, which always ſtand very near one another. The male flower has neither cups nor petals, but conſiſts only of one erect ſtamen or filament, which is conſiderably

long,

leaves, and is terminated by an oval anthera. The female flower has a bellied perianthium compoſed of one leaf divided into two at the end. There are no petals. The piſtil has ſeveral corniculated germina, with as many ſimple ſtyles with plain ſtigmata of an oval figure. The ſeeds follow theſe, and are as many in number as there were horns or germina; they are oblong, pointed at each end, and gibbous on one ſide, and are covered with a ſkin or rind. *Linnæi* Gen. Pl. p. 444. *Vaillant*, A. G. 1719. *Ponteder* Anth. *Dillen.* Gen. p. 169.

ZANONIA, in botany, the name of a genus of plants, the characters of which are theſe: It produces ſeparate male and female flowers; in the male flower the cup is a perianthium, compoſed of three leaves of an oval figure, expanding every way, and ſhorter than the flower. The flower is monopetalous, but divided into five ſegments, and has an open mouth. The ſegments are jagged, and are equal in ſize, and bend backwards. The ſtamina are five filaments of the length of the cup, ſtanding open at their ends, and terminated by ſimple apices. The female flowers grow on ſeparate plants, and have the cup and flower the ſame as in the male, only that the cup ſtands upon the germen of the piſtil. This germen is oblong, and from it are propagated three reflex conic ſtyles. The ſtigmata are bifid and curled; the fruit is a long and very large berry, truncated at the end, and very ſmall at the baſe. It contains three cells, and has a curled future near the apex; the ſeeds are two; they are of an oblong figure, and flat *Linnæi* Gen. Pl. p. 477. H. Malab. vol. 8. p. 47. 49.

ZANTHENES, in natural hiſtory, a name given by the antients to a foſſile ſubſtance found in Media. Pliny quotes Democritus for ſaying, that if rubbed in palm wine and ſaffron, it became as ſoft as wax, and yielded a very ſweet ſmell.

ZARFA, in botany, a name given by Leo Africanus, and others, to the *lotus* or nettle tree.

It has been doubted by ſome what tree he meant, but his own deſcription of the *Zarfa* clears it up: he ſays, that the leaves of the tree are like the nettle, the fruit like a cherry, but ſmaller, and in taſte very much like the jujube; and that the Arabians call it *rabich*.

ZARIFU, a word by which ſome of the chemical writers have expreſſed tin.

ZARNAB, in the materia medica, a term uſed by Aviſenna and Serapion to expreſs the *carpeſia* of the antient Greeks.

This was an aromatic drug uſed as a ſubſtitute for cinnamon, and was the young ſhoots of the tree which produces the cubebs, or ſome other ſuch ſhrub. It was a fine aromatic, ſtomachic, and cordial.

Galen gives an account of two kinds of it, called *Laerticum* and *Pontiacum*, from the names of places where they grew: both theſe ſeem to have been the roots of the ſame tree, and both to have been produced in the ſame country Pamphilia, but on two different mountains there.

Some are of opinion that the *Zarnab* of the Arabians, and *carpeſia* of the Greeks, were not the ſame thing, but two drugs very like one another; but though Paulus Ægineta, and ſome others are of this opinion, it ſcarce ſeems clearly made out. See the article CARPESIA.

ZARNACH, the ſame as the word *Zarnich*; the name of the orpiment of the Arabians. See ZARNICH.

It was not confined however to this ſenſe alone, but was uſed as a name for other things uſed in painting, and particularly for the *lapis armenus*.

Aetius tells us, that the Syrians called the *lapis armenus Zarnach*, and many others have followed their example. Dioſcorides and Theophraſtus keep the words, and the things ſignified by them, wholly ſeparate. They call the *lapis armenus* by the name of *armenion*, and the *Zarnach* by that of *arrenecon*, that is orpiment. The red and yellow orpiment were both called by this name, only with the addition of an epithet that expreſſed the difference of colour. Dioſcorides indeed mentions a ſort of red arſenic, different from the red orpiment, which he ſometimes calls *ſandarach*; but the Arabians confound all theſe things under the name *Zarnach*. See the article CARNID.

ZARNICH, in natural hiſtory, the name of a genus of foſſils; the characters of which are theſe: They are inflammable ſubſtances, not compoſed of plates or flakes, but of a plain ſimple and uniform ſtructure, not flexile nor elaſtic, ſoluble in ore, and burning with a whitiſh flame, and noxious ſmell like garlick.

Of this genus there are four known ſpecies: 1. A red one, which is the true *ſandarach*. (See the article SANDARACH.) 2. A yellow one, found in great abundance in the mines of Germany, and frequently brought over to us among and under the name of orpiment. 3. A greeniſh one, very common in the mines of Germany, and ſold in our colour-ſhops under the name of a coarſe orpiment. This is alſo found in our own country among the tin mines of Cornwall. And, 4. A whitiſh one, a very remarkable ſubſtance, which has the property of turning black ink to a fine florid red. This is common in the mines of Germany, but is of little value. *Hill*'s Hiſt. of Foſſils, p. 40.

ZARUTHAN, in ſurgery, a word uſed by ſome to expreſs a hard and unequal tumor of the breaſt, attended with a burning heat, and a violent but not continual pain.

This is by ſome refer'd to the cancer, and accounted a ſpecies of that terrible diſorder: its cauſe is ſuppoſed to be a ſharp ichorous humor in the blood.

ZAUROS, in ichthyology, a name given by the antient Greeks to that fiſh which we call *ſaurus* and *lacertus*, and which is called at Rome the *tarantola*.

It is truly a ſpecies of the oſmerus, and is diſtinguiſhed by Artedi by the name of the oſmerus, with eleven rays in the pinna ani. See the articles OSMERUS and SAURUS.

ZEA. In the writings of the antient Greeks, this word ſometimes is uſed to expreſs the libanotis. Dioſcorides tells us that the libanotis was by ſome called *Zea*, and by others *cachrys*.

It is remarkable alſo, that the word *cachrys* is by ſome uſed to ſignify the libanotis, and by others for the *Zea*. There cannot well be conceived two more differant plants than the *Zea* and the libanotis, the one being a corn, and the other a tall umbelliferous plant; and it is therefore unaccountable that that the Greeks and Romans ſhould have borrowed of one another the cuſtom of calling them both by the ſame name.

The word *Zea*, when taken out of this ambiguity, and aſcertained as the name of a corn alone, is yet not certain and determinate in its ſenſe in the various writers; moſt indeed make it the name of the ſpelta, or ſpelt corn; and this certainly is keeping up to the ſenſe of Dioſcorides, whoſe *Zea* is evidently the ſpelt corn. He mentions two kinds of it, the monococcous and the dicoccous; that is, ſuch as has only one grain or two in a huſk.

The *Zea*, or *Zeia* of Theophraſtus, is alſo evidently the ſame with the *Zea* of Dioſcorides, according to his deſcription; but there is much doubt whether it can be allowed to be the *Zea* of later writers in the ſame language. Theophraſtus ſays, that the *Zea* is the lighteſt of all corn; and in this Dioſcorides agrees with him: but Mneſitheus in Athenæus ſays, that the grain *Zea* is heavy, and the bread made of it the heavieſt and hardeſt to be digeſted of that of any grain, and that it was therefore to be eat very ſparingly, or it would do miſchief; and that people who had not been uſed to it, could not bear even a little of it without harm.

The ſame author adds, that it is a grain only fit to be cultivated in the cold northern climes, where other corn will not well grow; and that people, who could cultivate no other corn, were obliged to be very careful in the making of their bread of this, and always cautious of the quantity they eat of it.

It is ſufficiently plain from this, that the *Zea* of this author is wholly different from the ſpelt corn, that is, the *Zea* of the antient Greeks. Galen deſcribes a *Zea* which he ſays he had ſomewhere ſeen, agreeing with the characters of this corn, and making a blackiſh, heavy, and unwholſome bread.

The bread made of the ſpelt corn, or *Zea* of Theophraſtus, is lighter and whiter than any other bread; and the only ſeed of the corn kind which this heavy and coarſe *Zea* ſeems to agree with, is that kind of ſecale or rye deſcribed by Pliny, which he ſays was eſteemed a very bad grain, and only eaten when no other could be had, and which he deſcribes as growing up with a thin ſtalk, but bearing a great quantity of ſeeds, and thoſe black, heavy, and of a bitteriſh, diſagreeable taſte. This agrees with the *Zea* of Mneſitheus, in growing where no other grain would, and in all its other properties.

Many authors make the ſecale and olyra to be the ſame, and many alſo make the olyra and *Zea* to be the ſame; and thence rye and *Zea* are by many brought to be the ſame corn. Herodotus tells us of the Egyptians uſing olyra, or, as it is otherwiſe called, *Zea*; ſo he expreſſes himſelf. And Heſychius ſays, that *Zea* is a kind of grain otherwiſe called *olyra*; and Nicomedes ſays, that olyra is a name given to a kind of grain otherwiſe called rye or ſecale.

This author probably means the ſecale of Pliny already deſcribed, which is not the common rye, but the ſame grain with the *Zea* of Mneſitheus. Dioſcorides mentions olyra as a grain of the ſame genus with what he calls *Zea* or ſpelta, but of a different ſpecies; therefore whatever authors meant by theſe words at other times, it is evident that the olyra in the days of Dioſcorides, was very different from rye. The antients in general are very perplexed and confuſed in their accounts of the bread corns; but thus much may be known with certainty of the meaning of the different writers on this ſubject, and this may be a very fair ſtep to the unriddling all the reſt.

ZEBET, a word uſed by ſome of the chemical writers to expreſs dung.

ZEBLICIUM *marmor*, in natural hiſtory, a name given by ſeveral authors to a ſoft green marble variegated with black and white; and though the authors who have deſcribed it have not obſerved it, yet it no way differs from the white ophites of the antients. *Hill*'s Hiſt. of Foſſils, p. 485. See the article OPHITES.

ZEBRA, in natural hiſtory, the name of an animal of the aſs kind, common in Africa and in ſome part of the Eaſt-Indies. It is of the figure and ſtature of the mule, but is very different in colour, being very beautifully variegated with ſmall broad ſtripes of black, white, and brown, drawn from the ridge of the back to the belly. It is a very ſwift creature,

and large droves of them are uſually ſeen together. *Ray*'s Syn. Quad. p. 64.

ZEFR, a word by which ſome of the chemical authors expreſs pitch. See the articles PITCH and TAR.

ZEGI, or ZAGI, a word uſed by Aviſenna and others, to expreſs all the ſeveral vitriolic minerals.

Aviſenna ſometimes writes it *alzagiat*. Some have ſuppoſed it only the name of the *calcitis*; but Aviſenna tells us, that there are ſeveral kinds of it, the one yellow, which is *colcothar*; another white, which is *calcadis*; a third green, which is *chalcanthum*, or common vitriol; and a fourth red, which is *ſory*. See the article COLCOTHAR, *&c.*

The old interpreter of Aviſenna renders the word *Zagi* by *atramenta*, inks, and this has been much cenſured as ſeeming to expreſs their being all black; but this is not a juſt cenſure. The word *atramentum* is uſed by many good authors to ſignify ink, and all the ſalts of which ink is made, that is, all the ſorts of vitriol. See the article INK.

ZEHERECH, a word uſed by ſome of the chemical writers to expreſs flowers of braſs.

ZEITRABRA, a term uſed by ſome of the chemiſts to expreſs any thing that is fluxile.

ZELEM, in the materia medica of the antients, a name given by Aviſenna and others to a fruit common in Africa in their time, and much eſteemed by the people of that country, and called there by ſome *piper nigrorum*, the black people's pepper, or negro-pepper.

We have at this time given this laſt name to the *capſicum*; but that is very different from the plant thus called by theſe writers. Aviſenna tells us, that the *Zelem* was a fattiſh ſeed, of the ſize of a cich, and of a high flavour, in colour yellow on the outſide, and white within, and that it was brought from Barbary. It has been ſuppoſed by ſome, that the *Zelem* of the Arabians was the *traſi*, or ſweet cyprus-root, dug up to be eaten in the manner of the pignut. But it is plain, from this account of Aviſenna, that this is an erroneous opinion, the *Zelem* being evidently a fruit, not a root. He adds, however, that there was another plant, properly called *fulful alſuaden*, that is, *piper nigrorum*. This, he ſays, was a ſeed contained in pods like kidney-beans, and was black, and of a pungent and acrid taſte.

This was the ſame plant with that afterwards called *piper Æthiopum*, or Æthiopian pepper, which all authors figure and deſcribe as growing in pods.

Guilandinus groſsly miſtakes Serapio, who ſpeaks alſo to this effect, and ſuppoſes that he ſays all this of the *Zelem*, which he only ſays of the Æthiopian pepper, or what was properly called *piper Nigrorum*. This author, ſpeaking of the *Zelem*, calls it *hab*, which word the Arabians never uſe for a ſeed of a plant contained in pods, but always for the round and ſingle fruit of a tree, as a berry, or the like. And Rhaſes, where he is ſpeaking of the virtues of ſeveral fruits, brings in this *Zelem* among them. From the whole, we may at leaſt clear ourſelves of a great many errors in regard to the *Zelem*, by proving what it is not, though we cannot eaſily ſay what it is.

ZELPHI. See the article ZENDA, infra.

ZEMA, a word uſed by many of the old writers for a decoction or apozem.

ZEMASARUM, a word uſed by ſome of the chemical writers, as a name for cinnabar.

ZEMECH, a word uſed by ſome writers as a name for *lapis lazuli*.

ZEMIA, Ζημια, among the Athenians, is ſometimes taken in a large and general ſenſe for any kind of puniſhment; but more frequently for a pecuniary mulct or fine laid upon the criminal, according to the degree of his offence. *Potter*, Archæol. Græc. T. 1. p. 129.

ZEMPHYRUS, in the materia medica of the antients, a name given to a precious ſtone, the fragments of which they uſed as a cordial and ſudorific.

It appears by their accounts, that this ſtone was blue; and hence many have too haſtily judged, that it was the *lapis lazuli*; but in truth it was the ſapphire.

The word *Zemphyrus* is no where uſed, but in the writings of the later Greeks, and it is plainly formed, as moſt of their names of things are, on the Arabian word, expreſſing the ſame thing. This Arabian word is *ſemphir*; and this, in Aviſenna and Serapio, is always uſed as the name of a ſapphire, never as that of any other gem. We find alſo by their accounts, that this ſapphire was not the ſapphire of the antient Greeks; but the fine blue pellucid gem we now know by that name; for the ſapphire of Theophraſtus, and the other old writers, was only a kind of lapis lazuli.

ZENDA, a general term coined by Paracelſus, by which he and his followers expreſs extraneous or equivocal generation, or the production of bodies without a ſeminal principle. The word *zerunda* is uſed to expreſs this particular ſort of generation of men, and *zelphi* in regard to other animals.

ZENECHDON, a term uſed by the Arabian phyſicians for a preparation of arſenic, for external uſe; *zeech* being their name for arſenic.

ZENEXTOR, one of the many names by which the chemiſts have called mercury.

ZENGIFUR, a word by which ſome of the chemical writers have expreſſed cinnabar.

ZENI, a word uſed by many of the chemical writers as a name for vitriol.

ZENICON, the name of a poiſon, compoſed of ſeveral ingredients, and uſed to poiſon the tips of the arrows with which the Celtic hunters ſhot at the beaſts they purſued for food. The poiſon was known to be of that quick ſpreading nature, that as ſoon as the beaſt was fallen, the huntſman ran up to it, and cut out a large piece of the fleſh about the wound, immediately to hinder the venom from ſpreading farther. The antidote to this poiſon was ſuppoſed to be the leaves of oak, beech, and other trees.

ZENITH (*Cycl.*)—*Zenith* is alſo a word uſed by ſome medical writers to expreſs the firſt appearance of the menſes in young women.

ZENUPH, in the Jewiſh antiquities, a kind of tiara worn by the kings of Juda. See the article CIDARIS.

ZEOPHILOS, a word uſed by Quercetan as the name of an antimonial medicine.

ZEOPHYRUM, in the materia medica, the name of the *triticum æſtivum*, or *hordeum nudum*, as it is called by ſome authors, the naked barley. *Dale*, Pharm. p. 260.

ZEPHYRI *Fœtus*, a term uſed by Hartman, and ſome other writers, to expreſs a mole, or falſe conception.

ZERICHUM, a name given by ſome of the chemical writers to arſenic.

ZERNA, a word uſed by ſome of the chemical writers to expreſs an ulcerated lepra or impetigo; the chemical authors uſe it alſo as a name for the foulneſſes which they call the *lepræ metallorum*, or leproſies of metals.

ZERTA, the *Zerte*, a fiſh caught in the rivers of Italy, and ſome other places, of the figure of the chubb, and called by authors, *capito anadromus*, and the *blike*.

It very much approaches to the figure of the naſus, and has by ſome been eſteemed the ſame ſpecies of fiſh. It is of a long, and not flat ſhape, of a bright ſilvery colour, and covered with ſmall ſcales. Its back is of a browniſh hue, and its belly-fins of a mixed reddiſh and bluiſh colour; the ſide-lines reaching from the gills to the tail, are ſpotted with brown dots. Its head is thick, and its eyes large and white. Its mouth is ſoft and toothleſs; but the beginning of its throat is armed with ſtrong and ſharp teeth, ſeven in number. It ſeldom grows to more than two pound weight, and, at times, lives in rivers, at times in the ſea; and is eſteemed a very well taſted fiſh, eſpecially a little before the ſeaſon of its ſpawning. *Ray*'s Ichthyogr. p. 257.

The *Zerte* is that ſpecies of cyprinus deſcribed by Geſner and others under the name of *capito anadromus*. See the articles CAPITO and CYPRINUS.

ZERUMBETH, in the materia medica, a root found both in the Eaſt and Weſt Indies. The plant producing it is called by Piſo and Marggrave, *paco-ceroca*, and by Sir Hans Sloane, *zinziber ſylveſtre*. See the article GINGER.

It is of a yelloviſh grey colour on the outſide, but whiter within; when cut, it ſhews a very ſmooth and gloſſy ſurface; its ſmell is very aromatic and agreeable, and its taſte very acrid, ſcarce leſs ſo than ginger.

It is good in nervous caſes, and on all other occaſions that zedoary is. See the article ZEDOARY, *Cycl.*

ZESTOLUSIA, a term uſed by ſome medical authors to expreſs bathing in warm water, by way of diſtinction from *pſuchroluſia*, or bathing in cold water.

ZETETÆ, Ζητηται, among the athenians, were officers appointed upon extraordinary occaſions, to enquire after the public debts, when through the neglect of the receivers, or by other means, they were run up to large ſums, and began to be in danger to be loſt, if not called in. *Potter*.

ZETUS, a word uſed by ſome of the chemical writers as a name for vitriol.

ZEUGITÆ, Ζευγιται, among the Athenians, the third claſs of the people, or thoſe who had an eſtate of two hundred medimns. *Potter*, Archæol. T. 1. p. 14.

ZEUS, in the Linnæan ſyſtem of zoology, the name of a genus of fiſhes, of the general order of the acanthopterygii, the characters of which are, that the membrane of the gills has bones not parallel, that the body is flat, and the ſcales are ſharp. Of this kind are the aper, faber, *&c.*

The characters of this genus, according to Artedi, are theſe: The branchioſtege membrane does not conſiſt of parallel bones, as in other fiſhes, but contains various bones, ſometimes laid longitudinally, ſometimes tranſverſely, and ſometimes obliquely. The ſcales are rough, and the body very broad, thin, and compreſſed; as is alſo the head. The back-fin is long, and as it were double, being cut in near the middle part, almoſt to the bottom or baſe.

The ſpecies of this genus are theſe: 1. The *Zeus* with a prickly belly, and a tail rounded at the end. This is the *faber* or *john doree*. 2. The forked-tailed *Zeus*. This is the *faber indicus*, or *piexe gallo*. 3. The red *Zeus*, with an even tail, and with the ſnout bending upwards. This is the *aper*

of Rondeletius, and the *riondo*, of the Italians. *Artedi*, Gen. Piſc. p. 35.

ZIBELLINA, or the *Muſtela* ZIBELLINA, in zoology, the name of the creature whoſe furr is the *ſable*, ſo much valued among us.

It is an animal of the weaſel-kind, of the ſize of a cat, and of a duſky yellow colour, with a mixture of a deep brown; the anterior part of the head, and the ears, are of a browniſh-grey, and the hairs about its eyes, noſe, and mouth, very long. *Ray*'s Syn. Quad. p. 201.

ZIBETHICUM *Animal*, in zoology, the name of the creature commonly, but very improperly, called the *civet cat*; for it does not at all belong to the cat kind; but wholly to that of the dog; the head and noſe are plainly of the figure of the dog's; and the figure, number, and diſpoſition of the teeth, are plainly the ſame as in the wolf, fox, and dog.

Its colour varies very much; its more uſual one, however, is that of a pale grey, variegated with long black ſtreaks, though in the females it is often yelloviſh, and ſometimes whitiſh, and the ſpots black and round, like thoſe of the leopard, or cat of mountain.

The whole ſhape of the creature approaches to that of the wolf or dog; its ſnout is long and ſmall; its ears are ſmall and roundiſh; its hairs are like thoſe of the badger, but very ſoft. It body is thick and fleſhy, and ſomething reſembles the ſhape of a hog's; its feet are ſmall, and its legs very ſhort. The bags which contain the civet are placed between the anus and pudenda, and are found equally in the males and females; but in the male they are twice as large as in the female; they have a large cavity in their internal part, and their orifice is ſmall and cartilaginous. The perfumed liquor which is found in theſe bags, ſeems to be ſecreted from a number of glands, which lie between the two ſkins, of which they are compoſed. See Tab. of Quadrupeds, N°. 16.

It is remarkable, that in this creature, as in the badger, its noſe and belly are black, whereas in almoſt all other animals theſe parts are either whitiſh, or much paler than the reſt. Theſe creatures copulate backwards. *Ray*'s Syn. Quad. p. 178.

ZIBIBIÆ, in natural hiſtory, a name given by ſome authors to a large ſort of raiſins, reſembling the ſtones of dates in ſhape; they have much pulp, but very little moiſture.

ZICCARA, a name of an Indian fruit, reſembling a pine-cone, and containing twenty, thirty, or more, kernels, of no known uſe in medicine.

ZIDRACH, in natural hiſtory, the name given by Cuba, and ſome other authors, to that ſpecies of the ſyngnathus of Artedi, commonly called the *hippocampus*.

ZIFIUS, in ichthyology, a name given by Albertus to the *xiphias*, or ſword-fiſh.

ZIGER, a word uſed by ſome of the old writers, to expreſs a very fine kind of caſſia, extremely aromatic to the taſte, and of a purpliſh black in colour.

ZIGURELLA, in zoology, the name by which ſome have called the *julis*, a ſmall but very beautiful fiſh, common about Genoa, and in ſome degree approaching to the nature of the turdus or wraſſe. *Willughby*, Hiſt. Piſc. p. 324. See the article JULIS.

It is a ſpecies of the *labrus*, according to Artedi, and is diſtinguiſhed by the name of the *palmaris labrus*, with two large teeth in the upper jaw. See the article LABRUS.

ZIMENT-*Water*, or COPPER-*Water*, in natural hiſtory, the name by which ſome have called water found in places where there are copper-mines, and lightly impregnated with particles of that metal.

The moſt famous ſpring of this kind is about a mile diſtant from Newſol in Hungary, in the great copper-mine called by the Germans, *herrn grundt*. It is not eaſy to ſay at what time theſe waters were diſcovered, ſince there is no authentic account of it. Kircher, Brown, Toll, and others, mention them as well known in their times; but it is probable that they were not diſcovered in the days of Agricola, ſince he no where makes the leaſt mention of them; and it is not probable that ſo great a curioſity, and that ſo immediately in his own way, would have eſcaped him, if known at that time, eſpecially as he has commemorated the like virtue in the Schmolnich waters, much leſs famous for it, and of much leſs power than thoſe of Newſol. The water in this mine is found at different depths, and is received into baſons, for the purpoſe of ſeparating the copper from it: in ſome of theſe it is much more highly ſated with this metal than in others, and will make the ſuppoſed change of iron into that metal much ſooner. The moſt common pieces of iron uſed in the experiments, are horſe-ſhoes, nails, and the like; and they are found very little altered in ſhape, after the operation, except that their ſurfaces are more raiſed. Philoſ. Tranſ. N°. 479. p. 355.

The water which performs this wonderful change, appears greeniſh in the baſons where it ſtands; but if a glaſs of it be taken up, it looks clear as cryſtal: it has no ſmell, but has a very ſtrong vitriolic and aſtringent taſte, inſomuch that the lips and tongue are bliſtered and ſcorched on taſting it.

The people who taſte this water do not perceive the effect upon their lips, while they are in the mine, otherwiſe than by a gentle itching; but as ſoon as they come into the open air, the places where it has touched begin to ſwell, and matter is at length found in puſtules in them.

There is great difference however in the ſtrength of the water at different times, both as to its burning the lips, and its power upon the iron; when the ſprings yield but a ſmall quantity, it is always much the ſtrongeſt; but when there flows a very large ſtream of them, they are always more languid and weak. The caverns in which the baſons are placed to receive this water, are of no offenſive ſmell; and what appears ſomewhat ſingular, are free from vitriol, which abounds ſo much in other parts of the mine. There are no cryſtals, nor filaments of it, ſeen on the walls; and the ſtones, which are in other places blue with the admixture of it in their granules, are here white, from its abſence. This is probably owing to the humidity of the air in theſe places, which waſhes away all the particles of that ſalt, and carries them to parts of the mine, where they may concrete more eaſily.

The ſides of the caverns near the floor or bottom, very often afford a yelloviſh earthy ſubſtance of a foliated texture, reſembling iſinglaſs, and of an inſipid taſte.

The miners are well acquainted with the virtues of this water, in changing the metals; but they alſo uſe it as a medicine; whatever ſickneſs they are ſeized with, they firſt attempt its cure by a large doſe of this water, which uſually both vomits and purges them very briſkly.

They alſo uſe it in diſorders of the eyes, in ſome of which it muſt be of great power; but in others, it is very improper; ſo that upon the whole, they do more harm than good with it.

The copper produced from theſe waters is valued by the people much beyond any other copper, as being much more ductile, and running eaſier in the fire, the people in the neighbourhood have many veſſels of it; but it is to be obſerved, that its ductility and hardneſs grow after it is taken out of the water; for, while immerſed in it, it is friable.

It is obſerved, that after great rains the ſprings are always fuller than at other times, and the virtues of the water conſiderably leſs.

A pound of this water when ſtrongeſt being evaporated over a gentle fire becomes firſt turbid and cloudy, and afterwards depoſits a yelloviſh ſediment, when evaporated to drineſs. This ſediment is found to weigh two ſcruples and a half, and when warm water is poured upon this and afterwards filtred, there will be left about ſix grains of yelloviſh earth in the filtre; and the greeniſh ſolution being again evaporated to a pellicle, and this repeated ſeveral times, ſomewhat more than two ſcruples of a bluiſh-green vitriol will be ſeparated in ſmall cryſtals.

A ſmall quantity of oil of tartar being added to a pound of this water, the whole becomes turbid, and on filtration, leaves a large reſiduum in the filtre; this when dried will be found to weigh about two ſcruples and a half, and to be a cupreous vitriol with a very ſmall admixture of a neutral ſalt.

Finally, if a pint of this water be put into a bottle, and a ſmall piece of iron thrown into it, ſome bubbles will be immediately found ſtanding on the iron, and it will be by degrees changed to a copper colour; the ſecond day will ſhew the water conſiderably turbid, and it will afterwards look whitiſh, and white filaments will gather about the bottom and ſides of the glaſs, and about the iron, which by that time will look throughout of a coppery colour.

From theſe experiments we may eaſily underſtand what the true nature of the water is, that it contains a large quantity of the vitriol of copper, which it probably owes to a ſolution of that metal, by means of the acid of the common pyrites and water; when this is known, the effects are not difficultly accounted for, there being no real change of one metal into another; but the true ſtate of the caſe being that the particles of one metal are diſſolved and carried away, and thoſe of another metal depoſited in their place: A water thus impregnated is a menſtruum capable of diſſolving iron, and in the ſolution of that metal becomes ſo weakned as to let go the copper it before contained, in ſmall parcels. This is ſeen to be the caſe, by examining the changed metal while it lies in the water, the copper then appearing not a ſoft malleable and even maſs, but a congeries of granules cloſely placed together, and reſembling the ſmall granules or ova in the ſpawn of fiſhes; and it is very friable and fragile while in this ſtate.

This ſolution of one metal and depoſition of the particles of another in its place, is a thing very familiar in chemiſtry, and is ſeen every day in numerous inſtances; but in none ſo familiar as in a like caſe, or ſolution of iron and of copper in the ſame menſtruum. Thus, if a piece of copper be diſſolved in aqua fortis, and when this ſolution is perfected a piece of iron be thrown into the liquor, the ſame thing will be ſeen that is in this ſpring, for the iron will be diſſolved, and the copper which was before diſſolved in the menſtruum will be ſlowly precipitated and depoſited in the place of it.

This water can only depoſit ſo much copper as it before contained, in the ſolution; and this appears upon experiment to be much leſs than might have been imagined, the quantity being no more than in every pound ſo much as can be contained in about two ſcruples of vitriol; that being the utmoſt quantity ſeparable from it, with all the art that could be uſed. Thoſe people are therefore greatly miſtaken, who ſuppoſe, that if ever ſo much iron be put into the water there will be as much copper precipitated in its place. The quantity of copper, however, annually obtained in this manner is conſiderable, as the waters are conſiderable in quantity. Phil. Tranſ. N°. 479. p. 359.

ZIMEX, a word uſed by ſome of the old chemical writers, for verdigreaſe.

ZINARIA, a word uſed by the Arabians, for a kind of vitiated bile, called æruginous bile.

ZINC. See the article ZINC, *Cycl.* and *infra*.

ZINETUS, a word uſed by Paracelſus, as a name for one of the braſs-like marcaſites.

ZINGAR, a word uſed by ſome of the chemical writers for verdigreaſe; and by others for the flos æris, or flowers of copper or braſs.

ZINGI, in the materia medica, the name of a ſeed, ſometimes alſo called the aniſum ſtellatum, or ſtarry-headed aniſe. *J. Bauhin.* V. 1. p. 586.

ZINGIBER. See the article ZINZIBER, *Cycl.* and *Suppl.*

ZINGNITES, or ZINGRITES, a ſtone deſcribed by Albertus, Ludovicus Dulcis, and other writers of that time, and ſaid to be of a cryſtalline tranſparence; they give us no farther deſcription of it, but attribute a number of imaginary virtues to it.

ZINIAR, a name given by ſome of the chemical writers, for verdigreaſe.

ZINIAT, a word uſed by the old chemical writers, to expreſs either the action of fermentation, or any thing that is capable of exciting it in bodies.

ZINK, (*Cycl.*) in natural hiſtory, the name of a very remarkable foſſile ſubſtance, reſembling biſmuth in appearance, but of a bluer colour.

It is a very remarkable mineral, and one that has never been well underſtood as to its origin, till of late; for though the world well knew of a long time both *Zink* and *lapis calaminaris*, and knew that both of them had the remarkable property of turning copper into braſs, which one would think might have given a hint to the diſcovery of a natural alliance between them; yet have they been ever treated of as two different ſubſtances, by the writers on theſe ſubjects; and Dr. Lawſon was the firſt who ever publicly declared, and proved, *lapis calaminaris* to be the ore of *Zink*. See the article CALAMINARIS *Lapis*.

Zink is generally confounded with biſmuth, though in reality a very different body; but the regulus of theſe two minerals having a very great external reſemblance, the vulgar have not diſtinguiſhed them; and hence we hear of many ores of *Zink* in the leſs accurate writers, all which are truly the ores of biſmuth.

The *lapis calaminaris* is the true and general ore of *Zink*, yet that mineral is not confined to this ore alone, but is mixed in great abundance in its diſſeminated particles among the matter of the ores of other metals, particularly of lead.

Our artificers have long been acquainted with *Zink*, under the name of *ſpelter*; but none of them till of late have ever been able to make any gueſs as to its origin. We have much *Zink* brought to us from the Eaſt-Indies, under the name of *tutenag*; yet no body ever knew from what, or how it was produced there; and all that was heretofore known of it was, that among that ſtrange mixture of ores which the great mine yields at Goſſelaer in Saxony, when they were fuſed for other metals, a large quantity of *Zink* was produced; but Dr. Lawſon obſerving, that the flowers of *Zink* and of *lapis calaminaris* were the ſame, and that their effects on copper were the ſame, never ceaſed his inquiries till he found the method of ſeparating *Zink* from it.

The pure *Zink* is a ſolid metal-like body, of a bluiſh white, and ſomewhat leſs brittle than biſmuth, eſpecially when gently heated, and moſt of all the metallic minerals approaches to malleability: It melts in a very ſmall fire, and in a ſtrong one takes fire, burning with a bluiſh-green flame, and ſubliming into white flowers, which are with difficulty reducible again into the form of *Zink*: In an open fierce fire, it wholly flies off in vapour.

There is great reaſon to believe, that all the *Zink* or *tutenag* brought from the Eaſt-Indies, is procured from calamine; and we have now on foot at home, a work eſtabliſhed by the diſcoverer of this ore, which will probably make it very ſoon unneceſſary to bring any *Zink* into England, as we have great plenty of the calamine. *Hill*'s Hiſt. of Foſſ. p. 626.

The manner of extracting *Zink* from the lapis calaminaris, is this: The lapis calaminaris muſt be finely pulverized, and well mixed with an eighth part of charcoal-duſt, and put into a cloſe retort to prevent the acceſs of the air, which would inflame the *Zink* as it riſes. The retort is to be placed on a violent fire, ſufficient to melt copper. After ſome time the *Zink* riſes, and appears in the form of metallic drops within the neck of the retort. When the veſſel is cool, it muſt be taken out, by breaking off the neck of the retort. *Marggraf.* in the Mem. de l'Acad. de Berlin, 1746.

Mr. Marggraf obſerves, that different ſorts of lapis calaminaris, ſuch as the Poliſh, Hungarian, and Engliſh, afford different quantities of *Zink*. And that a particular kind found in England, gave near half its weight of *Zink*.

This extraction of *Zink*, does not always ſucceed. Some calamine from Bohemia and Aix-la-chapelle yielded nothing. But then, as theſe kinds did not tinge copper with a yellow colour, nor produce any change in it, he thinks them not true calamine. Hence he concludes, that a ſtone which mixed with charcoal, and expoſed to the moſt vehement action of a cloſe fire, produces no *Zink*; or which, in an open fire, does not produce braſs with copper and charcoal, is not true lapis calaminaris.

Zink, produced in the manner above-mentioned, may be hammered into thin plates; which cannot be done with the common *Zink*. We muſt refer to the learned author for ſeveral other obſervations relating to *Zink*, and its flowers. See the article *White* VITRIOL.

Mr. Boyle tells us he diſſolved *Zink* in an urinous ſpirit, and then put to it a quantity of acid ſpirit; but though a manifeſt conflict aroſe, yet the *Zink* remained diſſolved in the mixture. *Boyle*'s Works abr. Vol. 1. p. 521.

Zink may be diſſolved, not only by aqua-fortis, aqua-regia, oil of vitriol, ſpirit of nitre, ſpirit of ſalt, and other mineral menſtruums; but alſo by vegetable ſpirits, as diſtilled vinegar; and by animal ones alſo, as ſpirit of ſal armoniac, and ſpirit of human blood. Ibid. Vol. 3. p. 478.

Mr. Boyle obſerves, that if the ſeveral ſolutions of this mineral be compared, it will ſhew what a variety of taſtes is producible from one inſipid body, by aſſociating it with different menſtrua. Works abr. Vol. 1. p. 541.

The ſame author tells us, that by the help of *Zink*, duly mixed after a certain manner, he has given copper as rich a golden colour as ever he ſaw in the beſt gold. Ibid. Vol. 2. p. 180.

Zink gains weight by ignition. *Boyle*, ibid. p. 391. §. 11. But quære the circumſtances of the experiment; for in the ſame book, p. 395. §. 26. the filings of *Zink* put in a bolt-glaſs with a ſlender neck, and ſet upon quick coals for four hours, loſt weight.

Flowers of ZINK. The flowers of *Zink* are a ſubſtance famous in the writings of the chemiſts, who have led their followers into a thouſand errors by the names by which they have called them.

Some have called them *talc*, and a ſolution of them in vinegar, *oil of talc*; to which they have attributed very extraordinary qualities. Some have ſet the ignorant upon a fruitleſs attempt of extracting an oil from Venetian talc, to do all the things they have commemorated of this oil. Others have called theſe flowers the *ſericum*: Others the *aqua ſicca philoſophorum*; and others the philoſophic cotton.

The moſt ſimple and eaſy way of obtaining the flowers of *Zink* pure and white, is this: Melt the *Zink* in a tall crucible inclined in the furnace in an angle of 45 degrees or thereabouts; let the fire be moderate, little ſtronger than would be neceſſary for the melting of lead. If the *Zink* is left in this ſtate without being ſtirred, it forms a grey cruſt upon its ſurface, and becomes calcined by degrees under it into a granuloſe white ſubſtance; but to have the flowers, the matter muſt be ſtirred from time to time with an iron rod, and this cruſt broken as often as it ariſes; there will then after ſome time appear a bright white flame, and about two inches above it there will be found a very thick ſmoak, and with this there will ariſe a quantity of very white flowers, which will fix themſelves to the ſides of the crucible in the form of fine cotton.

Theſe flowers are to be ſeparated at times, and by careful management there may be collected from the *Zink* a greater weight of flowers than its own weight, when put into the fire. In working four pounds of *Zink* in this manner, there will be only about an ounce of a calcined earthy matter left at the bottom of the crucible, and the quantity of flowers will be about two drams and a half in each pound, more than the quantity of *Zink*; beſide that, it is eaſy to conceive from the manner of making them, that a great quantity muſt have been carried away with the ſmoak. And this is not to be prevented, ſince if the veſſel be cloſed to keep in the fumes, the external air being denied free acceſs, the ſublimation immediately ceaſes, and no more flowers can be obtained, till the veſſel is again opened, and the air admitted.

The fumes of *Zink* have a ſtrong ſmell of garlic, and are very noxious to the lungs. The reducing *Zink* into theſe flowers, is the deſtroying it abſolutely as to its metallic form; for none of the methods uſed by chemiſts to bring back metals to their original ſtate, are able to bring theſe flowers to *Zink* again.

Mr. Hellot, of the Academy of Sciences of Paris, who has given a very accurate analyſis of *Zink*, has tried the diffe-

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rent acid menſtrua upon it with very great care and attention to their effects.

Diſtilled vinegar was firſt tried. Eight ounces of this diſſolved, in ten days time, over a gentle fire, an ounce all but ſix grains of *Zink*; and after this it ceaſed to act upon the metal any longer, and was ſweetened in the manner of vinegar which has diſſolved lead: This, however, is an experiment not proper to be tried by the taſte, the ſolution being very miſchievous. Six ounces and two drams of an inſipid phlegm were diſtilled from this ſolution, and after this the fire being increaſed, ſtriæ began to appear on the top of the retort; the receiver being changed, there ſucceeded to theſe ſtriæ a ſublimation of very white and beautiful flowers of *Zink*; and after this a few drops of an oil, yellow at firſt, and afterwards green, came over into the receiver. The diſtillation yielded alſo about four drams of a ſulphureous liquor, inflammable as ſpirit of wine. This liquor being poured into a phial of water, at firſt ſwam upon it, and immediately afterwards blended with it in the manner of ſpirit of wine, and left only the few drops of oil ſwimming on the ſurface. This was reddiſh in colour, and of an aromatic ſmell.

This is the famous liquor called by the chemiſts oil of talc, and ſuppoſed to have ſo many great virtues, one of which is the fixing of ſilver; that is, in other words, the concentrating it to the weight of gold, and making it indiſſoluble in aqua-fortis, rendering it like gold ſoluble only in aqua-regia; but in all probability, this oil is really nothing but the eſſential oil of the grape from which the wine was made, whence the vinegar had been obtained; and then how idle muſt appear all theſe expectations from it.

The flowers ſublimed to the neck of the retort or head of the cucurbit, during the diſtillation, burnt at the flame of a candle, emitting a fine blue flame. Three ounces of ſpirit of ſalt diſſolve perfectly three drams, except two grains, of *Zink*; a great heat is perceived while this ſolution is making, and this acid as well as diſtilled vinegar leaves untouched a ſmall blackiſh reſiduum, from this metal. Some authors have ſuppoſed, that this reſiduum contained mercury; but experiments prove the contrary, and its lightneſs alone makes ſuch a conjecture very improbable.

This ſolution being diſtilled, yielded two ounces of phlegm, two drams of a weak ſpirit of ſalt of a very agreeable ſmell; and afterwards, on changing the receiver, a few drops of a very acid and yellowiſh ſpirit, and ſome flowers, raiſed themſelves to the neck of the retort.

Six ounces of ſpirit of nitre diſſolves five drams and a half of *Zink*, without leaving any remainder; and the remainder left in the ſolutions of it by diſtilled vinegar, and by ſpirit of ſalt, is itſelf ſoluble in this menſtruum. This ſolution being diſtilled, there were ſeparated four ounces of phlegm, and afterwards ſix drams of ſpirit of nitre; this was but very weak, and no more could be raiſed; the ſtronger part of the acid remaining intimately mixed with the *Zink* at the bottom of the veſſel, in form of a viſcous tranſparent ſubſtance, of a yellow or orange colour.

Three ounces of oil of vitriol, with an equal quantity of water, diſſolved ſix drams and twenty grains of *Zink*; when the liquor was thus far ſaturated there began to be formed regular cryſtals; and after two months ſtanding the whole liquor was evaporated, and a cake of tranſparent vitriol left in the bottom of the veſſel. Memoires Acad. Scienc. Par. 1735.

ZINZIBER, *Ginger*. See the articles GINGER, *Cycl.* and ZERUMBETH, *Suppl.*

ZINZIBER *Rubrum, red Ginger*, a name by which ſome authors have called the officinal caſſumunar-root.

ZINZIBER *Caninum, Dog's-ginger*, in botany, a name given by ſome of the old writers to the *perſicaria urens*, or biting arſmart; a plant which is very hot, and pungent to the taſte, and grows in watry places. It had hence the name of *hydropiper*, water-pepper, among the Greeks; and was called *Zinziber caninum*, or dog's-ginger, by Aviſenna and others, from its heat, and from an opinion that it would poiſon dogs that eat of it.

The Arabian name is *Zinzibil alkeleb*. Aviſenna, when he gives the hiſtory of it, begins with that of ginger: he ſays that he repeats the words of Dioſcorides; which he really does, but coupling together the common ginger and this, which he calls dog's-ginger, and theſe being deſcribed in two different parts of Dioſcorides, the commentator on Garcias accuſe him of having taken the name of Dioſcorides, and the ſenſe of ſome other Greek author.

This commentator is the only perſon who has given this part of Aviſenna a Latin verſion; but when he ſays, that the fruit is ſmall and contained in pods, he errs; for the word *ania* ſignifying ſubſtance, not pod; the only meaning of the author is, that the ſeeds are ſmall, and the miſinterpreting his words into the deſcription of a podded plant carries away the idea of the arſmart; which is not a podded plant, but is yet the true *Zinziber caninum* of Aviſenna, and the *hydropiper* of Dioſcorides.

ZINZIBER *Caninum* is alſo a name given by ſome authors to the *capſicum*, or Guinea pepper. *Ger.* Emac. Ind. 2.

ZINZILLA, a name by which ſome medical writers have called that ſpecies of the herpes, which we uſually call the *ſhingles*. See the article SHINGLES, *Cycl.*

ZIRBALIS *Hernia*, a term uſed by medical writers to expreſs that kind of rupture which is cauſed by a deſcent of the omentum into the ſcrotum.

ZIRBUS, the name by which the Arabian phyſicians have called the omentum.

ZIVOLO, in zoology, a name by which ſome authors have called the ſmaller ſpecies of *yellow-hammer*, from its conſtant note, which is only *zi, zi*.

It is of the ſize of the common ſparrow; its beak is thick and ſhort, its breaſt and belly yellowiſh, ſpotted with brown; and its head, back, wing, and tail of a duſky brown, but two of the tail-feathers on each ſide have a variegation of white.

The difference between the male and female in this ſpecies is, that the male is yellower, and has ſome yellow ſpots on its neck and ſides, which are wanting in the female. It is almoſt always ſeen on the ground, and feeds on ſeeds, *&c.* It ſeems but little if at all eſſentially to differ from the common yellow-hammer; and Mr. Ray has ſome ſuſpicion, that they are the ſame ſpecies. *Ray*'s Ornithol. p. 196.

ZIZANIA, in botany, a name uſed by ſome for the *lolium*, or darnel. *Ger* Emac. Ind. 2. See the article LOLIUM.

ZIZANIA, according to Linnæus, is a genus of plants diſtinct from the *lolium*, and its characters are theſe: It produces male and female flowers on the ſame plant: The male flowers have no cup, but the flower is a bivalve glume compoſed of two equal pointed leaves without awns, which ſurround one another; the ſtamina are ſix very ſhort filaments; the antheræ are oblong and ſimple. In the female flowers alſo there is no cup, but the flower is a one-leaved glume of a convoluted figure, having ſix nerves running along it, and ending in a point terminated by a long awn or beard. The germen of the piſtil is oblong, the ſtyle is divided into two parts, and the ſtigmata are plumoſe; the fruit conſiſts of the flower itſelf, which continues rolled up, and finally parts off horizontally at the baſe: In this is contained one oblong ſeed. *Linnæi* Gen. Plant. p. 455.

ZIZERIA, a word uſed by Apicius, and ſome other authors, to expreſs the inteſtines of fowls of the gallinaceous kind, often uſed in decoctions for glyſters, *&c.*

ZIZIPHORA, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: The cup is a very long, cylindric, and tubular perianthium; it is compoſed of one leaf, and is hairy, ſtriated, and at the extremity is divided into five very ſmall ſegments, and is bearded. The flower is ringent, and compoſed of a ſingle petal; the tube is cylindric, and of the length of the cup; the limb is very ſmooth; the upper lip is ovated, erect, emarginated, and obtuſe; the lower lip is broad and patent, and is divided into three rounded, equal ſegments. The ſtamina are two ſimple, patent filaments, of the length of the flower; the ſtigma is acuminated, and inflex. There is no fruit, but the cup contains four ſeeds, which are oblong and obtuſe, gibbous on one ſide, and angular on the other. Vid. *Linnæi* Gen. Plant. p. 13.

ZIZITH, in the Jewiſh cuſtoms, a name given by the Jews to the tufts or fringes, they uſed antiently to wear at the four quarters of their upper garments[a]; but which they now only wear under their cloaths, fixed to a ſquare piece of cloth, which repreſents the garment they antiently wore in their own country before their diſperſion. The *Zizith* of the modern Jews is a tuft made of eight threads of yarn, ſpun on purpoſe for this uſe; each having five knots, which take up half the length. That which is not knotted, being furled out, makes a kind of tuft or fringe[b].— [[a]Numb. xv. 36. Deuter. xxii. 12. [b]*Leo* of Modena, Cerem. of the Jews P. 1. c. 5. *Calmet.* Dict. Bibl. in voc.

ZIZYPHUS, the *Jujube-tree*, in botany, the name of a genus of trees, the characters of which are theſe: The flower is of the roſaceous kind, being compoſed of ſeveral petals arranged in a circular form; the piſtil ariſes from the cup, and finally becomes a fruit of the ſhape of an olive, and of a fleſhy ſubſtance including a ſtone divided into two cells, each of which contains an oblong ſeed.

The ſpecies of *Jujube*, enumerated by Mr. Tournefort, are theſe: 1. The cultivated *Jujube*, with large oblong fruit. And, 2. The wild *Jujube*. *Tourn.* Inſt. p. 626. See the article JUJUBE.

The *Zizyphus*, according to Linnæus, is only a ſpecies of rhamnus, with oval leaves, and two ſtyles; the fruit, or nucleus of which, contains two cells, and its corolla has five ſegments.

It is a native of Spain and Italy; and the fruit, which is of the bigneſs of an olive, and reddiſh when ripe, was once eſteemed as a pectoral, and ſometimes preſcribed in fevers; but is diſregarded in the preſent practice. *Hill*'s Hiſt. Plant. p. 292.

ZMILACES, in natural hiſtory, a name given by Pliny to a ſtone found in the river Euphrates, reſembling marble, and of a bluiſh green colour.

ZMILAMPIS, in natural hiſtory, the name of a gem, deſcribed by Pliny and the antients, which they tell us was very like the Proconnenſian marble, except that in the center of the ſtone there was always a bluiſh ſpot, reſembling the pupil of an eye.

The Proconnenſian marble of the antients was of a fine clear and elegant white, variegated with irregular black veins. Pliny's deſcription is ſo ſhort, that it has been ſuppoſed from him that the *Zmilampis* was a ſort of marble; he only ſays of it, that it was like the Proconnenſian marble, but blue in the middle. Many had inferred from this, that he meant no more by it than that this was a ſtone, which had blue veins inſtead of the black ones in the Proconnenſian kind. But when we examine the reſt of the antients, and find that it was a ſmall ſtone, found in the river Euphrates, and worn in rings; and that its blue ſpot was like a pupil of an eye, we may eaſily determine that it was one of thoſe gems which we call *oculus beli*, or *bellocchio*; of which there are a vaſt variety found in the rivers of the Eaſt-Indies, and many have a fine opake white ground, and a bluiſh or greeniſh ſpot for the pupil.

ZMILANTHES, in natural hiſtory, a name given by Solinus, and ſome others, to a gem called by the more correct writers *Zmilampis*. See the article ZMILAMPIS, *ſupra*.

ZOCHINACAZTLIS, in botany, a name by which ſome authors have called the *flos auriculæ*, a flower of New Spain, uſed in the making of the Spaniſh chocolate. *Hernand.* p. 30.

ZODIAC (*Cycl.*) ZODIAC *of the comets*. Caſſini hath obſerved a certain tract in the heavens, within whoſe bound (by many obſervations) he hath found moſt comets, tho' not all, to keep. This he makes as broad as the other *Zodiac*, and marks it with ſigns or conſtellations like that, which are, *Antinoüs*, *Pegaſus*, *Andromeda*, *Taurus*, *Orion*, the *Leſſer Dog*, *Hydra*, the *Centaur*, *Scorpion*, and *Sagittarius*.

ZODIACAL *Light*, a brightneſs reſembling that of the milky way, and which is ſometimes perceived in the heavens, at certain times of the year, after ſun-ſet, or before its riſe. The form of this light reſembles that of a pyramid, lying lengthways in the *Zodiac*, within which its point and axis are always incloſed, its baſe being placed obliquely with reſpect to the horizon. This phænomenon was firſt diſcovered, deſcribed, and named by Mr. Caſſini the elder. See *Mairan*, ſuite des Mem. de l'Acad Royale des Sciences, 1731. p. 3.

The *zodiacal light* is nothing but the ſolar atmoſphere, a rare and ſubtile fluid, either luminous by itſelf, or made ſo by the rays of the ſun ſurrounding its globe; but in a greater quantity, and more extenſively, about its equator, than any other.

The *zodiacal light* is more or leſs viſible according to circumſtances: But the ſolar atmoſphere is not always viſible by means of this light, though it be always ſeen about the globe of the ſun in total eclipſes.

One of the moſt eſſential circumſtances for the perception of the ſolar atmoſphere by the *zodiacal light*, is its having a ſufficient length on the *Zodiac*; for, without this, its brightneſs is entirely hid from us by the twilights.

Mr. de Mairan ſays, it may be proved from many obſervations, that the ſun's atmoſphere ſometimes reaches as far as the earth's orbit, and there meeting with our atmoſphere, produces the appearance of an aurora borealis. See the article AURORA *Borealis*, *Cycl.* and *Suppl.*

The length of the *zodiacal light* varies ſometimes in reality, and ſometimes in appearance only, from various cauſes.

The oblique poſition of this light, little different from that of the plane of the ecliptic, does not permit us to ſee it diſtinctly, and ſufficiently elevated above the horizon; but ſome time after ſun-ſet, towards the end of the winter, and in ſpring, or before ſun-riſing in autumn, and towards the beginning of winter. Several cauſes hinder our ſeeing it, any more than the milky way; ſuch as moon-light and ſtrong twilights, among others.

Mr. Caſſini [a] often mentions the great reſemblance of the *zodiacal light* to the tails of comets. Mr. Fatio [b] has made the ſame obſervation; and Mr. Euler has lately endeavoured to prove them owing to ſimilar cauſes [c].—[[a] Decouverte de la lumiere celeſte que paroit dans le *Zodiaque*, art. 41. [b] Lettre à Mr. *Caſſini*, printed at Amſterd. 1686. [c] *Euler*, in Mem. de l'Acad. de Berlin, Tom. 2.] See the article TAILS *of Comets*.

The figure of this ſolar atmoſphere muſt be lenticular, or that of a flatted ſpheroid. Mr. de Mairan gives us a draught of its appearance and projection. Lib. cit. c. 4. fig. 2.

The extent of the *zodiacal light* from the ſun to its point, is ſeldom leſs than 50 or 60 degrees: It has even been known to extend to 100 and 103°. Ib. c. 6.

This light ſeems to have no other motion than that of the ſun itſelf. Ib. c. 7.

Mr. Euler obſerves, that if the ſun has an atmoſphere, the force of the impulſe of light iſſuing from that globe, muſt drive particles of that atmoſphere before it; but as gravity is very ſtrong at the ſun, this impulſe would never drive thoſe particles beyond the limits of their atmoſphere, were it not for the centrifugal force ariſing from the ſun's motion round its axis. This being oppoſite to the action of gravity, and diminiſhing its effects, the impulſe of the light may conſiderably dilate the figure of the ſolar atmoſphere, from what it would be if it aroſe from the gravity and centrifugal force of its particles only; and this dilatation will be very conſiderable near the ſun's equator, and very ſmall towards its poles. The action of light thus diminiſhing the action of gravity, Mr. Euler attempts to calculate how far this diminution of gravity may increaſe the extent of the ſun's atmoſphere about its equator. He finds a cubic equation, the roots of which expreſs the ſemi-axis, or greateſt amplitude of this atmoſphere. He adds, that this equation having three real roots, it is poſſible that the ſolar atmoſphere may become a ring ſurrounding the ſun's globe, as the ring of Saturn ſurrounds the body of that planet. Loc. cit. p. 140.

ZONA, a word uſed by ſome authors for that ſpecies of herpes which others call the *zinzilla*, and we term the *ſhingles*.

ZONITES, in the materia medica of the antients, a name given to a kind of tutty, called alſo *placitis*. It had the latter name from the Greek, πλακος, a cruſt, it being formed by way of cruſt on the ſides of the furnaces. The latter name *zonites* was given it from its being formed of ſeveral coats, which, when broken tranſverſely, had the appearance of belts or zones. See the article FURNACE.

ZONITIS *Cadmia*, a name given by ſome authors to a kind of cadmia fornacum, from its uſually ſurrounding the upper parts of the furnaces like a girdle or belt.

ZOOLATRIA, ζωολατρια, a ſpecies of idolatry, wherein divine worſhip was offered to animals. *Hofm.* Lex. in voc.

The word is compoſed of ζωον, an animal, and λατρια, worſhip.

ZOOLOGY, (*Cycl.*) the ſcience of animals. This makes one of the three kingdoms, as they are called, of natural hiſtory; the vegetable and the mineral being the two others: In theſe, however, there is this difference made by writers, that while vegetables and minerals are treated of together, as all of a piece in each, the ſubjects of *Zoology* are divided, and it is made to compoſe, as it were, ſeveral kingdoms. Whoever is to write on plants and minerals, calls his work a treatiſe of botany, or mineralogy; and we have no words to expreſs any ſubdiviſion of them into kingdoms: but, in *Zoology*, we treat, as different ſubjects, the different parts of it; and the hiſtory of birds is ſeparated by ſome from the reſt under the name of *ornithology*; that of quadrupeds under the name of *tetrapodology*; and we have for the reſt, the words *entomology*, *amphibiology*, and the like, expreſſing theſe things which are properly but the parts of *Zoology*, as ſo many diſtinct and ſeparate ſtudies.

This may eaſily be amended, by our conſidering the animal world as we do the vegetable and mineral, and dividing it, as we do the others, into its proper families; it will then be found that theſe are no better diſtinctions than thoſe of the families of theſe things, and that the authors may as well ſet up ſeparate ſtudies under the names of *bulbology*, *umbelliferology*, and the like, as thoſe.

A natural diviſion of the ſubjects of *Zoology*, on this principle, will afford ſix ſeveral families of its ſubjects. 1. The hairy quadrupeds. 2. The birds. 3. The amphibious animals, ſuch as ſerpents, lizards, frogs, and tortoiſes. 4. The fiſhes. 5. The inſects. And ſixthly, thoſe loweſt order of animated beings the *zoophytes*. *Artedi* Ichthyol. See the articles QUADRUPED, BIRD, FISH, &c.

ZOOMINERALIA, a word uſed by ſome writers to expreſs certain ſubſtances which are of animal origin, yet have ſomewhat of the nature of ſtones, as pearls.

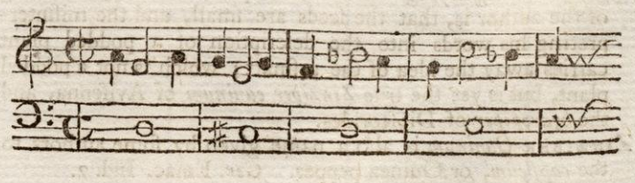
ZOOPHTHALMUS, in botany, a name given by the antient Greeks to the *ſedum majus*, or common great houſe-leek.

It had this name from the Greek ζωὸν, an animal, and ὀφθαλμὸς, an eye, as expreſſing a reſemblance to the eyes of large animals, in the round and radiated growth of its cluſters of leaves. They alſo called it *ambroſia*.

ZOOPHYTE (*Cycl.*)—ZOOPHYTE-*Marygold*. See the article MARYGOLD.

ZOPHOCIDELUS, in botany, a word uſed ſometimes as an epithet with the word *chamæleon*, and ſometimes ſingly as the name of a plant, in both caſes expreſſing the black chamæleon-thiſtle, which the antients carefully diſtinguiſhed, in their writings, from the white kind, the former being a poiſonous plant, the other not ſo.

ZOPPO, in the Italian muſic, is applied to all thoſe counterpoints, deſcribed under the articles PERFIDIATO, OBLIGATO, &c. Thus they ſay *contra-punto alla zoppa*, a lame or hopping counter-point; becauſe, in theſe, a note is placed between two others, each of half its value in time: When this comes to be played or ſung, the voice or inſtrument ſeems to proceed by unequal leaps or ſteps, like thoſe of a lame perſon. See the example here annexed.



There

There are *contra punto alla zoppa ſopra il ſogetto*, as well as *ſotto il ſogetto*, *i. e.* above and below the ſubject. See the article SOGETTO.

ZORABA, a word uſed by ſome of the chemical writers to expreſs vitriol.

ZOSTER, a word uſed by ſome to expreſs that kind of herpes, called by others *zona* and *zingilla*, and by us uſually known under the name of the *ſhingles*.

ZOTHECA, among the antients, the place where the animals deſigned for ſacrifice were kept. *Pitiſc.* in voc.

ZOZONISIUS, in natural hiſtory, a name of one of the gems of the antients, but of which our accounts are ſo ſhort, that we can make no conjecture of what it was. Pliny only tells us, that it was found in the river Indus, and uſed by the magi.

ZUFFOLO, in the Italian muſic, a little flute or flagelet, having a very ſhrill ſound, like the whiſtling of ſmall birds. *Broſſard.*

ZURNAPA, in zoology, the Arabian name of an animal of a very ſingular kind, and ſeeming properly to belong to no known genus of animals, but to be perfectly *ſui generis*. It is alſo called *camelopardelis* by Latin authors, and *geraffa* by eaſtern nations.

It is not certainly known whether it chews the cud or not; but as its hoofs are cloven, and it has horns on its forehead, and wants the fore-teeth in its upper jaw, and feeds on vegetables, it is probable that it does.

It is a ſingular, elegant, and beautiful creature, and is very remarkably tame and tractable, even ſcarce leſs ſo than a ſheep, and ſeems intended by nature for a domeſtic, not a ſavage animal. Its head is wholly of the make of the ſtag's, but differs in ſize, and has two little obtuſe horns, which are not more than ſix fingers breadth long, and are hairy: the male and female both have theſe, and the latter is diſtinguiſhed by having them ſhorter than the former. Its ears are larger, and like thoſe of the ox-kind; its tongue is alſo like that of an ox, and it wants the fore-teeth in the upper jaw. Its neck is remarkably long, ſtrait, and ſlender, in a grown animal. The neck is uſually ſeven feet long, and the meaſure from the tail to the top of the head eighteen feet; and when it ſtands erect, its head is ſixteen foot from the ground; it has a ſmall mane; its legs are very ſlender, and the forelegs very long; the hinder ones very ſhort, ſo that the creature ſeems always to ſtand upright.

Its hoofs are cloven exactly as thoſe of the ox, its tail reaches down to its hams, and is rounded and covered with very thick hairs; the middle of its body is ſlender; it is very like the camel in all its natural properties: when it runs it holds the two forefeet together, it lies down on the belly, and claps its neck down on the thighs and breaſt in the manner of the camel. As it ſtands it can ſcarce reach to eat the graſs, unleſs its fore-legs are very far expanded, and that is a poſture of great pain to it; ſo that nature ſeems to have allotted it to feed in its wild ſtate on the leaves of trees, which its long neck will very well enable it to get at. It is very beautifully ſpotted all over its body in the manner of the leopard.

The velvety covering of its horns ſeems to make it of the ſtag kind, but its ſhape is wholly different from thoſe of that genus. *Bellon.* Obſ. l. 2. c. 49.

ZYGÆNA, in zoology, the name of a fiſh of the ſhark kind, called in Engliſh *the ballance fiſh*, or the *hammer-headed ſhark*. See Tab. of Fiſhes, No. 2.

It is an extremely ſingular and remarkable fiſh, and differs not only from all the other ſharks, but from all the fiſh in the world in the figure of its head: this is not placed, as in all other fiſhes, longitudinally, or in a line with the body, but is ſet on tranſverſely as the head of a hammer or mallet upon the handle. This is ſemicircular at the front, and runs to ſo thin and ſharp an edge, that as the fiſh ſwims forward with violence, it may cut other fiſhes, and is terminated at each end by an eye; theſe are very large, and ſo placed, that they more conveniently look down than either upward or ſideway. In the farther part of the forehead alſo, near the eyes, on each ſide there is a large oblong foramen, ſerving either for hearing or ſmelling, or perhaps for both. The mouth is very large, and placed under the head, and armed with four rows of extremely ſharp and ſtrong teeth, flat, and ſerrated at their edges. The tail is compoſed of two fins, one vaſtly larger than the other; the body is rounded and very long, and is not covered with ſcales, but a thick ſkin; the back is aſh-coloured, and the belly white. *Rondelet.* de Aquat. p. 549.

The *Zygæna* is a ſpecies of *ſqualus*, according to the Artedian ſyſtem of ichthyology. See the article SQUALUS.

It is caught in the Mediterranean, and ſometimes in different parts of the ocean. Some authors have called it *Zygena*, and others *Libella*; which laſt anſwers to the Engliſh name of the *Ballance-fiſh*.

ZYGASTICUM, Ζυγαστικον, among the antients, money paid for weighing things.

The word comes from Ζυγον, a ballance. *Pitiſc.* Lex. Antiq in voc.

ZYGITÆ, in the Roman galleys, a term uſed to expreſs thoſe rowers in the triremes, or three-rowed galleys, who ſat on the ſecond row, that is above the thalamitæ and below the thranitæ. *Meibom.* de Trirem, See the article THALAMITÆ.

ZYGOPHYLLUM, in botany, the name of a genus of plants deſcribed by Linnæus, the ſame with the *fabago* of Tournefort. See the article FABAGO.

ZYGOSTATES, among the antients, an officer who was the overſeer of weights, and was to take care that tradeſmen uſed none but what were juſt. *Pitiſc.* Lex. Antiq. in voc.

ZYMAR, a name given by ſome of the chemical writers to verdigreaſe.

ZYME, a word uſed by many authors to expreſs ferment or leaven. See the next article.

ZYMOLOGY, in chemiſtry, a term uſed by ſome writers to expreſs a treatiſe on fermentation, or the doctrine of fermentation in general.

This is a very extenſive thing, and were it well accounted for, might help us to ſolutions of many things which at preſent appear extremely difficult to us.

Dr. Sympſon has written a treatiſe on this ſubject, wherein he refers the whole to the internal conflicts of acid and ſulphur in bodies, and ſeems to think that the phænomena of hot baths, the generation of minerals, and the production of mineral waters, the grand appearances of light, heat, and fire, and the generality of the ſubterranean phænomena of damps, earthquakes, and firy eruptions, and the appearance of meteors, may be all explained by the doctrine of fermentation, eſtabliſhed on this baſis.

Fermentation, according to this author, is nothing but an inteſtine colliſion between acid and ſulphur, put together by nature or art, and ſet in a combating motion, in order to the production of concretes, or ſome other end.

The phænomena of hot baths are explained on this foundation, by obſerving, that there is nothing of this kind without ſulphur, evident even to the ſenſes; and that an acid of ſome kind is neceſſary in all mineral fermentation. Acids are well known to be common in the earth, and on the conflicts of these with the ſulphurs evident in thoſe particular places, baths are made hot, and the minerals found about them are formed. Mineral ſulphurs are of different kinds, and according to theſe it is found that the waters of theſe hot baths differ alſo, ſome of them being ſafe to take internally, and others only fit for external uſe; in this the acid alſo may have its ſhare, for in its paſſage through the earth it frequently corrodes metalline ores, and carries their particles with it; theſe, if of iron, give virtues to the water, and render it proper in ſeveral diſeaſes: but if, on the other hand, they have diſſolved copper, they become unwholſome.

The ſulphurs and acids contained in the bowels of the earth, and occupying together large ſpaces of it, are thus formed into a ſort of beds of fermenting and hot matter, through which the water of theſe baths paſſing ſlowly and leiſurely on, cannot but be heated to the degree we ſee it of; and the greater the proportion of the acid, and the more the place abounds with metalline or mineral ores, the more hot and the more impregnated with virtues of minerals the water will be. Experiments ſhew, that ſulphur may be made to ferment violently with acids, and that in this fermentation it becomes communicated, volatilized, and made capable of ſolution in water, though before it was not; and hence is capable of impregnating the baths, as we ſee.

Theſe mineral productions are not all that are referred by this, and other authors who follow his ſyſtem, to the doctrine of acid and ſulphur fermentations. The vegetable world is ſaid to be as much influenced by it, and the growth of plants, or vegetation itſelf, is ſaid to be only a natural and ſlow-paced fermentation from the peculiar acid and ſulphur of each plant. Tachenius's doctrine of acids and alkalies, is wholly diſallowed in this ſcheme, and even in a great meaſure overthrown by it; and the doctrine of ſubterraneous fires is not neceſſary to heat the hot baths. It has been ſuppoſed that the ſulphur, in order to give this heat to them, muſt be itſelf flaming and burning; but it is proved in this ſyſtem, both by reaſon and experiment, that ſulphur properly combined with an acid, may both heat, and communicate its heat to other bodies by fermentation, without being itſelf ignited or burning within the bowels of the earth; the great improbability of which, in many places where hot baths are found, has been one of the grand reaſons for believing ſulphur had no ſhare in their production.

The acid, which is the other great cauſe of fermentation under ground, may be either ſuch as is inbred in the ſame mineral concretion while in *ſucco ſoluto*, or in the ſtate of its original formation; or an extrinſic and accidentally ſupervening one, which is well known to be of ſufficient power for ſuch an effect in the reduction of minerals already formed or completed. Some of the acid juices, which the earth in almoſt all parts abounds with, are looſe in themſelves, or fluctuating about, and others embodied in various animals: where they are bedded, and naturally contained in ſulphur, they are always ready for theſe changes of fermentation; but when they are in either of the other ſtates, they can only act as brought upon the ſulphurs by their own natural fluctuating courſe, or educed by water from the other minerals, and carried by it to the beds of ſulphur.

Thus

Thus the very water may be the efficient cauſe of the fermentation which afterwards gives the heat and virtues to it. All the acids, and all the ſulphurs contained in the earth, are not equally fit for this purpoſe; but ſome of the former have evidently ſo ſtrong a power over ſome of the latter, that they are ſufficient cauſes of heat in the mineral ingredients; and heat in any body concerned, is indeed the natural and neceſſary reſult of theſe fermentations.

The fermentation that ariſes between ſpirit of nitre and butter of antimony, is not from the ſalts in this ſublimate mixing with the acid in the diſſolvent, becauſe the ſame acids poured upon the ſame ſalts while incorporated with mercury in the form of ſublimate, is the cauſe of no fermentation at all: nay, ſublimate, in which the aforeſaid ſalts which are in butter of antimony are lodged, will diſſolve in an acid without the leaſt ebullition, like a piece of ice in water.

It is water always that ſets the inbred particles of acid and ſulphur into their great inward commotions, and makes the fermentation the ſtronger, and conſequently the heat by ſo much the greater. Thus a little water put to oil of vitriol, ſets the fermental principles of acid and ſulphur connatural to that oil, into ſo violent a fermentation and heat, that it is ſcarce poſſible even to endure the hand upon the glaſs where it is mixed. *Sympſon*'s Zymolog. Chym.

ZYMOSIS, a word uſed by ſome to expreſs fermentation, and by others for a flatulent tumor of the liver, or other of the viſcera. See the arricle ZYMGLOGY, *ſupra*.

ZYTHOGALA, *Beer-poſſet*, a drink recommended by Sydenham, as good to be taken after a vomit, for allaying the acrimonious and diſagreeable taſte it has occaſioned, as well as to prevent gripes. *Syden.* Obſerv. de Morb. acut. p. 39.

The word is formed of ζυθος, *cereviſia*, and γαλα, *lac*. See the article ZYTHUM, *Cycl.*



APPENDIX.

APPENDIX.

A.

ACT

ABATE, in the manege. A horſe is ſaid to *abate*, or take down his curvets, when working upon curvets, he puts his hinder legs to the ground both at once, and obſerves the ſame exactneſs in all the times. See the article CORVET, *Cycl.*

ABBA-*comes*. See the article ABBOT, *Cycl.*

ABDELAVI, a name given by Arabian authors to the Egyptian melon. See the article MELON, *Suppl.*

ABELMOSC, or ABELMOSCH, *(Suppl.)* is uſed by ſome authors for the Egyptian *ketmia*, with perfumed ſeeds. See KETMIA, N° 21. *Suppl.*

ABIGEAT. See ABIGEATUS, *Suppl.*

ABLATIVE *abſolute*. See the article ABSOLUTE, *Cycl.*

ABRICOT, in botany. See the article APRICOCK, *Suppl.*

ABRUS, in botany, a name ſometimes given to a ſpecies of *Orobus*. See the article OROBUS, *Suppl.*

ABSINTHIUM, *wormwood*, in botany, *&c.* See the article WORMWOOD, *Suppl.*

ABSINTHIUM is alſo a name given to other plants, by different authors; as to dwarf *ptarmica*, with leaves divided after the manner of wormwood; alſo to the alpine *chamæmile*, with ſouthernwood-leaves. Vid. *Tourn.* Inſt. Bot. p. 494, 496. See alſo the articles PTARMICA and CHAMÆMELUM, *Suppl.*

ABUTILON, the name of a genus of plants, according to Dillenius, but comprehended under the *ſida* of Linnæus. See the article SIDA, *Suppl.*

ACACIA *(Suppl.)*—*Baſtard* ACACIA, in botany, the name uſed by ſome for a genus of plants, called by others *robinia*. See ROBINIA, *Suppl.*

ACADEMICIAN, the ſame with *academic*, or *academiſt*. See ACADEMIC, *Cycl.* and ACADEMY, *Cycl.* and *Suppl.*

ACANTHIS, in ornithology, a name by which ſome call the gold-finch, from its feeding among thiſtles. See the articles CARDUELIS, *Suppl.* and GOLD-FINCH, *Append.*

ACAPTARE. See ACAPITARE, *Cycl.*

ACARUS *(Suppl.)* is alſo uſed by ſome naturaliſts as the claſſical name of the lice of animals, which are indeed of as many various genera as the animals on which they breed. See the article LOUSE, *Cycl.* and *Suppl.*

ACCENTED part of a bar, in muſic. See the articles ACCENT and MEASURE, *Cycl.*

ACCOMPTANT. See ACCOUNTANT, *Cycl.*

ACEPHALITÆ. See ACEPHALUS, *Cycl.*

ACH, or ACHE. See the article ACHE, *Cycl.*

ACHETA, in zoology. See the articles HARVEST-FLY and CIGALON, *Suppl.*

ACID *(Cycl.* and *Suppl.)* —Whether the air naturally contains any *acid*, is a queſtion among philoſophers. See the article AIR, *Append.*

ACIDULÆ *(Cycl.)* — See the article WATER, *Append.*

ACINACES, in antiquity, a Perſian weapon of the ſword kind. The word is Perſian, tho' etymologiſts affect to give it a Greek origin. Some repreſent the *acinaces*, as a kind of ſpear or javelin; others, with more probability, as a ſhort crooked ſword, ſhaped like the Turkiſh ſcymitar.

The figure was altered by Darius, and accommodated to that of the Grecian ſwords. Horace calls it *medus acinaces*, in regard the Romans confounded the Medes with the Perſians. It was alſo in uſe among the Scythians, where divine honours were paid it. *Boxhorn.* Epiſt. p. 220. ſeq. V. *Voſſ.* Etym. Lat. p. 5. *Martin* Lex. Philoſ. T. 1. p. 9. *Suid.* Lex. T. 1. p. 84. *Heſych. Aquin.* Lex. Milit. T. 1. p. 14. *Potter*, Arch. Græc. l. 3. c. 4. T. 2. p. 39. *Hor.* l. 1. Od. 17. *Herodot.* l. 4.

ACTINIA, in the hiſtory of inſects, a ſmall ſea-animal of a cylindric ſhape, equally thick in all parts, and about half an inch long; its tail is divided into three parts, or terminated, as it were, by three points. It lodges itſelf in little cavities of rocks and of the larger ſea-plants of the ſtony kind, and only appears on their ſurface when all is quiet about it. Round the mouth are placed a great number of tentacula, like ſo many conic rays, and diſpoſed in two or three ſeries ſucceſſively ſhorter than each other: theſe are in a continual vibratory motion, and by that means draw ſmall animals into its mouth for food. The whole animal is of a pale fleſh colour, except theſe tentacula, which have a beautiful variety of colours, red, yellow, blue, and many others. It is found on the coaſts of the American iſlands.

There are a variety of ſpecies, differing from each other in figure, colour, *&c.* but all of them furniſhed with numerous tentacula, or rays. *Hill*'s Hiſt. of Anim. p. 94. ſeq.

AIR

ADAM'S *apple*, *Adami pomum*, in botany, a name given by ſome to the orange. See the article ORANGE and ADAMI *pomum*, *Cycl.*

ADDER *(Suppl.)*—*Sea*-ADDER, the Engliſh name of a ſpecies of *ſyngnathus*, with a round body, and no pectoral or tail fins. See SYNGNATHUS, *Suppl.*

Water-ADDER, in zoology, a name given to the *natrix*. See the article NATRIX, *Suppl.*

ADDER's *wort*, in botany, a name ſometimes given to ſnakeweed, or biſtort. See BISTORT, *Suppl.*

ADDICO, in the civil law. See ADDICTIO, *Cycl.*

ADMINICULUM, in the French law. See ADMINICLE, *Cycl.*

ADMINISTRATRIX. See ADMINISTRATOR, *Cycl.*

AERIZUSA, a name given by the antients to the ſky-coloured *jaſper*. See the article JASPER, *Cycl. Suppl.* and *Append.*

ÆS *uxorium*, in antiquity, a ſum paid as a penalty for living batchelors to old age. This anſwered to the Athenian Αγαμιε δικη, and the Spartan οψιγαμιε, and κακογαμιε δικη. *Feſt.* and *Pitiſc.* Lex. Ant.

This tax for not marrying ſeems to have been firſt impoſed in the year of Rome 350, under the cenſorſhip of M. Furius Camillus, and M. Poſtumus. V. *Scalig.* and *Dacier*, not. in *Feſt.*

The method of levying it was this; at a cenſus or review of the people, each perſon was aſked, *Et tu ex animi ſententia uxorem habes liberûm quærendorum cauſâ?* He who had no wife, was hereupon fined after a certain rate, called *æs uxorium*. Hiſt. Acad. Inſcrip. T. 1. p. 79. ſeq.

AESPING, in zoology, the name of a ſpecies of *coluber*. See the article COLUBER, *Append.*

AFTER-*pains*, in midwifry. See the article LYING-*in-women*, *Suppl.*

AGAUPE, in botany, a name uſed by ſome authors for the *nymphæa*, or common white water lilly, and other ſpecies of that plant. *Marcgrave*, p. 21.

AGRIÆ, in zoology, the name of a claſs of quadrupeds, according to Dr. Hill, the characters of which are, that they have no teeth, and that their tongues are very long and cylindric. There are only two genera belonging to this claſs, which are the *myrmecophaga* and *manis*. See the articles MYRMECOPHAGA and LACERTUS *ſquamoſus*, *Suppl.*

AGRIMONY *(Suppl.)* — *Hemp*-AGRIMONY, in botany, the Engliſh name of the plant known among authors by that of *eupatorium*. See EUPATORIUM, *Suppl.*

Water-hemp-AGRIMONY, in botany, a name given to the bidens. See the article BIDENS.

AGUE *(Suppl.)*—AGUE-*cake*, the popular name for a hard tumour on the left ſide of the belly, lower than the falſe ribs, ſaid to be the effect of intermitting fevers. Vid. *Pringle*, Obſerv. on Diſeaſ. of Army, p. 179.

AIR *(Cycl.* and *Suppl.)*—It has been a queſtion among natural philoſophers, whether the *air* contains an acid or not. Monſieur Helot gives a probability to the affirmative; and it ſeems as if this acid were of a vitriolic nature. See Mem. Acad. Sciene. 1737. p. 378 and 1740. p. 141, 142. Edit. *Paris*.

If ſalt of tartar, or oil of vitriol, be expoſed to the open *air*, theſe, tho' extremely different ſubſtances, will each receive and imbibe ſo great a quantity of matter from the *air* as vaſtly to increaſe its weight, without any other alteration in its nature than the diluting or weakening it. The ſalt becomes a fluid liquor, called *oil of tartar per deliquium*, and increaſes to ſeveral times its quantity; and a vial of oil of vitriol, nearly filled and left unſtop'd, will ſoon be found to fill up of itſelf and run over.

In both theſe caſes, the aerial particles afforded to the expoſed ſubſtances, are only water; but the *air* evidently abounds alſo with a great variety of other principles, which it may and does occaſionally afford to other expoſed ſubſtances, whoſe pores are ſo formed as to admit them eaſily. Thus the mortar expoſed in the joinings of old walls, from the particles it attracts out of the *air*, forms a peculiar ſalt; and a deal ſhelf, moiſtened with the liquor of fixed nitre, has been known to become froſted over with perfect and pellucid cryſtals of pure nitre, only from the imbibing, or regaining the neceſſary acid from the *air*, in the ſame manner as if ſpirit of nitre had been poured upon it. A viol half filled with oil of tartar per deliquium, on being expoſed to the *air*, will often form a ſet of peculiarly figured cryſtals round the veſſel, a little above the ſurface of the water. Colcothar of vitriol, which is the caput mortuum, or reſiduum of vitriol, after all the acid has been driven from it by fire,

will, on being expoſed to the *air*, attract a new acid, and on being diſtilled again, it will yield more ſpirit or oil. Philoſ. Tranſ. N°. 157.

It is remarkable, that ſo ſtrong an acid as this ſhould float in the *air* unperceived, and exert itſelf only where proper admixtures and a proper nidus call it in. In both the caſes of nitre and vitriol diveſted of their acids, the *air* gives the proper acid again; yet in the caſe of the expoſed alkali ſalt, no acid, but only pure water is received; and in ſome acids, as the oil of vitriol, pure water, only, is received from the *air*. This is evidently proved by being careful in concentrating the liquor, firſt, to a certain degree of ſtrength; and then, after expoſing it a proper time, diſtilling away what was gained from the *air*. This will be found, by the ſmell and taſte, to be no other than pure ſimple water; and the liquor remaining in the retort, when all this is driven off, will be juſt as ſtrong as before, and juſt the ſame in quantity, and as ready to receive the ſame particles again.

The ſtronger the oil of vitriol is, the more powerfully it will attract the *air*'s humidity, and the more it will increaſe in weight. Such as is perfectly dephlegmated, will increaſe to more than three times its weight; three drams of it, in an experiment of Mr. Boyle's, increaſing to nine drams and thirty grains. The increaſe is much quicker at firſt, when it is ſtrongeſt, than afterwards when it is thoroughly diluted. Oil of vitriol, in the ſmall quantity here mentioned, will receive eighteen grains addition at firſt, in the ſame ſpace of time in which it will afterwards receive but two grains. The changes of moiſt and dry in the *air* alſo affect it. Philoſ. Tranſ. l. c.

It is remarkable, that ſulphureous *air* makes an efferveſcence with pure *air*. Thus if freſh *air* be let into a glaſs veſſel filled with ſulphureous vapours, ariſing from a mixture of ſpirit of nitre, with a vitriolic mineral, an efferveſcence will ariſe, and the freſh *air* will be nearly abſorbed, and the *air* in the veſſel, which was tranſparent and clear, will become a reddiſh turbid fume. After the efferveſcence is over, the turbid *air* again becomes clear, but upon the admiſſion of freſh *air* again becomes turbid, and the *air* is abſorbed as before. But after each re-admiſſion of freſh *air*, the quantity abſorbed is leſs and leſs, 'till no more is abſorbed. See *Hales*, Hæmaſtatics, p. 280. ſeq.

Dr. Hales thinks, that the efferveſcence ariſing from the mixture of freſh *air*, with that which is ſtrongly impregnated with ſulphureous fumes, may give riſe to that irkſome heat which we feel in ſummer, and is called a cloſe, ſultry, temperature of *air*. And hence the common obſervation, that lightning cools the *air* ſeems to be well founded, as being the laſt effort of this efferveſcence. *Hales*, ib. 284, 285.

ALANA *gleba*, a name ſometimes given to the yellowiſh white tripoli. See the article TRIPOLI, *Cycl.* and *Suppl.*

ALATED *leaf*, in botany. See LEAF.

ALAUDA, *(Suppl.)* in ichthyology, a name uſed by ſome authors for ſeveral ſpecies of the fiſh called *blennius*. See the article BLENNIUS, *Suppl.*

ALAUSA, in zoology. See the article THRISSA, *Suppl.*

ALBUGO *(Suppl.)* — Dr. Mead tells us of ſeveral cures of the *albugo*, performed by means of an eye powder which he recommends. The receipt is thus, Take of common glaſs any quantity, pound it in a mortar to a very fine powder; then add an equal quantity of white ſugar-candy, and levigate the mixture 'till it becomes impalpable.

A little of this powder put into the eye with a quill, every day, gradually wears off the ſpot.

Another method of removing the ſpeck, is to have it pared by a ſurgeon every day with a knife: But this ſeems a doubtful remedy. See Monit. et Pract. Medic. Append.

ALCA, in ornithology. See the article ALKA, *Suppl.*

ALCALI, ALCALINE. } See the articles { ALKALY, *Suppl.* ALKALINE, *Suppl.*

ALDER-*tree*, *alnus*, in botany. See the article ALNUS, *Suppl.*

Berry-bearing ALDER, the name of a genus of plants, called by authors *frangula*. See the article FRANGULA, *Suppl.*

ALDERAIMIN, or ADERAIMIN, in aſtronomy, a ſtar on the left ſhoulder of the conſtellation Cepheus.

ALECTRUONURUS *gramen*, in botany, a name uſed by ſome for the *feſtuca* of Linnæus. See FESTUCA, *Suppl.*

ALECOST, in botany, a name given by ſome to a ſpecies of tanzy, more uſually called *coſtmary*. See TANACETUM, *Suppl.*

ALEHOOF, in botany, a name by which ſome call *ground-ivy*. See the article GROUND-*ivy*, *Suppl.*

ALHAGI, in botany, the name of a genus of plants, according to Tournefort; but comprehended under the *hedyſarums* by Linnæus.

The characters are theſe: the flower is papilionaceous, the germen of which finally becomes a pod compoſed of a great number of parts, articulating, as it were, with each other, and containing each a kidney-ſhaped ſeed. To theſe marks it may be added, that the leaves grow in an alternate diſpoſition.

There is only one known ſpecies of this genus, called *geniſta ſpartium*, and *geniſta ſpinoſa*, by other writers. *Tourn.* Inſt. Bot. Corol. p. 54.

ALHEAL, a name given to ſeveral plants on account of their extraordinary virtues. See PANACEA, *Cycl.* and PANAX, *Append.*

ALISANDERS, in botany, a name given by ſome to the *ſmyrnium*. See the article SMYRNIUM, *Suppl.*

ALKANET, in botany. See the article ANCHUSA, *Suppl.*

ALLIARIA, in botany, the name ſometimes given to a ſpecies of *heſperis*, called in Engliſh *jack by the hedge*. See the article HESPERIS, *Suppl.*

ALLIGATOR, in zoology, the name given to the crocodile in the cold climates of America, where it does not grow to its full dimenſions. See CROCODILE, *Cycl.* and *Suppl.*

ALLIGATOR-*pear*, in botany. See the articles PEAR and PYRUS, *Suppl.*

ALMNOD *(Suppl.)*—*Dwarf* ALMOND, a name given by ſome to ſeveral ſpecies of peaches. See the article PERSICA, *Suppl.*

Ethiopian ALMOND, the name of a genus of plants, called by Linnæus *brabejum*. See BRABEJUM, *Suppl.*

ALVI *fluxus*, in medicine. See the article DIARRHOEA, *Cycl.* and *Suppl.*

ALVI *obſtructio*, coſtiveneſs, in medicine. See the article OBSTRUCTIO *alvi*, *Suppl.*

AMARACUS, in botany, a name ſometimes uſed for the *parthenium*. See the article PARTHENIUM, *Suppl.*

AMARYLLIS, in the Linnæan ſyſtem of botany, the name of a genus of plants, called in Engliſh *daffodil-lilly*, and by other botanical writers *lilio-narciſſus*. See the article LILIO-NARCISSUS, *Suppl.*

AMBER-*tree*, in botany, the Engliſh name of a genus of plants, called by Linnæus *anthoſpermum*. See ANTHOSPERMUM, *Append.*

AMBERBEI, the name of a genus of plants, according to Vaillant, but comprehended by Linnæus under that of *centauria*. See the article CENTAURIA, *Append.*

AMBULON, in botany, the name by which J. Bauhine calls the *myrica*, or ſweet-willow. See the article MYRICA, *Append.*

AMENTUM, among botaniſts, the ſame with *catkin*. See the article CATKIN, *Suppl.*

AMGAILA. See LEUCACANTHA, *Suppl.*

AMMODYTES, in zoology, the name of a ſpecies of *coluber*. See the article COLUBER, *Append.*

AMMONIACUM *ſal*, in chemiſtry, *&c.* See the article SAL *Ammoniacum*, *Cycl.* and *Suppl.*

AMMOSCHISTA, in natural hiſtory, a genus of ſtones of a laminated ſtructure, and ſplitting only horizontally, or into flat plates.

The *ammoſchiſta* are coarſe, harſh, and rough ſtones, of a very looſe texture, and appearing ſomething porous. They are conſiderably heavy, and compoſed of a large, coarſe, and obtuſely angular gritt, ſurrounded and in part held together by a looſe earthy ſpar. They are very ſoft and friable in the maſs, but much more ſo when reduced to ſmall pieces. They make a violent efferveſcence with aqua fortis, and will not eaſily ſtrike fire with ſteel.

The ſpecies of *ammoſchiſta*, are theſe: 1. The grey, friable, dull *ammoſchiſtum*. 2. The browniſh white, glittering *ammoſchiſtum*. 3. The greeniſh grey, ſhining *ammoſchiſtum*. 4. The yellowiſh grey, glittering *ammoſchiſtum*. 5. The hard, purple, and white *ammoſchiſtum*. And 6. The bluiſh, glittering ſlate ſtone. *Hill*'s Hiſt. of Foſſ. p. 443. ſeq.

AMOMUM, a name ſometimes given to a ſpecies of *ſium*. See the article SIUM, *Suppl.*

AMPHITRITE, in ichthyology, the name of a genus of ſmall water animals, the characters of which are, that they are of an oblong figure, and have a great number of deep ſtriæ, like ſo many lamellæ; and but one tentaculum, of a ſlender and oblong form, reſembling a piece of thread. They are only a few inches long, of a tolerable firm ſubſtance, and have been ranked by ſome authors among the *urticæ marinæ*, and by others among the *epipetrons*. Vid. *Hill*, Hiſt. Anim. p. 91.

ANARTHRA, in the hiſtory of inſects, a claſſical name eſtabliſhed by Dr. Hill, comprehending ſuch inſects as have neither wings nor limbs, and whoſe bodies are covered with a ſoft ſkin.

To this claſs belong the ſeveral genera of *worms* and *leeches*. See the articles WORM and LEECH, *Suppl.*

ANASARCOUS *ſwelling*. See DROPSY, *Append.*

ANEMOSPERMOS, in botany, the name ſometimes given to the *arctotis* of Linnæus. See the article ARCTOTIS, *Suppl.*

ANGLE *(Cycl.)*—In the practice of ſurveying, no *angles* of leſs than thirty degrees ſhould be taken: nor ſhould any be aſſumed but ſuch as are actually meaſured. See Hiſt. Acad. Scienc. 1740.

ANGUIS *Æſculapii*, the name of a ſpecies of *coluber*. See the article COLUBER, *Append.*

ANIMAL *(Suppl.)*—ANIMAL *ſubſtances* comprehend all the component parts of *animals*, of what uſe or intention ſoever they may be. See SUBSTANCE, *Cycl.*

Foſſile ANIMAL *ſubſtances*, thoſe found buried in the earth, at various depths, and embodied among various ſtrata.

Theſe are principally of four kinds: 1. Sea-ſhells. 2. The teeth, bony palate, and bones of fiſhes. 3. The bones of land *animals*. And 4. Complete fiſhes. See the articles

Foſſile

Foſſile BONES, *Foſſile* SHELLS, MARINE *remains*, and *Foſſile* IVORY, *Suppl.*

Fermentative quality of ANIMAL *ſubſtances.* See FERMENT and FERMENTATION, *Append.*

ANIMALCULES *(Suppl.)*—Dr. Hill, in his hiſtory of animals, has arranged *animalcules* under three claſſes: 1. Such as have no tails, nor any viſible limbs. 2. Thoſe which have tails, but no viſible limbs. And 3. Thoſe which have viſible limbs. See the article ANIMALCULE, *Cycl.* and *Suppl.*

The firſt claſs, which he calls *gymnia*, contains ſeveral genera: 1. The *enchelides*, of a cylindric or ſubcylindric figure. 2. The *cyclidia*, of a roundiſh or elliptic figure. 3. The *paramecia*, of an irregular oblong figure. 4. The *craſſpedaria*, with an apparent mouth and a ſeries of fimbriæ round it, in manner of a fringe.

The ſecond claſs, or thoſe with tails but no viſible limbs, he calls *cercaria*; of which there are only two genuſes: 1. The *cercaria*, with tails ſhorter than their bodies, and therefore called *bracburi*. 2. The *cercaria*, with tails longer than their bodies, and hence called *macrocerci*.

The third and laſt claſs contains ſuch *animalcules* as have viſible limbs, and thence denominated *arthrodia*. There are only two genera belonging to this claſs: 1. The *ſcelaſius*, an *animalcule* with viſible legs. 2. The *brachionus*, or wheel-animal, an *animalcule* furniſhed with an apparatus of arms for taking its prey. *Hill*, Hiſt. Anim. p. 1. ſeq.

ANIMI *deliquium*, fainting or ſwooning, in medicine. See the articles LIPOTHYMIA and SWOONING, *Suppl.*

ANNULATA, in zoology, the name of a ſpecies of *coluber*. See the article COLUBER, *Append.*

ANT-*bear*, in zoology, the Engliſh name of the *myrmecophaga* of Linnæus. See the article MYRMECOPHAGA, *Suppl.*

ANTHERICUM, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by Tournefort *phalangium*, and in Engliſh *ſpider-wort*. See the article PHALANGIUM, *Suppl.*

ANTHORA, in botany. See ACONITE, *Cycl.*

ANTHOSPERMUM, in botany, the name of a genus of plants, the characters of which are theſe: the cup is a one-leaved perianthium, divided into four ſegments reaching more than half way down; there is no corolla; the ſtamina are four capillary filaments, of the length of the cup; the antheræ are two in number, oblong and quadrangular; and the germen of the piſtil ſtands below the receptacle of the flower.

The male and female flowers are ſometimes ſituate on the ſame plant, but more frequently on different plants of the ſame ſpecies; in which laſt caſe, the female flowers have the piſtil and germen, but want the ſtamina. Vid. *Linnæi*, Gen. Plant. p. 496.

ANTIMONY *(Suppl.)*—The needles perceived in *antimony*, are, according to Monſieur Geoffroi, owing to the vitriolic acid united to a bitumen. See Mem. Acad. Scienc. An. 1734. p. 418.

Eſſence of ANTIMONY, an emetic wine made with glaſs of *antimony*; to which is ſometimes added a ſpicy ſtomachic.

Dr. Huxham ſays, he never found any antimonial preparation better, ſafer, and more efficacious than this ſimple infuſion of the glaſs of *antimony* in a generous white wine, with a little ſpice to render it more grateful to the ſtomach. This medicine given to twenty or thirty drops operates by gentle ſweats, and purges in larger doſes very mildly. The judicious phyſician here mentioned, recommends it in obſtinate rheumatiſms.

ANTIQUARY *(Suppl.)*—Since the printing this article, the ſociety of *antiquaries* have been incorporated, by the king's charter.

ANTISEPTIC, an appellation given to ſuch ſubſtances as reſiſt putrefaction. See PUTREFACTION, *Append.*

We have ſome curious experiments in relation to *antiſeptic* ſubſtances by Dr. Pringle, who has aſcertained their ſeveral virtues. Thus, in order to ſettle the *antiſeptic* virtue of ſalts, he compared it with that of common ſea-ſalt; which being one of the weakeſt, he ſuppoſes equal to unity, and expreſſes the proportional ſtrength of the reſt by higher numbers, as in the following table.

Salts, their antiſeptic virtue.		Salts, their antiſeptic virtue.	
Sea-ſalt —	1	Saline mixture	3
Sal gemmæ	1+	Nitre —	4+
Tartar vitriolated	2	Salt of hartſhorn	4+
Spiritus mindereri	2	Salt of wormwood	4+
Tartarus ſolubilis	2	Borax —	12+
Sal diureticus	2+	Salt of amber	20+
Crude ſal ammoniac	3	Alum —	30+

In this table the proportions are marked in integral numbers; only to ſome there is added the ſign +, to ſhew, that thoſe ſalts are poſſeſſed of a ſtronger *antiſeptic* virtue than the number in the table expreſſes, by ſome fraction; unleſs in the three laſt, where the ſame ſign imports, that the ſalt may be ſtronger by ſome units. Vid. *Pringle*'s Obſerv. on the Diſeaſes of the Army, Append. p. 322. ſeq.

Some reſinous and other ſubſtances even exceed the *antiſeptic* virtues of the neutral ſalts; thus myrrh, aſa fœtida, terra japonica and aloes, are at leaſt twelve times more *antiſeptic* than ſea-ſalt. Two grains of camphor is equivalent to ſixty grains of that ſalt. An infuſion of a few grains of Virginian ſnake-root, in powder, exceeds twelve times its weight of ſea-ſalt. Chamæmile flowers have nearly the ſame extraordinary quality. The jeſuits bark has it alſo. Beſides theſe, pepper, ginger, ſaffron, contrayerva-root, are twelve times more *antiſeptic* than ſea-ſalt. Dried ſage, rhubarb, the root of the wild valerian, mint, angelica, ground-ivy, ſena, green-tea, red-roſes, wormwood, muſtard and horſe-raddiſh, were likewiſe found more antiſeptic than the ſtandard.

To the claſe of *antiſeptic* medicines may likewiſe be added fermented liquors, acids, ſpirits, and even thoſe plants called anti-acids, and erroneouſly ſuppoſed haſteners of putrefaction, particularly horſe-raddiſh. Now vegetables, poſſeſſing this virtue, are the more valuable, in that, being uſually free of acrimony, they may be taken in much greater quantities, than either ſpirits, acids, reſins, or even the neutral ſalts.

Antiſeptics are preſcribed in all putrid, malignant, and peſtilential caſes. It is to be remarked, however, that different kinds of them are to be given in different diſeaſes, and even in different ſtages of the ſame diſeaſe. Thus, the bark is a ſpecific in a gangrene, when the veſſels are relaxed and the blood reſolved or diſpoſed to putrefaction; but will fail, if the veſſels are too full, or the blood be too thick. With the ſame caution is the bark to be uſed in wounds, *viz.* chiefly in caſes of abſorbed matter, when it infects the humours, and brings on a hectic fever.

By the great *antiſeptic* virtue of alum, the bark, and other aſtringents, it ſhould ſeem, that aſtriction had no ſmall ſhare in the cure of putrid diſorders; and, indeed, the very nature of putrefaction conſiſts in a ſeparation or diſunion of the parts. But as aſtringents are improper to be adminiſtered in many caſes, contrayerva-root, ſnake-root, camphor, *&c.* may ſupply their place; which, tho' highly *antiſeptic*, have very little, or any, of an aſtringent quality. Id. ibid. Append. paſſim.

APAGOGE, in logic. See ABDUCTION, *Cycl.*

APE, *ſimia*, in zoology. See the article SIMIA, *Suppl.*

APES. See APIS *infra.*

APHIS, in the hiſtory of inſects, the name of a genus of animals, otherwiſe called *pediculus arboreus*, and in Engliſh the *tree-louſe*.

The trunk of the *aphis* is reflex; the body is formed into two horns behind; the wings are four, and erect, or altogether wanting; and the legs are formed for walking not leaping.

Of this genus there are a great many ſpecies, denominated from the trees or buſhes on which they are found. Vid. *Hill*'s Hiſt. of Anim. p. 65.

APHRODITA, in the hiſtory of inſects, a genus of ſea-inſects about two inches in length and one in breadth, of an oval figure, and aculeated; it has alſo a perforation in the middle of the back, and is called in Engliſh the *ſea-mouſe*.

It is one of the gymnarthrodia, or inſects with naked bodies, and may be met with in great abundance on the Kentiſh coaſt, among rocks. There are ſeveral ſpecies of it. Vid. *Hill*'s Hiſt. of Anim. p. 90.

Columna calls it *Pudendum regale*; Bartholine, *vermis aureus*; others, *eruca marina griſeo-fuſca*; and ſome, *mus marinus*, or the *ſea-mouſe*.

APIS, or APES, in zoology, a large genus of four-winged inſects, the diſtinguiſhing characteriſtic of which is, that their wings are entirely membranaceous, and their tails furniſhed with a weapon, or ſting, capable of inflicting a wound.

This genus comprehends the bee, hornet, waſp, and humble-bee. See the articles BEE, HORNET, WASP, *Suppl.* For the hiſtory of the bee, in particular, ſee alſo the articles BEE-*worm*, WAX, HONEY, *&c. Suppl.*

APOSTACY, *(Cycl.)*—*Apoſtacy* is ſaid to have been antiently puniſhable, in England, by burning and tearing to pieces by horſes. Thus Fleta l. 1. c. 37. §. 2. *Apoſtatæ & ſacrilegi, & hujuſmodi, detractari debent et comburi.* And §. 4. *Si inde convincantur, detractentur, et ſuſpendantur.* Where Du Cange interprets, *detractari*, by *tirer a quatre chevaux.*

APPLE *(Suppl.)*—*Cuſtard*-APPLE, in botany, a name given by ſome to the *anona*. See the article ANONA, *Suppl.*

Sea-APPLE, in zoology, the Engliſh name of a ſpecies of *centronia*, or *ſea-hedge-hog*. See the article CENTRONIA, *Append.*

Sour APPLE, in botany, a name given by ſome authors to ſeveral ſpecies of *anona*, called by Plumier *guanabanus*. See the article ANONA, *Suppl.*

Star-APPLE, the Engliſh name of a genus of plants, called by Plumier *cainito*, and deſcribed by Linnæus under that of *chryſophyllum*. See CHRYSOPHYLLUM, *Append.*

Thorn APPLE, the Engliſh name of a genus of plants, called by authors *ſtramonium*. See the article STRAMONIUM, *Suppl.*

APTERIA, in the hiſtory of inſects, a claſſical name comprehending all thoſe inſects which have no wings. See the article INSECT, *Append.*

This ſeries is divided into two claſſes: 1. Such as have neither wings nor limbs, called *apteria anarthra*. And 2. Such as have limbs, but no wings, called *apteria podaria*. See the articles ANARTHRA and PODARIA, *Append.*

ARACHIDNA, in botany, the name uſed by ſome authors for

for a genus of plants, described by Linnæus under that of *arachis*. See the article ARACHIS, *Append.*

ARACHIDNOIDES, in botany, the name used by some for a genus of plants called by Linnæus *arachis*. See the article ARACHIS, *Append.*

ARACHIS, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: the cup is a perianthium, divided into two parts; the flower consists of three papilionaceous petals; the stamina are two subulated filaments, adhering at the base, and divided at the top; the antheræ are roundish; the germen of the pistil is oblong; the style subulated, and of the length of the germen; and the stigma simple: the fruit is a pod of an oblong oval form, narrowest in the middle, with only one cell, containing two oblong gibbous seeds.

This genus comprehends the *arachidna* and *arachidnoides* of other authors. Vid. *Linnæi* Gen. Plant. p. 361.

ARALIASTRUM, in botany, the name of a distinct genus of plants, otherwise called *panax*. See the article PANAX, *Append.*

ARBOR *vine*, a name used for some species of *convolvulus*, or *bindweed*. See the article CONVOLVULUS, *Suppl.*

ARCHANGEL, in botany, a name given to the white *lamium*, or *dead-nettle*. See the article LAMIUM, *Suppl.*

ARCTOTHECA, in botany, the name used by Vaillant for the *arctotis* of Linnæus. See the next article.

ARCTOTIS, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: the common cup is roundish and imbricated with squamæ; the composite flower is radiated; the proper hermaphrodite ones infundibuliform, with the limb divided into five segments; and the proper female ones ligulated and of a lanceolated shape; the tube is extremely short; the stamina are five very short capillary filaments; the antheræ are cylindric, of the length of the flower, and divided into five parts; the germen of the female flowers is ovato-quadragonal, villose, and coronated with very small squamæ; the style is filiform; and the stigmata, which are two in number, oval, thick, and erect. There is no pericarpium, the cup serving instead of one. The seeds are single, villose, coronated with the leaves of their proper perianthium, and placed in a circle. The receptacle is plane, and somewhat hairy. *Linnæi* Gen. Plant. p. 420.

ARENÆ, *sands*, in natural history. See the article SAND, *Cycl.* and *Suppl.*

ARGENTUM, *silver*, in natural history. See the article SILVER, *Cycl.* and *Suppl.*

ARISARUM *(Suppl.)* is also the name used by some for a species of *arum*, or *wake-robin*. See the article ARUM, *Suppl.*

ARMENIAN *bole*. See the article BOLE *armenic*, *Suppl.*

ARO-ORCHIS, in botany, a name by which some call a genus of plants, described by Linnæus under that of *kæmpferia*. See the article KÆMPFERIA, *Append.*

ARMY. For diseases incident to *armies*, see the articles DISEASE, CAMP, GARRISON, HOSPITAL, SOLDIER, *&c. Append.*

ARROW-*root*, in botany, the name of a genus of plants, called by authors *maranta*. See the article MARANTA, *Append.*

ARSON, in the law of England, a felony at common law, in maliciously and voluntarily burning the house of another by night or by day. See *Hawkins*'s, Pleas of the Crown, B. 1. chap. 39.

As to the punishment of *arson*, it seems now clearly settled, that the principal, not being in holy orders, is excluded from the benefit of clergy. See *Hawk.* lib. cit. B. 2. chap. 33. sect. 107.

In some places this crime is punished by burning the offender. And this was the old Roman law. See *Pitisc.* Lex. Antiq. in voc. *Incendiarius* and INCENDIARY, *Append.*

ARTHRODIA, in zoology, the name of a lately established class of animalcules, containing those with visible limbs. See the article ANIMALCULES, *Append.*

ASARABACCA, in botany, the name of a genus of plants, called by authors *asarum*. See the article ASARUM, *Suppl.*

ASCITES. See the articles DROPSY, *Cycl. Suppl.* and *Append.*

ASCYRUM, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: the cup is a four-leaved perianthium; the two exterior ones very small, placed opposite to each other, and linear; the two interior ones large, plane, erect, and cordated; all of them being permanent. The flower consists of four oval petals; the two exterior ones being opposite to each other, and very large; the interior ones smaller. The stamina are numerous capillary filaments, connected at their bases into four distinct parts; the antheræ are roundish; the germen of the pistil is oblong; there is no style: the stigma is simple; the fruit is an oblong acuminated capsule, formed of two valves, and included in the larger leaves of the cup; the seeds are numerous, small, and roundish.

It is extremely like the *hypericum* in appearance; but these characters sufficiently distinguish them. Vid. *Linnæi* Gen. Plant. p. 369.

ASH, in botany, the English name of a genus of trees, called by authors *fraxinus*. See FRAXINUS, *Suppl.*

Mountain-ASH, a name given by some to the *sorbus*, or *service-tree*. See the article SORBUS, *Suppl.*

Poison-ASH, a name given to the *toxicodendron* of botanists. See the article TOXICODENDRON, *Suppl.*

ASILUS, in zoology, the name of a genus of insects, called in English the *hornet-fly*, or *wasp-fly*. See the articles HORNET-*fly* and WASP-*fly*, *Suppl.*

The distinguishing characters of this genus, are these: they are of the two-winged kind, with a style or oblong body, terminated by a protuberance or head, and called a ballancer, under each wing: to this add, that the head is furnished, by way of mouth, with a snout of a subulated figure, which is simple and very sharp at the extremity. They are among the largest of the fly-kind. See the article FLY, *Suppl.*

Authors have called these insects by the names of *Muscæ crabroniformes*, *muscæ rapaces*, and *muscæ vespiformes*. *Hill*'s Hist. of Anim. p. 31.

ASINUS, the *ass*, in zoology, an animal of the horse-kind. See the article EQUUS, *Suppl.*

Though the *ass* agrees with the horse in many respects, it nevertheless has but a mean resemblance to that noble animal; being not only smaller, but wanting the symmetry and beauty, so conspicuous in the horse.

The *ass*'s ears seem much over-proportioned in length to the head. Its eyes are large, but have nothing bright or striking in them; the neck is long, but lank; and the tail is very long, but not hairy all the way, as in the horse. The fur of the *ass* is coarse and dun, only a streak of black runs down its back and across the shoulders.

So nearly allied are the horse and *ass* kind, that they will copulate together, the produce of which commixture is a mule. See the article MULE, *Suppl.*

There is a species of wild *ass*, called *zebra*, differing greatly in the colours and disposition of its streaks from the common *ass*. See ZEBRA, *Append.*

ASPEN-*tree*, in botany, the English name of the poplar with trembling leaves. See the article POPLAR, *Suppl.*

ASPHODEL, *asphodelus*, in botany. See the article ASPHODELUS, *Suppl.*

African ASPHODEL, a name used by some for the *phalangium*, or *spider-wort* of Tournefort. See PHALANGIUM, *Suppl.*

Lilly-ASPHODEL, the English name of a genus of plants. See the article LILIO-ASPHODELUS, *Suppl.*

ASS, *asinus*, in zoology. See the article ASINUS *supra.*

Wild ASS, *onager* and *zebra*. See the articles ONAGER, *Suppl.* and ZEBRA, *Append.*

ASTERIAS, in zoology, a name used by some naturalists for the star-fish, otherwise called *aster* and *stella marina*. See the article STELLA *marina*, *Suppl.*

ASTHMA *(Cycl.* and *Suppl.)*—Dr. Mead has lately given us his observations on this Distemper. Monit. & Pract. Medic. Cap. 8.

Whatever occasions the ambient air to enter the lungs with less freedom than usual, brings on this disease. Hence it may arise, 1st. From whatever is an impediment to the action of the diaphragm, the intercostal and abdominal muscles. 2dly, From whatever obstructs the free passage of the air into the aspera arteria, or its ramifications, whether the obstruction arises from a tumor, or from viscid humors. 3dly, The air itself may be a cause, if it be much heavier, or lighter than usual. 4thly, The tenderness of the lungs may sometimes occasion this distemper, as appears from those who are subject to a difficulty of breathing upon removing from the thick air of the town into the clear air of the country. 5thly, The difficult passage of the air thro' the lungs may be reckoned among the causes of difficult respiration. And this may happen either from the weakness of the heart, or the too great thickness of the blood.

The method of cure, in this distemper, must vary with its causes. Blood letting is, generally speaking, useful in every species of it. Vomits are useful, if the stomach or lungs be loaded with tough phlegm. The body must be kept open with gentle cathartics. Flatulent food and drink should be avoided; exercise used 'till weariness; and friction 'till a sweat is ready to break out.

Oxymel of squills and simple cinnamon water, or garlick, are good in case of viscid and tough humors. But if the fault lie in the nervous juice, the strong smelling gums are proper, especially the milk of gum ammoniac. Anodynes are very hurtful in the first case, but serviceable in this, if joined with volatile salts or spirits. The paregoric elixir is one of the best of this tribe.

As every kind of this disease is attended with more or less effervescence in the blood, the bark will be found useful; and the doctor assures us, that he has known instances where it has done vast services mixed with the cinnabar of antimony.

ASYLUM, in the history of insects, a name sometimes used for the gad-fly, called by zoologists *œstrum*. See the article OESTRUM, *Suppl.*

ATRACTYLIS, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: the cup is ovated, imbricated, and beset with numerous lanceolated squamæ; the flower is compound and radiated;

the ſtamina are five extremely ſhort and capillary filaments; the antheræ are cylindraceo-tubuloſe; the germen of the piſtil is very ſhort and coronated; the ſtyle is filiform, and of the length of the ſtamina; the ſtigma is bifid; and the ſeeds are of a compreſſed turbinated ſhape, and covered with a plumoſe down. Vid. *Linnæi* Gen. Plant. p. 384.

ATRACTYLIS is alſo the name uſed by Vaillant for the *carthamus*, or *baſtard-ſaffron*. See the article CARTHAMUS, *Suppl.*

AVENS, in botany, the Engliſh name of a genus of plants, called by authors *caryophyllata*. See CARYOPHYLLATA, *Suppl.*

AVOCADO, or AVOCADO-*pear*, in botany, a name given by ſome to the *perſea* of Plumier. See PERSEA, *Append.*

AVOSETTA, the Italian or modern name of a genus of birds, called in Latin *recurviroſtra*. See the article RECURVIROSTRA, *Suppl.*

AURELIA, in natural hiſtory, a ſynonymous term with *chryſalis*. See the article CHRYSALIS, *Append.*

AURELIANA, in botany, a name uſed by ſome writers for the PANAX, or *allheal*. See the article PANAX, *Append.*

AURICULA, a name ſometimes uſed for the *forficula*, or *earwig*. See the article FORFICULA, *Append.*

AURICULARIA, a name uſed by ſome for the ear-wig, a very troubleſome inſect. See the article EAR-*wig*, *Append.*

AURUM, *gold*, in natural hiſtory. See the article GOLD, *Suppl.*

AWK, or AUK. See the article AUK, *Suppl.*

AX-*vetch*, in botany, the Engliſh name of a genus of plants, called by authors *ſecuridaca*. See SECURIDACA, *Suppl.*

AXUNGIA *ſolis*, in natural hiſtory, a name uſed by ſome writers for the ſubſtance more uſually called *fileſiaca terra*. See the article *fileſiaca* TERRA, *Suppl.*

B.

BAT

BABOON, in zoology, the Engliſh name of ſuch monkeys as are uſually called by naturaliſts *papiones*. See the article PAPIO, *Suppl.*

BALANCE-*fiſh*, in zoology. See BALLANCE-*fiſh*, *Suppl.*

BALAUSTINE, a name given to the great double-flowered pomegranate. See the article PUNICA, *Suppl.*

BALISTES, in ichthyology. See the article BALLISTES, *Suppl.*

BALM, in botany, the ſame with *baum*. See BAUM.

BALSAM *of capevi*, or *capivi*, in pharmacy and natural hiſtory. See the article BALSAM *of copaiba*, *Suppl.*

Male-BALSAM, or BALSAM-*apple*, the name of a genus of plants, known among authors by that of *momordica*. See the article MOMORDICA, *Suppl.*

BALSAM-*tree*, in botany, a name uſed by ſome writers for the *terebinthus*, or turpentine-tree. See TEREBINTHUS, *Suppl.*

BALSAMINA *ſcandens*, a name by which ſome call the large fruited white bryony of Ceylon. See the article BRYONIA *alba*, *Suppl.*

BALSAMINE, in botany, the name of a genus of plants, called by authors *balſamina*. See the article BALSAMINA, *Suppl.*

BALSAMITA, in botany, the name by which ſome call coſtmary, a ſpecies of tanzy. See TANACETUM, *Suppl.*

BANE-*berry*, in botany, the Engliſh name uſed by ſome for the herb *chriſtopher*. See the article CHRISTOPHORIANA, *Suppl.*

BAR *(Suppl.)* —To BAR or STRIKE *a vein*, among farriers, an operation performed on the veins of a horſe's legs, or other parts of his body, in order to ſtop the courſe, and leſſen the quantity of malignant humors prevailing there.

It is thus performed: the farrier opens the ſkin, after diſengaging the vein, ties it above and below, and then ſtrikes between the two ligatures. Sportſm. Dict. in voc.

BARRACKS, in military affairs, buildings to lodge ſoldiers in fortified towns, or others. Thus we ſay the *barracks* of the Savoy, of Dublin, *&c.*

Barracks, when damp, are greatly prejudicial to the health of the ſoldiers lodged in them; occaſioning dyſenteries, intermitting fevers, coughs, rheumatic pains, *&c.* For which reaſon quarter-maſters ought to be careful in examining every *barrack*, offered by the magiſtrates of a place; rejecting all ground floors in houſes that have either been uninhabited, or have any ſigns of moiſture. Vid. *Pringle*, Obſerv. on the Diſeaſes of the Army, p. 13, 37, 81 and 97.

BARREN-*wort*, in botany, the Engliſh name of a genus of plants, known among authors by that of *epimedium*. See EPIMEDIUM, *Suppl.*

BARBADOES-*cherry*, in botany, the Engliſh name of a genus of plants, called by authors *malpighia*. See MALPIGHIA, *Suppl.*

BARBADOES-*tar*, a name ſometimes uſed for the thick black kind of *piſſaſphaltum*. See the article PISSASPHALTUM, *Suppl.*

BASELLA, in botany, the name uſed by ſome botaniſts for the *cuſcuta*, or dodder. See the article CUSCUTA, *Suppl.*

BATATAS, the name by which the plant producing our potatoes is ſometimes called. See the article POTATOES, *Suppl.* and *Append.*

BATCHELOR's *button*, in botany, the Engliſh name of a genus of plants, called by authors *lychnis*. See LYCHNIS, *Suppl.*

BEE

BATCHELOR's *pear*, a name uſed by ſome for ſeveral ſpecies of *ſolanum*, or night-ſhade. See SOLANUM, *Suppl.*

BATTERING-*ram*, in the military art of the antients. See ARIES, *Cycl.*

BAUM *(Suppl.)*—*Turky*-BAUM, a name given by ſome to the *dracocephalon*. See the article DRACOCEPHALON, *Suppl.*

Shrubby-BAUM, a name uſed by ſome for a genus of plants, called by authors *molucca*. See MOLUCCA, *Suppl.*

BAY *(Suppl.)* —*Alexandria*-BAY, in botany, a name given to the *ruſcus*, or butcher's broom. See RUSCUS, *Suppl.*

Cherry-BAY, or *cherry*-LAUREL, in botany, the Engliſh names of a genus of plants, called by Linnæus *padus*. See PADUS, *Append.*

Dwarf-BAY, a name ſometimes given to the *thymelæa* of authors. See the article THYMELÆA, *Suppl.*

Indian BAY, a name given by ſome to a ſpecies of myrtle. See the article MYRTUS, *Suppl.*

Roſe-BAY, a name uſed by ſome writers for the *chamærododendros*. See CHAMÆRODODENDROS, *Suppl.*

Sweet flowering BAY, the Engliſh name of a genus of plants, deſcribed by Linnæus under that of *magnolia*. See MAGNOLIA, *Suppl.*

BEAD *(Suppl.)*—BEAD-*tree*, in botany, the Engliſh name of a genus of trees, called by authors *azedarach*. See AZEDARACH, *Suppl.*

BEAM-*tree*, in botany, a name given to the *cratægus*. See the article CRATÆGUS, *Suppl.*

Hard-BEAM, or *horn*-BEAM, in botany. See the article CARPINUS, *Suppl.*

BEAN *(Suppl.)*—*Bog*-BEAN, *bug*-BEAN, or *buck*-BEAN, names given to the *menyanthes*. See the article MENYANTHES, *Suppl.*

Caper-BEAN, in botany, the Engliſh name of a genus of plants, called by authors *fabago*. See the article FABAGO, *Suppl.*

Trefoil-BEAN, in botany, the Engliſh name of a genus of plants, called by authors *cytiſus*. See CYTISUS, *Suppl.*

BEAN-*tree*, a name given to a genus of plants, called by authors *corallodendron*. See the article CORALLODENDRON, *Suppl.*

Kidney-BEAN-*tree*, a name uſed by ſome for the *glycine* of Linnæus. See the article GLYCINE, *Suppl.*

BEAR *(Suppl.)* —*Ant*-BEAR. See the article TAMANDUA, *Suppl.*

BEAR's *ear*, in botany, the name of a genus of plants, known among authors by that of *auricula*. See AURICULA, *Suppl.*

BEAR's *ear ſanicle*, in botany, a name given by ſome to the *cortuſa* of Linnæus. See the the article CORTUSA, *Suppl.*

BEAR's *foot*, in botany, a name given to ſeveral ſpecies of *hellebore*. See the article HELLEBORUS, *Suppl.* and HELLEBORE, *Cycl.*

BEARD *(Suppl.)*—*Old man's* BEARD, in botany, a name given by ſome to the *clematis* of authors. See CLEMATIS, *Append.*

BECCA-BUNGA, in botany, a name given to the *anagallis aquatica*, called in Engliſh *brook-lime*. See the article ANAGALLIS, *Suppl.*

BEDSTRAW, or *ladies* BEDSTRAW, in botany, the Engliſh name of a genus of plants, called by authors *gallium*. See GALLIUM, *Suppl.*

BEE-*flower*, in botany, the Engliſh name of a genus of plants, called by authors *orchis*. See ORCHIS, *Suppl.*

BEE-*fly (Suppl.)*—*Humble*-BEE-*fly*, a ſpecies of *culex*. See the articles HUMBLE, *Suppl.* and CULEX, *Append.*

BEER-*poſſet*. See ZYTHOGALA, *Suppl.*

BEETLE *(Suppl.)*—*Oil*-BEETLE, the Engliſh name of the *meloe* of zoologiſts. See the article MELOE, *Append.*

Water-BEETLE, the Engliſh name of a genus of *beetles*, called by Dr. Hill *dytiſcus*. See the article DYTISCUS, *Append.*

BELI *oculus*, in natural hiſtory. See OCULUS *beli*, *Suppl.*

BELL-*flower*, in botany, the Engliſh name of a genus of plants, called by authors *campanula*. See the article CAMPANULA, *Supp.l.*

BELL-*pepper*, in botany, a name uſed by ſome for the *capſicum*. See the article CAPSICUM, *Supp.l.*

BELLS, or *Canterbury* BELLS, in botany, a name given to the *campanula*. See CAMPANULA, *Suppl.*

Hair-BELLS, in botany, a name given to the *hyacinth*. See the article HYACINTH, *Suppl.*

BELLY-*ach-weed*, in botany, a name given to the *ricinoides*. See the article RICINOIDES, *Suppl.*

BELMUSK, or ABELMOSCH, in botany, names uſed for the *ketmia*. See the article KETMIA, *Suppl.*

BENJAMIN-*tree*, in botany, the name of a ſpecies of *laurus*, according to Linnæus, with deciduous leaves, without ribs, of an obverſely oval figure. See the article LAURUS, *Append.*

It is a native of the Eaſt and Weſt Indies, and is called by many late writers *arbor limonii folio*, *benzoinum fundens*, by reaſon benzoin is procured from it. See BENZOIN, *Suppl.*

BENNET-*herb*, *herba benedicta*, a name uſed by ſome for the *caryophyllata*, or avens. See CARYOPHYLLATA, *Suppl.*

BERBERRY, or BARBERRY-*buſh*, in botany. See the article BERBERIS, *Suppl.*

BERNARD *the hermit*, the Engliſh name of a ſpecies of *ſquill*. See the article SQUILLA, *Append.*

BETHLEHEM-*ſtar*, in botany, a name given to the *ornithogalum*. See the article ORNITHOGALUM, *Suppl.*

BETONY *(Suppl.)*—*Water*-BETONY, a name given to the *ſcrophularia*, or fig-wort. See the article SCROPHULARIA, *Suppl.*

BEZOAR-*goat*, a name uſed for the Indian antelope, or *gazella*, on account of the *bezoar-ſtone* found in its ſtomach. See GAZELLA, *Suppl.*

BIFOL, in botany, a name given by ſome to the *ophris*, or twyblade. See the article OPHRIS, *Suppl.*

BILBERRY, in botany, an Engliſh name given to the *vaccinium*, or *vitis idæa* of authors, called alſo the *whortle-berry*. See VITIS *idæa*, *Suppl.*

BILE *(Cycl.)*—The influence of *bile* upon the animal œconomy is allowed to be very great. By its fermentative quality, it promotes digeſtion; in which reſpect, it differs widely from vegetable bitters, which are retarders of fermentation. Vid. *Pringle*, Obſerv. on the Diſeaſes of the Army, p. 377.

However, in one thing, it agrees with them, *viz.* as a corrector of acidities. Id. ibid. p. 378.

Bile ſpeedily corrupts, but not to ſuch an high or offenſive degree as the blood or fibrous parts of the body. To this corruption of the *bile*, as one cauſe, Dr. Pringle attributes the paroxyſms in bilious fevers: nay, all bilious diſorders, as the cholera morbus, dyſentery, *&c.* are thought to be chiefly owing to a redundance or corruption of the *bile*. Hence, the reaſon why theſe diſorders are moſt frequent in hot countries, and in armies when much expoſed to the ſun, is, that the *bile*, if not more abundant, is in ſuch circumſtances more corrupted than uſual. Id. ibid. p. 184. 74.

BILIOUS *fever (Suppl.)*—Dr. Pringle, in his Obſervations on the Diſeaſes of the Army, remarks, that the *bilious* or putrid fever is epidemic in camps, eſpecially in low and marſhy countries, where the air being full of moiſt and putrid effluvia, tends to relax the fibres and promote putrefaction. As to the ſymptoms of the *bilious* fever, it always begins with chillneſs and laſſitude, pains of the head and bones, and a diſorder at the ſtomach. At night the fever runs high; the heat and thirſt are great; the tongue is parched; the head aches violently; the perſon gets no reſt, and often becomes delirious; but generally in the morning an imperfect ſweat brings on a remiſſion of all the ſymptoms. In the evening the paroxyſm returns, but without any cold fit, and is commonly worſe than the former: on the ſecond morning it remits as before. Theſe periods go on, daily, 'till the fever changes inſenſibly, either into a confirmed or into an intermitting ſhape. Sometimes looſe ſtools carry off the fit, and ſupply the place of ſweats: however, tho' it reſembles an ague in many particulars, yet it is rare to meet with a real ague in the camp, unleſs the perſon has been ill of it before he took the field. The remiſſions uſually appear from the beginning, eſpecially if the patient has been plentifully blooded: but ſometimes there are no remiſſions for the laſt two or three days. Hæmorrhages of the noſe happen frequently in the height of the paroxyſm, and always bring on the remiſſion ſooner and make it fuller. Vomiting or purging have the like effects. The fits are ſeldom preceded by ſhiverings, or any ſenſe of cold after the firſt attack; the pulſe is always full and quick during the paroxyſms, and in the remiſſions it ſtill indicates ſome degree of fever. The blood is florid, the craſſamentum is firm, in large quantity, and ſinks in the ſerum. Whilſt the weather continues warm, the *bilious* ſymptoms are moſt frequent, but as winter approaches, the inflammatory ones prevail. See INFLAMMATORY.

The doctor enumerates other ſymptoms, as crudeneſs of the urine, *bilious* ſtools, coſtiveneſs, *&c.* and farther obſerves, that the infantry are more liable to it than the cavalry.

As to the cure of the *camp-fever*, before it becomes continued, it depends upon the proper uſe of evacuations, the neutral ſalts, and the bark. Bleeding he judges indiſpenſible; which he would have repeated once or oftner, according to the urgency of the ſymptoms. After bleeding it will be neceſſary to give an emetic, the beſt time for doing which is in the remiſſion of the fever, and rather ſooner after a paroxyſm than before one. He adds, however, that vomits do harm when the ſtomach is anywiſe inflamed; in which caſe they ought never to be given. Ipecacuanha is the ſafeſt and eaſieſt, but antimonials make the moſt efficacious vomit. If the body remains coſtive, it is neceſſary to open it with ſome lenient phyſic; and eſpecially if the bowels are affected with pains, or a teneſmus. He likewiſe recommends ſalt of wormwood, lemon-juice, ſpiritus mindereri, and the bark; which laſt ought not to be given 'till the urine breaks, and the intermiſſions take place. Bleeding and purging are alſo neceſſary before the bark ought to be given: it anſwers beſt in ſubſtance adminiſtered in rheniſh wine, after ſtanding a night in infuſion.

If, after remiſſions or intermiſſions, the diſeaſe changes into a continued fever, bleeding becomes neceſſary, unleſs other ſymptoms forbid it; but whether there be room for bleeding or no, bliſters are not only uſeful, but the beſt remedy. To theſe may be joined the neutral ſalts and diaphoretic powders. But, tho' a ſweat be the proper criſis, it ought never to be promoted by theriaca, or the like hot medicines; unleſs the pulſe ſhould ſink and the petechiæ or other bad ſymptoms appear: in which caſe the warmer alexipharmics are neceſſary, as the diſeaſe has changed into a malignant fever. *Pringle*, Obſerv. on Diſeaſes of the Army, p. 165 and 202. ſeq. See *Malignant catarrhal* FEVER, *Suppl.* and MALIGNANT, *Append.*

BILOCULAR, in botany, is applied to a capſule having two cells. See CAPSULE, *Cycl.*

BIND-*weed (Suppl.)*—*Black*-BIND-*weed*, a name ſometimes for uſed the *tamnus*. See the article TAMNUS, *Cycl.*

Prickly-BIND-*weed*, a name given to the *ſmilax* of authors. See the article SMILAX, *Suppl.*

Sea-BIND-*weed*, the Engliſh name of a diſtinct genus of plants, called by botaniſts *ſoldanella*. See the article SOLDANELLA, *Suppl.*

BINN, *(Suppl.)* or BIN, the peaſe and whole oatmeal, uſed at Sea, and which are apt to ſpoil in caſks, Dr. Hales propoſes to prevent this, by putting them into large *bins*, with falſe bottoms of hair clothes laid on bars, whereby freſh air may be blown upwards thro' them, at proper times, with ſmall ventilators. See VENTILATOR, *Append.*

BINOMIAL *(Cycl.)*—*Impoſſible* BINOMIAL, in algebra, is uſed for a *binomial*, one of the terms of which is an impoſſible quantity. Thus, $a + \sqrt{} - bb$, is an *impoſſible binomial*.

BINOMIAL *ſurd* is uſed for a *binomial*, the terms of which are ſurds; as, $\sqrt{a} + \sqrt{b}$, or $a^m + b^m$, if m and n be fractions. The term *binomial ſurd*, is alſo applied to any quantity having a rational part and a ſurd part, as $25 + \sqrt{968}$. For the extraction of roots of *binomial ſurds*, ſee *Newton*'s Arithmetica Univerſalis, and *Mac Laurin*'s Algebra, p. 114---130.

BINOMIAL *curve* is uſed for a curve, the ordinate of which is expreſſed by a *binomial*. Thus if the ordinate of a curve be of this form $x \times \overbrace{e + fx^{\theta}}^{\lambda}$, the curve is called a *binomial curve*. *Stirling*, Method. differ. p. 58.

BINOMIAL *theorem* is often uſed to ſignify Sir Iſaac Newton's theorem for raiſing a *binomial* to any power, or for extracting any root of a *binomial*. See ROOT, *Suppl.*

BIOTA, in zoology, a name introduced by Dr. Hill for the *polype*. See the article POLYPE, *Suppl.*

It is of a cylindric figure, but variable; the tentacula are arranged in a ſingle ſeries round the aperture of the mouth, at the extremity of the body. There are ſeveral ſpecies of this animal.

Linnæus calls this creature *hydra*, no doubt, from the reproduction or repullulation of the parts, when cut off; and this name, *biota*, is likewiſe given it on the ſame account, being derived from βιος, life.

BIRCH *(Suppl.)* — BIRCH-*tree of America*, a name given by ſome to the *terebinthus*, or turpentine-tree. See TEREBINTHUS, *Suppl.*

BIRD *(Cycl.* and *Suppl.)*---*Admiſſive* BIRDS, *aves admiſſivæ*, in the augural ſcience of the antients, were birds of a happy omen, which denoted the approbation of the gods in an enterprize. *Danet.* Lex. in voc. *Baxt.* Gloſſ. p. 35. ſeq.

In which ſenſe *aves admiſſivæ* ſtand oppoſed to *arcivæ aves*.

BIRD's *cherry*, in botany, the Engliſh name of a genus of plants, called by Linnæus *padus*. See PADUS, *Append.*

BIRD's *eye*, in botany, the name of a genus of plants, called by authors *adonis flos*. See the article ADONIS *flos*, *Suppl.*

BIRD's *foot*, the Engliſh name of a genus of plants, called by authors *ornithopodium*. See the article ORNITHOPODIUM, *Suppl.*

BIRD's *foot trefoil*, a name given to ſome ſpecies of *lotus*. See the article LOTUS, *Suppl.*

BIRD-*lime*. See LIME-*twigs*, *Suppl.*

Water-BIRD-*lime*. See LIME-*twigs*, *Suppl.*

BIRD's *neſt*, in botany, a name uſed by ſome for the *daucus*, or carrot. See the article DAUCUS, *Suppl.*

BIRD's *pepper*, a name given to the *capſicum*, or Guinea pepper. See the article CAPSICUM, *Suppl.*

BIRD's *tongue*. See LINGUA *avis*, *Suppl.*

BIRTH *(Cycl.* and *Suppl.)*—*Difficult* BIRTH. See the article DELIVERY, *Suppl.*

BISHOP's *weed*, in botany, the Engliſh name of the *ammi*. See the article AMMI, *Suppl.*

BITTER *(Suppl.)*—*Bitters* are ſaid to reſiſt putrefaction and moderate fermentation: hence appears their uſe inputrid diſorders. *Bitters* likewiſe correct acidities, and aſſiſt digeſtion, by bracing the fibres of the ſtomach.

BITTER-*ſweet*, in botany, the Engliſh name of the *ſolanum ſcandens*, or climbing nightſhade. See the article SOLANUM, *Suppl.*

BITTER *vetch*, the Engliſh name of the *orobus*. See the article OROBUS, *Suppl.*

BITTER *wort*, the Engliſh name for the *gentiana* of authors. See the article GENTIANA, *Suppl.*

BLACK *berry*, the Engliſh name of a genus of plants called by authors *rubus*. See the article RUBUS, *Suppl.*

BLACK-*bind-weed*, or BLACK-*bryony*, a name given to the *tamnus* of authors. See the article TAMNUS, *Suppl.*

BLACK-*thorn*, a name uſed by ſome for the *prunus ſylveſtris*, or ſloe-tree. See the article PRUNUS, *Suppl.*

BLADDER-*lotus*. See the article LOTUS, *infra.*

BLADDER-*nut*, in botany, the Engliſh name of the *ſtaphylodendron*. See the article STAPHYLODENDRON, *Suppl.*

African BLADDER-*nut*, a name given to the *royena* of Linnæus. See the article ROYENA, *Suppl.*

Laurel-leaved-BLADDER-*nut*, the name uſed by ſome for the *Dodonæa* of Linnæus. See the article DODONÆA, *Suppl.*

BLADDER-*ſena*, a name given by ſome to the *colutea*. See the article COLUTEA. *Suppl.*

BLATTA *byzantia*, in the materia medica. See the article UNGUIS *odoratus*, *Suppl.*

BLEEDING, *(Suppl.)* according to Dr. Pringle, is the moſt indiſpenſible of all remedies in inflammatory diſeaſes; to the delaying of which too long, or not repeating it, are chiefly owing the bad conſequences of colds, as dangerous fevers, rheumatiſms, and conſumptions. He obſerves farther, that, in general, young practitioners are apt to be too ſparing in letting blood, by which means many lives are loſt: for a ſurgeon may be aſſured a ſoldier will never complain of a cough, or pains with inflammatory ſymptoms, wherein *bleeding* is not neceſſary; and from the ſizineſs of the blood, and continuance of the complaints, he is to judge of the neceſſity of repeating it, which, in caſe of a ſtitch, or difficult breathing, is never to be delayed. In inflammatory caſes, from twelve to fifteen ounces may be taken for the firſt *bleeding*, and ſomewhat leſs for all the reſt; and when it is neceſſary to exceed this quantity, it may be proper to follow Celſus's rule, in minding the colour of the blood whilſt it flows, and when it is of a blackiſh caſt, which is always the caſe in difficult breathing and great inflammations, to let it run till it becomes more florid. In all caſes where plentiful *bleeding* is indicated, it is beſt to do it in bed, to prevent fainting; and we may obſerve, that a perſon will bear the loſs of a much greater quantity of blood if the ſtream is ſmall, than by a large orifice, which ſome have thought neceſſary for making a more ſpeedy revulſion.

Bleeding is highly neceſſary in the phrenitis, ophthalmia, quinſey, rheumatiſm, cough, hectic fits, and, in general, in all inflammatory caſes. See *Pringle*'s Obſervations on the Diſeaſes of the Army, *paſſim.*

It is to be obſerved, however, that, in malignant and putrid diſorders *bleeding* frequently renders them more malignant, and therefore to be omitted, or at leaſt not repeated unleſs there appear evident marks of inflammation. See the articles MALIGNANT *fever*, BILIOUS *fever*, DYSENTERY, *&c.*

BLISTERS *(Suppl.)* are often neceſſary in inflammatory diſorders, as the phrenitis, ophthalmia, quinſey, pleuriſy, *&c.* as well as in chronic diſtempers, ſuch as palſies, *&c.* See PHRENITIS, OPHTHALMIA, *&c. Suppl.*

BLITE, in huſbandry. See the articles BLIGHT and RUBIGO, *Suppl.*

BLOIS, *Bole of* BLOIS, *Bolus Bleſenſis*. See the article BLESENSIS *bolus*, *Suppl.*

BLOOD *(Suppl.)*—In order to aſcertain the colour of the different parts of corrupted *blood*, Dr. Pringle made the following experiment. He took a freſh quantity without any inflammatory cruſt, and divided it into the craſſamentum, the ſerum with a few red globules in it, and the pure ſerum. The phials containing theſe ſeveral liquors were put into a furnace, where they ſtood ſome days, till they became thoroughly putrid.

The craſſamentum was changed from a deep crimſon to a dark livid colour; ſo that when any portion of it was diluted with water, it appeared of a tawney hue. Of the ſame colour was the ſerum in which the red globules remained. But the pure ſerum, after becoming turbid, dropped a white purulent ſediment, and changed into a faint olive green.

From this experiment he concludes, that the ichor of ſordes, and that of dyſentery fluxes, conſiſts of the ſerum tinged with a ſmall quantity of red blood putrified; and that when the ſerous veſſels are of a tawney caſt, we are not to refer that colour to inflammation, but to a ſudden ſolution of ſome of the red globules mixed with the ſerum.

A few drops of this putrid craſſamentum was mixed with the recent urine of a healthy perſon, which it immediately changed into a flame-coloured water, common in fevers and in the ſcurvy. After ſtanding an hour or two, the ſame gathered a cloud, reſembling what is ſeen in the crude urine of perſons in acute diſtempers.

As to a green ſerum, it is perhaps never to be ſeen in the veſſels of a living body, ſince it is not to be ſuppoſed that a perſon could ſurvive ſo great a change of the *blood*. In foul ulcers, indeed, and in other ſores, where the ſerum is left to ſtagnate long, the matter is found of a greeniſh colour, and is then always acrimonious. But the effects of a green ſerum is no where to be ſo much dreaded as in the caſe of an aſcites, where it is collected in ſo large a quantity. Of which we had, ſome time ſince, almoſt a fatal inſtance in Mr. Cox, ſurgeon at Peterborough, who, upon tapping a woman but a few hours after death, was ſo affected with the poiſonous ſteams of a green ſerum, that he was preſently ſeized with a peſtilential fever, and narrowly eſcaped with his life.

In regard to the ſediment which the ſerum dropped on becoming turbid, and which reſembled well digeſted matter, the doctor thinks it a terreſtrial ſubſtance, intended for the nouriſhment or reparation of the ſolid; in which opinion he was the more confirmed by obſerving a like ſediment in the urine of men in perfect health: and therefore concludes that the pus, or digeſted matter of ſores, is nothing but this ſubſtance ſeparated from the ſerum of the blood. And hence it is that all large ulcers are extremely weakening, from the great expence of *blood* in furniſhing this ſubſtance. Hence alſo it is, that iſſues are of more conſequence for making drains, than one would expect from the viſible evacuation: as near as the doctor could gueſs, an ounce of ſerum, after ſtanding ſome days, not furniſhing more of this matter than what might be produced in the daily diſcharge of a large pea-iſſue, or from a ſeton. *Pringle*, Obſerv. on Diſeaſes of the Army, Append. p. 386, *ſeq.* Experim. xlv.

There are frequent inſtances of the tawney colour of the ſerum, the reſolution of the craſſamentum, and even of the offenſive ſmell of *blood* recently drawn. And, indeed, if we reflect how putreſcent *blood* is in a heat equal to that of the human body, we may be convinced, that no ſooner is the perſpiration by the lungs impeded, than a corruption begins in the whole maſs; which, if not timely prevented, brings on ſome putrid diſeaſe. If the acrimony is great and ſudden, a fever or flux will enſue; but if the accumlation is ſo ſlow that the body grows habituated to the putrefaction, a ſcurvy prevails. This is the caſe in long voyages, on board unventilated ſhips; in marſhy countries; and, in a leſſer degree, in all northerly climates, in moiſt ſituations. *Id.* p. 400.

BLOOD-*flower*, in botany, the Engliſh name of the *hæmanthus*. See the article HÆMANTHUS, *Suppl.*

BLOWER, among dealers in horſes, a term uſed for ſuch horſes as wheeze much, without wanting wind. See the article WHEEZING, *Suppl.*

BOAR *(Suppl.)* The wild *boar*, among the huntſmen, has ſeveral names, according to its different ages; the firſt year it is called *a pig of the ſaunder*; the ſecond it is called *a hog*; the third, *a hog-ſteer*; and the fourth, *a boar*; when leaving the ſaunder he is called *a ſingler* or *ſangler*.

The *boar* generally lives to twenty-five or thirty years, if he eſcapes accidents. The time of going to rut is in December, and laſts about three weeks. They feed on all ſorts of fruits, and on the roots of many plants; the root of fern in particular ſeems a great favourite with them: and when they frequent places near the ſea coaſts, they will deſcend to the ſhores and demoliſh the tenderer ſhell-fiſh in very great numbers. Their general places of reſt are among the thickeſt buſhes that can be found, and they are not eaſily put up out of them, but will ſtand the bay a long time. In April and May they ſleep more ſound than at any other time of the year, and this is therefore the ſucceſsful time for the taking them in the toils. When a *boar* is rouzed out of the thicket, he always goes from it, if poſſible, the ſame way by which he came to it; and when he is once up, he will never ſtop till he comes to ſome place of more ſecurity. If it happens that a ſaunder of them are found together, when any one breaks away, the reſt all follow the ſame way. When the *boar* is hunted in the wood, where he was bred, he will ſcarce ever be brought to quit it; he will ſometimes make toward the ſides to liſten to the noiſe of the dogs, but retires into the middle again, and uſually dies or eſcapes there. When it happens that a *boar* runs a-head, he will not be ſtopt, or put out of his way by man or beaſt, ſo long as he has any ſtrength left. He makes no doubles nor groſſings when chaſed; and when killed makes no noiſe, if an old *boar*; the ſows and pigs will ſqueak when wounded.

The ſeaſon for hunting the wild *boar* begins in September and ends in December, when they go to rut. If it be a large *boar*, and

and one that has lain long at reſt, he muſt be hunted with a great number of dogs, and thoſe ſuch as will keep cloſe to him, and the huntſman, with his ſpear, ſhould always be riding in among them, and charging the *boar* as often as he can, to diſcourage him: ſuch a *boar* as this, with five or ſix couple of dogs, will run to the firſt convenient place of ſhelter, and there ſtand at bay, and make at them as they attempt to come up with him.

There ought always to be relays alſo ſet of the beſt and ſtaunchеſt hounds in the kennel; for if they are of young eager dogs, they will be apt to ſeize him, and be killed or ſpoiled before the reſt come up. The putting collars with bells about the dogs necks is a great ſecurity for them, for the *boar* will not ſo ſoon ſtrike at them when they have theſe, but will rather run before them. The huntſmen generally kill the *boar* with their ſwords or ſpears; but great caution is neceſſary in making the blows, for he is very apt to catch them upon his ſnout or tuſks, and if wounded and not killed, he will attack the huntſmen in the moſt furious manner. The places to give the wound with the ſpear is either between the eyes in the middle of the forehead or in the ſhoulder, both theſe places make the wound mortal.

When this creature makes at the hunter there is nothing for it but courage and addreſs, if he flies for it he is ſurely overtaken and killed; if the *boar* comes ſtrait up, he is to be received at the point of the ſpear; but if he makes doubles and windings, he is to be watched very cautiouſly, for he will attempt getting hold of the ſpear in his mouth, and if he does ſo nothing can ſave the huntſman but another perſon attacking him behind; he will on this attack the ſecond perſon, and the firſt muſt then attack him again; two people will thus have enough to do with him, and were it not for the forks of the boar-ſpears that make it impoſſible to preſs forward upon them, the huntſman who gives the creature his death's wound would ſeldom eſcape falling a ſacrifice to his revenge for it.

The modern way of boar-hunting is generally to diſpatch the creature by all the huntſmen ſtriking him at once; but the antient Roman way was, for a perſon on foot, armed with a ſpear, to keep the creature at bay, and in this caſe the *boar* would run of himſelf upon the ſpear to come at the huntſman, and puſh forward till the ſpear pierced him through.

The hinder claws of a *boar* are called *guards*.

In the corn he is ſaid to *feed*; in the meadows or fallow fields, to *rout*, *worm*, or *fern*; in a cloſe, to *graze*.

The *boar* is farrowed with as many teeth as he will ever have, his teeth increaſing only in bigneſs, not in number; among theſe there are four called *tuſhes* or *tuſks*, the two biggeſt of which do not hurt when he ſtrikes, but ſerve only to whet the other two loweſt, with which the beaſt defends himſelf, and frequently kills, as being greater and longer than the reſt. Gent. Recr. p. 1, 7, and 119. Trev. Dict. Univ. tom. iv. p. 1489, *voc. Sanglier.*

It is very remarkable, that theſe creatures in the Weſt Indies are ſubject to the ſtone in a very remarkable manner: few of them are abſolutely free from it, yet ſcarce any have the ſtones of any conſiderable ſize. It is common to find a great number in the ſame bladder, and they are uſually of about a ſcruple weight, and are angular, and that with great regularity, each having five angles. Phil. Tranſ. n. xxxvi.

Among the antient Romans *boar*'s fleſh was a delicacy; a *boar* ſerved up whole was a diſh of ſtate. *Pitiſc.* Lex. Ant. tom. i. p. 120. *voc.* APER.

The *boar* was ſometimes alſo the military enſign borne by the Roman armies, in lieu of the eagle. *Salmuth.* ad Pancirol. P. I. tit. liii. p. 278.

Among phyſicians a *boar*'s bladder has been reputed a ſpecific for the epilepſy. *Friend*, Hiſt. of Phyſ. tom. ii. p. 280. The tuſh of the wild *boar* ſtill paſſes with ſome as of great efficacy in quinzies and pleuriſies. *Alleyn*, Diſpenſ. p. 150.

BOAR, in the manege. A horſe is ſaid to *boar*, when he ſhoots out his noſe as high as his ears, and toſſes it in the wind. *Guill.* Gent. Dict. *in voc.*

BOLBONACH, in botany, a name given to the *lunaria* of authors. See the article LUNARIA, *Suppl.*

BOLE *(Suppl.)* — See the article BOLUS, *Suppl.* and *Append.*

BOLUS *Bleſenſis*. See the article BLESENSIS *bolus*, *Suppl.*

BOLUS *Etruſca*, the ſame with *Etruſca terra*. See the article ETRUSCA *terra*, *Suppl.*

BOLUS *Goltbergenſis*, the ſame with *terra Goltbergenſis*. See the article GOLTBERGENSIS *terra*, *Suppl.*

BOLUS *Lemnia*, the ſame with *terra Lemnia*. See the article LEMNIAN *earth*, *Suppl.*

BOLUS *Livonica*, the ſame with the *Livonica terra*. See the article LIVONICA *terra*, *Suppl.*

BOLUS *Noceriana*, the ſame ſame with *terra Noceriana*. See the article NOCERIANA *terra*, *Suppl.*

BOLUS *Veneta*. See the article VENETA *bolus*, *Suppl.*

BONANA, in botany, the name uſed for a genus of plants called by authors *muſa*. See the article MUSA, *Suppl.*

BONE *(Cycl.* and *Suppl.)*—All ſorts of *bone* may be ſtained, or dyed, any kind of colour, as directed under the article IVORY, *Append.*

BOREA, a name given by the antients to a ſpecies of jaſper, of a blueiſh green colour. See the article JASPER, *Append.*

BORECOLE, in botany, a name uſed for a ſpecies of *braſſica*. See the article BRASSICA, *Suppl.*

BOTRYS, in botany, a name ſometimes given to a ſpecies of *chenopodium*, called alſo *oak of Jeruſalem*. See the article CHENOPODIUM, *Suppl.*

BOTRYTIS, in botany, the name given by Micheli to a genus of moſſes, called by authors *byſſus*. See the article BYSSUS, *Suppl.*

BOTTLE *(Suppl.)*—*Blue* BOTTLE, a name uſed for the *cyanus* of authors. See the article CYANUS, *Suppl.*

BOWER *(Suppl.)*—*Ladies* BOWER, or *virgin's* BOWER, names given by us to a diſtinct genus of plants called by botaniſts *clematitis*. See the article VIRGIN'*s bower*. *Suppl.*

BOX-*thorn*, in botany, the Engliſh name of a genus of plants called by authors *lycium*. See the article LYCIUM, *Append.*

BRACHIONUS, in zoology, the name of a genus of animalcules of the *arthrodia* kind, containing all the wheel animals. See the articles ARTHRODIA and ANIMALCULE, *Append.* and WHEEL, *Suppl.*

BRACHURI, in zoology, a name given by Dr. Hill to a genus of animalcules of the tailed kind. See the article ANIMALCULE, *Suppl.* and *Append.*

Theſe animalcules are of a roundiſh figure, with tails ſhorter than their bodies; their ſkin is perfectly ſmooth, thin, and colourleſs. They are frequent in water-ponds, in pepper-water, and many other infuſions of vegetable ſubſtances. See *Hill*, Hiſt. Anim. p. 6, *ſeq.*

BRACHYPYRENIA, in natural hiſtory, a genus of foſſils of the claſs of *ſeptariæ*. See the article SEPTARIÆ, *Suppl.*

The *brachypyrenia* have a ſhort roundiſh nucleus, encloſed by and contained within the body of the maſs.

BRAMA *marina*, the ſea-bream, in ichthyology, a ſpecies of *ſparus*, according to Artedi. See the article SPARUS, *Sppul.*

BRAMBLE, or BRAMBLE *buſh*, in botany, the Engliſh name of a genus of plants called by authors *rubus*. See the article RUBUS, *Suppl.*

BRAMBLING, in zoology. See the article BRAMBLE, *Suppl.*

BRANCK *urſine*, a name uſed by ſome authors for the *acanthus*. See the article ACANTHUS, *Suppl.*

BRASSE, in ichythology, a name ſometimes given to the *lucioperca*, a ſpecies of pearch. See the articles PERCA and LUCIOPERCA, *Suppl.*

BREAD *(Suppl.)*—*S. John's* BREAD, in botany, the Engliſh name of the carob-tree, deſcribed by Tournefort under that of *ſiliqua*. See the article SILIQUA, *Suppl.*

BREAM *(Suppl.)*—*Sea*-BREAM, *brama marina*, in ichthyology, a ſpecies of *ſparus*. See the article SPARUS, *Suppl.*

BREAST *(Suppl.)* — *Diſeaſes of the* BREAST. See the article ASTHMA, *Append.*

BRIAR, in botany, a name given to ſeveral ſpecies of roſe. See the article ROSE, *Suppl.*

BRIMSTONE *wort*, in botany, a name given to the *pucedanum* of authors. See the article PUCEDANUM, *Suppl.*

BRIONY, in botany. See the article ERIONIA, *Suppl.*

BRISTOL *flower*, in botany, a name uſed by ſome for the *lychnis*. See the article LYCHNIS, *Suppl.*

BROCADE *(Cycl.)* — BROCADE-*ſhell*, the Engliſh name of a ſpecies of *cylindrus*. See the article CYLINDRUS, *Suppl.*

It is of a ſilvery white colour variegated with brown.

BROCATELLO, a name uſed by our lapidaries for the white and gold veined red marble. See the article MARBLE, *Suppl.*

BROCOLI, among gardeners. See BROCCOLI, *Suppl.*

BROMELIA, in the Linnæan ſyſtem of botany, the name of a genus of plants called by Tournefort *ananas*. See the article ANANAS, *Suppl.*

BROOM *(Suppl.)* — *Butcher's* BROOM, in botany, the Engliſh name of a genus of plants called by authors *ruſcus*. See the article RUSCUS, *Suppl.*

Green, and *white* BROOM, names given to the *ſpartium* of authors. See the article SPARTIUM, *Suppl.*

Spaniſh BROOM, *ſpartium*, in botany. See the article SPARTIUM, *Suppl.*

BROOM-*lime*, a name uſed for the plant known among authors by that of *veronica*. See the article VERONICA.

BROOM-*rape*, a name given to the orobanche of authors. See the article OROBANCHE, *Suppl.*

BROWN *wort*, in botany, a name given ſometimes to the *brunella*, or *prunella* of authors. See the article PRUNELLA, *Suppl.*

BROWN *wort* is alſo ſometimes uſed for the *ſcrophularia*. See the article SCROPHULARIA, *Suppl.*

BRUISE *wort*, in botany, a name given by ſome authors to the *lychnis*. See the article LYCHNIS, *Suppl.*

BRUSH *(Suppl.)* — *Silver*-BRUSH, the name by which ſome call the *barba Jovis*, a diſtinct genus of plants. See the article BARBA *Jovis*, *Suppl.*

BUBO, in ornithology. See the article OWL, *Suppl.* and *Append.*

BUCEROS, in ornithology, the name of a ſpecies of raven found in the Eaſt Indies, China, and Tartary. Its head, neck, rump, and tail are of a gloſſy black without the leaſt tinge of any other colour. It is of the bigneſs of a well grown pullet: its head is remarkably large, as is its beak, which has a conſiderable gibboſity towards the baſe, riſing above the reſt of the ſurface. See *Hill*, Hiſt. Anim. p. 383.

BUCK's *horn*, or *hart's horn plantain*, in botany, names given to the *coronopus* of authors. See the article CORONOPUS, *Suppl.*

BUCK's *horn creſs*, in botany, a name given to the *naſturtium* of authors. See the article NASTURTIUM, *Suppl.*

BUCK-*thorn*, in botany, the Engliſh name of a genus of plants called by authors *rhamnus*. See the article RHAMNUS, *Suppl.*

Sea-BUCK-*thorn*, in botany, a name given to the *rhamnoides* of authors. See the article RHAMNOIDES, *Suppl.*

BUCK-*wheat*, in botany, the Engliſh name of the *fagopyrum* of authors. See the article FAGOPYRUM, *Suppl.*

BUDDING, among gardeners, the ſame with innoculation, or innoculating. See the article INNOCULATION, *Cycl.* and *Suppl.*

BUGG, in the hiſtory of inſects, the Engliſh name of the *cimex*. See the article CIMEX, *Suppl.*

BUGG is alſo the Engliſh name of another genus of inſects found on ſeveral trees. See the article CHERMES, *Append.*

Houſe BUGG, in the hiſtory of inſects, the Engliſh name of a ſpecies of *coccus*. See the article COCCUS, *Append.*

BUGLOSS *(Suppl.)* — *Viper's* BUGLOSS, in botany, the Engliſh name of the *echium*. See the article ECHIUM, *Suppl.*

BULBINE, in botany, a name uſed by ſome for the *phalanguim* or ſpider-wort of Tournefort. See the article PHALANGIUM, *Suppl.*

BULL-*frog*, the Engliſh name of the largeſt ſpecies of the frog kind. See the articles FROG and RANA, *Suppl.*

BULLACE-*tree*, in botany, a name given to a ſpecies of the *prunus*, or plum tree. See the article PRUNUS, *Suppl.*

BULLY-*tree*, in botany, a name given to the *cainito* or *chryſophyllum* of authors. See the article CHRYSOPHYLLUM, *Append.*

BUNIUM, in the Linnæan ſyſtem of botany, the name of a genus of plants called by Tournefort *bulbocaſtanum*. See the article BULBOCASTANUM, *Suppl.*

BUNK, BUNKEN. See the article LEUCACANTHA, *Suppl.*

BUPLEURUM, hare's ear, in botany. See the article HARE'S *ear*, *Suppl.*

BURDOCK, in botany, the Engliſh name of a genus of plants called by authors *Xanthium*. See the article XANTHIUM, *Suppl.*

BURNET, in botany, the Engliſh name of a genus of plants called by authors *ſanguiſorba*. See the article SANGUISORBA, *Suppl.*

BURNET-*ſaxifrage*, in botany, a name improperly given by ſome to a ſpecies of *tragoſelinum*. See the article TRAGOSELINUM, *Suppl.*

BURNING *of diamonds*, is uſed among the jewellers for puting the diamonds into a fierce fire, in order to diveſt them of a yellow or brown colour. See DIAMOND, *Suppl.*

BURSA *paſtoris minor*, in botany, the name by which the *draba* of Linnæus is called by ſome writers. See the article DRABA, *Append.*

BUSH *(Suppl.)* — *Poiſon*-BUSH, the name by which the *tithymalus*, or ſpurge is ſometimes called. See the article TITHYMALUS, *Suppl.*

BUSTARD, the Engliſh name of a genus of birds called *otis* by authors. See the article OTIS, *Suppl.*

BUTTER-*bump*, a name uſed in ſome parts of England for the bittern, or *ardea ſtellaris*. See the article BITTERN, *Suppl.*

BUTTERFLY-*flower*, the name of a plant called by authors *orchis*. See the article ORCHIS, *Suppl.*

BUTTERFLY-*ſhell*, the Engliſh name of a ſpecies of *voluta*. See the article VOLUTA, *Suppl.*

BUTTERIS, among farriers, the ſame with *buttreſs*. See the article BUTTRESS, *Cycl.*

BUTTON-*tree*, a name given to ſome ſpecies of *platanus* and *cephalanthus*. See the articles PLANE-*tree*, *Suppl.* and CEPHALANTHUS, *Append.*

BUTTON-*tree of Jamaica*, a name given to the *conocarpus* of Linnæus. See the article CONOCARPUS, *Append.*

C.

CABBAGE *(Suppl.)* — *Sea*-CABBAGE, or ſea-cale, in botany, a name given to the *crambe* of authors. See the article CRAMBE, *Suppl.*

CABBAGE-*tree*, a name uſed by ſome for the palm-tree deſcribed by Linnæus under that of *phœnix*. See the article PHOENIX, *Suppl.*

CACALIANTHEMUM, in botany, the name by which Dillenius calls a genus of plants deſcribed by Linnæus under that of *kleinia*. See the article KLEINIA, *Append.*

CACTUS, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is a deciduous perianthium, formed of a ſingle leaf of a tubulated concave form, ſtanding on the germen, and covered with a kind of ſquamoſe leaves; the flower conſiſts of a great number of broad obtuſe petals, the exterior ones ſhort, the interior longer and connivent; the ſtamina are numerous ſubulated filaments, inſerted into the calyx, and ſhorter than the flower. The antheræ are oblong and erect; the germen ſtands under the tube of the cup: the ſtyle is cylindric, and of the length of the ſtamina: the ſtigma is capitated and multifid: the fruit is an oblong umbilicated berry, containing only one cell, and covered with little leaves, like the cup: the ſeeds are numerous, roundiſh, and ſmall.

This genus comprehends the *cereus*, *opuntia*, *melocactus*, *tuna*, and *pereſkia* of botanical authors. The *cereus* is a long cylindraceo-angulated plant; the *melocactus*, a roundiſh and angulated one; the *opuntia* is ramoſe and dichotomous; and the *pereſkia* is arboreſcent and folioſe. Vide *Linnæi* Gener. Plant. p. 210.

CADLOCK, in botany, a name uſed in ſeveral parts of England for the *rapiſtrum* of authors. See the article RAPISTRUM, *Suppl.*

CÆMENT *(Cycl.* and *Suppl.)* — We have various receipts for making *cæments* to mend broken china or glaſſes; one of the fineſt, and at the ſame time ſtrongeſt *cæments* for this purpoſe, is the juice of garlick ſtamped in a ſtone mortar; this will leave little or no mark, if done with care.

Another *cæment* for broken glaſſes, china, or earthen ware may be prepared by beating the white of an egg very clear, and mixing with it fine powdered quick lime; or iſinglaſs, powdered chalk, and a little lime may be mixed together, and diſſolved in fair water, with which the glaſſes, *&c.* are to be cæmented, and then ſet in the ſhade to dry; a precaution that ſhould be always obſerved, whichever of the above *cæments* be uſed.

CÆMENTS *for cracked chemical glaſſes*. To prepare a *cæment* for theſe glaſſes that will ſtand the fire: take wheat flour, fine powdered Venice glaſs, pulverized chalk, of each an equal quantity; fine brick duſt, one half of the quantity; and a little ſcraped lint: mix them all together with the whites of eggs: then, ſpreading this mixture upon a linnen cloth, apply it to the cracks of the glaſs, which muſt be well dried before you put it to the fire.

Old varniſh is another *cæment* which will anſwer the ſame purpoſe; for by gluing the pieces together therewith, and ſetting them to dry in the ſun, or a warm place, they will hold very well. *Smith*'s Laboratory, p. 171.

For the manner of preparing a *cæment* to bind together the various embelliſhments of grottos, ſee the article GROTTO, *Append.*

CAINITO, in botany, a name given by Plumier to a genus of plants deſcribed by Linnæus under that of *chryſophyllum*. See the article CHRYSOPHYLLUM, *Append.*

CALABASH, in botany, a name uſed by ſome for the *melopepo* of authors. See the article MELOPEPO, *Suppl.*

CALABASH-*tree*, the name of a genus of plants called by Plumier *cujete*, and deſcribed by Linnæus under that of *creſcentia*. See the article CRESCENTIA, *Suppl.*

CALAMINT *(Suppl.)* — *Water*-CALAMINT, in botany, a name given by ſome to ſeveral ſpecies of mint. See the article MENTHA, *Suppl.*

CALCITRAPA is made by Vaillant a diſtinct genus of plants, but ranked by Linnæus among the *centauria*. See the article CENTAURIA, *Append.*

CALCITAPRA is a name by which ſome call a ſpecies of *cnicus*. See the article CNICUS.

CALCITRAPA is alſo uſed as the name of ſeveral ſpecies of our common thiſtle. See the article THISTLE, *Suppl.*

CALCITRAPOIDES, a diſtinct genus of plants, according to Vaillant, but comprehended among the *centauria* by Linnæus. See the article CENTAURIA, *Append.*

CALF *(Suppl.)* — *Sea*-CALF, the Engliſh name of a genus of animals called by authors *phoca*. See the article PHOCA, *Suppl.*

CALF's *ſnout*, in botany, an Engliſh name for the *antirrhinum* of authors, otherwiſe called *ſnap-dragon*. See the article SNAP-DRAGON, *Suppl.*

CALKING, among painters, the ſame with calquing. See the article CALQUING, *Cycl.*

CALL, a name given by the miners in many parts of the kingdom to the red *telaugium*, variegated with black and white. See the article TELAUGIUM, *Append.*

CALLITRICHUM, καλλιτρίχον. See the article ADIANTUM, *Suppl.*

CAMEA, in natural hiſtory, the ſame with *camæa*, a genus of ſemipellucid gems. See the article CAMÆA, *Suppl.*

CAMEHUIA, in natural hiſtory, the ſame with what is called *camaieu* in the *Supplement*. See the article CAMAIEU, *Suppl.*

CAMPANULA *lychnidea*, the name by which J. Bauhine calls a ſpecies of the *convolvulus*, or bind-weed. See the article CONVOLVULUS, *Suppl.*

CAMMOCK, in botany, a name given by ſome to the *anonis*, or reſt harrow. See the article REST-HARROW, *Suppl.*

CAMOMILE, CHAMOMILE, or *Chamemile*, in botany, the Engliſh name of a genus of plants called by authors *chamæmelum*. See the article CHAMÆMELUM, *Suppl.*

CAMP *(Suppl.)* — Where the grounds are equally dry, thoſe *camps* are always moſt healthful which are pitched on the banks of large rivers; becauſe in the hot ſeaſon ſituations of this kind have a ſtream of freſh air from the water, ſerving to carry off the moiſt and putrid exhalations. On the other hand, next to marſhes, the worſt encampments are on low grounds cloſe beſet with trees: for then the air is not only moiſt and hurtful in itſelf, but, by ſtagnating, becomes more ſuſceptible of corruption. However, let the ſituation be ever ſo good, *camps* are frequently rendered infectious by the putrid effluvia of rotten ſtraw, and the privies of the army; more eſpecially if the bloody flux prevails, in which caſe the beſt method of preventing a general infection is to leave the ground with the privies, foul ſtraw, and other filth of the *camp* behind. This is to be frequently done, if conſiſtent with the military operations; but when theſe render it improper to change the ground often, the privies ſhould be made deeper than uſual, and once a day a thick layer of earth thrown into them till the pits are near full, and then they are to be well covered, and ſupplied by others. It may alſo be a proper caution, to order the pits to be made either in the front or rear, as the then ſtationary winds may beſt carry off their effluvia from the *camp*. Moreover, it will be neceſſary to change the ſtraw frequently, as being not only apt to rot, but to retain the infectious ſteams of the ſick. But if freſh ſtraw cannot be procured, more care muſt be taken in airing the tents as well as the old ſtraw. See *Pringle*, Obſerv. on the Diſeaſes of the army, p. 99, 103, &c.

CAMP-*diſeaſes*. See the article SOLDIER, *Append.*

CAMP-*fever*. See the article BILIOUS *fever*.

CAMP-*hoſpital*. See the article HOSPITAL.

CAMPAIGN *(Cycl.)* — The beginning of every *campaign* is conſiderably more unhealthy than if the men were to remain in quarters. After the firſt fortnight or three week's encampment, the ſickneſs decreaſes daily; the moſt infirm being by that time in the hoſpitals, the reſt more hardened, and the weather growing daily warmer. This healthy ſtate continues throughout the ſummer, unleſs the men get wet cloaths or wet beds; in which caſe a greater or leſſer degree of the dyſentery will appear, in proportion to the preceding heats. But the moſt ſickly part of the *campaign* begins about the middle or end of Auguſt, whilſt the days are ſtill hot but the nights cool and damp, with fogs and dews: then, if not ſooner, the dyſentery prevails; and though its violence is over by the beginning of October, yet the remitting fever gaining ground, continues throughout the reſt of the *campaign*, and never entirely ceaſes even in winter-quarters till the froſts begin.

At the beginning of a *campaign* the ſickneſs is ſo uniform, that the number may be nearly prædicted; but, for the reſt of the ſeaſon, as the diſeaſes are then of a contagious nature, and depend ſo much upon the heats of ſummer, it is impoſſible to foreſee how many may fall ſick from the beginning to the end of autumn. It is alſo obſerved, that the laſt fortnight of a *campaign*, if protracted till the beginning of November, is attended with more ſickneſs than the firſt two months of the encampment: ſo that it is better to take the field a fortnight ſooner, in order to return into winter-quarters ſo much the earlier.

As to winter-expeditions, though ſevere in appearance, they are attended with little ſickneſs, if the men have ſtrong ſhoes, quarters, fuel, and proviſions.

Long marches in ſummer are not without danger, unleſs made in the night, or ſo early in the morning as to be over before the heat of the day. See *Pringle*, Obſerv. on the Diſeaſes of the army, p. 118, *ſeq.*

CAMPHOR-*tree*, in botany, the name of a ſpecies of *laurus*, according to Linnæus, with oval gloſſy leaves on lax pedicles. See the article LAURUS, *Append.*

It is a native of many parts of the Eaſt: Breynius calls it *arbor camphorifera Japonica foliis laurinis, &c.*

The *camphor* of the ſhops is prepared from the wood of this tree by a coarſe kind of ſublimation. See the article CAMPHOR, *Cycl.* and *Suppl.*

CAMPION, in botany, the Engliſh name of a genus of plants called by authors *lychnis*. See the article LYCHNIS, *Suppl.*

CANARY. See *Colouring of* MARBLE.

CANARY-*graſs*, in botany. See the article GRASS, *Append.*

CANCER, the crab, in zoology, the name of a genus of *ſquillæ*. See the article SQUILLA, *infra.*

CANDLE-*berry-tree*, a name uſed by ſome for the *myrica* of authors. See the article MYRICA, *Append.*

CANDY-*carrot*, in botany, a name uſed by ſome for the *myrrhis* of Candia. See the article MYRRHIS, *Suppl.*

CANDY-*tuft-tree*, in botany, a name given to the *thlaſpi* of authors. See the article THLASPI, *Suppl.*

CANE *(Suppl.)* — *Bambo* or *bamboo* CANE. See the articles BAMBO and ARUNDO, *Suppl.*

Dumb CANE, in botany, a name given by ſome writers to the *arum*. See the article ARUM, *Suppl.*

Fiſhing-rod-CANE, the name of a ſpecies of *arundo*, or reed. See the article ARUNDO, *Suppl.*

Indian flowering CANE, in botany, the name of a genus of plants called by Linnæus and Tournefort *canna* and *cannacorus*. Se the articles CANNA and CANNACORUS, *Suppl.*

Sugar-CANE, in botany, the Engliſh name of a genus of plants called by Linnæus *ſaccharum*. See the article SACCHARUM, *Suppl.* and SUGAR, *Cycl.*

CANNABINA, baſtard-hemp, in botany, the name of a diſtinct genus of plants, the characters of which are theſe: the flower is apetalous, conſiſting of a number of ſtamina, and is barren, the ſeed being produced on diſtinct female plants of the ſame genus, which have no viſible flower. The ſeeds are triangular, oblong, and contained in membranous capſules.

The ſpecies of *cannabina* enumerated by M. Tournefort, are theſe: 1. The Cretic male *cannabina*, with flowers. 2. The Cretic fruit-bearing or female *cannabina*. Vide *Tourn.* Inſt. Bot. Coroll. p. 52.

CANTERBURY-*bell*, in botany, a name given by ſome to the *campanula* of authors. See the article CAMPANULA, *Suppl.*

CANTHARIS, the glow-worm, in the hiſtory of inſects. See the article GLOW-*worm*, *Suppl.*

CANTHARUS *unctuoſus*, a name by which ſome authors call the *meloe*, or oil-beetle. See the article MELOE, *Append.*

CANUTI *avis*, the name by which ſome call a ſpecies of *tringa*. See the article TRINGA, *Suppl.*

CAP *(Suppl.)* — *Black* CAP, the name uſed by the common people in many parts of the kingdom for the pewit, a bird of the *larus* or ſea-gull kind. See the article PEWIT. *Suppl.*

CAPER *(Suppl.)* — *Bean* CAPER, a name given by ſome to the *fabago* of authors. See the article FABAGO, *Suppl.*

CAPILLUS *veneris*. See the article ADIANTUM.

CAPILLUS *terræ*. See the article ADIANTUM.

CAPITALIS *reflexa*, in ſurgery, a kind of bandage called by the French *capeline*. See the article CAPELINE, *Suppl.*

CAPITO *anodromus*, a name by which ſome authors have called the *zerta* or *zerte*, a fiſh living partly in large rivers and partly in the ſea, and in ſome degree reſembling the common river chubb in ſhape. *Geſner*, de Piſc. p. 1269. See the article ZERTA, *Suppl.*

CAPNIAS, or *capnitis*, in natural hiſtory, names uſed by the antients for the pale bluiſh jaſper with black veins and clouds. See the article JASPER, *Append.*

CAPNORCHIS, the Indian bulbous-rooted fumitory, in botany, the name of a ſpecies of fumitory. See the article FUMARIA, *Suppl.*

CAPON's *tail graſs*, in botany, the Engliſh name of a genus of plants called by authors *feſtuca*. See the article FESTUCA, *Suppl.*

CAPRA, in ornithology, the name by which ſome call the *capella*, or lapwing. See the article CAPELLA, *Suppl.*

CAPREA, a name uſed by Pliny for the roe-deer, a creature not in the leaſt allied to the goat kind. See the article CAPREOLUS, *Suppl.*

CAPRICORNUS, in zoology, the name of a ſpecies of *mordella*, a genus of four-winged flies. See the article MORDELLA, *Append.*

CARABUS, in zoology, the name of a genus of four-winged flies, whoſe antennæ are oblong, ſlender, and ſetaceous; the thorax is ſomewhat convex, marginated, of a cordated figure, and truncated in the hinder part. Vide *Hill*, Hiſt. Animal. p. 47.

CARASSIUS, a name given by ſome to a ſpecies of *cyprinus*, with twenty bones in the back fin, and the ſide line ſtrait. See CYPRINUS, *Suppl.*

CARATAS, in botany. See the article KARATAS, *Append.*

CARAWAY, or CARRAWAY, in botany, the Engliſh name of a genus of plants called by authors *carui*. See the article CARUI, *Suppl.*

CARBO *aquaticus*, a name uſed by Geſner for the cormorant. See the article CORMORANT, *infra.*

CARDIA,

CARDIA, a name given by Dr. Hill to the heart-ſhells. See the article HEART-*ſhell*, *Suppl.*

CARDINAL's *flower*, in botany, a name uſed by ſome for the *rapuntium* of authors. See the article RAPUNTIUM, *Suppl.*

CARIQUEIBEIU, in zoology. See the article JIYA.

CARLOCK, a name uſed by ſome for the *raphaniſtrum* of authors. See the article RHAPHANISTRUM, *Suppl.*

CARNATION, in botany, a name given to ſeveral ſpecies of the *caryophyllus*, or pink, ſee the article PINK, *Suppl.*

Spaniſh CARNATION, a name given by ſome writers to the *poinciana*. See the article POINCIANA, *Suppl.*

CAROB-*tree*, the Engliſh name of the *ſiliqua* of Tournefort and the *ceratonia* of Linnæus. See the article SILIQUA, *Suppl.*

Candy-CARROT, a name given by ſome to the *myrrhis*. See the article MYRRHIS, *Suppl.*

Deadly, or *ſcorching* CARROT, in botany, a name given to the *thapſia* of authors. See the article THAPSIA, *Suppl.*

Mountain CARROT, a name ſometimes given to a ſpecies of *fennel*. See the article FOENICULUM, *Suppl.*

CASSIA, in the Linnæan ſyſtem of botany is made to comprehend both the *caſſia* and *ſena* of Tournefort. See the articles CASSIA and SENA, *Suppl.*

CASSIDA, in zoology, the name given by Dr. Hill to a genus of beetles, called in Engliſh the tortoiſe-beetles. See the article SCARABÆUS, *Suppl.*

Under this genus are comprehended all the clypeated beetles, or thoſe covered with a hard cruſt, of which there are a great many ſpecies.

CASSIDONY, in botany, a name given by ſome to the *ſtoechas* of authors. See the articles STOECHAS, *Append.*

Mountain CASSIDONY, or *Golden* CASSIDONY, names uſed for the *gnaphalium* of authors. See the article GNAPHALIUM, *Suppl.*

CASSINE, the caſſioberry-tree, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is a decompound umbel; the perianthium is very ſmall, thick at the baſe, divided into five parts, obtuſe and permanent; the flower conſiſts of a ſingle petal, divided into five ſuboval, obtuſe, patent ſegments, larger than the cup; the ſtamina are five ſubulated patent filaments, ſhorter than the flower; the antheræ are ſimple; the germen of the piſtil is conic; there is no ſtyle; the ſtigmata are three, reflex and obtuſe: the fruit is a roundiſh berry, with three cells; the ſeeds are ſingle and oval.

The *maurocenia* is nearly allied to this genus, which Dillenius makes a ſpecies of *phyllerea*. Vide *Linnæi* Gen. Plant. p. 126.

CASSIOBERRY *tree*, in botany, the name of a genus of plants called by Linnæus *Caſſine*. See the article CASSINE, *ſupra.*

CASSUMNIAR, in the materia medica, a root approaching to the nature of zeodary, though belonging to a different ſpecies of plants.

We have it from the Eaſt Indies; its ſurface is ſomewhat wrinkled, and is marked at certain diſtances with circular rings, which ſurround it and riſe prominent above the reſt of the ſurface. It is of a very compact nature, hard and heavy; not eaſily cut through with a knife, or powdered in a mortar. When cut it ſhews a very ſmooth and ſhining ſurface; and when broken, is found to be much yellower within.

It has a fragrant aromatic ſmell, and is a very famous medicine in nervous caſes, being accounted an excellent cardiac and ſudorific. It is alſo given as a ſtomachic and carminative with ſucceſs, and is moſtly preſcribed in powder, boluſſes, or infuſions. Vide *Hill*, Hiſt. Mat. Med. p. 568.

CAT, the Engliſh name of a well known domeſtic quadruped, of the *felis* kind. See the article FELIS, *Suppl.*

CAT-*mint*, in botany, the Engliſh name of the *cataria* of authors. See the article CATARIA, *Suppl.*

CATARACT *(Cycl.* and *Suppl.)* — Though it be, generally ſpeaking, true, that the cauſe of *cataracts* is the opacity of the cryſtalline humor, yet it is certain that a real membrane covering the pupil, has been ſometimes, though rarely, found. See Mem. Acad. Scienc. 1708. and Dr. *Mead*'s Monit. & Pract. Medic. cap. xi.

CATERPILLAR *(Suppl.)*—*Connaught* CATERPILLAR, a kind of caterpillar found in Ireland. See the article WORM, *Suppl.*

CATERPILLAR-*plant*, in botany, a name given to the *ſcorpioides* of Tournefort. See the article SCORPIOIDES, *Suppl.*

CATERPILLAR-*ſhell*, the Engliſh name of a ſpecies of *turbo*. See the article TURBO, *Suppl.*

CAUDA *marina*, in botany, the name uſed by Dodonæus for the *myoſurus* of botanical writers. See the article MYOSURUS, *Append.*

Dead CAVES, *Live* CAVES } See the article LIVE *caves*, *Suppl.*

CEDAR *(Suppl.)*—*Baſtard* CEDAR, a name given to the *guazuma*, or *theobroma*, of authors. See the article THEOBROMA, *Suppl.*

Bermudas CEDAR, a name given to a ſpecies of juniper. See the article JUNIPER, *Suppl.*

CEDAR *of Lycia*, or *Phœnicia*, names given to a ſpecies of juniper. See the article JUNIPER, *Suppl.*

Virginia and Carolina CEDAR, names given to a ſpecies of juniper. See the article JUNIPER, *Suppl.*

White CEDAR, a name given to a ſpecies of cypreſs. See the article CUPRESSUS, *Suppl.*

CEIBA, in botany, a name given to the *xylon* of authors. See the article XYLON, *Suppl.*

CELANDINE *(Suppl.)* *Leſſer* CELANDINE, in botany, the name of a genus of plants called by authors *ranunculus*. See the article RANUNCULUS, *Suppl.*

CELASTRUS, in botany, the name of a genus of trees, called alſo *euonymoides*, and in Engliſh, the African ſpindle-tree.

The characters are theſe: the cup is a very ſmall plane perianthium, formed of one leaf, divided into five unequal obtuſe ſegments: the flower conſiſts of five equal, oval, patent, ſeſſile petals, with their tops turned back; the ſtamina are five ſubulated filaments, of the length of the flowers; the antheræ are very ſmall, the germen of the piſtil is alſo very ſmall, and is immerſed in a large plane receptacle marked with ten ſtriæ; the ſtyle is ſubulated and ſhorter than the ſtamina; the ſtigma is obtuſe and trifid; the fruit is a coloured oval capſule, obtuſely trigonal, gibbous, formed of three valves, and containing three cells, in each of which are ſome oval coloured ſeeds, ſmooth and half covered by a calyptra, which is alſo coloured, and has an unequal rim divided into four parts. *Linnæi* Gen. Plant. p. 88.

There is a ſpecies with a triple ſtigma, and no ſtyle.

CELLS *of plants*, *Cellæ plantarum*, thoſe partitions or hollow places in the huſks or pods of plants, in which the ſeeds are lodged. *Miller*, Gard. Dict.

CENTAURIA, in the Linnæan ſyſtem of botany, the name of a large genus of plants, comprehending the *centaurium majus*, *jacea*, and *cyanus* of Tournefort and others; the *calcitrapa*, *calcitrapoides*, *rhaponticum*, *rhaponticoides*, *amberboi*, and *crocodilium* of Vaillant.

The characteriſtics of this genus are theſe: the cup is imbricated with ſquamæ; the ſtamina are five extremely ſhort capillary filaments; there is no ſtigma, nor pericarpium; the receptacle is ſetoſe.

As to the diſtinctions of the above genera, as they are called, they are theſe: the cup of the *calcitrapa* is armed with ſingle ſpines, which are large and erect; and the ſeeds either naked or coronated: the cup of the *calcitrapoides* has ſmall cluſtered ſpines: the cup of the *rhaponticum* is formed of lax undivided membranes: and in the *rhaponticoides*, of lanceolated and acuminated ſquamæ: in the *amberboi*, the ſquamæ of the cup are obtuſe and ſimple: in the *jacea* the ſquamæ are ciliated: in the *cyanus* they are likewiſe ciliated, but ſhorter; and, laſtly, the ſquamæ in the *crocodilium* are aculeated, and the ſeed downy and plumoſe. Vide *Linnæi* Gener. Plant. p. 417.

CENTAURIUM *majus*. This is made a diſtinct genus of plants by Tournefort, but comprehended along with ſeveral others under that of *centauria* by Linnæus. See the article CENTAURIA, *ſupra.*

CENTAURY, in botany. See the article CENTAURIUM, *Suppl.*

CENTIPED *worm*, a term uſed for ſuch worms as have a great many feet, tho' the number does not amount to an hundred, as the word ſeems to import. See the article SCOLOPENDRA, *Suppl.*

Mr. Maloet relates the hiſtory of a man, who for three years had a violent pain at the lower part of the forehead, near the root of the noſe; at length he felt an itching, and afterwards ſomething moving within his noſtril, which he brought away with his finger; it was a worm of the *centiped* kind, an inch and an half long, which run ſwiftly. It lived five or ſix days among tobacco. The patient was free of his pain ever after. Mr. Littre mentioned a like caſe in 1708, of a larger *centiped* voided at the noſe, after it had thrown the woman, in whoſe frontal ſinus it was, into convulſions, and had almoſt taken away her reaſon. Hiſt. Acad. Scienc. 1733.

CENTRONIA, in ichthyology, the name by which Dr. Hill calls the *echini marini*, or *echinodermata*, called in Engliſh ſea-hedge-hogs. See the article ECHINODERMA, *Suppl.*

The doctor makes them a diſtinct ſeries of animals, living under the defence of ſhelly coverings, formed of one piece, and furniſhed with a vaſt number of ſpines, moveable at the creature's pleaſure.

Of the *centronia*, or ſea-hedge-hog, we have the following ſpecies: 1. The roundiſh *centronia*, with ſmall papillæ: this is a conſiderably large ſpecies; the colour of the whole ſhell being of a duſky red, and the ſpines only a third of an inch long. 2. The roundiſh *centronia*, with very large ſquare ſpines. 3. The roundiſh *centronia*, with very large rounded ſpines. 4. The roundiſh bluiſh *centronia*, with differently ſhaped ſpines. 5. The depreſſed cordated *centronia*, with capillaceous ſpines. 6. The depreſſed flat *centronia*, with a digitated edge. 7. The depreſſed plane *centronia*, with five perforations on the diſk. 8. The depreſſed *centronia*, with two perforations near the edge. 9. The flat biperforate *centronia*, with a digitated edge. 10. The oval depreſſed *centronia*, with an undulated edge and ſix perforations. 11. The roundiſh *centronia*, with crooked and faſciculated ſpines, called in Engliſh the ſea-apple. 12. The globoſe *centronia*, with needle-like ſpines, and thence called the needle-ſhell.

The other ſpecies of *centronia* are very numerous, but may be all comprehended under the following diviſions. 1. The roundiſh

roundiſh, or ſubgloboſe kind, called by Klein *cidares*. See the article TURBAN-*ſhell*, *Suppl.*

2. The cordated kinds, called by Klein *ſpatangi* and *ſpatagoides*. See the articles SPATANGI and SPATAGOIDES, *Suppl.*

3. The flat kinds, called by Klein *placentæ*. See the article PLACENTA, *Suppl.*

Klein, who has been at much pains to arrange theſe bodies, has divided them into a number of other genera; but they may be all ranked under one or other of theſe diviſions. But beſide the known recent ſpecies, we meet with ſeveral others, foſſile, of a very ſingular figure; for which ſee the articles ECHINITES and ECHINI *foſſiles*, *Suppl.*

CEPA *Aſcalonica*, the ſame with eſchalot, vulgarly called *ſhallot*. See ONION, *Suppl.*

CEPHALANTHUS, in the Linnæan ſyſtem of botany, the name of a genus of trees, the characters of which are theſe: the cup conſiſts of a common perianthium, which contains ſeveral flowers collected into a kind of head; and of a proper perianthium, which is erect, permanent, and divided into four ſegments; the flower conſiſts of a ſingle petal; the tube is ſlender; the limb is divided into four parts, acute, reflex, and of the length of the tube; the ſtamina are four filaments, inſerted into the flower, and ſhorter than its limbs; the antheræ are ſimple; the germen of the piſtil is placed within the flower; the ſtyle and ſtigma are both ſimple; the fruit is an oblong capſule, containing only one cell, ſeveral of theſe grow together, and form a roundiſh head; the ſeeds are numerous and oblong; the flower has its limb ſometimes divided into five ſegments, inſtead of four; and then the proper perianthium has alſo five ſegments, and there are five ſtamina.

This genus comprehends the *platanocephalus* of Vaillant, and the *valerianoides* of Petiver. Vid. *Linnæi* Gen. Plant. p. 38.

CERAMBYX, a name given by ſome authors to the *capricorn-beetle*. See CAPRICORN *beetle*, *Suppl.*

CERATONIA, in botany, the name under which Linnæus deſcribes the *ſiliqua* of Tournefort. See SILIQUA, *Suppl.*

CERCARIA, in zoology, a claſs of animalcules lately eſtabliſhed by Dr. Hill, and containing all thoſe with viſible tails and no limbs. See the article ANIMALCULE, *Append.*

CERCIS, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, called by Tournefort *ſiliquaſtrum*. See the article SILIQUASTRUM, *Suppl.*

CERNUA, in zoology, a name uſed by Gaza for the *orpheus*, a ſpecies of *ſparus*. See the article ORPHEUS, *Suppl.*

CESSAMPELUS, a name by which many call the hoary branched ſpecies of *convolvulus*. See the article CONVOLVULUS, *Suppl.*

CESTRUM, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by other botaniſts *jaſminoidis ſpecies* and *hediunda*.

The characters are theſe: the cup is a ſmall, cylindric, obtuſe, perianthium, formed of a ſingle leaf, which is divided into five ſegments at the rim, erect, and obſcure; the flower conſiſts of a ſingle infundibuliform petal; the tube is cylindric, very long and ſlender, the opening being roundiſh and the limb plicated, and formed into five equal oval ſegments; the ſtamina are five thread-like filaments, adhering longitudinally to the tube, only ſending out a little denticle in the middle, which ſtands inward; the antheræ are roundiſh, but ſomewhat tetragonal, and ſtand within the opening of the petal; the germen of the piſtil is of a cylindric, but ſomewhat oval form, of the length of the cup; the ſtyle is filiform, and of the length of the ſtamina; the ſtigma is thick, obtuſe, and ſlightly emarginated; the fruit is an oval oblong berry, containing only one cell; in which are numerous and roundiſh ſeeds. *Linnæi* Gen. Plant. p. 82.

CHACE *(Cycl.)—Wild goose* CHACE, a term uſed to expreſs a ſort of racing on horſeback, uſed formerly, which reſembled the flying of wild geeſe, thoſe birds generally going a train one after another, not in confuſed flocks as other fowls do. In this ſort of race the two horſes after running twelve ſcore yards had liberty, which horſe ſoever could get the leading, to ride what ground the jockey pleaſed, the hindmoſt horſe being bound to follow him within a certain diſtance agreed on by articles, or elſe to be whipped in by the tryers and judges who rode by; and which ever horſe could diſtance the other, won the race. This ſort of racing was not long in common uſe, for it was found inhuman and deſtructive to good horſes when two ſuch horſes were matched together. For in this caſe neither was able to diſtance the other 'till they were both ready to ſink under their riders, and often two very good horſes were both ſpoiled, and the wagers forced to be drawn at laſt. The miſchief of this ſort of racing ſoon brought in the method now in uſe, of running only a certain quantity of ground, and determining the plate or wager, by the coming in firſt at the poſt.

CHÆTIA, in zoology, the name of a genus of inſects of the *apteria* kind, without any viſible limbs. See INSECT, *Append.*

The *chætia* reſembles a hair, or a piece of fine thread; its ſurface is ſmooth, its body rounded, and very ſlender in proportion to its length. It is called in Engliſh the *hair-worm*, or *guinea-worm*. *Hill*'s Hiſt. of Anim. p. 14. See the article WORM, *Suppl.*

CHAFFER, in zoology, the Engliſh name of a ſpecies of beetle. See the article SCARABÆUS, *Suppl.*

CHAFFINCH, in ornithology, a bird of the *fringilla* kind, with a ferrugineous breaſt, and the wings black, ſpotted with white. See the article FRINGILLA, *Suppl.*

CHALICE-*ſhell*, or CUP-*ſhell*. See SHELL, *infra.*

CHALK *(Suppl.)—Silver* CHALK, *argentaria creta*, the Engliſh name of a kind of earth, not *chalk*. See the article ARGENTARIA *creta*, *Suppl.*

CHAMÆCRISTA, in botany, the name given by Rivinus to the *caſſia* of other botaniſts. See the article CASSIA, *Suppl.*

CHAMÆMILE, in botany, a name given to the *chamæmelum* of authors. See the article CHAMÆMELUM, *Suppl.*

CHAMÆMORUS, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts of five leaves; the fruit is compoſed of many acini, in form of the mulberry.

There is only one ſpecies of this plant known, which grows on the tops of the higheſt hills in the north part of England, but cannot be cultivated in a garden by any art. Vid. *Miller*'s Gard. Dict. in voc.

CHAMBER *(Cycl.)*—As to the proportions of *chambers*, their length ſhould be to the breadth as $1\frac{1}{2}$ to 1, or ſome ſmall matter leſs, but ought never to exceed that proportion; and as for the height, it ſhould be three fourths of the breadth. The height of the *chambers* of the ſecond ſtory, ſhould be a twelfth part leſs than the height of thoſe below: thus, if the height of the firſt ſtory be ſixteen feet, that of the ſecond will be fourteen feet eight inches. As to the height of the third ſtory, it ſhould be only three fourths of the ſecond.

In building bed-*chambers*, regard ſhould be had as well to the ſituation of the bed, as to that of the chimney. For which reaſon, the chimney ought not to be placed juſt in the middle, but diſtant from it about two feet, or two and an half, in order to make room for the bed, which prevents this inequality from being diſcerned. Build. Dict. in voc.

CHAR, in ichthyology. See the article CHARRE, *Suppl.*

CHARVIL, or CHERVIL, in botany. See the article CHERVIL, *Suppl.*

CHEESE-*runnet*, in botany, a name uſed by ſome for the *gallium* of authors. See the article GALLIUM, *Suppl.*

CHEMICAL *glaſſes*, how cæmented, when cracked: ſee the article CÆMENT, *Append.*

CHERMES, in the hiſtory of inſects, a genus of the four-winged flies, the roſtrum of which is ſituate under the breaſt, and the lateral legs formed for leaping.

This genus comprehends the alder-bug, the fir-tree-bug, the graſs-bug, and elm-tree-bug; together with thoſe of the birch, maple, willow, aſh, nettle, apple-tree, poplar, *&c.* *Hill*'s Hiſt. of Anim. p. 64.

CHERRY-*tree*, in botany, the Engliſh name of a diſtinct genus of plants, called by authors *ceraſus*. See the article CERASUS, *Suppl.*

Barbadoes-CHERRY, or *cowhedge*-CHERRY, names given by ſome to the *malpighia* of authors. See the article MALPIGHIA, *Suppl.*

Bay-CHERRY, *Bird*-CHERRY, *Laurel*-CHERRY, *&c.* names uſed by ſome for a genus of plants, called by authors *padus*. See the article PADUS, *Append.*

Cornelian-CHERRY, a name given by ſome to the *cornus*, or cornel-tree, of others. See the article CORNUS, *Suppl.*

Winter-CHERRY, a name uſed by ſome for the *alkekengi* and *ſolanum* of others. See the articles ALKEKENGI and SOLANUM, *Suppl.*

CHERVIL *(Suppl.)* — *Wild*-CHERVIL, in botany, a name given to the *myrrhis* of authors. See the article MYRRHIS, *Suppl.*

CHESNUT-*tree*, the Engliſh name of a genus of plants, called by authors *caſtanea*. See the article CASTANEA, *Suppl.*

It is pity *cheſnut*-plantations are not more common. They quickly grow up, and are not only pleaſing to the eye, but their flowers prove no leſs agreeable to the ſmell, and even the taſte will be gratified in time. Another conſiderable uſe of theſe plantations, is to defend thoſe of other trees from the injuries of cold and froſt, which they do to admiration.

Next to oak-timber, that of *cheſnuts* is moſt coveted by carpenters and joiners. It likewiſe makes the beſt ſtakes, vine-props, and hop-poles; and is extremely proper for mill-timber, and water-works, or wherever it may lie buried.

Cheſnut-timber is alſo proper for columns, tables, cheſts, chairs, ſtools, bedſteads, and wine-caſks; giving the liquor the leaſt tincture of any wood whatſoever, and is exceeding durable, if dipped in ſcalding oil, or well pitched. Build. Diction. in voc.

Horſe-CHESNUT, in botany. See HIPPOCASTANUM, *Suppl.*

Scarlet-horſe-CHESNUT, a name given by ſome to the *pavia* of authors. See the article PAVIA, *Suppl.*

CHIAN *marble*. See the article CHIUM *marmor*, *Suppl.*

CHIARO *ſcuro*, among painters. See CLAIR *obſcure*, *Cycl.*

CHICHES,

CHICHES, a name given to the *cicer*, or chich-pea. See the article CICER, *Suppl.*

CHICK-*weed (Suppl.)*—*Berry bearing* CHICK-*weed*, in botany, a name given to the *cucubalus*. See the article CUCUBALUS, *Suppl.*

CHICKLING-*pea*, a name uſed by ſome for the *lathyrus* of authors. See the article LATHYRUS, *Suppl.*

Cæments for broken CHINA-ware. See CÆMENT, *Append.*

CHIONANTHUS, the *ſnow-drop-tree*, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is a one-leaved perianthium, divided into four ſegments at the edge, erect, acuminated, and permanent; the flower conſiſts of a ſingle petal, and is divided into four parts; the tube is very ſhort and patulous; the limb is divided into four extremely long ſegments, which are erect, acute, of a linear figure, and ſomewhat uneven; the ſtamina are two very ſhort filaments, of a ſubulated figure, and are inſerted into the tube; the antheræ are cordated and erect; the germen of the piſtil is of an oval figure; the ſtyle is ſimple and of the length of the cup; the ſtigma is obtuſe and trifid; the fruit is a round berry, containing only one cell, in which is included a ſingle ſtriated oſicle. *Linnæi* Gen. Plant. p. 8.

This genus is allied to the *nyctanthes*, *ſyringa*, *olea*, *liguſtrum*, *phillyrea*, and *jaſmine*, but, moſt of all, to the flower bearing *fraxinus*. There is only one known ſpecies of it.

CHIVES, a name given to a ſpecies of onion. See the article ONION, *Suppl.*

CHIVES is alſo a name given to the ſtamina of plants. See STAMINA, *Suppl.*

CHLOREUS, a name given to a bird of the thruſh kind, otherwiſe called *galbula*. See GALBULA.

CHOCOLATE-*tree*, in botany. See the article CACAO, *Suppl.*

CHOUGH, *coracias*, a bird of the corvus kind, no where ſo frequent with us as in Cornwall, and thence called the *corniſh chough*. See the article CORACIAS, *Suppl.*

CHRENECRUDA, a term occurring in writers of the middle age, and expreſſing a cuſtom of thoſe times, but its ſignification is doubtful. It is mentioned in *Lege Salica*, Tit. 61. which ſays, he who kills a man, and hath not wherewithal to ſatisfy the law, or pay the fine, makes oath that he has delivered up every thing he was poſſeſſed of; the truth of which muſt be confirmed by the oaths of twelve other perſons. Then he invites his next relations by the father's ſide to pay off the remainder of the fine, having firſt made over to them all his effects by the following ceremony. He goes into his houſe, and taking in his hand a ſmall quantity of duſt from each of the four corners, he returns to the door, and with his face inward throws the duſt with his left hand over his ſhoulders upon his neareſt of kin. Which done, he ſtrips to his ſhirt; and coming out with a pole in his hand, jumps over the hedge. His relations, whether one or ſeveral, are upon this obliged to pay off the compoſition for the murder. And if theſe (or any one of them) are not able to pay, *iterum ſuper illum chrenecruda qui pauperior eſt, jactat, & ille totam legem componat.* Whence it appears, that *chrenecruda jactare*, is the ſame with throwing the duſt, gathered from the four corners of the houſe. Goldaſtus and Spelman tranſlate it *viridem herbam*, green graſs, from the German *gruen kraut*, or from the Dutch *groen*, green, and *gruid*, graſs. Wendelinus is of a contrary opinion, who thinks that by this word *denotari purificationis approbationem*, from *chrein*, pure, chaſte, clean; and *keuren*, to prove: ſo that it muſt refer to the oaths of the twelve jurors. Be this as it will, king Childebert reformed this law by a decree, chap. 15. both becauſe it favoured of pagan ceremonies, and by reaſon ſeveral perſons were thereby obliged to make over all their effects: *De crenecruda lex quam paganorum tempore obſervabant, deinceps nunquam valeat, quia per ipſam cecidit multorum poteſtas. Du Cange*, Gloſſ. Lat.

CHRISTMAS-*roſe*, in botany, the name uſed by ſome for a ſpecies of black *hellebore*. See the article HELLEBORUS, *Suppl.*

CHRISTOPHER-*herb*. See the article CHRISTOPHORIANA, *Suppl.*

CHROASTACES, in natural hiſtory, a genus of pellucid gems, comprehending all thoſe of variable colours, as viewed in different lights.

Of this kind are the *opal* and the *aſteria*, or *oculus cati*. See the articles OPAL and ASTERIA, *Suppl.*

CHRONOMETER, a term uſed by ſome for a kind of clock, or machine, ſo contrived as to meaſure a ſmall part of time very exactly, even to the ſixteenth part of a ſecond.

We have a deſcription of one of theſe, made by the ingenious Mr. George Graham, in *Deſaguliers*, Experim. Philoſ. vol. I. p. 375.

A *chronometer* is of great uſe for meaſuring ſmall parts of time in aſtronomical obſervations, the time of the fall of bodies, the velocity of running waters, &c. But long ſpaces of time cannot be meaſured by it with ſufficient exactneſs, unleſs its pendulum be made to vibrate in a cycloid; becauſe, otherwiſe, it is liable to err conſiderably, as all clocks are which have ſhort pendulums that ſwing large arcs of a circle. Id. ibid. p. 376.

CHROSTASIMA, in natural hiſtory, the name uſed by Dr. Hill for all pellucid gems, which have one ſimple and permanent appearance in all lights.

Of this kind are the diamond, the carbuncle, the amethyſt, the ſapphire, the beryl, the emerald, and the topaz. See the articles DIAMOND, CARBUNCLE, &c. *Suppl.*

CHRYSALIS, in natural hiſtory, the name of that ſtate otherwiſe called *aurelia*, in which butterflies and ſeveral other animals paſs the time between their caterpillar or other creeping ſtate, and their winged one.

In this ſtate no creatures afford ſo beautiful a variety as the butterfly kinds; and they all paſs thro' this middle ſtate, without one exception.

The figure of the *aurelia* or *chryſalis*, generally approaches to that of a cone, or at leaſt the hinder part of it is of this ſhape; and the creature, while in this ſtate, ſeems to have neither legs nor wings, nor has any power of walking. It ſeems, indeed, to have hardly ſo much as life, and to be reduced to a very imperfectly organized maſs of matter. It takes in no nouriſhment in this ſtate, nor has it any organs for the taking any; and indeed its poſterior part is all that ſeems animated, this having a power of giving itſelf ſome motions. The external covering of the *chryſalis* is cartilaginous and conſiderably large, and is uſually ſmooth and gloſſy; but ſome few of them have a few hairs, ſome are alſo as hairy as the caterpillars from which they are produced, and others are rough, or, as it were, chagreened all over.

In all of theſe there may be diſtinguiſhed two ſides; the one of which is the back, the other the belly of the animal; and on the anterior part of the latter, there may always be diſtinguiſhed certain little elevations running in ridges and reſembling the fillets wound about mummies. The part whence theſe have their origin, is eſteemed the head of the animal; the other ſide or back is ſmooth, and is of a rounded figure in moſt of the *chryſaliſes*; but ſome have ridges on the anterior part and ſides of this part; and theſe uſually terminate in a point, and make an angular appearance on the *chryſalis*.

From this difference is drawn the firſt general diſtinction of theſe bodies. They are by this divided into two claſſes; the round and the angular kinds. The firſt kind are by the French naturaliſts called alſo *feves*, from the common cuſtom of calling the *chryſalis* of the ſilk worm, which is round, by this name.

There is ſomething more regular in this diſtinction alſo than might be at firſt conceived; for the diviſion is continued from the fly ſtate: the rounded *chryſaliſes* being almoſt all produced by the phalenæ or moths; and the angular ones by the papilios or day-flies. There are ſeveral ſubordinate diſtinctions of theſe kinds, but in general they are leſs different from one another than the caterpillars from whence they are produced.

The head of thoſe of the firſt claſs, uſually terminates itſelf by two angular parts, which ſtand ſeparate one from the other, and reſemble a pair of horns. In ſome theſe horns are bent into the form of creſcents, and turned one towards the other. The elm caterpillar, called the *bedaude*, is one that furniſhes a *chryſalis* of this kind; other *chryſaliſes* have only one ſuch horn, inſtead of two. Theſe horns always give a remarkable figure in their extenſion along the belly of the *chryſalis*; and when the bark is examined, there is a very remarkable appearance from the lines which run there, the figure often reſembling, very exactly, a human face, or a maſque of ſome kind: there is an eminence in the middle of the back, which repreſents a noſe as well as an engraver could have faſhioned it; and there are always a number of other marks and eminences, which imagination may form into eyes, chin, and the other parts of a face; and often the reſemblance is ſo perfect as to ſurprize the obſerver.

There are a great variety, and a great deal of beauty in the figures and arrangement of the eminences and ſpots on the other parts of the body of the *chryſalis* of different kinds; ſome have an arrangement of elegant figures all along one ſide, and ſeeming to be a ſort of prickles propagated from every ring of the body; and others have a ſecond arrangement of theſe ſort of ſpines, which begin about the end of the figure of the human face, and run quite to the extremity. The *chryſaliſes* that are thus furniſhed, appear actually prickly; and there are ſome others which have only a few of theſe prickles on every part; but theſe have uſually two protuberances on their ſides, which have the appearance of the fins of fiſhes. Theſe and the like varieties in marks and figure, give very plain means of dividing the *aurelia* of the ſeveral claſſes into a number of diſtinct genera.

It is a general obſervation, that thoſe *chryſaliſes* which are terminated by a ſingle horn, afford day-butterflies of the kind of thoſe which have buttoned antennæ, and whoſe wings, in a ſtate of reſt, cover the under part of the body, and which uſe all their ſix legs in walking, thoſe of many other kinds uſing only four of them. Thoſe *chryſaliſes*, which are terminated by two angular bodies, and which are covered with a great number of ſpines, and have the figure of a human face on their back in the greateſt perfection, afford butterflies of the day kind and of that claſs, the characters of which are, their walking on four legs and uſing the other two, that is, the anterior pair, in the manner of arms or hands. The

chryſaliſes which have two angular bodies on their heads, but ſhorter than thoſe of the preceding, and whoſe back ſhews but a faint ſketch of the human face, and which have fewer ſpines, and thoſe leſs ſharp, always turn into that ſort of butterfly, the upper-wings of which are divided into ſegments, one of which is ſo long as to repreſent a tail, and whoſe under-wings are folded over the upper part of the back. A careful obſervation will eſtabliſh many more rules of this kind, which is not ſo perfect as to be free from all exceptions, yet are of great uſe, as they teach us in general what ſort of fly we are to expect from the *chryſalis*, of which we know not the caterpillar, and therefore can only judge from appearances.

Theſe are the principal differences of the angular *chryſaliſes*; the round ones alſo have their different marks not leſs regular than thoſe.

The greater number of the round *chryſaliſes* have the hinder part of their body of the figure of a cone; but the upper end, which ought to be its circular plane baſe, is uſually bent and rounded into a ſort of knee: this is uſually called the head of the *chryſalis*; but there are alſo ſome of this kind, the head of which is terminated by a nearly plane ſurface: ſome of the creeping ten-legged caterpillars give *chryſaliſes* of this kind, which have each of them two eminences that ſeem to bring them towards the angular kind. Some of theſe are of a long and ſlender conic figure, terminating in a ſharp point; others are more thick and ſhort, and blunter at the ends; and ſome are very ſhort, and have no part conic except the point: in ſome of the kinds alſo the rounded end or head is flatted on two ſides, and this flatneſs is continued a little way along the belly; and of the conic ones, ſome have a ſort of hollow on the back, reſembling engraved work. Some of this kind alſo are not conic, but are flatted on the belly, and only rounded on the back; and ſome of them have, as it were, a ſort of noſe that bends over the belly.

Among the angular *chryſaliſes* there are ſome whoſe colours ſeem as worthy our obſervation as the ſhapes of the others. Many of them appear ſuperbly clothed in gold: and this in the ſeveral ſpecies is of ſeveral colours; in ſome it is a pure yellow, in others a very pale whitiſh yellow, and in others a greeniſh; but in all, the gold is very bright, and appears like the burniſhed parts of gilding. It is theſe elegant ſpecies which have obtained the names of *chryſalis* and *aurelia*, which are derived from Greek and Latin words, ſignifying gold; and from theſe all other bodies of the ſame kind have been called by the ſame names, though leſs or not at all entitled to them. As ſome kinds are thus gilded all over, ſo others are ornamented with this gay appearance in a more ſparing manner, having only a few ſpots of it in different places on their back and belly. Some ſpecies alſo have ſilver in the place of gold, either extending itſelf all over them, or forming ſome particular ſpots upon their back and belly. Theſe obvious marks, however, are not to be depended upon as certain characters of diſtinction, for accidents in the formation of the *chryſalis* may alter them; and thoſe which naturally would have been gilded all over, may be ſometimes only ſo in part, and either theſe or the others may by accidents be ſo formed as to ſhew nothing of this kind at all, but be only of a duſky brown. Thoſe, however, which have neither ſilver nor gold to recommend them to our eyes, do not want other colours, and thoſe beautifully variegated. Some of them are all over of an elegant green, as is the *chryſalis* of the fennel caterpillar; others are of an elegant yellow, and ſome of a bright greeniſh tinge, variegated with ſpots of a ſhining black; we have a very beautiful inſtance of this laſt kind in the *chryſalis* of the elegant cabbage-caterpillar. The general colour of the *chryſalis* of the common butterflies, however, is brown: they are of a very elegant cheſnut colour, and vary from this into all the ſhades of brown, from the moſt deep and duſky to ſuch as are almoſt white. Some alſo are of a fine deep black, and of theſe many are ſo ſmooth and gloſſy, that they are equal to the fineſt Indian japan. The common caterpillar of the fig-tree gives an inſtance of one of theſe beautifully gloſſy ones; the caterpillar of the vine affords another of theſe fine black *chryſaliſes*.

The rounded *chryſaliſes* do not afford any thing of that variety of colouring ſo remarkably beautiful in the augular ones; they are uſually of a duſky yellow, in different ſhades, and are often variouſly ſpotted with black: but theſe, as well as all other *chryſaliſes*, before they arrive at their fixed colour, paſs through ſeveral other temporary ones, ſome being of a different colour when firſt produced from the caterpillar, from what they are a few days afterwards; and ſome varying ſo greatly, though only in degree, as not to be diſtinguiſhable by the moſt converſant eye for what they were when firſt produced. The green rough caterpillar of the cabbage has a *chryſalis* which is green at firſt, and from that gradually goes through all the ſhades of green to a faint yellow, which is its laſting colour; and one of the oak caterpillars yields a *chryſalis* beautifully ſpotted with red at its firſt appearance, but theſe ſpots change to brown for their fixed colour: the third day from their formation uſually fixes their laſting colours; and if they are obſerved to turn black in any part after this time, it is a ſign that they are dead or dying.

The ſeveral ſpecies of inſects, as a fly, a ſpider, and an ant, do not differ more evidently from one another, in regard to appearance, than do a caterpillar, its *chryſalis*, and a butterfly produced from it; yet it is certain that theſe are all the product of the ſame individual egg; and nothing is more certain than that the creature which was for a while a caterpillar, is, after a certain time, a *chryſalis*, and then a butterfly. Theſe great changes produced in ſo ſudden a manner, ſeem like the metamorphoſes recorded in the fables of the antients, and indeed it is very probable that thoſe fables firſt took their origin from theſe changes. It appears in theſe caſes, that an inſect is immediately transformed into another perfectly different inſect, and this was for a long time ſuppoſed to be really the caſe: better obſervation, however, and the more improved modern philoſophy informs us, that nature does not uſe any ſuch violent and ſudden changes in any of her operations. Malpighi and Swammerdam were the firſt who traced the animal through all its ſeveral forms, and they ſoon found that there was in reality no ſuch change as was here talked of, but that the creature remained the ſame in all: they diſſected the creature a little before the times of their ſeveral changes, and found that the whole ſuppoſed metamorphoſis was due to the firſt ſtate's being a ſort of caſe, under cover of which it was neceſſary that certain parts, hereafter to become neceſſary to the animal, ſhould arrive at their proper ſtate; and that theſe parts were very diſtinct in the body of the animal at the time that it threw off its outer coat, in order to appear in another form, in which they had a better opportunity of becoming as dry and hard as they ought to be, and to be prepared for their final appearance in the open ſtate of the flying inſect. They evidently ſaw and proved, that the butterfly was all the time alive and growing within the body of the caterpillar, and that this growth was effected by a developement of parts, as we ſee to be the caſe in all ſorts of organized bodies, in the vegetable as well as animal world: and while they threw off all the falſe marvels of the tranſformations and changes which the world had before believed, in regard to theſe animals, they gave matter enough of real admiration in the diſcovery of the truth itſelf.

The words tranſformation and metamorphoſis then are found to be falſe terms in theſe ſubjects; but as we have already explained the true ſyſtem of the whole, we may be allowed to uſe theſe ſtill, as the moſt received terms, for theſe ſudden changes.

Every animal of this kind, we find, undergoes two of theſe tranſformations, the one out of the caterpillar into the *chryſalis*, the other out of the *chryſalis* into the butterfly. The laſt of theſe, when properly conſidered, has nothing very wonderful in it, as we find, on an accurate inſpection, that the *chryſalis* itſelf is a butterfly, only folded over with a thin ſkin. We find in it, while yet in this ſtate, every part of a butterfly; the wings, the legs, the antennæ, and the trunk may be all traced out; but they are folded and laid together in ſuch a manner, that the creature cannot in this ſtate make any uſe of them, nor is it fit that it ſhould, as they are all of them yet too ſoft and tender for uſe, and are placed in this ſtate with no other intent, than that they may be by degrees hardened.

The back of a *chryſalis*, when nicely obſerved, ſhews us the origin of the wings; and we may count in it the number of rings of the body. It is eaſy to find that there are nine of theſe rings; there are therefore three wanting of the number that the caterpillar had: theſe are the three at the anterior end, and of theſe the third, or that moſt diſtant from the head, is in part ſeen and in part hid by a cruſt, which is not divided in an annular manner, but which takes up the place of the two firſt rings; this is uſually called the corcelet, in the *chryſalis*, becauſe it is found to lie over the corcelet of the body of the encloſed butterfly: but it is on examining the other ſide, or belly of the *chryſalis*, that we find the ſeveral parts moſt peculiar to the butterfly. This part of the *chryſalis* is always carved as it were in relief, and every figure of this work is ſome part of the animal. Two plates, larger than all the reſt, which have their origin at the corcelet, and either touch or nearly meet one another on the belly, are the elevations formed by the four wings; theſe are placed two on each ſide, and have a much ſmaller extent allowed them than they have afterwards, when the animal is at liberty to fly about. There remains a triangular ſpace between the origin of the wings and the place where they meet in a point, and this is the receptacle of the parts, of the utmoſt conſequence to the animal. In this part one may eaſily trace nine ſtreaks, running longitudinally from the top, or head part, toward the tail; theſe are the legs, antennæ, and trunk of the butterfly, which are all extended ſtrait along the belly, in this ſtate; theſe are all much ſhorter than when the animal is in its perfect ſtate; and the trunk, when the *chryſalis* belongs to a ſpecies that has one, is not rolled up into a ſpiral form, but lies at length in the middle between the antennæ and pairs of legs.

The parts being thus diſtinguiſhable in the *chryſalis*, we eaſily find the difference of the ſpecies or claſs of the fly that is to proceed from it. The naked eye ſhews whether it be one of thoſe that have, or of thoſe that have not a trunk, and the aſſiſtance of a microſcope ſhews the antennæ ſo diſtinctly, that we are able to diſcern whether it belongs to the day or night claſs; and often to what genus, if not the very ſpecies: nay,

in the plumoſe horned kinds we may ſee by the antennæ whether a male or female phalena is to be produced from the *chryſalis*, the horns of the female being in this ſtate evidently narrower and appearing leſs elevated above the common ſurface of the body, than thoſe of the male.

All theſe parts of the *chryſalis*, however, though ſeen very diſtinctly, are laid cloſe to one another, and ſeem to form only one maſs; each of them is covered with its own peculiar membrane in this ſtate, and all are ſurrounded together by a common one, and it is only through theſe that we ſee them, or rather we ſee on theſe the figures of all the parts moulded within, and therefore it requires attention to diſtinguiſh them. There is however a time at which they are very eaſily diſtinguiſhed, when the external covering is thin and tranſparent, nay when this no longer exiſts, and when the others are perfectly tranſparent; and all the exterior parts may, after this ſtate, be eaſily ſeparated from one another. This however is at a time when it might be leaſt expected that any thing worthy obſervation ſhould appear; and therefore authors have diſregarded it; it is at that time when they ſay the whole is a maſs of jelly-like matter that this is to be ſeen, that is, at the time of its being firſt produced out of the body of the caterpillar; but this is a ſeaſon of ſhort duration, and muſt be careſully attended to.

The *chryſalis* is ſoft when firſt produced, and is wetted on the front with a viſcous liquor; its ſkin, though very tender at firſt, dries and hardens by degrees; but this viſcous liquor, which ſurrounds the wings, legs, &c. hardens almoſt immediately, and in conſequence faſtens all thoſe limbs, &c. into a maſs, which were before looſe from one another; this liquor as it hardens loſes its tranſparence and becomes brown: ſo that it is only while it is yet moiſt that theſe parts are to be ſeen diſtinct.

It is evident from the whole, that the *chryſalis* is no other than a butterfly, the parts of which are hid under certain membranes, which faſten them together, and when the limbs are arrived at their due ſtrength they become able to break through theſe membranes, and then expand and arrange themſelves in their proper order.

The firſt metamorphoſis therefore differs in nothing from the ſecond, except that the butterfly comes from the body of the caterpillar in a weak ſtate, with limbs unable to perform their offices; whereas it comes from the *chryſalis* perfect. *Reaumur*, Hiſt. Inſ. vol. i. p. 2—17. See the article FEVE, *Suppl.*

Mr. Reaumur has given us many curious obſervations on the ſtructure and uſes of the ſeveral coverings that attend the varieties of the caterpillar kind in this ſtate.

The creatures in general remain wholly immoveable in this ſtate, and ſeem to have no buſineſs in it, but a patient attendance on the time when they are to become butterflies: and this is a change that can happen to them only as their parts, before extremely ſoft and weak, are capable of hardening and becoming firm by degrees, by the tranſpiration of that abundant humidity which before kept them ſoft; and this is proved by an experiment of Mr. Reaumur, who encloſing ſome *chryſaliſes* in a glaſs tube, found, after ſome time, a ſmall quantity of water at the bottom of it, which could have come there no other way but from the body of the incloſed animal. This tranſpiration depends greatly on the temperature of the air: it is augmented by heat, and diminiſhed by cold; but it has alſo its peculiarities in regard to the ſeveral ſpecies of butterfly to which the *chryſalis* belongs.

According to theſe obſervations, the time of the duration of the animal in the *chryſalis* ſtate muſt be in different ſpecies very different; and there is indeed this wide difference in the extremes, that ſome ſpecies remain only eight days in this ſtate, and others eight months. It may be eaſily conceived from this, that there may be in one year two generations of caterpillars of the ſame ſpecies; and that the eggs laid by the butterfly in the latter end of autumn, having lain the winter in that ſtate, become hatched early in the ſpring, and the caterpillars produced from theſe being come to the *chryſalis* ſtate, remain in it but a little time, becauſe they are favoured by the warmth of the ſeaſon; and hatching into butterflies, theſe ſpeedily lay their eggs, that they may have a remainder of warm weather to be hatched in the remainder of the ſummer ſeaſon, and give a race of ſtrong caterpillars before the end of autumn: but circumſtances muſt happen very favourably in all reſpects, in order to bring this about.

Mr. Reaumur has proved that heat and cold make great differences in the time of hatching of the butterfly from the *chryſalis* ſtate: and this he particularly tried with great accuracy and attention, by putting them in veſſels in warm rooms, and in ice-houſes, and it ſeemed wholly owing to the haſtening or retarding the evaporation of the abundant humidity of the animal in the *chryſalis* ſtate, that it ſooner or later appeared in the butterfly form. He varniſhed over ſome *chryſaliſes*, in order to try what would be the effect of thus wholly preventing their tranſpiration; and the conſequence was, that the butterfly came forth from theſe two months later than their natural time. Thus was the duration of the animal in this ſtate lengthened, that is its life was lengthened, but that without any advantage to the creature, ſince it was in the time of its ſtate of inaction, and probably of inſenſibility.

Though this was of no conſequence, Mr. Reaumur deduces from it a hint that ſeems to be of ſome. He obſerves that hen's eggs, of which we make ſo many uſes, and eat in ſo many forms, are properly a ſort of *chryſalis* of the animal; their germ, after they are impregnated by the cock, containing the young animal alive, and waiting only a due degree of warmth to be hatched and appear in its own form. Eggs tranſpire notwithſtanding the hardneſs of their ſhells; and when they have been long kept, there is a void found near one of their ends between the ſhell and the internal membrane; this is a mark of their being ſtale, and is the effect of an evaporation of part of their humidity: and the ſame varniſh which had been uſed to the *chryſaliſes*, being tried on eggs, was found to preſerve them for two years, as freſh as if laid but the ſame day, and ſuch as the niceſt palate could not diſtinguiſh from thoſe that were ſo.

It is not yet known how much farther this uſeful ſpeculation might be carried, and whether it might not be of great uſe even to human life, to invent ſomething that ſhould act in the manner of this varniſh, by being rubbed over the body, as the athletæ did of old, and the ſavages of the Weſt Indies do at this time, without knowing why. See the article EGGS, *Suppl.*

But to return to the inſects which are the ſubjects of this article: their third ſtate, that in which they are winged, is always very ſhort, and ſeems deſtined for no other action but the propagation of the ſpecies. See the article GENERATION, *Suppl.*

CHRYSTAL *(Suppl.)*—*Sprig* CHRYSTAL, the Engliſh name of a genus of *chryſtals*, called by authors *ellipomacroſtyla*. See the article ELLIPOMACROSTYLA, *Suppl.*

Pebble CHRYSTAL, the name of a ſpecies of *petridium*. See the article PETRIDIA, *Append.*

CHRYSOLITE *paſte*. The way of making an artifical *chryſolite* paſte is this: take of prepared *chryſtal* two ounces, ordinary red lead eight ounces; mix theſe well together, and add crocus martis made with vinegar, twelve grains: mix all together; put them into a crucible, lute it over, and bake the whole for twenty-four hours, or longer, in a potter's kiln, and it will produce a very elegant reſemblance of the true *chryſolite*.

CHRYSOMELA, in zoology, a genus of inſects frequently confounded with the beetles, the antennæ of which are made in form of bracelets, or necklaces of beads, and are thickeſt toward their extremity: the body, in figure, approaches to oval, and the thorax is oblong and rounded.

Of this genus Dr. Hill enumerates a great many ſpecies, for which ſee his Hiſt. Anim. p. 43, *ſeq.* See alſo the article SCARABÆUS, *Suppl.*

CHRYSOMITHRES, in ornithology, the name by which ſome call the gold-finch. See the articles CARDUELIS, *Suppl.* and GOLD-FINCH, *Append.*

CHRYSOPHYLLUM, the *ſtar-apple*, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is a ſmall permanent perianthium, compoſed of five roundiſh leaves; the flower is formed of a ſimple campanulated petal; the limb being divided into ten ſegments, which are alternately roundiſh and patalous, and narrow and erect; the ſtamina are five ſubulated filaments; the antheræ are ſimple; the germen of the piſtil is roundiſh; the ſtyle is ſubulated; the ſtigma is ſimple; the fruit is a large berry, containing only one cell; the ſeeds are oſſeous, and three in number.

This genus comprehends the *cainito* of Plumier, and is of kin to the *rhamnus* and *ſideroxylum*. Vide *Linnæi* Gen. Plant, p. 81. See the articles RHAMNUS, *Suppl.* and SIDEROXYLUM, *Append.*

CHURN *owl*, a name given to a beautiful bird called by authors *caprimulgus*. See the article CAPRIMULGUS, *Suppl.*

CICUTARIA *(Suppl.)* is alſo uſed for a ſpecies of *cicuta*, or hemlock, called by ſome writers fool's-parſley. See the article CICUTA, *Suppl.*

Sweet CICUTARIA, the name ſometimes given to a ſpecies of *myrrhis*. See the article MYRRHIS, *Suppl.*

CIBOULS, a name given by ſome to a ſpecies of onions. See the article ONION, *Suppl.*

CICELY, the name of a genus of plants, called by authors *myrrhis*. See the article MYRRHIS, *Suppl.*

CILERY, in architecture, a term uſed to denote the drapery, or leaveage, which is wrought upon the heads of pillars. Build. Dict. *in voc.*

CIMELIARC, in church-architecture, the room where the plate, veſtments, &c. belonging to the church, are kept; this, in Engliſh, is called a veſtry.

CINNAMON-*tree*, in botany, makes only a ſpecies of the *laurus*, according to Linnæus; diſtinguiſhed by its oblong-ovated, trinervous, plane leaves. See the article LAURUS, *Append.*

Its berries are an excellent carminative, and much uſed in medicine.

CINQUEFOIL *(Suppl.)* — *Strawberry*-CINQUEFOIL, the name by which ſome call the *pentaphylloides* of Tournefort. See the article PENTAPHYLLOIDES, *Suppl.*

CIRSIUM, in botany, the name of a genus of plants, according to Tournefort, but comprehended under the *carduus*, or thiſtle, by Linnæus. See the article THISTLE, *Suppl.*

CISTUS *(Suppl.)* — *Dwarf* CISTUS, a name given by ſome to the *helianthemum*, or ſmall ſun-flower. See the article HELIANTHEMUM, *Suppl.*

CITRINE *ſtœchas*, in botany, a name uſed by ſome for a genus of plants called goldy-locks. See the article ELYCHRYSUM, *Suppl.*

CITRON *(Cycl. and Suppl.)* — CITRON *water*, a well known ſtrong water, or cordial, which may be thus made: take of fine thin lemon-peel eighteen ounces, of orange-peel nine ounces, perfect nutmegs one quarter of a pound, alcohol perfect, that is, the fineſt and beſt rectified ſpirit of wine two gallons and an half; digeſt in balneo mariæ for one night; draw off with a ſlow fire; then add as much water as will juſt make the mixture milky (which will be about ſeven quarts or two gallons) and add alſo two pounds of fine ſugar candy.

This compoſition may be improved by freſh elder-flowers hung in a cloth in the head of the ſtill, ſprinkled with amber-greeſe in powder, or its eſſence. This article is referred to WATER, but is there omitted.

CITY *(Cycl.)* — It has been obſerved that large *cities* are more liable than other places to peſtilential and putrid diſorders, which is owing to the ſtagnation and corruption of the air. This is always the caſe in thoſe which are low and unprovided with common ſewers; where the ſtreets are narrow and foul, the houſes dirty, water ſcarce, and jails and hoſpitals crowded: alſo when in ſickly times the burials are within the walls, or when dead animals and offals are left to rot in the kennels or on dunghills; when drains are not provided to carry off any large body of ſtagnating water in the neighbourhood; when fleſh-meats make the greateſt part of the diet, without a proper mixture of greens, bread, wine, or fermented liquors; from the uſe of old mouldy grain. In proportion to the number of theſe and the like cauſes concurring, a *city* will be more or leſs ſubject to peſtilential diſeaſes, or to receive the leaven of the true plague brought into it by any merchandize. *Pringle*, Obſervat. on the Diſeaſes of the Army, p. 284, *ſeq.*

However, as great *cities* furniſh many materials for vitiating the air, they likewiſe afford two conſiderable antidotes; the firſt ariſes from the circulation of the air, by means of the conſtant motion of people and carriages, and of the draughts made by fires: the other depends on the great quantity of an acid produced by fuel, the ſtrongeſt reſiſter of putrefaction. *Id. ibid.* p. 297.

CLARY, or *garden* CLARY, a name given to the *ſclarea* of Tournefort. See the article SCLAREA, *Suppl.*

Wild CLARY, in botany, the ſame with the *horminum* of Tournefort. See the article HORMINUM, *Suppl.*

CLEAVERS, or CLIVERS, in botany, the Engliſh name of a genus of plants called by authors *aparine*. See the article APARINE, *Suppl.*

CLEDGE, a name given by the miners to the upper part of the ſtratum of fuller's earth. See the article FULLER's *earth*, *Suppl.*

CLEMATIS, in botany, the name of a genus of plants, the characters of which are theſe: there is no calyx; the flower conſiſts of four lax oblong petals, of an uncertain ſhape; the ſtamina are numerous ſubulated filaments, ſhorter than the flower; the antheræ adhere to the ſides of them; the germina are numerous, compreſſed, and terminate in ſubulated ſtyles, which are longer than the ſtamina; the ſtigmata are ſimple; there is no pericarpium; the receptacle is capitated and ſmall; the ſeeds are numerous, roundiſh, compreſſed, and have the ſtyle adhering to them.

This genus comprehends the *clematitis*, *flammula*, and *viticella* of authors. See the article CLEMATITIS, *Suppl.*

CLIMBER, in botany, a name given to the *clematitis* of authors. See the article CLEMATIS, *Append.*

CLIVERS, or CLEAVERS, in botany. See the article APARINE, *Suppl.*

CLOCK *(Cycl.)* — What is inſerted in the *Cyclopædia* on this head, is taken from *Derham*'s Artificial Clock-maker. Since that time a fuller and more complete treatiſe on this ſubject has been publiſhed by Mr. Thiout, at Paris, which is recommended in the Hiſtory of the Royal Academy of Sciences, an. 1740.

CLOUDBERRY, in botany, the Engliſh name of a genus of plants, called in Latin *chamæmorus*. See the article CHAMÆMORUS, *Append.*

CLOWN's *wound-wort*, in botany, a name uſed by ſome for the *ſideritis* of authors. See the article SIDERITIS, *Suppl.*

COASTMARY, or COSTMARY, a name given by ſome to a ſpecies of tanzy, called by others *balſamita*. See the article TANACETUM, *Suppl.*

COB-*nut*, a name given by ſome to the *corylus*, or hazle. See the article HAZLE, *Suppl.*

COBELLA, in zoology, the name of a ſpecies of *coluber*. See the article COLUBER, *Append.*

COBWEB. This ſubſtance, dried and powdered, is eſteemed by ſome as a good aſtringent and abſorbent.

COCCUS, in the hiſtory of inſects, the name of a very comprehenſive genus, the trunk of which ariſes from their breaſt; the body is cetoſe behind; the wings only two, placed erect, and to be found only on the males.

This genus contains all the progal-inſects of Reaumur. See the article PROGAL-INSECT, *Suppl.*

The principal ſpecies are: 1. The *kermes*, or *coccus* of the holm-oak. 2. The Poland ſcarlet-grain, or the purple *coccus* of the roots of plants. 3. Cochineal, or the *coccus* of the opuntia. 4. The green houſe-bug, or the *coccus* of the orange tree. 5. The water-*coccus*, found on the leaves of the water-lilly. 6. The *coccus* of the birch tree. 7. The *coccus* of other inſects. 8. The *coccus* of canary-grais. 9. The *coccus* of the *jacobæa*. 10. The *coccuſes* of the alder, peach, *&c.* See the article KERMES, *&c. Suppl.*

COCCYGRIA, in botany, the name of a genus of plants, called by Tournefort *cotinus*. See the article COTINUS, *Suppl.*

COCK, *gallus*, in ornithology, the Engliſh name of the male of the gallinæ-kind. See the articles GALLINÆ and GALLUS, *Suppl.*

The front part of the *cock*'s head is ornamented with a longitudinal fleſhy creſt, or comb; and the wattles on the throat are two, they alſo are longitudinal and fleſhy.

In the choice of a dunghill-*cock*, he ſhould be of a large body, very long from the head to the rump, thick in the girth, the neck long, looſe, and high; the comb, wattles, and throat large; the eyes round and large, and anſwerable to the colour of his plume or main, as grey with grey, yellow with yellow, and ſo of the reſt; his beak ſhould be ſtrong and hooked; and his main or neck-feathers very long and gloſſy, covering his neck and ſhoulders; the legs ſhould be ſtrait and of a long beam, with very large and long ſpurs, a little bending; the colour ſhould be black, yellow, or browniſh; the claws ſhould be long and ſtrong; the tail long, bending back and covering the whole body; the wings very ſtrong; and the general colour ſhould be reddiſh.

Game COCK. See the article GAME, *Suppl.*

Indian COCK, the Engliſh name of a diſtinct genus of birds called by zoologiſts *crax*. See the article CRAX, *Suppl.*

COCK's-*comb*, in botany, a name given to a ſpecies of *pedicularis*, or louſe-wort. See the article PEDICULARIS, *Suppl.*

COCK's-*comb* is alſo a name given to a ſpecies of amaranth. See the article AMARANTH, *Suppl.*

COCK's-*foot-graſs*, in botany, a name given to a ſpecies of graſs. See the article GRASS, *Append.*

COCK's-*head*, in botany, the Engliſh name of a genus of plants called by authors *onobrychis*. See the article ONOBRYCHIS, *Suppl.*

COCK-*throppled*, a name given by dealers in horſes to one whoſe wind-pipe is ſmall and bends like a bow when he bridles his head. See the articles HORSE and HUNTER, *Suppl.*

COCKLE, *pectunculus*, the Engliſh name of thoſe *pectens* which have no ears. See the article PECTEN, *Suppl.*

COCO-*nut*, or COCOA-*nut*, in botany, the ſame with the cacao of Tournefort. See the articles CACAO, *Suppl.* and CHOCOLATE, *Cycl.*

COCOON. See the article SILK.

COD, in ichthyology, the Engliſh name of a ſpecies of *gadus*. See the article GADUS.

CODLIN-*tree*, in botany, the name of a ſpecies of apple-tree. See the articles APPLE and MALUS, *Suppl.*

CODLINS *and cream*, the name of a genus of plants called by Tournefort *Chamænerium*. See the article CHAMÆNERIUM, *Suppl.*

CŒNOTAPH. See the article CENOTAPH, *Cycl.*

CŒRULEUM *nativum*, a name frequently uſed by the antients for the friable blue ochre, called *lapis armenus*. See the article ARMENUS *lapis*, *Suppl.*

COFFEE-*tree*, the Engliſh name of a ſpecies of jaſmine. See the articles JASMINE, *Suppl.* and COFFEE, *Cycl.*

COGGLE, a ſmall fiſhing-boat upon the coaſt of Yorkſhire: it is alſo called a little *cogge*, from the old Teutonic *kogge*, a ſhip; whence the middle aged Latin *coggo*, *cogga*, *&c. Preparatis coggionibus*, *galleis*, *& aliis navibus*, *&c.* Mat. Paris. And hence the Latin *cogcio*, a wandering and begging ſeaman; and the *cogciones*, cog-men or boat-men, who, after ſhipwreck, or loſſes by ſea, travelled about to defraud the people by begging and ſtealing, are reſtrained by many civil and good laws. *Du Freſne.*

COIX, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by others *lacryma Jobi*. See the article LACRYMA, *Append.*

COLCOTHAR *(Cycl. and Suppl.)* — The Latin writers of the middle ages uſe *colcothar* as a name of vitriol in general, which was called by the Greeks *chalcanthum*.

Colcothar is originally an Arabic word, which does not ſignify the common vitriol, but the *chalcitis*. The word has been ſpelt *calchuthar*, and from this the word *chalcitis* differs not very much. The Greeks of the middle ages followed the Arabians in the uſe of the word *colcothar*, but added to it a termination proper to their language, and particularly to the cuſtom of thoſe times, which ſeemed not to expreſs exactly the ſame thing, but a diminutive of it: they wrote it *colcotharion*, or *chalcitarion*. This they alſo called the *orchis*, *orchidion*, the *ladi eladion*, and ſo in a thouſand other inſtances. Avicenna uſes the word *zagi* to expreſs this ſubſtance, but then he is by no means determinate

minate in it, but makes it include the *miſy*, *ſory*, and *melanteria*, as well as the *chalcitis*; but diſtinguiſhing in another place the ſeveral kinds of *zagi*, he tells us, that one was the *chalcand*, which was green; a ſecond the *chalcitis*, which was yellow; a third the *ſory*, which was red. *Alzagiat* is a name alſo uſed by him to expreſs all theſe kinds; and this word the interpreters generally render *atramenta*, inks. This is generally ſuppoſed to expreſs their being all black ſubſtances, which is not the caſe; but all that it does ſignify is, that they are all vitriolic foſſils: *atramentum* being a name of vitriol, as a ſubſtance uſed in the making of ink.

COLD *(Suppl.)* — The diſeaſes ariſing from *cold*, are all of the inflammatory kind, *viz.* coughs, pleuriſies, peripneumonies, rheumatic pains, and conſumptions; which, in the army, are almoſt always owing to neglected coughs. All poſſible means ought therefore to be uſed, in order to remove theſe in the beginning; for which purpoſe, ſmall and repeated bleedings are moſt efficacious, and likewiſe prove highly beneficial in coughs and the confirmed conſumption, even after a purulent ſpitting and hectic ſymptoms have appeared. The quantity drawn may be from four to ſeven or eight ounces, once in eight or ten days. It is obſervable, that the patients never find themſelves ſo much relieved on the firſt, as on the ſecond or third night after veneſection. See CONSUMPTION, *Append.*

COLD-*finch*, in zoology, the name of a bird of the *œnanthe* kind, or nearly approaching to that genus, common about the Peak in Derbyſhire. Its belly is white; its breaſt of a yelloviſh brown, and its head and back of a browniſh or greeniſh grey; the long feathers of its wings and tail are black, but with ſome variegation of white toward the end; its beak is ſlender, ſtrait, and ſomewhat ridged or triangular; it feeds on worms and other inſects. *Ray*'s Ornithology, p. 170.

COLE-*fiſh*, a name given to a ſpecies of beardleſs *gadus*. See the article GADUS, *Suppl.*

COLE-*wort*, the Engliſh name of a ſpecies of *cabbage*. See the articles CABBAGE and BRASSICA, *Suppl.*

Sea-COLE-*wort*, a name given to the *convolvulus* of authors. See the article CONVOLVULUS, *Suppl.*

COLLAR, among builders, the ſame with *cincture*. See CINCTURE, *Cycl.*

COLLAR-*beam*, among houſe-carpenters, the beam which is framed croſs betwixt two principal rafters. Build. Dict. in voc.

COLLIFLOWER, the name of a kind of *cabbage*. See the articles CABBAGE and BRASSICA, *Suppl.*

COLOCASIA, in botany, a name uſed by ſome for a ſpecies of *arum*. See the article ARUM, *Suppl.*

COLOQUINTIDA, a name often uſed for the *colocynthis* of botanical writers. See the article COLOCYNTHIS, *Suppl.*

COLT's *foot (Suppl.)* — *Alpine* COLT's *foot*, a name uſed by ſome for the *cacalia* of authors. See the article CACALIA, *Suppl.*

COLUBER, in zoology, the name of a very numerous genus of ſerpents, the abdomen of which is covered with ſcuta, and the under part of the tail with ſquamæ or ſcales.

Of this genus are the *natrix torquata*, the viper, and a great many other ſpecies. See the articles NATRIX, VIPER, *&c. Suppl.*

COLUMBINA *marga*, the name by which Pliny calls the ſtony bluiſh marle. See the article MARLE, *Suppl.*

COLUMBINE *(Suppl.)* — *Feathered* COLUMBINE, a name uſed by ſome for a plant known among authors by that of *thalictrum*. See the article THALICTRUM, *Suppl.*

COLUMNAR-*marble*, the ſame with the *baſaltes*, or *lapis lydius*. See the article BASALTES, *Cycl.* and *Suppl.*

COMB *(Suppl.)* — *Ladies*-COMB, or *Venus* COMB, the name of a diſtinct genus of plants, called by Tournefort *ſcandix*. See the article SCANDIX, *Suppl.*

COMB-*fiſh*, *pecten*, in ichthyology, a genus of fiſhes ſo called from the longitudinal ſtriæ reſembling the teeth of a *comb*, with which its ſtructure is covered. See PECTEN, *Suppl.*

COMBUSTIO *pecuniæ*, the antient way of trying mixed and corrupt money, by melting it down, upon payments into the Exchequer. In the time of king Henry II. a conſtitution was made called the trial by *combuſtion*; the practice of which differed little or nothing from the preſent method of aſſaying ſilver. But whether this examination of money by *combuſtion* was to reduce an equation of money only of ſterling, *viz.* a due proportion of alloy with copper, or to reduce it to pure fine ſilver, doth not appear. On making the conſtitution of trial it was conſidered, that tho' the money did anſwer *Numero et Pondere*, it might be deficient in value; becauſe mixed with copper or braſs, *&c.* Vide *Lownde*'s Eſſay upon Coin, p. 5.

COMET *(Suppl.)* — The *comet* which appeared in December 1743, and in January and February following was exceeding bright and diſtinct. The diameter of its nucleus being nearly equal to that of Jupiter. Its tail extended above 16 degrees from its body.

From the obſervations of Mr. Bliſs, and from ſome taken at the obſervatory of the earl of Macclesfield, Mr. Betts has determined this *comet*'s parabolic trajectory. He found the place of the aſcending node to be ☊. 15°. 45′. 20″; the logarithm of the perihelion diſtance 9.346472; the logarithm of the diurnal motion 0.940420; the place of the perihelion ♎. 17°. 12′. 55″; the diſtance of the perihelion from the node 151°. 27′. 35″; the logarithm, ſine, and coſine of the inclination of the orbit to the ecliptic 9.865138, 9.832616; and thence the time the *comet* was in the vertex of the parabola, or the time of the perihelion was Febr. 19ᵈ. 8ʰ. 12′. The motion of the *comet* in its orbit was according to the order of the ſigns.

From theſe elements, by the help of Dr. Halley's general table, he has given us the computation of the *comets* places, for the times of obſervation, and the differences between the obſerved and computed places, which ſeldom amount to above half a minute.

The nodes of this *comet* and of the planet Mercury, are within leſs than half a degree of each other, which perhaps gave riſe to a report, that the *comet* had carried Mercury from its orbit. But the *comet* was at that time diſtant from Mercury nearly $\frac{1}{3}$ of the ſemi-diameter of the *orbis magnus*, and almoſt twice as near to the ſun; hence it could have no ſenſible influence on the motions of that planet.

This *comet* is ſuppoſed at leaſt equal in magnitude to the earth. See Phil. Tranſ. N°. 474. ſect. 2.

Comet of 1743. See obſervations of this *comet* made at Vienna by father Frank, a Jeſuit, in Phil. Tranſ. N°. 470. ſect. 1.

The parabolic orbit of the *comet* of 1739, as obſerved by Signior Zanotti at Bologna, is deſcribed in Phil. Tranſ. N°. 461. ſect. 15.

The path of the *comet* which appeared from the beginning of March to the beginning of April 1742, has been computed by Mr. Hodgſon from the obſervations of the Jeſuits of Pekin in China. Vide Phil. Tranſ. N°. 481. p. 264.

COMFREY *(Suppl.)* — *Spotted* COMFREY, a name by which ſome call the *pulmonaria*. See the article PULMONARIA, *Suppl.*

COMMENDATORY *Abbot*. See ABBOT *in commendam*, *Cycl.*

COMPOSITION *(Cycl.)* — COMPOSITION *of ratios*, in arithmetic and algebra, is performed by multiplying the quantities or exponents of two or more ratios together; the produce is then ſaid to be compounded of the ratios whoſe components were multiplied. Thus if the quantities or exponents of the ratios *a* to *b*, *c* to *d*, *e* to *f*, be multiplied, we ſhall have $\frac{a}{b} \times \frac{c}{d} \times \frac{e}{f} = \frac{ace}{bdf}$. And the ratio *a c e* to *b d f*, is then ſaid to be compounded of the ſeveral ratios *a* to *b*, *c* to *d*, *e* to *f*, *&c.* Thus alſo the ratio of 10 to 12, is compounded of the ratio of 2 to 5, and of 3 to 4; for $\frac{2}{5} \times \frac{3}{4} = \frac{10}{12}$.

This operation is by ſome called *addition* of ratios.

CONCAMERATED, among builders, an appellation given to ſuch roofs as are arched in the manner of vaults.

CONCHA *anatifera*, in the hiſtory of ſhell-fiſh. See the article ANATIFERA *concha*, *Suppl.*

CONCHA *veneris*, in natural hiſtory, the name by which ſeveral ſpecies of *chama* are called. See the article CHAMA, *Suppl.*

CONCHÆ *margaritiferæ*, a name ſometimes uſed for thoſe *mytuli* which produce pearls. See the article MYTULUS, *Suppl.*

CONE *(Cycl.)* — CONE *and key*. Bracton, lib. 2. c. 37. num. 3. ſays, *Fœmina in tali ætate (i. e. 14 et 15 Annorum) poteſt diſponere domui ſuæ et habere* Cone *et* Key.

The words come from the Saxon *colne*, *i. e. calculus*, and key *clavis*; ſo that a woman was then held to be of competent years when ſhe was able to keep the accounts and keys of the houſe: and *Glan.* lib. 7. cap. 9. has ſomewhat to the ſame purpoſe.

CONE, in botany, an hard dry ſeed-veſſel of a conical figure, conſiſting of ſeveral woody parts; and is, for the moſt part, ſcaly, adhering cloſely together, and ſeparating when ripe. *Miller*'s Gardener's Dict. in voc.

CONGE *(Cycl.* and *Suppl.)* — The *conge*, originally, was a ring or ferril, fixed on the extremities of wooden pillars, to keep them from ſplitting; this, afterwards, came to be imitated in ſtone-work. Build. Dict. in voc.

CONGELATIONS. See FREEZING, *Suppl.*

CONIC-*ſection (Cycl.)* — The doctrine of the *conic-ſections* is of great uſe in phyſical and geometrical aſtronomy, and the phyſico-mathematical ſciences. This doctrine has been much cultivated by geometers antient and modern; and we have many good treatiſes on the ſubject; but that publiſhed by Mr. Simſon, profeſſor of mathematics at Glaſgow, deſerves to be particularly mentioned not only for its elegance, but for its geometrical accuracy, which as he juſtly remarks in his preface, has not always been ſo well obſerved in treatiſes of this kind, as it ought to be.

To the properties of the *conic-ſections* mentioned in the *Cyclopædia*, it may be proper to add the properties of their oſculatory circles or circles of curvature. See CURVATURE.

CONJUGATE *(Cycl.)* — CONJUGATE *hyperbolas*, in geometry. See HYPERBOLA, *Append.*

CONJURATION, *conjuratio*, *(Cycl.)* ſignifies a plot or confederacy, made by perſons combining together by oath or promiſe, to do ſome public harm.

But it was more particularly uſed, formerly, for the having a perſonal conference with the devil, or ſome evil Spirit, to know any ſecret, or to effect any purpoſe. *Anno* 5 *Eliz.* c. 16.

It is ſaid in ſome of our law books, that the difference between *conjuration* and *witchcraft* is, that the former endeavours by prayers and invocation of God's powerful name, to compel the devil to ſay or do what the offender commands him; the latter deals rather by friendly and voluntary conference or agreement with the devil or familiar, to have the offender's deſires ſerved, in lieu of blood, or other gift offered to the devil, eſpecially of the offender's ſoul. And both theſe differ from *inchantment* or *ſorceries*; becauſe thoſe are perſonal conferences with the devil, and theſe are but medicines and ceremonious forms of words (commonly called *charms*) without apparition. *Cowel.*

But all theſe nice diſtinctions are now uſeleſs, ſince the ſtatute of his preſent majeſty forbidding all proſecutions for witchcraft, *&c.*

CONOCARPODENDRON, in botany, a name given by Boerhaave to a genus of plants, deſcribed by Linnæus under that of *leucodendros*, or the ſilver pine-tree. See the article PINE-*tree*, *Suppl.*

CONOCARPUS, the *button-tree*, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is a very ſmall, erect perianthium, formed of one leaf, and divided, at the extremity, into five ſubulated ſegments; it is placed on the germen, and is permanent; there is no corolla; the ſtamina are five; the germen is large, compreſſed, obtuſe, thickeſt towards the point, and placed under the receptacle of the flower; the ſtyle is ſimple; there is no fruit, but the ſeed is naked and ſingle, and has on each ſide a prominent, membranaceous margin; a number of the germina are arranged together, in an imbricated manner, and form a ſhort and roundiſh one; they appear like ſo many reflex ſquamæ.

This genus comprehends the *rudbeckia* of Houſton, and is called *alni fructu laurifolia arbor*, by Sir Hans Sloane. Vide *Linnæi* Gen. Plant. p. 75.

CONSOLIDA, in botany, a name given by ſome authors to the plant more uſually called *bugle*. See BUGULA, *Suppl.*

CONSOUND, a name given to ſeveral different plants: thus *ſymphytum* is called the great *conſound*, *bugula* the middle *conſound*, *bellis* the leaſt *conſound*, and *ſolidago* the ſaracens *conſound*. See SYMPHYTUM, *&c. Suppl.*

CONSUMPTION *(Suppl.)* is frequently the conſequence of a neglected cold. See COLD, *Append.*

Beſides repeated ſmall bleedings, which is the beſt of all remedies for diminiſhing the hectic fits, the ſaline draughts and a cool diet are to be uſed. Colliquative ſweats may be checked by drinking about a pint of lime-water, ſoftened with a little new milk.

In the advanced ſtate of a *conſumption*, we may diſtinguiſh two kinds of coughs, one cauſed by the ulcers of the lungs, and the other by a thin rheum falling upon the fauces and trachea. For the firſt of theſe, about ten drops of balſam of Peru or Copaiba may be given twice a day in a bolus of conſerve of roſes; and for the latter, incraſſants, as conſerve of roſes and opium; which laſt ought to be given with caution, as being apt to heat the body.

CONVAL-*lily*, *lilium convallium*, or lilly of the valley. See the article LILIUM *convallium*, *Suppl.*

CONVALLARIA, in botany, the name given by Linnæus to a large genus of plants, comprehending the *lilium convallium*, *polygonatum*, and *unifolium* of other botanical writers. See LILIUM *convallium*, *&c. Suppl.*

The characters of the *convallaria*, according to Linnæus, are theſe: there is no calyx; the flower conſiſts of a ſingle ſmooth petal, of a campanulated form, divided at the extremity into ſix ſhort, obtuſe, patento-reflex ſegments; the ſtamina are ſix ſubulated filaments, inſerted into the petal of the flower, and ſhorter than it; the antheræ are oblong and erect; the germen of the piſtil is globoſe; the ſtyle is filiform and longer than the ſtamina; the ſtigma is obtuſe and trigonal; the fruit is a globoſe berry, containing three cells, and is ſpotted before it is ripe; the ſeeds are ſingle and roundiſh.

In the *lilium convallium*, the petal of the flower is globoſe, campanulated and patent; in the *polygonatum*, it is tubulato-campanulated; and in the *unifolium*, a third part of all the fructification is wanting.

Some of the ſpecies of Tournefort's *ſmilax* are likewiſe included in this genus; in which the petal of the flower is divided into ſix very acute and patent ſegments. Vide *Linnæi* Gen. Plant. p. 146.

CONYZA is alſo uſed, by C. Bauhine, for a different genus of plants from the *flea-bane*, and called *erigeron* by Linnæus. See the article ERIGERON, *Append.*

CONYZOIDES, or CONYZELLA, in botany, names by which Dillenius calls the *erigeron*, or ſweet flea-bane of Linnæus. See the article ERIGERON, *Append.*

COPAIBA, or COPAYBA, in natural hiſtory and pharmacy. See the articles COPIVI, *Cycl.* and BALSAM *of Copaiba*, *Suppl.*

COPERAS, in natural hiſtory, the ſame with *copperas*. See the article COPPERAS, *Cycl.* and *Suppl.*

COPPER *(Cycl.* and *Suppl.)*—*White* COPPER, a kind of metal frequently brought from China, and ſuppoſed, by many, to be natural. But according to Mr. Geoffroi, *white copper* is only a mixture of red *copper* with arſenic. See Hiſt. Acad. Scienc. 1739. p. 24.

CORAAGE, *coraagium*, in our old cuſtoms, a kind of impoſition extraordinary, growing upon ſome unuſual occaſion; and it ſeems to be of certain meaſures of corn: for *corus tritici* is a meaſure of wheat. *Bracton*, l. 2. c. 116. num. 6. who in the ſame chapter, num. 8. has theſe words,—— *Sunt etiam quædam communes præſtationes, quæ ſervitia non dicuntur, nec de conſuetudine veniunt, niſi cum neceſſitas intervenerit, vel cum rex venerit; ſicut ſunt hidagia, coraagia, & carvagia, et alia plura de neceſſitate et ex conſenſu communi totius regni introducta*, &c.

CORAL *(Cycl.* and *Suppl.)*—For the method of making artificial *coral* to adorn grottos, ſee GROTTO, *Append.*

CORAL-*tree*, or CORAL-*wood*, in botany, the Engliſh name of a plant, called by authors *corallodendron*. See the article CORALLODENDRON, *Suppl.*

CORCHORUS, the name of a genus of plants, by miſtake printed *corehorus*. See the article COREHORUS, *Suppl.*

CORIARIA, *myrtle-ſumach*, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is compoſed of five very ſhort leaves, which are concave and of a ſomewhat oval figure; the flower conſiſts of five petals, and is very like the cup; the ſtamina are ten filaments of the length of the flower; the antheræ are ſimple; the germina of the piſtil are five in number, compreſſed, and adhering together by their inner ſides; there are likewiſe five ſetaceous long ſtyles; the ſtigmata are ſimple; there is no pericarpium; the ſeeds, which are five in number, and kidney-ſhaped, being incloſed in the petals of the flower, which become carnous. Vid. *Linnæi* Gen. Plant. p. 204.

CORK *(Cycl.)*—Cups made of *cork*, are ſaid by ſome to be good for hectical perſons to drink out of. The Egyptians made coffins of *cork*; which being lined with a reſinous compoſition, preſerved dead bodies uncorrupted. The Spaniards line ſtone-walls with it, which not only renders them very warm, but corrects the moiſture of the air. The wood of the *cork*-tree is not only good firing, but applicable to ſeveral other uſes.

CORK-*tree*, the Engliſh name of a genus of plants, called by authors *ſuber*. See the article SUBER, *Suppl.*

CORMORANT, in ornithology, the Engliſh name of a bird of the order of *anſeres*, or gooſe kind, called alſo *pelicanus* and *corvus aquaticus*. See the articles PELICAN and CORVUS *aquaticus*, *Suppl.*

CORN-*bottle*, or *blue-bottle*, a name given to the *cyanus* of authors. See the article CYANUS, *Suppl.*

CORN-*flag*, in botany, a name given to the *gladiolus* of authors. See the article GLADIOLUS, *Suppl.*

CORN-*marygold*, a name given to the *chryſanthemum* of authors. See the article CHRYSANTHEMUM, *Suppl.*

CORN-*parſley*, in botany, a name given to a ſpecies of *ſium*. See the article SIUM, *Append.*

CORN-*ſallet*, in botany, a name given to the *valerianella* of authors. See the article VALERIANELLA, *Suppl.*

CORN-*violet*, a name uſed by ſome for the *campanula* of authors. See the article CAMPANULA, *Suppl.*

CORNEL-*tree*, in botany, the Engliſh name of a genus of plants, called by Latin writers *cornus*. See the article CORNUS, *Suppl.*

CORNELIAN, *ſarda*, in the hiſtory of gems. See the articles CORNELIAN, *Cycl.* and SARDA, *Suppl.*

CORNELIAN-*cherry*, a name uſed by ſome for a ſpecies of the *cornus*, or cornel-tree. See the article CORNUS, *Suppl.*

CORNER-*ſtones*, among builders, the name of the two ſtones which ſtand one in each jaumb of a chimney. Their faces are hollowed in breadth, being a certain ſweep of a circle. The breadth of each ſtone is equal to that of the jaumb, and their height reaches from the hearth to the mantle-tree

Corner-ſtones are commonly made of Rigate or fire-ſtone. Build. Dict. in voc.

CORSA, in architecture, the ſame with *plat-band*. See the article PLAT-BAND, *Cycl.*

CORTEX *aurantiorum*. The powder of *cortices aurantiorum*, ſometimes cures quartan agues. Commerc. Norimb. 1735. hebd. 11. §. 3.

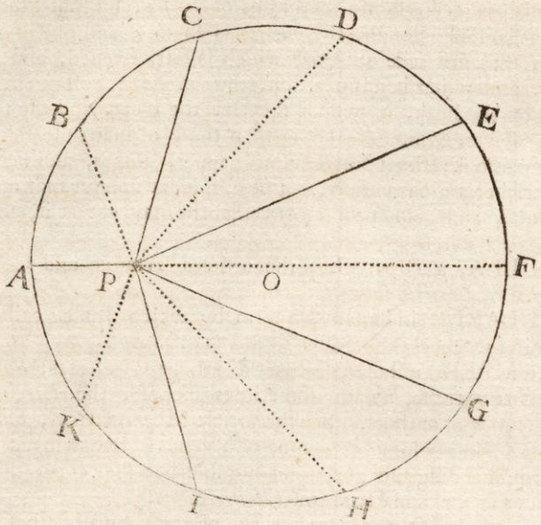
COSTMARY, the Engliſh name of a ſpecies of tanzy, called by ſome writers *balſamita*. See the article TANACETUM, *Suppl.*

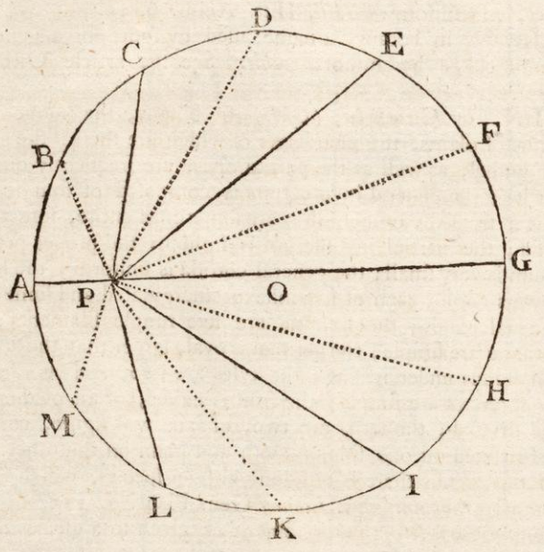
COSTUME *(Suppl.)*—To obſerve the *coſtume*, among painters, is to make every perſon and thing ſuſtain the proper character, by not only obſerving the ſtory, but the circumſtances, the ſcene of action, the country or place, habit, manners, *&c.*

The word is Italian, ſignifying cuſtom.

COTESIAN *theorem*, in Geometry, an appellation uſed for an elegant property of the circle diſcovered by Mr. Cotes. The theorem is,

If the factors of the binomial $a^\lambda \pm x^\lambda$ be required, the index λ being any integer: let the circumference ABCD, the center of which is O, be divided into as many equal parts as there are units in 2λ; and from all the diviſions let there be drawn to any point P in the radius OA, produced if neceſſary, the right lines AP, BP, CP, DP, EP, FP, &c. then ſuppoſing $OA = a$, $OP = x$, the product of all the lines AP, CP, EP, &c. taken from the alternate diviſions throughout the whole circumference, will be equal to $a^\lambda - x^\lambda$, or $x^\lambda - a^\lambda$, according as the point P is within or without the circle; and the product of the reſt of the lines BP, DP, FP, in the remaining alternate places will be equal to $a^\lambda + x^\lambda$.





For inſtance, if $\lambda = 5$, let the circumference be divided into 10 equal parts, and the point P be within the circle, then will $AP \times CP \times EP \times GP \times IP$ be equal to $\overline{OA}^5 - \overline{OP}^5$, and $BP \times DP \times FP \times HP \times KP = \overline{OA}^5 + \overline{OP}^5$. In like manner if λ be $= 6$, having divided the circumference into twelve equal parts, $AP \times CP \times EP \times GP \times IP \times LP$ will be equal to $\overline{OA}^6 - \overline{OP}^6$, and $BP \times DP \times FP \times HP \times KP \times MP = \overline{OA}^6 + \overline{OP}^6$.

The demonſtration of this theorem may be ſeen in Dr. *Pemberton*'s Epiſt. de Coteſii inventis.

By means of this theorem the acute and elegant author was enabled to make a farther progreſs in the inverſe method of fluxions, than had been done before. But in the application of his diſcovery there ſtill remained a limitation, which was removed by Mr. de Moivre. See Dr. *Smith*'s Theorem. logometrica & trigonometrica, added to *Cotes*'s Harmonia menſurarum, p. 114, 115. *De Moivre*, Miſcel. Analyt. p. 17, *ſeq.*

COTTON *(Cycl.)* — *Lavender*-COTTON, a name ſometimes given to a genus of plants, called by authors *ſantolina*. See the article SANTOLINA, *Suppl.*

COTTON-*tree*, in botany, the Engliſh name of a genus of plants, called by authors *goſſypium*. See the article GOSSYPIUM, *Append.*

Silk-COTTON, a name uſed by ſome for a genus of plants, called by authors *xylon*. See the article XYLON, *Append.*

COTTON-*weed*, a name uſed for the *gnaphalium* of authors. See the article GNAPHALIUM, *Suppl.*

COUCH-*graſs*, or dog's-graſs, in botany. See the article GRASS, *Append.*

COVENTRY-*bells*, a name ſometimes given to the *campanula*. See the article CAMPANULA, *Suppl.*

COUGHS *(Cycl.)* — See the articles COLD and CONSUMPTION, *Append.* and TUSSIS, *Suppl.*

COULTER *neb*, in zoology, a name given to the *anas arctica*. See the article DUCK, *Suppl.*

COW, in zoology, the female of the ox-kind. See the articles BOS and OX, *Suppl.*

Sea-COW, the Engliſh name of a genus of ſea-animals, called by zoologiſts *manati*. See the article MANATI, *Suppl.*

COW-*itch*, *phaſeolus hirſutis*, in botany. See the article PHASEOLUS, *Suppl.* Vide *Quinc.* Pharm. p. 230.

COW's-*lip of Jeruſalem*, in botany, a name ſometimes given to the *pulmonaria* of authors. See the article PULMONARIA, *Suppl.*

French COW's-*lip*, a name by which ſome call the *auricula*, or bear's ears of botanical authors. See the article AURICULA, *Suppl.*

COWL *(Cycl.)* — *Friar's*-COWL, in botany, a name ſometimes uſed for the *ariſarum* of authors. See the article ARISARUM, *Suppl.*

CRAB, in zoology, the Engliſh name of a genus of ſhell-fiſh, of the *ſquilla* kind. See the article SQUILLA, *infra.*

CRAB-*tree*, in botany, the Engliſh name of the *malus ſylveſtris* of authors. See the article MALUS, *Suppl.* and *Append.*

CRABRO, the hornet, in zoology, the name of a genus of flies of the *apis*, or bee-kind. See the articles BEE and HORNET, *Suppl.* and APIS, *Append.*

CRANE *(Cycl.)* — There are ſeveral improvements of this uſeful machine mentioned in *Deſagulier*'s Experim. Philoſ. p. 178, *ſeq.* particularly how to prevent the inconveniencies ariſing from ſudden jerks, as well as to increaſe its force by uſing a double axis in peritrochio, and two handles.

CRASPEDARIA, a genus of animalcules, without any viſible limbs or tails, but with an apparent mouth, and a ſeries of fimbriæ round it in the manner of a fringe.

Of this genus there are three ſpecies: 1. The *craſpedarium* with a roundiſh body. 2. The *craſpedarium* with an oval body. 3. The *craſpedarium* with a cylindric body. *Hill*'s Hiſt. of Anim. p. 5.

CRASSULA, in botany, the name of a diſtinct genus of plants called by ſome *baſtard-navel-wort*.

The characters of this genus are theſe: the cup is a perianthium, formed of five lanceolated, hollowed, acute, erect, and permanent leaves, which meet in ſuch a manner as to form a kind of tube; the corolla is ſomewhat of an infundibuliform ſhape, and is compoſed of five petals, the ungues of which are very long, linear, ſtrait, connivent, and joined at their baſes; and the bracteæ, which form the limb, oval and reflexo-patent; the nectaria are five very ſmall emarginated ſquamæ, annexed outwardly to the baſe of the germen; the ſtamina are five ſubulated filaments, of the length of the tube, and inſerted into the ungues of the corolla; the antheræ are ſimple; the germina are five, oblong, acuminated, and terminated by ſubulated ſtyles, of the length of the ſtamina; the ſtigmata are obtuſe; the fruit is compoſed of five oblong, acuminated, ſtrait, compreſſed capſules, opening longitudinally inwards; the ſeeds are numerous and ſmall. *Linnæi* Gen. Plant. p. 133.

Vaillant makes it only a ſpecies of *ſedum*. See the article SEDUM, *Suppl.*

CRAX, in zoology, a name given by the antients to the *ortygometra*, or daker hen, a bird larger than the quail, and common in Ireland and ſome of the northern counties of England. *Ray*'s Ornithology, p. 122. See the article ORTYGOMETRA, *Suppl.*

CRAY-*fiſh*. Theſe fiſh are comprehended among the ſpecies of *ſquillæ*. See the articles CRAY-*fiſh*, *Suppl.* and SQUILLA, *Append.*

CRAZE-*mill*, or CRAZING-*mill*, a mill in all reſpects like a griſt-mill to grind corn, and is ſo called by the tin-miners, who uſe it to grind their tin, which is yet too great, after trambling, and then it is trambled only.

CREEPER, the Engliſh name of a ſpecies of *iſpida*, which, though very unlike the common king's-fiſher both in colour and figure, yet is comprehended under that genus on account of the ſtructure of its feet. See the article ISPIDA, *Suppl.*

This ſmall bird has likewiſe been called *certhia* and *certhius*, by authors, and in Engliſh the ox-eye. See the article CERTHIA, *Suppl.*

CREODIBA, in the cuſtoms of the middle age, a robbery and murther committed in a wood, where the body of the perſon killed was burnt, in order to prevent any diſcovery of the crime. The word, ſays Wendelinus, is compounded of *gruy* and *diven*, that is, wood-robbers. Tit. 74. of the Salic Law, edit. Heroldi, relates to *creodiba*. *Du Cange*, Gloſſ. Lat.

CRESSES *(Suppl.)* — *Indian* CRESS, *Naſturtium Indicum*, in botany, the Engliſh name of a genus of plants, called by authors *cardamindum* and *tropæolum*. See the articles CARDAMINDUM, *Suppl.* and TROPÆOLUM, *Append.*

Sciatica CRESS, a name uſed by ſome for a genus of plants, called by others *iberis* and *cardamine*. See the article CARDAMINE, *Suppl.*

Sciatica CRESS, or *babylonian* CRESS, are names ſometimes alſo given to the *lepidium*, or Dittander. See the article LEPIDIUM, *Suppl.*

Water-CRESS, or *winter*-CRESS, names given by ſome writers to a genus of plants known among authors by that of *ſiſymbrium*. See the article SISYMBRIUM, *Suppl.*

CRESTED *graſs*, in botany. See the article GRASS, *Append.*

CRIMSON *graſs-vetch*, a name given to the *niſſolia*, a genus of plants. See the article NISSOLIA, *Suppl.*

CRINUM, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is a ſpathiform general involucrum, compoſed of two oblong leaves, which bend downwards, and expoſe to ſight a kind of little umbel; the flower conſiſts of a ſingle petal, which is infundibuliform; the tube is oblong, cylindric, and bent; the limb is divided into ſix lanceolato-linear, obtuſe, concave, reflex ſegments, three of which, alternately, are diſtinguiſhed by an uncinated appendage; the ſtamina are ſix ſubulated filaments ariſing from the baſe of the limb, they are of the length of the limb, and connivent; the antheræ are oblong, linear, incumbent, and aſſurgent; the germen of the piſtil is placed in the bottom of the flower; the ſtyle is ſubulated and ſhorter than the ſtamina; the ſtigma is trifid and very ſmall; the fruit is a capſule of a ſuboval figure, with three cells; the ſeeds are numerous.

This genus, of which we know only one ſpecies, is commonly, though improperly, reckoned a ſpecies of lilly-aſphodel. *Linnæi* Gen. Plant. p. 140.

CROCEUS, in natural hiſtory, is ſaid to be an amphibious animal which is neither fiſh nor bird, but both. All the ſummer it is a bird, of a ſaffron colour, and flies through the mountains; but towards the end of autumn it returns to the ſea and becomes a fiſh. It is only in the winter that they catch it, when it proves a very ſavoury bit. *Hoffm.* Lex. Univ. in voc.

CROCODILIUM, in botany, a diſtinct genus of plants, according to Vaillant; but comprehended by Linnæus under the *centauria*. See the article CENTAURIA, *Append.*

CROCODILODES, in botany, the name uſed by Vaillant for a genus of plants, called by others *atractylis*. See the article ATRACTYLIS, *Append.*

CROSS *(Cycl.)* — The adoration of the *croſs* appears to have been practiſed in the antient church, in as much as the heathens, particularly Julian, reproach the primitive chriſtians with it [a]. And we do not find that their apologiſts diſclaimed the charge. Mornay, indeed, aſſerted that this had been done by St. Cyril, but could not ſupport his allegation at the conference of Fontainbleau. St. Helena is ſaid to have reduced the adoration of the *croſs* to its juſt principle, ſince ſhe adored in the wood, not the wood itſelf, which had been direct idolatry and heatheniſm, but him who had been nailed to this wood [b]. With ſuch modifications ſome proteſtants have been induced to admit the adoration of the *croſs*: John Huſs allowed of the phraſe, provided it were expreſly added, that the adoration was relative to the perſon of Chriſt. But however Roman catholics may ſeem to triumph by virtue of ſuch diſtinctions and mitigations, it is well known they have no great place in their own practice: Imbert [c], the good prior of Gaſcony, was ſeverely proſecuted in 1683, for telling the people, that in the ceremony of adoring the *croſs*, practiſed in that church on Good-friday, they were not to adore the wood, but Chriſt who was crucified on it: the curate of the pariſh told them the contrary; it was the wood, the wood! they were to adore. Imbert replied, it was Chriſt, not the wood: for which he was cited before the archbiſhop of Bourdeaux, ſuſpended from his functions, and even threatened with chains and perpetual impriſonment. It little availed him to cite the biſhop of Meaux's diſtinction; it was anſwered, that the church allowed it not. [[a] Nouv. Rep. Lett. tom. x. p. 508. [b] *Du Pin*, Bibl. Eccleſ. tom. xvii. p. 34, *ſeq.* Id. Bibl. Ant. Separ. tom. ii. p. 310. *Tillem.* Mem. Eccleſ. tom. vii. Nouv. Rep. Lett. tom. xxi. p. 344. Jour. des Scav. tom. lix. p. 104. [c] *Wake*, Expoſ. of the Doct. of the Ch. of Eng. Pref. p. ix, *ſeq.* *ejuſdem.* Def. of Expoſ. p. 121, *ſeq.* Bibl. Univ. tom. xi. p. 459. Nouv. Rep. Let. tom. iv. p. 691.]

CROSS-*wort*, in botany, the Engliſh name of a genus of plants called by authors *cruciata*. See the article CRUCIATA, *Suppl.*

CROSS *of Jeruſalem*, a name ſometimes given to the *lychnis* of authors. See the article LYCHNIS, *Suppl.*

CROW *(Suppl.)* — *Scare*-CROW, the Engliſh name of a bird of the *larus* kind. See the articles LARUS, *Suppl.* and SCARE-*crow*, *Append.*

CROW-*flowers*, in botany, a name ſometimes give to a genus of plants, called by authors *lychnis*. See the article LYCHNIS, *Suppl.*

CROW-*garlick*, a name given by ſome writers to a ſpecies of onion. See the article ONION, *Suppl.*

CROWN-*imperial-ſhell*, the name of a ſpecies of *voluta*. See the article VOLUTA, *Suppl.*

CRYSTALLIZATION *of ſalts*. See the articles SALT and VEGETATION *of ſalts*, *Suppl.*

CTENITA, or CTENOIDES, names ſometimes given to thoſe *pectens*, which have one of their ſhells very convex. See the article PECTEN, *Suppl.*

CUBICLE, a name ſometimes uſed for a bed-chamber. See the article CHAMBER, *Cycl.* and *Suppl.*

CUCKOW-*flower*, in botany, a name uſed by ſome writers for the *cardamine*, or lady's-ſmock. See the article CARDAMINE, *Suppl.*

CUCKOW-*ſpit-inſect*, the Engliſh name of a ſpecies of *cicada*. See the articles CICADA and HARVEST-*fly*, *Suppl.*

CUCKSOO, the name of a common diſh among the Moors of Africa, made of flower, and prepared for ſeveral ways of dreſſing afterwards. They take fine wheat flower, or, when that is ſcarce, barley, millet, or *Indian* corn flower is made to ſerve: they firſt ſprinkle ſome water over the bottom of an unglazed earthen pan, and then ſhake ſome of this flower into it; they knead theſe together with their hands, and roll it backwards and forwards under their open palms; by this means they work it into grains like ſago, and then it is fit for uſe: when they have meat to ſtew, they do this in an earthen pot, and over the mouth of this they place a colander, in which is put a quantity of this granulated paſte; over this colander is fixed on a top or cover for the pot, and by this means as the meat ſtews, all the vapour that aſcends from it is received into the grains of *cuckſoo*; by that time the meat is done enough, the *cuckſoo* is ſo too; and opening the pot, they firſt take out this, which is ſoft, ſwelled, and tender, and piling it up in a diſh, they make a hollow in the top of the heap, in which they lay the meat, and then add their ſpices, which are better than thoſe of many neighbouring nations; the pooreſt uſing pepper, ginger, and ſaffron, the richer a great variety. The diſh is ſet upon a mat on the ground, and four people conveniently may eat at it, ſometimes ſix do.

CUCULLA, a cowl. See the articles ABBOT and COWL, *Cycl.*

CUCULARIA, in botany, a term by which Juſſieu calls the fumitory. See the article FUMARIA, *Suppl.*

CUCUMBER, in botany See the article CUCUMIS, *Suppl.*

Wild CUCUMBER, a name ſometimes uſed for the *elaterium* or *momordica* of authors. See the article MOMORDICA, *Suppl.*

CULEX, in zoology, the name of a genus of two-winged flies, comprehending the gnats and humble-bee-flies. See the articles GNAT and HUMBLE-*bee-fly*, *Suppl.*

The diſtinguiſhing characteriſtic of this genus is, that their head is furniſhed with a ſiphon, or ſucker, very ſlender, oblong, and filiform. *Hill*, Hiſt. Anim. p. 35.

CULLION, in botany, a name uſed by ſome for a genus of plants called by authors *orchis*. See the article ORCHIS. *Suppl.*

CUMIN, or CUMMIN, *(Cycl.)* in botany, the name of a genus of plants, the characters of which are theſe: the general umbel, as well as the partial ones, are frequently quadripartite; the general involucrum is compoſed of four leaves, longer than the umbel, they are ſometimes entire, ſometimes trifid; the partial involucrum is ſimilar; the proper perianthium is very ſmall; the general corolla is uniform; the ſingle flowers conſiſt each of five inflexo-emarginated and ſomewhat unequal petals; the ſtamina are five ſimple filaments; the antheræ are ſimple; the germen is oval, larger than the flower, and ſtands under its cup; the ſtyles are two, and very ſmall; the ſtigmata are ſimple; the fruit is naked, of an oval figure, and ſtriated; the ſeeds are two, of an oval figure, convex, and ſtriated on one ſide, ſmooth and plain on the other.

Of this genus there is only one known ſpecies, which is the common *cummin*. See *Linnæi* Gen. Plant. p. 115.

Meadow CUMMIN, a name ſometimes given to a ſpecies of *carui*. See the article CARUI, *Suppl.*

CUNEI, in natural hiſtory, a name given to thoſe *tellinæ*, which have one ſide of their ſhell much more extended in length than the other. See the article MYTULUS, *Suppl.*

CUNICULUS, in zoology, the name of a genus of animals of the *lepus*, or hare kind, called in Engliſh rabbits. See the articles RABBIT and LEPUS, *Suppl.*

CUNICULUS *Sibericus*, the name of the long-tailed Siberian rabbit, the fur of which is much valued. During the ſummer months many of them are beautifully variegated with oblique and tranſverſe ſtreaks of black and grey. *Hill*, Hiſt. Anim. p. 525.

CUNICULUS *Braſilienſis*, the name of a ſpecies of rabbit called by zoologiſts *aperea*. See the article APEREA, *Suppl.*

CUNILA, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants called by Tournefort *marrubiaſtrum*. See the article MARRUBIASTRUM, *Suppl.*

CUP-*ſhell*, or CHALICE-*ſhell*. See the article SHELL, *infra.*

CUPRUM, *copper*, in natural hiſtory. See the article COPPER, *Cycl.* and *Suppl.*

CURATAS, a title given to the petty princes of Peru. See the article CAZIC, *Suppl.*

CURATOR, among the Romans, an officer under the emperors, who regulated the price of all kinds of merchandize and things to ſell in the cities of the empire.

They had likewiſe the ſuperintendence of the cuſtoms and tributes; whence alſo they were called *logiſtæ*. *Hoffm.* Lex. in voc.

CURCULIO, in zoology, the name of a genus of beetles diſtinguiſhed from the others by having their antennæ affixed to an elongated horny ſnout. See the article SCARABÆUS, *Suppl.*

CURRENT *(Cycl.)* — The doctrine of *currents*, their cauſes, *&c.* is ſtill very imperfect: it were to be wiſhed that it were otherwiſe, for the improvement of navigation and natural hiſtory. See *Marſigli*, Hiſt. Phyſ. de la Mer, p. 44—47.

CURRODREPANUS, in antiquity, a kind of chariot armed with ſcythes. The driver of theſe chariots was obliged to

ride on one of the horſes, as there was no other ſeat for him: the uſual place for him being all armed with knives, as was likewiſe the hinder part of the chariot. There were no ſcythes pointing down to the earth, either from the beam or axle-tree; but theſe were fixed at the head of the axle-tree in ſuch a manner as to be moveable by means of a rope, and thereby could be raiſed or let down, and drawn forward or let fall backward by relaxing the rope. *Pitiſc.* Lex. Ant. *in voc.*

CURVATURE *(Cycl.)* — The theory of the *curvature* of lines is of great uſe in geometry, and in the phyſico-mathematical ſciences. Hence mathematicians have treated this ſubject fully. We ſhall here inſert as much of this doctrine as ſeems neceſſary to enable beginners to form a juſt notion of the ſubject, and refer thoſe who deſire a farther knowledge to Mr. Mac Laurin's Treatiſe of Fluxions, whom we have in this, as in many other articles, followed; becauſe he every where endeavours to avoid that air of paradox and myſtery which has been more than once made a reproach to modern mathematicians.

Any two right lines applied to each other, perfectly coincide; and the rectitude of lines admits of no variety. Arches of equal circles applied upon each other, perfectly coincide likewiſe; and the *curvature* is uniform in all the parts of the ſame, or of equal circles. Arches of unequal circles cannot be applied upon each other ſo as to coincide; but when they touch each other, the arch of the greater circle is leſs inflected from the common tangent, and paſſes betwixt it and the arch of the leſſer circle, through the angle of contacts formed by them, and is therefore leſs curve. Any two arches of curve lines touch each other when the ſame right line is the tangent of both at the ſame point; but when they are applied upon each other in this manner, they never perfectly coincide, unleſs they be ſimilar arches of equal and ſimilar figures: and the *curvature* of lines admits of indefinite variety. As the *curvature* is uniform in a given circle, and may be varied at pleaſure in circles by increaſing or diminiſhing their diameters, their flexure or *curvature* will therefore ſerve for meaſuring that of other lines. There is but one right line that can be the tangent of a given arch of a curve at the ſame point; but an indefinite variety of circles may touch it there; and theſe have various degrees of more and leſs intimate contact with it. And as of all the right lines that can be drawn through a given point in the arch of a curve, that is the tangent which touches the arch ſo cloſely, that no right line can be drawn between them; ſo of all the circles that touch a curve in any given point, that is ſaid to have the ſame *curvature* with it, which touches it ſo cloſely that no circle can be drawn through the point of contact between them, all other circles paſſing either within or without them both.

This circle is called the *circle of curvature*; its centre, the *centre of curvature*; and its ſemidiameter, the *ray* or *radius of curvature*, belonging to the point of contact. It is alſo called, eſpecially by foreign mathematicians, the *oſculatory circle*.

The arch of this circle cannot coincide with the arch of the curve, but it is ſufficient to denote it the circle of *curvature*, that no other can paſs between them; as the tangent of the arch of a curve cannot coincide with it, but is applied to it ſo that no right line can be drawn between them.

As in all figures, rectilinear ones excepted, the poſition of the tangent is continually varying; ſo the *curvature* is continually varying in all curvilinear figures, the circle only excepted.

As the curve is ſeparated from its tangent by its flexure or *curvature*, ſo it is ſeparated from the circle of *curvature* in conſequence of the increaſe or decreaſe of its *curvature*; and as its *curvature* is greater or leſs, according as it is more or leſs inflected from the tangent, ſo the variation of *curvature* is the greater or leſs according as it is more or leſs ſeparated from the circle of *curvature*.

It is manifeſt, that there is but one circle of *curvature* belonging to an arch of a curve at the ſame point. For if there were two ſuch circles, any circle deſcribed between theſe through that point, would paſs between the curve and circle of *curvature*; againſt the ſuppoſition.

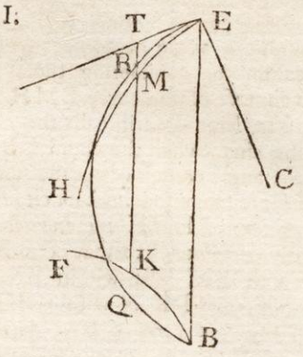
When any two curves touch each other in ſuch a manner that no circle can paſs between them, they muſt have the ſame *curvature*; for the circle that touches the one ſo cloſely that no circle can paſs between them, muſt touch the other in the ſame manner.

It appears from the demonſtrations of geometricians, that circles may touch curve lines in this manner; that there may be indefinite degrees of more or leſs intimate contact between the curve and the circle of *curvature*; and that a conic ſection may be deſcribed that ſhall have the ſame *curvature* with a given line at a given point, and the ſame variation of *curvature*, or a contact of the ſame kind with the circle of *curvature*.

If we conceive the tangent of any propoſed curve to be a baſe, and that a new line be deſcribed, whoſe ordinate is a third proportional to the ordinate and baſe of the firſt; this new line will determine the chord of the circle of *curvature*, by its interſection with the ordinate at the point of contact; and by the tangent of the angle in which it cuts that circle, it will meaſure the variation of the *curvature*. The leſs this angle is, the cloſer is the contact of the curve and circle of *curvature*; and of this contact there may be indefinite degrees.

To give an example: let any curve EMH (fig. I.) and a circle ERB touch the right line ET on the ſame ſide at E; let any right line TK, parallel to the chord EB, meet the tangent in T, EMH in M, and a curve BKF that paſſes through B in K: then if the rectangle MTK be always equal to the ſquare of ET, the *curvature* of EMH at E will be the ſame as that of the circle ERB; and the contact EM and ER will always be the cloſer, the leſs the angle is that is contained at B by the curve BKF, and the circle of *curvature* BQE.

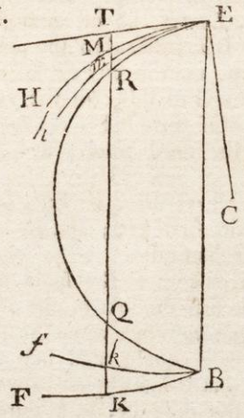
Fig. I.



For it is demonſtrable from the elements of geometry (ſee Mac *Laurin's* Fluxions, art. 366.) that all the circles that can be deſcribed through E fall without both ER and EM, or within them both, and no circle whatever can paſs between them when the rectangle MTK is always equal to the ſquare of ET, and the curve in which K is always found, paſſes thro' B, and conſequently the circle ERB, and the curve EM, have the ſame *curvature* at E.

Now let E*m* (fig. II.), any other curve touching ET in E, and *fk* B another curve paſſing through B meet TK in *m* and *k*, and let the rectangle *m*T*k* be likewiſe equal to the ſquare of ET; then will the *curvature* of E*m* at E be the ſame as that of the curve EM, as has been mentioned. But the rectangles *m*T*k*, MTK, RTQ being equal to each other, and their ſides therefore in a reciprocal proportion to each other, it is plain that if the arch B*k* paſs between BK the arch of the curve BKF, and BQ the arch of the circle BQE; the curve E*m* muſt paſs between EM the arch of the curve EMH, and ER the arch of the circle of *curvature* ERB: ſo that E*m* muſt have a cloſer contact with this circle than EM has with it; and the leſs the angle is that is formed by the curve FKB and the circle of *curvature* EQB at B, the cloſer is the contact at E of the curve EMH and the circle of *curvature* ERB. Thus the curve BKF, by its interſection with EB, determines the *curvature* of EM; and by the angle in which it cuts the circle of *curvature* it determines the degree of contact of EM and that circle, the angle BET and the right line ET being given.

Fig. II.



Hence it follows, that the contact of the curve EMH, and the circle of *curvature*, is cloſeſt when the curve BK touches the arch BQ in B, the angle BET being given; but it is farthеſt from this, or is moſt open, when BK touches the right line EB in B.

Hence, alſo, there may be indefinite degrees of more and more intimate contact between a circle and a curve.

The firſt degree is, when the ſame right line touches them both in the ſame point; and a contact of this ſort may take place betwixt any circle and any arch of a curve. The ſecond is when the curve EMH, and circle ERB have the ſame *curvature*, and the tangents of the curve BKF and circle BQE interſect each other at B in any aſſignable angle. The contact of the curve EM and circle of *curvature*, ER, at E is of the third degree, or order, and their oſculation is of the ſecond, when the curve BKF touches the circle BQE at B, but ſo as not to have the ſame *curvature* with it. The contact is of the fourth degree, or order, and their oſculation of the third, when the curve BKF has the ſame *curvature* with the circle BQE at B, but ſo as that their contact is

only of the ſecond degree: and this gradation of more and more intimate contact, or of approximation towards coincidence, may be continued indefinitely, the contact of EM and ER at E being always of an order two degrees cloſer than that of BK and BQ at B. There is alſo an indefinite variety comprehended under each order: thus, when EM and ER have the ſame *curvature*, the angle formed by the tangents of BK and BQ admits of indefinite variety, and the contact of EM and ER is the cloſer, the leſs that angle is. And when that angle is of the ſame magnitude, the contact of EM and ER is the cloſer the greater the circle of *curvature* is. When BK and BQ touch at B, they may touch on the ſame or on different ſides of their common tangent; and the angle of contact KBQ may admit of the ſame variety with the angle of contact MER; but as there is ſeldom occaſion for conſidering thoſe higher degrees of more intimate contact of the curve EMH and circle of *curvature* ERB, Mr. Mac Laurin calls the contact or oſculation of the ſame kind, when the chord EB and angle BET being given, the angle contained by the tangents of BK and BQ is of the ſame magnitude. Lib. cit. Art. 368.

When the *curvature* of EMH increaſes from E towards H, and conſequently correſponds to that of a circle gradually leſs and leſs, the arch EM falls within ER, the arch of the circle of *curvature*, and BK is within BQ. The contrary happens when the *curvature* of EM decreaſes from E towards H, and conſequently correſponds to that of a circle that is gradually greater and greater, the arch EM falls without ER, the arch of the circle of *curvature*, and BK is without BQ. And according as the *curvature* of EM varies more or leſs, it is more or leſs unlike to the uniform *curvature* of a circle; the arch of the curve EMH ſeparates more or leſs from the arch of the circle of *curvature* ERB, and the angle contained by the tangents of BKF and BQE at B, is greater or leſs. Thus the quality of *curvature*, as it is called by Sir Iſaac Newton [a], depends on the angle contained by the tangents of BK and BQ at B; and the meaſure of the inequability or variation of *curvature*, is as the tangent of this angle, the radius being given and the angle BET being right [b]. — [a Method of Flux. and Inf. Ser. Prob. vi. p. 75. b *Mac Laurin*, lib. cit. Art. 369.]

The rays of *curvature* of ſimilar arches in ſimilar figures, are in the ſame ratio as any homologous lines of theſe figures; and the variation of *curvature* is the ſame. See *Mac Laurin*, lib. cit. ſect. 370.

When the propoſed curve EMH, is a conic-ſection, the new line BKF is alſo a conic-ſection; and it is a right line when EMH is a parabola, to the axis of which the ordinates TK are parallel. BKF is alſo a right line when EMH is an hyperbola, to one aſymptote of which the ordinate TK is parallel. *Mac Laurin*, lib. cit. Art. 371, 372.

When the ordinate EB, at the point of contact E, inſtead of meeting the new curve BK, is an aſſymptote to it, the *curvature* of EM will be leſs than in any circle; and this is the caſe in which it is ſaid to be infinitely little, or that the radius of *curvature* is infinitely great. Of this kind is the *curvature* at the points of contrary flexure in lines of the third order. See *Mac Laurin*, lib. cit. Art. 377—379.

When the curve BK paſſes thro' the point of contact E, the *curvature* is greater than in any circle, or the radius of *curvature* vaniſhes; and in this caſe the *curvature* is ſaid to be infinitely great. Of this kind is the *curvature* at the cuſpids of the lines of the third order. See *Mac Laurin*, lib. cit. Art. 378, 379.

As to the circles of *curvature* for lines of the third or higher orders, ſee lib. cit. Art. 379; and Art. 380, when the propoſed curve is mechanical.

As lines which paſs thro' the ſame point have the ſame tangent when the firſt fluxions of the ordinates are equal, ſo they have the ſame *curvature* when the ſecond fluxions of the ordinate are likewiſe equal; and half the chord of the circle of *curvature* that is intercepted between the points wherein it interſects the ordinate, is a third proportional to the right lines that meaſure the ſecond fluxion of the ordinate and firſt fluxion of the curve, the baſe being ſuppoſed to flow uniformly. When a ray revolving about a given point, and terminated by the curve, becomes perpendicular to it, the firſt fluxion of the radius vaniſhes; and if its ſecond fluxion vaniſhes at the ſame time, that point muſt be the center of *curvature* [a]. The ſame may be ſaid, when the angular motion of the ray about that point is equal to the angular motion of the tangent of the curve; as the angular motion of the radius of a circle about its center is always equal to the angular motion of the tangent of the circle. Hence the various properties of the circle may ſuggeſt ſeveral theorems for determining the center of *curvature* [b]. — [a *Mac Laurin*, lib. cit. Art. 382, &c. b *Ibid.* Art. 389, &c.]

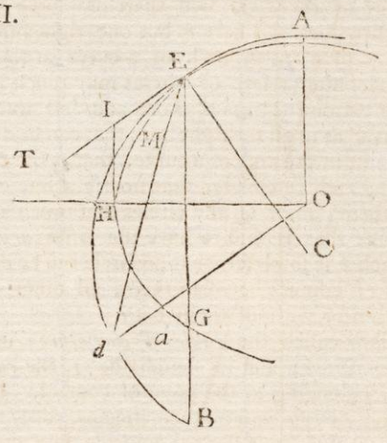
See alſo Art. 396, of the ſaid treatiſe, and the following, concerning the *curvature* of lines that are deſcribed by means of right lines revolving about given poles, or of angles that either revolve about ſuch poles, or are carried along fixed lines.

It is to be obſerved, that as when a right line interſects an arch of a curve in two points, if by varying the poſition of that line the two interſections unite in one point, it then becomes the tangent of the arch; ſo when a circle touches a curve in one point and interſects it in another, if, by varying the center, this interſection joins the point of contact, the circle then has the cloſeſt contact with the arch, and becomes the circle of *curvature*; but it ſtill continues to interſect the curve at the ſame point where it touches it, that is, where the ſame right line is their common tangent, unleſs another interſection join that point at the ſame time. In general, the circle of *curvature* interſects the curve at the point of oſculation, only, when the number of the ſucceſſive orders of fluxions of the radius of *curvature*, that vaniſhes at the term of time that this radius comes to the point of oſculation, is an even number. *Mac Laurin*, Flux. Art. 493.

It has been ſuppoſed by ſome, that two points of contact, or four interſections of the curve and circle of *curvature*, muſt join to form an oſculation. But Mr. James Bernoulli inſiſted juſtly, that the coalition of one point of contact and one interſection, or of three interſections, was ſufficient. In which caſe, and in general, when an odd number of interſections only join each other, the point where they coincide continues to be an interſection of the curve and circle of *curvature*, as well as a point of their mutual contact and oſculation. See *Mac Laurin*'s Fluxions, Art. 493.

From theſe principles the circle of *curvature* at any point of a conic-ſection may be determined. Suppoſe EMH (fig. III.) to be any conic-ſection, ET the tangent at E, HI a tangent parallel to EB, (a chord of the circle of *curvature*) that meets ET in I, and let EMH meet EB in G. Take EB to EG, in the ſame ratio as the ſquare of EI is to the ſquare of HI; or, when the ſection has a center as in the ellipſis and hyperbola, as the ſquare of the ſemi-diameter O*a* parallel to ET, is to the ſquare of the ſemi-diameter OA parallel to EB; and a circle deſcribed upon the chord EB that touches ET, will be the circle of *curvature*.

Fig. III.



When BET is a right angle, or EB is the diameter of the circle of *curvature*, EG will be the axis of the conic-ſection, and EB will be the parameter of this axis; and when the point G where the conic-ſection cuts EB, and B are on the ſame ſide of the point E, EMG will be an ellipſis, and EG the greater or leſſer axis, according as EG is greater or leſs than EB.

The propoſitions relating to the *curvature* of the conic-ſections, commonly given by authors, follow without much difficulty from this conſtruction.

1. When the chord of *curvature* thus found paſſes thro' the center of the conic-ſection, it will then be equal to the parameter of the diameter that paſſes thro' the point of contact.

2. The ſquare of the ſemi-diameter O*a*, is to the rectangle of half the tranverſe and half the conjugate axis, as the ray of *curvature* CE is to O*a*. And therefore the cube of the ſemi-diameter O*a*, parallel to the tangent ET, is equal to the ſolid contained by the radius of *curvature* CE, and the rectangle of the two axes. See *De Moivre*, Miſcel. Analyt. p. 235.

3. The perpendicular to either axis biſects the angle made by the chord of *curvature*, and the common tangent of the conic-ſection and circle of *curvature*.

4. The chord of the circle of *curvature* that paſſes thro' the focus, the diameter conjugate to that which paſſes thro' the point of contact, and the tranſverſe axis of the figure, are in continued proportion.

5. When the ſection is an ellipſis, if the circle of *curvature* at E meet O*a* in *d*, the ſquare of E*d* will be equal to twice the ſquare of O*a*. Hence E*d* : O*a* : : $\sqrt{2}$: 1. Which gives an eaſy method of determining the circle of *curvature* to any point E, when the ſemi-diameter O*a* is given in magnitude and poſition.

Several other properties of the circle of *curvature*, and methods of determining it when the ſection is given; or *vica verſa*, of determining the ſection when the circle of *curvature* is given, may be ſeen in Mr. *Mac Laurin*'s Fluxions, Art. 375.

Variation of CURVATURE. See VARIATION, *Suppl.*

Double

Double CURVATURE is uſed for the *curvature* of a line, all the parts of which are not ſituated in the ſame plane. See the next article.

CURVE *(Cycl.* and *Suppl.)* —The theory of *curves* is a very conſiderable branch of the mathematical ſciences. Thoſe who are curious of advancing beyond the knowledge of the circle and the conic-ſections, and to conſider geometrical *curves* of a higher nature, and in a general view, will do well to ſtudy Mr. Cramer's Introduction a *L'Analyſe des lignes Courbes Algebriques*, printed at Geneva, 4°. 1750, which the learned and ingenious author compoſed for the uſe of beginners. We have an elegant poſthumous work of Mr. Mac Laurin's, printed at the end of his Algebra, and intituled *De Linearum geometricarum proprietatibus generalibus.* The ſame author at a very early age gave a remarkable ſpecimen of his genius and knowledge in his *Geometria Organica*, and carried theſe ſpeculations farther afterwards, as may be ſeen in the theorems he has given us in the Philoſophical Tranſactions. See Dr. *Martin*'s Abridg. vol. viii. p. 62, ſeq.

Curves may be organically deſcribed by the rotation of angles, in the manner mentioned in the *Cyclopædia*, which is Sir Iſaac Newton's invention.

But there is another general method of deſcribing *curves* by the rotation of rulers or ſtrait lines, inſtead of angles.

Thus, if inſtead of angles we uſe three rulers, DQ, CN, SP, (fig. IV.) which are ſuppoſed to revolve about the poles D, C, S, and to cut one another always in three Points N, Q, and P; if any two of theſe interſections as N and Q, be carried along the given ſtrait lines AE, EB, the third interſection P will deſcribe a conic-ſection. See *Mac Laurin*'s Algebra, p. 346. ſeq.

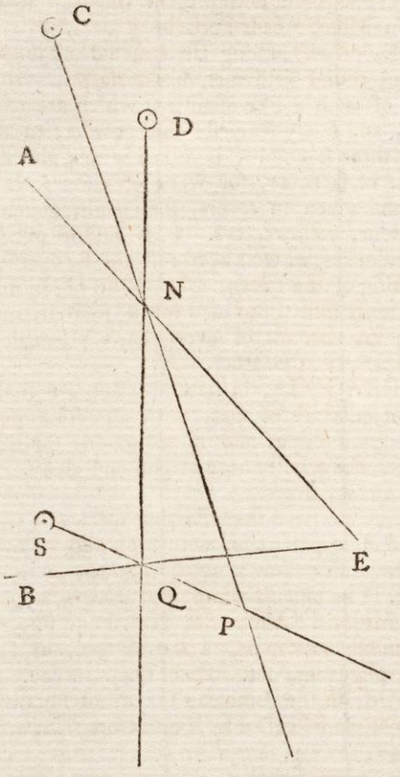


Fig. IV.

If you aſſume any number of poles whatſoever, and make rulers revolve about each of them, and all the interſections but one, be carried along given right lines, that one ſhall never deſcribe a line of a higher nature than a conic-ſection. And if inſtead of rulers you ſubſtitute given angles which move on the ſame poles, the *curve* deſcribed will ſtill be no more than a conic-ſection.

But by carrying one of the interſections neceſſary in the deſcription over a conic-ſection, lines of higher orders may be deſcribed. *Mac Laurin*, ib. p. 351.

The Rev. Mr. Brakenridge has given us a general method of deſcribing *curves* by the interſection of right lines moving about points in a given plane. See Phil. Tranſ. N°. 436. Dr. *Martin*'s Abridg. vol. viii. p. 58. ſeq. But the demonſtrations are not yet extant, excepting the particular caſes demonſtrated in his *Exercitatio Geometrica de Curvarum deſcriptione*, *Lond.* 1733, 4°.

Curves may alſo be deſcribed by the projection, or ſhadows of other *curves*. Thus the projection, or ſhadow of the circle upon different planes, will form the reſt of the lines of the ſecond order, or conic-ſections. This is evident, becauſe the rays of light proceeding from a point out of the plane of a circle, and falling upon the circumference of that circle form a cone, which being cut by the plane upon which the ſhadow of the circle is projected, the different conic-ſections will be formed according to the poſition of the interſecting plane.

In like manner the projections or ſhadows of lines of the third order, will form other lines of the third order; and projections or ſhadows of lines of the fourth order, will form lines of the fourth order, *&c.*

And as the circle, by the projection of its ſhadow, forms the conic-ſections, ſo the five diverging parabolas among the lines of the third order, will, by their ſhadows, form and exhibit all the reſt of the lines of that order. See *Newton*, enumerat. lin. tertij. ordin. publiſhed by Mr. *Jones*, 1711.

This hint of Sir Iſaac Newton has been lately purſued and illuſtrated with great elegance by Mr. Murdoch, in his treatiſe entitled, *Newtoni Geneſis curvarum per Umbras, ſeu perſpectivæ univerſalis elementa. Lond.* 1746, 8°.

By an accurate enumeration of theſe projections, Mr. Murdoch finds, that the number of ſpecies of the lines of the third order amount to ſeventy-eight in all.

CURVE *of a double curvature*, or CURVE *having a double curvature*, is uſed for a *curve*, all the parts of which do not lie in the ſame plane, that is, ſuch as cannot be deſcribed on the ſame plane.

The *curves* commonly treated of in geometry, are ſuppoſed to be deſcribed, or to have all their points placed in the ſame plane; but if a *curve* be ſuppoſed to be deſcribed on a *curve* ſurface, in ſuch a manner that all the points of that *curve* cannot lie or be ſituated in one and the ſame plane, then will the *curve* ſo deſcribed have a *double curvature*.

Monſieur Clairaut has publiſhed an ingenious treatiſe on *curves of a double curvature*. See his *Recherches ſur les Courbes, a double Courbure*, at *Paris*, 4°. 1731. Mr. Euler has alſo treated this ſubject in the Appendix to his *Analyſis infinitorum*, Vol. II. p. 323, ſeq.

CUSTARD-*apple*, a name uſed by ſome for the *guanabanus*, a ſpecies of *anona*. See the article ANONA, *Suppl.*

CUTTLE-*fiſh*, the Engliſh name of the *ſepia* of authors, called alſo the *ink-fiſh*. See the articles SEPIA and INK-*fiſh*, *Append.*

CYANEUS, in zoology, the name of a ſpecies of *coluber*. See the article COLUBER, *Append.*

CYANUS. This is made a diſtinct genus of plants by Tournefort, but comprehended under that of *centauria* by Linnæus. See the article CENTAURIA, *Append.*

CYCLIDIA, in zoology, the name uſed by Dr. Hill for a genus of animalcules of a roundiſh or elliptic figure, and without any viſible limbs or tail. See the article ANIMALCULE, *Suppl.* and *Append.*

CYMBIUM, in natural hiſtory, a name given to the *gondola*-ſhell. See GONDOLA.

CYNOCRAMBE, in botany, a name given to a ſpecies of *dog*'s mercury. See the article MERCURIALIS, *Append.*

CYNOCTONUM. See ACONITE, *Cycl.*

CYPRESS *(Cycl.* and *Suppl.)* —The timber of the *cypreſs-tree* is good for making cheſts, muſical inſtruments, and other utenſils. It never cleaves, and is extremely hard and durable; its bitter juice reſiſting worms and putrefaction. Thus, we are told, that the gates of St. Peter's church at Rome, made of *cypreſs-wood*, had laſted had ſix hundred years as freſh as new, when pope Eugenio ordered gates of braſs in their ſtead. Some will have it, that the wood, gophir, of which Noah's ark was made, was *cypreſs*; which Plato preferred to braſs itſelf, for writing his laws on. Build. Dict. in voc.

Summer-CYPRESS, a name uſed by ſome for the *chenopodium* of authors. See the article CHENOPODIUM, *Append.*

CYSTICAPNOS, in botany, a name uſed by Boerhaave for the *fumaria*, or fumitory. See FUMARIA, *Suppl.*

D.

DAFFODIL, the Engliſh name of a genus of plants known among authors by that of *narciſſus*. See the article NARCISSUS, *Suppl.*

DAFFODIL-*lilly*, in botany, a name ſometimes given to the *lilio-narciſſus* of authors. See the article LILIO-*Narciſſus*, *Suppl.*

Sea-DAFFODIL, the Engliſh name of a genus of plants called by authors *pancratium*. See the article PANCRATIUM, *Append.*

DARE. See the article LEUCISCUS, *Suppl.*

DAIRY, or DAIRY-*houſe*, in rural architecture, a building where milk, butter, cheeſe, whey, &c. are made or kept. See the articles MILK, BUTTER, &c. *Suppl.*

DAISY, in botany, the Engliſh name of a genus of plants called by authors *bellis*. See the article BELLIS, *Suppl.*

Great DAISY, a name ſometimes given to a genus of plants known among authors by that of *leucanthemum*. See the article LEUCANTHEMUM, *Suppl.*

Ox-eye DAISY, a genus of plants called by botanical writers *buphthalmum*. See the article BUPHTHALMUM, *Suppl.*

DAME's *violet*, in botany, a name uſed by ſome for the *heſperis* of authors. See the article HESPERIS, *Suppl.*

DAMP is ſometimes uſed in a ſynonymous ſenſe with moiſture. See the article MOISTURE, *Append.*

DANE-*wort*, or dwarf-elder, names ſometimes given to a genus of plants called by authors *ſambucus*. Seethe article SAMBUCUS, *Suppl.*

DARNEL, the Engliſh name given to a genus of plants called by botanical writers *lolium*. See the article LOLIUM, *Suppl.*

DARNEL-*graſs*. See the article GRASS, *Append.*

DARSINE, a kind of cinnamon. See the article CINNAMUM, *Suppl.*

DASYPUS, in zoology, the name of a genus of animals called *armadillo* and *tatu-muſtelinus*. See the articles ARMADILLO, TATU, and TATUETE, *Suppl.*

DATE *(Cycl.)* — DATE-*tree*, in botany, a name given to ſeveral ſpecies of palm-tree. See the article PALM, *Suppl.*

DATE-*plum*, the name of a genus of plants called by Linnæus *dioſpyros*, and by Tournefort *guaiacana*. See the article GUAIACANA, *Suppl.*

DAY-*lilly*, a name uſed ſometimes for the *hemerocallis* of authors. See the article HEMEROCALLIS, *Suppl.*

DEAD-*nettle*, in botany, the Engliſh name of a genus of plants called by authors *lamium*. See the article LAMIUM, *Suppl.*

DEADLY *carrot*, the Engliſh name of a genus of plants called by authors *thapſia*. See the article THAPSIA, *Suppl.*

DEADLY *nightſhade*, in botany, a name given to the *belladonna* of authors. See the article BELLADONNA, *Suppl.*

DEATH-*watch*, in zoology, the Engliſh name of the *pediculus* of old wood. It is nearly of the ſize of the common louſe, and the noiſe, reſembling the beating of a watch, is made by the male or female, when wooing each other. *Hill*, Hiſt. Anim. p. 22.

DECURSIO, in Roman antiquity, See the article CAMPICURSIO, *Suppl.*

DEER *(Suppl.)* — *Rein*-DEER, the Engliſh name of an animal of the *deer* kind, called by authors *rangifer*. See the article RANGIFER, *Suppl.*

DENTALIUM, in zoology, the ſame with *dentale*. See the article DENTALE, *Suppl.*

DERMESTES, the name given by Dr. Hill to a numerous genus of inſects commonly confounded with the *ſcarabæi*, or beetles, from which they are diſtinguiſhed by having their antennæ of a clavated figure. Vide *Hill*, Hiſt. Anim. p. 40.

DETTANDER. See the article LEPIDIUM, *Suppl.*

DEVICE, among painters, &c. the ſame with deviſe. See the article DEVISE, *Cycl.*

DEVIL *in a buſh*, a name ſometimes given to a genus of plants called by authors *nigella*. See the article NIGELLA, *Suppl.*

DEVIL's *bit*, in botany, a name uſed by ſome writers for the *ſcabioſa* of others. See the article SCABIOSA, *Suppl.*

DEW-*born*, in the management of cattle, an exceſſive ſwelling of the body, proceeding from the greedineſs of a beaſt to feed, when put into rank paſture.

This ſwelling is often ſo great that the creature runs the utmoſt hazard of burſting; in which caſe it ſhould be made to ſtir much, and purge well: but the proper cure is to bleed the creature in the tail, then putting a nutmeg into an egg, to thruſt it down the creature's throat, ſhell and all; after which by walking him up and down he will ſoon mend. Ruſt. Dict. in voc.

DIABETES *(Cycl.* and *Suppl.)* — According to Dr. Mead, the *diabetes* is a diſeaſe of the liver, and not of the kidneys, as has been generally thought. See Monit. & Pract. Medic. cap. ix. § 2. and Mechanic Account of Poiſons, Eſſay i. Ed. 4. The Doctor recommends the following medicine as efficacious in this diſtemper: take four pints of milk, boil it a little, and turn it with three drachms of alum; four ounces of this ſhould be taken three times a day at leaſt.

This diſeaſe happens moſt frequently to thoſe who, without due exerciſe, indulge themſelves with drinking vinous liquors, and then quench the thirſt ariſing from thence by too great a quantity of ſuch as are cooling.

The *diabetes* ſeem to have been rare among the antients, ſince Galen ſays he ſaw it but twice only.

DIAGONAL *ſcale*. See the article PLOTTING *ſcale*, *Cycl.*

DIALLING *(Cycl.)* — We have a treatiſe, by Mr. Deparcieux, on this ſubject, publiſhed 1740, recommended in Hiſt. Acad. Scienc. 1740.

DIAMOND *(Cycl.* and *Suppl.)* — When *diamonds* are fouled with a yellow or brown colour, it is a common practice among jewellers to put them into a fierce fire; this diveſts them of their colour, without doing them the leaſt ſenſible injury. *Du Fay*, in Mem. Acad. Paris. 1735.

DIAPENTE, *(Cycl.)* among farriers, a drink made for horſes, of gentian, round birthwort, barberries, myrrh, and ivory ſhavings, of each a like quantity, which are to be pounded ſeparately, and finely ſearced: this powder, to the quantity of two or three ſpoonfuls, is mixed with a pint and a half of muſcadine, or ſack, or, for want of either, with ſtrong ale or beer, and given in fevers, the cough, glanders, ſurfeits, inflammations, yellows, &c. It is ſaid to purify the blood from all foulneſſes, as well as to reſtrain the overflowing of the gall, working of the ſpleen, &c. Ruſt. Dict. in voc.

DIARY, a term ſometimes uſed for a journal, or day-book, containing an account of every day's proceedings. Thus we ſay *diaries* of the weather, &c.

DIAUGOPHRAGMIA, in natural hiſtory, a genus of *ſeptariæ*, whoſe ſepta are of ſpar, with an admixture of cryſtal, which being ſometimes alſo mixed among the matter of the tali, renders the whole more bright and gloſſy. See the article SEPTARIÆ, *Suppl.*

Of this genus we have the following ſpecies: 1. The ferrugineous red *diaugophragmia*, with browniſh yellow partitions. 2. The browniſh yellow *diaugophragmium*, with whitiſh partitions. 3. The blueiſh white *diaugophragmium*, with ſtraw-coloured partitions. Vide *Hill*, Hiſt. Foſſ. p. 522.

DIBBLE, among gardeners, a ſetting-tool, or forked ſtick, wherewith plants are ſet. Ruſt. Dict. in voc.

DICTAMNUS, in the Linnæan ſyſtem of botany, the name of a genus of plants called by Tournefort *fraxinella*. See the article FRAXINELLA, *Suppl.*

DIE. See the article DYE, *Cycl.*

DIER. See the article DYER, *Suppl.* and *Append.*.

DIESIS *(Suppl.)* — a wrong notation has crept into this article; for E, ♮ E, F, read E, ♯ E, F. And ſo in other places of this article, where ♮ E occurs, ſubſtitute ♯ E.

DIET. See the article FOOD, *Suppl.*

One great reaſon why leproſies, hot ſcurvies, dyſenteries, plagues, peſtilential fevers, and the like diſtempers, formerly ſo frequent in London, are now ſo rare, is the change that has been made in the *diet* of the inhabitants. Hoped beer, wine, and ſpirituous liquors coming into general uſe, have been a great means of ſuppreſſing putrid diſeaſes; greens and fruit are likewiſe more univerſally eat, and ſalted meats make a much leſs part of *diet* than formerly: to this add the more general conſumption of tea and ſugar. *Pringle*, Obſerv. on the Diſeaſes of the army, p. 294, *ſeq.*

A vegetable *diet* is moſt proper for ſcorbutic and hectical perſons, and does very well with people who have great exerciſe; but, in other circumſtances, a mixed *diet* of vegetable and animal ſubſtances, ſuch as is commonly uſed, ſeems beſt calculated to nouriſh and preſerve the body from decay. *Id. ibid.* p. 366, *ſeq.*

Irregularities in *diet* are commonly, though unjuſtly, ſuppoſed to have the greateſt ſhare in producing military diſeaſes; were this the caſe, the changes in the weather and ſeaſons would not ſo remarkably affect their health; the ſobereſt and moſt regular corps would not be ſo ſickly; different nations in the ſame camp, living variouſly, would not be afflicted with the ſame diſtempers; nor would there be ſuch an inequality in the numbers of the ſick in different years, were the greateſt part of diſeaſes owing ſolely to *diet*.

Againſt exceſs, the moſt common error in *diet*, the ſmallneſs of a ſoldier's pay is a ſufficient ſecurity: in regard to them, therefore

therefore, the danger lies on the other hand; for, when all are not obliged to eat in meſſes, ſome will be apt to lay out their pay upon ſtrong liquors, and to ſquander away in one day what is but barely a maintenance for a week; but, on the ſuppoſition that every man contributes his ſhare to a meſs, we may be aſſured there can be no errors in *diet* of any conſequence, whilſt almoſt the whole pay is ſpent upon common food. As to the abuſe of ſpirits and fruit, ſoldiers are generally blamed without any foundation; ſpirits being rather beneficial than hurtful to them, ſo often expoſed to the extremes of heat and cold, to moiſt and bad air, long marches, wet cloaths, and ſcanty proviſions; and as to fruit, a few diſorderly men may rob orchards, which is the only way they can come at fruit, but the camp-diſeaſes are incident to the moſt regular equally with them. See *Pringle*, Obſerv. on the Diſeaſes of the army, p. 86, *ſeq.*

A fundamental rule in regard to the *diet* of ſoldiers, is to oblige them to eat in meſſes, by which means their pay will be laid out upon wholeſome food. The greateſt impediment to meſſing are the wives and children, who muſt often be maintained on the ſoldier's pay; in which circumſtances it is not improper food, but the want of it, that may endanger a ſoldier's health.

The meſſing being eſtabliſhed, there remains only to ſee that the men be well ſupplied with bread, and that the markets be ſo regulated that the traders may have encouragement to come to the camp, and the meſſes have good proviſions at a moderate price; and particularly vegetables, which, during the hot weather, ought to make a great part of the *diet*. In eſtabliſhing the meſſes, ſome regulations might be made with regard to an allowance of ſpirits, either by ſtoppages on the pay or otherwiſe. This is already practiſed in the navy, and probably for the ſame reaſons that make ſpirits neceſſary for ſoldiers; ſince in ſhips men are liable to diſtempers from moiſt and corrupted air.

As to the *diet* of officers, their chief rule, in ſickly times, is to eat moderately, avoiding all ſurfeits and indigeſtion, and uſing wine in moderation. *Id. ibid.* p. 112, *ſeq.*

DIFFERENTIAL *equation* is uſed by ſome mathematicians for an equation involving infiniteſimal differences, or fluxions. Thus the equation $3x^2dx - 2axdx + aydx - 3y^2dy + axdy = 0$ in the foreign notation, or $3\dot{x}x\dot{x} - 2ax\dot{x} + ay\dot{x} - 3y^2\dot{y} + ax\dot{y} = 0$ in the Engliſh notation, is called a *differential equation*. But theſe equations ſhould conſiſtently with the Engliſh or Sir Iſaac Newton's notation, be rather called fluxional equations.

Hence ſome of our mathematicians have applied the term *differential equation* in another ſenſe, to certain equations defining the nature of ſeries's. See the article SERIES, *Append.*

DIFFERENTIAL *method*, in mathematics, an appellation given to a method of deſcribing a curve of the parabolic kind thro' any given number of points.

This method is given by Sir Iſaac Newton in the fifth lemma of the third book of his Principles. He diſtinguiſhes two caſes of this problem; the firſt, when the ordinates drawn from the given points to any line given in poſition, are at equal diſtances from each other; and the ſecond, when theſe ordinates are not at equal diſtances. He has given a ſolution of both caſes, but without demonſtration in that place, which has ſince been ſupplied by himſelf and others. See his Methodus Differentialis, publiſhed with other tracts of the ſame author, by Mr. Jones, London, 1711; and Stirling's explanation of the Newtonian *differential method* in the Philoſ. Tranſ. N°. 362. *Cotes*, de Methodo differentiali Newtoniana, in his works publiſhed by Dr. Smith; *Herman.* Phoronomia in Append. p. 389; ſee alſo *Le Seur* and *Jacquier*, in their Comment on Sir Iſaac's Principles, tom. ii. p. 42, *ſeq.*

Where it is to be obſerved, that the methods there demonſtrated by ſome of theſe authors extend to the deſcription of any algebraic curve through a given number of points, which Sir Iſaac, writing to Mr. Leibnitz, mentions as a problem of the greateſt uſe.

By this method, ſome terms of a ſeries being given, and ſuppoſed to be placed at given intervals, any intermediate term may be found nearly; and this therefore gives a method for interpolations. *Newt.* Meth. Differ. prop. v.

Any curvilinear figure may alſo be ſquared nearly, of which ſome ordinates may be found. *Newt. ibid.* prop. vi.

And this method may be extended to the conſtruction of mathematical tables by interpolation. *Ibid. in* ſchol. p. 100.

The ſucceſſive differences of the ordinates of parabolic curves, becoming ultimately equal, and the intermediate ordinate required being determined according to Sir Iſaac's rules, by theſe differences of the ordinates, is the reaſon of this method's being called the *differential method.*

To be a little more particular:

The firſt caſe of Sir Iſaac's problem amounts to this; a ſeries of numbers, placed at equal intervals being given, to find any intermediate number of that ſeries when its interval from the firſt term of the ſeries is given.

Subtract every term of the ſeries from the next following, and let the remainders be called firſt differences; then ſubtract each difference from the next following, and let theſe remainders be called ſecond differences; again, let each ſecond difference be ſubtracted from the next following, and let theſe remainders be called third differences, and ſo on: then if A be the firſt term of the ſeries, d' the firſt of the firſt differences, d'' the firſt of the ſecond differences, d''' the firſt of the third differences, *&c.* and if x be the interval between the firſt term of the ſeries and any term ſought, E, that is, let the number of terms from A to E, both incluſive, be $= x + 1$, then will the term ſought,

$$E = A + \frac{xd'}{1} + \frac{x.\overline{x-1}}{1.2}d'' + \frac{x.\overline{x-1}.\overline{x-2}}{1.2.3}d''' + \frac{x.\overline{x-1}.\overline{x-2}.\overline{x-3}}{1.2.3.4}d'''' + \&c.$$

which ſeries differs from the Newtonian in this, that the quantities $\frac{d''}{1.2}$, $\frac{d'''}{1.2.3}$, $\frac{d''''}{1.2.3.4}$ here uſed, ſignify the ſame with d'', d''', d'''', uſed by Sir Iſaac.

Hence if the differences of any order become equal, that is, if any of the quantities d'', d''', d'''' become $= 0$, we ſhall have a finite expreſſion for E, the term ſought; it being evident, that the ſeries muſt terminate when any of the differences d'', d''', *&c.* become $= 0$.

It is alſo evident that the coefficients $\frac{x}{1}$, $\frac{x.\overline{x-1}}{1.2}$, *&c.* of the differences, are the unciæ of the binomial theorem.

A method may be deduced from the foregoing expreſſion, of finding the ſums of the terms of ſuch a ſeries. For if we imagine a new ſeries, whereof the firſt term ſhall be $= 0$, the ſecond $= A$, the third $= A + B$, the fourth $= A + B + C$, the fifth $= A + B + C + D$, and ſo on, it is plain that the aſſigning one term of this ſeries is finding the ſum of all the terms A, B, C, D, *&c.* Now ſince thoſe terms are the differences of the ſums 0, A, $A + B$, $A + B + C$, $A + B + C + D$, and that, by the ſuppoſition, ſome of the differences of A, B, C, D, *&c.* are $= 0$; it follows that ſome of the differences of the ſums will alſo be $= 0$; and that whereas in the ſeries $A + xd' + \frac{x.\overline{x-1}}{1.2}d''$, *&c.* whereby a term was aſſigned, A repreſented the firſt term, d' the firſt of the firſt differences, and that x repreſented the interval between the firſt term and the laſt, we are to write 0 inſtead of A, A inſtead of d', d' inſtead of d'', d'' inſtead of d''', *&c.* and $x + 1$ inſtead of x; which being done, the ſeries expreſſing the ſums will be $0 + \overline{x+1}.A + \frac{\overline{x+1}.x}{1.2}d' + \frac{\overline{x+1}.x.\overline{x-1}}{1.2.3}d'' + \&c.$ or $\overline{x+1} \times A + \frac{x}{2}d' + \frac{x.\overline{x-1}}{2.3}d'' + \frac{x.\overline{x-1}.\overline{x-2}}{2.3.4}d''' + \&c.$ Or again, if the real number of terms of the lines be called z, that is, if $z = x + 1$, or $z - 1 = x$, we ſhall have the ſum of the ſeries $= z \times A + \frac{\overline{z-1}}{2}d' + \frac{\overline{z-1}.\overline{z-2}}{2.3}d'' + \frac{\overline{z-1}.\overline{z-2}.\overline{z-3}}{2.3.4}d''' + \&c.$ See *De Moivre*, Doctr. of Chances, p. 52, 53. Miſc. Analyt. p. 153.

For inſtance, let it be required to find the ſum of a ſeries of the ſquares of the natural numbers $1 + 4 + 9 + 16 + 25 + 36$

Then, $A = 1$ d'

4 3 d''

9 5 2 d'''

16 7 0

25 9 2 0

36 11 2

The ſum conſequently will be,

$$= z \times 1 + \frac{\overline{z-1}}{2} \times 3 + \frac{\overline{z-1}.\overline{z-2}}{2.3} \times 2$$

$$= z \times 1 + \frac{3z-3}{2} + \frac{zz-3z+2}{3}$$

$$= z \times \frac{6 + 9z - 9 + 2zz - 6z + 4}{6}$$

$$= z \times \frac{1 + 3z + 2zz}{6} = \frac{z.\overline{1+z}.\overline{1+2z}}{6} = \frac{6.7.13}{6} = 91$$

This eaſy example will be ſufficient to ſhew the applications of the rule. Thoſe who are deſirous of ſeeing its uſe in queſtions of chance, may conſult Mr. *de Moivre*'s Doctrine of chances, p. 53, *ſeq.* Various other inſtances of the uſe of this rule in finding ſums of progreſſions of figurate members, *&c.* may be ſeen in Miſc. Analyt. p. 154, *ſeq.*

As to the *differential method*, it is to be obſerved, that though Sir Iſaac and others have treated it as a method of deſcribing an algebraic curve, at leaſt of the parabolic kind, through any number of given points; yet the conſideration of curves is not at all eſſential, though it may help the imagination. The deſcription of a parabolic curve through given points, is the ſame problem as the aſſigning of quantities from their given differences, which may always be done by algebra, and by the

the resolution of simple equations. See Mr. *Stirling*'s Methodus Differentialis, p. 97. This ingenious author has treated fully of the *differential method*, and shewn its use in the solution of some very difficult problems.

DIFFERENTIAL *scale*, in algebra, is used for the scale of relation subtracted from unity. See the article *Recurring* SERIES, *Append.*

DIGESTION, how promoted by fermentation. See the article FERRMENTATION, *Append.*

DIMNESS *of sight*, in horses. Seethe article SIGHT, *Append.*

DISAFFORESTED, the same with deafforested. See the article DEAFFORESTED, *Cycl.*

DISBUDDING *of trees*, is the taking away such branches or sprigs, newly put forth, as are ill placed. Dict. Rust. in voc.

DISBURDENING *of fruit-trees*, is the taking off part of the leaves and fruit, when too numerous, that those which remain may grow the larger. Dict. Rust. in voc.

DISCLOSED, a term used for chickens or hawks newly hatched, or just peeping through the shells; also for buds or flowers just blown. Dict. Rust. in voc.

DISEASES *of soldiers*. See the article SOLDIERS, *Append.*

DISEMBARK, in the sea-language, signifies to land goods from on ship-board. Dict. Rust. in voc.

DISPLANTING, among gardeners, is the plucking up a tree or plant out of the ground. Dict. Rust. in voc.

DISPLANTING *scoop*, an instrument for taking up plants with earth about their roots. *Id. ibid.*

DISSEPIMENTUM, among botanists, the thin septum separating the cells of the fruits of plants.

DISTAFF, an instrument about which flax is tied, in order to the spinning it.

DISTAFF-*thistle*, a name sometimes given to the *atractylis* of authors. See the article ATRACTYLIS, *Append.*

DITTANDER, in botany, the English name of a genus of plants, called by authors *lepidium*. See the article LEPIDIUM, *Suppl.*

DITTANY *(Suppl.)* — *Bastard*-DITTANY, the English name of a genus of plants called by authors *Pseudo-dictamnus*. See the article PSEUDO-*dictamnus*, *Suppl.*

DOCK *(Suppl.)* in botany, the English name of a genus of plants called by authors *lapathum*. See the article LAPATHUM, *Suppl.*

DOCK, among sportsmen, denotes the fleshy part of a boar's chine, between the middle and the buttock.

DOCTOR *Tinkar's weed*, in botany, a name given to a genus of plants called by authors *triosteospermum* and *lonicera*. See the article LONICERA, *Append.*

DOE, the female of the buck-kind. See the article BUCK, *Cycl.* and *Suppl.*

DOG, *(Suppl.)* the English name of a very numerous genus of animals. See the articles DOG and CANIS, *Suppl.*

DOG's *bane*, in botany, the English name of a genus of plants called by authors *apocynum*. See the article DOG's *bane*, *Suppl.*

DOG-*berry-tree*, a name given to the *cornus*, or cornel-tree. See the article CORNUS, *Suppl.*

DOG-*days*, the same with canicular days. See the article CANICULAR, *Cycl.*

DOG's *grass*, in botany. See the article GRASS, *Append.*

DOG's *mercury*, in botany, a name given to a species of *mercurialis*. See the article MERCURIALIS, *Suppl.*

DOG's *stones*, in botany, a name by which some call the *orchis*. See the article ORCHIS, *Suppl.*

DOG's *tongue*, in botany, the English name of a genus of plants called by authors *cynoglossum*. See the article CYNOGLOSSUM, *Suppl.*

DOG's *tooth-shell*, the English name of a species of *dentalium*. See the article DENTALIUM, *supra.*

DOG-*wood*, a name sometimes given to the *cornus*, or cornel-tree. See the article CORNUS, *Suppl.*

DOG-*wood of Jamaica*, the name by which some authors call *robinia*, a genus of plants. See the article ROBINIA, *Suppl.*

DOG-*wood of Virginia*, a name sometimes given to a species of *laurus*, or bay-tree. See the article LAURUS, *Suppl.*

DOGGS, machines of iron for burning wood on; also hooks fixed in large timbers, for drawing them with horses. *Blanckley*, Nav. Expositor, p. 51.

DOOLS, a term used in several parts of the kingdom for balks, or slips of pasture, left between the furrows of ploughed lands. Dict. Rust. in voc.

DORIA, in botany, the name used by Dillenius for the *solidago*, or *virga aurea* of other botanists. See the article VIRGA *aurea*, *Suppl.*

DORMOUSE, the English name of a genus of animals called by authors *sorex*. See the article SOREX, *Suppl.*

DOTTEREL *(Suppl.)* — For MAINELLUS, referred to in this article, read MORINELLUS.

DOUBLE *(Cycl.* and *Suppl.)* — A hare is said to *double* when she keeps in plain fields, and winds about to deceive the hounds. Dict. Rust. in voc.

DOUBLE-*leaf*, or TWYBLADE, in botany, names given by some to the *ophris* of authors. See the article OPHRIS, *Suppl.*

DOUBLE-*tongue*, a name sometimes given to the *ruscus*, or butcher's broom. See the article RUSCUS, *Suppl.*

DOUCETS, or DOULCETS, among sportsmen, denote the testes of a deer or stag. Dict. Rust. in voc.

DOVE's *foot*, in botany, a name sometimes used for the *geranium*, or crane's bill of authors. See the article GERANIUM, *Suppl.*

DOWN, in natural history, denotes the finest feathers of geese, with which beds, pillows, *&c.* are stuffed: also the cottony substance growing on the tops of thistles, and other plants.

DOWNY, something partaking of the nature, or abounding with down: thus, some leaves, fruit, *&c.* are found covered with a *downy* matter.

DRABA, in the Linnæan system of botany, makes a distinct genus of plants, which have no style, and whose fruit is an oval pod of an oblong figure.

C. Bauhine calls it the *bursa pastoris minor*.

DRABA is also a name by which some species of two very distinct genuses of plants, not only from the former, but from each other, are sometimes called; those are the *lepidium* and *hesperis* of botanical writers. See the articles LEPIDIUM and HESPERIS, *Suppl.*

DRAFF, a term used in many parts of the kingdom for the wash given to hogs: also for the grains of brewers usually given to cows.

DRAGG *(Suppl.)* — *Draggs* are also a kind of basket used in clearing the aprons of ship-docks of filth. *Blanckley*, Nav. Expos. p. 51.

DRAGON *(Suppl.)* — *Sea*-DRAGON, in ichthyology, the English name of the *cottus*, with the second back-fin white. See the article COTTUS, *Suppl.*

DRAGON-*tree*, a name sometimes used for the palm-tree. See the article PALM, *Suppl.*

Wild DRAGON, a name sometimes given to *abrotanum*, or southernwood. See the article SOUTHERNWOOD, *Suppl.*

DRAW-*net*, a kind of net for taking the larger sort of wild fowl, which ought to be made of the best packthread, with wide meshes: they should be about two fathoms deep and six long, verged on each side with a very strong cord, and stretched at each end on long poles.

It should be spread smooth and flat upon the ground, and strewed over with sedge, grass, or the like, to hide it from the fowl; and the sportsman is to place himself in some shelter of grass, fern, or some such thing. Dict. Rust. in voc.

DRAW-*gear*, in husbandry, any kind of harness for drawing a waggon or other carriage.

DRAWING *of teeth*, or *Tooth*-DRAWING, in surgery. See the article TOOTH-*drawing*, *Suppl.*

DRAY, a name given by sportsmen to squirrel-nests, built in the tops of trees. See the article SQUIRREL, *Suppl.*

DRAY is also a kind of cart used by brewers for carrying barrels of beer; also a sledge drawn without wheels. Dict. Rust. in voc.

DREDGE, or DREG, a term used by the farmers for oats and barley mingled together. Dict. Rust. in voc.

DREDGERS, a term used in the admiralty-courts for the fishers for oysters. Dict. Rust. in voc.

DRIFFLAND, the same with droffland. See the next article.

DROFFLAND, or DRIFFLAND, in our old customs, a yearly payment made by some tenants to their landlords, for driving their cattle through the manor to fairs and markets. Dict. Rust. in voc.

DROP-*wort*, the English name of a genus of plants called by authors *filipendula*. See the article FILIPENDULA, *Suppl.*

Water-DROP-*wort*, the English name of a genus of plants called *œnanthe* by authors. See the article ŒNANTHE, *Suppl.*

DROPSY *(Suppl.)* — *Dropsies*, attended with anasarcous swellings, are not to be cured with purging alone, nor by soap, nor mercurials; but chiefly by the lixivial salts, either in the form of broom-ashes, salt of wormwood, or salt of tartar. The common method is this; about thirty or forty grains of salt of tartar is dissolved in an infusion of wormwood, to which is added spirit of juniper; and this mixture is to be given in three doses, and repeated daily. Besides this it may be proper to give the patient, once in four or five days, half a dram of *pilulæ ex coloquintida cum aloe*, as a purge; and toward the decline of the disease, some common chalybeate. The diuresis may also be promoted by swallowing garlick, or mustard-seed. See *Pringle*, Observ. on Diseases of the Army, p. 213.

DROSERA, in the Linnæan system of botany, the name of a genus of plants called by Tournefort *ros solis*. See the article ROS *solis*, *Suppl.*

DRUM *(Cycl.)* — *Mire*-DRUM, the name by which the bittern is called in several parts of the kingdom. See the article BITTERN. *Suppl.*

DUBBING *of a cock*, a term used by cock-masters for the cuting off a cock's comb and wattles. Dict. Rust.

DUCK's *foot*, in botany, the English name of a genus of plants known among authors by those of *podophyllum* or *anapodophyllum*. See the article ANAPODOPHYLLUM, *Suppl.*

DUCK-*weed*, or DUCK's *meat*, the English name of a genus of plants called by authors *lemna*. See the article LEMNA, *Append.*

DUMBNESS *(Cycl.)* — When this disorder arises from deafness, it sometimes admits of a cure. See the Phil. Trans. N°. 61. where Dr. Wallis gives an account of two persons deaf and dumb, who were taught to understand and speak a language. And in N°. 245. the doctor gives an account of his method for this purpose. This art is now practised successfully in London by the ingenious Mr. Baker.

DWALE, a name ſometimes given to the deadly nightſhade, or *belladonna*. See the article BELLADONNA, *Suppl.*

DYER's *broom*, in botany, the name of a ſpecies of *geniſta*. See the article GENISTA, *Suppl.*

DYNA, in commerce, a kind of Eaſt-Indian coin, worth about thirty Shillings of Engliſh money.

DYSENTERY *(Cycl.* and *Suppl.)* — The *dyſentery* is owing to cauſes little different from thoſe which produce the bilious or putrid fever. Accordingly it is agreed on all hands, that it proceeds chiefly from two cauſes, different in appearance, but in effect the ſame; one from acrimony generated within the body, and the other from foul ſteams, which being received into it, act as a ferment, and ſuddenly produces the ſame diſorder that ariſes more ſlowly from an internal cauſe.

As to the acrimony, it appears to be of the putrid kind, the *dyſentery* being moſt frequent in hot, cloſe, and moiſt ſeaſons, when bodies are moſt ſubject to putrefaction; and, beſides, prevails chiefly among thoſe of a ſcorbutic habit, or the meaneſt and pooreſt people, who, from foul air, bad diet, and naſtineſs, are moſt liable to putrid diſeaſes.

There is likewiſe an old obſervation, that ſuch ſeaſons as produce moſt flies, caterpillars, and other inſects (the increaſe whereof depends ſo much upon heat, moiſture, and conſequently upon corruption) have likewiſe been the moſt productive of *dyſenteries*.

Laſtly, it is beyond diſpute, that the infection is communicated by putrid effluvia from the bodies, but more eſpecially the fæces of thoſe who are ill of the diſtemper. See *Pringle*, Obſervations on the Diſeaſes of the Army, p. 224, *ſeq.*

This diſeaſe is the ſame in camps as in other places; its greater fatality in the former ariſing more from want of neceſſaries than from any extraordinary virulence in the *dyſentery* itſelf.

Phyſicians diſtinguiſh three ſtates of the *dyſentery*; the firſt, when recent, the ſecond, when it has continued ſome time, and has much impaired the ſtrength, weakened the tone of the inteſtines, and abraded their villous coat; and the third, when, either from the putrid fumes within the body, or the foul air of an hoſpital, a malignant fever is joined, and a mortification threatened.

In the firſt ſtage bleeding is proper, though not in the ſubſequent ones; alſo vomiting with *ipecacuhana*, in ſmall quantities, and repeated ſeveral times. *Vitrum ceratum antimonii* is alſo recommended as the moſt efficacious emetic for relieving the ſtomach and bowels, provided it be given in the beginning of the diſtemper. After vomiting, a purge of rhubarb, to which are added a few grains of ſalt of wormwood, may be given. In winter, indeed, and vernal fluxes, bleeding and rhubarb have been found ſufficient, without vomits. In regard to diet, the common practice is to confine the patient in the beginning to rice-gruel, panado, mutton-broth, and the like; and for drink rice or barley-water, or the white decoction are recommended. In the convaleſcent ſtate they may be allowed meat, but no ſmall beer, and never any milk unleſs diluted with lime-water. *Pringle*, Obſerv. on the Diſeaſes of the Army, p. 230, *ſeq.*

In the ſecond ſtage, the ſame diet, with ſmall doſes of the bark, to which has been added the extract of logwood, or the *tinctura Japonica*, is recommended.

The *dyſentery*, after a ſeeming cure, is apt to recur upon any cold, or error in diet: however, it is to be obſerved, that, for the moſt part, relapſes are not attended with ſuch acrimony as at firſt. When relapſes are apprehended, or the cure imperfect, the patient muſt ſtill uſe a ſoft mucilaginous diet, and continue to take ſome mild aſtringent; which laſt intention may be anſwered by lime-water, given to a pint a day, and ſoftened with half that quantity of boiled milk. Sometimes ſmall doſes of the bark have been no leſs effectual. *Id. ibid.*

Gripes always attend the *dyſentery*, and are relieved by opiates, by fomenting the belly, and by drinking chamemile-tea; for carminatives, in this caſe, inſtead of mitigating, increaſe the pains. The tea produces this effect not only by its antiſpaſmodic but antiſeptic virtue. The fomentations, which are made of herbs, adding ſome ſpirits, muſt be frequently repeated; and when theſe are found ineffectual, the pains may be relieved with a bliſter, or only a warm plaſter with a fourth or fifth part of the *emplaſtrum epiſpaſticum* added to it.

As to the third ſtage of this diſtemper, it coincides with the malignant or hoſpital fever. See the article HOSPITAL *fever*, *Append.*

DYTISCUS, in zoology, the name of a genus of four-winged flies, the antennæ of which are ſlender and ſetaceous. They have likewiſe feet formed for ſwimming, and their habitation is generally in the water, whence they have been called in Engliſh, water-beetles.

E.

EADISH, among farmers. See the article EDDISH, *Append.*

EAGLE *(Suppl.)* — *Sea*-EAGLE, in ichthyology, the Engliſh name of the *aquila marina*, a ſpecies of *raja*. See the articles RAJA and AQUILA *marina*, *Suppl.*

EAGLE-*bat*, the Engliſh name of an animal of the bat-kind. See the article VESPERTILIO, *Suppl.*

EAGLE-*flower*, the name by which ſome call the *balſamina*, a diſtinct genus of plants. See the article BALSAMINA, *Suppl.*

EAGRASS. See the article EDDISH, *Append.*

EAR-*wig*, *forficula*, a well known inſect, very ſwift, with two ſmall horns on its head, and ſix feet; its tail is forked; its body is about the thickneſs of a ſmall worm, and very ſmooth.

It is a very troubleſome creature, frequently introducing itſelf into the ears, and cauſing a great deal of pain by its biting: it likewiſe burrows in other parts of the body, which it bites in the ſame manner.

The dried powder of *ear-wigs* is eſteemed good for deafneſs; and the oil prepared from them, in convulſions and ſpaſms. Vide *Lemery*, Dict. des Drog. *in voc. Forficula.*

EARNING, or YEARNING, a name uſed in ſeveral parts of the kingdom for rennet.

EARSH. See the article EDDISH, *Append.*

EARTH *(Suppl.)* — *Fuller's* EARTH, *terra fullonica*, the Engliſh name of a ſpecies of marle. See the articles MARLE and FULLER'S *earth*, *Suppl.*

EARTH-*nut*, in botany, the Engliſh name of a genus of plants called by authors *bulbocaſtanum*. See the article BULBOCASTANUM, *Suppl.*

EARTH-*nut-peas*, in botany, the name of a genus of plants called by authors *lathyrus*. See the article LATHYRUS, *Suppl.*

African EARTH-*nut-peas*, in botany, a name ſometimes given to the *arachis* of authors. See the article ARACHIS, *Append.*

ECHINI *marini*. See the article CENTRONIA, *Append.*

ECLIPTIC *(Cycl.)* — The obliquity of the *ecliptic* is not conſtant. The mean obliquity is, according to Dr. Bradley, 23° 28′ 30″. Whether this obliquity be the reſult only of the nutation of the earth's axis from the cauſe mentioned in the article STAR, *Append.* or whether there be beſides ſome cauſe producing a gradual approach of the *ecliptic* to the equator, either at the rate of 1′ in 100 years, or at any other rate, is not yet aſcertained.

EDDISH, or EADISH, among farmers, denotes the latter paſture, or graſs, which comes after mowing or reaping, and is otherwiſe called eagraſs, earſh, and etch.

EEL-*backed*, a term uſe by dealers in horſes, for thoſe which have black liſts along their backs.

EFFLUVIA, *(Suppl.)* in medicine, are aſſigned as the cauſe of various diſorders, eſpecially of the contagious kind. Thus, when a conſiderable quantity of putrid *effluvia* has been admitted into the blood, beſides acting thereupon ſlowly, by way of inquinamentum, or ferment, they ſeem immediately to affect the nerves, and thereby to bring on ſome extraordinary diſorder of the whole frame. Hence ariſe ſpaſms, obſtructions, palpitations, a high degree of fever, or a languid circulation, chillneſs, or intenſe heat, and a variety of contrary ſymptoms, according to the different affection of the nerves. To putrid *effluvia* is likewiſe owing the jail diſtemper, which is the ſame with the hoſpital fever. See the article HOSPITAL-*fever*, *Append.*

Some, indeed, unacquainted with the dangerous nature of putrid *effluvia*, have aſcribed the mortality occaſioned by them, to a cold, or other the like cauſe; but, in this, they have entirely miſtaken the cauſe. Vide *Pringle*, Obſerv. on the Diſeaſes of the Army, p. 186, *ſeq.*

Effluvia iſſuing from corrupted ſubſtances chiefly conſiſt of the phlogiſton or ſulphur principle, ſince they ſo readily unite with, and volatilize acids, as appears from the increaſe and particular change of the ſmell. But it is proper to remark, that from a ſimple putrid ſubſtance the phlogiſton does not ariſe alone, but combined with the ſaline parts of the body; for this principle, when ſingle, is perhaps imperceptible to the ſmell; and, when diveſted of theſe ſalts, is never, ſo far as is known, peſtilential: ſo that the deleterious particles of rotten

ſubſtances

ſubſtances ſeem to conſiſt of a certain combination of the ſulphureous with the ſaline principle, which united, not only become the moſt irritating ſtimuli to the nerves, but act upon the humours as a putrid ferment in promoting their corruption. *Id. ibid.* p. 385. See the article MALIGNANT, *Append.*

EGG *(Suppl.)* — *Sea*-EGG, the Engliſh name of a ſpecies of *centronia*. See the article CENTRONIA, *Suppl.*

EGLANTINE, in botany, a name given to the ſweet-briar, a ſpecies of roſe. See the article ROSE, *Suppl.*

EGLECOPALA, a name ſometimes uſed for the ſtony, blueiſh marle. See the article MARLE, *Suppl.*

ELAEAGNON, or ELAEAGNON *Theophraſti*, in botany. See the article AGNUS *caſtus*.

ELATER, the name of a genus of four-winged flies with ſetaceous antennæ; which, when laid on their backs, have a power of leaping with great force and agility.

ELATERIUM, in botany, a name uſed by ſome for the *momordica* of others. See the article MOMORDICA, *Suppl.*

ELDEN, a word uſed in ſome parts of the kingdom for fuel. Dict. Ruſt.

ELDER-*tree*, *alnus*, in botany, the Engliſh name of a genus of plants. See the article ALNUS, *Suppl.*

Dwarf-ELDER, in botany, a name given ſometimes to the *ſambucus* of authors. See the article SAMBUCUS, *Suppl.*

Marſh-ELDER, or *Water*-ELDER, the name by which ſome writers call the OPULUS. See the article OPULUS, *Suppl.*

Spaniſh-ELDER, the Engliſh name of a genus of plants called by authors *Saururus*. See the article SAURURUS, *Suppl.*

ELEPHAS, the elephant, in zoology. See the article ELEPHANT, *Suppl.*

ELICHRYSUM, in botany, the name of a genus of plants, called in Engliſh *goldy-lock*. See the article ELYCHRYSUM, *Suppl.*

ELICHRYSUM, in botany, is alſo a name given by Tournefort to the *gnaphalium*, or cut-weed, of Linnæus. See the article GNAPHALIUM, *Suppl.*

EMPHEREPYRA, in natural hiſtory, a genus of *ſiderochita*, compoſed of various cruſts, or coats, ſurrounding a nucleus of the ſame matter and ſtructure with themſelves. See the article SIDEROCHITA, *Append.*

Of this genus we have the following ſpecies: 1. The very hard ſmooth *empherepyra*, with brown, yellow, and red cruſts. 2. The hard, glittering, rough *empherepyra*, with brown, purple, and deep yellow cruſts. 3. The ſoft browniſh-yellow *empherepyra*. 4. The ſoft *empherepyra*, with ſhining brown and duſky green cruſts. 5. The ſoft *empherepyra*, with lucid, whitiſh, yellowiſh, and red cruſts. *Hill*, Hiſt. Foſſ. p. 532, *ſeq.*

EMPRIMED, among ſportſmen, a term applied to a hart when he forſakes the herd. Dict. Ruſt. in voc.

ENCAMPMENT. See the article CAMP, *Append.*

ENCEPHALOS, ἐγκέφαλος, in phyſiology, is uſed for the brain. *Caſtel.* Lexic. Medic. See the article BRAIN, *Cycl.*

ENCHANTER's *nightſhade*, a name ſometimes given to a genus of plants, called by authors *circæa*. See the article CIRCÆA, *Suppl.*

ENCHELIDES, in zoology, the name of a genus of animalcules, containing the capillary eels, whether of pepper-water, vinegar, &c. See the articles ANIMALCULE, *Append.* and PEPPER, VINEGAR, and EEL, *Suppl.*

ENDEW, in falconry, is ſaid of a hawk that digeſts her meat ſo well, that ſhe not only diſcharges her gorge of it, but even cleanſes her pannel. Dict. Ruſt.

ENDIVE, *endivia*, in botany, a name given to ſeveral ſpecies of *cichorium*. See the article CICHORIUM, *Suppl.*

ENGOUTED, in falconry, is ſaid of a hawk's feathers when they have black ſpots in them. Dict. Ruſt.

ENHYDRIS, in zoology, a name given by the antient Greeks to the otter, from its living in the water. See the article LUTRA, *Suppl.*

ENHYDRI, in natural hiſtory, a genus of cruſtated ferrugineous bodies, formed into large, and in great part, empty caſes, encloſing a ſmall quantity of an aqueous fluid.

Of this genus we have only two ſpecies: 1. The thick ſhelled *enhydrus*, with black, reddiſh, brown, and yellow cruſts. 2. The thinner ſhelled *enhydrus*, with yellowiſh, brown, and purpliſh cruſts. *Hill*, Hiſt. Foſſ. p. 544.

ENSEELED, in falconry, a term uſed for a hawk which has a thread drawn through her upper eye-lid, and made faſt under her beak, to take away the ſight. Dict. Ruſt.

ENTERING *of a hawk*, among falconers, denotes her being allowed to kill for the firſt time. Dict. Ruſt.

ENTERING *of hounds*, is the inſtructing them how to hunt. Dict. Ruſt. See the article ENTRANCE, *Suppl.*

ENTERMEW, in falconry. See the article FALCON.

ENTERMEWER, among falconers, a hawk which changes the colours of her wings by degrees. Dict. Ruſt.

ENTERSELE, in architecture, a kind of ſmall ſtory, ſometimes called a *meazanine*. See the article MEZANINE, *Cycl.*

ENTRY, among ſportſmen, a term by which ſome call thoſe places or thickets, through which deer are found lately to have paſſed. Dict. Ruſt.

EPILOBIUM, in the Linnæan ſyſem of botany, the name of a diſtinct genus of plants, called by Tournefort *chamænerium*. See the article CHAMÆNERIUM, *Suppl.*

EQUATION *(Suppl.)* — Dr. Halley's method for the ſolution of *equations* is thus:

Let the root z of any *equation* be taken equal to $a \pm e$; where a is ſuppoſed to be taken near to the true value. Then from the quantity $a \pm e$ let all the powers of z found in the propoſed *equation*, be formed; and to theſe let their reſpective coefficients be prefixed. Let the power to be reſolved be ſubducted from the ſum of the parts of the firſt column where e is not found; and let the difference be $\pm b$. Then take the ſum of all the coefficients of e in the ſecond column, which call s: and having added all the coefficients of ee, the ſum of which is called t; the root ſought z, will, in a rational form, $= a + \frac{sb}{-ss \pm tb}$; and, in an irrational form, $= a \frac{\mp \frac{1}{2}s \mp \sqrt{\frac{1}{4}ss \mp bt}}{t}$

For inſtance, let it be propoſed to find a root of the *equation* $z^4 - \underset{d}{3}zz + \underset{c}{75}z = 10000$, where 10000 is the reſolvend.

For a firſt ſuppoſition let $a = 10$; we ſhall therefore have the *equation*

$$\begin{array}{l} z^4 = a^4 \pm 4a^3e + 6a^2ee \pm 4ae^3 + e^4 \\ -dzz = -da^2 \pm dae - dee \\ +cz = +ca \pm ce \\ = 10000 \pm 4000e + 600e \pm 40e^3 + e^4 \\ - \quad 300 \pm \quad 600e - \quad 3e \\ + \quad 750 \pm e \quad 75e \\ - 10000 \\ \hline \underset{s}{+450} \mp \underset{t}{40}\,15e + \underset{u}{597}ee \mp 40e^3 + e^4 = 0 \end{array}$$

The ſigns + and — with reſpect to e and e^3 are left doubtful, till it be known whether e be affirmative or negative; in which there is ſome difficulty, as in *equations* having ſeveral roots, the *homogenea comparationis*, as they are called, are often increaſed by diminiſhing a, and on the contrary diminiſhed by increaſing a. But the ſign of e is determined by the ſign of the quantity b; for the reſolvend being ſubtracted from the *homogeneum* formed from a, the ſign of se, and therefore of the parts prevailing in its compoſition, will always be contrary to the ſign of the difference b. Hence it will appear whether e be affirmative or negative, or whether a has been aſſumed greater or leſs than the true root. But e is always equal to $\frac{\frac{1}{2}s - \sqrt{\frac{1}{4}ss - bt}}{t}$, as often as b and t have the ſame ſign; but when they are connected with different ſigns, e becomes $= \frac{\sqrt{\frac{1}{4}ss + bt} - \frac{1}{2}s}{t}$. After that e has been found to be negative, e, e^3, e^5, &c. muſt be made negative in the affirmative members of the *equation*; and affirmative in the negative members, that is, they muſt be writ with a contrary ſign: but if e be affirmative, then muſt e, e^3, e^5, &c. be affirmative in the affirmative members, and negative in the negative.

In the propoſed example we have 10450 inſtead of the reſolvend 10000, or $b = +450$; from whence it appears that a was taken greater than the true root, and conſequently that e is negative. Hence the *equation* becomes $10450 - 4015e + 597ee - 4e^3 + e^4 = 10000$; that is, $450 - 4015e + 597ee = 0$. Therefore, $450 = 4015e - 597ee$, or $b = se - tee$; the root of which is $e = \frac{\frac{1}{2}s - \sqrt{\frac{1}{4}ss - bt}}{t}$, or $\frac{s}{2t} - \sqrt{\frac{ss}{4tt} - \frac{b}{t}}$, that is, in the preſent caſe, $e = \frac{2007\frac{1}{2} - \sqrt{3761406\frac{1}{4}}}{597}$, from whence the approximated root is found to be $= 9.886$. Now this root being taken for a ſecond ſuppoſition, and the operation being repeated we ſhall have $a + e = z = 9.886260336495$, which is very exact, ſcarcely exceeding the truth by above 2 the laſt figure.

This is ſufficient to give a notion of Dr. Halley's method: thoſe who deſire more examples, and farther inſtructions, may conſult the Philoſ. Tranſ. N°. 210. or Lowthorp's Abridg. vol. i. p. 85, *ſeq.*

Differential EQUATION. See the article DIFFERENTIAL, *Append.*

ERIFFS, a name given to canary birds about two years old. See the article CANARY, *Suppl.*

ERIGERON, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, called by other botaniſts *conyzoides*, *conyzella*, and *ſenecionis ſpecies*; and by us the great ſweet fleabane.

The characters of this genus, according to Linnæus, are theſe: the common cup is oblong, cylindric, imbricated, and beſet with ſubulated ſquamæ; the compoſite flower is radiated; the proper hermaphrodite ones are of an infundibuliform ſhape, the limb being divided into five ſegments; and the proper female ones linear, ſubulated, erect, and moſt frequently entire; the ſtamina of the hermaphrodite flowers are five very ſhort capillary filaments, the antheræ, cylindraceo-tubuloſe; the germen of the piſtil is extremely ſmall; the ſtyle is filiform; the ſtigmata are two, oblong and revolute; there is

no pericarpium; the ſeeds are ſmall, oblong, and covered with long down; the receptacle is naked and plane. See *Linnæi* Gen. Plant. p. 400.

The ſpecies of *erigeron* are theſe: 1. The ſingle lateral flowered *erigeron*, with ſquamoſe cups. 2. The toad-flax-leaved annual Canada *erigeron*, called by ſome *conyza*. 3. The coronopus-leaved *erigeron* of America. 4. The ovato-lanceolate-leaved camphorated *erigeron*. 5. The ſhort leaved *erigeron*. 6. The ramoſe, long leaved, ſmall flowered *erigeron*. 7. The larger flowered *erigeron*. *Hill*, Hiſt. Plant. p. 575.

ERINGO, in botany, the Engliſh name of the *eryngium*, a diſtinct genus of plants. See the article ERYNGIUM, *Suppl.*

ERUCA *marina griſeo-fuſca*, a name ſometimes given to the *aphrodita*, a genus of ſea-inſects. See the article APHRODITA, *Append.*

ETCH. See the article EDDISH, *Append.*

ETCH-*crop*, among farmers, the third crop of corn upon land newly broken up. Ruſt. Dict. in voc.

ETERNAL *flower*, the Engliſh name of two different genuſes of plants, the *gnaphalium* and *xeranthemum*. See the articles GNAPHALIUM and XERANTHEMUM, *Suppl.*

EVERLASTING-*pea*, the name of a genus of plants, called by authors *lathyrus*. See the article LATHYRUS, *Suppl.*

EUONYMOIDES, in botany, a name uſed by ſome for the *celaſtrus* of Linnæus. See the article CELASTRUS, *Append.*

EUPHONIC *accent*. See the article ACCENT, *Cycl.*

EWE, the Engliſh name of the female of the ſheep-kind. See the articles SHEEP and OVIS, *Suppl.*

EXAGON, the ſame with hexagon. See the article HEXAGON. *Suppl.*

EXERCISE *(Cycl.)* — Proper *exerciſe* conduces much to the health of ſoldiers in camp.

The *exerciſe* of a ſoldier may be conſidered under three heads; the firſt relating to his duty, the ſecond to his living more commodiouſly, and the third to his diverſions.

The firſt, conſiſting chiefly in the *exerciſe* of his arms, will be no leſs the means of preſerving health, than of making him expert in his duty; and frequent returns of this, early and before the ſun grows hot, will be made more advantageous than repeating it ſeldom, and ſtaying too long out at a time; for a camp affording little convenience for refreſhment, all unneceſſary fatigue is to be avoided.

As to the ſecond article, cutting boughs for ſhading the tents, making trenches round them for carrying off the water, airing the ſtraw, cleaning their cloaths and accoutrements, and aſſiſting in the buſineſs of the meſs, ought to be no diſagreeable *exerciſe* to to the men, for ſome part of the day.

Laſtly, as to diverſions, the men muſt be encouraged to them either by the example of their officers, or by ſmall premiums to thoſe who ſhall excel in any kind of ſports, as ſhall be judged moſt conducive to health; but herein great caution is neceſſary, not to allow them to fatigue themſelves too much, eſpecially in hot weather, or ſickly times; and above all, that their cloaths be kept dry, wet cloaths being the moſt frequent cauſe of camp-diſeaſes.

EXPEDITIONS *in winter*. See the article CAMPAIGN, *Append.*

EYE *(Suppl.)* — EYE-*flaps*, thoſe pieces of leather which covers the *eyes* of coach-horſes. Ruſt. Dict. in voc.

EYE-*brow*, in architecture, the ſame with liſt, or fillet. See the article FILLET, *Cycl.*

EYESSE, in falconry. See the article FALCON, *Suppl.*

F.

FABA *Græca*, in botany, a name ſometimes given to the *guiacana* of Tournefort. See the article GUIACANA, *Suppl.*

FAGG, in the ſea language, denotes the end of thoſe ſtrands which do not go through the tops, when a cable or rope is cloſed. *Blanckley*, Nav. Expoſ. p. 54.

FAINTING. Some people are extremely apt to *faint* during the operation of bleeding. In all caſes, therefore, where plentiful bleeding is indicated, it is beſt to do it in bed, in order to prevent the patient's *fainting*. It is likewiſe obſerved, that a perſon will bear the loſs of a much greater quantity of blood, if the ſtream is ſmall, than by a large orifice, which ſome think neceſſary for making a more ſpeedy revulſion. *Pringle*, Obſerv. on the Diſeaſes of the Army, p. 131. See the article LIPOTHYMIA, *Suppl.*

FAKE, in the ſea-language, one round or circle of a cable: this is otherwiſe called quoil. *Blanckley*, Nav. Expoſ. p. 54.

FAN *(Suppl.)* — FAN is alſo an inſtrument uſed in winnowing corn.

FAR, in horſemanſhip, a term uſed to denote any part of the horſe's right ſide: thus the *far*-foot, *far*-ſhoulder, *&c.* is the right foot, right ſhoulder, *&c.*

FASHIONS, a name ſometimes uſed for the farcin. See the article FARCIN, *Cycl.*

FAT *(Cycl.)* — The antients uſed the terms *adeps*, *pinguedo*, *ſevum*, indifferently: but modern anatomiſts have found it convenient to eſtabliſh a diſtinction; according to theſe *pinguedo* is made the general name for all *fat*, and *adeps* and *ſevum*, made branches or ſpecies of it: the *adeps* comprehends the thinner, ſofter, and moiſter ſort, which eaſily liquifies and difficultly coaleſces; the *ſevum*, ſuet, or leaf, includes the harder, coarſer, and drier [a].

According to an antient gloſſariſt *adeps* is properly the inner *fat*, or that which cleaves to the inteſtines [b].

The ſpecific virtues aſcribed to certain *fats* do not ſeem well warranted; ſome even doubt their being poſſeſſed of any properties different from other ſubſtances of like kind, unleſs what may ariſe out of their different conſiſtencies and degrees of volatility: that of the viper ſeems to have the moſt right to claim ſomething extraordinary upon that account [c].

The way of preparing *fat* for medicinal purpoſes, is to take out the ſkins, veins, fibres, *&c.* waſh it till it becomes unbloody; then melt, ſtrain, and preſerve it from air [d].

Some chemiſts deſcribe *adeps* as a pinguedo coagulaled or condenſed to a conſiſtence by the admixture of ſomething ſaline; for in diſtillation the ſulphureous part of the *adeps* aſcending, leaves only a ſaline matter at the bottom, the coagulation being deſtroyed, the ſubſtance ceaſes to be *adeps*, and is called *oleum adipis* [e].

[a *Blaſ.* Comm. ad Veſling, cap. i. p. 10. *Gal.* De uſu partium, lib. 16. *Gorr.* Def. Med. p. 374. *ſeq. in voc.* πιμελη. [b] See *Du Cange*, Gloſſ. Lat. tom. i. p. 56. [c] *Quinc.* Pharm. P. II. §. xii. p. 27. [d] Pharmac. Edinb. [e] See *Johnſ.* Chym. in Addit. p. 7.]

FAT, in the brewery. See the article VAT, *Cycl.*

FEATHER *(Suppl.)* — *Prince's* FEATHER, in botany, the name of a genus of plants called by authors *amaranthus*. See the article AMARANTHUS, *Suppl.*

FEE *(Cycl.)* in Latin *feudum*, and more antiently *feodum*, is defined by Stryckius [a], "Feudum eſt conceſſio dominii utilis "ſub lege fidelitatis." Theſe *feuds*, no doubt, took their origin from the conqueſts of the northern hive that overſpread Europe. The general divided the conquered country into large diſtricts, over each of which he placed one of his principal officers, and they again ſubdivided their provinces among the ſubalterns and ſoldiers; this was in lieu of pay, and theſe lands being given under the condition of fidelity, by which was chiefly meant aſſiſtance in war, made an united kingdom under the general, who generally aſſumed the title of king, as Hengiſt did in Kent, though he had it not before he made his conqueſt. [a Examen Juris Feudal. cap. ii. qu. 11.]

We muſt not imagine that *feuds* were always invariably of the ſame form; they altered much in proceſs of time. Craig diſtinguiſhes them into four ages, calling them *infantia*, *pueritia*, *adoleſcentia*, and *virilis ætas*. *Infantia* was from the firſt irruption of the northern nations, about the middle of the fifth century to *an.* 650, during which *feuds* were annual, or at moſt for life, like the Turkiſh timariots. *Pueritia* he reckons from 650 to 800, the time of Charlemagne; during which ſons crept into the ſucceſſion of their fathers. *Adoleſcentia* extended from this to Conrad II. *an.* 1022, or 1027. This emperor intending an expedition into Italy, the better to encourage his followers extended the right of ſucceſſion to grand-children and brothers. *Virilis ætas* followed, from Conrad to Frederic, *an.* 1155. in whoſe time the feudal books were compiled, and ſucceſſions to all heirs whatſoever eſtabliſhed.

This is the general account of the origin and progreſs of *feuds*. When they were firſt eſtabliſhed in this iſland has been matter of diſpute among the learned: Craig and Spelman ſay at the conqueſt; others aſſert their higher antiquity; lord chief juſtice Hale, particularly, aſſerts that the Norman cuſtoms derive from the Engliſh: this carries little probability with it. Sir Edward Coke, in the preface to his Sixth Report, brings an old Saxon charter, to prove that lands eſcheated for felony. In this charter, dated *an.* 995, Ethelred gives lands, forfeited by one Ethelſig, for ſtealing ſome ſwine, to one Ulfric, "in

" perpetuam hæreditatem," and then adds, " poſt iſtius la-
" bilis vitæ exceſſum, cuicunque ſibi libuerit ſucceſſori relin-
" quat." This clauſe of diſpoſing of his land by laſt will, and the omiſſion of fealty throughout the whole, ſhews this to have been no *feud* but rather allod, it being well known that after the conqueſt, till the time of Henry VIII, lands were not generally deviſeable by will; and that in all charters fealty was expreſſed: ſo that this forfeiture of the land, muſt rather be conſidered as a fine, or like the *confiſcatio bonorum* among the Romans, who knew nothing of *feuds*, than as a feudal eſcheat. Beſides, it muſt be obſerved in general, that no great ſtreſs can be laid on Saxon charters, moſt of them being forged by monks, and impoſed upon the ignorant Normans, when they enquired into the titles of convents to their lands. See *Rapin*, Hiſt. d'Angl. p. 500.

Craig's reaſons for affirming that the feudal law came in with William I. are, 1. That all the terms of art are French; nor does it appear that the Saxons had any words to expreſs the ſame things. 2. That the penalties inflicted for crimes, among the Saxons, were not the *amiſſio feudi*, but pecuniary, if the crimes were ſmall; and capital for thoſe of a higher nature. 3. It appears from all hiſtorians, that William aſſerted his dominion over all the lands in England, confiſcated the lands of all thoſe that followed Harold, and let others retain theirs *ſub lege fidelitatis*. Craig gives two examples of inveſtiture, one of Athelſtan, the other of the conqueror: Athelſtan's words are, " Ego Athelſtanus rex, do tibi Pauline Oddam & Roddam
" tam bona atque pulchra quam unquam mea erant, teſte Ma-
" thilde conjuge mea." The conqueror inveſted Hugo Lupus, his ſiſter's ſon, in the county of Cheſter, " tenendum
" ſibi & hæredibus ita liberé ad gladium, ut ipſe rex totam
" tenebat Angliam ad coronam." And Craig adds, " licet
" hæc poſterior diſpoſitio magis affinis inveſtituto videatur,
" neutra tamen feudalem diſpoſitionem ſapit, cum nulla ſit
" in eis ſervitiorum aut recognitionis præſtatio nulla, de do-
" mino ſuperiore mentio: propriuſque ad allodii formam ac-
" cedunt." Vide *Craig*, De Jur. Feud. lib. i. dieges. 7.

Authors are not agreed as to the etymology of *feudum* or *feodum*; their different opinions may be ſeen in *Strykii* Examen Juris Feudalis. He himſelf derives it from the Italian *fede*, with little reaſon, ſince *feuds* were by no means of an Italian but Gothic original, and therefore the Gothic languages ſhould be enquired into for the etymology of the word. That of Grotius [a] ſeems probable enough; he derives *feod* from *fe* and *od*, that is, *ſtipendii poſſeſſio*; *fe*, according to him, ſignifying of old *ſtipendium*, and *od*, or *oed*, *poſſeſſio*. This holds even now in the German language, where the word *kleinod* is uſed for a jewel, " quaſi *parvum bonum*, vel *parva poſſeſſio*." Schilter, in his Praxis Juris Romani in Foro Germanico, Exerc. lib. iv. § 23. derives *feod* pretty much in the ſame manner, *viz.* from the verb *fa* or *fahen*, which ſignifies *capere*, *in cuſtodiam tradere*, and *od*, ſignifying *bona*, *facultates*, *poſſeſſionem*, as Grotius ſays. Stryckius adds, that *feuds* were ſometimes called *leod*, from *od* and the verb *lehnen*, or *leihen*, to lend; and the Germans call a feud *lehn guht*, or ſimply *lehn*, to this day. *Leodum* and *leodes* was alſo taken for the vaſſal and for homage, as in an old record mentioned by Schilter, loc. cit. where it is ſaid, " fidelitatem præcelſo filio noſtro vel nobis
" & leode & *Samio* debeant promittere & conjurare." Where he thinks *ſamio* to be an error for *ſamto*, the abbreviation of *ſacramento*. Somner, in his Treatiſe of Gavelkind, gives another etymon (approved of by ſerjeant Wright, in his Treatiſe of Tenures) of *feod*, *viz.* from *fe*, *ſtipendium*, and the termination *hode*, *hoad*, or *head*, ſignifying a quality in abſtract: but this ſeems too metaphyſical and forced, and does not ſeem near ſo natural as the derivation from *od*, *bonum*, *poſſeſſio*, &c. [a Florum ſparſio ad Jus Juſtinian. p. 340.]

Craig defines a *feud* thus [b]: " *Feudum* eſt beneficium, ſeu be-
" nevola & libera rei immobilis aut æquipollentis conceſſio,
" cum utilis dominii tranſlatione retenta proprietate, ſeu do-
" minio directo, ſub fidelitate & exhibitione ſervitiorum ho-
" neſtorum." See his explanation, loc. cit. This is the proper and original meaning of a *feud*; time has ſo much altered it, that Hottoman thinks it ſhould be no longer called *feudum*, but *feudaſtrum*: the original intent and conſideration of granting them was for aſſiſtance in war; now, money is the chief conſideration; and variety of other than military ſervices have been introduced. [b De Jure Feudal. p. 42.]

The vaſſal or tenant could not alien his *fee* without the conſent of his lord [c]. However it ſeems that this was not long rigorouſly obſerved in England, ſince Magna Charta, cap. xxxii. provides, " quod nullus liber homo det de cætero am-
" plius alicui de terra ſua, quam ut de reſiduo terræ ſuæ poſſet
" ſufficient. fieri domino feodi ſervitium ei debitum quod per-
" tinet ad feodum illud." But neither was this well obſerved; ſince by Weſt. 3. 18 Ed. I. it was provided, that any one might alien any part, or the whole, " ita ut feoffatus teneat de
" capitali domino. In Scotland, where the feudal law is more ſtrictly obſerved, alienating half without licence, incurs a forfeiture of the whole; this they call recognition, and is the puniſhment of the vaſſal's ingratitude.

[c Stryck. Examen Juris Feudalis, cap. xix. queſt. 2.]

Writers on the feudal law have diſtinguiſhed the *ſubſtantialia*, the *naturalia*, and the *accidentalia* of *feuds*.

Subſtantialia, called by Craig *eſſentialia*, are the eſſentials, that is, qualities not implying each other, which if taken away the *feud* can no longer ſubſiſt.

Naturalia are the qualities ſuperadded by law.

Accidentalia are the qualities ſuperadded by agreement of the lord and vaſſal.

The *naturalia* are different in different places, and always preſumed, unleſs it be otherwiſe agreed between the parties. The *accidentalia* muſt be expreſſed not preſumed. Vide *Wolfii* Horæ Subſ. Marburg. an. 1729. trimeſtr. æſtiv. and *Craig*, p. 61.

Wolfius defines a *feud* thus, " Feudum eſt, dominium utile
" in re aliqua alteri a domino conceſſum ſub conditione fide-
" litatis mutuæ.
" *Subſtantialia* ſunt determinationes eſſentiales, quibus notio
" feudi in genere abſolvitur.
" *Naturalia* ſunt differentiæ ſpecificæ feudi auctoritate legis
" communiter recepta.
" *Accidentalia* ſunt differentiæ ſpecificæ ſpecierum feudorum a
" ſpecie juris auctoritate communiter recepta diverſorum."

FELIS, in zoology, the name of a very comprehenſive genus, or rather order, of animals. See the article CAT, *Suppl.* This order takes in the lion, the tyger, leopard, cat of the mountain, lynx, ounce, and the domeſtic cat. See the articles LION, TYGER, &c. *Suppl.*

FELL-*wort*, a name ſometimes given to the *gentiana*, or gentian of authors. See the article GENTIANA, *Suppl.*

FELON-*wort*, a name given to the *ſolanum*, or nightſhade of authors. See the article SOLANUM, *Suppl.*

FENNEL, in botany, the Engliſh name of a genus of plants called by authors *fœniculum*. See the article FOENICULUM, *Suppl.*

Scorching FENNEL, a name ſometimes given to a genus of plants known among authors by that of *thapſia*. See the article THAPSIA, *Suppl.*

PENNEL-*flower*, in botany, a name ſometimes given to the *nigella* of authors. See the article NIGELLA, *Suppl.*

FERMENT, *(Suppl.)* among phyſicians, is ſometimes uſed in a ſynonymous ſenſe with putrefaction, or rather for a putrid habit of body, conſidered as the cauſe of malignant diſorders.

But theſe authors are, nevertheleſs, very careful not to confound putrefaction with vegetable fermentation, accounting them only analogous proceſſes; for which reaſon they uſe the ſame term for the putrefying and fermenting agent. It were to be wiſhed, to avoid ambiguity, that we had two different words to denote the exciting cauſe of theſe two inteſtine commotions; but this is the leſs to be expected, on account of the tendency of all putrid animal ſubſtances to promote both animal putrefaction, and a vinous fermentation in vegetables. See the next article.

FERMENTATION *(Suppl.)* — In order to aſcertain the *fermentative* quality of animal ſubſtances, Dr. Pringle, in the Appendix to his Obſerv. on the Diſ. of the Army, has made ſeveral curious experiments: bread and water only ſtood ſeveral days, in a furnace, heated, as uſual, to 100 degrees; but two drams of freſh meat being added to double the former quantity of bread, and water in proportion, the mixture began to *ferment* in a few hours, and continued to do ſo about two days. For the moſt part the *fermentation* was ſo ſtrong that if the corks had not frequently given way the phials muſt have burſt. The bread and fleſh which at firſt lay at the bottom, ſoon roſe to the top, and, conſtantly, as the air elapſed, let fall ſome particles that had been buoyed up by the fluid; thus a ſediment was formed, reſembling lees, whilſt the lighteſt part, or flowers, remained on the ſurface; but the *fermentation* continuing, theſe alſo ſubſided, and the acid taſte and ſmell of the liquors, after the action ceaſed, was a farther proof of the preceding *fermentation*. This change was the more extraordinary, that when the motion began the mixture was tending to corruption, and, in effect, in a few hours afterwards, became offenſive; but next day the putrid ſmell abated, and went off, before the *fermentation* ceaſed.

The doctor made ſeveral other experiments, to the ſame purpoſe, and with nearly ſimilar effects; from all which, he thinks it probable that moſt animal ſubſtances tending to putrefaction, are endowed with a power of raiſing a *fermentation* in the farinacea, and even of renewing that action in ſuch as have undergone it before.

The effect of *fermentation* therefore is to change putrid ſubſtances to a ſtate of acidity, which they not only retain, but grow ſtill more and more acid. It is obſerved, indeed, that the acid ariſing from *fermentation* has ſomething of an auſtere and ſaltiſh taſte, but without any offenſive ſmell. Now, conſidering how much air is generated by *fermentation*, it may ſeem ſtrange that the ſame materials, uſed as food, ſhould make ſo little diſturbance in the body. And the difficulty would be the greater, did the ſaliva, as ſome ſuppoſe, promote both *fermentation* and putrefaction. See the article SALIVA.

From this theory of *fermentation* the doctor accounts for the ſourneſs or acidity of the ſtomach, a diſorder to which many people are ſubject; ſince not only a ſtrong, but an auſtere acid may be produced from the food of thoſe who live on fleſh, bread, and water only, as often as the ſtomach is relaxed,

or

or any way disabled from conveying the whole aliment into the intestines; for, what is left having time to undergo a complete *fermentation*, is thereby changed into a harsh sort of vinegar. See the article HEART-*burn*, *Append.*

Spirits, wines, acids, bitters, aromatics, and the hotter antiscorbutic plants retard alimentary *fermentation*, by their power of correcting putrefaction. However, they may have their several uses; some for checking immoderate *fermentation*, when by reason of a putrid effluvia, or a defect of it, the aliment may ferment too violently; and others, again, for bracing the stomach, and fitting it for expelling its contents in due time.

All these facts correspond with digestion; for the most nourishing and digestable food to people in health, consists in a due mixture of animal and vegetable substances with water: scorbutic or putrid habits require acids, wine, or other antiseptics. An acid abounding in the stomach, is corrected by absorbents; and, in a want of natural heat, and a debility of the stomach, wines, bitters, and warm and acid substances become necessary. See *Pringle*, Observ. on the Diseases of the Army, Append. p. 350, *seq.*

Fermentations have been usually supposed to engender great heat, and effervescence has been used as a synonimous term to express it by; it has not been imagined all this while, that many of the most violent of them are, instead of heat, attended with a very violent cold, as is easily proved by the thermometer.

It might be supposed, that water poured into spirit of wine should cool so fiery a liquor; but on the contrary, experiment proves, that there is always a considerable heat from this mixture, and that this heat is greater, as the proportion of the water is so. There is another phænomenon however in regard to spirit of wine more remarkable than this: as water, which is a cold phlegmatic liquor, might naturally be supposed to cool it, so a mixture of the essential vegetable oil might be as naturally expected to heat it; these being disposed the most readily of all bodies to take fire, and being composed almost entirely of a sulphureous matter; yet these liquors, mixed with spirit of wine, produce cold and not heat with it; and water, which generates so great a heat with spirit of wine, has no effect at all with these oils.

The reason of all this phænomena is, that water will not mix with oil, but that salts will. All spirit of wine contains a great deal of water, and all essential oils are well known to contain a great deal of essential salt. The water added to oils makes no change, because it mixes not with them; with spirit of wine it makes a heat by mixing with the water in that spirit, and dissipating the sulphur it is well known to contain; and the oils cool the spirit on the common principle of all salts cooling water, the salts originally contained in these oils immediately dissolving on the mixture, in the water contained in the spirit of wine: and the degree of cold, which is different with the different oils, is wholly regulated by the greater or lesser quantity of salt the several oils contain. Mem. Acad. Par. 1727.

FERMENTED *liquors (Suppl.)* are esteemed great antidotes to putrefaction; accordingly the abstinence from them is assigned as one cause why the Turks are more subject than other people to the plague, and other contagious distempers. It is likewise observed, that beer, wine, and spirituous liquors coming more into general use, has been one great means of suppressing putrid diseases. See *Pringle*, Observ. on the Diseases of the Army, p. 286, 294.

FERN *(Suppl.)* — *Dwarf*-FERN, the English name of a genus of plants called by botanists *filicula*. See the article FILICULA, *Suppl.*

Sweet FERN, a name by which some call the *myrrhis*, or wild chervil. See the article MYRRHIS, *Suppl.*

FERRET, the English name of an animal of the *mustela* kind. See the article MUSTELA, *Suppl.*

FERRY-*boat*. See the article BAC, *Suppl.*

FEVER *(Suppl.)* — *Ardent* FEVER. See the article INFLAMMATORY *fever*, *Append.*

Bilious FEVER. See the article BILIOUS, *Append.*

Malignant FEVER, or *jail* FEVER, the same with that called *hospital fever*. See the article HOSPITAL *fever*, *Append.*

FEVERFEW *(Suppl.)* — *Bastard*-FEVERFEW, in botany, a name sometimes given to the *parthenium* of authors. See the article PARTHENIUM, *Suppl.*

FEWMET, among sportsmen. See the article FUMET, *Append.*

FIANTS, or FUANTS, the dung of a badger, or fox, and of all other vermin. Rust. Dict. in voc.

FIDDLE, *(Cycl.)* — FIDDLE-*dock*, the name of a species of *lapathum*. See the article LAPATHUM, *Suppl.*

FIG-*tree*, *ficus*, in botany. See the article FICUS, *Suppl.*

Indian FIG, a name sometimes given to a genus of plants called by authors *opuntia*. See the article OPUNTIA, *Suppl.*

Infernal FIG, a name by which some call the *argemone*, called by authors the thorny Mexican poppy. See the article ARGEMONE, *Suppl.*

Pharaoh's FIG, a name sometimes used for a genus of plants called by authors *musa*. See the article MUSA, *Suppl.*

Marigold FIG, a name used by some for the *ficoides* of Tournefort, called by Linnæus *mesembryanthemum*. See the article FICOIDES, *Suppl.*

FIG-*shell*, a species of *dolium*. See the article DOLIUM, *Suppl.*

FILACEOUS, a term applied to such roots of plants as are full of filaments. See the article FILAMENT, *Cycl.*

FILAGO, in botany, a name used by Vaillant for the *gnaphalium*, or cud-weed. See the article GNAPHALIUM, *Suppl.*

FILBERT-*tree*, in botany, the English name of the hazle, called by authors *corylus*. See the article HAZLE, *Suppl.*

FILLAR-*horse*, that yoked immediately to a cart. See the article CART, *Suppl.*

FILLY, a term used in many parts of the kingdom for a female colt. See the article COLT, *Suppl.*

Ladies FINGER. See the article LADIES, *infra.*

FINGRIGO, in botany, a name used by some for a genus of plants called by Plumier *pisonia*. See the article PISONIA, *Suppl.*

FIR *(Suppl.)* — *Scotch* FIR, a name commonly given to the mountain-pine. See the article PINE, *Suppl.*

FIRE-*engine*, the common name of a machine to raise water by fire, or rather by the force of water turned into steam.

The first who gave a hint of the possibility of such a machine was the marquis of Worcester, in his Century of Inventions, printed at London in 1663. Captain Savery took the hint from him, and put the engine in practice: the captain's engine is described in Harris's Lexicon Technicum, under the head *Engine*. Farther improvements were afterwards made by Mess. Newcomen and Cawley, who brought it to the form in which it is now most commonly used.

The moving force in this machine is the expansion of water into steam; and that power is raised by fire, from whence the engine takes its name.

It is not possible in a few words, and without figures, to give any adequate idea of this most philosophical and useful contrivance. Dr. Desagnliers has given a very full description of the engine, in his Course of Experimental Philosophy; and as we may suppose that none of the curious in mechanics will choose to be without the doctor's book, we shall content ourselves with referring to his second volume, from p. 465 to 490.

This engine working by the steam into which water rises after it boils, should entitle it more properly to the name of the *steam-engine*, than to that of *fire-engine*, by which the engines for extinguishing fires are sometimes called.

It is considered as a defect in this fire or steam-engine, that the vessel in which the water is always kept boiling, is so large when only an inconsiderable part of the water is employed in the work. Mr. Blake has therefore endeavoured to regulate the just proportion between the altitude and base of the cylindrical vessel employed in this machine; and he finds that the broader the cylinder is, the better. See Phil. Tranlact. vol. xlvii. p. 197, *seq.*

This engine to raise water by steam seems to have received a farther improvement from Monsr. De Moura, a Portuguese gentleman, who, by an ingenious contrivance, has rendered it capable of working itself. See Phil. Transact. vol. xlvii. p. 436, *seq.*

As to the engines for putting out fires, those of Mr. Newsham seem to have merited universal approbation: for a detail of their construction, see *Desaguliers*, Course of Experim. Philos. vol. ii. p. 505, *seq.*

FIRM *ore*. See the article LEAD *ore*, *Suppl.*

FISH *(Suppl.)* — *Needle* FISH. See the article NEEDLE, *infra.*

FISH-*garth*, a wear or dam in a river for the taking of *fish*. Rust. Dict. in voc.

FITCH, or FITCHOW, a name given to the pole-cat, or to the skin or fur of that animal. See the article PUTORIUS, *Suppl.*

FIVES, among farriers, the same with VIVES. See the article VIVES, *Suppl.*

FIXEN, among sportsmen. See the article VIXEN, *Append.*

FLAG *(Suppl.)* — *Corn*-FLAG, a name by which some writers call the *gladiolus*. See the article GLADIOLUS, *Suppl.*

Sweet-scented FLAG, a name used by some for the *acorus* of botanical writers. See the article ACORUS, *Cycl.* and *Suppl.*

FLAG is also used for a kind of rush called sedge, as well as for the upper part of the turf, pared off to burn. Rust. Dict. in voc.

FLAG-*worm*, a kind of worm so called on account of its being found in flaggy ponds, and other sedgy places. Rust. Dict. in voc.

FLAREING, among seamen. See the article FLAIR, *Suppl.*

FLEA-*bane (Suppl.)* — *African* FLEA-*bane*, a term sometimes used for a genus of plants otherwise called *tarconanthus* and *parthenium*. See the article PARTHENIUM, *Suppl.*

Sweet FLEA-*bane*, the English name of a distinct genus of plants, called by Linnæus *erigeron*. See the article ERIGERON, *Suppl.*

FLIX-*weed*, the name of a genus of plants called by Tournefort and others *erysimum*. See the article ERYSIMUM, *Suppl.*

FLOAT-*boards*, those boards fixed to water-wheels of undershot mills, serving to receive the impulse of the stream, whereby the wheel is carried round. See the article *Water*-WHEEL, *Append.*

It is a disadvantage to have too great a number of *float-boards*. The best rule in this case is, to have just so many, that each of them may come out of the water as soon as possible, after it has received and acted with its full impulse; or, which comes

comes to the ſame thing, when the ſucceeding one is in a perpendicular direction to the ſurface of the water.

As to the length of theſe *float-boards*, it may be regulated according to the breadth of the ſtream. See *Deſaguliers*, vol. ii. p. 425, *ſeq*.

FLOAT-*graſs*, in botany. See the article GRASS, *Append.*

FLOWER *of Briſtol*, a name ſometimes uſed for the *lychnis* of botanical writers. See the article LYCHNIS, *Suppl.*

Gentle FLOWER, the Engliſh name of a genus of plants called by botanical writers *amaranthus*. See the article AMARANTHUS, *Suppl.*

Eternal FLOWER, a name by which ſome call the *xeranthemum* of botanical writers. See the article XERANTHEMUM, *Suppl.*

Everlaſting FLOWER, a term by which ſome call the *gnaphalium*, or cud-weed, of Linnæus and Tournefort. See the article GNAPHALIUM, *Suppl.*

FLOWER-*fence*, a term ſometimes uſed for a genus of plants known among authors by the name of *poinciana*. See the article POINCIANA, *Suppl.*

Four o' clock FLOWER, a name given by ſome to *jalap*. See the article JALAP, *Suppl.*

Side-ſaddle FLOWER, the name uſed by ſome for the *Sarracena* of botaniſts. See the article SARRACENA, *Suppl.*

Sultan-FLOWER, a name ſometimes uſed for the *cyanus*, or blue-bottle. See the article CYANUS, *Suppl.*

Sun-FLOWER, the Engliſh name of a genus of plants, called by botanical writers *helianthus* and *corona ſolis*. See the article SUN-*flower*, *Suppl.*

FLUELLIN, in botany, a name ſometimes given to ſpeed-well, called by authors *veronica*. See the article VERONICA, *Suppl.*

FLY *(Cycl.* and *Suppl.)* — *Humble-bee* FLY, the Engliſh name of a ſpecies of *culex*. See the articles HUMBLE, *Suppl.* and CULEX, *Append.*

FLY-*wort*, in botany, a name by which ſome call the *lychnis* of authors. See the article LYCHNIS, *Suppl.*

FLY, in mechanics, a croſs with leaden weights at its ends, or rather a heavy wheel at right angles to the axis of a heavy windlas or roller, by means of which the force of the power is not only preſerved, but equally diſtributed in all the parts of the revolution.

The *fly* may be applied to ſeveral ſorts of engines, whether moved by men, horſes, wind, or water; and is of great uſe in thoſe parts of an engine, which have a quick circular motion, and where the power or reſiſtance act unequally in the different parts of a revolution. In this caſe the *fly* becomes a moderator, making the motion of revolution almoſt every where equal.

The force of a *fly*, when joined with the ſcrew, for ſtamping the image upon coins, may be calculated thus: ſuppoſe its two arms to be each 15 inches long, meaſuring from the center of the weights to the axis of motion, and the weights to be 50lb. each, and the diameter of the axis preſſing upon the dye to be 1 inch; if every ſtroke be made in half a ſecond, and the weights deſcribe an half circumference, which will in this caſe be of 4 feet, the velocity will at the inſtant of the ſtroke be at the rate of 8 feet in a ſecond, and therefore the momentum 800; but the arms of the *fly* being as leavers, one brachium of which is 15 inches long, whilſt the other, *viz.* the ſemi-axis, is but of half an inch, we muſt increaſe this force 30 times, which will give 24000; an immenſe force, equal to that of 100 lb. weight falling 120 feet, or near 3 ſeconds in time; or to that of a body of 750lb. falling $16\frac{1}{12}$ feet, or one ſecond in time.

Some of theſe engines for coining crown-pieces have the arms of the *flies* five times as long, and the weights twice as heavy as thoſe here mentioned, ſo that the effect is ten times greater. *Deſaguliers*, Exper. Philoſoph. p. 245, 339.

FŒNUM *ſanctum*, *ſaint* FOIN, in botany, a name by which the *Onobrychis* of anatomiſts is ſometimes called. See the articles ONOBRYCHIS and SAINT-*foin*, *Suppl.*

FŒTUS *(Cycl.)* — The queſtion about the circulation of the blood in the *fœtus* ſeems not yet determined. See Mem. Acad. Scienc. 1699, 1701, 1703, 1717, 1725, and 1739.

FOLDAGE, among farmers, denotes the liberty of penning ſheep by night. Dict. Ruſt. in voc.

FOND, the ſame with fund. See the article FUND, *Cycl.*

FOOL's-*ſtones*, in botany, an appellation given by ſome to a genus of plants called *orchis* by botanical writers. See the article ORCHIS, *Suppl.*

FOOT-*huſks*, among herbaliſts, the ſame with the cup of a flower. See the article CALYX, *Suppl.*

FORCE, *(Cycl.)* in mechanics. — Whenever a body, which was at reſt begins to move, or has a motion which is either not uniform, or not direct, the cauſe of this change in the ſtate of the body is called *force* [a].

While a body remains in the ſame ſtate, either of reſt, or of uniform and rectilinear motion, the cauſe of its remaining in ſuch a ſtate, is in the nature of the body, and it cannot be ſaid, that any extrinſic *force* has acted on it: this internal cauſe or principle is called *inertia* [b]. [[a] Mr. *Euler*, in Mem. Acad. Berlin. 1745, p. 21. [b] *Ibid.*]

Mechanical *forces* may be reduced to two ſorts; one of a body at reſt, the other of a body in motion.

The *force* of a body at reſt, is that which we conceive to be in a body lying ſtill on a table, or hanging by a rope, or ſupported by a ſpring, *&c.* And this is called by the names of *preſſure*, *tenſion*, *force*, or *vis mortua*, *ſolicitatio*, *conatus movendi*, *conamen*, *&c.* To this claſs alſo of *forces* we muſt refer centripetal and centrifugal *forces*, though they reſide in a body in motion; becauſe theſe *forces* are homogeneous to weights, preſſures, or tenſions of any kind. But of this more particularly farther on.

The meaſure of this *force* is the weight with which the table is preſſed, or the rope ſtretched, or the ſpring is bent. And as to this meaſure there is no diſpute, notwithſtanding the diverſity of appellations by which it is called.

The *force of a body in motion* is on all hands agreed to be a power reſiding in that body, ſo long as it continues its motion, by means of which it is able to remove obſtacles lying in its way; to leſſen, deſtroy, or overcome the *force* of any other moving body, which meet it in an oppoſite direction; or to ſurmount any dead preſſure or reſiſtance, as tenſion, gravity, friction, *&c.* for ſome time; but which will be leſſened or deſtroyed by ſuch reſiſtance as leſſens or deſtroys the motion of the body.

This is called *moving force*, *vis motrix*, and by ſome late writers *vis viva*, to diſtinguiſh it from the *vis mortua* ſpoken of before: and by theſe appellations, however different, the ſame thing is underſtood by all mathematicians; namely, that power of diſplacing, of withſtanding oppoſite moving *forces*, or of overcoming any dead reſiſtance, which reſides in a moving body, and which, in whole or in part, continues to accompany it, ſo long as the body moves.

But about the meaſure of this ſort of *force*, mathematicians are divided into two parties. Both ſides agree that the meaſure of this *force* depends partly upon the maſs, or weight, of the body, and partly upon its velocity; ſo that upon any increaſe either of weight or velocity, the moving *force* will become greater. It is alſo agreed that the velocity being given, or being the ſame in two bodies, their *forces* will be in proportion to their maſſes or weights.

But when two bodies are equal, and the velocities with which they move are different, the two parties no longer agree about the meaſure of the moving *force*.

The Newtonians and Carteſians maintain, that the moving *force* is in proportion to the velocity with which the bodies move. But the Leibnitians aſſert, that the moving *force* is in proportion to the ſquare of the velocity; ſo that if the velocity of a moving body be double, triple, quadruple, *&c.* of that of another equal body, the *force* of the former will be fourtimes, nine times, ſixteen times as great as that of the latter. Hence the Newtonians pretend that the *vis motrix*, or moving *force* of bodies is in the compound ratio of their weights and velocities; and the Leibnitians maintain it to be in the compound ratio of the weights and the ſquares of the velocities. This controverſy was firſt ſtarted by the famous Mr. Leibnitz, and has been carried on by him and his followers near ſeventy years, during whith time a great number of pieces have been publiſhed on both ſides of the queſtion, and a great number of experiments have been made, or propoſed to be made in order to decide it: but tho' both parties agree in the event of the experiments, whether actually made or only propoſed, yet as the writers on each ſide have found a way of deducing from thoſe experiments a concluſion ſuitable to their own opinion, the diſagreement ſtill continues as wide as ever.

Now it muſt be owned that theſe oppoſite concluſions from the ſame experiments are not ſo much owing to falſe reaſoning on either ſide, as to their diſagreement in the principles on which the reaſoning is founded. See Dr. *Jurin*, in Phil. Tranſ. N°. 476. Thoſe who maintain that the moving *force* is as the weight into the velocity, lay down for a principle or axiom, that when two bodies meet one another in contrary directions, if their moving *forces* be equal, neither body will prevail over each other: and if their moving *forces* be unequal, the ſtronger will always prevail over the weaker. This is maintained by Mr. Mac Laurin, among others, in his piece which gained the prize in the Royal Academy of Sciences, in 1724, in his Fluxions, and lately in his Account of Sir Iſaac Newton's diſcoveries; it is alſo agreed to by all the oppoſers of the Leibnitian doctrine, though ſome do not formally lay it down as an axiom, but pretend to derive it from the more general principles of preſſure and the time it acts.

But the followers of Leibnitz deny the truth of this principle, and lay down others, which, as they pretend, are more clear and ſatisfactory, ſuch as, that it always requires a determinate degree of *force* to bend a given ſpring to a given degree, whether this be performed in a longer or ſhorter time, or *vice verſa*; that a given ſpring bent to a given degree, always communicates the ſame *force* to a body, by unbending itſelf, whether the time it takes to unbend itſelf be longer or ſhorter. Mr. 'S Graveſande's words are expreſs: *Idem elaſterium, eodem modo flexum, dum relaxatur equalem ſemper vim corpori communicat, ſive lentius ſive velocius relaxetur. 'S Graveſande*, Phyſ. Elem. Math. § 731. edit. 1742. It is true, he does not aſſume it as a principle, but derives it from a more general principle, that the *force* communicated by a preſſure is in a compound ratio of the preſſure and the ſpace through which it paſſes. But theſe propoſitions are alike denied by the Newtonians. Now if it be admitted, that thoſe bodies have equal *forces*,

which meeting each other in contrary directions, do not prevail over each other, it cannot be disputed, that bodies which have equal quantities of motion, have also equal *forces*; and consequently that the moving *forces* of bodies are in a compound ratio of their masses and velocities.

On the other hand, if it be admitted that a given spring bent to a given degree, always communicates the same *force* to whatever body it be applied to, it is no less indisputable that the *forces* of moving bodies will be in a compound ratio of their masses and the squares of their velocities. For the bending of a spring to the same degree, cannot be done by different masses with equal quantities of motion, or a spring by unbending itself cannot communicate to different masses equal quantities of motion; but the bending or unbending of the spring always corresponds to and with what the Leibnitians call the *vis viva*; that is, the product of the mass of a body by the square of its velocity. This is admitted by the Newtonians, and follows from the avowed principles of both parties.

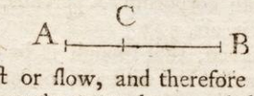
Thus, let M and *m* denote the masses of two bodies, V and *v* their respective velocities; then if any spring, a cross-bow for instance, bent to a certain degree, give the body M a certain velocity V, the same spring or cross-bow, bent to the same degree, will never give another body *m* a velocity *v*, so that MV shall be equal to *mv*, but will always communicate such a velocity to *m*, that MVV shall be equal to *mvv*. See the article SPRING, *Suppl.*

This is admitted by the Newtonians, but the conclusion, that the *forces* of the bodies M and *m* are equal, is denied.

To put an end, therefore, to this controversy, other principles must be found. This has been attempted by several authors, and we have had no small profusion of obscure metaphysics on this occasion. Many subtile reasonings have been formed from the nature of action, cause, effect, time, space, &c. by which we believe more readers have been confounded than enlightened; and after all the controversy is still undecided, and must remain so while the Newtonians, on one hand, assume, that *equal pressures in equal times produce equal moving forces*; and that the Leibnitians, on the contrary maintain, that *equal pressures urging a body through equal spaces produce equal forces.* Hence, supposing equal pressures to act on equal bodies, either to produce motion in them, or to stop what motion they have, the question will be, *whether the force generated or destroyed be proportional to the time the pressure acts, or to the space through which it acts.* For example, let two equal bodies, with the velocities, as 1 and 2, ascend against the action of uniform gravity, according to Galileo's hypothesis; it is certain that the body whose velocity is 2, will resist the *force* of gravity twice the time that the body whose velocity is only 1 can: and it is no less certain, that the body whose velocity is 2, will ascend to four times the height that the other can. So that if we measure the forces of these bodies by the pressure and time requisite to destroy their motion these *forces* will be as the velocities of the moving bodies; but if we measure the *forces* by the pressure, and space through which it extends, requisite to destroy these *forces*, we shall find them proportional to the squares of the velocities of the moving bodies.

This holds in uniform pressures, such as gravity is supposed to be near the earth; but if the pressure be not uniform, as it is not in the action of springs, which press more or less as they are more or less bent, we must then have recourse to the fluxions of the space and time. Thus if *p* stand for the pressure, *t* for the time, *s* for the space; the fluxion, or infinitesimal element as some call it, of the velocity will, according to both parties, be expressed by $\dot{pt}$. According to the Newtonians this is also the fluxion or element of the *force*; but according to the Leibnitians the element of the *force* is proportional to $\dot{ps}^2$. As to any demonstration, either that in unform pressures on the same body, the *force* produced is in proportion to the pressure and the time it acts, and in pressures not uniform that the element of the *force* is proportional to $\dot{pt}$; or that, on the contrary, the *force* thus produced is proportional to the pressure and space in the first case, or that its element is proportional to $\dot{ps}$ in the second case, we have never been fortunate enough to meet with any conclusive argument on either side: nor do we believe any such demonstration possible, till somebody shall be metaphysician enough to analyse the notions of *force*, action, time and space farther than has hitherto been done. — [[a] See *Dan. Bernoulli* in Act. Petrop. vol. viii. p. 100.]

It has been already mentioned, that some Leibnitians do not assume it as a first principle, that action or *force* is proportional to the pressure and space; but they say, that a pressure being given, its action will be proportional to the velocity of the point moved by that pressure. Hence they infer, that the whole action of a pressure, is at its intensity, as the velocity of the point to which it is applied, and as the time the pressure acts. And space being as the time and velocity, they conclude, the action of a pressure to be as that pressure and the space through which it acts. And hence they infer, that the force communicated by the pressure is also as the pressure and space. Thus, say they, if a point runs through a determinate space AB, and presses with a certain given *force* or intensity of pressure, it will perform the same action whe-



ther it move fast or slow, and therefore the time of the action in this case ought not to be regarded. *'S Gravesande*, lib. cit. § 723—728.

But the Newtonians do not submit to this reasoning, and insist, notwithstanding, that the action of the pressure is as the intensity of the pressure, and the time during which it acts, without any regard to the space through which it acts; and they make it an axiom, that equal pressures in equal times produce equal *moving forces*.

Leibnitz himself assumed it as certain, that the action is as the effect by the velocity with which it is produced: and hence he deduces, that the power is as the mass by the square of the velocity: his words, as quoted by Wolfius, are, *Calculum virium pararum seu actionum talem instituo. Sit spatium s, tempus t, velocitas v, corpus c, effectus e, potentia p, actio a, in motu æquabili erit tv ut s, et ut cs, tp ut a. Atque hæc quidem sine demonstratione assumi possunt. Accedit quod demonstrandum, ev ut a. Huic porro plurima theoremata demonstrari possunt*, e. gr. *p ut cv*^{2}. *Nam tp ut ev: sed e ut cs & s ut tv. Ergo fit tp ut ctv*^{2}, *seu p ut cv*^{2}. Vide Act. Petrop. tom. i. p. 232.

But as we cannot pretend to give a full account of all the arguments that have been made use of in this controversy, we must refer the curious to some of the principal authors on this subject, such as Sir Isaac Newton [a], Mr. Mac Laurin [b], Dr. Jurin [c], Dr. Pemberton [d], Mr. Robins [e], Mons. de Mairan [f], and others, on one side: Mess. Leibnitz [g], John [h] and Daniel Bernoulli [i], Herman [k], Poleni [l], Wolfius [m], 'S Gravesande [n], Camus [o], and many more, on the other. But notwithstanding all that has been said, the difficulty of determining whether the element of the moving *force* be proportional to $\dot{pt}$, or to $\dot{ps}$ still remains, and till that be demonstratively decided, we do not see but the question about the measure of the *force* of bodies in motion, must remain undetermined. See *Dan. Bernoulli*, in Act. Petrop. tom. i. p. 131, *seq.*

[a] Philos. Transf. N°. 371. one of the arguments there proposed being Sir Isaac's, according to Dr. Pemberton. [b] Acct. of Sir. Is. Newton's discoveries. Fluxions, art. 511, in the notes. Recueil des pieces qui ont emporté le prix, &c. tom. i. [c] Philos. Transact. N° 476, and in some other pieces. [d] Phil. Transf. N°. 371. [e] Pref. State of the Repub. of Let. May, 1728. [f] Mem. de l'Acad. Scienc. 1728. [g] Act. Erud. 1686. and Nouv. de la Rep. Let. Sept. 1686. art. 2. [h] Discours sur les loix de la communication du mouvement. oper. tom. iii. & Dissert. de vera notione virium vivarum. ib. [i] Acta Petropol. tom. i. p. 131, seq. Hydrodynamica, § i. [k] Acta Petropol. tom. i. [l] De Castellis. [m] Acta Petropol. tom. ii. & in Cosmolog. general. [n] Journ. Lit. and in Phys. Elem. Mathem. [o] Mem. de l'Acad. des Scienc. 1728.]

Though Leibnitz was the first that expressly asserted the *force* of a body in motion to be as the square of its velocity, yet Huygens has been thought to have led him into this notion. This eminent mathematician had demonstrated, that in the collisions of two bodies, perfectly elastic, the sum of the products of the bodies by the squares of their respective velocities, was the same after the shock as before. And this proposition is so far general as to obtain in all collisions of bodies that are perfectly elastic. It is also true when bodies of a perfect elasticity strike any immoveable obstacle, as well as when they strike one another; or when they are constrained by any power or resistance to move in directions different from those in which they impel one another [a]. These considerations might have induced Huygens to lay it down as a general rule, that bodies constantly preserve their *ascensional force* [b], that is, the product of their mass, by the height to which their center of gravity can ascend; and, therefore, in a given system of bodies the sum of the squares of their velocities will remain the same and not be altered by the action of the bodies among themselves, nor against immoveable obstacles. Leibnitz's metaphysical system led him to think that the same quantity of action or *force* subsisted in the universe; and finding this impossible, if *force* were estimated by the quantities of motion [c], he adopted Huygens's principle of the preservation of the ascensional *force*, and made it the measure of moving *forces*. But it is to be observed, that Huygens's principle is general only when bodies are perfectly elastic; and in some other cases, which Mr. Mac Laurin has endeavoured to distinguish [d]. — [[a] See *Mac Laurin*'s Fluxions, art. 571. [b] *Hæc constans lex est, corpora servare* vim suam ascendentem, *& idcirco summam quadratorum velocitatum illorm semper manere eandem. Hoc autem non solum obtinet in ponderibus pendulorum & percussione corporum durorum, sed in multis quoque mechanicis experimentis. Huygen.* Oper. tom. i. p. 248. [c] Huygens, p. 247. of the same book, observes, *Quod sæpe pereat pars motus, licet hunc in aliquo effectu edendo consumi, affirmare non possumus, ut in multis casibus percussionis durorum corporum — ita ut minime pro lege naturæ habendum sit, eandem motus quantitatem semper conservari, nisi alicui impendatur & consumatur; sed hæc constans lex est corpora servare vim suam ascendentem, &c.* Where it is to be observed, that by hard

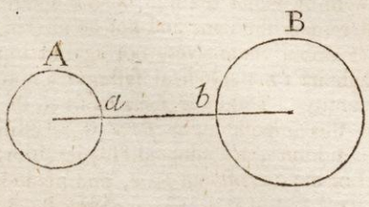
bodies Huygens means ſuch as are elaſtic, as appears from his treatiſe De motu corporum & percuſſione, oper. vol. ii. [d] *Mac Laurin*, lib. cit. art. 533.]

But it is to be obſerved, that though it be true, that in the colliſion of elaſtic bodies the *vis viva*, or aſcenſional *force* is preſerved before and after the ſhock; yet during the ſhock, while the elaſtic bodies are bending and preſs on each other, there ſeems to be a diminution of this *force*, which is afterwards reſtored by the action of their elaſticity; though the followers of Leibnitz do not allow that any *force* is loſt even during the ſhock. They ſay, the *vis viva* is communicated to the ſpring while it is bending, and then is recommunicated to the bodies by the unbending of the ſpring. They alſo deny that any *force* is loſt in the percuſſion of ſoft bodies. For though the *force* of the bodies impelling each other be diminiſhed, yet their *force* does not periſh, but is communicated to ſome other matter [e], ſuch as the ſubtle fluid cauſing coheſion and elaſticity [f]. — [e *Vis viva quæ in percuſſione amittitur, non perit, ſed conſervatur. Wolf.* Coſmol. § 486. *In toto univerſo ſemper conſervatur eadem virium vivarum quantitas.* ibid. § 487. *Vis viva — dum figura corporum in contactu mutatur, in alia materia conſervatur.* Ibid. demonſtr. § 486. [f] Mr. Dan. Bernoulli, ſpeaking of this principle of the preſervation of the *vis viva*, obſerves, *Quamvis principium univerſale ſit, non tamen eſt ſine circumſpectione adhibendum, quia ſæpe contingit ut motus tranſeat in materiam alienam. Ita verbi gratia poſitio illius valet pro regulis motuum ex percuſſione eruendis, ſi modo corpora ſint perfectè elaſtica; ſed cum talia non ſunt, facile eſt videre, partem* virium vivarum *ſive* aſcenſus potentialis *in compreſſionem corporum impenſam corporibus non reſtitui, ſed materiæ cuidam ſubtili, ad quam tranſiit, impreſſam hærere.* Hydrodynam. p. 12, 13. And Mr. Daniel Bernoulli, in this treatiſe, has aſſumed the preſervation of the *vis aſcendens* of Huygens, or, as others expreſs it, the *conſervatio virium virarum*; and, in Mr. Bernoulli's own expreſſion, *æqualitas inter deſcenſum actualem aſcenſumque potentialem*, as an hypotheſis of wonderful uſe in mechanics. But a late author contends that the concluſions drawn from this principle are oftner falſe than true. See De conſervat. virium vivarum diſſert. Lond. 1744. quarto.]

As to the eſtimation of the *force* of bodies in motion, Mr. Euler obſerves, that a body in motion may meet with two kinds of obſtacles, one oppoſing its velocity only, the other its direction. In either caſe, the body exerts its *force* on theſe obſtacles. When the velocity only of the body is changed, as it happens when two bodies in motion meet each other directly, the change reſulting is then ſaid to happen by ſhock, percuſſion, or colliſion. If the obſtacle be of ſuch a nature as only to oppoſe the direction of the body, as when it revolves in a ſling, or moves in an incurvated tube, the obſtacle then acts by preſſure, and this preſſure is called centrifugal *force*. Hence a double *force* is the reſult of the inertia of bodies: that produced by an obſtacle to its velocity is denominated *force* of percuſſion, and the other ariſing from the change of its direction is called *force* of preſſure [g]. — [g *Euler*, Mem. Acad. Berlin. p. 25.]

Leibnitz and his followers make a great difference between theſe two kinds of *forces*. They call *force* of preſſure *vis mortua*, and the *force* of percuſſion *vis viva*. By this oppoſition of terms, they not only ſignify that there is a difference between theſe *forces*, but alſo that they are heterogeneous or not comparable. Hence, though we have an exact meaſure of preſſures, they invented new rules for the meaſure and compariſon of percuſſions, and have thereby occaſioned great diſputes in the philoſophical world.

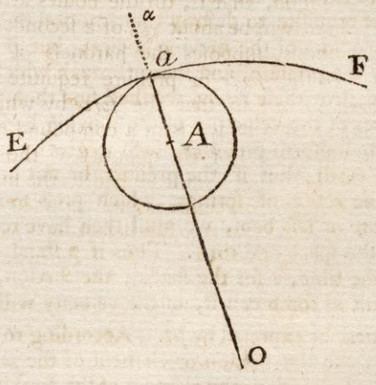
Philoſophers have ſtated this queſtion ſomewhat vaguely: to fix our notions, let us conſider the body B at reſt, and another body A ſtriking it with a given velocity, in the direction *ab*; it is manifeſt that A exerts an action of a certain *force* on B to diſturb its ſtate. The queſtion is, what



is the *force* exerted on B? Philoſophers have given themſelves little trouble to determine the true meaſure of this *force*: They have confined themſelves to the compariſon of different *forces* of the ſame kind. In eſtimating the quantity of *force* of the body A, by the quantity of the alteration which happens in the ſtate of the body B, they eaſily perceived that this change would be greater, according as the body A had a greater maſs, or a greater velocity. The Newtonians, or rather the Carteſians, and Leibnitians could not agree how to expreſs the reſults of the maſs, and velocity of the ſtriking body: the firſt inſiſt, that the *force* ſhould be expreſſed by the product of the maſs by the velocity. Leibnitz, on the other hand, pretends, that the meaſure of this *force* is the product of the maſs by the ſquare of the velocity. The diſpute has been carried on with great warmth on both ſides; but it ſeems almoſt needleſs to relate the various arguments brought by them in ſupport of their different opinions: for as they have never agreed about the effect, the quantity of which was to be the meaſure of the *force*, the diſpute often degenerated into a logomachy.

It is evident, that neither the one nor the other of theſe opinions admit any compariſon between the *force* of percuſſion and that of preſſure: for this is neither comparable to the product of the maſs by the velocity, nor to the product of the maſs by the ſquare of the velocity. The Leibnitians particularly deny the *vires mortuæ* and *vivæ* to be homogeneous; they make the ſame difference between them as between a line and a ſurface. It ſeems to them that experience confirms their notions; a ſmall blow, as that of a hammer on a nail, often producing an effect ſuperior to that of the greateſt preſſure, eſpecially if the ſame effect is to be produced in ſo ſhort a time as that of driving in the nail by the hammer. But thoſe who lay a ſtreſs on this example ſeem to think, that percuſſion is inſtantaneous. If this were true, there could be no doubt of the heterogeneity of the *vires mortuæ* and *vivæ*; for no preſſure, however great, can produce the leaſt ſenſible effect in an inſtant. Beſides, although the effect of percuſſion were not inſtantaneous, there ſtill appears ſo great a difference between the effects of ſtriking and thoſe of preſſing, that whether the force of percuſſion be proportional to its velocity, or to the ſquare or other power of its velocity, we can never produce a preſſure equivalent to a percuſſion: all which confirms the Leibnitians in their notion that preſſure and percuſſion are heterogeneous [h]. — [h Mem. Acad. Berlin. 1745. p. 29.]

Mr. Euler obſerves, with reſpect to this diſpute concerning the meaſure of vivid *force*, that we cannot abſolutely aſcribe any *force* to a body in motion, whether we ſuppoſe this *force* proportional to the velocity, or to the ſquare of the velocity: for the *force* exerted by a body, ſtriking another at reſt, is different from that which it exerts in ſtriking the ſame body in motion; ſo that this *force* cannot be aſcribed to any body conſidered in itſelf, but only relatively to the other bodies it meets with. There is no *force* in a body abſolutely conſidered, but its inertia, which is always the ſame whether the body be at reſt or in motion. But if this body be forced by others to change its ſtate, its inertia then exerts itſelf as a *force*, properly ſo called, which is not abſolutely determinable; becauſe it depends on the changes that happen in the ſtate of the body. Suppoſe, for inſtance, a body A forced to move in an incurvated tube, or along the curve ſurface E*a*F, the body in this caſe will preſs the ſurface wherever it touches it in a direction *a α* normal to the curve; and with a certain *force* commonly determined in mechanics, by the maſs of the body, its velocity, and by the radius of curvature O*a*. Now the body exerts a preſſure, or *vis mortua*;



yet it would be abſurd to aſcribe a certain and determinate *force* of preſſure to this body conſidered in itſelf, ſince this preſſure may vary very much, acording to the difference of the curvature of E*a*F. In like manner it ſeems unreaſonable to place a certain abſolute *force* of percuſſion in bodies, ſince it principally depends on the external circumſtances accompanying the ſhock.

A ſecond obſervation which has been made by ſeveral great men, is, that the effect of a ſhock of two or more bodies is not produced in an inſtant, but requires a certain interval of time. If this be ſo, the heterogeneity between the *vires vivæ* and *mortuæ* vaniſhes; ſince a preſſure may always be aſſigned, which in the ſame time, however little, ſhall produce the ſame effect. If then the *vires vivæ* be homogeneous to the *vires mortuæ*, and ſince we have a perfect meaſure and knowledge of the latter, we need require no other meaſure of the former than that which is derived from the *vires mortuæ* equivalent to them.

Now that the change of ſtate in the ſhock of two bodies does not happen in an inſtant, appears evidently from the experiments made on ſoft bodies: in theſe, percuſſion forms a ſmall cavity, viſible after the ſhock, if the bodies have no elaſticity. Such a cavity cannot certainly be made in an inſtant. And if the ſhock of ſoft bodies require a determinate time, we muſt certainly ſay as much of the hardeſt, though this time may be ſo ſmall as to be beyond all our ideas. Neither can any inſtantaneous ſhock agree with that conſtant law of nature,

by

by virtue of which nothing is performed *per saltum*. But it is needleſs to inſiſt farther on this, ſince the duration of any ſhock may be determined from from the moſt certain principles.

There can be no ſhock or colliſion of bodies, without their making mutual impreſſions on each other: theſe impreſſions will be greater or leſs according as the bodies are more or leſs ſoft, other circumſtances being the ſame. In bodies called hard, the impreſſions are ſmall; but a perfect hardneſs, which admits of no impreſſion, ſeems inconſiſtent with the laws of nature [i]: ſo that while the colliſion laſts, the action of bodies is the reſult of their mutually preſſing each other. This preſſure changes their ſtate; and the *forces* exerted in percuſſion are really preſſures, and truly *vires mortuæ*, if we will uſe this expreſſion, which is no longer proper, ſince the pretended infinite difference between the *vires vivæ* and *mortuæ* ceaſes [k].—[[i] See the article HARD *bodies*, *Suppl.* [k] *Euler*, ibid. p. 32, 33.]

The *force* of percuſſion, reſulting from the preſſures bodies exert on each other while the colliſion laſts, may be perfectly known, if theſe preſſures be determined for every inſtant of the ſhock.

The mutual action of the bodies begins the firſt moment of their contact, and is then leaſt; after which this action increaſes, and becomes greateſt when the reciprocal impreſſions are ſtrongeſt [l]. If the bodies have no elaſticity, and the impreſſions, they have received, remain, the *forces* will then ceaſe. But if the bodies be elaſtic, and the parts compreſſed reſtore themſelves to their former ſtate, then will the bodies continue to preſs each other, till they ſeparate. To comprehend therefore perfectly the *force* of percuſſion, it is requiſite to define, firſt, the time the ſhock laſts, and then to aſſign the preſſure correſponding to each inſtant of this time: and as the effect of preſſures in changing the ſtate of any body may be known, we may thence come at the true cauſe of the change of motion ariſing from colliſion. The *force* of percuſſion, therefore, is no more than the operation of a variable preſſure during a given time; and to meaſure this *force* we muſt have regard to the time, and to the variations according to which the preſſure increaſes and decreaſes. [[l] Vide infra.]

Mr. Euler has given us ſome calculations with reſpect to theſe particulars [m]. It will be ſufficient here only to illuſtrate their tendency by the inſtance he brings. Suppoſe two bodies A and B; that the hardneſs of theſe bodies is equal; and ſuch, that being preſſed together with the *force* of 100lb. the impreſſion made on each is of the depth of $\frac{1}{1000}$ part of a foot. Suppoſe, farther, B to be at reſt, and fixed, and that A ſtrikes it with the velocity of 100 feet in a ſecond; according to Mr. Euler, the greateſt *force* of compreſſion will be equivalent to 4000lb. and this *force* will produce in each of theſe bodies an impreſſion equal to $\frac{1}{25}$ of a foot; and the duration of the colliſion, that is, till the bodies arrive at their greateſt compreſſion, will be about $\frac{1}{800}$ of a ſecond. Mr. Euler, in his calculations, ſuppoſes the hardneſs of a body to be proportional to the *force* or preſſure requiſite to make a given impreſſion on it; ſo that the *force* by which a given impreſſion is made on a body, is in a compound ratio of the hardneſs of the body and of the quantity of the impreſſion. But he obſerves, that regard muſt be had to the magnitude of the bodies, as the ſame Impreſſion cannot be made on the leaſt bodies as on the greateſt, from the defect of ſpace through which their component particles muſt be driven: he, therefore, only conſiders the leaſt impreſſions, and that the bodies are of ſuch magnitudes, that with reſpect to them the impreſſions may be looked upon as nothing. What he ſuppoſes about the hardneſs of bodies, neither implies elaſticity nor its defect, elaſticity only producing a reſtitution of figure and impreſſion when the preſſing *force* ceaſes; but this reſtitution needs not be here conſidered. It is likewiſe ſuppoſed, that the bodies ſhocking have plane and equal baſes, by which they touch each other in the colliſion; ſo that the impreſſion hereby made diminiſhes the length of each body. It is farther to be obſerved, that in Mr. Euler's calculations, bodies are ſuppoſed ſo conſtituted, that they may not only receive impreſſions from the *forces* preſſing them, but that a greater *force* is requiſite to make a greater impreſſion. This excludes all bodies fluid or ſolid in which the ſame *force* may penetrate farther and farther, providing it have time, without ever being *in equilibrio* with the reſiſtance. Thus a body may continually penetrate farther into ſoft wax, although the *force* impelling it be not increaſed. In theſe, and the like caſes, nothing is required but to ſurmount the firſt obſtacles; which being once done, and the connexion of parts broken, the penetrating body always advances, meeting with the ſame obſtacles as before, and deſtroying them by an equal *force*. But Mr. Euler only conſiders the firſt obſtacles which exiſt before any ſeparation of parts, and which are, no doubt, ſuch, that a greater impreſſion requires a greater *force*. This, indeed, principally takes place in elaſtic bodies; but it ſeems likewiſe to obtain in all bodies when the impreſſions made on them are ſmall, and that the contexture of their parts is not altered. —[[m] Ibid. p. 37, *ſeq.*]

Theſe things being premiſed, let the maſs or weight of the body A be expreſſed in general by A, and let its velocity before the ſhock be that which it might acquire by falling from the height a. Farther, let the hardneſs of A be expreſſed by M, and that of B by N, and let the amplitude of the baſe, by which the impreſſion is made be cc; then will the greateſt compreſſion be made with a *force* $\sqrt{\frac{MNcc}{M+N}\times Aa}$. Therefore if the hardneſs of the two bodies, and the plane of their contact during the whole time of their colliſion be the ſame, this *force* will be $\sqrt{Aa}$, that is, as the ſquare root of the *vis viva* of the ſtriking body A. And as $\sqrt{a}$ is proportional to the velocity of the body A, the *force* of percuſſion will be in a compound ratio of the velocity and of the ſubduplicate ratio of the maſs of the body ſtriking: ſo that in this caſe neither the Leibnitian nor the Carteſian proportions take place. But this *force* of percuſſion depends chiefly on the hardneſs of the bodies; the greater this is, the greater will the *force* of percuſſion be. If M = N, this *force* will be as $\sqrt{Mcc\times Aa}$, that is, in a compound ſubduplicate ratio of the *vis viva* of the body ſtriking, of the hardneſs, and of the plane of contact. But if M, the hardneſs of one of the bodies, be infinite, the *force* of percuſſion will be as $\sqrt{Ncc\times Aa}$; at the ſame time if M = N, this force will be as $\sqrt{\frac{1}{2}Ncc\times Aa}$. Therefore all other things being equal, the *force* of percuſſion, if the ſtriking body be infinitely hard, will be to the *force* of percuſſion if both the bodies be equally hard, as $\sqrt{2}$ to 1.

Mr. Euler farther deduces from his calculation, that the impreſſion received by the body A will be as $\sqrt{\frac{N\times Aa}{M+N\times Mcc}}$ and the impreſſion on B will be as $\sqrt{\frac{M\times Aa}{M+N\times Ncc}}$. If, therefore, the hardneſs of A, that is M, be infinite, it will ſuffer no impreſſion, whereas that on B will extend to the depth of $\sqrt{\frac{Aa}{Ncc}}$. But if the hardneſs of the two bodies be the ſame, or that M = N, they will each receive equal impreſſions of the depth $\sqrt{\frac{Aa}{2Ncc}}$. So that the impreſſion received by the body B, in this caſe, will be to the impreſſion it receives in the former as 1 to $\sqrt{2}$ [n]. —[[n] Ibid. p. 46, 47.]

Mr. Euler has likewiſe conſidered and computed the caſe when the ſtriking body has its anterior ſurface convex, with which it ſtrikes an immoveable body whoſe ſurface is plane [o]. He has alſo examined the caſe when both bodies are ſuppoſed immoveable [p]; and from his formulæ he deduces the known laws of the colliſion of non-elaſtic and elaſtic bodies. He has alſo determined the greateſt preſſures the bodies receive in theſe caſes [q]; and likewiſe the impreſſions made on them. In particular he ſhews that the impreſſion received by the body ſtruck, or B, if moveable, is to the impreſſion received by the ſame body when immoveable as $\sqrt{B}$ to $\sqrt{A+B}$. —[[o] Ibid. p. 48. § xxiv. [p] Ibid. § xxv. xxvi. [q] Ibid. § xxvii.]

This doctrine of Mr. Euler may ſerve to ſhew, that the diſpute about the meaſure of *forces* is very needleſs in phyſics; ſince the laws of motion may, independently of any hypotheſis about the meaſure of the *vis viva*, be deduced from the moſt unconteſted principles of preſſure and time. But we doubt whether we ſhall be enabled hereby to ſettle the metaphyſical part of this diſpute to the ſatisfaction of both parties, each of which may aſſent to all that Mr. Euler ſays, and yet adhere either to the Carteſians or Leibnitians. —But whatever may be ſaid of the metaphyſical part of the diſpute, it is certain, from experience,

That the number of equal ſprings requiſite to produce any velocity in a given body, is always proportional to the ſquare of the velocity to be produced. Thus if one ſpring can, by unbending half, produce one degree of velocity in a body, it will require four equal ſprings to produce two degrees of velocity in that body; nine ſprings to produce three degrees of velocity, *&c.* See the article SPRING, *Suppl.*

Alſo, if a portion of a yielding ſubſtance, as clay, tallow, *&c.* be juſt ſufficient to ſtop the motion of a body moving with a certain degree of velocity, it will require four times the quantity of the ſame reſiſting ſubſtance to ſtop it, if the velocity of the moving body be double, *&c.* The ſame holds in the reſiſtance of wood againſt muſquet-balls, as Mr. Robins obſerves in his New Principles of Gunnery: ſo that a ball moving with twice the velocity of another, will penetrate four times as deep into earth, clay, tallow, wood, *&c.* And in like manner if the action of one man, one horſe, or other animal, can give a certain degree of velocity to a given maſs, it will require the action of four equal men, horſes, *&c.* to give the ſame maſs two degrees of velocity; nine men, horſes, *&c.* to give it three degrees of velocity; and ſo on.

Theſe practical points have been put out of all queſtion by the experiments of Poleni, 'S Graveſande, Deſaguliers, and others, and are of great uſe, although they do not decide the controverſy about the meaſure of the *force* of bodies in motion.

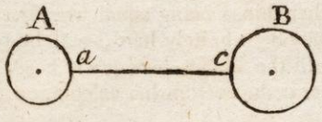
FORCE *of inertia*, or *vis inertiæ*. It may be a queſtion, whether the *vis inertiæ* of bodies can properly be called a *force*? As

to

to which Mr. Euler obſerves, that if we give the name of *force* to ſuch cauſes only as can change the ſtate of bodies, the *inertia*, by which all bodies remain in their ſtate of motion, or reſt, cannot properly be called *force*; although a true *force* may ſometimes be the reſult of it. For when the inertia preſerves a body in its ſtate of reſt, or an uniform and direct progreſſion, the ſame inertia may be the cauſe of a change in the ſtate of other bodies: ſo that tho' the name of *force* does not belong to this inertia, with reſpect to the body wherein it reſides, yet it may change into a *force* with reſpect to other bodies. Mr. Euler[a] even thinks it probable that all the changes which happen in the world, ariſe, without exception, from the inertia of bodies, and that there are no other *forces* in nature than what are excited by this inertia. — [[a] In Mem. Acad. Berlin. 1745. p. 22.]

To illuſtrate this, he conſiders a body A (fig. I.) moving with a given velocity in the direction *ac*: ſo long as this body meets with no obſtacle, its motion will continue with the ſame velocity, and in the ſame direction, and thus it will perſevere in the ſame ſtate, the cauſe of this perſeverance being the inertia of the body. But ſuppoſing another body B at reſt, and that the body A has approached ſo near to B, that their extremities touch; what will happen? The bodies

Fig. I.



being impenetrable, it is plain that A cannot remain in its ſtate, without diſturbing that of B; ſince A muſt, in order to continue its motion, either drive B before it with a velocity equal to, or greater than its own, or it muſt turn aſide. Alſo the body B cannot remain in its ſtate of repoſe, unleſs A ſtops, or returns, or deflects to one ſide. All this clearly ſhews, that theſe two bodies cannot at the ſame time preſerve their ſtate. When A touches B, the ſtate of one or both muſt be changed, ſince both equally endeavour to preſerve their ſtate: there can be no reaſon why the one ſhould ſuffer a change rather than the other, and therefore the ſtate of both muſt be altered. But whatever change happens in this reſpect it muſt ariſe from the *vis inertiæ*; for when B's ſtate of reſt is changed to motion, the cauſe is the inertia of A; ſince B would have remained eternally at reſt had it not been for the appulſe of A. In like manner, the cauſe of the change which happens in the motion of the body A, can be nothing elſe than the inertia of B, ſince without this A would have preſerved its motion without any alteration. The inertia being the cauſe of the perſeverance of a body in its ſtate, cannot be conceived but as a principle of reſiſtance to any change of ſtate; ſince we could not ſay that a body has power of remaining in its ſtate, if it gave way without reſiſtance to any cauſe endeavouring to alter that ſtate. This conſideration authoriſes the giving the name of *force* to the inertia, taking the term *force* in an extenſive ſenſe. When then the body A endeavours by its inertia to preſerve its uniform rectilinear motion, it has at the ſame time the *force* to reſiſt all obſtacles; and the body B, the inertia of which exerts itſelf in the preſervation of its ſtate of reſt, has a *force* by which it reſiſts all cauſes endeavouring to draw it out of that ſtate. Hence in the ſhock of theſe two bodies, both being unable to preſerve their ſtate, becauſe of their impenetrability, and the inertia of each reſiſting a change, this inertia of the one muſt produce a change in the other; therefore, though the inertia cannot be called a *force* with reſpect to the body in which it reſides, becauſe it only produces a preſervation of its ſtate, yet with reſpect to other bodies it may become a true *force*, by which their ſtate is changed. Now as many bodies muſt ſhock each other in a world full of bodies differently moved, and that ſome muſt hinder others from perſevering in their ſtate, it follows, that the ſtate of all thoſe bodies muſt undergo perpetual changes; and the cauſe of all theſe will be the inertia by which all bodies have a tendency to preſerve their ſtate. Nor do the changes which continually happen in the world oblige us to aſcribe moving *forces* to bodies, different from their inertia, ſince this alone may produce all the alterations we obſerve[b]. — [[b] Ibid. p. 23, 24.]

The inertia, as well as impenetrability and extenſion, is an univerſal property of all matter; and this inertia is proportional to the maſs or quantity of matter. A body, whether at reſt or in motion, has the ſame inertia, or the ſame power or *force* to preſerve its ſtate. This inertia is the cauſe of a body's reſiſting either to a change of its velocity, or of its direction: and from hence ariſes the two kinds of *forces* before mentioned[c]. — [[c] Ibid. p. 25.]

Central FORCE. It may be proper here to ſubjoin ſomething on the head of *centripetal* and *centrifugal*, or, in one word, *central forces*, to what is ſaid in the *Cyclopædia*, under the head CENTRAL. The doctrine of *central* or *centripetal* and *centrifugal forces* has been much cultivated by mathematicians, as being of extenſive uſe in the theory of gravity and other phyſico-mathematical ſciences.

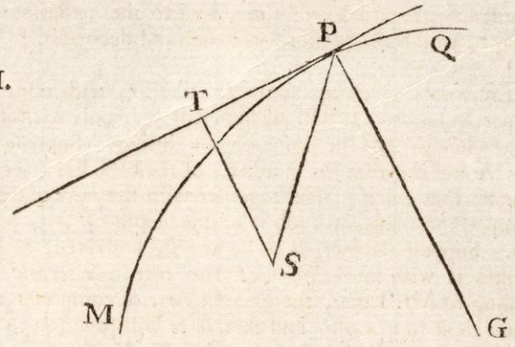
In this doctrine it is ſuppoſed, that a body at reſt never moves itſelf: and that a body in motion never changes the velocity or direction of its motion of itſelf; but that every motion would continue uniform, and its direction rectilinear, unleſs ſome external *force* or reſiſtance affected it. Hence, when a body at reſt always tends to move, or when the velocity of any rectilinear motion is accelerated continually, or when the direction of a motion is continually varied and a curve line deſcribed, theſe are ſuppoſed to proceed equally from the influence of ſome power that acts inceſſantly; which may be meaſured either by the preſſure of the quieſcent body againſt the obſtacle that hinders it to move, in the firſt caſe; or by the acceleration of the motion, in the ſecond; or by the flexure of the curve deſcribed, in the third caſe; due regard being had to the time in which theſe effects are produced, and the other circumſtances, according to the principles of mechanics. Effects of the power of gravity of each kind fall under our conſtant obſervation near the ſurface of the earth; for the ſame power which renders bodies heavy while they are at reſt, accelerates them when they deſcend perpendicularly, and bends their motion into a curve line when they are projected in any other direction than that of their gravity. But we can judge of the powers that act on the celeſtial bodies by effects of the laſt kind only. And hence it is that the doctrine of *central forces* is of ſo much uſe in the theory of the planetary motions.

Sir Iſaac Newton has treated of *central forces* in book i. § 2. of his principles. Mr. De Moivre has given the following elegant general theorem relating to the ſame ſubject, in the Phil. Tranſ. and in his Miſcel. Analyt. p. 231.

Let MPQ be any given curve in the perimeter of which a body moves: let P be the place of the body in the curve, S the center of *forces*, PG the radius of concavity or curvature, ST the perpendicular drawn from the center of *forces* to the tangent of the curve in P; then will the *centripetal force* be every where proportional to the quantity $\frac{SP}{PG \times ST\ cub.}$

See Miſcel. Analyt. p. 231.

Fig. II.



What is here called the *center of force*, is the point to which the *central force* is always directed.

Monſ. Varignon has alſo given two general theorems on this ſubject in the Memoirs of the Acad. Scienc. an. 1700, 1701, and has ſhewn their application to the motions of the planets. See alſo the ſame Memoirs, an. 1706, 1710.

Mr. Mac Laurin has alſo treated the ſubject of *central forces* very fully in his Fluxions, from art. 416 to 493. where he gives a great variety of expreſſions for theſe *forces*, and ſeveral elegant methods of inveſtigating them.

Sir Iſaac Newton has demonſtrated[d] this fundamental theorem of *central forces*, that the areas which revolving bodies deſcribe by radii drawn to an immoveable center, lie in the ſame immoveable planes, and are proportional to the times in which they are deſcribed. — [[d] Princip. lib. i. prop. 1.]

A late eminent mathematician obſerves that this law, which is originally Kepler's, is the only general principle in the doctrine of *centripetal forces*; but ſince this law, as Sir Iſaac Newton himſelf has proved, cannot hold whenever a body has a gravity or *force* to any other than one and the ſame point, there ſeems to be wanting ſome law that may ſerve to explain the motions of the moon and ſatellites which have a gravity towards two different centers: the law he lays down for this purpoſe is,

That where a body is deflected by two *forces* tending conſtantly to two fixed points, it will deſcribe by lines drawn from the two fixed points, equal ſolids in equal times, about the line joining thoſe fixed points. See *Machin*, of the Laws of the Moon's Motion, in the poſtſcript. This ſhort treatiſe is publiſhed at the end of the Engliſh tranſlation of Sir Iſaac Newton's Principles.

FORCE, in practical mechanics. We have ſeveral curious as well as uſeful obſervations in Deſaguliers's Experimental Philoſophy, concerning the comparative *forces* of men and horſes, and the beſt way of applying them. An horſe draws with the greateſt advantage when the line of direction is level with his breaſt: in ſuch a ſituation, he is able to draw 200lb. eight hours a day, walking about two miles and an half an hour. And if the ſame horſe is made to draw 240lb. he can work but ſix hours a day, and cannot go quite ſo faſt. On a carriage, indeed, where friction alone is to be overcome, a middling horſe will draw 1000lb. But the beſt way to try a

horſe's *force*, is by making him draw up out of a well, over a ſingle pully or roller; and in ſuch a caſe one horſe with another will draw 200lb. as already obſerved.

Five men are found to be equal in ſtrength to one horſe, and can, with as much eaſe, puſh round the horizontal beam of a mill, in a walk 40 feet wide; whereas three men will do it in a walk only 19 feet wide.

The worſt way of applying the *force* of a horſe, is to make him carry or draw up hill: for, if the hill be ſteep, three men will do more than a horſe, each man climbing up faſter with a burden of 100lb. weight, than a horſe that is loaded with 300lb. a difference which is owing to the poſition of the parts of the human body being better adapted to climb than thoſe of a horſe.

On the other hand, the beſt way of applying the *force* of a horſe, is in an horizontal direction, wherein a man can exert leaſt *force*; thus a man drawing a boat along, by means of a rope coming over his ſhoulders, cannot exert above one ſeventh part of the *force* of a horſe employed to the ſame purpoſe.

The very beſt and moſt effectual poſture in a man, is that of rowing; wherein he not only acts with more muſcles at once for overcoming the reſiſtance, than in any other poſition; but as he pulls backwards, the weight of his body aſſiſts by way of leaver. *Deſaguliers*, Exp. Phil. vol. i. p. 241, *ſeq.* where we have ſeveral other obſervations relative to *force* acquired by certain poſitions of the body, from which that author accounts for moſt feats of ſtrength and activity. Ibid. p. 254. *ſeq.*

FORCER, in mechanics, is properly a piſton, without a valve. See the article PISTON, *Cycl.*

There are ſeveral ways of making *forcers*: the moſt common of all conſiſts of a braſs cylinder, a very little leſs in diameter, at its top and bottom, than the bore of the barrel of the pump, and turned ſtill leſs at the middle, in order to let in a leathern ring or collar (made of a thick leather put round the braſs cylinder) which makes it juſt equal to the bore of the barrel, ſo as to fit it quite when it is put into it.

The ſecond ſort of *forcers* conſiſts of three braſs cylinders which can be ſcrewed together. The middle one ought to be almoſt equal in diameter to the bore of the pipe, ſo as to ſlide in it without any friction. The upper cylinder and the lower muſt be a little leſs, and equal to one another. There are two leathers which muſt be put between them when they are unſcrewed: then it is evident, that if the cylinders be ſcrewed together, and the leathers, which ought to be a little bigger than the braſs cylinders, apply themſelves folding upwards round the upper cylinder, and downwards round the lower, they will become juſt equal to the bore of the barrel; and conſequently they will hinder any air from getting through the ſides of the *forcer*, when it moves up and down in the barrel. The uſe of the middle braſs cylinder is to hinder the leathers from turning themſelves back by the motion.

This kind of *forcer* has, above the other, the advantage of having a great deal leſs friction; and beſides, as the leathers, which are applied to it, may be thin ones, they are much ſmoother than thick ones, which are uſed in the other.

But the beſt way of making *forcers*, is, to have a plunger, or ſolid braſs cylinder, equal in length to the barrel of the pump, and a little leſs in the diameter than the bore; ſo that it may move freely in it without any friction. There muſt be two hollow, ſhort, braſs cylinders, or rather rings, at the top of the barrel, which can be ſcrewed together; the upper one muſt be equal in bore to the barrel, and the lower a little leſs: there are two leathers, both having in the middle a leſs hole than the bore of the pipe; the one muſt be applied between the barrel and the lower ring, and the other between the ſame ring and the upper one; and the whole muſt be ſcrewed together. Then if the ſolid cylinder or *forcer*, be put into it, and moved up and down, it is evident that the two before-mentioned leathers, which are applied the one to the barrel and the other to the inſide of the hollow cylinder or ring, will hinder any air from getting between them and the ſolid cylinder.

The advantage of this kind of *forcer*, is, that it has no other friction but at the top of the barrel, and that the inſide of the barrel need not be ſmooth, as in other kinds of pumps; but only the outſide of the *forcer* muſt be turned true and poliſhed, which can be done with much more eaſe. See *Deſaguliers*, Courſe of Experim. Philoſ. p. 161, 162.

FORCING *pump*. See the article PUMP, *Append.*

FORCING *pipe*. See the article PIPE, *Append.*

FORFICULA, the ear-wig, in zoology, the name of a genus of inſects, the tail of which forms a kind of forceps, capable of pinching; the exterior wings are very ſhort, but dimidiated; and the antennæ are ſetaceous. See the article EAR-*wig*, *Append.*

FORM *(Cycl.)* — FORM *of a ſeries*, in algebra, is uſed for that affection of an undeterminate ſeries, ſuch as,

$Ax^n + Bx^{n+r} + Cx^{n+2r} + Dx^{n+3r}$, &c. which ariſes from the different values of the indices of x.

Thus if $n = 1$, and $r = 1$, the ſeries will aſſume the *form*, $Ax + Bx^2 + Cx^3 + Dx^4 +$, &c.

If $n = 1$, and $r = 2$, the *form* will be, $Ax + Bx^3 + Cx^5 + Dx^7 +$, &c.

If $n = \frac{1}{2}$, and $r = 1$, the *form* is,

$Ax^{\frac{1}{2}} + Bx^{\frac{3}{2}} + Cx^{\frac{5}{2}} + Dx^{\frac{7}{2}} +$, &c.

Again, if $n = 0$, and $r = -1$, the *form* of the ſeries will be $A + Bx^{-1} + Cx^{-2} + Dx^{-3} +$, &c.

When the value of a quantity cannot be found exactly, it is of uſe in algebra, as well as in common arithmetic, to ſeek an approximated value of that quantity ſufficient for practice. Thus in arithmetic, as the true value of the ſquare root of 2 cannot be aſſigned, a decimal fraction is found to a ſufficient degree of exactneſs in any particular caſe. And this decimal fraction is in reality no more than an infinite ſeries of fractions converging or approximating to the true value of the root required. For the expreſſion $\sqrt{2} = 1.41421356$, &c. is equivalent to this $\sqrt{2} = 1 + \frac{4}{10} + \frac{1}{100} + \frac{4}{1000} + \frac{2}{10000} + \frac{1}{100000} +$, &c. Or ſuppoſing

$x = \frac{1}{10}$, $\sqrt{2} = 1 + \frac{4}{x} + \frac{1}{xx} + \frac{4}{x^3} + \frac{2}{x^4} + \frac{1}{x^5} +$, &c.

$= 1 + 4x^{-1} + x^{-2} + 4x^{-3} + 2x^{-4} + x^{-5} +$, &c. which laſt ſeries is a particular caſe of the general indeterminate ſeries $Ax^n + Bx^{n+r} + Cx^{n+2r} +$, &c. when $n = 0$, $r = -1$, and the coefficient $A = 1$, $B = 4$, $C = 1$, $D = 4$, $E = 2$, &c.

But the application of the notion of approximations in numbers, to ſpecies, or to algebra, is not ſo obvious. Sir Iſaac Newton, with his uſual ſagacity, took the hint, proſecuted it, and thereby diſcovered general methods in the doctrines of infinite ſeries, which before him had only been treated in a particular manner, though with great acuteneſs, by Dr. Wallis and a few others. See *Newton*'s Meth. of Fluxions and infinite Series, with Mr. Colſon's Comment; as alſo the Analyſis per æquationes numero terminorum infinitas, publiſhed by Mr. Jones, in 1711, and ſince tranſlated and explained by Mr. Stewart, together with Sir Iſaac's Quadrature of Curves, Lond. 1745, quarto. To theſe may be added Mr. *Mac Laurin*'s Algebra, part II. chap. x. p. 244. and *Cramer*'s Analyſe des Lignes Courbes Algebriques, ch. vii. p. 148.

Among the various methods for determining the value of a quantity by a converging ſeries, that ſeems, on many occaſions, preferable to the reſt, which conſiſts in aſſuming an indeterminate ſeries equal to the quantity, the value of which is ſought, and afterwards determining the values of the terms of this aſſumed ſeries.

For inſtance, ſuppoſe a logarithm being given, it were required to find its number.

Let the number be $= 1 + x$, and the given logarithm $= z$. Then, by the nature of logarithms and fluxions (ſee the article FLUXION and LOGARITHM, *Suppl.*) $\dot{z} = \frac{\dot{x}}{1+x}$, and $\dot{z} + x\dot{z} = \dot{x}$. Suppoſe,

$x = Az + Bz^2 + Cz^3 + Dz^4 +$, &c. conſequently,

$\dot{x} = A\dot{z} + 2Bz\dot{z} + 3Cz^2\dot{z} + 4Dz^3\dot{z} +$, &c. $= \dot{z} + x\dot{z}$

$= \dot{z} + Az\dot{z} + Bz^2\dot{z} + Cz^3\dot{z} + Dz^4\dot{z} +$, &c.

Now if the correſponding terms of theſe two equal ſeries's (each being $= \dot{x}$) be compared, we ſhall have

$A = 1$, $B = \frac{1}{2}$, $C = \frac{1}{6}$, $D = \frac{1}{24}$, &c. which values being ſubſtituted in the ſeries $Az + Bz^2 + Cz^3 +$, &c. give,

$x = z + \frac{1}{2}z^2 + \frac{1}{6}z^3 + \frac{1}{24}z^4 + \frac{1}{120}z^5 + \frac{1}{720}z^6 +$, &c.

$= z + \frac{1}{1.2}z^2 + \frac{1}{1.2.3}z^3 + \frac{1}{1.2.3.4}z^4 + \frac{1}{1.2.3.4.5}z^5$

$+$, &c. And conſequently $1 + x$, the number ſought, will be $= 1 + z + \frac{1}{1.2}z^2 +$, &c.

But the indeterminate ſeries $Az + Bzz + Cz^3 +$, &c. was here arbitrarily aſſumed, and will not ſucceed in all caſes.

For inſtance, if from an arc given it were required to find the tangent. Let $x =$ tangent, $v =$ arc, the radius $= 1$. Then, from the nature of the circle, we ſhall have $\frac{\dot{x}}{1+xx} = \dot{v}$, or $\dot{x} = \dot{v} + xx\dot{v}$. Now if to find the value of x we ſuppoſe $x = Av + Bv^2 + Cv^3 +$, &c. and operate as before, we ſhall find all the coefficients B, D, F, of the even powers of v, each $= 0$. Therefore the ſeries aſſumed is not of a proper *form*. But ſuppoſing $x = Av + Bv^3 + Cv^5 + Dv^7 +$, &c. we ſhall find $A = 1$, $B = \frac{1}{3}$, $C = \frac{2}{15}$, $D = \frac{17}{315} +$, &c. and conſequently $x = v + \frac{1}{3}v^3 + \frac{2}{15}v^5 + \frac{17}{315}v^7 +$, &c.

Now to find a proper indeterminate ſeries in all caſes, tentatively, would often be very laborious, and often an impracticable work. Mathematicians have therefore endeavoured to find out a general rule for this purpoſe. But, till lately, the method has been but imperfectly underſtood and delivered. Moſt authors, indeed, have explained the manner of finding the coefficients A, B, C, D, &c. of the indeterminate ſeries $Ax^n + Bx^{n+r} + Cx^{n+2r} +$, &c. which is eaſy; but the values of n and r, wherein the main difficulty lies, have been aſſigned by many, as if they were ſelf-evident, or at leaſt diſcoverable by an eaſy trial or two, as in the laſt example.

Sir Iſaac Newton himſelf has ſhewn the method of determining the number n, by his rule for finding the firſt term of a converging ſeries, by the application of his parallelogram and ruler. For the particulars of this method, ſee the authors above cited. See alſo the article PARALLELOGRAM, *infra.*

Dr. Taylor, in his Methodus incrementorum, inveſtigates

the number r; but, according to Mr. Stirling[a], the rule given by the doctor fails sometimes. [[a] Lineæ tert. ordin. Newtonian. p. 28.]

Mr. Stirling found a correction of Dr. Taylor's rule, but says he cannot affirm it to be universal, having only found it by chance. 'S Gravesande observes, that though he thinks Mr. Stirling's rule never leads into error, yet that it is not perfect. See *'S Gravesande*, De determin. form. seriei infinit. printed at the end of his Matheseos universalis elementa, Lugd. Bat. 1727. This learned professor has endeavoured to rectify the rule. But Mr. Cramer has shewn it to be still defective in several respects; and he himself, to avoid the inconveniences to which the methods of those who wrote before him are subject, has ascended to the first principles of the method of infinite series, and has entered into a more exact and instructive detail of the whole method, than is to be met with elsewhere; for which, and for many other reasons, his treatise deserves to be particularly recommended to beginners.

But it must be observed, that in determining the value of a quantity by a converging series, it is not always necessary to have recourse to an indeterminate series: for it is sometimes more expeditious to find it by common division, or by extraction of roots. See *Newton*, Meth. of Fluxions and inf. Series, above cited. Thus, if it were required to find the arc of a circle from its given tangent, that is, to find the value of v in the fluxional equation, $\dot{v} = \frac{\dot{x}}{1+xx}$, by an infinite series: divide $\dot{x}$ by $1+xx$, the quotient will be the series $\dot{x} - x^2\dot{x} + x^4\dot{x} - x^6\dot{x} +$, &c. And taking the fluents of each term, we shall have $v = x - \frac{1}{3}x^3 + \frac{1}{5}x^5 + \frac{1}{7}x^7 +$, &c. which is the series often used for the quadrature of the circle. If $x = 1$, that is, if x be the the tangent of 45°, then will $v = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} +$, &c. = the length of an arc of 45°, that is, $\frac{1}{8}$ of the circumference of a circle, whose radius $= 1$; or $\frac{1}{4}$ of the circumference, if the diameter $= 1$. Consequenly, if 1 be the square of the diameter, $1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} +$, &c. = the area of the circle: because $\frac{1}{4}$ of the circumference multiplied by the diameter, gives the area of the circle. And this is Leibnitz's series, as also James Gregory's.

FORMED *stones*, in natural history. See the article *Formed* STONES, *Suppl.*

FORMICA, among sportsmen, the name of a disease incident to spaniels. See the article SPANIEL, *Suppl.*

FORMICATION *(Cycl.)* — This term is also used among builders, for an arching or vaulting.

FORMS, among sportsmen, is said of a hare when she squats in any place. Dict. Rust. in voc.

FOUCADE. See the article FOUGADE, *Cycl.*

FOULDAGE, the same with foldage. See the article FOLDAGE, *Append.*

FOUNDATION *(Cycl.)* — Architects ought to use the utmost diligence in regard to *foundations*, since of all errors which may happen in building, an error in this point is most pernicious.

The ground fit for building upon is of various kinds; sometimes it is so hard as scarce to be cut with iron; in other places it is stiff, blackish, or whitish. This last is reckoned the weakest; and, in general, that is the best which requires most labour in cutting or digging.

When the ground is very bad, you must get large oaken piles of such a length as may reach the sound ground, and whose diameter must be about one twelfth part of their length: these must be driven down with a machine, as close to one another as possible, and that under the middle walls as well as the outer ones; and upon their tops large planks are to be pinned down. But if the ground be only faulty in some places, arches may be turned over them, by which means no part of the weight of the building will rest upon them.

As to the rules necessary to be observed in constructing the ground-work, they are these: 1. That the bottom of the trench be made exactly level. 2. That the lowest ledge or row be all of stone, laid close together. 3. That the breadth of the ground-work be at least double that of the wall that is to be raised on it. However, art ought always to give way to discretion, for the breadth may be regulated according to the goodness of the ground, and the weight of the intended edifice. 4. That the *foundation* be made to diminish as it rises, only care must be taken that it do so equally on both sides. 5. That you ought never to build upon the ruins of an old *foundation*, unless well assured of its depth and goodness. Build. Dict. in voc.

FOUNDATION *of bridges*. See the article BRIDGE, *Suppl.*

FOX, *vulpes*, in zoology, an animal of the dog-kind. See the articles CANIS and VULPES, *Suppl.*

FOX *tail-grass*, in botany. See the article GRASS, *Append.*

FOYLING *of land*, among farmers, is the fallowing it in the summer or autumn. Dict. Rust. in voc.

FOYLING, among sportsmen, a term used for the footsteps of a stag, on the grass or leaves. Dict. Rust. in voc.

FRACTION *(Cycl.)* — *Infinite series of* FRACTIONS. The sums, or rather the limit of the sums of infinite series's of *fractions*, has been one of the principal objects of the modern methods of computation; and these sums may often be found. Thus the sum of $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} +$, &c. *ad infinitum*, or rather, the limit to which this sum may approach nearer than by a given difference is 1. So likewise the limit of the sum $\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} +$, &c. is $\frac{1}{2}$. And these and the like sums of geometric progressions may be readily found, by applying the common rule for determining the sum of geometric progressions from the first and last terms and the ratio given. For in these converging infinite geometric progressions, the last term must be considered as 0; so that the sums of the antecedents of these progressions are considered as the sum itself, because they differ from the sum of the progression by less than any assigned quantity; but in every geometric progression the sum of the antecedents is to the sum of the consequents as one antecedent to one consequent. Hence calling the sum S, the first term a, and the ratio r, we shall have $S : S - a :: a : ar :: 1 : r$.

Therefore $Sr = S - a$, or $S = \frac{a}{1-r}$. Thus if $a = \frac{1}{2}$, and $r = \frac{1}{2}$, S will $= \frac{1}{2}$ divided by $\frac{1}{2}$, or 1. And if $a = \frac{1}{3}$, and $r = \frac{1}{3}$, S will $= \frac{1}{3}$ divided by $\frac{2}{3}$, or $\frac{1}{2}$; and so of the rest.

But the series's of *fractions* that occur in the solution of problems are rarely reducible to geometric progressions; nor can any general rule, in cases so infinitely various, be given. The art here, as in most other cases, is only to be acquired by examples, and by a careful observation of the arts used by great authors in the investigation of the series's of *fractions* they have considered. And the general methods of infinite series which have been carried so far by Mr. de Moivre[a], Mr. Stirling[b], and Mr. Euler[c], are often found necessary to determine the sum of a very simple series of *fractions*. — [[a] Miscel. Analyt. passim. [b] Method. Differentialis. [c] Analys. infinitorum, & Act. Petropol. passim.]

The sum of a series of *fractions* decreasing continually, is not always finite, but sometimes infinite, that is, no limit can be assigned but what may be exceeded by the sum of a certain number of the terms of the series. This is the case of the series $\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6}$, &c. called the harmonic series, the sum of which (as has been said under the article PROGRESSION) exceeds any given number, and the analogy of this progression with the space comprehended between the Apollonian hyperbola and its asymptote, shews this. But the same may be shewn independently of the hyperbola from the nature of progressions. See *Jac. Bernoulli*, De Seriebus infinit.

The foundation of Mr. Bernoulli's demonstration is, that a number of terms, beginning from any part of the series, may be found, the sum of which shall always exceed unity, and consequently the number of terms of the series being supposed infinite, as many partial sums as we please, each exceeding unity, may thus be taken out of the series, which therefore may be continued till it exceed any given number.

But if the denominators of this harmonic series, $\frac{1}{1}, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}$, &c. be squared, that is, if we form the series $\frac{1}{1}, \frac{1}{4}, \frac{1}{9}$, &c. the common numerator of which is 1, and the denominators of which are the squares of the natural numbers 1, 2, 3, 4, &c. the sum of this series of *fractions* will not only be limited, as was said under the head PROGRESSION, *Suppl.* but this sum will be precisely equal to the sixth part of the number, which expresses the ratio of the square of the circumference of a circle to the square of its diameter. That is, if the circumference be 3.14159, &c. and the diameter 1, then will $\frac{1}{1} + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} + \frac{1}{25} +$, &c. $= \frac{\overline{3.14159, \&c.}^2}{6}$. This proposition was first discovered by Mr. Euler, and his investigation may be seen in the Acta Petropolit. vol. vii. Mr. Mac Laurin[a] has since observed, that this may easily be deduced from his Fluxions, art. 822. — [[a] Philos. Transf. N°. 469.]

It would require a treatise to enumerate the various kinds of series's of *fractions* which may be summed. Sometimes the sum or limit of the infinite series cannot be assigned, either because it is infinite, as in the harmonic series $\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4}$, &c. or although this sum be finite, as in the series $\frac{1}{1} + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} +$, &c. yet its sum cannot be assigned in finite terms, or by the quadrature of the circle, or hyperbola, which was the case of this series before Mr. Euler's discovery; but yet the sum of any given number of the terms of the series may be expeditiously found, and the whole sum may be assigned by approximation, independently of the circle. See *Stirling*, Method. Different. and *De Moivre*, Miscel. Anal.

Besides the series's of *fractions*, the sums of which converge to a certain quantity, there sometimes occur series's of *fractions*, which converge by a continual multiplication. Of this kind is the series found by Dr. Wallis[a], for the quadrature of the circle, which he expresses thus,

$$\square = \frac{3\times3\times5\times5\times7\times7\times9\times 9\times \&c.}{2\times4\times4\times6\times6\times8\times8\times10\times \&c.}$$ where $\square$ signifies the ratio of the square of the diameter to the area of the circle. Hence the denominator of this *fraction*, continued *ad infinitum*, is to its numerator as the circle is to the square of its diameter. It may be observed, that this series is equivalent to, $\frac{3\times3}{8}\times\frac{5\times5}{24}\times\frac{7\times7}{48}\times$, &c. or to $\frac{3^2}{3^2-1}\times\frac{5^2}{5^2-1}\times\frac{7^2}{7^2-1}\times$, &c. that is, the product of the squares of all the odd

odd numbers 3, 5, 7, 9, &c. is to the product of the same squares severally diminished by unity, as the square of the diameter is to the area of the circle [b].—[[a] Arithmet. infinit. prop. cxci. Oper. vol. i. p. 469. [b] Id. Oper. vol. ii. p. 819.]

These products of *fractions*, and the like quantities arising from the continued multiplication of certain factors, have been particularly considered by Mr. Euler, in his Analysis infinit. vol. I. chap. xv. p. 221, *seq.*

Continued FRACTION is used for a *fraction* the denominator of which is a whole number with a *fraction*, the denominator of which is again a whole number and a *fraction*, and so on, whether this affection be continued *ad infinitum*, or whether the series breaks off after a finite number of terms. Thus,

$\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}+$, &c. or $\frac{1}{2}+\frac{2}{3}+\frac{3}{4}+\frac{4}{5}+$, &c. are *continued fractions*.

If we make use of letters instead of numbers, we shall have general expressions of these *fractions*, thus,

$$a+\frac{1}{b}+\frac{1}{c}+\frac{1}{d}+\frac{1}{e}+\frac{1}{f}+, \&c.$$

and

$$a+\frac{\alpha}{b}+\frac{\beta}{c}+\frac{\gamma}{d}+\frac{\delta}{e}+\frac{\varepsilon}{f}+, \&c.$$

The reduction of these *continued fractions* to those of a common form, is not difficult by the usual rules of arithmetic and algebra. Thus, to give an example, which may at the same time shew the use of these *continued fractions*, suppose the *continued fraction*

$$3+\frac{1}{7}+\frac{1}{15}+\frac{1}{1}+\frac{1}{292}+\frac{1}{1}+\frac{1}{1}+, \&c.$$

which expresses the circumference of a circle, when the diameter is one; if we stop at $\frac{1}{7}$, we shall have $3+\frac{1}{7}=\frac{21+1}{7}=\frac{22}{7}$. If we stop at $\frac{1}{15}$, we shall have

$$3+\frac{1}{7}+\frac{1}{15}=3+\frac{1}{\frac{106}{15}}=3+\frac{15}{106}=\frac{318+15}{106}=\frac{333}{106}$$

But if we stop at $\frac{1}{1}$, which is convenient on account of the small *fraction* $\frac{1}{292}$, added to the last denominator 1, we shall then find, $3+\frac{1}{7}+\frac{1}{15}+\frac{1}{1}=\frac{355}{113}$. The first of the reductions gives the proportion of Archimedes, and the last that of Adrian Metius.

But as beginning at the last denominator of the *continued fraction* makes the computation somewhat tedious, shorter methods have been contrived for the reduction of these *fractions*, and for a continued approximation to their true value. And Mr. Cotes's method for the reduction of ratios to smaller terms, may be here applied. (See the article RATIO, *Suppl.*) For it is to be observed, that when the numerators of the *continued fraction* are each units, the denominators will be the quotients arising from the continued divisions in Mr. Cotes's method; or in the common, for reducing *fractions* to a lower denomination, which is in effect the same as Euclid's method for finding the greatest common measure of two magnitudes, lib. x. prop. 3.

But a detail of these things would lead us too far, we therefore refer the reader for a farther account of these *continued fractions* to Dr. *Wallis*'s Arithmet. infinit. prop. 191. oper. vol. i. p. 469, *seq.* *Huygens*, Descript. automat. planetar. in oper. posthum. p. 173, *seq.* edit. Amstelod. 1728. and particularly to Mr. *Euler*'s Analys. infinit. vol. I. cap. xviii. p. 295, *seq.* who has shewn the use and application of this doctrine in many instances.

Lord Brouncker seems to have been the first who considered *continued fractions*, or at least who first applied them to the quadrature of curves. The hint seems useful, but has been pretty much neglected, excepting in approximations to *fractions* or ratios expressed in great numbers. See the article RATIO, *Suppl.* His series for the quadrature of the circle, is

$$\square=1-\frac{1}{2}\frac{9}{2}\frac{25}{2}\frac{49}{2}\frac{81}{2}, \&c.$$

in his and Dr. Wallis's notation, which amounts to the same thing as

$$1+\frac{1}{2}+\frac{9}{2}+\frac{25}{2}+, \&c.$$

in the notation of Huygens and Euler.

The symbol $\square$ denotes, as before, the ratio of the square of the diameter to the area of the circle.

Repetend of a decimal FRACTION, See the article REPETEND, *Append.*

FRAMBOISE, a name used by some for the *rubus*, or blackberry-bush. See the article RUBUS, *Suppl.*

FRANK *(Cycl.)* — FRANK, among farmers, denotes a place to feed a boar in. Dict. Rust. in voc.

FRAY, among sportsmen. A deer is said to *fray* her head when she rubs in against a tree to renew it, or cause the pills of her new horns to come off.

FREAM, among farmers, arable or ploughed land worn out of heart, and laid fallow till it recover.

FREAM, among sportsmen, a term used for the noise of a boar in rutting time. Dict. Rust. in voc.

FRET, in music, is used for the stops used on some instruments, especially bass viols and lutes: it consists of strings tied round the neck of the instrument at such distances, within which such and such notes are to be found. These strings or *frets* are sometimes, yet seldom, put on the bass violin for learners, and taken off again when they can find the notes without them. On lutes and viols they always remain. *Grassin.* Mus. Dict. in voc.

FRESCO *(Cycl.)* — The brushes and pencils for this work ought to be long and soft, otherwise they will rake and raise the painting. The colours should be full, and flowing from the brush; and the design perfect: for, in this work, you cannot alter or add upon any colour.

FRIAR's *cowl*, in botany, a name by which some call the *arisarum* of botanical authors. See the article ARISARUM, *Suppl.*

FRICTION *(Cycl.)* — It is hardly possible to give general and exact rules concerning *friction*, since it depends upon the structure of bodies, the form of their prominent parts and cavities, and upon their rigidity, their elasticity, their coherence, and other circumstances. Some authors have made *friction* upon a horizontal plane equal to one third of the weight; but others have found that it was only one fourth of it, and sometimes only $\frac{1}{6}$ or $\frac{1}{7}$ of it. Of late, authors have told us, that *friction* depends not on the surface of the body, but its weight only; but neither is this found to be accurately true. In lesser velocities, the *friction* is nearly in the same ratio as the velocities; but in greater velocities the *friction* increases in higher proportion, whether the bodies are dry or oiled.

It being of great importance to diminish this *friction*, several contrivances have been invented for that purpose. In wheel-carriages, the *friction* is transferred from the circumference of the wheel (where it would act if the wheel did not turn round) to the circumference of the axis; and, consequently, is diminished in the proportion of the radius of the axis to the radius of the wheel. In these, therefore, the *friction* is always diminished by diminishing the diameter of the axis, or by increasing the diameter of the wheel. The *friction* is likewise diminished by making the axis of an engine to rest upon the circumferences of wheels that turn round with it, instead of resting in fixed grooves that rub upon it; for, by this contrivance, the *friction* is transferred from the circumference of those wheels to their pivots; and the *friction* may be still diminished farther, by making the axles of those wheels rest upon other *friction*-wheels that turn round with them.

Dr. Desaguliers has treated fully of the *friction* of engines, carriages, &c. See his Course of Experim. Philos. vol. i. p. 133 to 138. and p. 182 to 254. see also p. 458 to 460.

FRIGERATORY, among builders, denotes a place designed to keep things cool in summer. Build. Dict. in voc.

FRILL, in falconry. When a hawk trembles or shivers, they say she *frills*. Dict. Rust. in voc.

FRINGE-*tree*, the English name of a genus of plants called by botanical authors *chionanthus*. See the article CHIONANTHUS, *Append.*

FRINGILLA, in zoology, the name of a bird, known in English by the name of the chaffinch, and called *spina* by the antient naturalists.

The same word is also sometimes used as the name of the brambling, a bird more frequently known by the name of the *montifringilla*, and called *orospina* by the old authors. See the article MONTIFRINGILLA, *Suppl.*

FRITTILLARIA *crassa*, in botany, a name sometimes given to the *asclepias*, or swallow-wort. See the article ASCLEPIAS, *Suppl.*

FROG, among farriers, the same with frush. See the article FRUSH, *Append.*

FRONTALIS *verus musculus*, in anatomy, a name given by Douglas, in his Myography, to one of the muscles of the face, called also by himself, and, since his time, by Albinus, *corrugator supercilii*. See the article CORRUGATOR, *Suppl.*

FROUNCE, a disease in horses, when small warts or pimples arise in the midst of the palate, which are very soft and sore, and sometimes breed in the lips and tongue.

This

This diſorder is occaſioned many ways; ſometimes by eating wet hay, whereon rats or other vermin have piſt; by drawing frozen duſt into his mouth among the graſs, &c.

As to the method of treatment, it conſiſts in letting him blood in the two largeſt veins under the tongue, and waſhing the ſore with vinegar and ſalt, or with ale and ſalt, till they bleed. Dict. Ruſt. in voc. *Camery*.

FROUNCE, in falconry, a diſeaſe incident to hawks, ariſing from moiſt and cold humours falling down to the palate and root of the tongue; by which means they loſe their appetite and cannot cloſe their clap. Waſhing with alum-water, lemon-juice, &c. is held good for it.

FROWEY, a term uſed by workmen for timber, which is evenly tempered, and works freely without tearing. Build. Dict. in voc.

FRUCTIFICATION *(Suppl.)* — The organs of *fructification* in plants are the *pointal*, generally contained in the middle of flowers; and the *threads*, which ſurround it, furniſhed at their extremities with little *heads*; theſe the botaniſts term, the firſt the *piſtillum*, the ſecond the *ſtamina*, and the third, or heads of the ſtamina, the *antheræ*, or *apices*. See the article FLOWER, *Suppl.*

The apices contain the *farina fœcundans*, a fine ſubtile matter analogous to the *ſemen maſculinum* in animals; the ſtamina ſerve only for their ſupport, and to convey nutrition to them; and the *piſtillum* is the part deſtined to receive this *farina*, and convey it to the ſeeds.

It is upon theſe principles that the excellent Linnæus has founded his ſyſtem of the vegetable world, and formed his claſſes. This author's work has been received by the learned world in all nations with the reſpect it merits; but has been too generally cenſured among the ſlighter proficients in botanical reſearches, as abſtruſe, difficult, and unintelligible. The viewing theſe things in a new light, and the neceſſity of making new words to convey new ideas, has indeed given this great attempt ſomething of the face of an abſtruſe piece; but premiſing a few general hints, it may not be difficult to vindicate the author from the heavy charges which have been laid againſt him, and give the Engliſh reader a clear and perfect view of his work.

From the ſtructure and uſe of the *piſtillum*, *ſtamina*, and *apices*, it is eaſy to conceive that the former muſt be accounted the *female*, and the two latter the *male parts* of flowers. This is the great baſis of his ſyſtem. To expreſs the different combinations of theſe in the different claſſes of plants, by formal deſcriptions to each, had been tedious, and an over burthen to the memory: to avoid this, he has excellently contrived the compriſing that deſcription, or general character, in one word. It is eaſy to conceive there could be no word already in uſe, that could expreſs what had never before been thought of; he was therefore neceſſitated to invent new ones for this purpoſe. He has ventured therefore to form twenty-four ſuch, for his claſſes, which are of that number, and has taken them from that language which all the learned have ever uſed on the ſame occaſion, the Greek; and this with the leaſt oſtentation or ſhew of learning imaginable: in ſhort, to underſtand all theſe, there is no need of knowing more Greek than that ἀνὴρ ſignifies a man, or any thing male; and γυνὴ, a woman, or female; that δυνάμις is power or efficacy; ἀδελφὸς, a brother; and thence ἀδελφὰι, brotherhoods or communities; that σὺν is together; γένεσις, generation or origin; and οἶκος, a houſe, or habitation; that πολὺς ſignifies many; γάμος, marriage; and κρυπτὸς, hidden, or concealed: and that the numbers one, two, three, four, five, ſix, ſeven, eight, nine, ten, twelve, and twenty, or their derivatives, once, twice, &c. are expreſſed by the Greek words μόνος, δὶς, τρὶς, τέτρα, πέντε, ἕξ, ἑπτὰ, ὀκτὼ, ἐννέα, δεκὰς, δώδεκα, εἴκοσι: there needs, I ſay, no more knowledge of Greek than this, to underſtand perfectly the meaning of all the terms this author, to avoid tedious deſcriptions, has uſed as the characters of his claſſes. To begin with certainty and regularity;

He firſt divides the whole vegetable world into ſuch ſpecies as have their flowers viſible and obvious to the eyes, and ſuch as have them inviſible, or at the utmoſt ſcarce diſcernible.

Thoſe which have them viſible he then divides again into ſuch as have the *ſtamina*, *apices*, and *piſtillum*, that is the male and female parts of fructification in the ſame flower: Theſe he for that reaſon calls *hermaphrodite* flowers.

And ſuch as have the male and female parts of *fructification*, that is the *apices* and *piſtillum*, either in different flowers upon the ſame ſtalk, or upon different plants of the ſame ſpecies: theſe he calls the diſtinct male and female flowers.

Thoſe which have the different organs of *fructification* lodged in the ſame flower, he again divides into ſuch as have the ſtamina in no part growing together, or cohering to one another: and ſuch as have them either growing together or cohering together mutually in ſome part, either with one another, or with the *piſtillum*.

Thoſe which have them in no part cohering either with the *piſtillum* or with one another, he again ſubdivides into ſuch as obſerve no exact or accurate proportion of length one among another; and ſuch as have ever two of the ſtamina ſhorter than the reſt.

From theſe general diviſions he deſcends to his particular claſſes, of which he eſtabliſhes twenty-four.

The firſt thirteen are of the plants which have *hermaphrodite* flowers, with the organs of *fructification* disjunct, no where cohering with one another, and obſerving no exact proportion in length.

The firſt is the *monandria:* the word is derived from the Greek μόνος and ἀνὴρ, one male part, and ſignifies a flower that has only one ſuch. This claſs accordingly comprehends thoſe plants which have an *hermaphrodite* flower, and in it only one ſingle *ſtamen:* of this claſs are the *blite*, *turmeric*, &c.

The ſecond is of the *diandria*; the word, derived from the ſame ἀνὴρ and δὶς, twice, and ſignifying a flower that has two male parts, comprehends all thoſe plants which have *hermaphrodite* flowers with two *ſtamina* in each: of this claſs are the *jaſmine*, *phillerea*, *olive*, *roſemary*, *butterwort*, &c.

The third is of the *triandria*; the word, derived from the ſame ἀνὴρ and τρὶς, thrice, ſignifies a flower that has three male parts in it, and comprehends thoſe plants which have *hermaphrodite* flowers with three *ſtamina* in each: of this claſs are the *valerian*, *ſaffron*, many of the *graſſes*, &c.

The fourth is of the *tetrandria*; the word, derived from the ſame ἀνὴρ and τέτρας, four times, ſignifies a flower that has four male parts, and accordingly comprehends thoſe plants which have *hermaphrodite* flowers with four *ſtamina* in each; of this claſs are the *teaſel*, *madder*, *plantain*, &c.

The fift his of the *pentandria*; the word derived, from the ſame ἀνὴρ and πέντε, five, ſignifies a flower with five male parts, and accordingly this claſs comprehends thoſe plants which have *hermaphrodite* flowers with five *ſtamina* in each; of this claſs are the *primroſe*, *willow-herb*, *bind-weed*, &c.

The ſixth is of the *hexandria*; the word, derived from the ſame ἀνὴρ and ἕξ, ſignifies a flower that has ſix male parts, and accordingly comprehends thoſe plants which have *hermaphrodite* flowers with ſix *ſtamina* in each; theſe *ſtamina*, the author obſerves, are either all equal in length, or alternately one ſhorter than another: of this claſs are *garlick*, *hyacinths*, *meadow-ſaffron*, &c.

The ſeventh is of the *heptandria*; the word, derived from the ſame ἀνὴρ and ἑπτὰ, ſeven, ſignifies a flower with ſeven male parts, and comprehends thoſe plants which have *hermaphrodite* flowers with ſeven *ſtamina* in each: of this claſs are the *horſe-cheſnut* and *trientalis*.

The eighth is of the *octandria*; the word, derived from the ſame ἀνὴρ and ὀκτὼ, eight, ſignifies a flower with eight male parts, and comprehends thoſe plants which have *hermaphrodite* flowers with eight *ſtamina* in each: of this claſs are the *maple*, *rue*, *heath*, &c.

The ninth claſs is of the *enneandria*; the word, derived from the ſame ἀνὴρ and ἐννέα, nine, ſignifies a flower that has nine male parts, and comprehends thoſe plants which have *hermaphrodite* flowers with nine *ſtamina* in each: of this claſs are the *bay*, *rhubarb*, &c.

The tenth claſs is of the *decandria*; the word, derived from the ſame ἀνὴρ and δεκὰς, ten, ſignifies a flower which has ten male parts, and comprehends all thoſe plants which have *hermaphrodite* flowers with ten *ſtamina* in each: of this claſs are the *Judas-tree*, *baſtard-dittany*, *caltrops*, &c.

The eleventh is of the *dodecandria*; the word, derived from the ſame ἀνὴρ and δώδεκα, twelve, ſignifies a flower which has twelve male parts in it, and comprehends thoſe plants which have *hermaphrodite* flowers with twelve *ſtamina* in each: of this claſs are the *aſarabacca*, *agrimony*, &c.

The twelfth is of the *icoſandria*; the word, derived from the ſame ἀνὴρ and εἴκοσι, twenty, ſignifies ſtrictly a flower with twenty male parts in it; the author however does not underſtand it in that ſtrict ſenſe, but uſing it as we frequently do words expreſſing large quantities, as indefinite and in an indeterminate ſenſe, defines it to mean only a larger number of *ſtamina* than are expreſſed under any other of the diſtinctions; and comprehends under it, in this claſs, all thoſe plants which have *hermaphrodite* flowers and more than twelve *ſtamina* in each; thoſe *ſtamina* alſo growing to the inner ſide of the cup of the flower, not to the receptacle of the future ſeeds: of this claſs is the *torch-thiſtle*, the *myrtle*, *ſtorax*, the *almond*, &c.

The thirteenth is of the *polyandria*; the word, derived from the ſame ἀνὴρ and πολὺς, many, ſignifies, in an exact ſenſe, no other than what he makes the *icoſandria*, the title of the laſt claſs, expreſs: theſe are, perhaps, the only two words in which his expreſſion is deficient, the name he has given the claſſes not at all importing their particular difference from one another: this, however, he has vey acurately done in the character which follows them; and comprehends under this claſs thoſe plants which have *hermaphrodite* flowers with more than twelve *ſtamina* in each, but which grow in this to the receptacle of the future ſeed, not as in the other claſs to the inner ſide of the cup of the flower; of this claſs are the *water-lilly*, *poppy*, *celandine*, &c.

Theſe are the claſſes this accurate diſtinguiſher has eſtabliſhed among the *hermaphrodite* flowers, whoſe *ſtamina* have no regular

gular proportion of length, in regard to one another. To these he next subjoins two classes of such of them as have ever two of their *stamina* shorter than the rest.

The first of these (the fourteenth class of the general order) is of the *didynamia:* the word derived from the before-mentioned δὶς and δυνάμις, power or efficacy, signifies with him such flowers as have two of their male parts of more efficacy than the rest; and in this class he accordingly comprehends all those plants which have *hermaphrodite* flowers, two of whose *stamina* are longer, and of greater efficacy in the great work of fecundating the seeds, than the rest: of this class are the *thyme*, *lavender*, *basil*, &c.

The second of these (the fifteenth class in the general order) is of the *tetradynamia:* the word derived from the before-mentioned τέτρας and δυνάμις, signifies a flower with four of its male parts of more efficacy than the rest; and in this class he comprehends the plants with *hermaphrodite* flowers, four of the *stamina* of which are longer than the rest: of this class are the *scurvy-grass*, *radish*, *mustard*, &c.

From these he proceeds to those *hermaphrodite* flowers whose *stamina* cohere, either mutually among one another, in different manners; or with the *pistillum* of the flower: these co alitions of the *stamina* he calls brotherhoods, or communities, and according to the different state of these, and their conjunctions with the *pistillum*, he establishes five classes of them.

The first of these (the sixteenth in the general order) is of the *monadelphia:* the word derived from the before-mentioned μόνος, single, and ἀδελφὰ, brotherhoods, or communities, signifies with him a flower whose *stamina*, by means of the filaments running in among one another, are all formed into one body; and under this class he comprehends those plants with *hermaphrodite* flowers, whose *stamina*, or male parts, are all bound together in one body: of this class are the *crane's-bill*, *mallow*, &c.

The second of these (the seventeenth class in the general order) is of the *diadelphia:* the word derived from the before-mentioned δὶς and ἀδελφὰ, signifies with him a flower whose *stamina* are, by the conjunction of their filaments, formed into two bodies; and under this class he comprehends those plants which have *hermaphrodite* flowers, the *stamina* of which are so clustered together into two bodies: of this are the *fumitory*, *milkwort*, *broom*, &c.

The third of these (the eighteenth in the general order) is of the *polyadelphia:* the word derived from the before-mentioned πολὺς and ἀδελφὰ, signifies with him a flower whose male parts are clustered into three or more separate bodies; and in this he comprehends those plants with *hermaphrodite* flowers, whose *stamina*, by the conjunction of their filaments, are formed into three or more clusters: of this class are the *orange*, *St. John's wort*, &c.

The fourth of these classes (the nineteenth in the general order) is of the *syngenesia:* the word derived from σὺν, together, and γένεσις, generation, origin, or formation, signifies with him such flowers as have their male parts naturally formed into a single regular congeries; and accordingly he comprehends under this class such plants as have *hermaphrodite* flowers, the *stamina* of which, by the junction of their *apices*, are formed into a single, regular, cylindric body: of this class are the *lettuce*, *succory*, *hawkweed*, &c.

The fifth of these classes (the twentieth in the general order) is of the *gynandria:* the word derived from γυνὴ, a woman, or female, and ἀνὴρ, male, signifies with this author a conjunction of the male and female parts of a flower at their origin; and he accordingly comprehends under this class those plants which have *hermaphrodite* flowers, the *stamina*, or male parts of which grow to the *pistillum*, or female part of the flower, and not to the receptacle of the seeds: of this class are the *barrenwort*, *passion-flower*, *birthwort*, &c.

Next after these he ranges those plants which have flowers not *hermaphrodite*, but regularly and distinctly male and female, as the sexes in animals are disposed; and after these such plants as have flowers irregularly of one, or the other, or sometimes of both sexes:

Of these he establishes only three classes.

The first of these (the twenty-first class in the general order) is of the *monoecia:* the word derived from the before-mentioned μόνος, and οἶκος, a habitation, signifies with this author such plants as have their distinct flowers on the same individual; and he comprehends accordingly under it those plants which have the male and female flowers distinct in themselves, but placed on the same plant, or the different stalks from the same root: of this class are the *alder*, *mulberry*, *amaranth*, *arrowhead*, &c.

The second of these (the twenty-second class in the general order) is of the *dioecia:* the word derived from the same οἶκος and δὶς, signifies with him plants which have their male and female flowers, not on the same individual; and accordingly comprehends under it such plants as have distinct male and female flowers, on different plants of the same species, either of which, the male and female plants, as they are hence called, might have arisen from the same seed: of this class are the *willow*, *misletoe*, *hemp*, and *spinach*, &c.

The third of these (the twenty-third in the general method) is of the *polygamia:* the word derived from πολὺς, many, and γάμος, marriage, signifies with this author plants which have a diversity of combinations and many ways of *fructification*, in the same species; and accordingly hs comprehends under this class those plants which have, in the same species, some flowers male, others female, each distinct and perfect in its kind; and others mixed or *hermaphrodite*, with the male and female organs of *fructification* both in each: of this class are *pellitory of the wall*, *orrache*, the *ash*, &c.

After all these he places those plants whose flowers are either absolutely invisible, or scarce discernible by the eye: of these he makes only one, his twenty-fourth and last class, the *cryptogamia:* the word derived from κρυπτὸς, hidden, or concealed, and the before-mentioned γάμος, or marriage, signifies a set of plants, in which the *fructification* is concealed: and under this last class he comprehends those plants which either flower, as is generally supposed, within the fruit, or have the organs of their *fructification* so mingled as to escape our observation: of this class are the *ferns*, *mosses*, *liverworts*, and *mushrooms*.

These are the classes into which this author has regularly and certainly reduced the whole vegetable world; the characters of which are so expressive, and the parts they are founded upon so fixed and invariable in their nature and office, that there seems no reason hereafter to perplex the world with any new system.

As the classes are here all taken from the number, site and disposition of the male parts of the flower; so the orders which make their subdistinctions are, by this author, deduced from the differences of the female parts or *pistillum*; and as that is single, double, triple, and so on, they are on the same principles named *monogynia*, *digynia*, *trigynia*, &c.

It were to be wished indeed that the characters of the different genera of these classes were as perfect and accurate as the classes themselves: this, however was more than the work of one man; the author has fixed the general distinction, and led the way; and it is easy now for a much less genius to follow him.

FROWEY, a term used by workmen for timber which is evenly tempered all the way, and works freely without tearing. Build. Dict. in voc.

FRUIT *(Suppl.)*—*Ripening of* FRUIT. For the method of forwarding this operation of nature, see the article RIPENING, *Append.*

FRUSH, or FROG, among farriers, that part of a horse's foot, which is placed from the middle of the sole towards the heel, upon both sides: it is more soft and higher raised than the rest of the sole. Dict. Rust. in voc.

FRUSTUM *(Cycl.)* — FRUSTUM *of a cone.* The cylinder generated by the revolution of the rectangle EBCF (fig. I.) about one of its sides EB, which is the height of the *frustum* of a cone, the other side BC being the radius of its greatest base, is to the *frustum* generated by the revolution of the trapezium EBCH, as the square of BC is to the rectangle contained under BC and EH, added to one third part of the square of the difference of these lines. *Archimedes.*

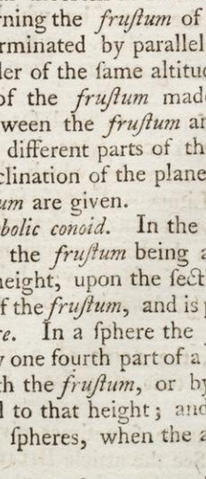


Fig. I.

We have a general theorem in Mr. Mac Laurin's Treatise of Fluxions, concerning the *frustum* of a sphere, cone, spheroid, or conoid, terminated by parallel planes, when compared with a cylinder of the same altitude, on a base equal to the middle section of the *frustum* made by a parallel plane. The difference between the *frustum* and the cylinder is always the same in different parts of the same, or of similar solids, when the inclination of the planes to the axis, and the altitude of the *frustum* are given.

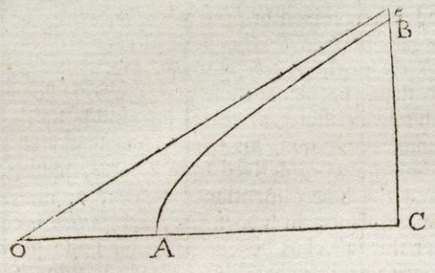
FRUSTUM *of a parabolic conoid.* In the parabolic conoid this difference vanishes, the *frustum* being always equal to a cylinder of the same height, upon the section of the conoid that bisects the altitude of the *frustum*, and is parallel to its bases.

FRUSTUM *of a sphere.* In a sphere the *frustum* is always less than the cylinder by one fourth part of a right angled cone, of the same height with the *frustum*, or by one half of a sphere of a diameter equal to that height; and this difference is always the same in all spheres, when the altitude of the *frustum* is given.

In the cone, the *frustum* always exceeds the cylinder by one fourth part of the content of a similar cone that has the same height with the *frustum*.

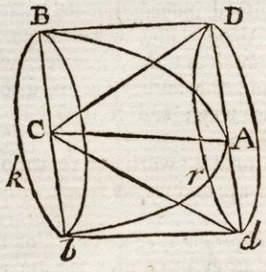
FRUSTUM *of an hyperbolic conoid.* In the hyperbolic conoid this excess is the same as in the cone generated by the triangle OC*e*, (fig. II.) formed by the axis OC, the asymptote O*e*, and the perpendicular C*e*, the altitude of the *frustum* and the inclination of the axis to their bases being the same in both.

Fig. II.



FRUSTUM *of a spheroid.* In the spheroid AB*kb*, (fig. III.) the cylinder exceeds the *frustum*; and the difference between them is the same as in the cone CD*rd*, the plane D*rd*, or B*kb*, being supposed parallel to those which terminate the *frustum.* In different inclinations of those planes, when the altitude of the *frustum* is given, that difference is reciprocally as the cube of the diameter B*b*, which is the conjugate of CA, the axis of the *frustum.* But if the altitude of the *frustum* be also varied so as to be reciprocally proportional to the diameter B*b*, then the difference between the *frustum* and cylinder will be always of the same magnitude in the same spheroid or conoid.

Fig. III.



When the inclination of the axis of the solid to the planes that terminate the *frustum* is given, the difference between the *frustum* and cylinder, in the same, or in similar bodies, is as the cube of their common altitude. *Mac Laurin*'s Fluxions, Introd. p. 24, 25.

These propositions concerning *frustums* are of use in gauging. See the article GAUGING, *Suppl.*

FUMAGE, a term used in some parts of the kingdom for dung, or manuring with dung.

FUMER, in zoology, a name given to the pole-cat. See the article PUTORIUS, *Suppl.*

FUMET, among sportsmen, a term used for the ordure or dung of harts, otherwise called fewmets.

FUNCTION *(Cycl.)* — The term *function* is used in algebra, for an analytical expression any way compounded of a variable quantity, and of numbers, or constant quantities. Therefore every analytical expression, in which, besides a variable quantity x, there are constant quantities, is a *function* of x. Thus $a+3x$, $ax-4xx$, $ax+b\sqrt{aa-xx}$, c^x, &c. are *functions* of x.

The difference of *functions* consists in the manner in which they are compounded; and depends, therefore, upon the operations by which quantities may be compounded and mixed. These operations are, addition, subtraction, multiplication, and division, the raising to powers, and extraction of roots, to which the resolution of equations ought to be referred. Beside these operations, which are called algebraical, there are other transcendental ones, such as exponential, logarithmic, and many others arising from the inverse method of fluxions.

Functions may arise from the most simple and analytical operations: thus we have the multiple *functions* $2z$, $3z$, $\frac{1}{2}z$, az, &c. and the powers of z, as z^2, z^3, $z^{\frac{1}{2}}$, z^{-1}, &c. are called *functions.*

Functions are divided into *algebraical* and *transcendental: algebraical* or *algebraic functions*, are those formed by algebraic operations only; such are those above specified, except c^x, which belongs to the following species.

Transcendental functions are those formed by transcendental operations: such are exponential quantities or powers, the exponents of which are variable quantities; whereas in algebraic *functions* the exponents are always constant quantities.

It is to be observed as to *transcendental functions*, that those *functions* only of a variable quantity are to be deemed transcendental, which not only enter the composition with, but also affect the variable quantity: thus if z signifies a circular arc, or a logarithm, then will ca^z, and the like expressions, be *transcendental functions* of z. But if the transcendental operation appertains only to constant quantities, the *function* is no more than algebraic: thus if c denote the circumference of a circle, the radius of which is $=1$, c will be a transcendental quantity, and yet the expressions $c+z$, cz^2, $4z^c$, are but algebraic *functions* of z. Some indeed have doubted whether z^c ought to be ranked among algebraic *functions*, or not; but the doubt is of small weight. And some choose to call the powers of z, the exponents of which are irrational numbers, *interscendent functions:* thus $z^{\sqrt{2}}$ is an interscendent *function* of z.

On the subject of *functions*, their divisions, transformations, explication by infinite series, &c. Mr. Euler should be consulted, who has treated this matter very fully in the first chapter of his Analys. infinitorum.

FURCA & *flagellum*, in our old writers, denotes the meanest of all servile tenures, when the bondman was at the disposal of his lord for life and limb. — *Ipse tenet in villenagio ad* furcam & flagellum *de domino suo*, &c.

FURROW, among gardeners, denotes a ridge or swelling on the side of a tree, stalk, fruit.

FURROW is also used for the deep trench left between ridges, to drain off the superfluous moisture.

FURZE, in botany, the English name of a genus of plants called by authors *genista spartium.* See the article GENISTA *spartium, Suppl.*

FUSTIC-*tree*, in botany. See the article FUSTUC, *Suppl.*

G.

GABLOCKS, the name by which the artificial spurs of game cocks are called. See the article COCK, *Suppl.*

GADDS, among miners. See the article DIGGING, *Suppl.*

GAFFS, a name sometimes used for the gablocks of cocks. See the article GABLOCK, *supra.*

GALANGAL, the name by which the root of a genus of plants called by Linnæus *Kæmpferia*, is commonly known. See the article KÆMPFERIA, *Append.*

GALANTHUS, in the Linnæan system of botany, the name of a distinct genus of plants, which Tournefort makes only a species of *Narcisso-leucoium.* See the article NARCISSO-*leucoium, Suppl.*

GALE, in botany, the name of a genus of plants described by Linnæus under that of *myrica.* See the article MYRICA, *Append.*

GALL-*sickness*, a name sometimes given to bilious and intermitting fevers. See the article BILIOUS *fever, Append.*

GALLY, on ship-board, a place in the cook-room, where the grates are put up, fires lighted, and the victuals boiled or roasted. *Blanckley*, Nav. Expositor, p. 62.

GAMMER-*lamb.* See the article GIMMER-*lamb, Append.*

GAMMONING, on ship-board, are several turns of rope taken round the bow-sprit, and reeved through holes in the knees of the head, for the greater security of the bow-sprit. *Blanckley*, Nav. Exp. p. 62.

GANDER, the popular name for a male goose: one of these will serve five geese.

GAR-*fish*, in ichthyology, a name used in several parts of the kingdom for the *esox.* See the article ESOX, *Suppl.*

GARGET, a disease of cattle, consisting in a swelling of the throat and the neighbouring parts; to prevent which, bleeding in the spring is recommended.

GARGIL, a distemper in geese, which by stopping the head frequently proves mortal. Three or four cloves of garlick, beaten in a mortar with sweet butter, and made into little balls, and given the creature fasting, is the ordinary cure. Dict. Rust. in voc.

GARLICK *(Suppl.)* — *Wild*-GARLICK, a name by which some call a species of onion. See the article ONION, *Suppl.*

GASKETS, on ship-board, the small cords used for fastening sails to the yards when furled up. *Blanckley*, Nav. Exp. p. 63.

GAST-

GAST-*hound*. See the article HOUND, *Append.*

GATE, among ſportſmen, a term uſed for the footſteps of a hart. Dict. Ruſt. in voc.

GATTON-*tree*, a name ſometimes given to the cornel-tree. See the article CORNUS, *Suppl.*

GAULE, in botany, a name uſed by ſome writers for the *myrica*, or ſweet-willow. See the article MYRICA, *Append.*

GAZE-*hound*, or GAST-*hound*. See the article HOUND, *Append.*

GELDER-*roſe*, the term by which ſome call the *opulus*, or water-elder. See the article OPULUS, *Suppl.*

GENERATION *(Cycl.* and *Suppl.)* — The antients believed that males and females were equally concerned in the work of *generation*, and that the fœtus was formed in the womb by a mixture of the ſeminal juices of both ſexes; without pretending to know, or determine by any ſyſtem, the manner of nature's operation.

Modern philoſophers have thought that they ſaw farther than the antients, and have, at different times, adopted the two ſyſtems of *generation* mentioned in the *Cyclopædia* under this head.

But the late experiments of Monſ. de Buffon, and of Mr. Needham, if they do not eſtabliſh a new ſyſtem, ſeem at leaſt in a great meaſure to overturn the old ones.

Monſ. de Buffon has endeavoured to prove that the ova in women and quadrupeds are chimeras, and that the ſpermatic animalcule cannot be the fœtus. He could never find any ova which had detached themſelves from the ovary, and paſſed through the Fallopian tube into the matrix. But he diſcovered a glandular body on the female teſticle, which anatomiſts had miſtaken for one of theſe; which glandular body, at certain times, ſwelled, opened and diſcharged a liquor full of the ſame animalcules, which Lewenhoek took for living creatures in the ſemen of males. And Monſ. de Buffon adds that he found bodies perfectly ſimilar to theſe, not only in the ſemina of very different animals, but in the infuſions of plants, of grains, and in the juices of fleſh-meats, dreſſed and prepared by the fire ſo as to leave no creature living in them. From whence this ingenious gentleman concludes, that theſe pretended animalcules are not future animals of the ſpecies of the father: he does not even allow them to be true animals, but ſays they are ſomething of an intermediate nature between brute matter and animals; parts organized and animated, the aſſemblage of which forms the fœtus. See Lettres de Monſ. de Maupertuis, let. 17.

But the chief difficulty conſiſts in conceiving how the fœtus is formed from theſe elements. Monſ. de Buffon thinks that every part of the body in both ſexes furniſhes theſe organic moleculæ, the reſervoirs of which are the ſeminal liquors of both ſexes; that theſe liquors arrange and unite themſelves by attraction, in certain internal moulds, in a manner which that learned author has endeavoured to explain at large; but which will not ſeem ſuſceptible of any abridgment, to thoſe who would not chooſe to run the riſque of miſrepreſenting his ſentiments on ſo obſcure a ſubject; we therefore refer to the original, that is, to the Hiſtoire Naturelle, printed at Paris, 1749, where the ſubject of the *generation* of animals takes up the greateſt part of the ſecond volume.

Monſ. de Maupertuis's ſyſtem, in his Venus Phyſique, has a near reſemblance to that of Monſ. de Buffon, and tends equally to overturn the ſyſtems of the ova, and of the ſpermatic animalcules, which have prevailed among modern phyſiologiſts. The former of theſe gentlemen, to confirm his own and Mr. de Buffon's opinion, adds an account of a ſexdigitary family, as he calls it, at Berlin, many of which had a ſupernumerary finger or toe, and ſometimes both. He ſays that this ſexdigitiſm, or quality of having ſupernumerary fingers or toes, has been tranſmitted equally by the father and by the mother; that it was loſt by alliances with thoſe who had but the common number of fingers. He adds, that he does not believe that any one will aſcribe the continuation of ſexdigitiſm in a family, to chance; theſe ſupernumerary parts might have been accidental varieties at firſt, but if they be once eſtabliſhed by a ſufficient number of *generations*, where both ſexes have had them, they then become a foundation for a diſtinct ſpecies; and perhaps all the different ſpecies diſcernible in animals of the ſame kind, have been multiplied in this way. What we may obſerve in other animals gives ground for theſe ſuſpicions. See the Letter before cited.

GEODES, in natural hiſtory, a genus of cruſtated bodies formed into large and in great part empty caſes, incloſing a ſmall quantity of earthy, or arenaceous matter. See the article SIDEROCHITA. *Append.*

Of this genus are the following known ſpecies: 1. The cracked *geodes*, with ferrugineous brown and yellow cruſts. 2. The wrinkled *geodes*, with ferrugineous reddiſh-brown and gold-yellow cruſts. 3. The ſparkling *geodes*, with ferrugineous purpliſh and orange-coloured cruſts. 4. The long ſcabrous *geodes*, with a ſingle purpliſh cruſt. 5. The long *geodes*, with a ſingle blackiſh cruſt. *Hill*, Hiſt. Foſſ. p. 541.

GERMANDER-*tree*, in botany, the Engliſh name of a genus of plants known among authors by that of *teucrium*. See the article TEUCRIUM, *Suppl.*

GESSES, the ſame with *jeſſes*. See the article JESSES, *Append.*

GHERKINS. See the article GUERKINS, *Append.*

GIDDINESS, the popular name for the diſtemper called by phyſicians *vertigo*. See the article VERTIGO, *Cycl.*

Giddineſs in horſes is cured by a glyſter and blood-letting, to be repeated after two days moderate exerciſe. Dict. Ruſt. in voc.

GIGG *(Cycl.)* — GIGGS, among farriers, ſmall bladders or bliſters on the inſide of a horſe's lips. They muſt be laid open, and cleanſed with ſalt and vinegar, or alum-water. Dict. Ruſt. in voc.

GIGGE, in the manufacture of flax, denotes a hole made in the earth, where fire is made to dry the flax laid over it. Dict. Ruſt. in voc.

GILDER. See the article GUILDER, *Append.*

GILDING *(Cycl.* and *Suppl.)* - GILDING-*knife*, a ſlip of the hollow Spaniſh cane, cut up to a ſmooth and ſharp edge, with a good pen-knife: this cane-knife cuts the gold-leaf better than one of ſteel, as it is apt to ſtick to this laſt.

GILDING-*pallet*, a flat piece of wood, about three inches long and an inch broad, covered with a piece of fine woollen cloth.

By breathing upon this pallet, to moiſten the cloth a little, and then clapping it gently down upon the gold-leaf, this may be raiſed from the cuſhion, and conveyed to the work to be gilded.

GILL-*go-by-ground*, the name uſed by ſome writers for ground-ivy. See the article IVY, *Suppl.*

GILLIFLOWER, or JULY-*flower*, in botany, the Engliſh name given to ſeveral ſpecies of *caryophyllus*. See the article PINK, *Suppl.*

Queen's GILLIFLOWER, the name by which ſome call a diſtinct genus of plants, deſcribed by authors under that of *heſperis*. See the article HESPERIS, *Suppl.*

Stock GILLIFLOWERS, the name of another diſtinct genus of plants called by botanical writers *leucoium*. See the article LEUCOIUM, *Suppl.*

GIMMER-*lamb*, or GAMMER-*lamb*, a term uſed by country-people for a female or ewe lamb. Dict. Ruſt. in voc.

GINGER, the Engliſh name of a genus of plants called by authors *zinziber*. See the article ZINZIBER, *Suppl.*

GINGIDIUM, a name uſed by ſome botaniſts for a ſpecies of fennel. See the article FOENICULUM, *Suppl.*

GINSENG, in botany, the name given by the people of the Eaſt-Indies to the *panax* of botanical writers. See the article PANAX, *Append.*

GIRDLE *(Suppl.)* — GIRDLE-*wheel*, a ſmall ſpinning-wheel made for hanging to a woman's girdle, or apron-ſtring; ſo that ſhe may ſpin with it, though walking about. Dict. Ruſt. in voc.

GIRKIN, among gardeners, denotes a ſmall kind of cucumber, uſed for preſerving, about the end of October. Ruſt. Dict. in voc.

GIRT, among builders, the ſame with fillet. See the article FILLET, *Cycl.*

GIRTHS *of a ſaddle*, the ſtrong ſtraps, made of a canvas ſtuff called *girth*-web; which being buckled under the horſe's belly, ſerve to fix the ſaddle. Ruſt. Dict. in voc.

GLADDON, or GLADWIN, in botany, the name of a plant, otherwiſe called ſpurge-wort. Ruſt. Dict. in voc.

GLADE, in zoology. See the article GLEAD.

GLADE, in gardening, an open and light paſſage made through a wood, by lopping off the branches of trees. *Miller*, Gard. Dict. in voc.

GLADWIN, a name ſometimes uſed for the *iris*, or *flower de luce*. See the aricle IRIS, *Suppl.*

GLANDULOUS *roots*, among botaniſts, ſuch tuberoſe roots as are faſtened together in large numbers by ſmall fibres or threads. Ruſt. Dict. in voc.

GLASS-*wort*, is ſometimes uſed as the name of a genus of plants deſcribed by Linnæus under that of *ſalicornia*. See the article SALICORNIA, *Append.*

GLASSES, *chemical*, how cæmented, when cracked. See the article CÆMENT, *Append.*

GLASTONBURY-*thorn*, a name ſometimes given to the *meſpilus*, or medlar. See the article MEDLAR, *Suppl.*

GLAUBER's *ſalt*. See the article SAL *mirabile*, *Suppl.*

GLAZIER, an artificer who works or deals in glaſs.

GLEAD, or GLADE, a name uſed in the northern parts of the kingdom for the *milvus*, or kite. See the article KITE, *Append.*

GLEBA *alana*, a name by which ſome call the yellowiſh white *tripoli*. See the article TRIPOLI, *Cycl.* and *Suppl.*

GLEDE, in ornithology. See the article GLEAD, *Append.*

GLISTER. See the articles CLYSTER, *Cycl.* and ENEMA, *Suppl.*

GLOBE-*daiſy*, the Engliſh name of a genus of plants called by authors *globularia*. See the article GLOBULARIA, *Suppl.*

GLOBE-*crow-foot*, a name ſometimes given to the *helleborus*, or black hellebore. See the article HELLEBORUS, *Suppl.*

GLOBE-*amaranth*, the name of a genus of plants called by botanical writers *amarantboides*. See the article AMARANTHOIDES, *Suppl.*

GLOBE-*fish*, in ichthyology, the name by which many ſpecies of the *oſtracion* are called in Engliſh. See the article OSTRACION, *Suppl.*

GLOBE-*flower*, or GLOBE-*bottle*, names ſometimes given to the *cyanus*, or blue-bottle. See the article CYANUS, *Suppl.*

GLOBE-*thiſtle*, in botany, the Engliſh name of the *echinopus*. See the article ECHINOPUS, *Suppl.*

GLORIOSA, *ſuperb lilly*, in botany, the name of a diſtinct genus of plants, the characters of which are theſe: there is no cup: the flower conſiſts of ſix oblong, lanceolated, undulated, and every way long petals, reflex nearly to the baſe; the ſtamina are ſix ſubulated filaments, patulous and ſhorter than the petals of the flower; the antheræ are incumbent; the germen of the piſtil is globoſe; the ſtyle is filiform, inclined, and longer than the ſtamina; the ſtigma is ſimple and obtuſe; the fruit is an oval pellucid capſule, conſiſting of three valves, and containing three cells; the ſeeds are numerous, globoſe, and diſpoſed in a double ſeries. *Linnæi* Gen. Plant. p. 144.

Tournefort, in the Memoirs of the Academy of Sciences, has called this genus *methonica*. Id. ibid.

GLUE *(Suppl.)* — *Bees* GLUE, a name uſed by ſome for crude or rough wax. See the article WAX, *Suppl.*

GLUT, among falconers, denotes the ſlimy ſubſtance that lies in a hawk's pannel. Dict. Ruſt. in voc.

GLUTTON, *gulo*, in zoology, a name ſometimes given to the reddiſh brown *muſtela*, with the middle of its back black. See the article MUSTELA, *Suppl.*

GNOMONIC *(Cycl.)* — GNOMONIC, or GNOMONICAL *projection*, that which repreſents the circles of an hemiſphere, upon a plane touching it in the vertex, by lines or rays from the center of the hemiſphere to all the points of the circles to be projected.

In this projection all the great circles of the ſphere are projected into right lines. Any leſſer circle parallel to the plane of projection is projected into a circle. And any leſſer circle not parallel to the plane of projection, is projected into a conic ſection.

The *gnomonic projection* is alſo called the *horologiographic projection*, becauſe it is the foundation of dialling. In other reſpects it is not much uſed, becauſe the circles of the ſphere are projected into conic ſections, which are difficult to deſcribe. However this projection has its conveniencies in the ſolution of ſome problems of the ſphere, on account of the great circles being all projected into right lines.

Mr. Emerſon, known by an ingenious treatiſe upon Fluxions, has given the theory and practice of the *gnomonic projection*, in his Treatiſe on the Projection of the Sphere, Lond. 1749, octavo. See alſo Mr. *Murdoch*'s Newtoni Geneſis Curvarum per Umbras, p. 46, *ſeq.*

GOAT's *rue*, in botany, the Engliſh name of a genus of plants called by authors *galega*. See the article GALEGA, *Suppl.*

GOAT's *ſtones*, in botany, a name ſometimes given to the *orchis* of botanical writers. See the article ORCHIS, *Suppl.*

GODWIT, in zoology, the Engliſh name of the *ægocephalus*. See the article ÆGOCEPHALUS, *Suppl.*

GODWIT, in ornithology, the Engliſh name of a ſpecies of *tringa*. See the article TRINGA, *Suppl.*

GOLD *of pleaſure*, in botany, a term by which ſome call the *myagrum* of botanical authors. See the article MYAGRUM, *Suppl.*

GOLD-*finch*, in ornithology, the name of a ſpecies of *fringilla*. See the article FRINGILLA, *Suppl.*

It is ſmaller than the common ſparrow, but of a more elegant form; its colours are extremely beautiful and gay; there is a ſpot of red at the baſe of the beak; the top of the head is black, and its hinder part white; the neck and back are of a mixed colour, compoſed of grey and reddiſh brown; the belly is white; the ground colour of the wings and tail is black, but they are elegantly variegated with yellow and white; the legs are ſhort, and the hinder toe is longer than any of the others.

GOLDEN *flower-gentle*, a name ſometimes given to ſeveral ſpecies of the *amaranth*. See the article AMARANTH, *Suppl.*

GOLDEN-*cups*, a name by which ſome call the *ranunculus*, or *crow-foot*. See the article RANUNCULUS, *Suppl.*

GOLDEN-*head*, in ornithology, a water-fowl, otherwiſe called *anas arctica*. See the article DUCK, *Suppl.*

GOLDY-*locks*, the Engliſh name of a genus of plants, called by botanical writers *elichryſum*. See the article ELICHRYSUM, *Suppl.*

GOLF, or GOUF, the name of a diverſion, or exerciſe, much uſed in Scotland, and played upon the lawns, or links, as they are there called.

It conſiſts in driving a ball with clubs, between two goals or holes, half a mile or a mile aſunder. He who can do this with the feweſt ſtrokes of his club is the conqueror.

GOMER, or HOMER, a Hebrew meaſure. See the article CORUS, *Suppl.*

GONDOLA-*ſhell*, a ſpecies of *dolium*. See the article DOLIUM.

GOOSE-*foot*, in botany, the Engliſh name of a genus of plants called by botaniſts *chenopodium*. See the article CHENOPODIUM, *Suppl.*

GOOSE-*graſs*, in botany, a name ſometimes given to the *aparine* of authors. See the article APARINE, *Suppl.*

GOOSEANDER, a name uſed in ſeveral parts of the kingdom for a ſpecies of *mergus*. See the articles MERGUS and MERGANSER, *Suppl.*

GOOSEBERRY *of Barbadoes*, a name by which ſome call the *pereſkia* or *cactus* of botanical writers. See the article CACTUS, *Suppl.* and *Append.*

American GOOSEBERRY, the name of a genus of plants called by botaniſts *melaſtoma*. See the article MELASTOMA, *Suppl.*

GORCE, in botany, See the article GORSE, *Append.*

GOREING, or GORING, is ſaid of a ſail when cut ſlanting, ſo that it is broader at the clew than at the earing, as all topſails and top-gallant-ſails are. *Blanckley*, Nav. Exp. p. 65.

GORSE, or GOSSE, in botany, a name ſometimes uſed for furze. See the articles ULEX and GENISTA *ſpartium*, *Suppl.*

GOSLINGS, a term uſed to denote young geeſe. See the article GOOSE, *Suppl.*

GOSSYPIUM, the *cotton-plant*, in botany, the name of a genus of plants, the characters of which are theſe: the cup is double, the exterior one being compoſed of one leaf deeply divided into three ſegments, and the inner one ſlightly divided into five ſegments; the flower conſiſts of five leaves adhering at the baſe, cordated at the top, plane, and patent; the ſtamina are numerous filaments, which by adhering together form a kind of cylinder at the baſe; the antheræ are kidney-ſhaped; the germen of the piſtil is roundiſh; the ſtyle columnar, and of the length of the ſtamina; the ſtigmata are four, and pretty thick; the fruit is a roundiſh capſule, divided into four cells and containing numerous egg-ſhaped ſeeds, ſurrounded with a fine downy matter. Vide *Linnæi* Gen. Plant. p. 331.

GOUF, or GOLF. See the article GOLF, *Append.*

GOURD *(Suppl.)* — *Bitter* GOURD, a name ſometimes given to the *colocynthis* of botanical writers. See the article COLOCYNTHIS, *Suppl.*

Indian tree-GOURD, a term by which the *cujete*, or *creſcentia*, of botanical writers, is ſometimes called. See the article CRESCENTIA, *Suppl.*

Sour GOURD, in botany, a name ſometimes given to the *baobab*, or *baobob*. See the article BAOBAB, *Suppl.*

GOURD-*worm*, the Engliſh name of a ſpecies of worm found in the inteſtines of ſeveral animals. It has this name from its reſembling the ſeed of the gourd in figure.

GOURDY *legs of horſes*. See the article GREASE, *Cycl.*

GOUT-*wort*, a name ſometimes given to a genus of plants called by botaniſts *angelica*. See the article ANGELICA, *Suppl.*

GRAIN *(Suppl.)* — *Oily* GRAIN, the name by which ſome call the *ſeſamum*, or *myagrum* of botanical writers. See the article MYAGRUM, *Suppl.*

Scarlet GRAIN, in botany, a term ſometimes uſed to denote the *opuntia* and *ilex* of botanical writers. See the articles OPUNTIA and ILEX, *Suppl.*

GRAMEN, *graſs*, in botany, the name by which botaniſts call a large genus of plants. See the article GRASS, *Append.*

GRAMEN *murorum, ſpicâ longiſſimâ*, the name given by Mr. Raymond to a genus of plants called by Linnæus *feſtuca*. See the article FESTUCA, *Suppl.*

GRAPE, the fruit of the vine. See the article VITIS, *Suppl.*

Sea-ſide GRAPE, in botany, a name by which ſome call the *guajabara*. See the article GUAJABARA, *Append.*

Hyacinth GRAPE, a name ſometimes uſed for the *muſcari*, a genus of plants. See the article MUSCARI, *Suppl.*

GRASS, *gramen*, in botany, the Engliſh name of a large genus of plants, the characters of which are theſe: the flower, which is diſpoſed in faſciculi, has no petals, conſiſting wholly of a number of ſtamina, ariſing, for the moſt part, out of a ſquamoſe cup; the germen of the piſtil finally becomes a roundiſh or oblong ſeed, incloſed in the cup itſelf, or in a diſtinct capſule, and containing very little farina or flour. See *Tournefort*, Inſt. Bot. p. 516. See alſo the Article GRASS, *Suppl.*

Of this genus there are a vaſt multiplicity of ſpecies, enumerated by the above-mentioned author, whom the curious may conſult on that head.

Canary-GRASS, the Engliſh name of a diſtinct genus of plants called by botaniſts *phalaris*. See the article PHALARIS, *Suppl.*

Capon's tail GRASS, the Engliſh name of a diſtinct genus of plants called by botaniſts *feſtuca*. See the article FESTUCA, *Suppl.*

Creſted-GRASS, or *Cock's foot* GRASS, names given to a diſtinct genus of plants, called by Linnæus *cynoſurus*. See the article CYNOSURUS, *Suppl.*

Couch-GRASS, a name given to the green-leav'd *triticum*, with a creeping root. See the article TRITICUM, *Suppl.*

Dog's GRASS, *gramen Caninum*, the name by which ſome call a ſpecies of *triticum*. See the article TRITICUM, *Suppl.*

Sea-dog's GRASS, a name ſometimes given to the double-ſpiked *ſecale*, or rye. See the articles SECALE and RYE, *Suppl.*

Dog's-tail GRASS, the Engliſh name of a diſtinct genus of plants called by authors *cynoſurus*. See the article CYNOSURUS. *Suppl.*

Fox-tail GRASS, the Engliſh name of a diſtinct genus of plants known among botaniſts under that of *alopecurus*. See the article ALOPECURUS, *Suppl.*

Knot-GRASS, a name given to ſeveral diſtinct genera of plants. See the articles POLYGONUM and PARONYCHIA, *Suppl.*

Love-GRASS, a name ſometimes given to a ſpecies of *briza*, a diſtinct genus of plants. See the article BRIZA, *Suppl.*

Meadow-GRASS, the Engliſh name of a diſtinct genus of plants called by authors *poa*. See the article POA, *Suppl.*

Hard Meadow-GRASS, a name ſometimes given to a ſpecies of the *cynoſurus*, or *dog's-tail graſs*. See the article CYNOSURUS, *Suppl.*

Millet-GRASS, in botany. See the article MILIUM, *Suppl.*

Oat-GRASS, in botany, a name by which ſome call a ſpecies of *feſtuca*. See the article FESTUCA, *Suppl.*

Buſh-oat-GRASS, or *tall oat*-GRASS, names given to a diſtinct genus of plants, called by botaniſts *bromus*. See the article BROMUS, *Suppl.*

Quaking GRASS, *gramen tremulum*, the name by which ſome call a ſpecies of *briza*. See the article BRIZA, *Suppl.*

GRASS *of Parnaſſus*, the Engliſh name of a diſtinct genus of plants called by authors *Parnaſſia*. See the article PARNASSIA, *Suppl.*

Pudding-GRASS, a name ſometimes given to the *pulegium*, or penny-royal, a ſpecies of mint. See the articles MENTHRA and MINT, *Suppl.*

Rattle-GRASS, a name ſometimes uſed for the *pedicularis*, or louſe-wort. See the article PEDICULARIS, *Suppl.*

Scorpion-GRASS, the Engliſh name of a genus of plants called by botaniſts *ſcorpioides*. See the article SCORPIOIDES, *Suppl.*

Shave-GRASS the name uſed by ſome writers for the *equiſetum* of botaniſts. See the article EQUISETUM, *Suppl.*

Silk-GRASS, a name by which ſome call two very different genuſſes of plants, the aloe and dog's-bane. See the articles ALOE and DOG'*s-bane*, *Suppl.*

Sword-GRASS, a name ſometimes given to the *gladiolus* of botaniſts. Ruſt. Dict. in voc.

Trefoil-GRASS, or *three-leaved* GRASS, a diſtinct genus of plants. See the article TREFOIL, *Suppl.*

Vetch-GRASS, the Engliſh name of a diſtinct genus of plants called by authors *niſſolia*. See the article NISSOLIA, *Suppl.*

Viper's GRASS, a name by which ſome call the *ſcorzonera* of botanical writers. See the article SCORZONERA, *Suppl.*

GRAVING, in the ſea language, is the bringing a ſhip a-ground, and then burning off with furze, reed, or broom, all the filth and foulneſs that ſticks to her bottom without-board, in order to pay her new. *Blanckley*, Nav. Exp. p. 67.

GRAVITY *(Cycl.)* — To determine the ſpecific *gravity* of bodies accurately, requires ſo much care, and is liable to ſo many difficulties, that we need not be ſurprized when we find authors differing from one another. The lateſt we have on this ſubject, and the beſt, is Dr. Richard Davies, in the Philoſ. Tranſact. N°. 488. This gentleman has with great pains and judgment collected all the experiments of this kind, that have been made by the moſt accurate authors, ſhewing how widely they diſagree, and pointing out the cauſes of their differences: and he has alſo given us the ſpecific *gravities* of ſeveral ſubſtances from his own obſervations; to which we refer the curious.

GRAY, the Engliſh name of a ſpecies of duck, otherwiſe called gadwall. See the article GADWALL, *Suppl.*

GRAYMILL, in botany, a name ſometimes given to the *lithoſpermum* of authors, more uſually called gromwell. See the article LITHOSPERMUM, *Suppl.*

GREEN *(Suppl.)* — *Saxon* GREEN, an extremely beautiful *green* colour, the proceſs of dying which is this: the cloth or ſilk is firſt to be dyed a Saxon blue, in the following manner; having ground nine parts of indigo with twenty of red arſenic into a fine powder, add forty-eight parts of ſtrong ſpirit of vitriol; which mixture ſwells, grows hot, and emits a ſulphureous ſmell. After ſtanding in a moderate warmth for twenty-four hours, pour off the liquid part, which will be of an extremely deep blue. A ſmall quantity of this liquor, dropt into hot water, inſtantly ſpreads, tinges it of a fine light blue, and fits it for dying the prepared wool, cloth, or ſilk; and, by increaſing or diminiſhing the proportion of the blue compoſition, the colour may be rendered deeper or lighter.

The cloth or ſilk, thus dyed blue, is next to be dipt in the yellow decoction of weld or ſuſtic, and the deſired colour will be obtained.

Or the ſubject may be died *green* at one operation, by boiling it for a little time in a mixture of the blue and yellow liquors.

By thus combining any blue and yellow dyes, in different proportions, all the ſhades of *green* may be produced, from the bluiſh *green* of the cabbage-leaf to the greeniſh yellow of the olive.

Winter-GREEN, the name of a diſtinct genus of plants called by authors *pyrola*. See the article PYROLA, *Suppl.*

GREEN-*finch*, the Engliſh name of a ſpecies of *fringilla*, which has a ſtrong tinge of *green* diffuſed over all its body; the wings and tail are black, but both variegated with a beautiful yellow. See the article FRINGILLA, *Suppl.*

GREENS, in diet. It is to be obſerved, that *greens* as well as fruit are but a flatulent diet, and therefore ought to be eaten with moderation in bilious diſorders. However, on account of their antiſeptic quality, they are eſteemed good for preventing putrid and contagious diſeaſes. *Pringle*, Obſerv. on the Diſeaſes of the Army, p. 210, 294.

GREY, or GRAY, in zoology. See the article GRAY, *Suppl.*

GREY *fly*, the name of a ſpecies of two-winged flies, called by zoologiſts *œſtrum*. See the article ŒSTRUM, *Suppl.*

GRICE, a term uſed by country people for a young wild boar. Dict. Ruſt. in voc.

GRIG, in ichthyology, a name frequently uſed for the ſand-eel or *ammodytes*. See the article AMMODYTES, *Suppl.*

GRIPES, in the dyſentery. See the article DYSENTERY.

GRISLEY *ſeeds*, among herbaliſts, denote thin, flat ſkinny ſeeds. Ruſt. Dict. in voc.

GROATS, a term uſed in many parts of the kingdom for culled oats or oat-meal only half ground. Dict. Ruſt. in voc.

GROOVE *(Suppl.)* — GROOVE, or GROVE, among joiners, denotes the channel that is made by their plough in the edge of a moulding, ſtyle, or rail.

GROOVE alſo denotes a gardener's tool for tranſplanting flowers. Dict. Ruſt. in voc.

GROTTO *(Cycl.* and *Suppl.)* — A cæment for artificial *grottos* may be made thus: take two parts of white roſin, melt it clear, and add to it four parts of bees wax; when melted together add two or three parts of the powder of the ſtone you deſign to cæment, or ſo much as will give the cæment the colour of the ſtone; to this add one part of flower of ſulphur: incorporate all together over a gentle fire, and afterwards knead them with your hands in warm water. With this cæment the ſtones, ſhells, *&c.* after being well dried before the fire, may be cæmented. *Smith*'s Laboratory, p. 169.

Artificial red coral branches, for the embelliſhmrnt of *grottos*, may be made in the following manner: take clear roſin, diſſolve it in a braſs pan; to every ounce of which add two drams of the fineſt vermillion: when you have ſtirred them well together, and have choſen your twigs and branches, peeled and dried, take a pencil and paint the branches all over whilſt the compoſition is warm; afterwards ſhape them in imitation of natural coral. This done, hold the branches over a gentle coal-fire, till all is ſmooth and even as if poliſhed.

In the ſame manner white coral may be prepared with white lead, and black coral with lamp-black.

A *grotto* may be built with little expence of glaſs, cinders, pebbles, pieces of large flint, ſhells, moſs, ſtones, counterfeit coral, pieces of chalk, *&c.* all bound or cæmented together with the above deſcribed cæment.

GROUND-*pine*, in botany. See the article CHAMÆPYTIS, *Suppl.*

Stinking GROUND-*pine*, the name by which ſome call the *polycnemum* and *camphorata* of botanical writers. See the articles POLYCNEMUM, *Append.* and CAMPHORATA, *Suppl.*

GROUND-*worm*, in the hiſtory of inſects. See the articles WORM and EARTH-*worm*, *Suppl.*

GROUNSEL, *ſenecio*, in botany, See the article SENECIO, *Suppl.*

African GROUNSEL, a name ſometimes given to a genus of plants called by Linnæus *kleinia*. See the article KLEINIA, *Append.*

GROWSE, in ornithology. See the article GROUSE, *Suppl.*

GRUB-*ax*, or GRUBBAGE, among gardeners, *&c.* a tool for grubbing up the roots of trees, weeds, *&c.* Ruſt. Dict. in voc. See GRUBBING, *Suppl.*

GUABANI, in botany, the name of a delicate fruit of the Weſt-Indies, cooling and of a ſweet taſte: it is about two hands breadth long, and has a white delicious pulp, containing a number of hard kernels or ſeeds.

GUAIACAN, in botany, a name by which ſome authors have called the tree whoſe wood is the *lignum vitæ*, or *guaiacum* of the ſhops.

GUAJABARA, the *ſea-ſide-grape*, the name of a genus of plants, the characters of which are theſe: the flower is of the roſaceous kind, conſiſting of ſix petals; in the center ariſes the pointal, which afterwards becomes a pulpy fruit, incloſing one roundiſh ſtone terminating in a point.

The ſpecies of *guajabara* are theſe, 1. The *ſea-ſide-grape*, with oblong leaves. 2. The common *ſea-ſide-grape*, with roundiſh leaves. 3. The *ſea-ſide-grape*, with very broad leaves. 4. The *ſea-ſide-grape*, with ſmaller and longer leaves.

All theſe ſorts, which are natives of the Weſt-Indies, muſt be propagated by ſeeds, ſown in pots of light rich earth, and plunged into an hot-bed of tanner's bark: the plant muſt conſtantly remain in a ſtove, being too tender to live in the open air, even in our warmeſt weather; only in ſummer they may be frequently refreſhed with water, and have freſh air admitted to them. *Miller*'s Gard. Dict. in voc.

GUANA, in zoology, a ſpecies of lizard, otherwiſe called *iguana*. See the article IGUANA, *Suppl.*

GUARANTY, in politics, an engagement of mediatorial or neutral ſtates, whereby they pledge their faith, that the articles of a particular treaty ſhall be inviolably obſerved on both ſides.

This engagement implies, that the guarantees are obliged to aſſiſt the party invaded contrary to the treaty, againſt the injurious agreſſor; but not if the war is occaſioned by any other cauſes than the violation of the articles of peace. *Puffendorff*, Law of Nature and Nations, book VIII. ch. viii. § 7.

GUAVA, a name ſometimes given to the *guajava* of Tournefort. See the article GUAJAVA, *Suppl.*

GUERKINS, a kind of cucumbers for pickling, otherwiſe called gherkins. Dict. Ruſt. in voc.

GUERNSEY-*lilly*, a name uſed for a genus of plants, called by ſome *amaryllis*, and by others *lilio-narciſſus*. See the article LILIO-NARCISSUS, *Suppl.*

GUILLEMITES, an order of monks in Flanders, whoſe habit reſembles that of the Ciſtertians: they follow the rule of St. Auguſtine, and are governed by a ſuperior, who does not take the title of provincial, aad is elected every four years. See *Broughton*'s Dict. Relig. in voc.

GUINEA-*henweed*, in botany, a name by which ſome call the *petiveria* of botanical writers. See the article PETIVERIA, *Suppl.*

GUINEA-*pepper*, the Engliſh name of a genus of plants, called by authors *capſicum*. See the article CAPSICUM, *Suppl.*

GUINEA-*wheat*, a name ſometimes given to the maiz, or Indian corn, called by botaniſts *yucca*. See the article YUCCA, *Suppl.*

GUINEA-*worm*, in the hiſtory of inſects, the ſame with what zoologiſts call *chætia*. See the article CHÆTIA, *Append.*

GULO, in zoology, a name ſometimes given to a ſpecies of *muſtela*. See the article GLUTTON, *Append.*

GUM *(Suppl.)* — Grew, in his Anatomy of Plants, makes the following remarks concerning the import of the word *gum*, and the diſtinction thereof both from a roſin and a mucilage.

A roſin, he obſerves, is originally a turpentine, or acidulous liquor, having an exceeding ſmall quantity of watery parts mixed therewith; and which, for that reaſon, will not be diſſolved in water, but only in oil: of this kind are maſtic, benzoin, tacamahaca, commonly called *gums*, though, ſtrictly ſpeaking, they are all true roſins.

A *gum*, on the other hand, is originally a milky liquor, having a greater quantity of water mixed with its oily parts; and which, for that reaſon, diſſolves either in water or oil: of this kind are ſagapenum, opopanax, ammoniac, *&c.*

A third ſort of *gum* is that which is unoily; and which, therefore, diſſolves only in water, as *gum* arabic, the *gum* of the cherry-tree, *&c.*

Theſe laſt ſubſtances, though commonly called *gums*, are only dried mucilages; being originally nothing elſe but the mucilaginous lymph iſſuing from the veſſels of the tree, in the ſame manner as it does from comfrey, mallows, *&c.* and even from the cucumber; the veſſels thereof, upon being cut acroſs yielding a lymph which is plainly mucilaginous, and which being well dried at length becomes a kind of *gum*, or rather a hardened mucilage.

In like manner, the *gums* of the plumb-tree, cherry-tree, and the like, are nothing elſe but dried mucilages.

If we will take the word in its wideſt ſenſe, all *gums* are originally either a terebinth, or a milk, or a mucilage. *Grew*, Anat. of Plants, book III. ch. iv. p. 134.

Gums, in medicine, ſhould always be ſtrained before they are uſed, as being ſeldom free from droſs and other admixtures, which hinder their operation.

Dr. Pringle, in his Obſervations on the Diſeaſes of the Army, tells us, that *gums* are all powerful antiſeptics. See the article ANTISEPTICS, *Append.*

GUM-*ſuccory*, in botany, a name by which the *chondrilla* of authors is ſometimes called. See the article CHONDRILLA, *Suppl.*

GUNDELIA, in botany, a diſtinct genus of plants called *hacub* by Vaillant; the characters of which are theſe: there is ſcarcely any common cup, except the ſurrounding leaves; the flower is of the compound kind, uniformly tubulated, being made up of equal hermaphrodite floſcules, conſiſting of a ſingle clavated petal, divided into five ſegments at the edge; the ſtamina are five very ſhort capillary filaments; and the antheræ cylindraceous, tubulated, and long: the germen of the piſtil is ovated, immerſed in the receptacle, crowned with very ſmall ſquamæ, and placed at the bottom of each floſcule; the ſtyle is filiform, and longer than the flower-petals; the ſtigmata are two in number, and turned backwards; there is no pericarpium; the ſeeds, which are ſingle, roundiſh, and acuminated, being concealed in the receptacle, which is of a conic figure. *Linnæi* Gen. Plant. p. 386.

GUNNERY *(Cycl.)* — Mr. Robins, from the experiments related in his New Principles of *Gunnery*, having concluded, that the force of fired gun-powder, at the inſtant of its exploſion, is the ſame as that of an elaſtic fluid of a thouſand times the denſity of the common air, and that the elaſticity of this fluid, like that of air, is proportionable to its denſity, propoſes the following problem:

The dimenſions of any piece of artillery, the weight of its ball, and the quantity of its charge being given, to determine the velocity which the ball will acquire from the exploſion, ſuppoſing the elaſticity or force of the powder at the firſt inſtant of its firing to be given.

In the ſolution of this problem he aſſumes the two following principles: 1. That the action of the powder on the bullet ceaſes as ſoon as the bullet is got out of the piece. 2. That all the powder of the charge is fired, and converted into an elaſtic fluid, before the bullet is ſenſibly moved from its place.

Theſe aſſumptions, and the concluſions before-mentioned, make the action of fired gun-powder to be entirely ſimilar to that of air condenſed a thouſand times; and from thence it will not be difficult to determine the velocity of the ball ariſing from the exploſion. For the force of the fired powder diminiſhing in proportion to its expanſion, and ceaſing when the ball is out of the piece; the total action of the powder may be repreſented by the area of a curve, the baſe of which repreſents the ſpace through which the ball is accelerated; and the ordinates to which, repreſent the force of the powder at every point of that ſpace. And theſe ordinates being in reciprocal proportion to their diſtance from the breech of the gun, becauſe when the ſpaces occupied by the fired powder are as 1, 2, 3, 4, *&c.* the force of the powder, or the ordinates repreſenting it, will be as, 1, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, *&c.* it appears that the curve will be a common hyperbola, and that the area intercepted between it, its aſymptote, and the two ordinates repreſenting the force of the powder at the firſt exploſion and at the muzzle of the piece, will repreſent the total action of the powder on the ball. But if the ball were urged through the ſame ſpace, by an uniform force equal to its gravity, the total action of this force would be repreſented by a rectangle, the baſe of which would be the baſe of the curve or intercepted portion of the aſymptote before-mentioned, and the height of which would repreſent the uniform force of gravity. Hence the ſquare of the velocity of the ball reſulting from the action of the gunpowder, will be to the ſquare of the velocity reſulting from the action of gravity, as the area of the hyperbolic ſpace is to the area of the rectangle [a]. But the velocity of the ball reſulting from gravity is given, being the velocity it would acquire from a height equal to the ſpace through which the powder accelerates it; and the proportion between the hyperbolic ſpace and the rectangle is alſo given, from the analogy of hyperbolic ſpaces and logarithms [b]; therefore the velocity of the ball ariſing from the action of the fired gun-powder will be given. — [a By prop. 39. lib. i. of Newton's Principles. b See the article LOGARITHM, *Suppl.*]

To give an example of this, let us ſuppoſe the length of the barrel of a gun to be 45 inches, its diameter, or rather the diameter of the ball to be $\frac{3}{4}$ of an inch; and the ſpace occupied by the powder to be $2\frac{5}{8}$ inches; to determine the velocity which will be communicated to a leaden bullet by the exploſion, ſuppoſing the bullet laid at firſt with its ſurface contiguous to the powder.

By the theory here laid down it appears, that at the firſt inſtant of the exploſion the flame will exert, on the ball lying cloſe to it, a force one thouſand times greater than the preſſure of the atmoſphere. But the medium preſſure of the atmoſphere is eſteemed equal to that of a column of water 33 feet high; whence lead being to water as 11,345 to 1, this preſſure will be equal to that of a column of lead 34,9 inches in height, whence multiplying this by 1000, a column of lead 34900 inches high would produce a preſſure equal to what is exerted on the ball by the powder in the firſt inſtant of the exploſion; and the leaden ball being $\frac{3}{4}$ of an inch in diameter, and conſequently equal to a cylinder of lead on the ſame baſe $\frac{3}{4}$ an inch in height, the preſſure at firſt acting on it will be equal to 34900×2, or 69800 times its weight; whence the force of gravity is to that of the powder at its firſt exploſion, as 1 to 69800. Now an uniform force, as 1, accelerating the ball through a ſpace of $45 - 2\frac{5}{8} = 42\frac{3}{8}$ inches, will give it a velocity of 15.07 feet in one ſecond of time; for this is the velocity the ball would acquire in falling from a height of $42\frac{3}{8}$ inches. And an initial force, as 69800, but diminiſhing continually, as the hyperbolic ordinates, will, upon computation, be found to communicate a velocity to the ball, which will be to that communicated by gravity as 110.7 to 1. Therefore the velocity of the ball ariſing from the action of the gun-powder will be $= 110.7 \times 15.07 = 1668.249$ feet in one ſecond of time; that is, the ball, when it firſt leaves the piece, will be carried at the rate of 1668 feet in one ſecond.

As to the firſt of the principles here aſſumed, the author has obſerved, in the Philoſ. Tranſact. N° 469. p. 445, that it would be found erroneous, if examined with a geometrical rigour; ſince it cannot be queſtioned but the flame acts in ſome degree on the bullet after it is out of the piece: but in experiments no ſuch accuracy is attainable; minute irregularities

ties are the neceſſary concomitants of all complicated experiments: in the colliſion of bodies, in the running or ſpouting of water, even in ſmall velocities, irregularities happen, not reconcileable to theory or to each other: what may not then be ſuppoſed to happen from the action of ſo furious a power as gun-powder? From experiments it appears, that velocities of bullets fired from the ſame piece, charged with the ſame powder, and all other circumſtances, as nearly as poſſible, the ſame, do yet differ from each other by ſometimes more than $\frac{1}{30}$ part of the whole: but this is a ſmall degree of inaccuracy in a caſe of this nature, and if the action of the flame on the bullet, after it is out of the piece, is ſo ſmall as to produce no greater effect than what may be deſtroyed by the inevitable variations of the experiments, the neglecting it entirely is both convenient and a reaſonable procedure. Now what gives ground to think that this poſtulatum, though not rigorouſly true, may be ſafely aſſumed, is the conſideration of the ſpreading of the flame by its own elaſticity, as ſoon as it eſcapes from the mouth of the piece; for by this it may be conceived that the part of it which impinges on the bullet may be neglected, although the impulſe of the flame be a very remarkable force.

With regard to the ſecond aſſumed principle, that all the powder is fired before the bullet is ſenſibly moved from its place; it is to be obſerved, that this very poſition, having been examined by a committee of the Royal Society, was, after ſeveral experiments, determined in the negative; from whence many may be ready to conclude, that the whole theory muſt be overturned. But this requires a farther diſcuſſion, and it will appear that though this principle be not rigorouſlly true, no more than the former, yet it ſeems alſo that it may be ſafely admitted in inveſtigating the effects of powder, ſince, even in ſhort barrels, where the ſpace the bullet was impelled thro' was not five inches, and where of courſe the deficiency of velocity was greateſt, it cannot amount to one thirtieth of the whole. This will appear from the experiments made by the committee; for when the barrel was ſo ſhortned, that the bullet being placed cloſe to the wad, lay with its outer ſurface nearly level with the mouth of the piece; yet even in this ſhort tranſit of the bullet but $\frac{1}{6}$ of the whole charge, at a medium, was collected unfired; which $\frac{1}{6}$, properly reduced, amounts to but $\frac{1}{12}$ of the charge. This reduction is founded on theſe conſiderations, that the powder uſed by the committee being unequally grained, when the ſmaller grains, collected by ſifting, were uſed, the quantity remaining unfired was leſs at a medium in the ratio of 5 to 3, than when it was uſed without ſifting. Alſo, by extracting the ſalt-petre from the powder collected unfired, there was leſs ſalt-petre contained in it than in real powder, nearly in the ratio of 9 to 7. Now theſe two proportions compounded, make the proportion of 15 to 7, in which proportion muſt the quantities of powder unfired be reduced, in order to determine the quantity of fine good powder that might be ſuppoſed to remain unfired in the experiments brought to confirm the aforeſaid theory.

Now it appears by experiments, that the velocities of bullets placed in the ſame ſituation are in the ſubduplicate proportion of the charges: conſequently the deficiency of velocity ariſing from the loſs of $\frac{1}{12}$ of the charge will be about $\frac{1}{24}$ of the velocity only. And in the experiments made with a barrel $5\frac{1}{3}$ inches in length, where the ball had not three inches to move, the quantity of real powder collected unfired from a charge of 12dwt. would have been no more than 16 grains, at a medium, or $\frac{1}{18}$ of the whole charge, which would produce a deficiency of $\frac{1}{36}$ of the velocity only: a difference leſs than what frequently occurs in the exacteſt repetition of the ſame experiments.

This, it is thought, is fully ſufficient to juſtify the principle in queſtion; eſpecially as in all caſes of real uſe the length of the barrel, in proportion to the quantity of the charge, will be much greater than in the inſtances here mentioned. See Phil. Tranſ. N°. 469, p. 450, 452, *&c.* and ſee the Experiments of the committee in the Tranſactions, N°. 465, p. 172, 173, *&c.*

The greateſt part of thoſe who have written on the manner in which powder takes fire, have ſuppoſed it to be done by regular degrees; the firſt grains firing thoſe contiguous, and they the next ſucceſſively; and it has been generally thought, that a conſiderable time was employed in theſe various communications: for Mr. Daniel Bernoulli, in his *Hydro-dynamica*, has concluded from ſome experiments made at Peterſburg, that the greateſt part of the charge eſcapes out of the piece unfired, and that the ſmall part which is fired, does not take fire 'till it is near the mouth. Many theories too have been compoſed on the time of the progreſs of the fire amongſt the grains, and the different modifications which the force of powder did thence receive; and it has been generally conceived, that the proper lengths of pieces were determinable from this principle; that they ſhould be long enough to give time for all the powder to fire.

But no ſuch regular and progreſſive ſteps ſeem obſervable in the exploſion. For conſidering that by loading with a greater weight of bullet, and thereby almoſt doubling the time of the continuance of the powder in the barrel, its force receives but an inconſiderable augmentation; and that doubling and trebling the uſual charge, the powder thus added always produces a correſpondent effect in the velocity of the bullet; likewiſe, that in a piece near four feet in length, charged with an uſual charge of powder, the velocity communicated to the bullet, during the firſt three inches of its motion, is full half the velocity acquired in its whole paſſage thro' the barrel; and conſidering alſo that the elaſticity or force of the powder, in the three firſt inches of its expanſion, is at a medium near eight times greater than in the laſt two feet of the barrel; it may be concluded from all theſe circumſtances, that the time employed by the powder in taking fire was not neceſſary to be attended to in theſe computations; but that the whole maſs might be ſuppoſed to be kindled, before the bullet was ſenſibly moved from its place.

And the experiments reported by the committee of the Royal Society, in the Tranſaction, N°. 465, before-mentioned, are ſtrong proofs that the powder is not fired in the progreſſive manner uſually ſuppoſed; for when the ſhort barrel was charged with 12 penny-weight and ſix penny-weight reſpectively, the quantity of powder which was collected unfired from 12 penny-weight, did not exceed by three grains, at a medium, what was collected from ſix penny-weight, although the bullet was a leſs time in paſſing thro' the barrel with 12 penny-weight than with ſix, it having a leſs way to move; conſequently the quantity remaining unfired of the ſix penny-weight, did not continue unfired for want of time; ſince when the piece was charged with 12 penny-weight, the additional ſix penny-weight was conſumed in a ſhorter time. See Phil. Tranſ. N°. 469. p. 450.

Mr. Robins has alſo given us an ingenious way of determining, by experiments, the velocity which any ball moves with, at any diſtance of the piece it is diſcharged from.

This may be effected by means of a pendulum made of iron, having a broad part at bottom, covered with a thick piece of wood, which is faſtened to the iron by ſcrews. Then having three poles joined together by their tops and ſpreading at bottom, ſuch as are vulgarly uſed in weighing and lifting heavy bodies, and called by workmen triangles, on two of theſe poles, towards their tops, are ſcrewed on ſockets, on which the pendulum is hung by means of a croſs piece, which becomes its axis of ſuſpenſion, and on which it ought to vibrate with great freedom. Something lower than the bottom of the pendulum there ſhould be a brace, joining the two poles to which the pendulum is ſuſpended; and to this brace there is faſtened a contrivance made with two edges of ſteel, ſomething in the manner of a drawing pen; the ſtrength with which theſe edges preſs on each other being diminiſhed or increaſed at pleaſure, by means of a ſcrew. To the bottom of the pendulum ſhould be faſtened a narrow ribbon, which paſſing between the ſteel edges, may hang looſely down by means of an opening cut in the lower piece of ſteel.

The inſtrument being thus fitted, if the weight of the pendulum, the reſpective diſtances of its center of gravity, and of its center of oſcillation, from its axis of ſuſpenſion, be known, it may from thence be found, what motion will be communicated to this pendulum by the percuſſion of a body of a known weight moving with a known degree of velocity, and ſtriking it in a given point; that is, if the pendulum be ſuppoſed at reſt before the percuſſion, it will be known what vibration it ought to make in conſequence of ſuch a blow; and if the pendulum being at reſt, is ſtruck by a body of a known weight, and the vibration which the pendulum makes after the blow is known, the velocity of the ſtriking body may from thence be determined.

Now the extent of the vibration, made by the pendulum, may be meaſured by the ribbon. For if the preſſure of the ſteel edges on the ribbon be regulated by the ſcrew, ſo as to be free and eaſy, tho' with ſome minute reſiſtance to hinder its ſlipping of itſelf: then ſetting the pendulum at reſt, let the part of the ribbon between the pendulum and the ſteel edges be drawn ſtrait, but not ſtrained, and fixing a pin in the part of the ribbon contiguous to the edges, the pendulum ſwinging back by the impulſe of the ball, will draw out the ribbon to the juſt extent of its vibration, which will be determined by the interval on the ribbon between the edges and the place of the pin.

The computation by which the velocity of the ball is determined, from the vibration of the pendulum after the ſtroke, is founded on this principle of mechanics; That if a body in motion ſtrikes on another at reſt, and they are not ſeparated after the ſtroke, but move on with one common motion, then that common motion is equal to the motion with which the firſt body moved before the ſtroke: whence, if that common motion and the maſſes of the two bodies are known, the motion of the firſt body before the ſtroke is thence determined. On this principle it follows, that the velocity of a bullet may be diminiſhed in any given ratio, by its being made to impinge on a body of a weight properly proportioned to it; and hereby the moſt violent motions, which would otherwiſe eſcape our examination, are eaſily determined by the retarded motions which have a given relation to them.

See New Princip. of Gunnery, p. 28, 29, &c. See alſo the Phil. Tranſ. N. 469, p. 444. where a ſmall correction, relating to a number in Mr. Robins's 8th propoſition, is mentioned.

It is to be obſerved, that the length to which the ribbon is drawn, is always nearly the chord of the arch deſcribed by the aſcent; it being ſo placed, as to differ inſenſibly from thoſe chords which moſt frequently occur; and theſe chords are known to be in the proportion of the velocities of the pendulum acquired from the ſtroke. Hence it follows, that the proportion between the lengths of ribbon drawn out at different times, will be the ſame with that of the velocities of the impinging bullets.

Now from the computations delivered by Mr. Robins, it appears, that the velocity of the bullet was 1641 feet in one ſecond of time, when the chord of the arch deſcribed by the aſcent of the pendulum, in conſequence of the blow, was $17\frac{1}{4}$ inches. Therefore, by the proportion of any other lengths of ribbon drawn out, by any percuſſion, to $17\frac{1}{4}$, the proportion of the velocity with which the bullets impinge, to the known velocity of 1641 feet in 1″, will be determined.

As experiments of this kind are often attended with danger and difficulty, thoſe who may be diſpoſed to make any, will find ſeveral uſeful practical cautions, in p. 31, 32 and 33 of the ſaid Treatiſe.

By the experiments recited at large, in Propoſition IX. of the ſame Treatiſe, it appears, that the computations from Mr. Robins's theory, compared with thoſe experiments, which were made with barrels of various lengths, from ſeven inches to forty-five, and with different quantities of powder, from ſix penny-weight to thirty-ſix, have a remarkable coincidence, and ſuch as occurs but in few philoſophical ſubjects of ſo complicated a nature.

Suppoſing, for inſtance, the length of a barrel to be 45 inches, the quantity of powder 12 penny-weight, and the ball $\frac{3}{4}$ inch diameter, weighing $1\frac{1}{3}$ ounce, or $\frac{1}{12}$ of a pound averdupoiſe, and the windage or exceſs of the diameter of the barrel above that of the bullet about $\frac{1}{40}$ of an inch; the velocity of the bullet will, by theory, be about 1670 feet in one ſecond: and this velocity is found in theſe experiments, to be the mean velocity which the ball really receives in thoſe circumſtances. Hence we may determine the velocities with which muſket and cannon ſhot are diſcharged from their reſpective pieces by their uſual allotment of powder.

For as a leaden ball of $\frac{3}{4}$ inch diameter, and weighing nearly $1\frac{1}{3}$ ounce averdupoiſe, being fired from a barrel of 45 inches in length with half its weight of powder, will have a velocity at its iſſuing from the piece, which, if uniformly continued, would carry it near 1700 feet in 1″: ſo if inſtead of a leaden ball an iron one of the ſame diameter was placed in the ſame ſituation in the ſame piece, and was impelled by the ſame quantity of powder, the velocity of ſuch an iron bullet would be greater than that of the leaden one, in the ſubduplicate ratio of the ſpecific gravities of lead and iron; and ſuppoſing that ratio to be as 3 to 2, and computing on the foregoing principles, it will appear, that an iron bullet of 24 lb. weight, ſhot from a piece of 10 feet in length, with 16 lb. of powder, will acquire from the exploſion a velocity which, if uniformly continued, would carry it nearly 1650 feet in 1″. But if inſtead of this full charge weighing two thirds of the ball, we ſuppoſe the charge to be only half that weight, then its velocity will be no more than at the rate of 1490 feet in 1″; and the ſame would be the velocities of every leſſer bullet, fired with the ſame proportions of powder, if the lengths of all pieces were conſtantly in the ſame ratio with the diameters of their bore: and tho' this proportion does not always hold, yet the difference is not conſiderable enough to occaſion a very great variation from the velocities here aſſigned. But in theſe determinations, the windage is ſuppoſed to be no more than is juſt neceſſary for the eaſy putting down the bullet; whereas in real ſervice, either thro' negligence or unſkilfulneſs, it often happens, that the diameter of the bore ſo much exceeds the diameter of the bullet, that great part of the inflamed fluid eſcapes by its ſide; whence the velocity of the ſhot may, in this caſe, be conſiderably leſs than what is here aſſigned: however, part of this may poſſibly be compenſated by the greater heat which in all probability attends the firing of theſe large quantities of powder.

The theory here eſtabliſhed ſuppoſes what is ſaid under the head GUN-POWDER, that the powder when fired is equally hot with iron at the beginning of its white heat; but in very ſmall quantities of powder the heat is probably leſs, and conſequently the elaſticity leſs than what ariſes from this ſuppoſition. Now this decreaſe of elaſticity in ſmall quantities of powder has been found in many trials actually to take place. For inſtance, according to the theory before laid down, the velocity given the ball by the action of the powder is in round numbers 1670 feet in 1″; and this, as has been ſaid, is confirmed by the experiments taken at a medium. If now the barrel and poſition of the ball remaining the ſame, there be placed in the ſpace that contained 12 penny-weight of powder there mentioned, only one penny-weight; it follows, that if the elaſticity of the ſmaller charge be the ſame in proportion to its quantity with that of the larger, then the velocity of the bullet, when impelled by the exploſion of the ſmaller charge, will be to the velocity of a bullet impelled by a greater charge in the ſubduplicate ratio of the quantities of the reſpective charges, that is, in the ſubduplicate ratio of 1 to 12. Conſequently the velocity communicated by 12 penny-weight being known to be that of 1670 feet in 1″, the velocity communicated by one penny-weight would be that of 482 feet in 1″ nearly; but by repeated trials differing little from each other, it has been found, that the real velocity acquired by the ball in this caſe, from the exploſion of one penny-weight, was rather leſs than that of 400 feet in 1″. Whence it is evident, that the elaſticity of one penny-weight of powder, when fired, is leſs in proportion to its quantity than that of 12 penny-weight, as it ought to be by the theory.

So if three penny-weight of powder be placed in the ſame manner with the one penny-weight laſt mentioned, the real velocity the ball will acquire from the exploſion, will be from 740 to 720 feet in 1″. Whereas, ſuppoſing the elaſticity of three penny-weight, when fired, to be in ſimilar circumſtances the ſame with that of 12 penny-weight, the velocity acquired by the ball ſhould be 835 feet in 1″.

It is farther to be obſerved, that the theory eſtabliſhed under the head GUN-POWDER, ſuppoſes that in the firing of gun-powder about $\frac{3}{100}$ of its ſubſtance is converted by the ſudden inflammation into a permanent elaſtic fluid, the elaſticity of which, in proportion to its heat and denſity, is the ſame with that of the common air in the like circumſtances: it farther ſuppoſes, that all the force exerted by gun-powder in its moſt violent operations, is no more than the action of the elaſticity of the fluid thus generated; and theſe principles enable us to determine the velocities of bullets impelled from fire arms of all kinds.

From this theory appears the inconcluſiveneſs of what ſome authors have advanced relating to the advantages of particular forms, for the chambers of mortars and cannon; for all their laboured ſpeculations on this head are evidently founded on very erroneous opinions about the actions of fired powder. See lib. cit. p. 41.

But it muſt not be diſſembled, that however probable this theory may be from the experiments and reaſons on which it is founded, there ſtill remains a difficulty which ſeems not yet fully accounted for. The doubt ariſes from ſome experiments made before a committee of the royal ſociety, who hereupon gave it as their opinion, that the change of the form in the chamber will produce a change of the diſtance to which the bullet is thrown. The experiments upon which this opinion was founded, were as follows:

Three braſs chambers were made, whoſe depths were reſpectively three inches, $1\frac{1}{2}$ inch and $\frac{3}{4}$ inch; ſo turned as to fit the chamber of a braſs mortar exactly; each of theſe chambers contained, when full, one ounce troy of powder. The ball was of braſs, weighing nearly 356 ounces troy. The ball touched the powder of the charge in all theſe experiments. With the firſt chamber of three inches deep, the elevation of the mortar being 45°, the range taken at a medium of three ſhot was 741 feet: and the mean diſtance to which the ball was thrown with the chamber of $\frac{3}{4}$ inch deep, was but 464 feet. As to the chamber of $1\frac{1}{2}$ inch, it not fitting the chamber of the mortar exactly, the ranges were very irregular; but the leaſt range, tho' fired late in the damp of the evening, exceeded the fartheſt range of the $\frac{3}{4}$ inch chamber, and the fartheſt range extended to 686 feet; ſo that the committee ſeem well warranted in their opinion. The difficulty is to reconcile this with the foregoing theory. Its ingenious author has, in general obſerved, in the account of his book given in the Phil. Tranſ. N°. 469, p. 455, that when the charge is much ſmaller than the uſual allotment of powder, there are ſome irregularities, as thoſe ariſing from the different heat of ſmall and large quantities of powder, to which head too perhaps muſt be referred the experiments made by the committee on the effect of different ſmall chambers; but in cuſtomary charges, the velocities of bullets reſulting from all the experiments hitherto made, are really ſuch as the theory requires. And it appears, that theſe velocities are much greater than what they have been hitherto accounted; and there are reaſons from the theory to believe, that in cannon ſhot the velocities may ſtill exceed the foregoing computation. See Phil. Tranſ. N°. 465.

If a bullet be laid at a conſiderable diſtance from the charge, the principles before laid down cannot then be applied to determine the velocity of the ball; they being only applicable in caſes where the bullet is contiguous to the charge, or nearly ſo. For by what is ſhewn under the head GUN-POWDER, when the ſurface of fired powder is not confined by a heavy body, which it is obliged to impel before it, the flame dilates itſelf with a velocity much beyond what it can at any time communicate to a bullet by its continued preſſure; becauſe the powder having acquired a conſiderable degree of velocity of expanſion, the firſt motion of the ball will not

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be produced by the continued preſſure of the powder, but by the percuſſion of the flame. From whence it follows, that the velocity of a bullet, laid a conſiderable diſtance before the charge, ought to be greater than what would be communicated to it by the preſſure of the powder acting as before-mentioned in this article. And this deduction from theory is confirmed from experience, by which it was found that a ball laid in a barrel, at the diſtance of $11\frac{1}{4}$ inches from the breech, and impelled by 12 penny-weight of powder, acquired in its diſcharge a velocity of about 1400 feet in 1″; whereas if it had been acted on by the preſſure of the flame only, it would not have acquired a velocity of 1200 feet in 1″. The ſame was found to hold true in all other greater diſtances (and alſo in leſſer, tho' not in the ſame degree) and in all quantities of powder. And from hence ariſes a conſideration of conſequence in practice, which is, that no bullet ſhould at any time be placed at any conſiderable diſtance before the charge, unleſs the piece be extremely well fortified: for a moderate charge of powder, when it has expanded itſelf thro' the vacant ſpace, and reaches the ball, will, by the velocity each part has acquired, accumulate itſelf behind the ball, and be thereby prodigiouſly condenſed; whence if the barrel be not extraordinary ſtrong, it muſt burſt. This is confirmed by the experience of an exceeding good tower muſket of very tough iron, which being charged with 12 dwt. of powder, and the ball being placed 16 inches from the breech; upon firing the piece, part of the barrel, juſt behind the bullet, was ſwelled out to double its diameter, and two large pieces burſt out of it. If the powder be not placed together at the breech, but ſcattered uniformly thro' the whole cavity left behind the bullet, the progreſſive motion of the flame may hence be ſuppoſed to be prevented by the expanſion of the neighbouring parts. And it was found that the ball being laid as before, $11\frac{1}{4}$ inches from the breech, its velocity, in this caſe, inſtead of 1400 feet in 1″, was only 1100 feet. See New Princip. of Gunnery, Part I. Prop. xii.

It appears from experience, that bullets of the ſame diameter and denſity impinging on the ſame ſolid ſubſtance with different velocities, will penetrate that ſubſtance to different depths, which will be in the duplicate ratio of thoſe velocities nearly. Thus a leaden bullet of $\frac{3}{4}$ of an inch in diameter, being fired againſt a ſolid block of elm with different velocities, as of 1700 feet, 730, and 400 feet in 1″; the cavities were found to be as 55, 10 and 3 reſpectively; which are nearly in the duplicate proportion of thoſe velocities: perfect regularity in caſes of this nature cannot be expected, when the unequal texture of the ſame piece of wood, and the change of the form, and the bullet by the ſtroke, are conſidered.

From the penetration being in the duplicate proportion of the velocity of the impinging body, it follows, that the reſiſtance of the wood, like that of gravity, is uniform. See New Princip. of Gunnery, p. 94, 95.

GUN-POWDER *(Cycl.)* — *Gun-powder*, fired either in a vacuum or in air, produces by its exploſion, a permanent elaſtic fluid.

If a red-hot iron be included in a receiver, and the receiver be exhauſted, and *gun-powder* be then let fall on the iron, the powder will take fire, and the mercurial gage will ſuddenly deſcend upon the exploſion; and, tho' it immediately aſcends again, yet it will never riſe to the height it firſt ſtood at, but will continue depreſſed by a ſpace proportioned to the quantity of *gun-powder* which was let fall on the iron. By this means (firing ſmall quantities at a time) the mercurial gage may be reduced from $29\frac{1}{2}$ inches to $12\frac{3}{4}$. Now this experiment, which has been often repeated, proves the propoſition with reſpect to the production of a permanent elaſtic fluid in a vacuum; for the deſcent of the gage could only be effected by the preſſure of ſome new generated fluid in the receiver, ballancing in part the preſſure of the external air. That this fluid, or ſome part of it at leaſt was permanent, appears from thence, that tho' in theſe experiments the quickſilver aſcended after the operation, yet next day it had aſcended no higher than to $22\frac{1}{2}$, at which place it ſeemed to continue fixed. And, that this fluid is elaſtic, is proved from the deſcent of the mercurial gage: ſince the quantity of matter contained in this fluid, could not by its gravity alone have ſunk the quickſilver by the leaſt ſenſible quantity; alſo from its extending itſelf through any ſpace, however great, the experiment ſucceeding in either a large or ſmall receiver, only the larger the receiver the leſs will be the deſcent of the mercurial gage to the ſame quantity of powder; the preſſure of the generated fluid diminiſhing as its denſity diminiſhes. See Phil. Tranſ. N°. 295.

The ſame production likewiſe takes place, when *gun-powder* is fired in the air [a]; for if a ſmall quantity of *powder* be placed in the upper part of a glaſs tube, and the lower part of the tube be immerged in water, and the water be made to riſe ſo near the top that only a ſmall portion of air is left in that part where the *gun-powder* is placed; if in this ſituation the communication of the upper part of the tube with the external air be cloſed, and the *gun-powder* be fired, (which may eaſily be done by a burning-glaſs) the water will, in this experiment, deſcend on the exploſion, as the quickſilver did in the laſt, and will always continue depreſſed below the place, at which it ſtood before the exploſion, and the quantity of this depreſſion will be greater, if the quantity of *powder* be increaſed, or the diameter of the tube be diminiſhed. From whence it is proved, that as well in air as in a vacuum, the exploſion of fired *powder* produces a permanent elaſtic fluid [b]. — [a *Haukſbee*, Phyſ. Mechan. Exp. p. 81. b *Robins*'s New Prin. of Gunnery, Prop. I.]

It alſo appears from experiment, that the elaſticity or preſſure of the fluid produced by the firing of *gun-powder*, is *cæteris paribus*, directly as its denſity. This follows from hence, that, if in the ſame receiver a double quantity of *powder* be let fall, the mercury will ſubſide twice as much as in the firing of a ſingle quantity. For the vapour produced from the double quantity, being contained in the ſame receiver, will be of double the denſity of that produced from the ſingle quantity; whence the elaſticity or preſſure, eſtimated by the deſcent of the mercury being likewiſe double, the preſſure is directly as its denſity. Alſo the deſcents of the mercury, when equal quantities of *powder* are fired in different receivers, are reciprocally as the capacities of thoſe receivers; and conſequently as the denſity of the produced fluid in each.

To determine the elaſticity and quantity of this elaſtic fluid, produced from the exploſion of a given quantity of *gun-powder*, Mr. Robins premiſes, that the elaſticity of this fluid increaſes by heat, and diminiſhes by cold, in the ſame manner as that of the air; and that the denſity of this fluid, and conſequently its weight, is the ſame with the weight of an equal bulk of air, having the ſame elaſticity and the ſame temperature. From theſe principles, and from his experiments, for a detail of which we muſt refer to the book itſelf, he concludes, that the fluid produced by the firing of *gun-powder* will be $\frac{3}{770}$ of the weight of the *gun-powder*; and the ratio of the reſpective bulks of the *powder*, and the fluid produced from it, will be, in round numbers, 1 to 244. See New Princip. of Gunnery, Scholium to Prop. II.

Hence we are certain, that any quantity of *powder* fired in any confined ſpace, which it adequately fills, exerts at the inſtant of its exploſion againſt the ſides of the veſſel containing it, and the bodies it impells before it, a force at leaſt 244 times greater than the elaſticity of common air, or, which is the ſame thing, than the preſſure of the atmoſphere; and this without conſidering the great addition which this force will receive from the violent degree of heat with which it is endued at that time; the quantity of which augmentation is the next head of Mr. Robins's enquiry. He determines that the elaſticity of the air is augmented, when heated to the extremeſt heat of red-hot iron, in the proportion of 796 to $194\frac{1}{3}$; and ſuppoſing that the flame of fired *gun-powder* is not leſs hot than red-hot iron, and the elaſticity of the air, and conſequently of the fluid generated by the exploſion, being augmented by the extremity of this heat in the ratio of 796 to $194\frac{1}{3}$, it follows, that if 244 be augmented in this ratio, the reſulting number, which is $999\frac{3}{4}$, will determine how many times the elaſticity of the flame of fired *powder* exceeds the elaſticity of common air, ſuppoſing it to be confined in the ſame ſpace which the *powder* filled before it was fired.

Hence then the abſolute quantity of the preſſure exerted by *gun-powder* at the moment of its exploſion, may be aſſigned; for ſince the fluid then generated, has an elaſticity $999\frac{3}{4}$, or in round numbers, 1000 times greater than common air; and ſince common air, by its elaſticity, exerts a preſſure on any given ſurface equal to the weight of the incumbent atmoſphere, with which it is in equilibrio, the preſſure exerted by fired *powder*, before it has dilated itſelf, is 1000 times greater than the preſſure of the atmoſphere, and conſequently the quantity of this force, on a ſurface of an inch ſquare, amounts to above ſix tun weight; which force, however, diminiſhes, as the fluid dilates itſelf.

Tho' it has here been ſuppoſed, that the heat of *gun-powder*, when fired in any conſiderable quantity, is the ſame with iron heated to the extremity of a red heat, or to the beginning of a white heat, yet it cannot be doubted but that the fire produced in the exploſion is ſomewhat varied (like all other fires) by a greater or leſs quantity of fuel; and it may be preſumed, that according to the quantity of *powder* fired together, the flame may have all the different degrees from that of a languid red heat to the heat ſufficient for the vitrification of metals; but as the quantity of *powder* requiſite for the production of this laſt mentioned heat, is certainly greater than what is ever fired together for any military purpoſe, we ſhall not be far from our ſcope, if we ſuppoſe the heat of ſuch quantities as come more frequently in uſe to be, when fired, nearly the ſame with the ſtrongeſt heat of red-hot iron; allowing a gradual augmentation to this heat in larger quantities, and diminiſhing it when the quantities are very ſmall.

Some authors have attributed the force of *gun-powder*, or at leaſt a conſiderable part of it, to the action of the air contained

tained either in the *powder* or between the intervals of the grains. They have ſuppoſed that air to exiſt in its natural elaſtic ſtate, and to receive all its addition of force from the heat of the exploſion; but from what was ſaid before, relating to the increaſe of the elaſticity of the air by heat, we may conclude, that the heat of the exploſion cannot augment the elaſticity to five times its common quantity; conſequently, the force ariſing from this cauſe only, cannot amount to more than the 200th part of the real force exerted on this occaſion. Ibid. p. 43.

We muſt here obſerve, that the experiment of firing *gun-powder*, in the top of a tube, by means of a burning-glaſs, and thereby making the water deſcend, and hence deducing that there is a permanent air or elaſtic fluid contained in *gun-powder*, and that thoſe who pretend to account for the effects of *gun-powder*, from the rarefaction of the natural air, alledge an inſufficient cauſe; this, I ſay, was ſo long ago as the year 1690, ſhewn by Mr. John Bernoulli in his diſſertation *De effervescentia et fermentatione*. But as the experiment of this ingenious author was made with ſo very ſmall a quantity of *powder* as four grains or corns *(granulæ)* and that the ſpace the water ſubſided was not exactly meaſured; it is no wonder that he ſhould conclude this factitious air to be only ſomething more than 100 times *(centies et amplius)* denſer than the natural air. See *Jo. Bernoulli*, Oper. vol. i. p. 35, 36.

But if this gentleman has ſuppoſed the force of *gun-powder* too little, his ſon Mr. Daniel Bernoulli, in his *Hydrodynamica*, has on the other hand ſuppoſed it a great deal too much, making its elaſticity not leſs than 10000 times greater than that of the air. His reaſons are founded, chiefly, on the great quantity of *powder* that eſcapes unfired from guns. But that this quantity of unfired *powder* is not very conſiderable, ſeems to be fully proved under the head GUNNERY.

The variations of the denſity of the atmoſphere does not any way alter the action of *powder*. By comparing ſeveral trials, made at noon in the hotteſt ſummer ſun, with thoſe made in the freſhneſs of the morning and the evening, no certain difference could be perceived; and it was the ſame with thoſe made in the night and in winter. Indeed, conſidering that the ſame quantity of that elaſtic fluid in which the force of *powder* conſiſts, is generated in a vacuum and in common air, it is difficult to conceive how this force can be affected by the greater or leſs denſity of the atmoſphere.

But the moiſture of the air has a very great influence on the force of *powder*, for that quantity which in a dry ſeaſon would communicate to a bullet a velocity of 1700 feet in one ſecond, will not in damp weather communicate a velocity of more than 12 or 1300 feet in a ſecond, or even leſs, if the *powder* be bad and negligently kept. New Princip. of Gunnery, p. 43, 44.

This agrees with an experiment made before a committee of the Royal Society, where *powder* having been dried by being put into a phial placed in boiling water, threw a ball out of a mortar twice as far as the ſame quantity of *powder* taken out of the ſame barrel before it was dried. Now the ranges under the ſame circumſtances of charge, elevation, *&c.* being as the ſquares of the velocities of the ball, theſe velocities, in this experiment, will be to each other nearly as 17 to 12, which gives ranges as 289 to 144. Phil. Tranſ. N°. 465, p. 182, 183.

If *powder* be damp, ſhot made with equal quantities of it out of the ſame parcel, will differ conſiderably from each other, perhaps ten times more than if the *powder* was in good order. A ſmall charge ſeems to loſe a greater part of its force than a larger, each being equally damp. Another circumſtance attending damp *powder* is, a remarkable foulneſs in the piece, after firing, much beyond what ariſes from an equal quantity of dry *powder*. New Princip. of Gunnery, p. 44.

That *powder* will imbibe moiſture from the air, and thereby increaſe in weight, is certain. A parcel of very good *powder* being placed on a white paper, pierced with a great number of fine holes, and held over the ſteam of hot water; the *powder* in half a minute was increaſed about $\frac{1}{50}$ in weight. Another parcel continuing longer in the ſteam was increaſed by $\frac{1}{24}$ part. That the moiſture of the atmoſphere has a like effect, appears from this; that an ounce of *powder* kept for ſome time in a room having a fire in it every day, being dried before the fire, loſt above $\frac{1}{100}$ part of its weight; one third of which it regained in leſs than two hours, by being removed to a part of the room diſtant from the fire. And as the air is often much moiſter than when this experiment was tried, and that the open air is more moiſt than a room with a fire; it cannot be doubted but that the twentieth or thirtieth part of the ſubſtance of the beſt *powder* is water. Now as a certain quantity of water mixed with *powder* will prevent its firing at all, it cannot be doubted but every degree of moiſture muſt abate the violence of the exploſion; and hence the effects of damp *powder* are not hard to account for.

It is to be obſerved, that the moiſture imbibed by *powder* does not render it leſs active when dried again. Indeed, if *powder* be expoſed to the greateſt damps without any caution, or if common ſalt abounds in it, as often happens thro' negligence in refining the nitre, the moiſture it imbibes may, in ſuch caſes, be perhaps ſufficient to diſſolve ſome part of the nitre, which is a laſting damage that no drying can retrieve. But when tolerable care is taken in preſerving *powder*, and the nitre it is compoſed of has been well purged from common ſalt, it will retain its force much longer than is uſually ſuppoſed; and it is ſaid that *powder* has been known to have been preſerved for 50 years, without any apparent damage from its age.

Some care is neceſſary in the drying of damp *gun-powder*; for there is a degree of heat, which tho' not ſufficient to fire the *powder*, will yet melt the brimſtone, and deſtroy the texture of the grains. Nay more, there is a heat with which the brimſtone will flame and burn away gradually, and yet the *powder* will not explode; of this any one may ſatisfy himſelf by heating a piece of iron red-hot, and then throwing a few grains of *powder* on it at different intervals, during the time of its cooling, for by this means he will find, that at a certain time the ſeparate grains that fall on the iron will not explode, but will burn with a ſmall blue flame for ſome ſpace of time, the grain ſtill remaining unconſumed. Indeed, when it has begun to burn in this manner, it ſometimes ends with exploding, but this more commonly happens when a number of grains lie near together, for then tho' each ſeparate flame is not ſufficient to explode its reſpective grain, yet the whole fire made by them all together grows ſtrong enough at laſt to end in a general exploſion; however, by attending to the proper temperature of the iron, and ſpreading the grains, two or three inches ſquare may be covered with a blue lambent flame, which will laſt a conſiderable time without any exploſion, and the grains afterwards will not apparently have loſt either their colour or their ſhape. Now ſince theſe grains, when the brimſtone is thus burnt or even melted out of them, will no longer act as *powder*, it is evident that *powder* may be ſpoiled by being dried with too violent a heat. Ibid. Schol. to Prop. x.

The velocity of expanſion of the flame of *gun-powder*, when fired in a piece of artillery without either bullet or other body before it, is prodigious. By the experiments of the author ſo often quoted, it ſeems this velocity cannot be much leſs than 7000 feet in a ſecond. This however muſt be underſtood of the moſt active part of the flame. For, as was obſerved before, the elaſtic fluid in which the activity of *gun-powder* conſiſts, is only $\frac{3}{10}$ of the ſubſtance of the powder, the remaining $\frac{7}{10}$ will in the exploſion be mixed with the elaſtic part, and will by its weight retard the activity of the exploſion; and yet they will be ſo completely united as to move with one common motion, but the unelaſtic part will be leſs accelerated than the reſt, and ſome of it will not even be carried out of the barrel, as appears by the conſiderable quantity of unctuous matter, which adheres to the inſide of all fire-arms after they have been uſed. Theſe inequalities in the expanſive motion of the flame, render it impracticable to determine its velocity otherwiſe than from experiments. The foundation of which determination is, that a barrel being fixed in a proper ſituation on a pendulum, ſuch as deſcribed under the head GUNNERY, and being charged with 12 dwt. of powder, without either ball or wad, the powder being only put together by the rammer; on the diſcharge the pendulum aſcended through an arch whoſe chord was 10 or $10\frac{1}{10}$ inches. Now if the piece be again loaded with the ſame quantity of powder, rammed down by a wad of tow weighing 1 dwt. it may be ſuppoſed, that this wad being very light, will preſently acquire that velocity, with which the elaſtic part of the fluid will expand itſelf when uncompreſſed; and it was accordingly found, that the chord of the aſcending arch was by this means augmented to 12 inches; ſo that by the additional weight of 1dwt. of matter moving with the velocity of the ſwifteſt part of the vapour, the pendulum aſcended through an arch whoſe chord was two inches longer than before. And by calculating upon theſe facts and the principles laid down in his book, Mr. Robins determines that the velocity with which this 1 dwt. of matter moved, muſt be about 7000 feet in one ſecond. Ibid. prop. xi.

It is this prodigious celerity of expanſion of the flame of fired *gun-powder*, which is its peculiar excellence, and the circumſtance in which it ſo eminently ſurpaſſes all other inventions, either antient or modern, for the purpoſe of military projections: for as to the quantity of motion of theſe projectiles only, many of the warlike machines of the antients produced this in a degree far ſurpaſſing that of our heavieſt cannon-ſhot or ſhells; but the great celerity given to theſe bodies cannot be in the leaſt approached by any other means than by the flame of powder. The reaſon of this difference is, that the antients could by weights, or the elaſticity of ſprings and ſtretched cords, augment their powers to any degree deſired; but then each addition of power brought with it a proportional addition of matter to be moved: ſo that as the power increaſed, thoſe parts of the machine which were to communicate motion to the projectile and were conſequently

to move with it, were likewiſe increaſed; and thence it neceſſarily happened, that the action of the power was not ſolely employed in giving motion to the impelled body, but much the greateſt part of it was ſpent in accelerating thoſe parts of the machine in which the power reſided, to enable them to purſue the body to be projected with perpetual impulſe, during its whole paſſage through the extent of their activity. Hence then it came to paſs, that, though theſe antient machines could throw enormous weights, they could project them but with ſmall degrees of celerity, compared with what we can communicate to our cannon and muſket-ſhot; whence in all operations, where theſe great velocities are uſeful, our machines are infinitely ſuperior to thoſe of antiquity; although, in more confined and ſhorter projections, theſe laſt have ſome advantage which may yet render them worthy of the attention of thoſe military geniuſes, who have capacity enough to conſider each part of the profeſſion according to its true and genuine value, independent of the partial eſtimation of the times they live in. Ibid. p. 55.

Powder being a mixture of ſulphur and charcoal, which are very inflammable ſubſtances, with ſalt-petre, which in itſelf is not, if the ſalt-petre be too much in quantity, when compared with the other two, their burning may not be ſufficient to conſume the whole of the ſalt-petre; whence the fire may be leſs violent, and conſequently the powder leſs vigorous, than if ſome of the ſalt-peter was taken away, and a like quantity of the other materials were added in its ſtead. On the other hand, if the ſalt-petre in the compoſition be leſs than what the burning of the other two ſubſtances can eaſily conſume, the fire will be leſs active than it ought to be, becauſe it is not augmented ſo much as it would be if a large quantity of ſalt-petre had been added to the compoſition.

Hence it appears that the goodneſs of powder is not to be eſtimated only from the quantity of ſalt-petre contained in it, although that ſubſtance ſeems to be the baſis of the elaſtic fluid, in which its force conſiſts. For ſince the converting of the ſalt-petre into that fluid, and the elaſticity of the fluid, afterwards, depend in ſome meaſure on the violence of the fire produced at the exploſion, it is plain that there is a certain proportion in the mixture of the materials, which will beſt contribute to this purpoſe, and conſequently to the perfection of the powder.

What this proportion is, has been aſcertained by experience, and it ſeems now to be generally agreed, that in any quantity of powder $\frac{3}{4}$ of it ſhould be ſalt-petre, the remaing $\frac{1}{4}$ conſiſting of equal quantities of ſulphur and charcoal. This is the proportion followed by the French, and by moſt nations in Europe: we, indeed, pretend to a greater degree of nicety in our proportions; though, it is ſaid, they do not greatly differ from what is here mentioned; nor is it certain that they are preferable: this however may be depended on, that no methods of proving powder, hitherto generally practiſed in England, could at all aſcertain the difference; and other powders made with the uſual proportions, are nothing inferior to ours. Ibid. p. 62.

But it is not the due proportion of the materials only, which is neceſſary to the making of good powder; another circumſtance, not leſs eſſential, is the mixing them well together; if this be not effectually done, ſome parts of the compoſition will have too much ſalt-petre in them, and others too little; and in either caſe there will be a loſs of ſtrength in the powder.

As the excellence of powder then depends on ſo many particulars, in the quality and quantity of the materials, and in the working them together, it is, doubtleſs, of great importance, that thoſe who receive the public ſtores ſhould have it in their power to ſatisfy themſelves about the goodneſs of what is delivered to them. The method moſt commonly followed for this purpoſe, here with us, ſays the author above quoted, is to fire a ſmall heap of it on a clean board, and to attend nicely to the flame and ſmoke it produces, as likewiſe to the marks it leaves behind it on the table; from all which inſtructive particulars the merit of the powder is aſcertained with great accuracy, as is pretended: but beſides this uncertain method, which, how much ſoever it may be practiſed, none will undertake ſeriouſly to defend, there are, on particular occaſions, other contrivances made uſe of, all which bear ſome analogy to the common powder-triers, ſold at the ſhops: only they are more artfully fabricated, and inſtead of a ſpring they move a weight, which is a more certain and equable power.

But theſe machines, though more perfect than the common powder-triers, are yet liable to great irregularities; for as they are all moved by the inſtantaneous ſtroke of the flame, and not by its continued preſſure, they do not determine the force of the fired powder with that certainty and uniformity which were to be deſired in theſe kinds of trials: and therefore, the method followed by the French, in the receiving of powders from the makers, ſeems to be much better. Their practice is thus:

They have, in each magazine, a ſmall mortar caſt with its bed, according to a determined pattern, which is the ſame throughout the kingdom: this mortar is always pointed at 45°, and it contains juſt three ounces of powder; and it is a ſtanding maxim, that no powder can be received into their ſtores, unleſs three ounces of it, placed in the chamber of this mortar, throws a ſolid ball of 7 $\frac{1}{2}$ inches diameter to the diſtance of at leaſt 55 French fathom. But if each barrel of powder was to be proved in this manner, the trouble of charging the mortar, &c. would be intolerable, and the delay ſo great, that no buſineſs of this kind could ever be finiſhed. The method by firing againſt a pendulum, in the manner mentioned under the head GUNNERY, ſeems a readier way; but ſtill it requires ſome nicety and time, which it were to be wiſhed could be obviated. Ibid. p. 63.

It has been obſerved that a heap of *gun-powder* of a certain diameter being fired, will always ſet fire to another heap not diſtant from the former above eight times its diameter.

Perſons keeping more than 200lb. weight of *gun-powder* at one time, within the cities of London and Weſtminſter, or their ſuburbs, &c. are liable to forfeitures if it be not removed; and juſtices of peace may iſſue warrants to ſearch for, ſeize, and remove the ſame, 5 and 11 Geo. I. and 5 Geo. II. cap. 20.

GURGIPTING, in falconry, a term uſed when a hawk is ſtiff and choaked up. Ruſt. Dict. in voc.

GUTTA *roſacea*, in medicine, denotes a red or pimpled face; a diſtemper, which, tho' not always owing its original to hard drinking, is nevertheleſs moſt incident to tiplers of ſtrong beer, wines, ſpirits, &c.

As to the cure, beſides making a revulſion by bleeding, bliſtering, cupping, iſſues, &c. the diet ought to be moiſtening and cooling, as lettuce, purſlain, ſorrel and ſpinach: the drink may be an emulſion of the cold ſeeds, milk and water, clarified whey, &c.

In the uſe, however, of this cooling regimen, great caution is neceſſary; for if a perſon be taken off at once from his ſtrong liquors, and allowed nothing but whey, or milk and water, it may coſt him his life, by haſtening a ſudden decay of heat, palling his appetite, and bringing on a leucophlegmatia, or dropſy. *James*'s Medicinal Dictionary, in voc.

As for what concerns topics, much caution is likewiſe to be uſed. If there be only redneſs without pimples, and the diſeaſe recent, refrigerants and repellants take place: but if puſtules appear, diſcutients muſt be mixed; and if theſe puſtules ſeem hard, and the diſeaſe be of long ſtanding, there may be reaſon for emollients to ripen and digeſt the tough and viſcid matter, which is afterwards to be let out. Id. ibid.

If the diſeaſe be ſtubborn, and the tubercles grown hard, we are to begin with emollients, both fotus and ointment: ſuch are the decoction of mallows, vervain, ſolomon's ſeal, and linſeed; alſo a cerate of ſperma ceti, or Bate's white cerate. Id. ibid.

GUTTER *(Cycl.)* — *Gutters* are either parallel to the horizon, or vertical. The former ſhould be made with a proper deſcent, that there may be a good current, as the workmen term it; for if laid too level, the water will be apt to ſtand in plaſhes.

As to the vertical *gutters*, or thoſe formed by two roofs meeting at right angles to each other, or by the end of one roof joining to the ſide of another, they are either made of lead, or tiles, which are either plain or concave; theſe laſt are called *gutter*-tiles, and may be eaſily laid. But in laying on the plain tiles the workman begins at one ſide of the *gutter*, and ſo works acroſs, as if it were plain work, and then brings the next row of tiles back again; ſo that he works forth and back, to and fro, from right to left. By this means the *gutters* laid after this manner are not angular, but of a kind of diſtorted curvilinear form, which prevents the mortar from being waſhed away with the rain. Build. Dict. in voc.

GWAYF, or WAIF. See WAIF, *Cycl.*

GYMNARTHRIDIA, in the hiſtory of inſects, a ſeries or claſs of inſects, which have ſoft and naked bodies, furniſhed with limbs. See INSECT, *Append.*

Theſe have been generally called *zoophytes*, a term expreſſing creatures partly of an animal, and partly of a vegetable nature; but as it is now well known that there are none ſuch, it is proper the term *zoophyte* ſhould no longer be retained.

Under this claſs are comprehended the *limax*, or the naked ſnail, the *lernea*, *meduſa*, *aphrodita*, *amphitrite*, &c. *Hill*, Hiſt. Anim. p. 87. See the articles LIMAX, LERNEA, &c. *Append.*

GYMNOSOPHISTS *(Cycl.)* — There were likewiſe African *gymnoſophiſts*, who dwelt upon a mountain in Ethiopia, near the Nile, without the accommodation either of houſe or cell. Theſe did not form themſelves into ſocieties, like thoſe of India; but each had his private retirement, where he ſtudied and performed his devotions by himſelf. If any perſon had killed another by chance, he applied to theſe ſages for abſolution, and ſubmitted to whatever penances they enjoyned. They pretended to an extraordinary frugality, and lived only upon the fruits of the earth. Lucian aſcribes to theſe philoſophers ſeveral new diſcoveries in aſtronomy, *Broughton*, Dict. Relig. in voc.

GYMNIA, in zoology, a new eſtabliſhed claſs of animalcules, containing ſuch as have neither tail, nor any viſible limbs. See the article ANIMALCULE, *Append.*

GYPSUM *(Suppl.)* — GYPSUM *ſtriatum*, *ſtriated plaſter-ſtone*, in natural hiſtory, the name commonly uſed for the whitiſh leſs gloſſy *tricheria*, with ſhort thick filaments. See the article TRICHERIA, *Suppl.*

It is of a rude, irregular and unequal ſurface, and lax, friable texture, found in maſſes of various ſizes, from one to twelve or eighteen inches over, but always broad and flat; its thickneſs being uſually but an inch and an half, and in the broadeſt pieces ſeldom much more than two inches: it is compoſed of conſiderably large and coarſe longitudinal filaments, running uſually very evenly through the maſs: it is eaſily fiſſile in a perpendicular direction, that is parallelly to the arrangement of theſe filaments: it is of a dull whitiſh colour, and its filaments, when examined ſingly, have a ſlight ſhare of tranſparency.

It will not at all give fire with ſteel, nor ferment with *aqua fortis*, but very readily calcines to a perfectly white ſubſtance. It is found in clay and marle pits, among the ſtrata of gravel, and in the fiſſures of ſtone, and is common in Yorkſhire and other parts of the kingdom.

The Germans uſe it in the fluxing the ſulphureous ores of metals; and our druggiſts ſell it under the name of Engliſh talc, for cleaning of ſilver lace. See *Hill*'s Hiſt. Foſſ. p. 89.

Tymphacian GYPSUM, a name given by the antients to the hard, fungous, alkaline, white marle, otherwiſe called *calx nativa*, or native lime. See the article CALX, *Suppl.*

GYRINUS, in zoology, the name ſometimes uſed for a ſpecies of *mordella*. See the article MORDELLA, *Suppl.*

GYRLE, among ſportſmen, See the article GIRLE, *Append.*

GYROVAGI, in eccleſiaſtical writers, monks who leaving their monaſteries, under the pretence of piety, wandered about from one religious houſe to another. *Du Cange*, Gloſſ. Lat. tom. ii. p. 683.

The ſame appellation was alſo given to prieſts, who left their pariſhes. Id. ibid.

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HÆMATOPUS, the *Sea Pye*, in Ornithology, a genus of birds of the order of the Scolopaces.

Its beak is of a compreſſed form, ending in a cuneiform figure, and the upper and under chaps are equal in length.

Authors deſcribe it under different names, ſome calling it the *Pica Marina*, others *Himantopus*; but *Hæmatopus* ſeems the moſt proper. See the articles HIMANTOPUS, and PICA *marina*, *Suppl.*

HAIR-*Bell*, in botany, the name by which ſome call the *Hyacinth*. See the article HYACINTH, *Suppl.*

HAIR-*Worm*, the Engliſh name of a ſpecies of worms, called by zoologiſts *Chætia*. See the article CHÆTIA, *Append.*

HAKEL, or HATCHEL. See HATCHEL, *Append.*

HALIOTIS, in the natural hiſtory of ſhells, the name of a large genus, called in Engliſh *Ear-ſhells*. See the article EAR-*Shells*, *Suppl.*

HALL (*Cycl.*) — The length of a *Hall* ſhould be at leaſt twice and a quarter its breadth, and in great buildings three times its breadth. As to the height of *Halls*, it may be two thirds of the breadth; and if made with an arched ceiling, it will be rendered much handſomer, and leſs ſubject to fire. In this caſe its height is found by dividing its breadth into ſix parts, five of which will be the height from the floor to the under ſide of the key of the arch. Build. Dict. in voc.

HALM. See the article HAUM, *Append.*

HAMMER-*headed-ſhark*, the Engliſh name of the *Zygæna*. See the article ZYGÆNA, *Suppl.*

HARDBEAM, or HORNBEAM, in botany, the name by which ſome call the *Carpinus* of authors. See the article CARPINUS, *Suppl.*

HARE. (*Suppl.*)—*Sea*-HARE, the Engliſh name of a genus of inſects, called by Dr. Hill *Lernea*. See the article LERNEA, *App.*

HARE's-*foot Trefoil*, in botany. See the articles TRIFOLIUM and TREFOIL, *Suppl.*

HARE's *Lettuce*, in botany, the name by which ſome call the *Sonchus*, or Sow-thiſtle. See the article SONCHUS, *Suppl.*

HARE's-*Strong*, in botany, the name by which the *Peucedanum* or Hog's-fennel, is ſometimes called. See the article PEUCEDANUM, *Suppl.*

HARLE, a name uſed in ſome parts of the kingdom for the *Merganſer*. See the Article MERGANSER, *Suppl.*

HARP-*Shell*, a ſpecies of *Dolium*. See DOLIUM.

HARIOT. See the article HARIOT, *Cycl.*

HART-*wort*, in botany, a name ſometimes given to the *Tordylium* of authors. See the article TORDYLIUM, *Suppl.*

Ethiopian HART-*wort*, the name by which ſome call the *Peucedanum*, or Hog's-fennel. See the article PEUCEDANUM, *Suppl*,

HART's-*horn*, in botany, the name of a genus of plants, otherwiſe called *Buck's-horn*, and by botaniſts *Coronopus*. See the article CORONOPUS, *Suppl.*

HASEL, or HASLE, in botany. See the article HAZLE, *Suppl.*

HATCHEL, or HITCHEL, in the manufactory of flax, hemp, *&c.* a tool, not unlike a card, for dreſſing and combing them into fine hairs. See the article CARD, *Cycl.*

They conſiſt of ſharp pointed iron-pins, or teeth, ſet orderly in a board. Dict. Ruſt. in voc.

Of theſe there are ſeveral ſorts, ſome with finer and ſhorter teeth, others with them coarſer and longer.

HATCHET-*Vetch*, in botany, the name by which the *Securidaca*, a diſtinct genus of plants, is ſometimes called. See the article SECURIDACA, *Suppl.*

HATCHING (*Cycl.*)—The artificial method of *hatchings* eggs, as practiſed in Egypt, has been mentioned in the Cyclopædia; and Mr. Reaumur has diſcovered, that the heat neceſſary for this purpoſe, is nearly the ſame with that mark'd 32, upon his thermometer, or that mark'd 96 on Fahrenheit's. If, therefore, eggs be kept in this degree of heat, they will as certainly *hatch*, as if the parent hen had ſat upon them; and, indeed, it is impoſſible it ſhould be otherwiſe, ſince this heat anſwers nearly to that of the ſkin of the hen, or even of mankind; ſo that the empreſs Livia, as Pliny relates, might truly *hatch* a chicken in her boſom, if ſhe had but the patience to keep an egg there, for the ſame number of days that it ought to have continued under a hen.

After many experiments, Mr. Reaumur found, that ſtoves, heated by means of a baker's oven, ſucceeded equally well with thoſe made hot by layers of dung. The furnaces of glaſs-houſes, and thoſe of the melters of metals, might, no doubt, be made to anſwer the ſame purpoſe. If, therefore, an eaſy method could be found to regulate the heat of the ſtove, it would be extremely convenient for bakers or paſtry-cooks to *hatch*, with little or no expence, a very great number

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of chickens; which they might diſpoſe of to the country people, to be reared up till marketable. Should a thermometer be judged neceſſary for this purpoſe, it will be ſufficient to mark on it only ſuch degrees as are abſolutely neceſſary; by which means the inſtrument will not only come cheaper, but be more readily underſtood by the ignorant people, for whoſe uſe it is deſigned.

Such an inſtrument, however, may be wholly diſpenſed with; a lump of butter, of the ſize of a walnut, melted with half as much tallow, ſerving to indicate the heat of the ſtove with ſufficient exactneſs. When the heat is too great, this mixture, which is to be kept in a phial, will become as liquid as oil; and when the heat is too ſmall, it will remain fixed in a lump; but it will flow like thick ſyrup, upon inclining the bottle, if the ſtove be of a right temper. Great attention, therefore, ſhould be given to keep the heat always at this degree, by letting in freſh air, if it be too great, or ſhutting the ſtove more cloſe, if it be too ſmall.

But this is not all. That all the eggs in the ſtove may equally ſhare the irregularities of the heat, it will be neceſſary to ſhift them from the ſides to the center, and *vice verſa*; thereby imitating what the hens themſelves do by thoſe upon which they ſit; for hens are frequently ſeen to make uſe of their bills, to puſh to the outer parts thoſe eggs that were neareſt to the middle part of their neſts, and to bring into that middle part ſuch as before lay neareſt to the ſides of the ſame.

As to the form of the ſtoves, no great nicety is neceſſary. A chamber over an oven will do very well; only in order to aſcertain the due degree of heat, it will be neceſſary to have phials of butter, as directed above, in ſeveral parts of the room; and when the heat wants to be either increaſed or diminiſhed, it is ſufficient to diminiſh or increaſe the communication between the air in the room and that abroad, by opening or ſhutting ſome of the openings made in the wall for that purpoſe.

In order to cheriſh the new hatch'd chickens, capons may be taught to tend them in the ſame manner as hens do. Mr. Reaumur tells us, that he has ſeen above two hundred chickens at once, all led about and defended by only three or four ſuch capons; which clucked like hens, to call in the chickens that had ſtrayed too far off; and even redoubled their call, when they found any nice bits, to invite the young brood to come and pick them up. Nay cocks may be taught to do the ſame office, which they, as well as the capons, will continue to do all their lives afterwards.

But Mr. Reaumur, not ſatisfied with the aſſiſtance he could thus procure from cocks and capons, has invented a ſort of low boxes without bottoms, and lined with furs. Theſe, which he calls artificial parents, not only ſhelter the chickens from the injuries of the air, but afford a kindly warmth; ſo that they preſently grow fond of them, and take the benefit of their ſhelter as readily as they would have done under the wings of a hen.

For a few weeks after *hatching*, it will be neceſſary to keep the chickens in a room artificially heated, and furniſhed with theſe boxes; but afterwards they may be ſafely expoſed to the air in the court-yard, in which it may not be amiſs to place one of theſe artificial parents to ſhelter them, ſhould there be any occaſion.

As to the manner of feeding the young brood, they are generally a whole day after being *hatched*, before they take any food at all; and then a few crumbs of bread may be given them for a day or two, or millet-ſeeds mixed with the crumbs; after which they will begin to pick up inſects and graſs for themſelves.

People in the country, who have plenty of conveniencies for the raiſing of poultry, will hardly give themſelves the trouble to *hatch* chickens in this artificial manner. It is in villages near great towns, and principally in the neighbourhood of the capital city, that it would be of the greateſt importance to promote the eſtabliſhment of this kind of ſtoves. Vid. Mr. *Trembley*'s Abſtract of the Art of Hatching domeſtic fowls, tranſlated from the original treatiſe of Mr. Reaumur, where he explains every difficulty.

HATCHING *of Bees*. See the article *Bee*-WORM, *Suppl.*

HATCHING, among miners. See the article DIGGING, *Suppl.*

HAVER, a word uſed in ſome parts of the kingdom for oats. Dict. Ruſt. in voc.

HAUGH, the ſame with HAW. See the article HAW, *Suppl.*

HAUM, HALM, or HAWM, among farmers, denotes the ſtem or ſtalk of corn, peaſe, beans, &c. from the root to the ear. Dict. Ruſt. in voc.

HAWK (*Suppl.*)—*Make* HAWK, in falconry, a name given to an old ſtanch hawk; which, being uſed to fly, will teach a young one. Ruſt. Dict. in voc.

HAW-*thorn*, the Engliſh name of ſeveral ſpecies of Meſpilus, or Medlar. See the article MESPILUS, *Suppl.*

HAWM. See the article HAUM, *Append.*

HAZLE, or HAZEL *(Suppl.)*—*Witch*-HAZLE, a name ſometimes uſed for the *Ulmus*, or Elm. See the articles ULMUS and ELM, *Suppl.*

HEART-*burn*. In ſurfeits, or upon ſwallowing without due maſtication; when meats are eat tough and fat, or with farinaceous ſubſtances unfermented; or when by any accident the ſaliva is vitiated, too ſcanty, or not intimately mixed with the food, the fermentation becomes tumultuous, the ſtomach ſwells with air, and this extraordinary commotion being attended with an unuſual heat, brings on the uneaſineſs called the *heart-burn*; which is remedied by whatever promotes a greater ſecretion of ſalvia, or helps to mix it with our aliment. *Pringle*, Obſerv. on the diſeaſes of the army, p. 168. See the article FERMENTATION, *Append.*

HEART's-*eaſe*, a name ſometimes uſed for a ſpecies of violet, otherwiſe called *Panſay*. See the article VIOLET, *Suppl.* It is ſaid to be good for ruptures and the falling ſickneſs. Ruſt. Dict. in voc.

HEAT *(Suppl.)* — *Heat* is found to expand and dilate metals conſiderably, as uppears from an experiment of Muſchenbroek, who tells us, that having prepared cylindric rods of iron, ſteel, copper, braſs, tin, and lead, he expoſed them firſt to a pyrometer with two flames; then ſucceſſively to one with three, four, and five flames. But previous to this trial, he took care to cool them equally, by expoſing them ſome time upon the ſame ſtone; when it began to freeze, and Fahrenheyt's thermometer was at 32 degrees. The effects of which experiment are digeſted in the following table, where the degrees of expanſion are marked in parts equal to the $\frac{1}{125\,00}$ part of an inch.

Expanſion of	Iron	Steel	Copper	Braſs	Tin	Lead
By one flame	80	85	89	110	153	155
By two flames, placed cloſe together	117	123	115	220		274
By two flames 2 $\frac{1}{2}$ inches diſtant	109	94	92	141	219	263
By three flames placed cloſe together	142	168	193	275		
By four flames placed cloſe together	211	270	361			
By five flames	230	310	310	377		

It is to be obſerved of tin, that it will eaſily melt, when heated by two flames placed together. Lead commonly melts with three flames, placed together, eſpecially if they burn long.

From theſe experiments it appears at firſt view, that iron is the leaſt rarified of any of theſe metals, whether it be heated by one or more flames; and therefore is moſt proper for making machines, or inſtruments, which we would have free from any alterations by heat or cold, as the rods of pendulums for clocks, *&c.* So likewiſe the meaſures of yards or feet ſhould be made of iron, that their length may be as nearly as poſſible the ſame, ſummer and winter.

The expanſion of lead and tin, by only one flame, is nearly the ſame; that is, almoſt double of the expanſion of iron. It is likewiſe obſervable, that the flames, placed together, cauſe a greater rarefaction, than when they have a ſenſible interval between them; iron, in the former caſe, being expanded 117 degrees, and only 109 in the latter; the reaſon of which difference is obvious.

By comparing the expanſions of the ſame metal, produced by one, two, three, or more flames, it appears, that two flames do not cauſe double the expanſion of one; nor three flames three times that expanſion, but always leſs; and theſe expanſions differ ſo much the more from the ratio of the number of flames, as there are more flames acting at the ſame time.

It is alſo obſervable, that metals are not expanded equally, at the time of their melting, but ſome more, ſome leſs: Thus tin began to run, when rarified 219 degrees; whereas braſs was expanded 377 degrees, and yet was far from melting. *Deſagul.* vol. 1. p. 423, *ſeqq.*

HEAT, in Medicine. Great *Heats* are not ſo much the immediate, as the remote cauſe of a general ſickneſs, by relaxing the fibres, and diſpoſing the fibres to putrefaction; eſpecially among ſoldiers, and perſons expoſed the whole day to the ſun; for the greateſt *heats* are ſeldom found to produce epidemic diſeaſes, till the perſpiration is ſtopped by wet cloaths, fogs, dews, damps, &c. and then ſome bilious or putrid diſtemper is the certain conſequence, as fluxes, and ardent intermitting fevers. Nevertheleſs, it muſt be allow'd, that *heats* have ſometimes been ſo great, as to prove the more immediate cauſe of particular diſorders. As when centinels have been placed without cover, or frequent reliefs, in ſcorching *heats*; or when troops march, or are exerciſed in the *heat* of the day: or when people imprudently lie down and ſleep in the ſun: All theſe circumſtances are apt to bring on diſtempers, varying according to the ſeaſon of the year. In the beginning of ſummer, theſe errors produce inflammatory fevers; and, in the end of it, or in the beginning of autumn, a remitting fever, or dyſentery. *Pringle*, Obſerv. on the Diſeaſ. of the army, p. 79, *ſeqq.*

To prevent, therefore, the effects of intemperate *heat*, commanders have found it expedient ſo to order the marches, that the men come to their ground before the heat of the day; and to give ſtrict orders, that none of them ſleep out of their tents; which in fixed encampments may be covered with boughs, to ſhade them from the ſun. It is likewiſe a rule of great importance to have the ſoldiers exerciſed before the cool of the morning is over; for, by that means, not only the ſultry *heats* are avoided, but the blood being cooled, and the fibres braced, the body will be better prepared to bear the heat of the day. Laſtly, in very hot weather, it has been found proper to ſhorten the centinels duty, when obliged to ſtand in the ſun. Id. ibid. p. 95.

HEATH *(Suppl.)* — *Mountain*-HEATH, a name ſometimes given to the *Saxifrage* of botanical writers. See the article SAXIFRAGE, *Suppl.*

Berry-bearing HEATH, a name ſometimes given to a genus of plants, called by botaniſts *Empetrum*. See the article EMPETRUM, *Suppl.*

Low-pine HEATH, the name of a diſtinct genus of plants, called by botaniſts *Coris*. See the article CORIS, *Suppl.*

HECKLE, among hemp-dreſſers. See HATCHEL, *ſupra.*

HECTIC. See the article CONSUMPTION, *Append.*

HEDERA *(Suppl.)* —*Virginian*-HEDERA, the name by which Plukenet calls the *Meniſpermum* of Linnæus. See the article MENSPERMUM, *Append.*

HEDGE-*hog*, in zoology, the Engliſh name of a genus of animals, called by zoologiſts *Erinaceus*. See the article ERINACEUS, *Suppl.*

HEDGE-*hog*, in botany, the Engliſh name of a genus of plants, called by botaniſts *Erinacea*, See the article ERINACEA, *Suppl.*

Sea HEDGE-*hog*, the Engliſh name of a ſeries of ſhell-fiſh, called by different authors *Centronia*, *Echini marini*, *Echinodermata*, &c. See CENTRONIA, *Append.* and ECHINODERMA, *Suppl.*

HEDGE-*hog-Medica*, the name by which ſome call ſeveral ſpecies of *Medica*, or lucerne. See the article MEDICA, *Suppl.*

HEDGE-*hog-thiſtle*, a name ſometimes given to a diſtinct genus of plants, called by authors *Cactus*. See the article CACTUS, *Append.*

HEDGE-*hyſſop*, a name ſometimes given to a diſtinct genus of plants, called by botaniſts *Digitalis*. See the article DIGITALIS, *Suppl.*

HEDGE-*muſtard*, the name of a genus of plants, known among botaniſts by that of *Eryſimum*. See the article ERYSIMUM, *Suppl.*

HEDGE-*nettle*, a name ſometimes given to a genus of plants, called by botaniſts *Galeopſis*. See the article GALEOPSIS, *Suppl.*

HEDGE-*nettle-ſhrub*, a name by which ſome call the *Praſium*, a diſtinct genus of plants. See the article PRASIUM, *Suppl.*

HEDGE-*ſparrow*, the Engliſh name of a ſpecies of *Motacilla*, See the article MOTACILLA, *Suppl.*

HEDIUNDA, in botany, a name uſed by ſome writers for the *Ceſtrum* of Linnæus. See the article CESTRUM, *Append.*

HEDYSARUM, in the Linnæan ſyſtem of botany, the name of a large genus of plants; which that author makes to comprehend the *Hedyſarum*, *Onobrychis*, and *Alhagi* of Tournefort. See the articles HEDYSARUM and ONOBRYCHIS, *Suppl.* and ALHAGE, *Append.*

HEEL, among carpenters, denotes an inverted *Ogee*. See the article OGEE, *Cycl.*

HEINASE, among ſportſmen, a roe-buck of the fourth year. Ruſt. Dict. in voc.

HELEGUG, in zoology, a name given to the *Anas arctica*. See the article DUCK, *Suppl.*

HELENIUM, in botany, the name uſed by ſome for ſeveral ſpecies of *Aſter*, or ſtar-wort. See the article STAR-WORT, *Suppl.*

HELIANTHUS, in the Linnæan ſyſtem of botany, the name by which that author calls the *Corona ſolis*, or great *ſun-flower*. See the article SUN-*flower*, *Suppl.*

HELICHRYSUM, in botany, a name uſed by ſome authors for the *Gnaphalium*, or cudweed. See the article GNAPHALIUM, *Suppl.*

HELIOTROPE, in botany, the name by which ſome call the turnſol, a diſtinct genus of plants. See the article HELIOTROPIUM, *Suppl.*

HELIOTROPIUM is alſo a name uſed by ſome for a ſpecies of *Ricinoides*. See the article RICINOIDES, *Suppl.*

HELIOTROPIUM is likewiſe uſed by ſome for the *Helianthus*, *Corona ſolis*, or great ſun flower. See the article SUN-*flower*, *Suppl.*

HELLEBORE, in botany, the Engliſh name of a diſtinct genus of plants. See the article HELLEBORUS, *Suppl.*

Baſtard-HELLEBORE, the name of a genus of plants, called by authors *Helleborine*. See the article HELLEBORINE, *Suppl.*

White-HELLEBORE, the name of a genus of plants, otherwiſe called *Veratrum*. See the article VERATRUM, *Suppl.*

HELM, *(Cycl.)* a term uſed by country people for wheat or rye-ſtraw, bruiſed by thraſhing, or otherwiſe, and uſually bound up in bundles for thatching. See THATCHING, *Append.*

HELMET-*flower*, in botany, a name by which ſome call the *Scutellaria*, or *Caſſida* of authors. See the article CASSIDA, *Suppl.*

HEMANDIA, *(Suppl.)* This is an error of the preſs, for HERNANDIA See HERNANDIA, *Append.*

HEMEROBIUS, in zoology, a name uſed by ſome for the fly, called *Golden-eye*, and *Chryſopis*. See the article CHRYSOPIS, *Suppl.*

HEMLOCK, in botany, the Engliſh name of a genus of plants, called by botaniſts *Cicuta*. See the article CICUTA, *Suppl.*

Baſtard-HEMLOCK, the name by which ſome call a diſtinct genus of plants, known among botaniſts by that of *Cicutaria*. See the article CICUTARIA, *Suppl.*

HEMP, in botany, the Engliſh name of a diſtinct genus of plants, called by botanical writers *Cannabis*. See the article CANNABIS, *Suppl.*

Baſtard-HEMP, the Engliſh name of a genus of plants, called by Tournefort *Cannabina*. See the article CANNABINA, *Suppl.*

Water-HEMP, a name ſometimes uſed for a genus of plants, called by botanical writers, *Bidens*. See the article BIDENS, *Suppl.*

HEMP-*Agrimony*, a name ſometimes given to a diſtinct genus of plants, called by botaniſts *Eupatorium*. See the article EUPATORIUM, *Suppl.*

HEN *(Suppl.)* — HEN-*houſe*, a place or building, made for ſheltering or confining poultry. Dict. Ruſt. in voc.

HENBANE, *(Suppl.)* — *Yellow*-HENBANE, a name by which ſome call the *Nicotiana* of botanical authors. See the article NICOTIANA, *Suppl.*

HEPS, in botany, the ſame with *hips*. See the article HIPS, *Append.*

HERB-*Bennet*, *herba benedicta*, a name ſometimes given to a diſtinct genus of plants, called by authors *Caryophyllata*. See the article CARYOPHYLLATA, *Suppl.*

HERB-*Chriſtopher*, *herba Chriſtophoriana*, in botany, the name of a diſtinct genus of plants. See the article CHRISTOPHORIANA, *Suppl.*

HERB-*Gerard*, in botany, a name ſometimes given to a diſtinct genus of plants, otherwiſe called *Angelica*. See the article ANGELICA, *Suppl.*

HERB *of grace*, a name by which ſome call rue. See the article RUTA, *Suppl.*

HERB-*Robert*, a name ſometimes uſed for the *geranium*, or crane's bill. See the article GERANIUM, *Suppl.*

HERB-*Trefoil*, in botany, See the articles TREFOIL and TRIFOLIUM, *Suppl.*

HERB-*Trinity*, in botany, a name ſometimes given to the violet. See the article VIOLA, *Suppl.*

HERB-*True-love*, the name by which the *Herb-Paris* is ſometimes called. See the article HERBA-*Paris*, *Suppl.*

HERB-*Twopence*, the name of a diſtinct genus of plants, called otherwiſe *Lyſimachia*, or *Summularia*. See the article LYSIMACHIA, *Suppl.*

HERB-*Willow*, or *Willow-herb*, a name ſometimes given to two diſtinct genuſes of plants, the *Lyſimachia* and *Chamænerium*. See the articles CHAMÆNERIUM, and LYSIMACHIA, *Suppl.*

HERCULES's *Alheal*, the name of a diſtinct genus of plants, deſcribed by Linnæus under that of *Panax*. See the article PANAX, *Append.*

HEMISPHÆRIA, a name by which Dr. Hill calls the genus of flies, known in Engliſh by that of *Lady-Cow*.

Ray, and other writers, have deſcribed theſe among the Beetles. See the article SCARABÆUS, *Suppl.*

HERMIT-*fiſh*, the name by which ſome call the long-tailed Squilla, with a ſoft tail, and the right claw the larger. See the article SQUILLA, *Append.*

HERMODACTYLE, *Hermodactylus*, in botany, a name improperly uſed by ſome for the *Iris*, or flower-de-luce of botaniſts. See the article IRIS, *Suppl.*

The true *Hermodactyle* is the root of a ſpecies of *Colchicum*, or *Meadow-ſaffron*. See the article MEADOW-*ſaffron*, *Suppl.*

HERN, the ſame with *Heron*. See the article HERON, *Suppl.*

A *Hern* at ſiege, among ſportſmen, is one ſtanding at the water-ſide, watching for prey. Dict. Ruſt. in voc.

HERN-*ſhaw*, or HERNERY, a place where the Herons breed. Id. ibid.

HERNANDIA, in botany, the name of a diſtinct genus of plants, the characters of which are theſe: The petals of the flower are multifid, and placed in a circular order; the male and female flowers ſtand on diſtinct plants. There is no pericarpium; but the cup of the flower is very large, ſwelled, and roundiſh; containing a plicated oval nut, with only one cell, and a globoſe nucleus. *Linnæi* Gen. Plant. p. 516.

We know only one ſpecies of this genus, which is the *hernandia*, with a large umbilicated ivy-like leaf, commonly called in the Weſt-Indies *Jack in a box*.

It is a native of Jamaica, Barbadoes, and other parts of the Weſt-Indies; and is propagated among us in the gardens of the curious, by only ſowing the ſeed in a hot-bed in the ſpring. They muſt be conſtantly kept in the back ſtove. Vid. *Miller*'s Gard. Dict. in voc.

HERRIOT. See HARIOT, *Cycl.*

HETEROPYRÆ, in natural hiſtory, the name of a genus of ferrugineous foſſils, compoſed of ſeveral coats, incloſing a nucleus of a different ſubſtance from themſelves, and often looſe, and rattling in them. See the article SIDEROCHITA. *Append.*

Of this genus there are the following ſpecies: 1. The hard *heteropyra*, with brown and purpliſh cruſts, and a whitiſh-green nucleus. 2. The rough, purpliſh *heteropyra*. 3. The miſ-ſhapen *heteropyra*, with ferrugineous, red, and duſky yellow cruſts, and a greeniſh-white nucleus. 4. The yellow, brown, and black *heteropyra*, with a whitiſh nucleus. 5. The yellow, ferrugineous, and purpliſh-creſted *heteropyra*, with a pale-yellow nucleus. 6. The coarſe, yellow, and brown-cruſted *heteropyra*, with a browniſh-yellow nucleus. 7. The coarſe *heteropyra*, with brown, black, and orange-colour'd cruſts, and a yellow nucleus. *Hill.* Hiſt. Foſſ. p. 536.

HIGH-*taper*, in botany, a name by which ſome call the *Verbaſcum* of botaniſts. See the article VERBASCUM, *Suppl.*

HILL, in the natural hiſtory of the Earth, *&c.* See the article MOUNTAIN, *Suppl.* and *Append.*

HINNULARIA, in zoology, a name given by ſome authors to a ſpecies of Eagle. See the article PYGARGUS, *Suppl.*

HIPPO, in zoology, the name of a ſpecies of *Coluber*, the ſcuta of whoſe abdomen are one hundred and ſixty, and the ſquamæ of the tail one hundred. See the article COLUBER, *Append.*

HIPPURIS *(Suppl.)*—Pliny has made a great confuſion of plants under this name. The antients called the *Hippuris*, or horſe-tail, *Polygonum*, on account of its having ſo many joints in its ſtalks and branches; this name confounded it with the knot-graſs and Pliny has made a deſcription from the accounts of different authors, which has the characters and qualities of both, and therefore ſuits neither.

It is eaſy however to trace his errors; where he ſpeaks of the ſtalks being naked, ruſh-like, and brittle, it is plain that he is ſpeaking of the *Horſe-tail*; and where he gives it ſmall oval and pointed leaves, it is equally certain that he means this of the knot-graſs; but he adds in one place, that it has a large ſpreading root, that it grows in woods and ſhady places, and that it bears a round fruit like a coriander-ſeed. Theſe are characters belonging neither to the horſe-tail nor knot-graſs; and might ſeem to beſpeak this *Hippuris* a plant different from both; but it rather appears, that Pliny has brought in by an error of his own a third plant, to perplex the caſe, and is here tranſcribing ſome author's account of the Solomon's-ſeal, or polygonatum, a name ſounding like the word polygonum, and eaſily miſtaken for the ſame word, by ſo haſty a writer as this author appears to have been. He had before err'd in his opinion, that the polygonum and horſe-tail were the ſame plant; and here taking the polygonatum to be the ſame plant with the polygonum, he has not ſcrupled to attribute to the horſe-tail whatever he found recorded of the polygonatum.

HIPPURIS is alſo a name given by Dillenius to the *Chara* of Linnæus, a diſtinct genus of plants. See the article CHARA. *Suppl.*

HIND-*calf*, a female hart of the firſt year. She fawns in April and May. Her fleſh is ſofter than that of a hart, but not ſo ſavoury, and is dreſt after the ſame manner. If it be roaſted, it ought to be larded, dipt in a marinade or pickle, and moiſtened while it is roaſting.

HITCHEL, the ſame with *Hatchel*. See HATCHEL, *Append.*

HITCHING, in horſemanſhip, is to wriggle or move forwards by degrees, or to knock the legs together in walking. Dict. Ruſt. in voc.

HIVE-*droſs*, a name ſometimes given to crude or rough wax. See the article WAX, *Suppl.*

HOCK, the ſame with *Ham*. See HAM, *Cycl.*

HOG's-*fennel*, in botany, the Engliſh name of a genus of plants, called by botaniſts *Peucedanum*. See the article PEUCEDANUM, *Suppl.*

HOG-*plum*, the name of a diſtinct genus of plants, called by authors *Spondias*. See the article SPONDIAS, *Suppl.*

HOG-*weed*, the name of a diſtinct genus of plants, called by Linnæus *Boerhaavia*. See the article BOERHAAVIA, *Suppl.*

HOLIBUT, or HOLYBUT, in ichthyology, a name given by the people of ſome parts of England to the Turbott in general; but in other parts, only to the larger fiſhes of that ſpecies.

HOLLI, the Indian name for what the Spaniards call *ulli*; a reſinous liquor, which flows ſpontaneouſly from the tree *Holquaghuytl*, or *Chilli*. It is often mixed with chocolate in the making, in the proportion of one fourth part: it gives the chocolate in this caſe no very diſagreeable flavour; and it becomes a very powerful medicine in dyſenteries. It is uſual, however, before the making it, to mix the cacao and *Holli* on an iron plate, and torrify them thoroughly together. *Ray*'s Hiſt. Plants.

HOLLOW-*root*, in botany, a name ſometimes given to the *fumaria*, or fumitory. See the article FUMARIA, *Suppl.*

HOLLY *(Suppl.)*—The timber of *holly* is the whiteſt of all hard wood, and therefore uſed by the inlayers. See the article MARQUETRY, *Cycl.*

It is alſo fit for all ſturdy uſes, and therefore preferred to all others by the mill-wright, turner, and engraver. It makes the beſt handles and ſtocks for tools, flails, cart-whips, bowls, ſhivers, and pins for blocks; and is excelnt for door-bars, &c.

Knee-HOLLY, a name ſometimes given to the *Ruſcus*, or butchers broom. See the article RUSCUS, *Suppl.*

Sea-HOLLY, the name by which ſome call the *eryngium* of botanical writers. See the article ERYNGIUM, *Suppl.*

HOLY-*thiſtle*, or BLESSED *Thiſtle*, a name ſometimes given to the *Cnicus*, or ſaffron-flower of botaniſts. See the article CNICUS, *Suppl.*

HOLY-*Roſe*, or *Rock-Roſe*, names given to a diſtinct genus of plants, called by botaniſts *Ciſtus*. See the article CISTUS, *Suppl.*

HOMO, *Man*, in zoology. See the articles MAN, *Append.* and ANTHROPOMORPHA, *Suppl.*

HONE-*wort*, *Sium*, in botany, the name of a diſtinct genus of plants. See the article SIUM, *Suppl.*

HONESTY, in botany, a name ſometimes uſed for the *Lunaria*, or moon-wort. See the article LUNARIA, *Suppl.*

HONEY-*flower*, a name by which the *Melianthus*, a diſtinct genus of plants, is called in Engliſh. See the article MELIANTHUS, *Suppl.*

HONEY-*ſuckle*, *French* HONEY-*ſuckle*, a name ſometimes uſed for the *Hedyſarum* of botanical writers. See the article HEDYSARUM, *Suppl.*

Trumpet HONEY-*ſuckle*, the name by which ſome call the *Periclymenum* of Tournefort. See the article PERICLYMENUM, *Suppl.*

Upright HONEY-*ſuckle*, the name of a genus of plants, called by Linnæus *Lonicera*. See the article LONICERA, *Suppl.*

HOOD, *(Cycl.)* — HOOD, on ſhip-board, is a copper-frame, made to go on the top of the chimney, and to ſhift as the wind does, that the ſmoke may always fly to leeward. *Blanckly*, Nov. Expoſitor, p. 78.

HOOK-*land*, or OPE-*land*, among farmers, land ploughed and ſowed every year. Dict. Ruſt. in voc.

HOOPOE, in ornithology, the Engliſh name of the *Upupa*, See the article UPUPA, *Suppl.*

HOP-*hornbeam*, a name ſometimes given to the *Carpinus* of botaniſts. See the article CARPINUS, *Suppl.*

Wild-HOP, a name ſometimes given to the *Dodonæa*, a diſtinct genus of plants. See the article DODONÆA, *Suppl.*

HOREHOUND. *(Suppl.)*—*Black* or *ſtinking* HOREHOUND, in botany, the Engliſh name of a genus of plants, called by botanical writers *Ballote*. See the article BALLOTE, *Suppl.*

Baſe-HOREHOUND, a name by which ſome call the *Stachys* of botaniſts. See the article STACHYS, *Suppl.*

Baſtard-HOREHOUND, the Engliſh name of a genus of plants, called by botaniſts *Marrubiaſtrum*. See the article MARRUBIASTRUM, *Suppl.*

Water-HOREHOUND, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Lycopus*. See the article LYCOPUS, *Suppl.*

HORNS-*and Hedge-hog*, the name of a genus of plants, called by botaniſts *Medica*. See the article MEDICA, *Suppl.*

HORNBEAM, in botany, the Engliſh name of a genus of plants, called by botaniſts *Carpinus*. See the article CARPINUS, *Suppl.*

HORNED-*Poppy*, in botany. See the article POPPY, *App.*

HORSE *(Suppl.)*—HORSE-*dung* is uſed by gardeners for making hot-beds, being eſteemed fitter than any other for this purpoſe; but it is to be obſerved, that it is ſo much the better, the higher the *Horſe* is fed. Ruſt. Dict. in voc.

HORSE-*Cheſnut*, a name given by ſome to the *Hippocaſtanum* of botanical writers. See the article HIPPOCASTANUM, *Suppl.*

Scarlet HORSE-*Cheſnut*, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Pavia*. See the article PAVIA, *Suppl.*

HORSE-*heal*, a name ſometimes uſed for Elecampane, or *Helenium*. See the article HELENIUM, *Suppl.*

HORSE-*hoeing*, in *Huſbandry*. See thearticle HUSBANDRY *Suppl.*

HORSE-*Mint*, the Engliſh name given to a ſpecies of *Mint*. See the articles MINT and MENTHA, *Suppl.*

HORSE-*Radiſh*, the name of a diſtinct genus of plants, called by botaniſts *Cochlearia*, or Scurvy-graſs. See the article COCHLEARIA, *Suppl.*

HORSE-*ſhoe-vetch*, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Hippocrepis*, or *Ferrum equinum*. See the article FERRUM *equinum*, *Suppl.*

HOSE-*in-Hoſe*, a name given to a genus of plants, called by botaniſts *Primula veris*. See the article PRIMULA, *Suppl.*

HOSPITAL *(Cycl.)*—Camp *Hoſpitals* are either general or regimental.

The general *hoſpitals* are of two kinds, *viz.* the flying *hoſpital*, attending the camp at ſome convenient diſtance, and the ſtationary *hoſpital*, which is fixed to one place. In the choice of both, it will be better to have them in towns than villages, as the former will afford larger wards, beſides more of other conveniencies: Theſe wards ſhould be as airy as poſſible.

As to the diſpoſition of *hoſpitals*, in regard to preſerving the purity of the air, the beſt rule is to admit but few patients into each ward. It will alſo be found a good expedient, when the ceilings are low, to remove ſome part of them, and to open the garret ſtory. The doors and windows may likewiſe be opened, and ventilators uſed to purify the air of every ward. In winter *hoſpitals*, the wards are to be warmed with chimneys, and never by ſtoves; for, though the latter may warm a large ward better, and at a leſs expence, yet by ſcarce making any draught of air, they will be apt to increaſe its putrid quality; whereas a fire, kept up in a chimney, acts like a conſtant ventilator.

The general *hoſpital* ſhould receive only ſuch ſick as the regimental ones cannot conveniently contain, together with thoſe who cannot be moved with the army. Without this diſperſion of the ſick, the general *hoſpital*, in bad ſeaſons, would have a greater number, than could be well attended; and what is equally, if not more pernicious, it would be too much crouded, by which means the contagion would ſpread, and the mortality be rendered more general.

Regimental *hoſpitals* are of the greateſt importance, and therefore ſhould be ſupplied with blankets and medicines from the public ſtores, with an allowance alſo for nurſes and other neceſſaries. Nor are they to be maintained in the field only, but alſo in winter-quarters, as there will always be a great many more ſick, than can be taken care of in the general *hoſpital*.

Barns, ſtables, grannaries, and other out-houſes, but above all, churches, make the beſt *hoſpitals*, from the beginning of June to October: for as the greateſt danger ariſes from foul air, which cannot be compenſated by diet or medicine, we may lay it down as a rule, that the more airy and large the *hoſpitals* are, the leſs danger there is of the ſickneſs ſpreading. *Pringle* Obſerv. on the Diſeaſes of the Army, p. 104, *ſeqq.*

HOSPITAL-*fever*, a name given to the *malignant catarrhal fever*, as being frequent in hoſpitals. See the article FEVER, *Suppl.*

Dr. Pringle has given us an elaborate account of the riſe, ſymptoms, and cure of this terrible diſeaſe, in his obſervations on the diſeaſes of the army. It may be owing to a great many concurring cauſes, but the principal are foul and putrid air, occaſioned by filth and impurity of any kind. Hence it is no wonder that it prevails in marſhy countries after hot ſeaſons, and in populous cities; eſpecially if low, and ill-aired, unprovided with common ſhores, or where the ſtreets are narrow and foul, the houſes dirty, water ſcarce, and where jails or hoſpitals are crouded, and not ventilated and kept clean; when in ſickly times the burials are within the towns, and the bodies not laid deep; when ſlaughter-houſes are alſo within the walls; or when dead animals or offals are left to rot in the kennels, or on dunghils; when drains are not provided, to carry off any large body of ſtagnating or corrupted water, in the neighbourhood; when fleſh-meats make the greateſt part of the diet, without a proper mixture of bread, greens, wine, or other fermented liquors; from the uſe of old and muſty grain, or what has been damaged by a wet ſeaſon; or, laſtly, when the fibres are relaxed by immoderate warm bathing.

When the diſeaſe comes on ſlowly, the ſymptoms are ſmall interchanges of heats and cold, trembling of the hands, interrupted ſleep, &c. But when it advances faſt, the above ſymptoms are all in a higher degree; and beſides theſe, the patient is afflicted with great laſſitude, a nauſea, pains in the back, a conſtant pain and confuſion in the head, a dejection of ſpirits, and an uncommon tremor of the hands. If the ſick lie warm, and have had no preceding flux, the body is generally coſtive; but when they lie cold, as they often do in field-hoſpitals, the pores of the ſkin being ſhut, a diarrhœa is a common ſymptom: in the worſt caſes, a flux appears in the laſt ſtage; when the ſtools are involuntary, colliquative, ichorous, or bloody, and of a cadaverous ſmell; which are the effects of a mortification of the bowels, and the ſigns of approaching death: ſome are never delirious, but all are under a great ſtupor or confuſion. The petechiæ are the frequent, but not inſeparable attendants of the fever; they are ſometimes of a brighter or paler red, at other times of a livid colour, but are never raiſed above the ſkin. For the moſt part, theſe ſpots are ſo little conſpicuous, that unleſs looked for attentively, they may eſcape notice. They are thickeſt on the breaſt and back, leſs on the legs and arms, and the Dr. never remembers to have ſeen any upon the face. This fever, tho' of the continued kind, has often exacerbations at night, with remiſſions, and partial ſweats next day; and, after a long continuance, is apt to change into a hectic, a remitting, or intermitting form.

Prognoſtics in it. To have a little dilirium, the ſtrength little impaired, turbid urine in the decline of the diſeaſe, and at the ſame time a gentle ſweat or moiſture diffuſed over the body, are reckoned good ſigns; and it ſeems peculiar to malignant fevers, that deafneſs is rather a good ſign.

Method of cure. This varies according to the ſtate of the diſeaſe, which may be diſtinguiſhed into three periods; the firſt continuing as long as the perſon is able to go about; the ſecond beginning with his confinement, and the third when the pulſe ſinks, and a ſtupor comes on.

In the firſt, as well as in the other periods, the cure is principally to be aimed at by removing the patient out of the foul air. When this cannot be done, the ward or room ſhould be purified by making a ſucceſſion of air by means of fires, or letting it in by doors and windows, or diffuſing the ſteams of vinegar.

The next thing to be done, is to promote a diaphoreſis, which, in this period, ſhould only be attempted by mild ſudorifics, as the *ſpiritus Mindereri*.

When the fever is confirmed, contrayerva-powders, with nitre, camphor, the common ptiſan acidulated, and ſuch medicines as are good in inflammatory caſes, ought to be given. Coſtiveneſs is to be prevented by emollient clyſters. But opiates are dangerous, both in this and the third ſtage, in which the pulſe ſinks, and ſtupor is greater, a delirium impends, and petechiæ often appear. When this is obſerved to be the caſe, the nitre and diaphoretic medicines are to make room for a decoction of ſnake-root, to which a ſmall quantity of ſtrong water may be added. It may alſo be given in ſubſtance from two to four ſcruples a day, with ſenſible good effects. Towards the decline of the fever, an equal quantity of peruvian bark may be joined with the root. Wine is alſo an excellent cordial at this period, and may be given either made into Whey, or added to the panado, which was the only food allowed to the ſick. It may be taken from half a pint to a quart a day, according to the ſtrength of the patient. Perhaps there is no rule of more importance, than to give ſtrict charge to the attendants of the ſick, never to let the patient, when low, remain above two or three hours without taking ſomething cordial and nouriſhing. But however neceſſary wine, volatiles, and other cordials are in this low ſtate of the fever, it ought to be remembered, that they muſt never be given with an intention to force a ſweat, but only as antiſeptics, and to ſupport the *vis vitæ*. If there be danger of a phrenitis coming on, it will be proper to call in the aſſiſtance of epiſpaſtics. Sinapiſms too may be uſed when the pulſe is greatly ſunk. If a diarrhœa comes on in the decline of the fever, it is to be moderated, by adding a few drops of the tinctura thebaica, to the full quantity of the alexipharmic decoction; or by giving a ſpoonful or two of an aſtringent mixture. In proportion, however, to the putrid nature of the ſtools, aſtringents are to be uſed with the more caution. When the fever is over, there are few but complain of a vertigo, and want of reſt, a continuation of the deafneſs, and other nervous ſymptoms, are frequently the conſequence of great lowneſs; in which caſe, the pillulæ Matthæi are to be given at night, with analeptics and medicines of the ſtrengthening kind. Vid. *Pringle*'s Obſerv. on diſeaſ. of army. p. 243—278.

HOSPITAL - *Ventilator*. See the article VENTILATOR, *Append*.

HOVEL, properly ſignifies a covering, or ſhelter for cattle, made of hurdles, or the like; but is alſo uſed for any other mean building. Ruſt. Dict. in voc.

HOUND (*Suppl.*)—*Gaze*-HOUND, or *Gaſt*-HOUND, one who makes more uſe of his ſight than ſmell, from the word *gaze*, to ſtare at.

Theſe dogs make excellent ſport with the fox and hare, and are much uſed in the north of England, and on champaign ground, rather than buſhy and woody places. Dict Ruſt. in voc.

HOUSE (*Cycl.* and *Suppl.*) — *Summer*-HOUSE, a little edifice erected at the corner of a garden, and contrived ſo as to let in air on all ſides; or to exclude it, as you find proper. Build. Dict. in voc. *Summer*.

HOUSING (*Cycl.*) — HOUSING, among brick-layers, a term uſed for a brick which is warped, or is caſt crooked or hollow in burning; in ſuch a caſe, they ſay it is *houſing*. Build. Dict. in voc.

HUMBLE-*bee-fly* is a ſpecies of *Culex*; it is lanigerous, and has ſomewhat obſcure wings. See the articles HUMBLE, *Suppl.* and CULEX, *Append*.

HUMBLE-*plant*, a name ſometimes given to the *mimoſa*, or ſenſitive plant. See the articles MIMOSA and SENSITIVE, *Suppl*.

HUNGARICUS *morbus*, a diſeaſe ſo called from its being firſt obſerved in the imperial army in Hungary, in the year 1566; from whence it ſpread over a great part of Europe.

It is deſcribed as a malignant fever, attended with ſickneſs at the ſtomach, a pain and hardneſs about the epigaſtric region, great thirſt from the beginning, a parched tongue, and a conſtant head-ach, ending in a delirium. It was highly contagious and mortal, and is ſuppoſed to have been a compound of the bilious and hoſpital fever, taking its riſe firſt in the camp, but acquiring that high degree of malignity from the foul air of the places in which the ſick were crouded. *Pringle*, Obſerv. on the diſeaſes of the army, p. 118, ſeq. See the articles BILIOUS and HOSPITAL-*fever*, *Append*.

HUNGRY *Evil* (*Cycl.*) — Nothing is better in this diſtemper, than to feed the horſe ſeveral times a day with wholeſome bean-bread well baked, or oats well dried and ſifted. Dict. Ruſt. in voc.

HUTCH, among farmers, denotes a veſſel or particular place in which to lay corn; alſo a kind of hollow trap for the taking of weeſels, or other vermin, alive. Dict. Ruſt. in voc.

HYACINTH (*Suppl.*) — *Grape* HYACINTH, or *Muſk* HYACINTH, the Engliſh name of a genus of plants, called by botanical writers *Muſcari*. See the article MUSCARI, *Suppl*.

HYACINTH *of Peru*, or the *Starry* HYACINTH, names ſometimes given to a diſtinct genus of plants, known among authors, by that of *Ornithogalum*, and called in Engliſh Star of Bethlehem. See the article ORNITHOGALUM, *Suppl*.

Tuberoſe HYACINTH, the name by which ſome call the *Polyanthes* of Linnæus. See the article POLYANTHES, *Append*.

HYDRA, or HYDRUS, in zoology, names given to the water-ſnake, called by authors *Natrix*. See the article NATRIX, *Suppl*.

HYDRA, is alſo the name by which Linnæus calls the *Polype*. See the articles POLYPE, *Suppl.* and BIOTA, *Append*.

HYDROCANTHARUS, the name by which ſome call the water-beetle. See the article DYTISCUS, ſupra.

HYDROCORAX, in ornithology, the name by which Barrelier calls the Indian-raven. See the article CORVUS *Indicus*, *Suppl.* and BUCEROS, *Append*.

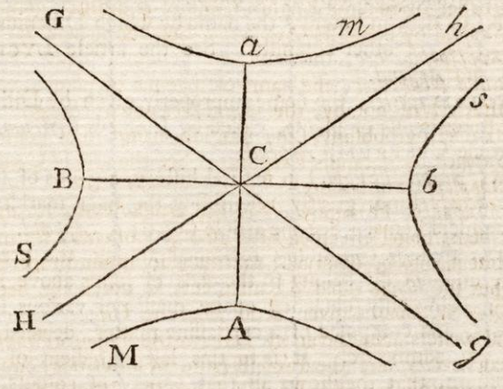
HYDROMETER (*Suppl.*) — We have ſeveral new improvements of this inſtrument, in Deſaguliers, Experim. Philoſoph. vol. 2. p. 233, ſeq.

HYDROPHOBIA (*Cycl.*) — Vinegar is recommended by Dr. Kramer, as a ſpecific againſt the *Hydrophobia*, eſpecially, if ſome powder of Cantharides is mixed with it. The Receipt given by him is, to boil from four to ten grains of the fine powder of Cantharides, in an ounce and an half, or two ounces, of the beſt vinegar, which is to be given warm to the patient. Commerc. Norimb. 1735, hebd. 1183.

HYDROPIPER, a name uſed by ſome for the *Perſicaria*, or arſmart, of other botannical writers. See the article PERSICARIA, *Suppl*.

HYPERBOLA (*Cycl.*) — *Conjugate* HYPERBOLAS, a name given to four *Hyperbolas*, when the firſt and ſecond Axes of two oppoſite *Hyperbolas* are the ſecond and firſt Axes of two other oppoſite *Hyperbolas*.

Thus if two oppoſite *Hyperbolas* A M, *a m* have the line A *a*, for their firſt Axis, and the line B *b*, for their ſecond Axis; and if two other oppoſite *Hyperbolas* B S, *b s*, have on the contrary, B *b* for their firſt Axis, and A *a* for their ſecond Axis, theſe two *Hyperbolas* B S, *b s* are ſaid to be conjugate to the *Hyperbolas* A M, *a m*, and the four together are called conjugate *Hyperbolas*.



The Aſymptotes H C *h*, G C *g*, of the *Hyperbolas* A M, *a m*, will alſo be the Aſymptotes to the *Hyperbolas* B S, *b s*. See *L' Hopital*, Sect. Coniq. Art. 132.

HYPERICOIDES, in botany, the name by which Plumier calls the *Aſcyrum* of Linnæus, a diſtinct genus of plants. See the article ASCYRUM, *Append*.

HYPERICUM, in the Linnæan ſyſtem of botany, a large genus of plants; which, according to that author, comprehends the *Androſæmum* and *Hypericum* of Tournefort. See the articles ANDROSEMUM and HYPÆRICUM, *Suppl*.

HYPETHRE, in antient architecture, two rows of pillars all about, and ten at each face of any temple, *&c.* with a Periſtyle within of ſix columns.

I.

JAS ICE

JACEA, *knapweed*, is comprehended by Linnæus among the *Centauria*. See the article CENTAURIA, *Append.*

JACINTH, in botany, a name uſed by ſome for the *hyacinth*. See the article HYACINTH, *Suppl.*

JACK *(Suppl.)*—JACK is alſo uſed for a well known engine to turn a ſpit; for a horſe or wooden frame to ſaw timber upon; for an inſtrument to pull off a pair of boots; for a great leathern pitcher to carry drink in; for a ſmall bowl that ſerves as a mark at the exerciſe of bowling; and for a young pike. Dict. Ruſt. in voc.

JACK *by the hedge*, a name ſometimes given to the *Thlaſpi* of botanical writers. See the article THLASPI, *Suppl.*

JACK *by the hedge* is alſo uſed as the name of a ſpecies of *Heſperis*. See the article HESPERIS, *Suppl.*

JACK *in a box*, the name by which ſome call a diſtinct genus of plants, called by botaniſts *Hernandia*. See the article HERNANDIA, *Append.*

JACOB's *Ladder*, a name uſed by ſome for the *Polemonium* of botanical writers. See the article POLEMONIUM, *Suppl.*

JACOBÆOIDES, in botany, the name of a genus of plants, according to Vaillant, but comprehended under the *Solidago* by Linnæus. See the article SOLIDAGO, *Append.*

JAIL-*fever*, a name given to the *malignant catarrhal fever*, as being frequent in jails; it is likewiſe call'd the *hoſpital fever*, for a like reaſon. See the articles FEVER and HOSPITAL-*fever*, *Append.*

JALAP, a name ſometimes given to the *Convolvulus*, or bind-weed of botaniſts. See the article CONVOLVULUS, *Suppl.*

JAMBS, among carpenters and bricklayers. See the article JAUMS, *Append.*

JANNOCK, a kind of oaten bread, much uſed in the northern parts of England, and made of ſour leaven. Dict. Ruſt. in voc.

JASMINE *(Suppl.) Ilex-leaved* JASMINE, the name by which the *Lantana*, a diſtinct genus of plants, is ſometimes called. See the article LANTANA, *Suppl.*

Arabian, or *Indian* JASMINE, the Engliſh name of a genus of plants, called by Linnæus *Nyctanthes*. See the article NYCTANTHES, *Append.*

Scarlet JASMINE, a name ſometimes given to the *Bignonia*, or trumpet flower. See the article TRUMPET-*flower*, *Suppl.*

Red-JASMINE, a name given to the *Plumeria* of botanical writers. See the article PLUMERIA, *Suppl.*

Perſian-JASMINE, the name by which ſome call *Lilac*. See the article LILAC, *Suppl.*

Fennel-leaved JASMINE, a name ſometimes given to *Quamoclit*. See the article QUAMOCLIT, *Suppl.*

JASMINOIDES, in botany, the name by which Dillenius calls the *Lycium*, of other botaniſts. See the article LYCIUM, *Suppl.* and *Append.*

JASMINOIDIS *ſpecies*, the name improperly given by Dillenius to a diſtinct genus of plants, called by Linnæus *Ceſtrum*. See the article CESTRUM, *Append.*

JASPER, *Jaſpis, (Suppl.)* in natural hiſtory, a genus of ſtones of the *Scrupi*-kind, greatly reſembling the finer marbles, or ſemi-pellucid gems. See the article SCRUPI, *Append.*

Jaſpers, though commonly reckoned among the precious ſtones, undoubtedly belong to the claſs of foſſils above referred to; being only detached opake maſſes of various forms and ſizes, and compoſed of a cryſtalline matter, debaſed with an earthy admixture. It is to this laſt ingredient of their compoſition, that they owe all that variety of colours, and difference of opacity, whence naturaliſts have ſubdivided them into no leſs than ſeven orders, containing the white, the green, the red, &c. *Jaſpers*.

Of the white *Jaſpers*, there is only one known ſpecies, the hard, ſhining, white, marbly *Jaſper*, commonly called the *Nephritic ſtone*, on account of its ſuppoſed virtue in caſes of the ſtone and gravel. It is found in many parts of America, particularly the great river of the Amazons, and worn by the natives as an amulet. As to its medical virtues, they are too ridiculous to deſerve a ſerious refutation; but its other uſes merit the attention of lapidaries, ſince it is capable of being faſhioned into cups and vaſes of a beautiful poliſh, and great brightneſs.

Of the green and greeniſh *Jaſpers*, we have the following ſpecies: 1. The hard, fine green *Jaſper*. This is found in many parts of the world, as Egypt, Tartary, China, &c. and worn as an amulet againſt fluxes, hæmorrhages, &c. 2. The ſoft duſky green *Jaſper*. This ſtone, which is of much leſs beauty and value than the foregoing ſpecies, is very common in Germany, Italy, France, England, &c. 3. The hard bluiſh green *Jaſper*, with red variegations. This is the *heliotrope* of the antients, and *blood-ſtone* of the moderns. It is common in Africa, Egypt, and the Eaſt-Indies; and is worked into cups, vaſes and ſnuff-boxes. 4. The hard whitiſh-green *Jaſper*, which is the nephritic ſtone of authors. It is found in many parts of America, where the natives faſhion it into figures of birds, beaſts, fiſhes, and other forms; and formerly uſed to wear it hung to their lower lips. A thouſand amazing ſtories are told, by very grave authors, of the nephritic qualities of this ſtone. 5. The hard, yellowiſh-green *Jaſper*, celebrated likewiſe for its nephritic virtues. It is found in ſeveral parts of America, as alſo in Germany, Bohemia, and ſome other countries of Europe. 6. The bluiſh-green, marbly *Jaſper*, variegated with grey and black. 7. The hard, greyiſh-green *Jaſper*, called by authors the *Jade*, or *Lapis divinus*, the divine ſtone. 8. The dull, deep green *Jaſper*, called by different authors *Molochite*, *Molochites*, and *Malachites*. 9. The bluiſh-green, ſofter, dull *Jaſper*. This is the *borea*, or ſky-coloured *Jaſper* of the antients, and makes a very beautiful appearance in cups, vaſes, and other ornamental things. 10. The duſky-green *Jaſper*, variegated with white and fleſh colour; this, tho' a coarſer ſpecies than the preceding one, is not without its beauty.

Of the red *Jaſpers*, we know only four ſpecies: 1. The hard, variegated, purple *Jaſper*: This is the roſe-coloured *Jaſper* of authors. It is a very beautiful ſtone, and capable of a high poliſh. It is found in the Eaſt and Weſt-Indies, as alſo in Germany, Bohemia, and Spain, but of a coarſer kind. 2. The bright red *Jaſper*, variegated with white. America and Europe both afford this ſpecies; but thoſe from the former are the fineſt. 3. The dull, purple and white *Jaſper*. This, tho' of a coarſe and irregular ſtructure, is not unfrequently found manufactured into handles of knives, and other toys, both in England, Italy, and Germany. 4. The hard, dull, fleſh-coloured *Jaſper*. It is of an extremely pale whitiſh red, generally throughout.

The fourth order of *Jaſpers* contains thoſe of a brown colour, of which we have only one ſpecies, the pale-brown, hard *Jaſper*, with purple veins. It is common on the Yorkſhire and Suſſex ſhores, and alſo in many of our gravel-pits.

The fifth order contains the yellowiſh *Jaſpers*, of which there is only one known ſpecies, the yellowiſh, hard, variegated *Jaſper*. This is the turpentine-coloured *Jaſper* of the antients. It is very common in the Eaſt-Indies; and we have it alſo in Germany, Bohemia, and other parts of Europe, but inferior to the oriental ones.

The bluiſh *Jaſpers* conſtitute a ſixth order; and of theſe there are only two ſpecies: 1. The pale bluiſh *Jaſper*, with black veins and clouds; called by the antients the ſmoaky *Jaſper*. 2. The bluiſh, marbly *Jaſper*, variegated with white.

The ſeventh and laſt order of *Jaſpers* contains the black ones, whereof there are only two ſpecies: 1. The black, marbly *Jaſper*, variegated with white. 2. The black, marbly *Jaſper*, variegated with yellow. *Hill*, Hiſt. Foſs. p. 573—592.

JAUMS, among carpenters, denote the door-poſts, as alſo the upright poſts at the ends of window-frames. Build. Dict. in voc.

JAUMS, among bricklayers, *&c.* the upright ſides of chimneys, from the hearth to the mantle-tree. Id. ibid.

JAY, in zoology, the Engliſh name of a ſpecies of *Corvus*, with the upper feathers of the wings blue, variegated with black and white. See CORVUS, *Suppl.*

IBERIS *(Suppl.)* is alſo the name uſed by ſome writers for a ſpecies of *Lepidium*, or dittander. See the article LEPIDIUM, *Suppl.*

ICE-*houſe*, a building deſigned to preſerve *Ice*, for the uſe of families in the ſummer ſeaſon.

Theſe are more generally uſed in warm countries, than with us; particularly in Italy, where the meaneſt perſon, who rents a houſe, is not without his vault or cellar for keeping of *Ice*.

Ice-houſes being much more uſed with us than formerly, it may not be amiſs to give ſome general directions for the choice of the ſituation, and ſtructure of them; as alſo for the management of the *Ice*.

The ſituation, then, ſhould be upon a dry ſpot of ground; becauſe wherever there is moiſture, the *Ice* will melt: for which reaſon, too much care cannot be taken to make drains all round them. The place ſhould likewiſe be elevated, and as much expoſed to the ſun and air as poſſible.

As to the figure of the building itſelf, the proprietor may chooſe ſuch as pleaſes his own fancy; but a circular form is the beſt for the well where the *Ice* is to be preſerved, which ſhould be large in proportion to the quantity to be kept.—It is beſt to have as much as may ſerve two or three years, in caſe of a mild winter, when little or no *Ice* is to be got. At

the bottom of the well, there ſhould be a ſpace of about two feet deep left to receive any moiſture which may drain from the *Ice*; and a ſmall drain under ground ſhould be laid from this, to carry off the wet. Over this ſpace of two feet ſhould be placed a ſtrong grate of wood; and the ſides of the well ſhould be built of brick, at leaſt two bricks thick; for the thicker it is, the leſs danger there will be of the well being affected by any external cauſe.

When the well is brought up within three feet of the ſurface, there muſt be another outer arch or wall begun, which muſt be carried up to the height of the intended arch of the well; and if there is another arch turned over from this wall, it will add to the goodneſs of the houſe. The roof muſt be high enough above the inner arch, to admit of a door-way to get out the *Ice*. If the building is to be covered with ſlates, or tiles, reads ſhould be placed conſiderably thick under them, to keep out the ſun and external air; the thickneſs of ſix or eight inches, with a plaſtering of hair and lime, will be ſufficient to prevent all danger.

The external wall needs not be built circular, but of what figure the proprietor pleaſes. Sometimes the *Ice-houſe* is ſo contrived as to have an handſome alcove ſeat in its front.

Two feet diameter is ſufficient for the aperture of the mouth of the well; which ſhould have a ſtone, ſo contrived, as to ſtop it up in the exacteſt manner; and all the vacant ſpace between this aperture and the outer door, ſhould be filled up with barley-ſtraw; and this laſt is to be always ſhut, before the inner door is opened. The building thus finiſhed, ſhould have time to dry, before the *Ice* is put into it.

If a layer of reads be placed ſmooth over the grate at the bottom of the well, on which to lay the *Ice*, it will do better than ſtraw, which is commonly uſed; and as to the choice of the *Ice*, the thinner it is, the eaſier it may be broken to powder: for the ſmaller it is broken, the better it will unite, when put into the well. In putting it in, care muſt be taken to ram it as cloſe as poſſible; as alſo to allow a vacancy of about two inches all round next the ſide of the well, to give paſſage to any moiſture occaſioned by the melting of ſome of the *Ice*.

When the *Ice* is put into the well, if a little ſalt-petre be mixed with it at every ten inches, or foot thickneſs, it will cauſe the *Ice* to join more cloſely into a ſolid maſs. *Miller*'s Gard. Dict.

JEAN-CAPELLE, in ichthyology, a name given by Ruyſch, and ſome others, to the fiſh called by authors, the *Faber Indicus*, or Indian Doree; and more expreſſively named by Artedi, the Zeus with a forked tail. See the article ZEUS, *Suppl.*

JEMBUT, in the materia medica, a name uſed by Aviſenna and others, to expreſs the ſeeds in the pods of the carob tree, or ſiliqua dulcis; which they call *Charub* or *Charnub*, and the Greeks *Ceratium*. Theſe ſeeds contained in the pods of this tree, when carefully dryed, ſerved the antient phyſicians as weights; and hence is derived the Greek word Ceration for a weight which expreſſes one of theſe ſeeds. The Arabian writers mention two kinds of this tree Charnub: The one they call Alſcemi, and the other Alnabati. Theſe are tranſlated Syriaca and Nabathæa ſiliqua. Pliny, Columella, and all the other antients who have written on theſe ſubjects, mention the Syrian ſiliqua, or Charnub. This is called Scemi or Xami; and they have alſo mentioned the ſiliqua Græca, which is the common ſiliqua. The diſtinction Aviſenna makes between the Syrian and Nabathæan ſiliqua or Charnub is, that the firſt was a purgative, and gave relief in colics, and other pains in the bowels; and that the other was an aſtringent, and was very ſucceſsful in the cure of fluxes of blood, particularly in profluvia of the menſes; and that it was for this purpoſe both eaten and put up as a peſſary.

JERGUER, in the Cuſtom-houſe, an officer who overſees the actions and accounts of the waiters. Dict. Ruſt. in voc.

JERSEY, among wool-combers, denotes the fineſt wool taken out of other ſorts, by dreſſing it with a *Jerſey-comb*. Dict. Ruſt, in voc.

JERUSALEM-*cowſlip*, a name by which ſome call the *Pulmonaria* of botaniſts. See the article PULMONARIA, *Suppl.*

JERUSALEM-*ſage*, a name ſometimes given to two diſtinct genuſes of plants, the *Pulmonaria* and *Phlomis*. See the articles PHLOMIS and PULMONARIA, *Suppl.*

JESSES denote the ribbons hanging down from garlands and crowns; alſo the ſhort ſtraps of leather faſtened to a hawk's legs, and ſo to the vervels. Dict. Ruſt. in voc.

JESSAMIN, or JESSAMY, in botany, the ſame with *Jaſmine*. See JASMINE, *Suppl.*

JESUITS *Bark*, the name of a medicinal drug, otherwiſe called *cortex peruvianus*, and *quinquina*, or *quinaquina*. See the articles QUINQUINA, *Cycl.* and PERUVIAN, *Cycl.* and *Suppl.*

Falſe JESUIT's-*Bark*, a name ſometimes given to the *Balſamita* of botaniſts. See the article BALSAMITA, *Append.*

JETAIBA, in botany, a name uſed by ſome authors for the tree which affords the Gum Anime of the ſhops. *Piſo*, p. 60.

JEWS *Mallow*, a name by which the *corchorus*, a diſtinct genus of plants, is ſometimes called. See the article CORCHORUS, *Append.*

INCENDIARY, *Incendiarius*, is applied to one who is guilty of maliciouſly ſetting fire to another's houſe. This offence is called *Arſon* in our law.

Among the antients, criminals of this kind were to be burnt. *Qui ædes, acervumque frumenti juxta domum poſitum ſciens, prudenſque dolo malo combuſſerit, vinctus, igni necatur. Pitiſc.* Lex Ant. in voc.

INCINERATED *Salts*, in Chemiſtry, the ſame with lixivial ſalts. See INCINERATION and LIXIVIOUS, *Cycl.* and SALTS, *Suppl.*

INDEX *of Relation*, in Algebra, the ſame as *Scale of Relation*. See SCALE *of Relation* and SERIES, *Append.*

INDIAN-*arrow-root*, in botany, a name ſometimes given to the *Maranta* of botaniſts. See the article MARANTA, *Ap.*

INDIAN-*fig*, the name by which ſome call the *Opuntia* of botaniſts. See the article OPUNTIA, *Suppl.*

INDIAN *god-tree*, the name given by ſome to a ſpecies of fig-tree. See the article FICUS, *Suppl.*

INDIAN-*reed*, a name given to the *Cannacorus* of botanical writers. See the article CANNACORUS, *Suppl.*

INFARCTION of the Liver. See HEPATIS *infarctus*, *Sup.*

INFLAMMATION *of the Eyes*, the ſame with what phyſicians call *Ophthalmia*. See the article OPHTHALMIA, *Cycl.*

INFLAMMATORY *Diſeaſes*. To theſe are to be referred coughs, pleuriſies, peripneumonies, acute rheumatiſms, *Inflammations* of the brain, bowels, and other parts, attended with a fever; alſo leſſer *Inflammations* without a fever, and fevers of an *inflammatory* kind, where no part is ſo peculiarly affected as to give name to the diſeaſe. And, laſtly, all chronic diſorders ariſing from *Inflammations*, whereof the chief are old coughs, conſumptions, and the rheumatiſm without a fever.

All theſe diſeaſes are the conſequences of catching colds, and are prevented by the ſame means as colds. See the article COLD, *Append.*

Bleeding is the moſt indiſpenſible remedy in the cure of all *inflammatory* diſeaſes, and therefore to the delaying this too long, or not repeating it, it is owing, that colds end in dangerous fevers, rheumatiſms, or conſumptions. See the article BLEEDING, *Append.*

In all *inflammatory* diſorders, the principal intention of cure is to diminiſh the force of the blood, to thin it, and to relax the fibres; on which account, bleeding, attenuants, and diaphoretics, are the chief remedies. An early ſweat tends alſo to prevent an *inflammatory* fever; for which purpoſe, the diaphoretic draught of the Edinburgh diſpenſatory is recommended; or, inſtead of it, a ſpoonful of the plain Spiritus Mindereri may be given every two hours, till a ſweat breaks out; or two ſcruples of the ſalt of hartſhorn, ſaturated with about three ſpoonfuls of common vinegar, may be given in one draught at bed-time. *Pringle*, Obſerv. on the the Diſeaſes of the army, p. 73, 77, 127, ſeq.

INFLAMMATORY *fevers*. Theſe may be diſtinguiſhed into two ſtages; the firſt whilſt the pulſe continues hard, in which it is proper to bleed; and the ſecond, when, the *inflammatory* ſymptoms ſtill remaining, the pulſe is too low for that evacuation. In this laſt ſtate, bliſters are the chief remedy, and which, except in a few ſingular caſes, are not to be uſed ſooner. If the bliſters are large, it is better to apply them gradually, than many at a time. It is uſual to begin with the back, and, if neceſſary, to apply them next to the legs or thighs, reſerving the arms laſt, that the patient may be ſo much the longer conveniently moved. In great lowneſs, attended with a delirium, ſinapiſms applied to the ſoles of the feet, have frequently more efficacy than bliſters, in raiſing the pulſe, and relieving the head.

If the body has been coſtive before the diſeaſe, it is proper to open it by a laxative, after bleeding; and after recovery, ſome lenient phyſic is generally requiſite, for preventing a too haſty repletion incident to convaleſcents, upon indulging their appetites. *Pringle*, Obſerv. on the Diſ. of the army, p. 134.

There is no caution more neceſſary to a young phyſician, than to abſtain from all opiates throughout theſe fevers, however much the patient may complain of pain or watchfulneſs. Indeed, if the fever be accompanied with a diarrhœa, which is not critical, the looſeneſs is to be gradually checked by diaſcordium, after giving rhubarb, and endeavouring to turn the humours to the ſkin by the uſe of diaphoretics, (omitting the nitre) with the uſe of the white decoction for common drink. Id. ibid. 136.

INK-*fiſh*, the ſame with the *Sepia*, or cuttle-fiſh. This animal, when it is in danger of being taken, emits a black liquor like ink, out of its mouth in conſiderable quantities, whereby the water being obſcured, it finds an opportunity of eſcaping; and from this property it has got the name of the *Ink-fiſh*. See the article SEPIA, *Append.*

INSECTS. (*Suppl.* — Dr. Hill, in his hiſtory of animals, has eſtabliſhed a new ſyſtem of *Inſects*; which is this:

He firſt ſubdivides them into three general ſeries, each whereof comprehends under it ſeveral claſſes, and thoſe again many diſtinct genera.

The firſt ſeries of *Inſects* is called *Apteria*; becauſe under it are comprehended all *Inſects* of what kind ſoever, having neither wings nor limbs.

Of this ſeries there are two claſſes, the *Anarthra* and *Podaria*. See the articles ANARTHRA and PODARIA, *Append.*

The ſecond ſeries of *Inſects* is called *Pteraria*, as comprehending all the winged kinds.

Of this ſeries there are likwiſe two orders or ſubdiviſions: 1. The *Pteraria Diptera*, or *Inſects* with two wings. 2. The *Pteraria Tetraptera*, or thoſe with four wings. See the article PTERARIA, &c. *Append.*

The third and laſt ſeries of *Inſects* is called *Gymnarthridia*, and comprehends all thoſe *Inſects* which have ſoft and naked bodies, furniſhed with limbs. See GYMNARTHRIDIA.

INTERCALATION. See the article INTERPOLATION, *infra.*

INTERMITTING *fever*. See the article BILIOUS *fever*, *Append.*

INTERPOLATION, *(Cycl.)* in algebra, is uſed, for the finding an intermediate term of a ſeries, its place in the ſeries being given. This is alſo called *Intercalation.*

The method of doing this is called the *Method of Interpolations*, or *Intercalations.*

When the algebraic equation of the ſeries is given, the term required, whether it be a primary or intermediate term, may be found by the reſolution of affected equations; but when this equation is not given, as it often happens, the value of the term ſought muſt be exhibited by a converging ſeries, or by the quadrature of curves. See *Stirling*, Method. Different. p. 86. ſeq. *Meier*, in act. petrop. Tom. II. p. 180, ſeq.

When the firſt, ſecond, or other ſucceſſive differences of the terms of a ſeries become at laſt equal, the *interpolation* of any term of ſuch a ſeries may be found by Sir Iſaac Newton's Differential Method. See DIFFERENTIAL *Method*, *App.*

INTERSCENDENT, in Algebra, is applied to quantities, when the exponents of their powers are radical quantities. Thus $Z^{\sqrt{2}}$, $z^{\sqrt{m}}$, &c. are *interſcendent* quantities. *Euler*, introduct. ad Analyſ. infinit. Vol. I. pag. 6. Hence, an *interſcendent* Series or Function is eaſily underſtood. See the article FUNCTION, *Append.*

IN-TURN, among wreſtlers, is when one puts his thigh between thoſe of his adverſary, and lifts up his thigh. Dict. Ruſt. in voc.

JOCKEY, in the management of horſes, the perſon who trims up, and rides about horſes for ſale. Ruſt. Dict. in voc.

JOCKLET, or YOCLET, a term uſed in ſome parts of Kent for a little farm which requires but one yoke of oxen to till it. Dict. Ruſt. in voc.

JOHN's *bread*, or St. JOHN's *bread*, a name ſometimes given to the *ceratonia*, or carob-tree, called by Tournefort *Siliqua*, See the article SILIQUA, *Suppl.*

JOHN's, or *Sweet* JOHN's, a name ſometimes given to the *Caryophyllus*, or pink. See the article PINK, *Suppl.*

JOINT-*Clerks of the Acatery*. See the article ACATERY, *Cycl.*

JOKY. See the article JOCKEY, *Append.*

JONQUIL, a name given by ſome to the *Narciſſus* of botaniſts. See the article NARCISSUS, *Suppl.*

JOVIS *barba*, in botany, the name of a diſtinct genus of plants. See the article BARBA *Jovis*, *Suppl.*

IRON *(Suppl.)* —For the expanſion of *Iron* by heat. See the article HEAT, *Append.*

IRON-*wood*, in botany, the name of a genus of plants, called by botaniſts *Sideroxylum*. See the article SIDEROXYLUM, *Append.*

Filings of Iron, in medicine, when reduced to an impalpable powder, is an excellent form to be given in female diſorders, in which the body is weak, languid, and full of acidities; the juices are themſelves the beſt menſtruum in the world for it, as appears from its producing eructations of the ſmell of garlick, and by its tinging the excrements as black as ink. The natural heat, before wanting, is always excited by this means.

IRRIGATION, *Irrigatio*, denotes the watering of a meadow, garden, &c. Dict. Ruſt. in voc.

ISARUS, in zoology, a name given by the antients to the chamoy-goat. See the article RUPICAPRA, *Suppl.*

ISOPERIMETRICAL *(Cycl.)* — *Iſoperimetrical* lines and figures have greatly engaged the attention of mathematicians ſince the invention of fluxions. The analyſis of the general problem concerning figures, that among all thoſe of the ſame perimeter produce maxima and minima, was given by Mr. James Bernoulli, from computations that involve ſecond and third fluxions. [a] And ſeveral inquiries of this nature have been ſince proſecuted in like manner, but not always with equal ſucceſs. Mr. Mac Laurin, to vindicate the doctrine of fluxions from the imputation of uncertainty, or obſcurity, has illuſtrated this ſubject, which is commonly conſidered as one of the moſt abſtruſe parts of this doctrine, by giving the reſolution and compoſition of theſe problems by firſt fluxions only; and in a manner that ſuggeſts a ſynthetic demonſtration, ſerving to verify the ſolution [b]. [a *Analyſis magni problematis iſoperimetrici*, Act. erudit. Lipſ. 1701. p. 213, ſeq. b See *Mac Laurin's* Fluxions, B. I. chap. 13. p. 486, ſeq. See alſo Mem. Acad. Scienc. 1706. 1718. and *Jo. Bernoulli*, oper. Tom. I. p. 202, 208, 424, ſeq. Tom. II. p. 235, ſeq.]

ISSUES *(Suppl.)* — *Iſſues* above the ſhoulder-blades are good in aſthmatic caſes; and Dr. Mead thinks that their benefit in this and ſome other diſtempers, lies not only in giving vent to the humours, but likewiſe in leſſening the over great tenſion of the nerves. Monit. et Pract. medic. cap. v.

The uſe of *Iſſues* or ſetons, made in the ſide on the part moſt affected, is recommended inſtead of bleeding in conſumptive caſes. See the article CONSUMPTION, *Append.* and ISSUE, *Suppl.*

ITCH *(Cycl.)* —Sulphur is ſpecific in this diſorder, being both more ſafe and more efficacious than mercury. For unleſs a mercurial ointment were to touch every part of the ſkin, there can be no dependance on it; whereas by a ſulphureous one, a cure may be procured only by partial unctions.

It would ſeem, as if the *Itch*-inſects, like other animals, were killed by the ſteams of brimſtone, though only raiſed by the heat of the body.

As to the internal uſe of mercury, which ſome have accounted ſpecific, there are many inſtances of people who have undergone a complete ſalivation for the cure of the venereal diſeaſe, without curing the *Itch.*

A pot of ſulphureous ointment may be prepared thus: take of common ſulphur one ounce; of the root of white hellebore, two drams; or one dram of crude ſal ammoniac; make them into an ointment with two ounces and an half of hog's lard. This quantity will ſerve for four unctions, once every night. But to prevent any diſorder that might ariſe from ſtopping too many pores at once, it will be proper to anoint only one fourth of the body at one time.

Though the *Itch* may be thus removed by one pot of ointment, it will be proper to renew the application, and to touch the parts moſt affected, for a few nights longer, till a ſecond quantity, equal to the firſt, is alſo exhauſted; and, in the worſt caſes, to ſubjoin the internal uſe of ſulphur. Now, as the fumes of the ſulphur may heat the blood, at a time when the perſpiration is ſo much impeded, the patient ſhould live all the while on a cool diet, and guard againſt cold. If he be of a full habit, or in any degree feveriſh, it will be proper to bleed and take phyſic; otherwiſe, neither of the two evacuations is neceſſary. See the article SCABIES, *Suppl.*

ITCH-*animal*, a creature found in the puſtules of the *Itch*; it is a ſpecies of *Acarus*. See the article ACARUS, *Append.*

JUCCA, in botany, the name of a diſtinct genus of plants, otherwiſe called *Yucca*. See the article YUCCA, *Suppl.*

JUCKING, the notes of a cock-partridge, inviting the hen to come to him. Theſe ſerve the ſportſman in good ſtead for finding the places where they are. Ruſt. Dict. in voc.

JUCURUTA, a very beautiful ſpecies of owl, found in the Brazils, and variegated with black and yellow.

JUFFERS, among carpenters, a term uſed for pieces of wood, about four or five inches ſquare, and of ſeveral lengths.

JUGLANS, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, called by Tournefort ſimply *Nux*; and in Engliſh the *Walnut-tree*. See the article NUX, *Suppl.*

JUJUBE-*tree*, the Engliſh name of a diſtinct genus of plants, called by authors *Ziziphus*. See the article ZIZIPHUS, *Suppl.*

JULIANS, the name of a diſtinct genus of plants, called by botaniſts *Heſperis*. See the article HESPERIS, *Suppl.*

JULY-*flowers*, the Engliſh name for ſeveral ſpecies of *Caryophyllus*, or pink. See the article PINK, *Suppl.*

JUNCUS *odoratus*, *aromaticus*, and *rotundus*, in botany, names given to the *Schænanth*. See the article SCHÆNANTH, *Suppl.*

IVORY *(Cycl.* and *Suppl.)*—*Staining or Dying of* IVORY. To ſtain *Ivory* of a fine green colour, take to two parts of verdigreaſe one part of ſal armoniac.

JUTTY-*heads*, in the ſea-language, platforms ſtanding on piles, near the docks, and projecting without the wharfs for the more convenient docking and undocking ſhips. *Blanckley*, Nav. Expoſitor, p. 84.

JUG, a ſort of earthen pot, or pitcher, to hold drink; alſo a term uſed in many parts for a common, paſture, or meadow. Ruſt. Dict. in voc.

JUNAMES, in huſbandry, denotes land ſown with the ſame grain, as it had been the preceding year.

JUPITER's-*beard*, the Engliſh name of a diſtinct genus of plants, called by Tournefort *Barba Jovis*. See the article BARBA *Jovis*, *Suppl.*

IVY *(Suppl.)* —*Ground*-IVY, *Hedera terreſtria*, the name of a genus of plants, the characters of which are theſe; the cup is a one-leaved perianthium, tubulated, cylindric, ſtriated, very ſmall, and permanent; with its mouth divided into five acuminated, unequal ſegments. The flower is monopetalous, and ringent; the tube is ſlender and compreſſed, the upper lip being erect, obtuſe, and ſemibifid; the under one patent, large, obtuſe, and trifid. The ſtamina are four, ſtanding under the upper lip of the flower; each of the two pair of antheræ is arranged in the form of a croſs. The germen of the piſtil is quadrifid; the ſtyle is filiform, and inclinated; the ſtigma bifid and acute. There is no pericarpium beſide the cup; the ſeeds, which are ovated, and four in number, being contained in it. *Linnæi* Gen. Plant. p. 269.

Virginian-IVY, a name uſed by ſome writers for the *Meniſpermum*, a diſtinct genus of plants. See the article MENISPERMUM, *Append.*

K.

KAB, in Jewiſh antiquity. See the article CAB, *Suppl.*

KÆMPFERIA, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: The cup is a ſimple ſpatha, conſiſting only of one leaf, and opening on one ſide. The flower conſiſts of a ſingle petal; the tube is long and thin, the limb is plane, and divided into ſix parts, three of the ſegments being alternately lanceolated in figure, and equal in ſize; two other of the ſegments are of an ovated form, and the ſingle lower one is divided into five parts, which are each vertically cordated; all the ſegments are equal in length. The ſtamen is a ſingle filament, of a membranaceous ſtructure, and ſomewhat ovated figure, and is emarginated. The anthera is of a lineal figure, it grows to the filament all its length, and ſcarce emerges out of the tube of the corolla. The germen of the piſtil is roundiſh; the ſtyle is of the length of the tube, and the ſtigma is obtuſe. The fruit is a roundiſh, and ſomewhat trigonal capſule, compoſed of three valves, and containing three cells, in each of which there are a great number of ſeeds. Vid. *Linnæi* Gen. Plant. p. 4.

The root of the *Kæmpferia*, of which there is only one known ſpecies, is the *Galangal* of the ſhops. See the article GALANGAL, *Suppl.*

KAHIASEE, in the turkiſh court, an officer of ſtate, anſwering to our maſter of the ceremonies.

KANTREF, or KANTREV. See the article CANTRED, *Suppl.*

KARFE, a kind of Cinnamon. See the article CINNAMUM, *Suppl.*

KARLE *(Cycl.)* — KARLE-*hemp*, a term uſed by country people for the latter green hemp. Dict. Ruſt. in voc.

KASTRIL, in zoology, the ſame with *Keſtril*, a bird of the hawk-kind. See the article KESTRIL, *Suppl.*

KATKIN. See the article CATKIN, *Suppl.*

KEELERS, in the ſea language, ſmall tubs for holding ſtuff to grave a ſhip's bottom. *Blanckley*, Nav. Expoſ. p. 85.

KEEVE, or KEEVER, a large tub, or brewing veſſel, in which ale or beer ferments before it is tunned. Dict. Ruſt. in voc.

KENNEL, a term uſed indifferently for a puddle, a watercourſe in the ſtreets, a houſe for a pack of hounds, and the pack or cry of hounds themſelves. Dict. Ruſt. in voc.

Among ſportſmen, a fox is ſaid to *kennel*, when he lies cloſe in his hole. Id. ibid.

KERSEY, a kind of coarſe woollen cloth, made chiefly in Kent and Devonſhire. Dict. Ruſt. in voc.

KESITAH. This word is to be met with in Geneſis [a], and in Job [b]; and is tranſlated in the ſeptuagint and vulgate Sheep or Lambs. But the Rabbins and modern interpreters are generally of opinion, that *Keſitah* ſignifies rather a piece of money. Bochart and Eugubinus are of opinion the ſeptuagint meant *Minæ*, and not *Lambs*; in Greek *hecatonmnon*, ἑκατομνων inſtead of ἑκατον ἀμνων. Now a Mina was worth ſixty Hebrew ſhekels, and conſequently ſix pounds ſixteen ſhillings and ten pence halfpenny ſterling [c]. M. de Pelletier of Rouen, is of opinion, that *Keſitah* was a Perſian coin, ſtamped on one ſide with an archer (*Keſitah*, or *Keſeth*, in Hebrew, ſignifying a Bow) and on the other with a Lamb; that this was a gold coin known in the eaſt by the name of a Daric [d], and was in value about twelve livres and ten pence French money. Several learned men, without mentioning the value of the *Keſitah*, ſay it was a ſilver coin, the impreſſion whereof was a ſheep; for which reaſon the ſeptuagint and vulgate tranſlate it by this name. Calmet is of opinion, that *Keſitah* was a purſe of gold or ſilver. In the eaſt they reckon at preſent by purſes. The word *Kiſta* in Chaldee ſignifies a meaſure, a veſſel. And *Euſtathius* ſays, that *Kiſta* is a Perſian meaſure. Jonathan and the *Targum* of *Jeruſalem* tranſlate *Keſitah* a pearl [e].

[a] Gen. XXXIII. 19.—[b] Job XLII. 11.—Or Nine pounds *Engliſh*, ſuppoſing, as Dr. *Prideaux* does, that a ſhekel is worth three ſhillings.— [d] A Daric is a piece of gold, worth, as Dr. *Prideaux* ſays, five and twenty ſhillings *Engliſh*. See his Connect. P. I. p. 101.— [e] See *Calmet* Comment. upon Gen. XXXIII. 19. Gen. XXV. 12, &c. and Dict. Bibl.]

KEY *(Suppl.)* — KEYS, a name commonly given to the ſeeds of aſh-trees. Dict. Ruſt. in voc.

KID, in zoology, the Engliſh name of the young of goats. See the article GOAT, *Suppl.*

KIDNEYS *(Cycl.)* — The lymphatic veſſels of the *Kidneys* appear upon blowing by the ureter into the pelvis of the *Kidney*. See Hiſt. de l'Acad. des Sciences, 1733.

KIDNEY-*bean-tree*, the name by which ſome call the *Glycine*. See the article GLYCINE, *Suppl.*

KIDNEY-*wort*, in botany, a name promiſcuouſly uſed for two diſtinct genuſes of plants, called by botaniſts *Geum*, and *Cotyledon*. See the articles GEUM and COTYLEDON, *Suppl.*

KILLOS, a name given by the miners of Cornwall to a ſtone of the ſlate kind, found in the mines there. See the article GROWAN, *Suppl.*

KINE, in zoology. See the articles COW and BO, *Suppl.*

KING-*fiſher*, the Engliſh name of a genus of birds, called by zoologiſts *Iſpida*. See the article ISPIDA, *Suppl.*

KING's-*ſpear*, a name ſometimes uſed for the *Aſphodelus* of botaniſts. See the article ASPHODELUS, *Suppl.*

KINKS, in the ſea language. When ropes are new, or too hard laid, they are apt in folding, to make turns, which are called *Kinks*. *Blanckley*, Nav. Expoſ. p. 16.

KIPE, a kind of oſier baſket, wide in the middle, and narrow at both ends, uſed for taking fiſh. Ruſt. Dict. in voc.

KIPE is alſo the name of a game, which conſiſts in throwing ſomething into a hole, called the *Kipe*-hole.

KIRTLE, a term uſed for a ſhort jacket; alſo for a quantity of flax, about an hundred weight. Ruſt. Dict. in voc.

KITE, in ornithology, the Engliſh name of a bird of the hawk-kind, with a brown body, and a white head; its tail is forked, and the wings are immoderately long and large, meaſuring nearly three times the length of the body. See the article MILVUS, *Suppl.*

KLEINIA, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: The cup is cylindric, and covered with ſquamæ; the compound flower is tubuloſe; the proper one infundibuliform, inſenſibly terminating in a tube; the ſtamina are five very ſhort capillary filaments; the antheræ are cylindraceo-tubuloſe; the germen of the piſtil is coronated; the ſtyle is filiform, and of the length of the ſtamina; the ſtigmata are two, oblong, and revolute. There is no pericarpium. The ſeeds are ſolitary, oblong, and covered with very long capillary down. The receptacle is naked, plane, and punctated. *Linnæi* Gen. Plant. p. 394.

Linnæus queries whether this genus be not the ſame with the *Tithymaloides* of Tournefort. See the article TITHYMALOIDES, *Suppl.*

KNAG, a term uſed by country people for a knot in wood; alſo for the branches which grow out in the hart's-horns, near the forehead. Ruſt. Dict. in voc.

KNEE-*holm*, or KNEE-*holly*, the name by which ſome call the *Ruſcus*, or Butcher's-broom. See the article RUSCUS, *Suppl.*

KNIGHT's *Croſs*, a name ſometimes uſed for the *Lychnis*, a diſtinct genus of plants. See the article LYCHNIS, *Suppl.*

KNOLL, a term uſed in many parts of the kingdom for the top of a ſmall hill, or for the hill itſelf. Ruſt. Dict. in voc.

KNOT-*berries*, in botany, the name by which ſome call the *Rubus*. See the article RUBUS, *Suppl.*

KNOT-*graſs*. *(Suppl.)*—*Mountain* KNOT-*graſs*, or *ſingle* KNOT-*graſs*, the name ſometimes given to a diſtinct genus of plants, called by botaniſts *Paronychia*. See the article PARONYCHIA, *Suppl.*

L.

LABURNUM, in botany, the name uſed by Rivinus, for the cytiſus of other botaniſts. See the article CYTISUS, *Suppl.*

LACRYMA *Jobi*, in botany, the name of a genus of plants, the characters of which are theſe: The male flowers are formed into a lax ſpike; the female ones are fewer in number, and are ſituate at the baſe of the male ſpike on the ſame plant. In the male flowers the cup is a glume, containing two flowers, and has no awns; the corolla is alſo a glume, without any ariſtæ or awns. The ſtamina are three capillary filaments; the antheræ are oblong, and quadragonal. In the female flowers, the cup is alſo a glume, containing two flowers, as is the corolla, both being without any awns. The germen of the piſtil is of an oval form; the ſtyle is ſhort, and divided into two parts. The ſtigmata are two in number, corniculated, and longer than the flower. The ſeed, which is ſingle and roundiſh, is covered by the indurated cup. Vid. *Linnæi* Gen. Plant. p. 445.

LADDER *to heaven*, the name by which ſome call the *Polygonatum*, a diſtinct genus of plants. See the article POLYGONATUM, *Suppl.*

LADIES *bed-ſtraw*, in botany, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Gallium*. See the article GALLIUM, *Suppl.*

LADIES *bower*, or *Virgin's bower*, names given to a diſtinct genus of plants, called by botaniſts *Clematitis*. See the article VIRGIN'S *bower*, *Suppl.*

LADIES *comb*, or VENUS'S *comb*, in botany, the name of a diſtinct genus of plants, called by botaniſts *Scandix*. See the article SCANDIX, *Suppl.*

LADLE *(Suppl.)* — LADLE-*boards*, thoſe boards diſpoſed on the circumference of the water-wheels of over-ſhot mills; forming hollows, or receptacles not unlike ladles to receive the water that falls upon the wheel. See the article *Water*-WHEEL, *Append.*

LADIES *finger*, the name by which ſome call a ſpecies of *Vulneraria*. See the article VULNERARIA, *Suppl.*

LADIES *mantle*, in botany, the name of a genus of plants, known among authors by that of *Alchimilla*. See the article ALCHIMILLA, *Suppl.*

LADIES *ſeal*, a name ſometimes given to a diſtinct genus of plants, called by botaniſts *Tamnus*. See the article TAMNUS, *Suppl.*

LADIES *traces*, a name ſometimes uſed for the *Orchis*, a diſtinct genus of plants. See the article ORCHIS, *Suppl.*

LADY *cow*, the Engliſh name of a genus of beetles, called by ſome *Hemiſphæria*. See the articles SCARABÆUS, *Suppl.* and HEMISPHÆRIA, *Append.*

LAKE-*weed*, in botany, a name ſometimes uſed for the *Perſicaria*, or arſmart. See the article PERSICARIA, *Suppl.*

LAMB'S *Lettuce*, a name by which ſome call the *Valerianella*, a diſtinct genus of plants. See the article VALERIANELLA, *Suppl.*

LAMPADIAS is uſed by ſome authors for a kind of bearded comet, which, as they pretend, reſembles a burning lamp, being of ſeveral ſhapes; its flame or blaze tapering upward ſometimes like unto a ſword, and being at others double or triple pointed.

LANIARDS. See the article LANNIERS, *Suppl.*

LANIO, in ornithology, the name uſed by Linnæus for the butcher-bird. See the article LANIUS, *Suppl.*

LANNAR, in ornithology, a bird of the hawk-kind. See the article LANNARIUS, *Suppl.*

LANYARDS. See the article LANNIERS, *Suppl.*

LAPIS *Calaminaris*, in natural hiſtory. See the article CALAMINARIS *Lapis*, *Suppl.*

LAPPA, in botany, a name uſed by ſome for the *Xanthium*, or burdock. See the article XANTHIUM, *Suppl.*

LAPWING, in ornithology, the Engliſh name of the black-breaſted *Tringa*, with a hanging creſt. See the article TRINGA, *Suppl.*

Were the *Lapwing* leſs common, it would be highly eſteemed for its beauty. It is very frequent in our fenny countries, and in the wet places of moſt other parts of Europe.

Authors have deſcribed it under the names *Vanellus*, *Capra*, and *Capella*. See the article CAPELLA, *Suppl.*

LARCH-*tree*, in botany, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Larix*. See the article LARIX, *Suppl.*

LASER-*wort*, in botany, the name of a diſtinct genus of plants, See the article LASERPITIUM, *Suppl.*

LASK, a term uſed by farriers for a looſeneſs in horſes, frequently fatal to them. Ruſt. Dict. in voc.

LATCHETS, the ſame with *Laſkets*. See the article LASKETS, *Suppl.*

LATHYRUS is alſo a name uſed by ſome for the *Niſſolia* of others. See the articles LATHYRUS and NISSOLIA, *Suppl.*

LAVENDER, the Engliſh name of a diſtinct genus of plants, called by authors *Lavendula*. See the article LAVENDULA, *Suppl.*

Cotton LAVENDER, the name by which ſome call the *Santolina* of botaniſts, a diſtinct genus of plants. See the article SANTOLINA, *Suppl.*

French LAVENDER, a name ſometimes given to a diſtinct genus of plants, called by authors *Stoechas*. See the article STOECHAS, *Append.*

Hollow-leaved Sea LAVENDER, a name ſometimes uſed for a ſpecies of *Sarracena*. See the article SARRACENA, *Suppl.*

Sea LAVENDER, the Engliſh name of a diſtinct genus of plants, known among botaniſts by that of LIMONIUM. See the article LIMONIUM, *Suppl.*

LAVER, in botany, the Engliſh name of a genus of plants, called by botaniſts *Tremella*. See the article TREMELLA, *Suppl.*

LAUREL, *Laurus*, in botany, the name given by Linnæus to a large genus of plants. See the article LAURUS, *Append.*

Alexandrian LAUREL, a name ſometimes given to the *Ruſcus*, or butcher's broom. See the article RUSCUS, *Suppl.*

Dwarf LAUREL, or *ſpurge* LAUREL, names ſometimes given to the *Thymelæa* of botaniſts. See the article THYMELÆA, *Suppl.*

Portugal LAUREL, the name of a diſtinct genus of plants, called by authors *Padus*, or *Lauro-Ceraſus*. See the article LAURO-*Ceraſus*, *Suppl.*

Sea-ſide LAUREL, a name ſometimes given to the *Phyllanthus*, a diſtinct genus of plants. See the article PHYLLANTHUS, *Suppl.*

LAUROTAXA, in botany. See the article RUSCUS, *Suppl.*

LAURUS, in the Linnæan ſyſtem of botany, the name of a large genus of plants, comprehending the *Laurus*, or common bay-tree, of Tournefort; the *Cinnamon-tree*, the *Camphor-tree*, and the *Perſea*, *Borbonia*, *Benzoe*, and *Saſſafraſs* of others.

The characters of this genus are theſe: There is no calyx, the corolla much reſembles a calyx, and has been miſtaken for one; it conſiſts of ſix erect, hollow, ovo-acuminated petals, alternately exterior; the nectarium is compoſed of three coloured, acuminated turbercles, terminating each in two hairs, and ſtanding round the germen; the ſtamina are nine filaments, ſhorter than the corolla, compreſſed, obtuſe, and placed in threes; the antheræ adhere to the edge of the upper part of the filaments on each ſide; and there are two globoſe corpuſcles, affixed, by a very ſhort filament, to each of the ſtamina of the inner ſeries, near the baſe; the germen is oval; the ſtyle is ſimple, equal, and of the length of the ſtamina; the ſtigma is obtuſe and oblique; the fruit is a drupe of an oval, acuminated figure, containing only one cell, and contained in the corolla; the ſeed is a ſingle ovato-acuminated nut; its kernel is of the ſame ſhape.

The greater number of the ſpecies of this genus, as the cinnamon-tree, camphor-tree, &c. are of the hermaphrodite kind; but ſome, as the common bay, have the male flowers on ſeparate trees: In this caſe the ſtamina vary in number from eight to fourteen, and the corolla is naked, and divided into four parts. The little bodies adhering to ſome of the filaments, are the great characteriſtics of the genus. Vid. *Linnæi* Gen. Plant. p. 174.

LAURUSTINE, the Engliſh name of a genus of plants, known among authors by that of *Tinus*. See the article TINUS, *Suppl.*

LAW-*Day*, *Lagedayum*, in our old Law-writers, was any day of open court, and commonly uſed for the courts of a county or hundred. It is alſo called *View of frank-pledge*, or *Court-leet*. — *Et quieti ſint de Sectis Comitatuum & Hundredorum noſtrorum, de viſu franci plegii & Lawdayorum*, &c. Chart. 39. H. 3. *Terms of law.*

LAYR. See the article LAIR, *Cycl.*

LAYES, or LEYES, a term uſed in many parts of England, for ſuch paſture ground, as formerly had been tilled and ſown. Ruſt. Dict. in voc.

LAZEROLE, in botany, a name uſed for ſeveral ſpecies of medlar. See the articles MESPILUS and MEDLAR. *Suppl.*

LEAM, or LIAM, among ſportſmen, the line for holding a hawk or dog, more uſually called a Leaſh. See the article LEASH, *Cycl.*

LEDGERS, among builders. See the article PUTLOGS, *Cycl.*

LEE *(Suppl.)* — LEE-*ſangs* are ropes reeved into the cringles of a yacht's or hoy's ſails. *Blankley*'s Naval Expoſitor, p. 93.

LEECH, the ſame with LEETCH. See the article LEETCH, *Suppl.*

LEEK *(Suppl.)* — *Houſe*-LEEK, the Engliſh name of a genus of plants, called by botanical writers *Sedum*. See the article SEDUM, *Suppl.*

LEMNA, *Duckweed*, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by others LENTICULA and HYDROPHACE.

The characters of it are theſe: It produces diſtinct hermaphrodite and female flowers on the ſame plant. In the hermaphrodite flowers the cup is monophyllous, of a roundiſh figure, and opens ſidewiſe; it is dilated obliquely outwards, and is large, expanded, obtuſe, and not divided at the edges. There is no corolla; but in this calyx there ſtands two ſubulated, crooked filaments, of the length of the cup, and on theſe double globoſe antheræ. In the female flower there is no corolla; the calyx is the ſame as in the other. The germen of the piſtil is of an oval form; the ſtyle is ſhort and permanent, the ſtigma ſimple. The fruit is a rounded capſule, but terminating in a point, and contains only a ſingle cavity; in which are lodged a ſmall number of ſeeds, of an oblong figure, pointed at each end, and ſtriated on one ſide. Vid. *Linnæi* Gen. Plant. p. 508.

The ſpecies of *Lemna* enumerated by authors are theſe. 1. The roundiſh leaved, ſingle rooted *Duck-weed*. 2. The ſingle rooted *Lemna*, with oblong leaves. 3. The many rooted, broad, oval leaved *Duck-weed*. 4. The ſingle rooted, oval leaved *Lemna*. 5. The oval leaved *Lemna* with no root. 6. The ramoſe, pediculated *Lemna*, with oblong leaves. Vid. *Hill*'s Hiſt. Plant. p. 128.

Beſides theſe ſix diſtinct ſpecies of *Lemna*, there are two varieties that may eaſily be miſtaken for diſtinct ſpecies alſo: theſe are a very ſmall, oblong, and thick leaved kind; and a larger, roundiſh, and thin leaved one.

The common *Lemna* is recommended, as a refrigerant, and reſtringent; and Bates tells us of a wonderful cure performed by an infuſion of it in wine, in an obſtinate jaundice. Id. ibid. p. 130.

LEMON-*tree*, *Limon*, in botany. See the article LIMON, *Suppl.*

The culture of the *Lemon-tree* is much the ſame with that of the Orange-tree. See the article ORANGE, *Suppl.*

However, it is proper to obſerve, that the common *Lemons* are ſomewhat hardier than the orange, and require a greater ſhare of freſh air in winter, for which reaſon they ſhould be placed nearer to the doors or windows of the green-houſe. Another difference likewiſe deſerves to be mentioned; and that is, that the *Lemons* require to be more plentifully watered than the orange. But as to the tender kinds of *Lemons*, they muſt be treated with more care. *Miller*, Gard. Dict.

Water-LEMON, a name ſometimes given to the *Granadilla*, or paſſion flower. See the article GRANADILLA, *Suppl.*

LENTIL, in botany, the Engliſh name of a diſtinct genus of plants, called by botanical writers, *Lens*. See the article LENS, *Suppl.*

Lentils make excellent ſweet fodder; and are therefore to be preferred to all other kinds for calves and other young cattle. They likewiſe are the beſt as well as cheapeſt food for pidgeons. Ruſt. Dict. in voc.

Peruvian-LENTISK, the name ſometimes given to the *Molle* of botanical authors. See the article MOLLE, *Suppl.*

LEOPARD, in zoology, the Engliſh name of the long-tailed *Felis*, with the upper ſpots round, and the lower ones virgated. See the article FELIS, *Suppl.*

LEPRAS, in ichthyography. See the article TURDUS, *Suppl.*

LEPROSY *(Cycl.)* — The leſſer degrees of *Leproſy* are frequently confounded with the ſcurvy, and even itch; from which, however, it may be diſtinguiſhed by the hardneſs of the ſkin in one or more parts of the body, attended with a dry ſcurf, ſometimes oozing puſtules, or dry ſcabs, and always with ſome degree of itching; whereas the true ſcorbutic ſpots are of a livid colour, not commonly ſcurfy or raiſed above the ſkin, and are attended with manifeſt ſigns of a lax ſtate of the fibres, and corruption of the blood. For a real ſcurvy imports a flow, but general reſolution or putrefaction of the whole frame; whereas the ſcabies, impetigo, or leproſy may be found to affect thoſe of a very different conſtitution. *Pringle*, Obſerv. on Diſeaſ. of the Army, p. 306.

This diſorder is ſo far from being curable by externals only, that it is ſometimes dangerous to attempt to remove the ſcurfs of *leprous* people in that manner. On the contrary, it is neceſſary to change the humours, by a ſpare diet, exerciſe, alterative mercurials, or frequent purges of the ſaline kind. Id. ibid.

Dr. Mead recommends the Tincture of Cantharides in this diſtemper. *De morbis biblicis*.

LEPTURA, in the hiſtory of inſects, the name of a genus of four-winged flies, the antennæ of which are oblong, ſlender, and ſetaceous; the exterior wings are truncated at their extremity, and the thorax is of a ſubcylindric figure. *Hill*, Hiſt. Anim. p. 46.

Theſe flies have been, by the generality of authors, reckoned among the beetles. See the article SCARABÆUS, *Suppl.*

LEPTURUS, the name is of Greek origin, and is form'd of the λεπτος ſlender, and ουρα a tail; expreſſing that this fiſh has a very long and ſlender tail.

LEPUS *Marinus*, a name uſed by many authors for the *Lernea*. See the article LERNEA, *Append.*

LERNEA, in zoology, the name of a genus of naked inſects. Its body is of an oblong, cylindric figure, from one to two inches long; and is perforated in the forehead; the tentacula reſemble ears.

It is found on rocks waſhed by the ſea, and even on the ſides of the bream, carp, and roach, in many of our ponds and rivers.

Authors have called it *Lepus marinus*, the ſea-hare; of which they enumerate a great many ſpecies. *Hill*, Hiſt. Anim. p. 88.

LESSES, a term uſed by ſportſmen for the dung of a wild boar, bear, or wolf. Ruſt. Dict. in voc.

LETTUCE — *(Suppl.)* *Lamb*'s LETTUCE, in botany, the name of a genus of plants, called by botaniſts *Valerianella*. See the article VALERIANELLA, *Suppl.*

Wild-LETTUCE, a name ſometimes given to the *Prenanthes*. a diſtinct genus of plants. See the article PRENANTHES, *Suppl.*

LEUCO-*Narciſſo-lirion*, a name uſed by *Lobel*, for the plant called by Linnæus *Galanthus*, and comprehended by Tournefort among the *Narciſſo-Leucoiums*. See the article NARCISSO-*Leucoium*, *Suppl.*

LEUCOIUM *bulboſum*, a name ſometimes given to a ſpecies of *Narciſſo-Leucoium*, according to Tournefort, but made a diſtinct genus by Linnæus, under the name *Galanthus*. See the article NARCISSO-*Leucoium*, *Suppl.*

LEUCORHOEA. See the article FLUOR *Albus*, *Suppl.*

LIBELLULA, in zoology, the name of a genus of two winged flies, the mouth of which is furniſhed with jaws, the antennæ ſhort, and the tail terminated by a kind of forceps.

The ſpecies of this genus are very numerous, ſome carrying their wings erect when they ſit, and others horizontally. Vid. *Hill*, Hiſt. Anim. p. 73.

LICE *of trees*. See the article APHIS, *Append.*

LIFE *(Suppl.)* — *Annuity for* LIFE. Dr. Halley's Table of the values annuities for lives for different ages, inſerted in the Cyclopædia, under ANNUITY, was computed at a high rate of intereſt, and coincides nearly with Mr. De Moivre's Tables at 6 per Cent; but as intereſt is now much fallen, it may be proper here to ſhew the values of ſuch Annuities, when intereſt is eſtimated at 3, 3½, 4, and 5 per Cent.

Value of an Annuity for life of 1 £. Intereſt being,

Age	3 *per* Ct.	3½ *per* C.	4 *per* Ct.	5 *per* Ct.
9 *and* 10	19. 87	18. 27	16. 88	14. 60
8, 11	19. 74	18. 16	16. 79	14. 53
7, 12	19. 60	18. 05	16. 64	14. 47
13	19. 47	17. 94	16. 60	14. 41
6, 14	19. 33	17. 82	16. 50	14. 34
15	19. 19	17. 71	16. 41	14. 27
16	19. 05	17. 59	16. 31	14. 20
5, 17	18. 90	17. 46	16. 21	14. 12
18	18. 76	17. 33	16. 10	14. 05
19	18. 61	17. 21	15. 99	13. 97
4, 20	18. 46	17. 09	15. 89	13. 89
21	18. 30	16. 96	15. 78	13. 81
22	18. 15	16. 83	15. 67	13. 72
23	17. 99	16. 69	15. 55	13. 64
3, 24	17. 83	16. 56	15. 43	13. 55
25	17. 66	16. 42	15. 31	13. 46
26	17. 50	16. 28	15. 19	13. 37
27	17. 33	16. 13	15. 04	13. 28
28	17. 16	15. 98	14. 94	13. 18
29	16. 98	15. 83	14. 81	13. 09
30	16. 80	15. 68	14. 68	12. 99
2, 31	16. 62	15. 53	14. 54	12. 88
32	16. 44	15. 37	14. 41	12. 78
33	16. 25	15. 21	14. 27	12. 67
34	16. 06	15. 05	14. 12	12. 56
35	15. 86	14. 89	13. 98	12. 45
36	15. 67	14. 71	13. 82	12. 33
37	15. 46	14. 52	13. 67	12. 21
38	15. 26	14. 34	13. 52	12. 09
1, 39	15. 05	14. 16	13. 36	11. 96
40	14. 84	13. 98	13. 20	11. 83
41	14. 63	13. 79	13. 02	11. 70
42	14. 41	13. 59	12. 85	11. 57
43	14. 19	13. 40	12. 68	11. 43
44	13. 96	13. 20	12. 50	11. 29
45	13. 73	12. 99	12. 32	11. 14
46	13. 49	12. 78	12. 13	10. 99
47	13. 25	12. 57	11. 94	10. 84
48	13. 01	12. 36	11. 74	10. 68
49	12. 76	12. 14	11. 54	10. 51
50	12. 51	11. 92	11. 34	10. 35
51	12. 26	11. 69	11. 13	10. 17
52	12. 00	11. 45	10. 92	9. 99
53	11. 73	11. 20	10. 70	9. 82
54	11. 46	10. 95	10. 47	9. 63
55	11. 18	10. 69	10. 24	9. 44

Value of an Annuity for life of 1 £. Intereſt being

Age	3 per Ct.	3½ per Ct.	4 per Ct.	5 per Ct.
56	10. 90	10. 44	10. 01	9. 24
57	10. 61	10. 18	9. 77	9. 04
58	10. 32	9. 91	9. 52	8. 83
59	10. 03	9. 64	9. 27	8. 61
60	9. 73	9. 36	9. 01	8, 39
61	9. 42	9. 08	8. 75	8. 16
62	9. 11	8. 79	8. 48	7. 93
63	8. 79	8. 49	8. 20	7. 68
64	8. 46	8. 19	7. 92	7. 43
65	8. 13	7. 88	7. 63	7. 18
66	7. 79	7. 56	7. 33	6. 91
67	7. 45	7. 24	7. 02	6. 64
68	7. 10	6. 91	6. 75	6. 36
69	6. 75	6. 57	6. 39	6. 07
70	6. 38	6. 22	6. 06	5. 77
71	6. 01	5. 87	5. 72	5. 47
72	5. 63	5. 51	5. 38	5. 15
73	5. 25	5. 14	5. 02	4. 82
74	4. 85	4. 77	4. 66	4. 49
75	4. 45	4. 38	4. 29	4. 14
76	4. 05	3. 98	3. 91	3. 78
77	3. 63	3. 57	3. 52	3. 41
78	3. 21	3. 16	3. 11	3. 03
79	2. 78	2. 74	2. 70	2. 64
80	2. 34	2. 31	2. 28	2. 23

The columns marked 3 per Ct. &c. ſhew the values of annuities for LIFE in years purchaſe, and decimals of a year; thus an annuity for LIFE at 3 per Ct. for an age of 56, will be 10. 90. that is worth 10 $\frac{9}{10}$ years purchaſe.

Dr. Halley alſo publiſhed a Table [a] for eſtimating the probabilities of life, grounded on the Breſlau Bills of Mortality; and the values of annuities for *life* have been commonly determined from this Table, and from the rate of intereſt. See *De Moivre*, Doct. of Chances, p. 211, ſeq.

We ſhall here inſert Dr. Halley's Table, divided into ſeveral columns, ſhewing alternately the age, and the number of perſons living of that age.—[[a] Philoſ. Tranſ. N° 196. Lowthorp's Abridg. Vol. III. p. 671.]

Age	Perſons	Age	Perſons	Age	Perſons	Age	Perſons
1	1000	22	586	43	417	64	202
2	855	23	579	44	407	65	192
3	798	24	573	45	397	66	182
4	760	25	567	46	387	67	172
5	732	26	560	47	377	68	162
6	710	27	553	48	367	69	152
7	692	28	546	49	357	70	142
8	680	29	539	50	346	71	131
9	670	30	531	51	335	72	120
10	661	31	523	52	324	73	109
11	653	32	515	53	313	74	98
12	646	33	507	54	302	75	88
13	640	34	499	55	292	76	78
14	634	35	490	56	282	77	68
15	628	36	481	57	272	78	58
16	622	37	472	58	262	79	49
17	616	38	463	59	252	80	41
18	610	39	454	60	242	81	34
19	604	40	445	61	232	82	28
20	598	41	436	62	222	83	23
21	592	42	427	63	212	84	20

By the help of this table we may find what the reſpective probabilities are for a man of a certain age, 30, for inſtance, living 1, 2, 3, 4, &c. years. Thus, look for the number 30 in one of the columns of age; then over-againſt that number in the next adjacent column on the right hand, you will find 531, under which are written 523, 515, 507, 499, &c. each correſponding, reſpectively, to the numbers written in the column of age; the meaning of which is, that out of 531 perſons living of the age of 30, there remain but 523, 515, 507, 499, &c. that attain the reſpective ages of 31, 32, 33, 34, &c. and who conſequently do from that term of 30, live 1, 2, 3, 4, &c. years reſpectively.

Hence ſuppoſing the quantities A, B, C, D, E, &c. to repreſent reſpectively the perſons living at a given age, and the ſubſequent years, it is evident, that there being A perſons of the age given, and one year after B perſons remaining, the probability which the perſon of the given age has to continue in life, for one year, is meaſured by the fraction $\frac{B}{A}$ and that the probability which he has to continue in life for two years, is meaſured by the fraction $\frac{C}{A}$ and ſo on. Therefore, if money bore no intereſt, it would be ſufficient to multiply thoſe probabilities by the ſum to be received annually, and the ſum of the products would expreſs the preſent value of the annuity. But as money bears intereſt, all thoſe values muſt be properly diſcounted at compound intereſt according to a given rate, and the new reſulting value will be the true value of an annuity for a given life at a given rate of intereſt.

Mr. De Moivre obſerved, that in Dr. Halley's Table the probabilities of life decreaſed nearly in an arithmetic progreſſion, when conſidered from a term given, and hence he found an eaſy rule for the value of an annuity on a life of a given age. His rule is, $\frac{1 - \frac{r}{n} P}{r - 1}$ where P repreſents the value of an annuity certain of 1 £ for as many years as are intercepted between the age given, and the extremity of old age, ſuppoſed at 86, and that interval of life is expreſſed by n. r ſtands for the amount of the principal and intereſt of 1 £ in one year.

The rule, therefore, in words at length, will be, Take the value of an annuity certain for ſo many years as are denoted by the complement of life; multiply this value by the rate of intereſt, and divide the product by the complement of life; then let the quotient be ſubtracted from 1, and let the remainder be divided by the intereſt of 1 £; then this laſt quotient will expreſs the value of an annuity for an age given. See *Complement* of LIFE, *infra*.

Thus ſuppoſe it were required to find the preſent value of an annuity of 1 £ for an age of 50, intereſt being at 5 per cent. The complement of life being 36; let the value of an annuity certain, according to the given rate of intereſt, be taken from the tables of ſuch annuities [a], and this value will be found to be 16.5468. Let this value be multiplied by the rate of intereſt 1. 05; the product will be 17. 3741. Let this product be divided by the complement of life, that is, in this caſe, by 36, the quotient will be 0. 04826; ſubtract this quotient from unity, the remainder will be 0.5174. Laſtly, divide this quotient by the intereſt of 1 £; that is, in the preſent caſe, 0. 05, and the new quotient will be 10. 35, which will expreſs the value of an annuity of 1 £ to continue during a life of 50, or, in other words, how many years purchaſe a life of 50 is worth [b].—[[a] See *Dodſon*'s Calculator, p. 11.—[b] *De Moivre*'s Annuit. Probl. I. and Doctr. of Chances, p. 213, ſeqq.

The following queſtions being of frequent uſe, we have here inſerted them, with the rules for their ſolution.

I. The values of two ſingle lives being given, to find the value of an annuity granted for the time of their joint continuance; or, the value of two ſingle lives being given, to find the value of the joint lives.

Multiply together the values of the two lives, and reſerve the product. Let that product be again multiplied by the intereſt of 1 £; and let that new product be ſubtracted from the ſum of the values of the lives, and reſerve the remainder. Divide the firſt quantity reſerved by the ſecond, and the quotient will expreſs the value of the two joint lives.

Thus ſuppoſing one life of 40 years of age, the other of 50, and intereſt at 5 per Cent; the value of the firſt life will be found in the tables to be 11. 83; the value of the ſecond 10. 35; and the product will be 122. 4405, which product muſt be reſerved. Multiply this again by the intereſt of 1 £; that is, by 0. 05, and this new product will be 6. 122025. which being ſubtracted from the ſum of the lives, or 22. 18, the remainder will be 16. 057975, and this is the ſecond quantity reſerved. Now dividing the firſt quantity reſerved by the ſecond, the quotient will be 7. 62 nearly; and this expreſſes the values of the two *joint lives*.

II. The values of two ſingle lives being given, to find the value of an annuity upon the longeſt of them; that is, of an annuity to continue ſo long as either of them is in being.

From the ſum of the values of the joint lives, ſubtract the value of the joint lives, and the remainder will be the value of the longeſt.

Suppoſe for inſtance, two lives, one worth 13 years purchaſe, the other 14, and intereſt at 4 per Cent. The ſum of the values of the lives is 27; the value of the two joint lives by the rule before given is 9. 23; and ſubtracting 9. 23 from 27, the remainder 17. 77 is the value of the longeſt of the two lives.

III. The values of three ſingle lives being given, to find the value of an annuity upon the longeſt of them:

Take the ſum of the three ſingle lives, from which ſum ſubtract the ſum of all the joint lives combined two and two; then to the remainder add the value of the three joint lives, and the reſult will be the value of the longeſt of he three lives.

Thus ſuppoſing the ſingle lives to be 13, 14, and 15 years purchaſe, the ſum of the values will be 42; the values of the firſt and ſecond joint lives are 9. 24; of the firſt and third 9. 65; of the ſecond and third 10. 18; the ſum of all which is 29. 06; which being ſubtracted from the ſum of the lives, that is, from 42, the remainder will be 12. 94; to which adding the value of the three joint lives 7. 41, the ſum 20. 35, will be the value of the longeſt of the three joint lives.

IV. To find the preſent value of a remainder in fee, after a life of a given age. That is, ſuppoſing A to be in poſſeſſion of an annuity for his life; and that B after the deceaſe of A, is to have the annuity for him and his heirs for ever, to find the preſent value of the remainder; or, as ſome call it, the reverſion.

From

From the value of the fee ſimple or perpetuity, ſubtract the value of the *life* in poſſeſſion; what remains will be the value of the reverſion.

Thus ſuppoſing that A is 60 years of age; an annuity upon his *life*, intereſt at 5 per Cent. would be 8. 39; which being ſubtracted from the value of the fee, or perpetuity 20, the remainder will be 11. 61; which is the preſent value of the expectation of B.

By this rule the value of an eſtate ſubject to a jointure may be determined.

In like manner, ſuppoſing that C were to have an annuity for him and his heirs for ever, after the *lives* of A and B, then from the perpetuity or fee ſimple ſubtracting the value of the longeſt of the two *lives* A and B, the remainder will expreſs the value of C's expectation.

Thus, ſuppoſing the ages of A to be 40, and of B to be 50, the value of an annuity upon the longeſt of theſe two *lives* would be found by the foregoing rule to be 14. 56: and this being ſubtracted from the perpetuity 20, the remainder is 5. 44; which is the value of C's expectation.

V. To find the value of an annuity for *life*, after another annuity for *life*.

Suppoſe for inſtance, that A is in poſſeſſion of an annuity for his *life*, and that B, after the *life* of A, is to have the annuity for his *life* only, and that his heir or repreſentative is to have nothing, in caſe A ſurvives B; what is the value of the *life* of B, after the *life* of A.

From the preſent value of the *life* of B, ſubtract the preſent value of the joint *lives* of B and A, and the remainder will be the value of B's expectation.

There are many other uſeful queſtions, the determinations of which depend on the values of annuities for *lives*, joint *lives*, and ſucceſſive *lives*; but it would lead us too far to inſert them here: We muſt therefore refer the reader to M. De Moivre's annuities on *lives*; eſpecially the fourth edition, which is more correct than the former. See alſo the Doctrine of Chances, page 211, 212, &c.

We think it proper to add, that Mr. Kerſeboom's Table of the value of annuities for *life*, does not agree entirely with thoſe of M. De Moivre, either at 3, or 3 ½ per Cent. intereſt. But as Mr. Kerſeboom ſeems to have taken great pains in his obſervations on the probabilities of *life*, it may be worth while here to inſert his Table.

Mr. Kerſeboom's table of annuities for *life*.

Let the annuity be 100 guilders a year upon a *life* under a year old.

	Guilds.	
Its preſent value is - - - - - -	1667	that is 6 per Ct.
Upon a *life* of 5 years to 1 incluſive, is	1869	- - 5. 35
10 - - 6 - -	1835	- - 5. 45
15 - - 11 - -	1770	- - 5. 65
20 - - 16 - -	1667	- - 6. 00
25 - - 21 - -	1587	- - 6. 30
30 - - 26 - -	1515	- - 6. 60
35 - - 31 - -	1429	- - 7. 00
40 - - 36 - -	1334	- - 7. 50
45 - - 41 - -	1212	- - 8. 25
50 - - 46 - -	1093	- - 9. 15
55 - - 51 - -	971	- - 10. 30
60 - - 56 - -	840	- - 11. 40
65 - - 61 - -	709	- - 14. 10
70 - - 66 - -	570	- - 17. 55

See Phil. Tranſ. N° 450. Sect. 15.

Monſieur de Parcieux has alſo given us many uſeful obſervations tending to determine the probability of the duration of the *life* of man. See Eſſai ſur les probabilités de la durée de la vie humaine, Paris, 1746. 4to.

According to this gentleman's eſtimate, the values of annuities for *life* are higher than thoſe of M. De Moivre's Tables. Thus ſuppoſing intereſt at 5 per Cent. Mr. De Parcieux eſtimates an annuity for *life* of 100 livres, according to the following table.

Table of the values of an annuity of 100 livres for *life*, according to Monſieur de Parcieux. Intereſt at 5 per Cent.

Age	Livres	Age	Livres	Age	Livres
3	1557	14	1602	25	1523
4	1582	15	1594	26	1516
5	1600	16	1586	27	1508
6	1613	17	1578	28	1500
7	1620	18	1571	29	1492
8	1624	19	1565	30	1484
9	1627	20	1558	31	1475
10	1625	21	1551	32	1464
11	1622	22	1544	33	1453
12	1617	23	1537	34	1442
13	1610	24	1530	35	1431
36	1419	56	1022	76	480
37	1407	57	999	77	455
38	1394	58	975	78	431
39	1379	59	950	79	408
40	1362	60	924	80	386
41	1344	61	898	81	365
42	1324	62	871	82	345
43	1304	63	843	83	324
44	1284	64	814	84	301
45	1264	65	784	85	278
46	1243	66	752	86	256
47	1222	67	722	87	234
48	1201	68	693	88	210
49	1180	69	664	89	184
50	1158	70	636	90	158
51	1136	71	610	91	132
52	1114	72	584	92	105
53	1091	73	558	93	71
54	1068	74	532	94	47
55	1045	75	506	95	00

Complement of LIFE, is uſed by Mr. De Moivre, for that time which remains from a given age to the extremity of old age, eſtimated by that author at 86 years. Annuit. on Lives, p. 14. Doctrine of Chances, p. 213, ſeq.

Thus, ſuppoſing an age of 50, the *Complement of life* will be 36; becauſe this number is the difference between 86 and 50.

Expectation of LIFE, is uſed by Mr. De Moivre, for the time which a perſon of a given age may juſtly expect to continue in being, that is when the chance for his living or dying becomes equal.

According to that gentleman's calculation, upon the ſuppoſition of an equal decrement of *life*, the *Expectation of life* would be expreſſed by $\frac{1}{2}n$, if n denotes the complement of *life*. Thus the *expectation of life* for a man of 50 years of age will be, $18=\frac{36}{2}$: That is, he had an equal chance, or of 1 to 1, of living 18 years. But if that interval be once attained, there ariſes a new expectation of $\frac{1}{4}n$; and afterwards of $\frac{1}{8}n$, &c. Annuities p. 65, 66.

Hence he gives the ſolution of the following problem: To find the *expectation* of two joint *lives*, that is, the time which two *lives* may expect to continue together in being.

For this the rule is, from one half of the ſhorteſt complement ſubtract the ſixth part of its ſquare, divided by the greateſt complement, the remainder will expreſs the number of years ſought.

Thus ſuppoſing a *life* of 40, and another of 50; the ſhorteſt complement will be 36; the greateſt 46; ½ of the ſhorteſt will be 18; the ſquare of 36 is 1296, whereof the ſixth part is 216, which being divided by 46, the quotient will be $\frac{216}{46}$ = 4. 69; and this being ſubtracted from 18, the remainder 13. 31 will expreſs the number of years due to the two joint *lives*. As to the probability of one *Life*'s ſurviving others, ſee *de Moivre*, Annuit. p. 54. Doct. of Chances, p. 223.

Inſurance upon LIVES. The value of inſurances upon *Lives* depends upon the probability of the continuance of any propoſed *life* or *lives*, during any propoſed term. Any queſtions of this kind may be determined from Dr. Halley's Table, and from the principles of the Doctrine of Chances. But, as far as we can learn of the practice on ſuch occaſions, the premiums paid to inſurers are generally higher than any computation founded on obſervations concerning the probabilities of human *life*, will warrant. Thus it is not unuſual to make a perſon pay 5 per Cent. for the inſurance of his *life* for a twelvemonth, that is, in caſe the perſon dies within the year, the inſurer is to pay 100 *l.* for every 5 *l.* received. Now it appears from Dr. Halley's Table, which eſtimates the probability of *life* low enough, that 5 per Cent. is an adequate value only for a *life* of an advanc'd age, ſuch as 64.

LIFE *everlaſting*, a name by which the *Elichryſum*, or *Gnaphalium*, of botanical writers, is ſometimes called. See the article GNAPHALIUM, *Suppl.*

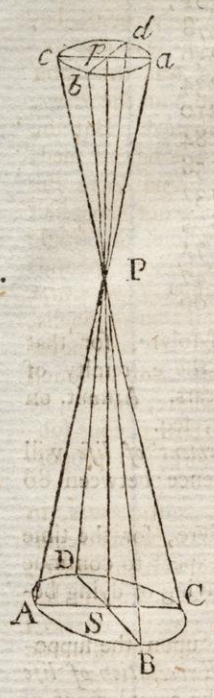
LIGHT *(Cycl.)* — The motion of *Light* was deduced from the obſervations of an apparent inequality in the times of the eclipſes of the ſatellites of Jupiter, by Mr. Romer [a]; but the concluſion was attacked by Monſieur Caſſini. Mr. Romer's opinion found an able advocate in Dr. Halley [b]; who removed Caſſini's difficulty, and left Mr. Romer's concluſion in itsfull force. In the year 1707, Monſieur Maraldi endeavour'd to give a new ſtrength to Caſſini's arguments; but Monſieur Romer's doctrine found a new defender in Mr. Pound [c]. — [[a] See Phil. Tranſ. N° 136. Lowthorp's Abridg. Vol. I. p. 409. [b] Phil. Tranſ. abr. by Lowth. Vol. I. p. 409, 422. [c] 'sGrav. Phyſ. Elem. N° 2636, ſeqq.]

Mr. Romer's deduction from his theory was, that *Light* ſpent about eleven minutes in its paſſage from the ſun to us; but it hath ſince been concluded by others, from the like eclipſes of Jupiter's ſatellites, that it is propagated as far in about ſeven minutes. — [[b] Phil. Tranſ. N° 406, *'sGraveſande*, Phyſ. Elem. N 2638.]

Our excellent aſtronomer, Dr. Bradley, has found nearly the ſame velocity of *Light*, from his accurate obſervations, and moſt ingenious theory, to account for ſome apparent motions in the fixed ſtars. Phil. Tranſ. N° 406. See the article STAR, *Suppl.*

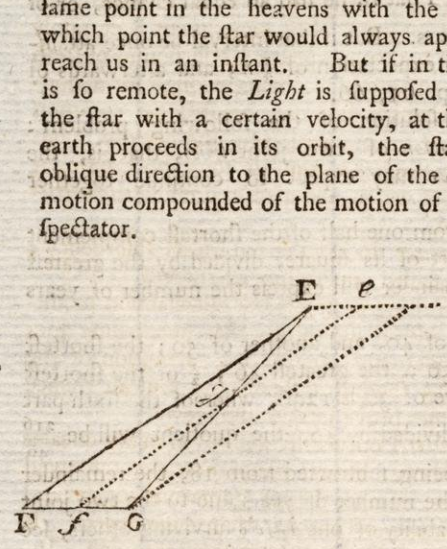
To underſtand this, it muſt be premiſed, that the fixed ſtars are luminous bodies, and at reſt, with reſpect to our planetary ſyſtem, from which they are vaſtly remote. In this ſyſtem alſo the earth is conſidered as one of the planets, and moving about the ſun.

Fig. 1.



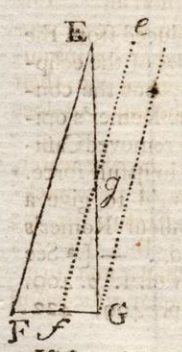
Suppoſe the ſun repreſented in S, (Fig. 1.) and that the circle A B C D repreſents the path of the earth, or the ecliptic. At the center S ſuppoſe a perpendicular S P raiſed to the plane of the ecliptic, and that this perpendicular paſſes thro' any fixed ſtar. If a ſpectator were placed in S, he would ſee the ſtar in the ſame perpendicular; but if the ſpectator paſſes over the circle A B C D, the diameter of which is ſuppoſed to bear a ſenſible, tho' ſmall proportion to the diſtance of the ſtar, it will be perceived to change its ſituation in the heavens. For a ſpectator in A would ſee the ſtar in the line A P *a*; in C he would ſee the ſame ſtar in the line C P *c*; and ſo in any other point of his progreſs: Whence it follows, that the ſtar would ſeem to deſcribe a circle in the heavens repreſented by *a b c d*. If the diſtance of the ſtar was ſo very great, that in reſpect of it the diameter of the earth's orbit A C might be eſteemed a point; in this caſe, the foreſaid circle would be entirely inſenſible; all the lines drawn from the points of the orbit to the ſtar might paſs for perpendiculars to the plane of the ecliptic, and in appearance would correſpond to the ſame point in the heavens with the perpendicular in S, in which point the ſtar would always appear, if its light would reach us in an inſtant. But if in this caſe, where the ſtar is ſo remote, the *Light* is ſuppoſed to be propagated from the ſtar with a certain velocity, at the ſame time that the earth proceeds in its orbit, the ſtar will be ſeen in an oblique direction to the plane of the orbit; becauſe of the motion compounded of the motion of *Light*, and that of the ſpectator.

Fig. 2.



Suppoſe the *Light* to move in the line E G (Fig. 2.) making an angle with the line F G, in which the ſpectator is carried along; whom we ſhall conceive placed in F. Let the velocity of the ſpectator be to the velocity of the *Light*, as F G to E G. While the ſpectator moves along F G, the *Light* does the ſame along E G; and the particle of *Light*, which is in E, when the ſpectator is in F, enters the eye only when he arrives at G. Now the direction of the *Light*, with reſpect to the eye, makes with the line F G the angle E F G. For if we conceive the line F E drawn, and to be carried with a parallel motion along with the eye, ſo that in reſpect thereof it be at reſt, while this continues moving, the *Light* will reach the eye in the direction of the ſaid line; for when the eye ſhall be in *f*, the middle point between F and G, the transferred line will cut E G in its middle point *g*, to which the particle of *Light* has reached, and which is likewiſe the middle point of the transferred line *f e*. Wherefore the particle of *Light*, which was in E, in the extremity of the line E F, arrives at, and will enter the eye in the direction *e g*.

Fig. 3.



Let the angle E G F (Fig. 3.) be a right one, and E G to F G as the velocity of the *Light* to the velocity of the earth in its orbit; then E F G will be the angle, which the ray of *Light* entering the eye, makes with the plane in which the earth moves round the ſun.

If the earth be in B, (Fig. 4.) it moves in the direction of the tangent to its orbit in this point; that is, if we ſuppoſe the ſpectator in the ſun, the direction of the earth's motion is parallel to S C; and making the angle *a* S C equal to the angle E G F, in the former figure, the line S *a* will repreſent the line in which the ſpectator would ſee the ſtar.

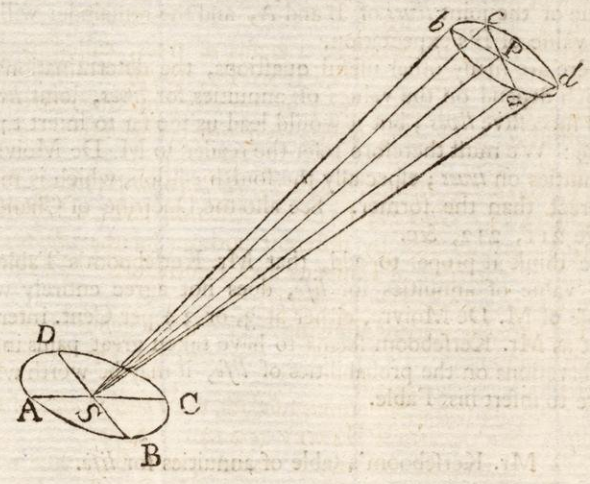
Fig. 4.



In the ſame manner when the earth is in D, the ſpectator in the ſun will ſee the ſtar in S *c*, the angles P S *c* and P S *a* being equal; and this line S *a* or S *c*, by its revolution about P S, would deſcribe a cone, whoſe baſe in the heavens would be a circle repreſenting the apparent path of the ſtar thro' a whole year: Let us ſuppoſe this circle to be *a b c d*, as in the annexed figure.

When the ſtar is not in the perpendicular to the plane of the ecliptic, but the line P S (Fig. 5.) is inclined to that plane, the lines which determine the apparent motion of the ſtar in the heavens, will form cones, as in the caſes already explained; only they would be oblique, and in both caſes the apparent path of the ſtar in the heavens would be determined as above; but in this laſt caſe it would be an ellipſis, the greater diameter of which would be equal to the diameter of the circle *a b c d*, of the former figures; ſo that knowing this ellipſis, the circle might eaſily be found, which the ſtar would deſcribe, if placed in the perpendicular to the plane of the ecliptic.

Fig. 5.



The only way to determine, whether the ſtars deſcribe ſuch ellipſes, is by obſervations; in making which there are great difficulties, which however Mr. Bradley has with incomparable induſtry ſurmounted.

Nothing can immediately be determined concerning the foreſaid elliptic motion. The diſtance of the ſtar from the pole of the world muſt be meaſured at different times of the year; and from the different diſtances, the elliptic motion is to be determined by calculation, allowing for the motion of the pole itſelf during the ſpace of time between the obſervations; for the pole moves in a leſſer circle, one degree of which it paſſes over in ſeventy years. Mr. Bradley, making all neceſſary allowances, obſerved ſeveral ſtars at different times of the year, whereby he immediately diſcovered, that their diſtances from the pole of the world varied; and was convinced that this variation could not be attributed to the nutation of the pole; for he examined two ſtars at equal diſtances from the pole, but ſo oppoſite, that the one ought to have receded from the pole as much as the other acceded to it, if the motion was in the pole itſelf. But this did not fall out ſo; for the change of the one ſtar was double of that of the other; a proper allowance being always made for the pole's motion ariſing from above the revolution. However this indefatigable obſerver inferr'd from his obſervations, that the ſtars in certain times receded from, and acceded to, the pole of the world with a motion entirely analogous to that which is performed in an ellipſis; and alſo that they move in ſuch curves, for each of which the motion in the ſame little circle, as *a b c d*, (Fig. 5.) anſwers, when the ſtars are referred to the perpendicular in S to the plane of the ecliptic; and the diameter of this minute circle for them all is $40'' \frac{1}{2}$.

It is plain from obſervations, to which of the abovementioned cauſes we are to aſcribe the motion of the ſtar. For if the firſt takes place, the ſtar would be carried from *a* to *c*, while the earth paſſed over the part A B C of its orbit; but this being contrary to obſervation, this cannot be the true cauſe. But this change in the ſituation of the ſtar takes place according to the obſervations, while the earth deſcribes the part B C D of its orbit, which is juſt what the ſecond cauſe requires.

If both the cauſes took place at the ſame time, the arc, deſcribed by the earth, would differ from that indicated by either of them; beſides, this concurrence of the cauſes is contrary to the obſervations; unleſs perhaps it may be thought reaſonable to attribute a little influence to the firſt cauſe, but ſo very ſmall a portion, as not to be ſenſibly perceived in the obſervations.

From all which the following concluſions may be deduced: 1. That the ſecond cauſe alone takes place here, viz. That the diſtance of the ſtars is ſo great, that the diameter

ter of the earth's orbit has no ſenſible proportion to it. 2. That the angle F E G (Fig. 2.) in the abovementioned triangle, is 20″¼; and conſequently that the ratio of E G to F G, or the velocity of the *Light* to the velocity of the earth in its orbit, as 10210 to 1; whence it follows that the *Light* comes from the ſun to us in eight minutes and an half. 3. That the *Light* proceeds with the ſame velocity from all the ſtars; for all have the ſame angle F E G. Whence, (if we ſuppoſe that all the ſtars are not equally diſtant from us, as many arguments prove) it will follow, that the motion of *Light*, all the way it paſſes through the immenſe ſpace, above our atmoſphere, is æquable or uniform. 4. Laſtly, It muſt be conſidered, that very ſmall differences cannot be perceived; and no body will deny, but that in meaſuring a ſmall angle, an error of a ſecond may be committed, whatever care is uſed to prevent it; and therefore, although we have ſaid, that the firſt cauſe is to be rejected, we do not deny that the ſtars may poſſibly by its influence deſcribe a minute circle whoſe diameter is 1″, or even a little more. *s'Graveſande* Phyſ. Elem. Math. L 2. c. 1. p. 709. ſeq. Hence it appears, that the ſucceſſive propagation of *Light* will cauſe an *aberration* in the appearances of the ſtars, planets, and comets. After Mr. Bradley had diſcovered this cauſe of error in the apparent places of the fixed ſtars, Mr. Clairaut [a] and others [b], inveſtigated ſeveral rules for the computation of this aberration. Mr. Euler [c] alſo has lately given us a paper on this ſubject. —[[a] Mem. Acad. Scienc. 17. —[b] Mr. Simpſon, in his Eſſays. —[c] Mem. de L'Academ. de Berlin, Tom. 2. Pp. 141, ſeq.]

LIGNUM *Vitæ*, the wood of a genus of trees, called by botaniſts *Thuya*. See the article THUYA, *Suppl.*

Lignum Vitæ is much valued by turners; making extremely beautiful cups, bowls, boxes, and other curioſities. Ruſt. Dict. in voc.

LILLY *(Suppl)*—*Aſphodel*-LILLY, *Belladonna* LILLY, *Daffodel*-LILLY, *Guernſey*-LILLY, *Mexican*-LILLY, *Japan*-LILLY, names uſed by different authors for the *Amaryllis*, or *Lillio-Narciſſus* of Linnæus and Tournefort. See the article LILIO-NARCISSUS, *Suppl.*

LILLY-*Daffodel*, a name ſometimes given to a genus of plants, known among authors by that of *Pancratium*. See the article PANCRATIUM, *Append.*

Day-LILLY, a name ſometimes uſed for the *Hemerocallis* of botaniſts. See the article HEMEROCALLIS, *Suppl.*

Hyacinth-LILLY, in botany, a name given by ſome writers to the *Scilla*, or *Lillio-Hyacinthus*, of botaniſts. See the article LILLIO-HYACINTHUS, *Suppl.* and SCILLA, *Append.*

May-LILLY, the name by which ſome call the *Convallaria* of Linnæus, a large genus of plants, comprehending the *Lillium-Convallium*, *Polygonatum*, &c. of other writers. See the article CONVALLARIA, *Append.*

Perſian-LILLY, a name ſometimes given to the *Fritillaria*, a diſtinct genus of plants. See the article FRITILLARIA, *Suppl.*

Superb-LILLY, the Engliſh name of a diſtinct genus of plants, called by Linnæus *Glorioſa*. See the article GLORIOSA, *Append.*

Water-LILLY, *Nymphæa*, in botany, the name of a genus of plants. See the article NYMPHÆA, *Suppl.*

LIMAX, in the hiſtory of inſects, the name of a genus of theſe animals, comprehending all the naked ſnails, See the article SNAIL, *Suppl.*

The body of the *Limax* is of a figure approaching to cylindric, and is perforated at the ſide; the tentacula are four in number, and two of them have the appearance of eyes.

Of this genus authors enumerate the following ſpecies: 1. The black naked *Snail*. 2. The red naked *Snail*. 3. The yellow one, called the *Amber Snail*, variegated with ſpots of a greyiſh colour. 4. The very large grey *Limax*, ſpotted with a duſky-brown. 5. The little ſhort and thick grey *Limax*, without ſpots. 6. The ſmooth-bodied, reddiſh-brown *Limax*. 7. The ſmall duſky-brown, furrow'd *Limax*. 8. The deep chocolate-coloured *Limax*. *Hill*, Hiſt. Anim. p. 87.

LIME *(Cycl.)* — LIME-*water*. It appears now from the ingenious Dr. Alſton's experiments, that one part of quick *Lime* is ſufficient for five or ſix hundred parts of water. Water will diſſolve but a certain portion of quick *Lime*; and how much that is cannot be eaſily aſcertained. So far ſeems certain from Dr. Alſton's experiments, that one pound of quick *Lime* is ſufficient for making ſix hundred pounds of good *Lime* water; and that thoſe who with Charas have ſuppoſed, that the ſecond and third *Lime-water* is weaker than the firſt, have been led into error by the ſmall quantity of water they uſed. And it has been generally believed, that in order to obtain good *Lime-water*, the quick *Lime* muſt not only be recent, and fully calcined, but alſo for one part of quick *Lime* only eight, ten, or at moſt twelve parts of water taken; as if it could impregnate no more. But the Doctor ſays he has found by many experiments, that it is altogether indifferent whether the water be hot or cold, poured on gradually, or at once, the water poured on the *Lime*, or the *Lime* thrown into the water; whether the quick *Lime* be in ſhells, or ſlaked; or even expoſed to the air for ſeveral months, for ſuch quantities of the water as are commonly uſed; and if the quick *Lime* be freſh, whether for one pound of it, eight, ten, twenty, fifty, or five hundred pounds of water be taken. Only it is neceſſary, even for the firſt water after the ebullition is over, to ſtir and mix the *Lime* with the water, and allow it time to impregnate itſelf; which is beſt known by the cruſt formed on its ſurface. Filtration indeed is not neceſſary, if it be not to prevent any undiſſolved *Lime* being mixed with it; or cruſts diminiſhing its tranſparency.

The Doctor, for his own uſe, poured about eight pounds of boiling water upon a pound of ſtone quick *Lime* in a glazed earthen veſſel. He drank about a pint and an half of this *Lime-water*, daily for about ſixteen months; filling up the veſſel, when neceſſary, with freſh water, ſometimes hot, and ſometimes cold, without obſerving any difference in the *Lime-water*, which he conſtantly filter'd through grey paper, before he drank it. He obſerved, that the *Lime* was not exhauſted after two years and two months, nor was the water ſenſibly weaker, when it ſtood a ſufficient time on the *Lime*, which he knew by the cruſts that were formed. But the *Lime* becoming conſiderably lighter, after it is long thus uſed, it at length requires ſeveral days to ſubſide, and form the cruſts, and after the cruſts are formed, it does not leave half the water clear, as it did at firſt. On the whole, this ſingle pound of *Lime* afforded the Doctor about ſix hundred pounds of *Lime-water*. He adds, that having taken *Lime-water* made indifferently of Lime-ſtone, or of Chalk, or of Shells, and ſometimes made of all the three together, he was never able to diſcover any difference in their effects. But ſo much *Lime-water* is not to be obtained from quick-lime, unleſs it be freſh, completely calcined, and free from heterogeneous ſubſtances; for if defective in any of theſe, it will yield proportionably leſs *Lime-water*.

Lime-water, which was long looked on as a cauſtic, was, in the laſt century, found to be a very ſafe and valuable remedy. It is uncertain who firſt ventured to give it inwardly; but Willis, Bates, and Moreton ſeem to have uſed it much. *Lime-water* kills worms, and many other, if not all, inſects; hence Dr. Alſton concludes it might prove a good anthelmintic for children, and experience has confirmed this notion.

It is probable, that *Lime-water* may be of great uſe in long ſea voyages, in preventing the corruption of water, or inſects breeding in it, as well as curing the diſeaſes to which ſeafaring people are moſt ſubject. The experiment is certainly ſafe, eaſy, and attended with no expence; one pound of freſh well-burnt quick-lime of any kind, being enough for a hogſhead of water, which may not only be uſed for common drink by the diſeaſed, or for prevention by the healthy; but alſo by boiling and expoſing it to the air for a ſhort time, it may be reduced to ſweet water, and uſed in dreſſing the victuals of the moſt delicate.

The virtues of *Lime-water* do not depend on its abſorbency; and it may as juſtly be called antalcaline, as antacid.

Lime-water prevents or long protracts the putrefaction of animal ſubſtances. Dr. Alſton alſo thinks that quick-lime in a ſhip's well, would effectually prevent the corruption of the water, and conſequently the putrid ſteams, or foul air thence ariſing, which ſometimes prove fatal to the crew.

The virtues of *Lime-water* outwardly applied in many diſeaſes of the ſkin, in excoriations, ulcers, gangrenes, &c. are well known. Perhaps there is not a better gargariſm for ſeveral ſorts of ſores in the mouth and throat, than *Lime-water*. It has alſo been known to be of great uſe in the tooth-ach. Inwardly taken, *Lime-water* has all the virtues of the pure element, which are not a few; and on which probably depend the good effects of mineral waters, more than on the minerals they contain. Dr. Alſton never found it cauſed thirſt; on the contrary, he found it quenched thirſt, as well as ſimple-water, and cuſtom rendered it agreeable. *Lime-water* is notably detergent and attenuating, even more ſo than ſoap itſelf, of mucous, viſcid, and other animal ſordes, which makes it preferable, in many caſes, to the pureſt, as well as to mineral waters. In a word, *Lime-water* may be ſaid, in general, to purify the blood, with as good reaſon, as any one medicine whatever, eſpecially from any putrid, purulent, or ſcorbutic foulneſs.

That *Lime-water* is lithontriptic has been ſhewn ſufficiently by Dr. Hales, and more fully by Dr. Whytt; and this has been further confirmed by Dr. Alſton, who has ſhewn the efficacy of *Lime-water* in this reſpect, not only when made by the firſt infuſion, and aſſiſted by artificial heat; but even after fifty or more infuſions, and in the common air. The Doctor thinks that the energy of *Lime-water* in this caſe probably conſiſts in its penetrating detergency, whereby inſinuating itſelf among the ſolid parts of the calculi, or into their pores, it ſeparates them, or diminiſhes their coheſion, but does not diſſolve them.

Since there is but a ſmall proportion of *Lime* in the water, it may be thought that taking a few grains of the quick-lime in ſubſtance would prove much more effectual in the Stone, than large quantities of *Lime-water*. But this is a miſtake; and hence Mrs. Stephens's egg-ſhells and ſnail-ſhells, if burnt to quick-lime, can never be equally ſucceſsful with *Lime-water* for the Stone.

As for the *aquæ benedictæ compoſitæ*, or *compound Lime-waters*, they are not to be compared with ſimple *Lime-water* in the gravel; nor, in Dr. Alſton's opinion, in any diſeaſe requiring this water.

The Doctor adds, in his Appendix, that though he cannot yet determine how far *Lime-water* may be proper, even in

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acute diſtempers, yet he has found it ſafe in feveriſh colds; and by the caſes he there mentions, it ſeems probable that *Lime-water*, by its diluent, and diuretic qualities, may prove more uſeful in fevers, than is at preſent believed.

However, this may prove on farther trials, it may be ſaid, in general, that *Lime-water* is diluent, detergent, antiſeptic, anthelmintic, diuretic, and vulnerary; uſeful in all diſeaſes proceeding from, or accompanied with obſtructions in the bowels or glands, viſcid phlegm, calculous concretions, or putrefaction; and commended for the ſcurvy, ſcrophulæ, gravel, conſumption, empyema, aſthma, arthritis vaga, œdematous ſwellings, diabetes, fluor albus, fluxes, &c. and outwardly for diſeaſes of the ſkin, ulcers, gangrenes, &c. It may be taken to the quantity of a pound, once, twice, or thrice a day; or uſed for common drink. See Dr. Alſton's Diſſertation on quick-lime, and *Lime water*, Edinb. 1752.

The ingenious and learned Dr. Whytt of Edinburgh, has greatly recommended *Lime-water*, in the ſtone and gravel. See his eſſay on the virtues of *Lime-water*, in the cure of the ſtone. This gentleman prefers oyſter-ſhell *Lime-water* to any other for thoſe diſtempers. Dr. Alſton ſeems to think this a matter of indifference, and was himſelf cured chiefly by the ſtone quick-lime water before-mentioned.

LIMER, or LIME-*Hound*, names ſometimes uſed for the blood-hound. See the article HOUND, *Suppl.*

LIMITED, adjunct. See the article ADJUNCT, *Cycl.*

LIMITS *(Suppl.)* — We may add to what is ſaid under this head in the *Supplement*, that there being two caſes of variable quantities and ratio's tending to a *Limit*, it might have conduced to perſpicuity, and prevented diſputes, to have diſtinguiſhed theſe different *Limits* by ſome addition. As in the firſt caſe, to have called it a *Limit* or ultimate ratio *incluſive*; becauſe the *Limit* is the laſt of the quantities or ratio's limited: And in the ſecond, to have called it a *Limit* or ultimate ratio *excluſive*; becauſe the quantities limited never attain to the *Limit*, tho' they approach to it indefinitely.

This diſtinction may perhaps receive ſome farther illuſtration from the following example. It is known that the oſculatory circle is a circle that touches a curve ſo cloſely that no other circle can be drawn through the point of contact between them, all other circles paſſing within or without them both; and hence the oſculatory circle is ſuppoſed to have an equal curvature with the curve at that point. See Mr. *Mac Laurin*'s flux. art. 364.

Now if we conceive the oſculatory circle at the end of the great axis of an ellipſis, it will fall entirely within the ellipſis; and the curvatures of the ellipſis and oſculatory circle may both be ſaid to be *limits* of the curvatures of all the circles falling wholly within, and touching the ellipſis at the end of its great axis. But the term *Limit* will not in both caſes have preciſely the ſame meaning; for the oſculatory circle is a *Limit incluſive*, being the laſt of the circles limited; and the ellipſis is a *Limit excluſive*, none of the circles limited ever coinciding with it. As to the circles which fall wholly without the ellipſis, and touch it at the end of its great axis, they have no *Limit incluſive*, no circle touching the ellipſis ſo cloſely, that no other can paſs between; the only *Limit* here is *excluſive*, the ellipſis itſelf.

The contrary of this happens at the endo f the leer axis. At any other point of the ellipſis one half of every oſculatory circle is a *Limit incluſive* of the ſemicircles that fall within, and the other half is a *Limit incluſive* of thoſe that fall without.

May we not aſk, if a curve is the *Limit* of its inſcribed or circumſcribed polygons in any other ſenſe, than the curvature of the illipſis is the *Limit* of the curvatures of the circles before deſcribed, which approach nearer and nearer to the curve, but never coincide with it? It is true we hear it often ſaid, that the oſculatory circle is æquicurval, and ſo coincides with the ellipſis; but this ſeems a conſequence of the language of infiniteſimals. It would be more accurate to ſay, that the curvature of the ellipſis is the *Limit excluſive* of all the before mentioned circles, and that the oſculatory circle is their *Limit incluſive*. That excellent geometer, Mr. Simſon, in his Conic Sections, Lib. v. Prop. 36. Cor. ſays only, after demonſtrating the chief property of the oſculatory circle, that *eandem habere cum ſectione conica curvaturam dicitur*, giving this only as an appellation, but not as a propoſition.

LIMNOPEUCE, in botany, the name by which Vaillant calls the *Hippuris* of Linnæus. See the article HIPPURIS, *Suppl.*

LINE *(Cycl)* — *Algebraic* LINES are divided into different orders, according to the degree of their equations. Theſe degrees are eſtimated, as in determined equations, by the degree of the higheſt term of the equation.

Thus $a + by + cx = 0$ is a general equation, expreſſing the nature of *Lines* of the firſt order, or of ſtrait *Lines*.

The equation $a + by + cx + dyy + exy + fxx = 0$ repreſents the *lines* of the ſecond order; that is, the conic ſections, and the circle, which is one of them.

And the equation $a + by + cx + dyy + exy + fxx + gy^3 + hxyy + ix^2y + lx^3 = 0$, expreſſes in general the *lines* of the third order. And the *Lines* of the fourth and higher orders may be expreſſed in the like manner. See *Cramer*, Introd. a l'analyſe des lignes courbes. p. 52, ſeq.

Mr. Cramer uſes the terms, *Line* of the ſecond, third, fourth, &c. order, and *Curve* of the ſecond, third, fourth, &c. order, indifferently. Sir Iſaac Newton has made a diſtinction: according to him,

LINE *of the third order* is the ſame as CURVE *of the ſecond kind*; becauſe a *Line* of the firſt order, cannot, ſtrictly ſpeaking, be called a Curve.

Lines of the third order may be cut by a right line in three points, and by a circle in ſix points.

We have a ſhort treatiſe by Sir Iſaac Newton upon the *Lines* of the third order, entitled, *Enumeratio linearum tertii ordinis*, which was firſt printed at the end of Dr. Clarke's latin tranſlation of Sir Iſaac's Optics; and ſince publiſhed more correctly by the late Mr. Jones in 1711, with the treatiſe of quadratures, and other tracts of its illuſtrious author.

This enumeration is ſo conciſe, as to need a comment. Mr. Stirling gave one in 1717; but this comment is too difficult for beginners. Mr. Cramer has lately explained this ſubject very fully, in his *Introduction a l'analyſe des lignes courbes algebriques*, printed at Geneva 1750, 4to, to which the curious may have recourſe; as alſo to the Appendix to Mr. Mac Laurin's Algebra, entitled, De linearum geometricarum proprietatibus generalibus; and to Mr. *Euler*'s Analyſis infinitorum, Vol. II.

An algebraic *Line* of the order m can cut another algebraic *Line* of the order n, in the number of points expreſſed by mn, but not in more. Thus if $m = 1$ and $n = 2$, the *lines* of thoſe orders can interſect each other in two points only; and if $m = 2$ and $n = 2$, then may they interſect each other in four points, as is well known; ſince a ſtrait *Line* cannot interſect a conic ſection in more than two points; nor can one conic ſection interſect another in more than four points. In like manner if $m = 5$ and $n = 4$, then may the *lines* of theſe orders interſect each other in 20 points; but not in more. See *Cramer*, Anal. des lignes courbes, p. 75, 76.

The number of the ſpecies of the *Lines* of the third order amount to 78. See Mr. *Murdoch*'s Geneſis Curvarum per Umbras. Sir Iſaac reckoned only 72 ſpecies of the third order; but Mr. Stirling and Mr. Stone have ſhewn his enumeration to be imperfect; and Mr. Murdoch has ſince found ſome new ſpecies.

LION. The *Lion* is comprehended among the *felis*, or cat-kind of animals. See the article FELIS, *Append.*

LION'*s leaf*, the Engliſh name of a genus of plants, deſcribed by Tournefort under that of *Leontopetalon*. See the article LEONTOPETALON, *Suppl.*

LION'*s foot*, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Catanance*. See the article CATANANCE, *Suppl.*

LIQUID *Amber*, in botany, the name of a diſtinct genus of plants, called by botaniſts *Anthoſpermum*, and *Tournefortia*. See the articles ANTHOSPERMUM, *Append.* and TOURNEFORTIA, *Suppl.*

LIQUORICE *(Suppl.)*—*Vetch*-LIQUORICE, the Engliſh name of a genus of plants, called by botaniſts *Orobus*. See the article OROBUS, *Suppl.*

Wild LIQUORICE, the name of a diſtinct genus of plants, called by authors *Aſtragalus*. See the article ASTRAGALUS, *Suppl.*

LIQUORS, fermented. See the article FERMENTED *liquors*, *Suppl.* and *Append.*

LIST, in the ſea-language, the ſame with *luſt*. See the article LUST, *Suppl.*

LITHONTRIPTIC *(Suppl.)* — The reward which the parliament of England gave to Mrs. Stephens, the inventreſs of ſome medicines, which were ſaid to be a perfect and certain cure for the *Stone*, made the generality of the world believe, that they were really as efficacious as they were pretended to be; but it appeared, on examination, that the opinion of a cure in the very inſtances on the ſucceſs of which the reward was given, was erroneous; and that the *Stones* had all the time remained in the bladders of the patients, tho' ſuppoſed to have been voided, after being diſſolved and waſhed away by the medicines.

The principal inſtance of a ſuppoſed cure was Mr. Gardiner. This man was in December 1748, examined by able ſurgeons, and found to have a ſtone in his bladder; after this he took Mrs. Stephens's medicines for eight months without intermiſſion; and at the end of that time he declared himſelf free from all his uſual complaints; and on ſearching him, there could no ſtone be found in the bladder. Mr. Gardiner died about three years afterwards, and his body was opened. When the bladder was examined, there were found in it ſix preternatural apertures of different ſizes; but the biggeſt capable of admitting the end of a finger. Each of theſe apertures led to a ſeparate bag form'd by an enlargement of the internal membrane of the bladder, protruded between the fibres of its muſcular coat. Theſe bags were eaſily ſeen on the back part of the bladder a little above the veſiculæ ſeminales, and when viewed on the outſide, they ſeemed to be but two, tho' in reality equal in number to the openings within, and divided from one another by the duplicature of the internal membrane, which form'd a ſeptum between each of them. Philoſ. Tranſ. N° 462. p. 12.

As to Mrs. Stephens's medicine, it is a compoſition of ſoap, and lime made of different ſhells, which every body knows

knows to be highly cauſtic; and is therefore condemned by Dr. Mead; ſince its corroſive quality muſt be injurious to the bladder. However, under proper management, he thinks it may be of ſome ſervice in expelling gravel by the urinary paſſages; tho' it will never be able to break calculi of the hardneſs of ſtone: And beſides, its long continued uſe muſt be attended with great danger, for the reaſons above given. And as for its ſubſtitute, the ſoap-lees, though it be a medicine of a more commodious form for taking, yet it will not prove much ſafer in its conſequences, for the ſame reaſons. *Mead*, Monit. and Pract. Medic. pag. 199, ſeq.

Dr. Whytt of Edinburgh, after conſidering the inconveniencies, and ſometimes the miſchiefs alſo, of this celebrated ſpecific, reſolved to omit the ſoap, and try what virtues lime-water might have in diſſolving the calculus. See the article LIME-*water*, *Append.*

His firſt experiments were made on ſeveral fragments of calculi, with lime-water, from common quick-lime; and afterwards reſolving to try the power of animal lime, he repeated them with lime-water made with oyſter-ſhells and cockle-ſhells, well calcined, by pouring ſeven or eight pints of water on one pound of the freſh calcined ſhells. The experiments ſucceeded with both ſorts; but he ſoon found, that the oyſter and cockle-ſhell lime-water poſſeſſed a much greater power of diſſolving the calculus, than that of the ſtone-lime.

He therefore propoſes the drinking of ſhell-lime-water to the quantity of four pints, every day, for adults; and for children leſs in proportion: And he concludes with inſtances of the happy effects of this method. However, as ſtones of great hardneſs can never be diſſolved by any medicine whatſoever, Dr. Mead recommends, in theſe caſes, a new method of cutting for the Stone. Id. ibid. See the article LITHOTOMY, *Append.*

Dr. Hartley has publiſhed, in the London Gazette, the following receipt for making a *lithontriptic* electuary. Take five pounds of Alicant ſoap, ſhaved, and one pound of oyſter-ſhell lime; put them into a tin veſſel, and pour upon them five quarts of water; make the water boil, till the ſoap be perfectly diſſolved in it, and then ſtrain all into a glazed earthen veſſel. Expoſe this maſs to the air, ſtirring it every day, till it becomes both mild to the taſte, and of a proper conſiſtence to be formed into pills, or long pellets, without ſticking to the fingers. This may be expected to happen in two or three months. If it becomes ſufficiently mild before it has acquired a due conſiſtence, it may be brought to this, by being heated over the fire, in a tin veſſel: If it acquires a too hard conſiſtence, before it is ſufficiently mild, it muſt be ſoftened with water. This is what the Doctor calls the *lithontriptic* maſs or electuary; which he orders to be made in a tin veſſel, becauſe a braſs or copper one would make it emetic.

He gives another more expeditious way of making it, which is this: Pour two gallons of water upon a pound of oyſter-ſhell lime; ſtir it two or three times, and when it has fallen to the bottom, pour off the clear part of the water. Repeat this fifteen or twenty times, or till the clear water, which is poured off, be almoſt taſteleſs; leaving about five pints of water upon the lime, after the laſt ablution. Then pour this mixture of water and dulcified lime upon five pounds of Alicant-ſoap, ſhaved; and proceed as directed in the firſt receipt. The maſs, prepared in this manner, will be fit for uſe in a few days, or even immediately; but then the Doctor prefers the foregoing receipt, where time can be allowed for it.

If the maſs of ſoap and oyſter-ſhell lime, dulcified in either of the above-mentioned ways, be made of the conſiſtence of an electuary, it is then called the *lithontriptic* electuary; which for cure is more convenient than the maſs, for thoſe who deſire to take the medicine diſſolved in a liquid vehicle, as milk, water ſweetened with honey or ſugar, water flavoured with brandy or rum, and ſmall beer.

Where a perſon is ſuppoſed to have a large Stone in the kidneys or bladder, he ought to take every day as much of the maſs, or electuary, as contains two ounces of the ſoap, unleſs his pain and provocation to make water be violent; in which caſe it will be proper to begin with about half this quantity, and to increaſe it as he can bear. The medicine ought alſo, in this caſe, to be dulcified, in an extraordinary degree.

By this medicine, the Doctor thinks the generation of gravel, and gravel-ſtones, may be entirely prevented. See the article STONE, *Append.*

It is likewiſe recommended in diſorders of the ſtomach and bowels, ariſing from, or attended with acidities there; and in gouty habits. The patient may, in many of theſe caſes, begin with ſuch a quantity every day, as contains an ounce of ſoap, and afterwards increaſe or leſſen this quantity, as he finds occaſion.

LITHOTOMY *(Cycl.)* — We have an hiſtory of the lateral operation for the ſtone by Monſ. Morand, who argues, that the methods of Celſus, Frere Jacques, Rau, and Cheſelden, are in the main the ſame. See Mem. de L'Acad. des Sciences, 1731.

Mr. Cheſelden's method is deſcribed in his anatomy, Chap. VI. of the fifth edition This method of cutting for the ſtone is much recommended by Dr. Mead; who aſſures us, that now not only children and youths, but alſo perſons advanced in years, may ſubmit to this operation, without great danger; and in caſe the ſtone prove too big to be extracted without tearing the neck of the bladder, it is now no longer neceſſary to ſplit the ſtone, before the extraction; the invention of which is aſcribed to Ammonius, a Greek phyſician, who from thence was ſurnamed λιθοτόμος, the lithotomiſt. *Mead*, Monit. and Pract. Med. p. 203.

Mr. Houſtet has collected a great many inſtances of ſtones lodged in ſacs formed in the bladder, from which it was impoſſible to extract them, without tearing the bladder, or cutting on one ſide of the ſac, which Mr. Garengeot did once with ſucceſs. In ſome of the caſes which he mentions, the veſſels of the bladder were in appearance grown into the ſtone, and the extraction of the ſtone was attended with a mortal hæmorrhage. See Mem. de L'Acad. de Chirurg. Tom. I.

The diſtenſion of the bladder with a liquor in performing the high operation for the Stone, is attended with difficulties, eſpecially in women. Dr. Kulm has therefore contrived an elevatory catheter for that ſex. The bending of the inſtrument is fitted to the turn of the os pubis, and its great curve, inſtead of being only furrowed, is pierced quite through. He introduces this, with its convexity to one ſide, then gently raiſes it to the hypogaſtrium, and cuts ſecurely upon it. See Nov. Act. Erudit. Lipſ. Mart. 1732.

LITHOZUGIA, in natural hiſtory, the name of a genus of foſſils, of the claſs of the *Scrupi*, compoſed of a cryſtalline matter a little debaſed, and containing within them various extraneous bodies, as pebbles, &c. See the article SCRUPI, *Append.*

Dr. Woodward has ranked this genus among the pebbles, becauſe of the pebbles they contain; which is by no means a ſufficient reaſon for confounding two ſuch different foſſils; the *Lithozugia* approaching to the nature of flint.

Mercatus and other naturaliſts have called the *Lithozugia* *oculati lapides*; and among Engliſh lapidaries they are known by the name of *Pudding-ſtones*. See the article OCULATUS *Lapis*, *Suppl.*

Of this genus we have the following ſpecies, 1. The yelloviſh-white *Lithozugium*, filled with pebbles. 2. The greeniſh-white *Lithozugium*, filled with pebbles. 3. The red *Lithozugium*, filled with pebbles. Vid. *Hill*, Hiſt. Foſſ. p. 557.—559.

Beſides theſe, there are other *Lithozugia* of a coarſer texture, approaching to the nature of quarry-ſtone; of theſe we have the following ſpecies: 1. The fleſh-coloured *Lithozugium*, filled with reddiſh, impure, cryſtalline nodules. 2. The bluiſh and glittering *Lithozugium*, filled with white, impure, cryſtalline nodules. 3. The whitiſh-green elegant *Lithozugium*, filled with cryſtalline nodules: And, 4. The friable, pale-red *Lithozugium*, variegated with white veins, and red nodules. *Hill*, Hiſt. Foſſ. p. 560—562.

LIVE *ever*, a name ſometimes given to the *anacampſeros*, or orpin, a diſtinct genus of plants. See the article ANACAMPSEROS, *Suppl.*

LIVE *in idleneſs*, a name ſometimes uſed for the violet. See the article VIOLA, *Suppl.*

LIVER *(Suppl.)* — *Infarction of the* LIVER. See the article HEPATIS *Infarctus*, *Suppl.*

LIZARD's *tail*, the Engliſh name of a genus of plants, deſcribed by Linnæus under that of *Saururus*. See the article SAURURUS, *Suppl.*

LOCKER-*gowlans*, a name by which ſome call a ſpecies of Hellebore. See the article HELLEBORUS, *Suppl.*

LOCUST, or *St.* JOHN's *bread*, in botany, names uſed by ſome for the *Ceratonia*, or *Siliqua*, of botaniſts, See the article SILIQUA, *Suppl.*

Baſtard LOCUST, a name ſometimes uſed for a diſtinct genus of plants, called by botaniſts *Courbaril*, or *Hymenæa*. See the article HYMENÆA, *Suppl.*

LOCUST *of Virginia*, a name by which a ſpecies of *acacia* is ſometimes called. See the article ACACIA, *Suppl.*

LOCUST-*tree*, in botany, a name given by the people of the Weſt-Indies to a ſpecies of *Acacia*. See the article ACACIA, *Suppl.*

LOGARITHM *(Suppl.)* — In the common tables of *Logarithms* we find the *Logarithm* correſponding to any given number within the limits of the table, by inſpection; but it is of uſe alſo to have a table wherein the *Logarithms* are placed in their natural order, from 0 to 100,000 for inſtance, and with the correſponding natural numbers; ſo that a *Logarithm* being given, we may find the correſponding number by inſpection only, which can ſeldom be done by the common tables; nor can the correſponding number to a *Logarithm* not in the table be found without ſome trouble.

A table of this ſort is called by Dr. Wallis an *anti-logarithmic canon*; and by this canon a *Logarithm* being given, its number may be found with the ſame facility that a *Logarithm* of a given number may be found by the common canon.

Dr.

Dr. Wallis tells us, that a canon of this kind was formed many years ago. It was begun, perhaps, by Harriot, and it was finiſhed at leaſt, and prepared for the preſs, if not begun, by Warner. This canon ſeems to have been loſt; but the loſs has been ſupplied by Mr. Dodſon. See the *Anti-logarithmic canon* by James Dodſon, Lond. 1742. fol. where the author alſo ſhews the conſtruction and uſe of his table at large.

Imaginary LOGARITHM is uſed for the *logarithm* of negative and imaginary quantities [a], ſuch as $a - \sqrt{-a}$, &c. Thus alſo the fluents of certain imaginary fluxionary expreſſions, ſuch as $\frac{\dot{x}}{x\sqrt{-1}}$, $\frac{a\dot{x}}{2bx\sqrt{-1}}$, &c. are *imaginary logarithms*.

[a *Euler*, Analyſ. infin. Vol. 1. pag. 72, 74.]

The expreſſion $\frac{\dot{x}}{x}$ repreſents the fluxion of the *Logarithm* of x, and the fluent therefore of $\frac{\dot{x}}{x}$ is the *Logarithm* of x; but no *Logarithm* can repreſent the fluent of $\frac{\dot{x}}{x\sqrt{-1}}$, which is therefore called an *imaginary Logarithm*.

However, when theſe *imaginary Logarithms* occur in the ſolutions of problems, they may be transformed into circular arcs or ſectors; that is, the imaginary *Logarithm*, or imaginary hyperbolic ſector becomes a real circular ſector. See *Bernoulli*, Oper. Tom. I. p. 400. and p. 512. *Mac Laurin*'s Fluxions, Art. 762, ſeq. *Walmeſley*, Anal. des meſ. p. 63.

LOGARITHMIC. This head is referred to in the *Append.* from the article CURVE, in the *Suppl.* by miſtake. But ſee the article LOGARITHMIC, *Suppl.*

LOGGERHEAT, in the ſea-language, denotes a large round ball of iron, with a long handle, for heating pitch. *Blanckley*'s Nav. Expoſ. p. 100.

LOGWOOD, the wood of a genus of plants, called by Linnæus *Hæmatoxylum*. See the article HÆMATOXYLUM, *Suppl.*

LONDON *pride*, a name uſed among Gardeners for the *geum*, a diſtinct genus of plants. See the article GEUM, *Suppl.*

LONICERA, *(Suppl.)* in the Linnæan ſyſtem of botany, the name of a large genus of plants, comprehending, according to that author, the *Caprifolium*, *Periclimenum*, *Chamæceraſus* and *Xyloſteum* of Tournefort, and other botaniſts; together with the *Trioſteoſpermum* and *Symphoricarpos* of Dillenius. See the articles CAPRIFOLIUM, &c. *Suppl.*

The characters are theſe. The cup is a ſmall perianthium, placed on the germen, and divided into five ſegments. The flower conſiſts of a ſingle petal, the tube is oblong, and gibboſe downwards, the limb is divided into five ſegments, one of which is more deeply ſerrated than the reſt, and all turn backward. The ſtamina are five ſubulated filaments, nearly of the length of the flower; the antheræ are oblong, the germen is roundiſh, and placed under the receptacle, the ſtyle is filiform, and of the length of the flower, the ſtigma is obtuſely capitated. The fruit is a roundiſh, umbilicated berry, containing two cells; the ſeeds are roundiſh and compreſſed.

As they all agree in theſe general characters, they are to be accounted only one genus. *Linnæi* Gen. Plant. p. 75.

LOOKING *Glaſs (Suppl.)*—*Venus's* LOOKING *glaſs*, in botany, a name by which ſome call the *Campanula*. See the article CAMPANULA, *Suppl.*

LOOSE *ſtrife*, a name ſometimes given to the *Lyſimachia*, or willow-herb of botaniſts. See the article LYSIMACHIA, *Suppl.*

Podded LOOSE *ſtrife*, the name of a genus of plants, called by botaniſts *Epilobium*, or *Chamænerium*. See the article CHAMÆNERIUM, *Suppl.*

Spiked LOOSE *ſtrife*, the name of a genus of plants, called by botaniſts *Salicaria*. See the article SALICARIA, *Suppl.*

LORANTHUS, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by others *Lonicera*. See the article LONICERA, *Suppl.*

LORD *in groſs*, he who is *Lord*, not by reaſon of any manor, as the king in reſpect of his crown, &c. *Termsof law*, *Blount*, *Cowel.*

LOTE-*tree*, in botany, the name of a genus of plants, called by authors *Celtis*. See the article CELTIS, *Suppl.*

LOTUS *Africanus*, in botany, a name by which ſome call the *Guaiacana* of Tournefort. See the article GUAIACANA, *Suppl.*

Bladder LOTUS, a name ſometimes given to a ſpecies of *Vulneraria*. See the article VULNERARIA, *Suppl.*

LOVE-*graſs*, in botany. See the article GRASS, *Append.*

LOVE *in a miſt*, a name uſed among gardeners for the *Granadilla*, or paſſion-flower. See the article GRANADILLA, *Suppl.*

LOVE *lies a-bleeding*, a popular name for the *Amaranth*. See the article AMARANTH, *Suppl.*

LOUSE *(Suppl.)* — *Tree*-LOUSE, a genus of inſects, called by zoologiſts *Aphis*. See the article APHIS, *Append.*

LOUSE-*wort*, a name uſed by ſome for the *Delphinium* of botannical writers. See the article DELPHINIUM, *Suppl.*

LOUSE-*wort* is alſo the Engliſh name of a genus of plants, called by botaniſts *Pedicularis*. See the article PEDICULARIS, *Suppl.*

LOWINGS, in falconry. See the article LUNES, *Append.*

LUMBRICUS, in zoology, the name of a genus of inſects, called in Engliſh earth-worms. See the articles WORM and EARTH-*worms*, *Suppl.*

The *Lumbricus* is an inſect of the larger kind, of an oblong form, conſiderably thick rounded in ſhape, and covered with a ſoft and ſlender ſkin, marked with annular ridges, and furrows. When full grown, it is often ten inches, or more, in length, and more than a third of an inch in diameter. Its colour is a duſky red.

It is common every where, at little depths, under the ſurface of the earth; it is not unfrequently alſo met with in the human inteſtines, as well as in thoſe of other animals, in which ſtate it has been ſuppoſed a different creature, and called by a new name.

Beſides the common earth-worm, there is found another ſpecies of *Lumbricus* in the mud about the Sea-ſhores, very large, growing very often to a foot or more in length; it entirely reſembles the other, only that it is of a paler red, and has its ſkin covered with little prominences, which makes it rough or ſcabrous to the touch. Vid. *Hill*, Hiſt. Anim. p. 15.

LUNES, or LOWINGS, in falconry, leaſhes, or long lines to call in hawks. Ruſt. Dict. in voc.

LUNGS *(Suppl.)* — *Sea*-LUNGS, the Engliſh name of the *Meduſa*, agenus of inſects. See the article MEDUSA, *Append.*

Ships-LUNGS, a name given to the ventilators of ſhips. See the article VENTILATOR, *Append.*

LUNG-*wort (Suppl.)*— *Cow's* LUNG-*wort*, a name ſometimes given to the *Verbaſcum*, or Mullein. See the article VERBASCUM, *Suppl.*

LURCHER, among ſportſmen, a kind of hunting dog, like a mongrel greyhound, with pricked ears, a ſhaggy coat, and generally of a yellowiſh-white colour. Ruſt. Dict. in voc.

LUST-*wort*, a name by which ſome call *Ros ſolis*, a diſtinct genus of plants. See the article ROS *ſolis*, *Suppl.*

LYCIUM, *Avignon-berry*, *Avignon-thorn*, or *box-thorn*, in botany, the name of a genus of plants, the characters of which are theſe: The cup is a ſmall, erect, obtuſe, permanent perianthium, divided into five ſegments; the flower conſiſts of a ſingle infundibuliform petal; the tube is cylindric, patent and crooked; the limb is ſmall, divided into five ſegments, obtuſe and patulous; the ſtamina are five ſubulated filaments, growing out of the tube of the flower; they are ſhorter than it, and inclinated; the antheræ are erect; the germen of the piſtil is roundiſh; the ſtyle is ſimple, and longer than the ſtamina; the ſtigma is bifid and thick; the fruit is a roundiſh berry, containing two cells; the ſeeds are numerous, and kidney-ſhaped; and the receptacles are convex. Vid. *Linnæi* Gen. Plant. p. 81.

This genus comprehends likewiſe the *Jaſminoides* of other authors.

LYCOCTONUM. See the article ACONITE, *Cycl.*

LYING *under the ſea*, is when, in a ſtorm, the ſhip is a-hull, and the helm ſo faſtened a-lee, that the ſea breaks upon her bow, or broadſide. *Blanckley*, Nav. Expoſ. p. 102.

LYNCHET, among farmers, a line of green ſward, ſerving as a boundary to ſeparate plowed land, in common fields. Ruſt. Dict. in voc.

LYSIMACHIA *filiquoſa*, the name by which ſome call the *Chamænerium* of Tournefort. See the article CHAMÆNERIUM, *Suppl.*

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MACAO, in zoology, the name of a ſpecies of parrot. See the article MACAW, *Suppl.*

MACAW, *(Suppl.)* or MACAW-*tree*, in botany, the name of a ſpecies of palma, or *Phœnix*. See the article PHOENIX, *Suppl.*

MACHINE *(Cycl.)* — The ſimple *Machines*, or mechanical powers, according to their different ſtructure, ſerve for different purpoſes; and it is the buſineſs of the ſkilful mechaniſt to chooſe them, or combine them, in the manner that may be beſt adapted to produce the effect required, by the power which he is poſſeſſed of, and at the leaſt expence. The lever can be employed to raiſe weights a little way only, unleſs the engine itſelf be moved; as, for inſtance, to raiſe ſtones out of their beds in quarries. But the axis and wheel may ſerve for raiſing weights from the greateſt depths. Pullies being eaſily carried, are therefore much employed in ſhips. The wedge is excellent for ſeparating the parts of bodies; and the ſcrew for compreſſing or ſqueezing them together; and its great friction is even ſometimes of uſe, to preſerve the effect already produced by it. The ſtrength of the *Machine*, and of its parts, muſt be proportioned to the effects which are to be produced by it. Thus, when the center of motion is placed between the power and the weight, it muſt ſuſtain the ſum of their efforts: a ſmall ballance, therefore, ought not to be employed for weighing great weights; for theſe diſorder its ſtructure, and render it unfit for ſerving that purpoſe with accuracy. Neither are great *Machines* proper for producing ſmall effects. It were to be wiſhed, that we had a detail of all theſe things drawn up by ſome ſkilful and experienced mechaniſt.

From theſe ſimple *Machines*, compounded ones are formed by various combinations, and ſerve for different purpoſes; in all which the ſame general laws take place; and particularly this, that the power and weight ſuſtain each other, when they are in the inverſe proportion of the velocities which they would have in the directions wherein they act, if they were put in motion.

But in practice the friction of *Machines* is to be conſidered, without allowing for which we ſhall often find ourſelves at a loſs See the article FRICTION, *Append.*

Accurate deſcriptions and draughts of *Machines* would be a very curious and uſeful work. But to make a collection of this kind as advantageous as poſſible, it ſhould, beſides the deſcriptions of *Machines*, contain an analyſis of them; pointing out their advantages and diſadvantages; the reaſons of the conſtructions; and the general problems, implied in theſe conſtructions, with their ſolutions, ſhould be extracted. None of theſe things have as yet been done, in a complete and ſatisfactory manner, in any treatiſe of this kind. However, many curious particulars may be gathered from Strada, Beſſon, Beroaldus, Auguſtinus de Ramellis, Bockler, Leupold, Beyer, Limpergh, Van Zyl, Perault, and others; a ſhort account of whoſe works we find in *Wolfii* commentatio de præcipuis ſcriptis mathematicis. Elem. Mathef. Univ. Tom. 5. pag. 84. ſeq. To theſe muſt be added, Monſieur Belidor's Architecture Hydraulique, and Dr. Deſaguliers's Courſe of Experimental Philoſophy. The Royal Academy of Sciences at Paris have alſo given us a collection of *Machines* and inventions approved of by them. This work, publiſhed by Monſieur Gallon, conſiſts of ſix volumes in 4to, containing engraved draughts of the *Machines*, with their deſcriptions annexed. But a complete inſtitution of practical *Mechanics* is ſtill wanting. See the article MECHANICS, *Append.*

MACHINE *of Marly (Cycl.)* — This *Machine* was made by a common mechanic of Liege, and has a great many excellent contrivances; but yet does not raiſe all the water that it might have done, becauſe the maker did not know how to give the River Seine all the advantages of which it was capable. Hence appears the neceſſity of a mechanic's being well acquainted with mathematics; or that able mathematicians would apply themſelves to mechanics more than they do, and not think it below them to direct workmen. See *Deſagul.* Exper. Philoſ. Vol. II. p. 442, to 449.

According to Dan. Bernoulli's computation, the effect of the *Machine of Marly* is not more than $\frac{1}{56}$ of its abſolute force; that is, there is a loſs of $\frac{55}{56}$ of that force. *Dan. Bernoul.* Hydrodyn. p. 182.

MACHINES *for raiſing water*. See the article *Raiſing* WATER, *Append.* See alſo the article FIRE-*engine*.

MACROCERCI, the name eſtabliſhed by Dr. Hill for a large genus of animalcules, diſtinguiſhed from all others by having tails longer than their bodies. See the article ANIMALCULE, *Cycl. Suppl.* and *Append.*

MAD-*wort*, the Engliſh name of a genus of plants, called by botaniſts *Alyſſon*. See the article ALYSSON, *Suppl.*

MADDER *(Suppl.)* — *Petty*-MADDER, the Engliſh name of a genus of plants, known among authors by that of *Rubeola*. See the article RUBEOLA, *Suppl.*

MADNESS — Dr. Michelotti relates the cure of a young man, who, after being expoſed to very hot weather at ſea, and having committed violent debauches in drinking, became mad, without any fever. He was cured by violent bleeding, ſtarving, weak very cold drink, the cold bath, and pouring cold water on his head. Hiſt. de l'Acad. des Scienc. 1734. See the article MANIA, *Suppl.*

MAGNESIA, the ſame with *Manganeſe*. See the article MANGANESE, *Suppl.*

MAGNET *(Cycl.)* — *Armed* MAGNET. See the article LOAD-STONE, *Suppl.*

The power of natural *Magnets* may be greatly increaſed by art; and this ſeems to have received farther and very great improvements from Dr. Knight. See Philoſ. Tranſ. N° 474. p. 163. ſeq.

The poles of natural *Magnets* may be inverted, or their directions may be changed. Remarkable inſtances of this may be ſeen in the Phil. Tranſ. N° 101. p. 164. ſeq. and N° 476. p. 36. ſeq. Thus the magnetical virtue may be placed in ſuch a manner, that the two oppoſite ends of a ſtone ſhall become, both, ſouth poles; and the middle quite round, a north pole. Or, the two oppoſite ends may be north poles; and the two oppoſite ſides ſouth poles. Half of the ſurface of the ſtone may be made a north pole, and the other half a ſouth pole. A north pole may be placed ſo as to be ſurrounded by a ſouth pole; and at the other end of the ſtone, a ſouth ſurrounded by a north pole; ſo that the edges of each ſurface have a pole of a different denomination from that which occupies the middle. See Phil. Tranſ. N° 476. p. 361. ſeq.

Artificial MAGNET. *Artificial Magnets* have been made in great perfection by the before mentioned gentleman. See the Phil. Tranſ. N° 474, p. 161. ſeq. where various experiments of the force of theſe *Artificial Magnets* are recorded; one in particular weighing, without its armour, juſt an ounce, and with the armour, cramps, and rings, one ounce 17 pen. wt. lifted ſix pounds ten ounces troy weight. See pag. 166, N° cit.

It is hoped, that Doctor Knight will ſoon oblige the world with his diſcoveries in magnetiſm. In the mean time, the ingenious Mr. Canton has found out a method of making artificial *Magnets*, without the uſe of, and yet far ſuperior to, natural ones. This gentleman has ſucceeded ſo well in his attempts to convey a conſiderable magnetic virtue to bars of hardened ſteel, as to be able to impregnate ſuch bars with this virtue, to as high a degree as any of the ſame weight and dimenſions which he had yet ſeen or heard of; and to as high a degree, as, he apprehends, the ſame bars in their preſent ſtate are capable of being impregnated. Mr. Canton has publiſhed the deſcription of his proceſs, with ſuch directions, that any perſon may readily perform the ſame.

The apparatus, beſides the bars of hard and ſoft ſteel, conſiſts only in an iron poker and tongs, the larger they are, and the longer they have been uſed, the better. But for the application of this apparatus, we muſt refer to the ingenious author himſelf, who has expreſſed himſelf clearly and conciſely, and added figures for the more eaſy intelligence of his proceſs. See a method of making artificial *Magnets*, without the uſe of natural ones, by *John Canton*, M. A. London, 1751. See alſo Phil. Tranſ. Vol. 47. p. 31.

MAGPYE, in ornithology, the Engliſh name of a large order of birds. See the article PICA, *Suppl.*

MAHOGANY, a well known, and, juſtly, much valued wood, brought from Jamaica, and other parts of the Weſt-Indies.

It is the wood of a very beautiful tree, with pinnated leaves, but hitherto not reduced to any certain claſs or genus of plants. Cateſby, indeed, who ſaw only the withered remains of its flower, tells us, that he could plainly perceive it to be pentapetalous, or conſiſting of five leaves. Its fruit has ſome, tho' but a remote, reſemblance to that of the pine.

MAIDEN-*hair (Suppl.)* — *Black* MAIDEN-*hair*, a name ſometimes given to the *Filicula*, or dwarf Fern. See the article FILICULA, *Suppl.*

Engliſh MAIDEN-*hair*, the name of a genus of plants, called by botaniſts *Trichomanes*. See the article TRICHOMANES, *Suppl.*

White MAIDEN-*hair*, the name by which ſome call the *Ruta-muraria*, or wall-rue. See the article RUTA-*muraria*, *Suppl.*

MAILLS, on ſhip-board, are ſquare machines, compoſed of a number of rings interwoven net-wiſe, and uſed for rubbing

off the loose hemp which remains on lines or white cordage, after it is made. *Blanckley*'s Nav. Expos. p. 102.

MAKE-*Hawk*, in falconry. See the article HAWK, *Append.*

MALIGNANT *(Cycl.)* — *Malignant* fevers and fluxes are frequent, not only in marshy countries, after hot seasons, but in populous cities. See the article CITY, *Append.*

History abounds with examples of *malignant* or pestilential fevers, added to the other calamities of a siege: Nay, there is scarce any instance of a town being long invested, without some fatal malady of this kind; which may, in great part, be attributed to the filth of the place, crowded with people and cattle. Corrupted grain, and meats long salted becoming putrid, have likewise given rise to *malignant* diseases.

It is remarkable how much the plague, and other pestilential fevers, hot scurvies, and dysenteries have abated in Europe within this last century; a blessing we can ascribe to no other second cause, than to the improvement of every thing relating to cleanliness, and to the more general use of Antiseptics. See the article ANTISCEPTICS, *Append.*

In regard to diet too, it may be observed, that hopped beer, wine, and spirituous liquors coming more into general use, have been a great means of suppressing putrid and *malignant* diseases. Greens and fruit are likewise more universally eat, and salted meats make a much less part of diet than formerly. To this add the more general consumption of tea and sugar. All which are no inconsiderable antiseptics. *Pringle*, Observ. on Dis. of the army, p. 284, 288, 293.

As to the contageous nature of all putrid disorders, Dr. Pringle thinks that the putrid effluvia, received into the blood, have a power of corrupting the whole mass, of which he conceives the resolution of the blood, and sometimes even its smell, in the advanced state of a *malignant* fever, the offensiveness of the sweats, and other excretions, the livid spots, blotches, and mortifications incident to this distemper, to be sufficient proofs. By the acrimony of these effluvia, the nerves are affected with various spasms, the pulse is always quickened, at first raised, but soon depressed. Id. ibid. p. 298.

Were putrefaction the only change made in the body by contagion, it would be easy to cure such fevers, at any period, by the use of acids, or other antiseptics. But, as this cannot be effected, till the stated time of their decline, it seems probable, that whilst the sceptic progress goes on, the fever is chiefly supported by an inflammation in the brain; so that a cure cannot be expected, till the obstructing matter is resolved or suppurated. Id. ibid.

That this is the case, appears from the method of cure. Thus, before the inflammation is fixed, the sceptic particles may be expelled by sweating; after that period, the most effectual method is to support the strength; but so as not to increase the inflammation; and near the end of the last stage of the disease, the humours being resolved by putrefaction, the obstruction is thereby removed; at which time the stronger antiseptic and cordial medicines have place, in order to correct and expel what is so much vitiated. In this low state the volatiles are often necessary for raising the pulse: Wine is a constant cordial; and not only wine, but camphor, snake-root, and the bark, are endowed with strong antiseptic qualities. Id. ibid. p. 299. seq. See the articles BILIOUS *fever*, HOSPITAL-*fever*, DYSENTERY, &c. *Append.*

MALABAR-*nut*, in botany, the English name of a genus of plants, called by botanists *Adhatoda*. See the article ADHATODA, *Suppl.*

MALL, or *Sea*-MALL, the name by which we call several species of the *Larus*, or gull. See the article LARUS, *Suppl.*

MALLOW, in botany, the English name of a genus of plants, called by botanists *Malva*. See the article MALVA, *Suppl.*

Jews MALLOW, the name by which some call the *Corchorus*, of botanists. See the article CORCHORUS, *Append.*

Indian MALLOW, a name given to two different genuses of plants, called *Sida* and *Urena*, by botanists. See the articles SIDA and URENA, *Suppl.*

Marsh-MALLOW, the English name of a genus of plants, called *Althæa* by botanical writers. See the article ALTHÆA, *Suppl.*

Syrian MALLOW, or *Venetian* MALLOW, names by which some call the *Ketmia*, of botanical authors. See the article KETMIA, *Suppl.*

Vervain MALLOW, the English name of a distinct genus of plants, known among botanists by that of *Alcea*. See the article ALCEA, *Suppl.*

Yellow MALLOW, a name sometimes given to the *Sida* of Linnæus. See the article SIDA, *Suppl.*

MALOBATHRUM, among the Romans, a precious kind of ointment, brought from the Indies through Syria to Rome. *Pitisc.* in voc.

MALTSTER, a person whose employment it is to make malt, or one who trades with it. Rust. Dict. in voc.

MALVINDA, in botany, the name given by Dillenius, to a genus of plants, called by Linnæus *Sida*. See the article SIDA, *Suppl.*

MALUS, the *Apple-tree*, in botany, the name of a genus of plants, the characters of which are these; the flower is rosaceous, and consists of several leaves; the fruit is fleshy, almost round, and for the most part umbilicated at both ends; it is divided into several cells or partitions, in each of which is contained an oblong callous seed.

The species of *Apple-tree*, enumerated by Mr. Tournefort, are these: 1. The *Apple* with a full or double flower. 2. The *Dwarf-Apple*, with white fruit; this is rather a shrub than a tree. 3. The *Dwarf-Apple*, with reddish fruit. 4. The *Crab-tree*, or wild *Apple*, with very sour fruit. 5. The wild *Apple*, with acid fruit. 6. The wild *Apple*, with white and acid fruit. 7. The large *Apple*, with very tender and early ripening fruit. 8. The cultivated *Apple*, with green spots both without and within the fruit. 9. The garden *Apple*, with fruit almost without a pedicle. 10. The garden *Apple*, with roundish pale green fruit, of a sweetish acid taste. 11. The garden *Apple*, with greenish iron coloured fruit. 12. The garden *Apple*, with fruit full of protuberances. 13. The garden *Apple*, with orbicular, sweet-scented fruit. 14. The garden *Apple*, with bright purple fruit. 15. The garden *Apple*, with blood coloured fruit, of a sweetish sour taste. 16. The garden *Apple*, with large reddish and very acid fruit, and a long pedicle. 17. The garden *Apple*, with deep red and violet scented fruit. 18. the garden *Apple*, with pale red, scentless, and large fruit. 19. The garden *Apple*, with deep blood-red coloured fruit, variegated with rust-coloured spots. 20. The garden *Apple*, with turbinated, tender fruit. 21. The garden *Apple*, with oblong, hard, chesnut-tasted fruit. 22. The garden *Apple*, with globose fruit, partly red and partly yellow, and of a sweetish-sour taste. 23. The garden *Apple*, with orbicular sessile fruit, of a vinous taste. 24. The garden *Apple*, with pentagonal stelliform fruit, and somewhat acid taste. 25. The garden *Apple*, with polygonal fruit, of a vinous and somewhat acid taste. 26. The large, angular, vinous-tasted garden *Apple*. 27. The garden *Apple*, with large pileiform greenish-yellow fruit. 28. The garden *Apple*, with striated fruit, variegated with yellowish-red spots. 29. The garden *Apple*, with fruit partly white, and partly reddish, variegated with red spots. 30. The angular, sweet, garden *Apple*, dissolving in the mouth. 31. The angular, whitish, citron-coloured garden *Apple*. 32. The fructiferous *Apple*, with fading flowers. 33. The garden *Apple*, with oblong, sugar tasted, Anis-scented, greyish iron-coloured fruit. 34. The garden *Apple*, with whitish fruit partly punctated, and partly variegated with deep-red striæ. 35. The hard, sugar tasted garden *Apple*, with purple fruit. 36. The garden *Apple*, with very sweet, red, sessile fruit. 37. The oblong, somewhat arched, very white garden *Apple*, of a sweetish acid Taste. *Tournef.* Inst. Bot. 634, seq.

MAN, *Homo*, in zoology, is ranked by Linnæus at the head of a class of animals, which he calls *Anthropomorpha*. See the article ANTHROPOMORPHA, *Suppl.*

He distinguishes *Men*, according to their colours; into the European, or white *Men*; the American, or reddish-coloured *Men*; the Asiatic, or tawney-brown-coloured men; and lastly, those of Africa, or the blacks. *Linnæi*, system. Natur. p. 63. Mons. Bufon, among many other curious particulars, has given us several relating to the natural history of *Man*. See Histoire Naturelle Vol. III. pag. 305. Edit. Paris. That ingenious author has entered into a considerable detail with respect to the varieties of the human species. See Vol. III. pag. 371, seq. of the same work.

MANCHINEEL-*tree*, the English name of a genus of plants, called by botanists *Mancanilla*. See the article MANCANILLA, *Suppl.*

MANGLES, in botany, the name by which Plumier calls the *Rhizophora* of Linnæus. See the article RHIZOPHORA, *Suppl.*

MANGROVE-*tree*, a name by which some call the *Ketmia*. See the article KETMIA, *Suppl.*

MANGROVE-*grape*, the name of a genus of plants, known among authors by that of *Guajabara*. See the article GUAJABARA, *Append.*

MANIS, in zoology, the name of the scaly lizard, otherwise called *Lacertus squamosus*. See the article LACERTUS *squamosus*, *Suppl.*

MANNING *(Suppl.)* — MANNING *of a hawk*, in falconry, is the making her tractable, gentle, and tame. Dict. Rust. in voc.

MANTLE *(Suppl.)* — *Ladies*-MANTLE, in botany, the English name of a genus of plants, known among authors by that of *Alchimilla*. See the article ALCHIMILLA, *Suppl.*

MARACOCK, a name sometimes used for the *Granadilla* of botanical writers. See the article GRANADILLA, *Suppl.*

MARANTA, *Indian arrow-root*, in botany, the name of a genus of plants, the characters of which are these; the cup is a small perianthium affixed upon the germen, of a lanceolated figure, and consisting of three leaves; the flower is monopetalous, and of the ringent kind; the tube is oblong, compressed, crooked, and oblique; the limb is divided into six parts, the alternate exterior segments being of an ovated figure, equal in size, and small, one standing below,

below, and two above; whereas the two lateral ſegments are very large, of a roundiſh figure, and repreſent a lower lip; the the upper one being ſmall, and bipartite. The ſtamen is a ſingle membranaceous filament, much reſembling a ſegment of the corolla; the anthera is of a linear figure, and affixed to the ſide of the filament; the germen of the piſtil is roundiſh, and is placed beneath the receptacle of the flower; the ſtyle is ſimple, and of the length of the flower; and the ſtigma is ſomewhat trigonal and bent. The fruit is a roundiſh capſule, ſomewhat obſcurely trigonal, and compoſed of three valves, in each of which there is a ſingle, hard, rugoſe ſeed, of an ovated figure.

It is a native of America, deſcribed by Plumier, and is nearly allied to the Canna, but cannot be joined with it. Vid. Linnæi Gener. Plantar. p. 2.

MARJORAM *(Suppl.)* — *Spaniſh* MARJORAM, a name uſed by ſome for the *Urtica*, with pellitory leaves and round balls. See the article URTICA, *Suppl.*

Sweet MARJORAM, a name given by ſome to a genus of plants, called by others *Parthenium*. See the article PARTHENIUM, *Suppl.*

MARKING-*Yarn*, in ſhips of war, is white yarn ſpun the wrong way, and put into all cordage of three inches and upwards, as the king's mark. *Blanckley*'s Naval Expoſitor, p. 103.

MARSH-*Elder*, or *Water-Elder*, the name by which ſome call the *Opulus*. See the article OPULUS, *Suppl.*

MARSH-*fever*, is a ſpecies of bilious *fever*. See the article BILIOUS, *Append.*

Thoſe, ſeized with the *Marſh-fever*, are tormented with a burning heat, and violent head-ach. They complain likewiſe of intenſe thirſt, aking of the bones, a pain of the back, great laſſitude and inquietude; and frequently of a nauſea, ſickneſs, or a pain about the pit of the ſtomach; which is ſometimes attended with a vomiting of green or yellow bile, of an offenſive ſmell. The head is ſometimes ſo ſuddenly and violently affected, that without any previous complaint, the patients run about in a wild manner, as if they were mad; and would throw themſelves out of windows, or into the water, if not prevented. *Pringle*, Obſerv. on the Diſ. of the Army, p. 171.

MARSH *trefoil*, the name of a genus of plants, called by authors *Menyanthes*. See the article MENYANTHES, *Suppl.*

MARSHY *Countries*. It is to be obſerved, that neither canals, nor even large inundations, where the water is deep, are nearly ſo dangerous in regard to peoples health, or exhale ſo much noxious vapours, as *marſhy* grounds, or meadows that have been once floated, and but lately drained; and that fields, tho' dry in appearance, may nevertheleſs be moiſt, by the tranſpiration of ſubterraneous water. *Pringle*, Obſerv. on the Diſ. of the Army, p. 82.

By this exhalation, as well as by that of ditches and canals, in all which innumerable plants and inſects die and rot, the atmoſphere is filled, eſpecially during the latter part of ſummer and autumn, with moiſt, putrid, and inſalutary vapours. Add to this, that *marſhy* countries being low, and without hills to receive the winds, or direct them in ſtreams upon the lower grounds, the air is apt to ſtagnate and corrupt. The common water too, being either collected from rains, and preſerved in ciſterns, or drawn from ſhallow wells, is, in hot and dry ſeaſons, ſoon corrupted; ſo that every thing conſpires, in ſummer, not only to relax the ſolids, but to diſpoſe the humours to putrefaction. Id. ibid. p. 2.

In *marſhy* countries rainy and moiſt ſeaſons differ greatly; ſince intenſe and continued heats occaſion the greateſt moiſture in the atmoſphere, by the immenſe exhalations they raiſe; whereas frequent ſhowers, during the hot ſeaſon, cool the air, check the exceſs of vapours, dilute and refreſh the corrupted ſtagnating water, and precipitate all putrid and noxious effluvia. But, if heavy rains in the beginning of ſummer, are ſucceeded by great and uninterrupted heats, thoſe rains, by overflowing the meadows, ſerve only for matter of more exhalation, and to make the ſeaſon more ſickly, and the diſtempers more fatal. Id. ibid. p. 5.

The epidemic of the hot ſeaſon, and the great endemic of *marſhy* countries, is a fever of an intermitting nature, commonly of a tertian ſhape, but of a bad kind; which in the damper places and worſt ſeaſons, appears in the form of a double tertian, remittent, continued, putrid, or even an ardent fever. *Marſhy* countries are likewiſe ſubject, more than any others, to the cholera morbus, dyſentery, and a kind of ſcurvy, peculiar to a moiſt and corrupted air; the ſymptoms of which laſt agree ſo much with the ſea-ſcurvy, that they may be accounted the ſame diſeaſe; the exhalations of the canals and *marſhes*, in hot weather, acting like the vapour which riſes from the bildge-water of a ſhip. Id. ibid. p. 6, ſeq.

As to the diet neceſſary in moiſt places, it may be obſerved in general, that thoſe who can afford to live above the common rate, keep freeſt from the diſeaſes of the *marſhes*. For ſuch climates require dry houſes, the apartments raiſed from the ground, proper exerciſe, without labour in the ſun, or in the evening damps, a juſt quantity of vinous liquors, and victuals of good nouriſhment. Without ſuch helps, not only ſtrangers, but the natives themſelves, are extremely ſickly after hot and cloſe ſummers. Id. ibid. p. 9.

MARTAGON, the name given by ſome to ſeveral ſpecies of *Lilly*. See the article LILIUM, *Suppl.*

MARTIN, in ornithology, the Engliſh name of the black *Hirundo*, with only the throat white. See the article HIRUNDO, *Suppl.*

MARYGOLD *(Suppl.)* — *Fig*-MARYGOLD, the name by which ſome call the *Ficoides* of botaniſts. See the article *Suppl.* and *Append.*

MASH, the name of a drink given to horſes or cattle. It is made of half a peck of ground malt, put into a pail; on which is poured as much hot ſcalding water, as will wet it well; then ſtirring it about half an hour, till it becomes lukewarm, and ſweet like honey, it is to be given to the horſe.

A *maſh* is only given after a purge, to make it work better; after hard labour, or for drink in time of ſickneſs. Ruſt. Dict. in voc.

MASTER-*wort*, a name ſometimes given to the *Aſtrantia* of botanical writers. See the article ASTRANTIA, *Suppl.*

MASTIC-*tree*, the name by which ſome call the *Lentiſcus* of authors. See the article LENTISCUS, *Suppl.*

MASTIC-*tree of Jamaica*, a name ſometimes given to the *Calaba*, or *Caryophillum*. See the article CARYOPHILLUM, *Append.*

Indian MASTIC, the name by which the *Molle*, or Peruvian Lentiſk is ſometimes called. See the article MOLLE, *Suppl.*

MATFELON, a name ſometimes gived to the *Jacea* of botaniſts, more uſually called *Knapweed*. See the article JACEA, *Suppl.*

MATURATION *of fruit*. For the ſeveral ways of haſtening the *maturation of fruit*, ſee the articles HOT-*beds*, FORCING, and CAPRIFICATION, *Suppl.*

MAUDLIN, the Engliſh name of a genus of plants, called by botaniſts *Ageratum*. See the article AGERATUM, *Suppl.*

MAUROCENIA, in botany, the name of a genus of plants, the characters of which are theſe; the cup is a very ſmall one-leaved perianthium, divided into five ſegments, and permanent; the flower conſiſts only of one leaf, divided into five oval, patent ſegments; the ſtamina are five erect ſubulated filaments, longer than the flower; the antheræ are ſimple; the germen of the piſtil is conic; there is no ſtyle; the ſtigmata are three, and gibbous; the fruit is an oval berry, umbilicated with the ſtigmata; the ſeeds are three, oblong, and ſcarce ſeparable from the pulp.

Dillenius makes this genus a ſpecies of Frangula. Vid. *Linnæi* Gen. Plant. p. 125.

MAW, or SEA-MAW, the ſame with the *Sea-Mall*. See the article MALL, *ſupra.*

MAY-*buſh*, in botany, a name ſometimes given to the *Meſpilus*, or Medlar. See the article MESPILUS, *Suppl.*

MAY-*duke*, a name uſed among Gardeners for a ſpecies of cherry-tree. See the article CERASUS, *Suppl.*

MAY-*lilly*, a name ſometimes uſed for the *Convallaria*, or *Lilium Convallium*. See the article LILIUM CONVALLIUM, *Suppl.*

MAY-*weed*, a name by which ſome call the *Chamæmile*. See the article CHAMÆMELUM, *Suppl.*

MAZE, in gardening, the ſame with *Labyrinth*. See the article LABYRINTH, *Cycl.* and *Suppl.*

MEADOW-*graſs*, in botany. See the article GRASS, *Append.*

MEADOW-*rue*, the Engliſh name of a genus of plants, called by botaniſts *Thalictrum*. See the article THALICTRUM, *Suppl.*

MEADOW-*ſweet*, in botany, the Engliſh name of a genus of plants, called by authors *Ulmaria*. See the article ULMARIA, *Suppl.*

MEALY-*tree*, in botany, a name ſometimes given to the *Viburnum*. See the article VIBURNUM, *Suppl.*

MECHANICS *(Cycl.)* — The term *Mechanics* has of old been, and ſtill is, uſed in a double ſenſe in very different ſciences, both with reſpect to their objects and principles. For the name *Mechanics* is applied equally to that ſcience which treats of the equilibrium and compariſon of powers; and to that ſcience in which the nature, generation, and alteration of motion is explained. To avoid ambiguity, therefore, it would be proper to give the name *Statics* to the ſcience of the equilibrium and compariſon of powers, and to reſtrain the term *Mechanics* to the ſcience of motion.

Theſe two ſciences not only differ as to their objects and principles, but alſo with reſpect to the times in which they have been cultivated. Some of the principles of *Statics* were eſtabliſhed by Archimedes; but Galileo laid the firſt foundation of Mechanics, when he inveſtigated the deſcent of heavy bodies; and ſince his time, by the aſſiſtance of the new methods of computation, a great progreſs has been made, particularly by Sir Iſaac Newton, in his Principia. This admirable work is now rendered more acceſſible to beginners by the learned comment of the fathers le Seur and Jacquier, printed, with the text, at Geneva,

1739, 4to, 1742, 4 vols. 4to. We have alſo the ſciences of Statics and *Mechanics* treated of under the name of Phoronomia, by the late learned profeſſor Herman. Amſt. 1716. 4to. Mr. Euler's *Mechanica, ſive de motus ſcientia*; is ſufficiently recommended by the name of the author, well known as one of the moſt eminent mathematicians in Europe. This work, however, did not eſcape the cenſure of a late ingenious writer; but granting the juſtneſs of his remarks, it may be ſaid, that a few inaccurate expreſſions, owing to analogies carried too far, and to the ſtyle of infiniteſimals, are but ſmall flaws in ſuch a work. As to ſtatics, the ſubject has been almoſt exhauſted by Varignon, in his Mecanique, Paris, 1725, 2 vol. 4to.

The doctrine of machines or engines is a principal branch of *Mechanics*; but has not as yet been treated as it deſerves. We ſhall here inſert a few obſervations on this uſeful ſubject, from a late eminent author.

In treating of machines, we ſhould conſider the weight that is to be raiſed, the power by which it is to be raiſed, and the inſtrument or engine by which this effect is to be produced. There are two principal problems that ought to be reſolved in treating of each of them.

The firſt is, to determine the proportion which the power and weight ought to have to each other, that they may juſt ſuſtain one another, or be in æquilibrio.

The ſecond is, to determine what ought to be the proportion of the power and weight to each other, in a given machine, that it may produce the greateſt effect poſſible, in a given time.

All the writers on *Mechanics* treat of the firſt of theſe problems, but few have conſidered the ſecond, tho' equally uſeful with the other.

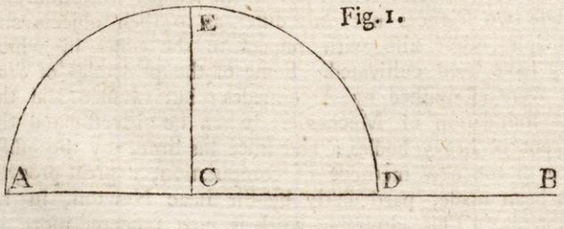
As to the firſt problem, this general rule holds in all powers: Suppoſe the engine to move, and reduce the velocities of the power and weight to the reſpective directions in which they act; find the proportions of thoſe velocities; then if the power be to the weight, as the velocity of the weight is to the velocity of the power, or, which amounts to the ſame thing, if the power multiplied by its velocity, gives the ſame product as the weight multiplied by its velocity, this is the caſe wherein the power and weight ſuſtain each other, and are in equilibrio; ſo that in this caſe, the one would not prevail over the other, if the engine was at reſt; and if it is in motion, it would continue to proceed uniformly, if it were not for the friction of its parts, and other reſiſtances.

The ſecond general problem in *Mechanics*, is, to determine the proportion which the power and weight ought to bear to each other, that when the power prevails, and the machine is in motion, the greateſt effect poſſible may be produced by it in a given time. It is manifeſt, that this is an inquiry of the greateſt importance, tho' few have treated of it. When the power is only a little greater than that which is ſufficient to ſuſtain the weight, the motion is too ſlow; and tho' a greater weight is raiſed in this caſe, it is not ſufficient to compenſate the loſs of time. When the weight is much leſs than that which the power is able to ſuſtain, it is raiſed in leſs time; and this may happen not to be ſufficient to compenſate the loſs ariſing from the ſmallneſs of the load. It ought, therefore, to be determined when the product of the weight multiplied by its velocity, is the greateſt poſſible; for this product meaſures the effect of the engine in a given time, which is always the greater in proportion as the weight which is raiſed is greater, and as the velocity with which it is raiſed is greater. We ſhall therefore ſubjoin ſome inſtances of this kind, that may be demonſtrated from the common elementary geometry; wiſhing that farther improvements may be made in this moſt uſeful part of *Mechanics*.

When the power prevails, and the engine begins to move, the motion of the weight is at firſt gradually accelerated. The action of the power being ſuppoſed invariable, its influence in accelerating the motion of the weight decreaſes, while the velocity of the weight increaſes. Thus the action of a ſtream of water, or air, upon a wheel, is to be eſtimated only from the exceſs of the velocity of the fluid above the velocity already acquired by the part of the engine which it ſtrikes, or from their relative velocity. On the other hand, the weight of the load that is to be raiſed, and the friction, tend to retard the motion of the engine; and when theſe forces, viz. thoſe that tend to accelerate it, and thoſe that tend to retard it, become equal, the engine then proceeds with the uniform motion it has acquired.

Let A B (Fig. 1.) repreſent the velocity of the ſtream, A C, the velocity of the part of the engine which it ſtrikes,

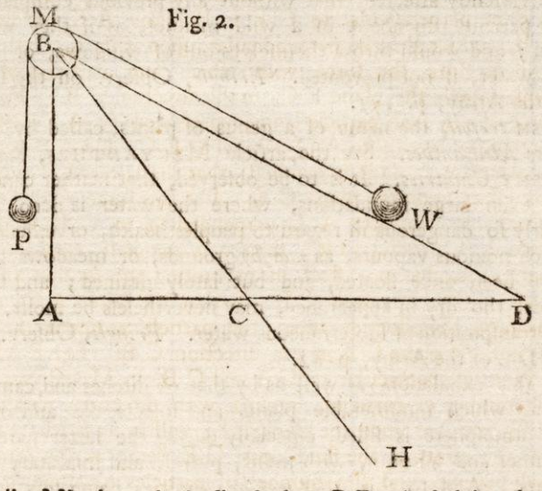
Fig. 1.



when the motion of the machine becomes uniform; and C B will repreſent their relative velocity, upon which the effect of the engine depends. It is known that the action of a fluid, upon a given plane, is as the ſquare of this relative velocity; conſequently the weight raiſed by the engine, when its motion becomes uniform, being equal to this action, it is likewiſe as the ſquare of C B. Let this be multiplied by A C, the velocity of the part of the engine impelled by the fluid; and the effect of the engine in a given time will be proportional to $A C \times C B^2 =$ (ſuppoſing C B to be biſſected in D) $A C \times 2 C D \times 2 D B = 4 A C \times C D \times D B$; conſequently, the effect of the engine is greateſt, when the product of A C, C D, and D B is greateſt. But it is eaſy to ſee, that this product is greateſt, when the parts A C, C D, and D B, are equal; for if you deſcribe a ſemicircle upon A D, and the perpendicular C E meet the circle in E, then $A C \times C D = C E^2$, and is greateſt, when C is the center of the circle; ſo that in order that $A C \times C D \times D B$ may be the greateſt poſſible, A D muſt be biſſected in C; and C B having been biſſected in D, it follows, that A C, C D, D B, muſt be equal; or that A C, the velocity of the part of the engine impelled by the ſtream, ought to be but one third of A B, the velocity of the ſtream. In this caſe, when (abſtracting from friction) the engine acts with the utmoſt advantage; the weight raiſed by it is to the weight that would juſt ſuſtain the force of the ſtream, as the ſquare of C B, the relative velocity of the engine and ſtream, to the ſquare of A B, which would be the relative velocity, if the engine was quieſcent; that is, as 2×2 to 3×3, or 4 to 9. Therefore, that the engine may have the greateſt effect poſſible, it ought to be loaded with no more than $\frac{4}{9}$ of the weight, which is juſt able to ſuſtain the efforts of the ſtream. See *Mac Laurin*'s Account of Sir Iſaac Newton's Diſcov. p. 171. ſeq. and Fluxions, Art. 908.

Again ſuppoſe that a given weight P, (Fig. 2.) deſcending by its gravity in the vertical line, raiſes a greater weight W likewiſe given, by the rope P M W (that paſſes over the fixed

Fig. 2.



pully M) along the inclined plane B D, the height of which B A is given; and let it be required to find the poſition of this plane, along which W will be raiſed in the leaſt time, from the horizontal line A D to B. Let B C be the plane upon which if W was placed, it would be exactly ſuſtained by P; in which caſe, P is to W as A B to B C. But W is to the force with which it tends to deſcend along the plane B D, as B D to A B; conſequently the weight P is to that force, as B D to B C. Therefore the exceſs of P above that force (which exceſs is the power that accelerates the motions of P and W) is to P, as B D — B C to B D; or taking B H upon B C equal to B D, as C H to B D. But it is known that the ſpaces deſcribed by motions uniformly accelerated, are in the compound ratio of the forces which produce them and the ſquares of the times; or that the ſquare of the time is directly as the ſpace deſcribed in that time, and inverſely as the force; conſequently, the ſquare of the time, in which B D is deſcribed by W, will be directly as B D, and inverſely as $\frac{C H}{B D}$, and will be leaſt when $\frac{B D^2}{C H}$ is a minimum; that is, when $\frac{B C^2}{C H} + C H + 2 B C$, or (becauſe 2 B C is invariable) when $\frac{B C^2}{C H} + C H$ is a minimum. Now as when the ſum of two quantities is given, their product is a maximum, when they are equal to each other; ſo it is manifeſt, that, when their product is given, their ſum muſt be a minimum, when they are equal. Thus it is evident, that as in Fig. 1. the rectangle or product of the equal parts A C and C D was equal to $C E^2$; ſo the rectangle of any two unequal parts, into which A D may be divided, is leſs than $C E^2$, and A D is the leaſt ſum of any two quantities, the product of which is equal to $C E^2$. But the product of $\frac{B C^2}{C H}$ and C H is $B C^2$, and conſequently given; therefore the ſum of $\frac{B C^2}{C H}$ and C H is leaſt, when

theſe

theſe parts are equal, that is, when C H is equal to B C, or B D equal to 2 B C. It appears, therefore, that when the power P and weight W are given, and W is to be raiſed by an inclined plane, from the level of a given point A to the given point B in the leaſt time poſſible; we are firſt to find the plane B C, upon which W would be ſuſtained by P, and to take the plane B D double in length of the plane B C; or we are to make uſe of the plane B D, upon which a weight that is double of W could be ſuſtained by the power P.

For another example, ſuppoſe a fluid, moving with the velocity and direction A C, (Fig. 3.) ſtrike the plane C E; and ſuppoſe that this plane moves parallel to itſelf in the direction C B, perpendicular to C A, or that it cannot move in any other direction. Then let it be required to find the moſt advantageous poſition of the plane C E, that it may receive the greateſt impulſe from the action of the fluid. Let A P be perpendicular to C E in P, draw A K parallel to C B, and let P K be perpendicular upon it in K, and A K will meaſure the force with which any particle of the fluid impells the plane E C, in the direction C B. For the force of any ſuch particle being repreſented by A C, let this force be reſolved into A Q parallel to E C, and A P perpendicular to it; and it is manifeſt, that the latter A P only has any effect upon the plane C E. Let this force A P be reſolved into the force A L perpendicular to C B, and the force A K parallel to it; then it is manifeſt, that the former, A L, has no effect in promoting the motion of the plane in the direction C B: ſo that the latter A K, only, meaſures the effort by which the particle promotes the motion of the plane C E in the direction C B. Let E M and E N be perpendicular to C A and C B, in M and N; and the number of particles, moving with directions parallel to A C, incident upon the plane C E, will be as E M. Therefore the effort of the fluid upon C E being as the force of each particle, and the number of particles together, it will be as A K × E M; or, becauſe A K is to A P (= E M,) as E N to C E, as $\frac{EM^2 \times EN}{CE}$; ſo that C E being given, the problem is reduced to this, to find when $EM^2 \times EN$ is the greateſt poſſible, or a maximum. But becauſe the ſum of EM^2 and of EN^2 (= CM^2) is given, being always equal to CE^2, it follows, that $EN^2 \times EM^4$, is greateſt, when $EN^2 = \frac{1}{3} CE^2$; in the ſame manner as it was demonſtrated above, that when the ſum of A C and C B (Fig. 1.) was given, $AC \times CB^2$ was greateſt, when $AC = \frac{1}{3} AB$. But when $EN \times EM^4$ is greateſt, its ſquare root $EN \times EM^2$ is of neceſſity at the ſame time greateſt. Therefore the action of the fluid upon the plane C E in the direction C B is greateſt when $EN^2 = \frac{1}{3} CE^2$, and conſequently $EM^2 = \frac{2}{3} CE^2$; that is, when E M, the ſine of the angle A C E, in which the ſtream ſtrikes the plane, is to the radius, as the $\sqrt{2}$ to $\sqrt{3}$; in which caſe it eaſily appears, from the trigonometrical tables, that this angle is of 54°. 44′.

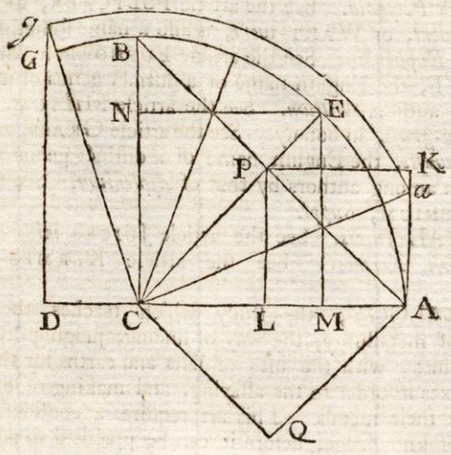


Fig. 3.

Several uſeful problems in *Mechanics* may be reſolved by what was ſhewn in the preceding paragraph. If we repreſent the velocity of the wind by A C, a ſection of the ſail of a wind-mill perpendicular to its length by C E, as it follows from the nature of the engine, that its axis ought to be turned directly towards the wind, and the ſail can only move in a direction perpendicular to the axis, it appears, that, when the motion begins, the wind will have the greateſt effect to produce this motion, when the angle A C E, in which the wind ſtrikes the ſail, is of 54°. 44′. In the ſame manner, if C B repreſent the direction of the motion of a ſhip, or the poſition of her keel, abſtracting from her lee-way, and A C be the direction of the wind, perpendicular to her way, then the moſt advantageous poſition of the ſail C E, to promote her motion in the direction C B, is when the angle A C E, in which the wind ſtrikes the ſail, is of 54°. 44′. The beſt poſition of the rudder, where it may have the greateſt effect in turning round the ſhip, is determined in like manner. And the ſame angle enters likewiſe into the determination of the figure of the rhombuſes that form the baſes of the cells in which the bees depoſite their honey, in the moſt frugal manner. See the article BEE, *Suppl.*

But it is to be carefully obſerved, that when the ſine of the angle A C E is to the radius as $\sqrt{2}$ to $\sqrt{3}$; or, which is the ſame thing, when its tangent is to the radius, as the diagonal of a ſquare to its ſide; this is the moſt advantageous angle only at the beginning of the motion of the engine; ſo that the ſails of a common wind-mill ought to be ſo ſituated, that the wind may indeed ſtrike them in a greater angle than that of 54°. 44′. For it is demonſtrable, that when any part of the engine has acquired the velocity c, the effort of the wind upon that part will be greateſt, when the tangent of the angle in which the wind ſtrikes it is to the radius, not as the $\sqrt{2}$ to 1, but $\sqrt{2} \times \frac{9cc}{4aa} \times \frac{3c}{2a}$ to 1, the velocity of the wind being repreſented by a. If, for example, $c = \frac{1}{3} a$; then the tangent of the angle A C E ought to be double of the radius; that is, the angle A C E ought to be of 63° 26′. If $c = a$; then A C E ought to be of 74° 19′. This obſervation is of the more importance, becauſe, in this engine, the velocity of the parts of the ſail remote from the axis, bears a conſiderable proportion to the velocity of the wind, and perhaps ſometimes is equal to it; and becauſe a learned author, Mr. Daniel Bernoulli, has drawn an oppoſite concluſion from his computations in his *Hydrodynamics*, by miſtaking a minimum for a maximum; where he infers, that the angle in which the wind ſtrikes the ſail, ought to decreaſe as the diſtance from the axis of motion increaſes; that if $c = a$, the wind ought to ſtrike in an angle of 45°; and that if the ſail be in one plane, it ought to be inclined to the wind, at a medium, in an angle of 50°. How he fell into theſe miſtakes, is ſhewn by Mr. *Mac Laurin*, in his Fluxions, §. 914.

In like manner, though the angle A C E of 54°. 44′. be the moſt advantageous at the beginning of the motion, when a ſhip ſails with a ſide wind; yet it ought to be enlarged afterwards as the motion increaſes. In general, let A a, parallel to C B, be to A C, as the velocity which the engine has already acquired in the direction C B, to that of the ſtream; upon A C produced take A D to A C as 4 to 3, draw D G parallel to C B, and let a circle deſcribed from the center C with the radius C a, meet D G in g; and the plane C E ſhall be in the moſt advantageous ſituation for promoting the motion of the engine, when it biſſects the angle $a C g$.

It is generally ſuppoſed, that a direct wind always promotes the motion of a ſhip, the ſail being perpendicular to the wind, more than any ſide-wind; and this has been affirmed in ſeveral late ingenious treatiſes; but, to prevent miſtakes, we are obliged to obſerve, that Mr. *Mac Laurin* has demonſtrated the contrary, in his Treatiſe of Fluxions, §. 919; where other inſtances of this ſecond general problem in *Mechanics* are given, to which we refer. See *Mac Laurin's* Account of Sir Iſaac Newton's Philoſophical Diſcoveries, B. II. c. 3. p. 173. ſeq.

MECHOACAN, *(Cycl.)* the name by which the great American *Convolvulus*, or bindweed, is known in the ſhops. See the article CONVOLVULUS, *Suppl.*

MEDIC-*vetching*, a name by which ſome call the *Onobrychis*. a diſtinct genus of plants. See the article ONOBRYCHIS, *Suppl.*

MEDICA *(Suppl)*—*Baſtard*-MEDICA, the Engliſh name of a genus of plants, called by botanical writers *Medicago*. See the article MEDICAGO, *Suppl.*

MEDLAR *(Suppl.)* — *Parſley-leaved* MEDLAR, the name by which ſome call a ſpecies of *Cratægus*. See the article CRATÆGUS, *Suppl.*

MEDUSA, in zoology, the name of a genus of inſects, of the order of the *Gymnarthria*. See the article GYMNARTHRIA, *Append.*

The body of the *Meduſa* is of an orbiculated convex figure of a gelatinous ſubſtance, and not hairy. The tentacula, or the plicæ, which ſerve inſtead of them, are ſituated in the center of the under part of the animal. Authors have deſcribed them under the names *Urticæ marinæ*, and *Pulmones marini*. See the article URTICA *Marina*, *Suppl.*

MELANCHOLY *thiſtle*, *Cirſium*, in botany, the name of a ſpecies of *Thiſtle*. See the article THISTLE, *Suppl.*

MELANTHIUM, in botany, a name uſed by ſome authors for a ſpecies of *Nigella*. See the article NIGELLA, *Suppl.*

MELOE, in zoology, the name of a genus of four-winged flies, whoſe antennæ are ſlender and filiform; and the exterior wings dimidiated. It is called in Engliſh the *oil-beetle*, as being ſoft and mucuous to the touch. It is black, but not at all gloſſy, and has been deſcribed by authors under the names *Scarabæus mollis*, *Cantharus unctuoſus*, and *Proſcarabæus*. See the article SCARABÆUS, *Suppl.*

MELON *(Suppl.)* — *Water*-MELON, the name of a genus of plants, called by botaniſts *Anguria*. See the article ANGURIA, *Suppl.*

Thiſtle-MELON, *Cactus*, in botany, the name of a genus of plants. See the article CACTUS, *Suppl.* and *Append.*

MENIANTHES, in botany, the ſame with *Menyanthes*, a diſtinct genus of plants. See the article MENYANTHES, *Suppl.*

MENISPERMUM, in botany, the name of a diſtinct genus of plants, the characters of which are theſe: The cup is a deciduous perianthium, compoſed of ſix ovato-oblong leaves, erecto-patent, and of the length of the corolla; which conſiſts of ſix ovato-oblong, obtuſe, hollow petals, erecto-patent, like the leaves of the cup; the ſtamina are ſix very ſhort filaments; the antheræ are ſimple, and ſhorter than the corolla; the germina are three, ſuboval, and terminate in as many patenti-reflex ſtyles, of the length of the corolla; the ſtigmata are obtuſe and emarginated. The fruit is compoſed of three oval berries, each containing a ſingle cell, and in it a large, ſingle, lunulated, compreſſed ſeed. *Linnæi* Gen. Plant. p. 155.

Plukenet calls this genus the one-leaved Virginian *hedera*, with the leaves of convolvulus.

MERCURY *(Suppl.)* — *Virgin*-MERCURY, called *Jungfraw* by the German miners, is uſed for that which diſcovers itſelf without the aſſiſtance of fire. This is ſometimes ſeen in drops, globules, or larger maſſes in the ore, or falls in drops from the crevices in the roof or walls of the mine, or finally is found in large quantities in the hollows of the rocks. Theſe large collections of pure virgin quickſilver often diſcover themſelves by burſting out in ſmall ſtreams in the mines of Friuli. They ſometimes are ſurpriſed with a ſtream of it like a thread, which gradually increaſing to the thickneſs of a packthread, continues to run three or four days, and diſcharges in that time a vaſt quantity of the quickſilver; if the miners can follow this ſpring to the head, they generally obtain a large quantity more; and often this ſort of ſpringing up of it leads them to very rich veins of the mine which they did not before know of. They give the ſame name of *Jungfraw* or virgin-quickſilver alſo to that *Mercury* which has no need of fire for the ſeparation, but is waſh'd out of its ores by a ſieve and large quantities of water, continually and forcibly running on it.

The ores of quick-ſilver often contain a large quantity of that mineral embedded in them in this form, and often ſo mix'd in other parts with ſulphurs, as to be diſguiſed into cinnabar; in this caſe a great deal is ſeparated by this waſhing, which at the ſame time frees the ore from dirt, and renders it fitter for the operation of the fire, by which a great deal more is then extracted.

The union of *Mercury* with antimony is very difficult, but has been effected by Monſ. Malouin. See Hiſt. Ac. Scienc. 1740.

The ſame gentleman ſucceeded alſo in uniting *Mercury* with tin and lead, ſo as to improve theſe metals in ſome reſpects, rendering them harder, whiter, and more ſonorous. Hiſt. Ac. ibid.

Engliſh MERCURY, the name of a diſtinct genus of plants, called by botaniſts *Chenopodium*. See the article CHENOPODIUM, *Suppl.*

MERLIN, in ornithology, the Engliſh name of the yellow-legged *Falco*, with a variegated back, and a brown and white belly. See the article FALCO, *Suppl.*

This bird is alſo called *Oeſalon*. See the article ŒSALON, *Suppl.*

MESHES *of nets*, the openings and vacancies in net-works. Ruſt. Dict. in voc.

MESSES *of ſoldiers*, in what reſpect uſeful. See the article DIET, *Append.*

METALS are expanded by *Heat*, but in different degrees. See the articles HEAT and PENDULUM, *Append.*

By what may be learned from the analyſes of metals, ſo far as that ſubject has yet been proſecuted, it ſeems that they all contain a running *Mercury* fixed in them, as water is fixed in dry, animal, and vegetable ſubſtances; and joined with a ſulphur or an inflammable part, and an earth, with a little ſalt in ſome of them. *Shaw*'s Lectures, p. 162.

METHONICA, in botany, the name given by Tournefort to a diſtinct genus of plants, called by Linnæus *Glorioſa*. See the article GLORIOSA, *Append.*

METOPE *(Cycl.)* — Le Clerc obſerves, that the beauty of *Metopes* conſiſts in their regularity, on appearing to be perfect ſquares; and yet when they are equally ſquare, they appear to be leſs in height than in breadth, on account of the projecture of the little bandelet; for which reaſon they ſhould be made a minute or two more in height than in breadth, in order to make their appearance uniform.

He alſo obſerves, that when the triglyphs and *Metopes* follow each other regularly, the columns muſt only ſtand one by one; excepting thoſe of the inner angles, which ought always to be accompanied by two others, one on each ſide; and here it is worth remarking, that theſe two columns which accompany that of the angle, are not leſs neceſſary on account of the ſolidity of the building, than of the regularity of of the intercolumniations.

MEU, MEW, or SPIGNEL, a name ſometimes given to the *Meum* of botaniſts. See the article MEUM, *Suppl.*

MEWING, a diſorder incident to all kind of birds, being the caſting of their feathers. Ruſt. Dict. in voc.

MIDAS's *Ear-ſhell*, a name uſed by ſome for a ſpecies of *buccinum*, or trumpet-ſhell. See the article TRUMPET-*ſhell*, *Suppl.*

MILFOIL, a name ſometimes given to the *Milleſolium*, or yarrow, of other writers. See the article MILLEFOLIUM, *Suppl.*

MILK-*vetch*, the name of a genus of plants, called by botaniſts *Aſtragalus*. See the article ASTRAGALUS, *Suppl.*

Baſtard MILK-*vetch*, a name ſometimes given to the *Phaca*, or *Aſtragaloides*, of botaniſts. See the article ASTRAGALOIDES, *Suppl.*

MILK-*wort*, the name of a diſtinct genus of plants, called by authors *Polygala*. See the article POLYGALA, *Suppl.*

MILK-*wort*, or WART-*wort*, is alſo a name ſometimes given to the *Euphorbia*. See the article EUPHORBIA, *Suppl.*

MILLET, the Engliſh name of a diſtinct genus of plants, called by authors *Milium*. See the article MILIUM, *Suppl.*

MILLET-*graſs*, in botany. See the article GRASS, *Append.*

MILT-*waſte*, the Engliſh name of a diſtinct genus of plants, known among authors by that of *Aſplenium*. See the article ASPLENIUM, *Suppl.*

MINERAL *Juices*. See the article JUICES *mineral*, *Suppl.*

MINERAL *Kermes*. See the article KERMES *mineral*, *Suppl.*

MINERALOGY, the ſtudy which teaches the previous part of metallurgy, the way of finding, judging of, and digging mines; with the uſes of ſalts and earths for the making of fluxes in order to the aſſaying, and making of ores to ſeparate their metals. This art requires a conſiderable compaſs of knowledge, before it can be practis'd to advantage; for as it includes the diſcovery, ſinking, and working of mines, it requires a competent knowledge of the nature of effluvia, and the effects of all mineral matters, ſalts, ſulphurs, &c. as well as the knowledge of all valuable mineral ſubſtances, as earths, bitumens, ſtones, ores, gems, and metals. It likewiſe requires a knowledge in the internal ſtructure of the earth, and its various ſtrata, with a competent ſkill in menſuration, hydraulics, meaſuring, and mechanics; for without theſe we can never judge what mountain, plain, or valley is proper to be dug, or in what manner to dig it, how to diſcharge the water that may flow into the works, how the beds of ore and ſtone will dip and run, how the various kinds of earth, marble, and other mineral or metalic matter, are to be cut through or broken, or how the general proceſs of mining ſhould be conducted, in order to procure, with the leaſt expence, the matter of the ore. *Shaw*'s Lectures, p. 240.

MINT *(Suppl.)* —*Corymbiferous* MINT, in botany, a name given by ſome to a ſpecies of Tanzy. See the article TANACETUM, *Suppl.*

Spear-MINT, the name commonly given to the narrow leaved ſpiked *Mint*. See the articles MENTHA and MINT, *Suppl.*

Cat's-MINT, the Engliſh name of a genus of plants, called by botanical writers *Cataria*. See the article CATARIA, *Suppl.*

MIRE-*Drum*, and MIRE-*Snipe*, names uſed in different parts of the kingdom for the *ardea ſtellaris*, or bittern. See the articles BITTERN and HERON, *Suppl.*

MISCARRIAGE, the popular term for *Abortion*. See the articles ABORTION, *Cycl.* and PREGNANCY, *Suppl.*

MISLETOE, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Viſcum*. See the article VISCUM, *Suppl.*

MITCHELS, among builders, are purbeck ſtones, from fifteen inches ſquare to two feet, ſquared and hewed ready for paving. Ruſt. Dict. in voc.

MITHRIDATE-*muſtard*, in botany, the name by which ſome call the *Thlaſpi*, or treacle muſtard. See the article THLASPI, *Suppl.*

Baſtard-MITHRIDATE-*muſtard*, a name ſometimes given to the *Thlaſpidium* of botaniſts. See the article THLASPIDIUM, *Suppl.*

MITRE-*ſhell*, the Engliſh name of the ſmooth and ſlender buccinum, with a ſplit roſtrum. See the article TRUMPET-*ſhell*, *Suppl.*

MOCK-*orange*, a name by which the *ſyringa*, or pipe-tree, is ſometimes called. See the article SYRINGA, *Suppl.*

MOCK-*privet*, a name ſometimes given to the *Phyllerea* of botaniſts. See the article PHYLLEREA, *Suppl.*

MODILLION *(Cycl.)* — In the Corinthian order it is uſual to have a leaf which takes up the whole breadth, and almoſt the whole length, of the modillions; but Le Clerc is of opinion, that they would be more graceful if this leaf were leſs, both in length and breadth. The leaf ought likewiſe to be of the ſame kind with thoſe which make the ornament of the capital. Build. Dict. in voc.

MOISTURE. The bad effects of too much *moiſture*, in regard to health, has been conſidered under the article MARSHY *Countries*, *Append.*

Stink-

MOMORDICA *(Suppl.)* — *Stinking* MOMORDICA, a name uſed by ſome for the large fruited white *bryony* of Ceylon. See the article *Bryonia alba*, *Suppl.*

MONBIN, in botany, the name given by Plumier to a genus of plants, called by other botaniſts *Spondias*. See the article SPONDIAS, *Suppl.*

MONEDULA, in ornithology, a name uſed by ſome writers for the *Jackdaw*, a ſpecies of *Corvus*. See the articles CORVUS, and JACKDAW, *Suppl.*

MONEY-*wort*, the Engliſh name of a diſtinct genus of plants, known among botaniſts by that of *Nummularia*. See the article NUMMULARIA, *Suppl.*

MONK's-*rhubarb*, the Engliſh name of the broad-leaved garden *Lapathum*, or dock. See the article LAPATHUM, *Suppl.*

MONKEY, in zoology, a name given by way of diſtinction to thoſe apes which have tails; the others, or thoſe without tails, being more properly called *apes*.

The ſame diſtinction holds in latin, the tailed ones being called *Cercopitheci*, and thoſe without tails *Simiæ*. See the articles CERCOPITHECUS and SIMIA, *Suppl.*

MONKEY, in the ſea-language, a block made of iron, with a catch, uſed in gins for driving piles. *Blanckley*'s Naval Expoſitor, p. 107.

MONOCEROS *piſcis*. Beſides the two kinds of unicorn-fiſh deſcribed in the Supplement under the article MONOCEROS, there is another very large one of the ſame genus. See the article UNICORN, *Suppl.*

MONOCULUS, in zoology, the name of a genus of inſects, of the Podaria kind. See the article PODARIA, *Append.*

Its body is ſhort, of a roundiſh figure, and covered with a firm cruſtaceous ſkin; the fore legs are ramoſe, and ſerve for leaping and ſwimming. It has but one eye, which is large, and compoſed of three ſmaller ones.

Of this genus, many of which have been reckoned among the microſcopic animals, authors enumerate a great number of ſpecies; for which ſee *Hill*, Hiſt. Anim. p. 22.

MONORCHIS. Beſide the common ſignification of this word as the name of a plant, phyſicians have alſo us'd it to expreſs a man who has but one teſticle.

MONOTRIGLYPH, in architecture, denotes the ſpace of one *Triglyph*, between two pillaſters or two columns. Build. Dict. in voc. See the article TRIGLYPH, *Cycl.*

MOON *(Cycl.)* — The path of the *moon* is concave towards the ſun throughout.

In other ſecondary planets, as the ſatellites of the ſuperior planets, that part of the path of theſe ſatellites which is neareſt the ſun, is convex towards the ſun, and the reſt is concave. And we often find in elementary treatiſes of aſtronomy, the *Moon*'s path repreſented in the ſame manner; that is, as partly convex and partly concave towards the ſun; but this is a miſtake. For it is to be obſerved, in general, that the force which bends the courſe of the ſatellite into a curve, when the motion is referred to an immoveable plane, is, at the conjunction, the difference of its gravity towards the ſun, and of its gravity towards the primary. When the former prevails over the latter, the force that bends the courſe of the ſatellite tends towards the ſun; and conſequently the concavity of the path is towards the ſun; and this is the caſe of the *Moon*. When the gravity towards the primary exceeds the gravity towards the ſun, at the conjunction, then the force that bends the courſe of the ſatellite tends towards the primary, and therefore towards the oppoſition of the ſun; conſequently the path is there convex towards the ſun; and this is the caſe of the ſatellites of Jupiter. When theſe two forces are equal, the path has, at the conjunction, what mathematicians call a point of rectitude; in which caſe, however, the path is concave towards the ſun throughout.

The gravity of the *Moon* towards the ſun having been found to be greater, at her conjunction, than her gravity towards the earth, ſo that the point of equal attraction, where thoſe two powers would ſuſtain each other, falls then between the *Moon* and earth, ſome [a] have apprehended that either the parallax of the ſun is very different from that which is aſſign'd by aſtronomers, or that the *Moon* ought neceſſarily to abandon the earth. This apprehenſion may be removed eaſily, by attending to what has been ſhewn by Sir Iſaac Newton, and is illuſtrated by vulgar experiments concerning the motions of bodies about one another, that are all acted upon by a third force in the ſame direction. Their relative motions not being in the leaſt diſturbed by this third force, if it act equally upon them in parallel lines; as the relative motion of the ſhips in a fleet, carried away by a current, are no way affected by it, if it act equally upon them; or as the rotation of a bullet or bomb, about its axis, while it is projected in the air; or the figure of a drop of falling rain, are not at all affected by the gravity of the particles of which they are made up, towards the earth. It is to the inequality of the action of the ſun upon the earth and *Moon*; and the want of parallelism in the directions of theſe actions, only, that we are to aſcribe the irregularities in the motion of the *Moon*.

[a] The ingenious Mr. *Baxter*, author of *Matho*, or coſmotheoria puerilis.]

But it may contribute towards removing this difficulty to obſerve, that if the abſolute velocity of the *Moon*, at the conjunction, was leſs than that which is requiſite to carry a body in a circle there around the ſun, ſuppoſing this body to be acted on by the ſame force which acts there on the *Moon* (i. e. by the exceſs of her gravity towards the ſun, above her gravity towards the earth) then the *Moon* would, indeed, abandon the earth. For, in that caſe, the *Moon* having leſs velocity than would be neceſſary to prevent her from deſcending within that circle, ſhe would approach to the ſun, and recede from the earth. But tho' the abſolute velocity of the *Moon*, at the conjunction, be leſs than the velocity of the earth in the annual orbit, yet her gravity towards the ſun is ſo much diminiſhed by her gravity towards the earth, that her abſolute velocity is ſtill much ſuperior to that which is requiſite to carry a body in a circle, there, about the ſun, that is acted on by the remaining force only. Therefore, from the moment of the conjunction, the *Moon* is carried without ſuch a circle, receding continually from the ſun to greater and greater diſtances, till ſhe arrives at the oppoſition; where being acted on by the ſum of thoſe two gravities, and her velocity being now leſs than what is requiſite to carry a body in a circle, there, about the ſun, that is acted on by a force equal to that ſum, the *Moon* thence begins to approach to the ſun again. Thus, ſhe recedes from the ſun, and approaches to it by turns, and in every month her path hath two apſides, a perihelium at the conjunction, and an aphelium at the oppoſition; between which ſhe is always carried in a manner ſimilar to that in which the primary planets revolve between their apſides. The planet recedes from the ſun at the perihelium, becauſe its velocity, there, is greater than that with which a circle could be deſcribed about the ſun at the ſame diſtance by the ſame centripetal force; and approaches towards the ſun from the aphelium, becauſe its velocity, there, is leſs than is requiſite to carry it in a circle, at that diſtance about the ſun. See *Mac Laurin*'s Account of Sir Iſaac Newton's Phil. Diſc. Book 4. c. 5.

MOON-*wort*, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Lunaria*. See the article LUNARIA, *Suppl.*

MOON-*trefoil*, a name by which the *Medicago* of botaniſts is ſometimes called. See the article MEDICAGO, *Suppl.*

MOON-*ſeed*, in botany, the Engliſh name of a genus of plants, called by botaniſts *Meniſpermum*. See the article MENISPERMUM, *Append.*

MOOR-*buzzard*. See the article BUZZARD, *Suppl.*

MOOTER, in the dock-yards, the perſon who forms and ſmooths the tree-nails for uſe. *Blanckley*'s Nav. Expoſitor, p. 108.

MORBUS *Hungaricus*. See the article HUNGARICUS *morbus*, *Append.*

MORDELLA, a name given by ſome writers to the *Ear-wig*. See the article EAR-*wig*, *Append.*

MORDELLA, in zoology, the name of a genus of four-winged flies, diſtinguiſhed by having the laſt joint of the antennæ globoſe; moſt of the ſpecies have alſo legs for leaping. See the article FLY, *Suppl.*

Of this genus there are a great many ſpecies, for which ſee *Hill*, Hiſt. Anim. p. 49.

MORILLES, a kind of muſhroom, about the bigneſs of a wallnut, pierced with holes like a honey-comb, and ſaid to be good for creating an appetite. They are alſo accounted reſtorative, and frequently uſed in ſauces and ragouts.

MORMYLUS, in ichthyology, the name of a ſpecies of *Sparus*, with the upper jaw longeſt, and with twelve parallel, tranſverſe black lines on each ſide. See the article SPARUS, *Suppl.*

MORTAR *(Cycl.)* — It is ſaid, that the ſpherical figure is beſt for the chamber of a *mortar*. Hiſt. Acad. Scienc. 1740.

But this propoſition ſeems doubtful. By ſome experiments made before the Royal Society in 1742, it appeared, that the longeſt cylindrical chambers of the ſame capacity threw the ball fartheſt; which may give ground to ſuſpect that a long cylinder might be a better figure for the chamber of a *Mortar* than a ſphere of equal capacity. See the article GUNNERY, *Append.*

Coehorn MORTAR, a ſmall kind of *Mortar*, invented by the famous engineer baron Coehorn, to throw ſmall ſhells or granades. Theſe *Mortars* are commonly fixed, to the number of a dozen, to a block of oak, at an elevation of 45°.

MORTIFICATION, in medicine. See the article SPHACELUS, *Cycl.* and *Suppl.*

MOSCHUS, the *muſk animal*. See the articles MOSCHIFERUM *animal*, and MUSK, *Suppl.*

MOTH, in zoology, the Engliſh name of a large claſs of butterflies, comprehending all the nocturnal ones, or thoſe which fly by night, and called *Phalenæ* by authors. See the article PHALENÆ, *Suppl.*

MOTH-*mullein*, in botany, the Engliſh name of a diſtinct genus of plants, known among botanical writers by that of *Blattaria*. See the article BLATTARIA, *Suppl.*

MOTHER-*wort*, the name for two diſtinct genuſes of plants, the *cardiaca* and *matricaria*, of botanical writers. See the articles CARDIACA and MATRICARIA, *Suppl.*

MOTHER *of thyme*, the Engliſh name of a diſtinct genus of plants, called by botaniſts *ſerpyllum*. See the article SERPYLLUM, *Suppl.*

MOUNTAIN, or HILL. It has been found by experiment, that *hills*, though they meaſure twice as much as the plain ground they ſtand on, yet the produce of one can be no more than that of the other; and therefore in purchaſing lands, the hills ought to be eſtimated, not according to their ſuperficies, but according to the baſe on which they ſtand. So that in ſome caſes; that is, if the ſoil be equally rich, two acres on the ſide of a hill ought to paſs for no more than one upon the plain of equally rich land.

The reaſon of this is evident; for as long as all plants preſerve their upright method of growing, *hilly* ground can bear no more plants in number than the plain at the baſe. Again, as to building on a *hill*, the two ſides can bear only the ſame number of houſes as the baſe on which it ſtands. The ſame holds in regard to park-pailing over an *hill*; for tho' the meaſure over it be ſometimes near double the line at the bottom, yet both may be incloſed by the ſame number of pales of the ſame breadth. *Miller*'s Gard. Dict. in voc. *Hills*.

The method often uſed for meaſuring the heights of *Mountains*, by the ſinking of the mercury in the barometer, is very far from being accurate in practice. That the mercury generally falls, when the barometer is carried up to a higher ground, is true, and has been known ever ſince the time of Paſcal. The only queſtion is, in what proportion? and this queſtion is not yet determined with ſufficient accuracy. The rule followed by the generality of authors, is, that the heights of *Mountains*, or other riſing grounds, are as the logarithms correſponding to the heights of the mercury in the barometer. And the foundation of this rule is, that the denſity of the air is every where proportional to the weight of the ſuperincumbent air. But the application of this principle is improper in the preſent caſe, becauſe it can hold true only when the air is of the ſame degree of heat, which it ſeldom is, on the different parts of high *Mountains*, in the valleys, and at the ſurface of the ſea. In aſcending the Cordelleras of Peru, for inſtance, the air is found to be of all temperatures, from the hotteſt ſummer, to the coldeſt winter. And experiments are directly contrary to the rule. For by Father Feuillée's obſervations on the Pic of Tenerif, the mercury in the barometer ſtood at 17 inches five lines Paris meaſure, at the height of 13158 Paris feet above the ſurface of the ſea, when the barometer at that ſurface ſtood at 27 inches 10 lines. But, according to the rule abovementioned, the barometer on the Pic ought to have been above two inches and two lines lower than what it was found to be by the experiment.

A difference may alſo be perceived between the computed and obſerved heights of the barometer, at much ſmaller elevations; ſuch as 1542 feet; where the obſerved height of the mercury exceeded that found by computation above a line and an half; which would make a very conſiderable error in the height of the place.

From whence it follows, that the elaſticity or ſpring of the air at different heights, is not proportional to its denſity, or which amounts to the ſame thing, that the mean degree of heat is different at different heights from the ſurface of the earth; for it is well known, that a difference of heat will make a difference of elaſticity in the air, its denſity remaining the ſame. See *Daniel Bernoulli* Hydrodynamic. p. 213. ſeq.

This learned author obſerves, that father Feuillée's experiment on the Pic of Tenerif, overturns all the rules and hypotheſes hitherto contrived for diſcovering the heights of places, from the fall of mercury in the barometer. Mr. Bernoulli has given a new hypotheſis of his own, and has founded ſome computations on it, which agree pretty well with the experiments he mentions; but it were to be wiſhed that this ſubject were re-examined with more care by a greater variety of experiments than has been done hitherto.

Monſ. Caſſini de Thuri has given us [c] a detail of ſeveral obſervations made with care on two high *Mountains* of Auvergne, and upon the *Mountain* Canigou, one of the higheſt of the Pyrenees. From theſe obſervations it appears, that the variations of the heights of the mercury in the barometer, correſponding to the elevation of places above the level of the ſea, follow no regular progreſſion; there having been found ſometimes an inch of difference between the height of the mercury found by obſervation on the *Mountain* Canigou, from the height that reſulted from the progreſſion eſtabliſhed in the Memoirs of the Royal Academy in 1703. This progreſſion being deduced from obſervations made at ſmall elevations, proved erroneous; nor have any of the hypotheſes made ſince been ſufficient to reconcile the irregularities in obſervations, the exactitude of which admits of no doubt. [c Mem. Acad. Scienc. 1740. p. 94.]

MOUNTAIN-*heath*, the name by which ſome call the *Saxifrage* of botanical writers. See the article SAXIFRAGE, *Suppl.*

MOURAILLE, or BARNACLES, among farriers, is an inſtrument compoſed of two branches joined at one end with a hinge. It is commonly made of iron, and ſerves to take hold of a horſe's noſe, and keep it tight by bringing to, or almoſt cloſing the other end of the branches, and ſo tying them with a ſtrap.

MOUSE *(Suppl.)* — MOUSE, in the ſea language, is a large knot artificially made by the riggers on the ſhip's ſtays. *Blanckley*'s Nav. Expoſ. p. 108.

MOUSE-*ear*, a name ſometimes given to the *Hierachium*, or hawkweed of botaniſts. See the article HIERACHIUM, *Suppl.*

MOUSE-*tail*, the Engliſh name of a diſtinct genus of plants, known among botaniſts by that of *Myoſurus*. See the article MYOSURUS, *Append.*

Dor-MOUSE, the Engliſh name of a genus of animals, called by authors *Sorex*. See the article SOREX, *Suppl.*

Sea-MOUSE, the Engliſh name of a genus of inſects, called by Dr. Hill *Aphrodita*. See the article APHRODITA, *Append.*

MULBERRY-*blite*, a name uſed by ſome for a ſpecies of blite. See the article BLITUM, *Suppl.*

MULCH, a term uſed by gardeners for rotten dung, or the like, thrown upon beds of young plants, to preſerve them from the bad effects of cold or drought.

MULES, among farriers, a diſorder incident to horſes, otherwiſe called *Scratches*. See the article SCRATCHES, *Cycl.*

MULLEIN, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Verbaſcum*. See the article VERBASCUM, *Suppl.*

MULLET *(Suppl.)* is alſo uſed as the name of ſeveral ſpecies of *Trigla*. See the article TRIGLA, *Suppl.*

MUNDICK *(Cycl.)* — This mineral ſubſtance is of an arſenical nature. See *Geoffroi*, in Mem. Acad. Scienc. 1738. p. 107. edit. Paris.

MUS-*marinus*, a name uſed by ſome for the *Aphrodita*, a genus of ſea inſects. See the article APHRODITA, *Append.*

MUSCA, *Crabroniformis* and *Rapax*, names ſometimes uſed for the Fly. See the article ASILUS, *ſupra.*

MUSCA *Veſpiformis*, the Waſp-fly. See the article ASILUS, *ſupra.*

MUSCLE *(Suppl.)* — *Acceleratory* MUSCLES. See the article ACCELERATOR, *Cycl.*

MUSCUS, *Moſs*, in botany, a very comprehenſive claſs of plants, containing a great many diſtinct genera. See the article MOSS, *Suppl.*

MUSICAL *Accent*, among Hebrew grammarians. See the article ACCENT, *Cycl.*

MUSICAL *Numbers (Suppl.)* — A table of *muſical* numbers within any propoſed limit may be thus expeditiouſly formed. Place the terms of the progreſſion 1, 5, 25, 125, &c. in a column under each other; and multiply every term of this progreſſion by 3, continually, till you foreſee that the products will exceed the propoſed limit. Then if all the numbers thus found be doubled continually, till it be foreſeen that the doubled numbers would exceed the propoſed limit; all theſe products together, with the powers of 2, will give the *muſical* numbers required.

Thus if it were required to find all the *muſical* numbers within the compaſs of eleven octaves; that is, between 1 and 2048; form the column 1, 5, 25, &c. and multiply every term by 3, continually, as in the annexed example;

1. 3. 9. 27. 81. 343. 729, &c.
5. 15. 45. 135. 405. 1215, &c.
25. 75. 225. 675. 2025, &c.
125. 375. 1125, &c.
625, 1875, &c.
&c.

The numbers of which being doubled as often as poſſible within the limit 2048, and collected and ranged in order with the powers of 2, will give the following numbers, 1. 2. 3. 4. 5. 6. 8. 9. 10. 12. 15. 16. 18. 20. 24. 25. 27. 30. &c. as in the following table;

Table of *muſical* numbers, contained in eleven octaves.

Num.	Chord Aſc.	Chord Deſc.	Num.	Chord Aſc.	Chord Deſc.	Num.	Chord Aſc.	Chord Deſc.
1	F	B	144	G	A	750	B ♯	F♭
2	F¹	B¹	150	G ♯	A♭	768	C	E
3	C	E	160	A	G	800	C ♯	E♭
4	F²	B²	162	Ȧ	G·	810	Ċ ♯	Ė♭
5	A	G	180	B	F	864	D	*D*
6	C	E	192	C	E	900	D ♯	*D*♭
8	F³	B³	200	C ♯	E♭	960	E	C
9	G	A	216	D	*D*	972	Ė	Ċ
10	A	G	225	D ♯	*D*♭	1000	E ♯	C♭
12	C	E	240	E	C	1024	F¹⁰	B¹⁰
15	E	C	243	Ė	Ċ	1080	F ♯	B♭
16	F⁴	B⁴	250	E ♯	C♭	1125	F ♯ ♯	B♭♭
18	G	A	256	F⁸	B⁸	1152	G	A
20	A	G	270	F ♯	B♭	1200	G ♯	A♭
24	C	E	288	G	A	1215	Ġ ♯	Ȧ♭
25	C ♯	E♭	300	G ♯	A♭	1250	G ♯ ♯	A♭♭
27	D	*D*	320	A	G	1280	A	G
30	E	C	324	Ȧ	G·	1296	Ȧ	Ġ
32	F⁵	B⁵	360	B	F	1350	Ȧ ♯	Ġ♭
36	G	A	375	B ♯	F♭	1440	B	F
40	A	G	384	C	E	1458	Ḃ	F
45	B	F	400	C ♯	E♭	1500	B ♯	F♭
48	C	E	405	Ċ ♯	Ė♭	1536	C	E
50	C ♯	E♭	432	D	*D*	1600	C ♯	E♭
54	D	*D*	450	D ♯	*D*♭	1620	Ċ ♯	Ė♭
60	E	C	480	E	C	1728	D	*D*
64	F⁶	B⁶	486	Ė	Ċ	1800	Ḋ ♯	*D*♭
72	G	A	500	E ♯	C♭	1875	D ♯ ♯	*D*♭♭
75	G ♯	A♭	512	F⁹	B⁹	1920	E	C
80	A	G	540	Ḟ ♯	B♭	1944	Ė	Ċ
81	Ȧ	Ġ	576	G	Ȧ	2000	E ♯	C♭
90	B	F	600	G ♯	A♭	2025	Ė ♯	Ċ♭
96	C	E	625	G ♯ ♯	A♭♭	2048	F¹¹	B¹¹
100	C ♯	E♭	640	A	G			
108	D	*D*	648	Ȧ	Ġ			
120	E	C	675	Ȧ ♯	Ġ♭			
125	E ♯	C♭	720	B	F			
128	F⁷	B⁷	729	Ḃ	F			
135	F ♯	B♭						

To underſtand this table it is to be obſerved, that by dividing a given ſtretched ſtring or chord, by means of a moveable bridge, the ſounds produced by its parts will be higher in pitch than thoſe produced by the given chord. And, on the contrary, if we multiply a chord, that is, by a moveable bridge lengthen the ſounding part of a chord, we ſhall have ſounds lower in pitch than the given chord. Hence we have the foundation of an aſcending, and of a deſcending ſcale of muſical ſounds. The firſt column of each diviſion of the table, marked *Num.* expreſſes the muſical numbers; the ſecond column marked *Aſc.* the names of the notes in the aſcending ſcale; and the third column marked *Deſc.* the names of the notes of the deſcending ſcale. Thus if the given chord be unity, and called F, then will 15 be E in the the fourth octave aſcending of F; 45 will be B in the ſixth octave of F, &c. In the deſcending ſcale unity will be B; 15 will be C in the fourth octave deſcending from B; and 45 will be F of the ſixth octave, &c.

The reaſon why unity is marked F in the aſcending ſcale, and B in the deſcending ſcale, is, becauſe according to the received notation of what is called the natural ſcale among muſicians; F has no fourth in aſcending, nor B a fourth in deſcending. Now it is plain that no aliquot diviſion of a ſtring can give a fourth, or any of its octaves aſcending; nor can any multiple of a ſtring, give the fourth, or any of its octaves, in deſcending. For the fourth being expreſſed by $\frac{3}{4}$ in aſcending; and by $\frac{3}{4}$ in deſcending, its octaves will be $\frac{3}{32}$, $\frac{3}{64}$, $\frac{3}{128}$, &c. in the firſt caſe, and $\frac{3}{8}$, $\frac{3}{16}$, $\frac{3}{32}$, &c. in the ſecond caſe, none of which numbers can be multiples, or ſubmultiples of a given ſtring.

F and B being the given ſounds, their octaves will be expreſſed by F¹, F², F³, &c. and B¹, B², B³, &c. which are, reſpectively, the firſt, ſecond, and third octaves above the F and below B.

A dot marked over a letter ſhews that it ſignifies a ſound higher by a comma than the ſound expreſſed by the letter itſelf. And a dot placed below, denotes the ſound to be lowered by a comma. Thus, in the table I find 81 to be Ȧ | G, which denotes that A, or the ſharp in the ſeventh octave of F, aſcending, is raiſed a comma; and that G or the ſharp third from B, deſcending, is lowered by the ſame interval.

If B in the deſcending ſcale be ſuppoſed to be a tritonus, that is, two tones major, and one tone minor above F of the aſcending ſcale, then will A in one of theſe ſcales correſpond or be denoted by the ſame numbers with G in the other ſcale; and C will correſpond to E, but D in the aſcending ſcale will not be expreſſed by the ſame numbers as in the deſcending ſcale: For in the former D will be a tone major above C, whereas in the latter D muſt by analogy be a tone major below E, and therefore only a tone minor above C, which is the reaſon why *D* is in Italicks in the deſcending ſcale.

Mr. Henſling has mentioned the diſtinction between an aſcending and a deſcending ſcale in the Miſcel. Berolinens. He places unity in the aſcending ſcale in F, as it ought; but in the deſcending ſcale he places unity in E, which diſturbs the analogy of the two ſcales.

The trumpet and french horn, not having (commonly) a compaſs beyond four octaves; and their ſounds being formed in a manner analogous to thoſe produced by the diviſion of a ſtring, it follows that all the true notes of theſe inſtruments will be repreſented by the muſical numbers, 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, 16, &c. This is a fact well known [a], and a confirmation of the truth of that theory which derives all muſical proportions from the elements 2, 3, and 5[b]. — [a See the article TRUMPET, *Append.* and Philoſ. Tranſ. N° 195. [b] See Phil. Tranſ. loc. cit.]

MUSK *Hyacinth*, a name ſometimes given to a diſtinct genus of plants, called by botaniſts *Muſcari*. See the article MUSCARI, *Suppl.*

MUSK-*ſeed*, a name uſed by ſome writers for the *Ketmia*. See the article KETMIA, *Suppl.*

MUST *(Suppl.)* — A *muſt* for artificial wine may be thus made: Take twenty pounds of fine ſugar; five gallons of water; four ounces of white tartar finely pulverized, or cream of tartar, and boil them in a large veſſel over a gentle fire.

MUSTARD *(Suppl.)*—*Mithridate*-MUSTARD, the name of a genus of plants, called by botaniſts *Thlaſpi*. See the article THLASPI, *Suppl.*

Baſtard-Mithridate-MUSTARD, the ſame with the *Thlaſpidium* of botanical writers. See the article THLASPIDIUM, *Suppl.*

Rough-Podded MUSTARD, the name by which a ſpecies of *Syſimbrium* is ſometimes called. See the article SYSIMBRIUM, *Suppl.*

Tower-MUSTARD, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Turritis*. See the article TURRITIS, *Suppl.*

Treacle-MUSTARD, a name promiſcuouſly uſed for two diſtinct genuſes of plants, the *Thlaſpi* and *Jonthlaſpi*. See the articles THLASPI and JONTHLASPI, *Suppl.*

MUTULE *(Cycl.)* — Le Clerc makes *Mutules* in the entablement of the Doric order, not only to diſtinguiſh it the more from other entablements, but alſo becauſe they agree very well with the nobleneſs of this order, and add ſomething of a maſculine beauty to it.

Mutules are commonly made of the ſame breadth with the triglyphs; but the ſame author thinks it would be much better if they were made of the ſame breadth with the capitals of the triglyphs. Nor does he run his *Mutules* ſo near the extremity of the larmier or drip, as is uſually done; leaving a ſpace of three or four minutes between the two, that the profile may appear the more diſtinctly.

MYOCTONUM. See the article ACONITE, *Cycl.*

MYOSURUS, *Mouſe-tail*, in botany, the name of a diſtinct genus of plants, the characters of which are theſe: the cup is a deciduous perianthium, compoſed of five ſemi-lanceolate, obtuſe, reflex, coloured leaves, joined on above the baſe. The corolla, which is conſiderably ſmaller than the cup, conſiſts of five extremely minute petals, and is tubulated at the baſe, and opens obliquely inwards. The ſtamina are five filaments, of the length of the cup; the antheræ are erect, and oblong: the germina are very numerous, and are placed on the receptacle in form of a conic, oblong cluſter; there are no ſtyles; the ſtigmata are ſimple; there is no pericarpium; the receptacle is extremely long, ſtyliform, and covered with numerous, oblong, and acuminated ſeeds, laid in an imbricated manner. *Linnæi* Gen. Plant. p. 134.

This genus has a great affinity with the ranunculus, and is common in our corn fields. Dodonæus calls it *Cauda Murina*.

MYRICA, *Sweet William*, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: The male flowers are arranged in an oblong amentum; the cup is a ſquama of a lunulated figure; there is no corolla, nor proper perianthium; the ſtamina are four, rarely ſix, thread-like filaments, longer than the cup; the antheræ are two in number, and didymous. The female flowers are the ſame as the male ones; the germen of the piſtil is of an oval ſhape; the ſtyles are two; and the ſtigmata ſimple; the fruit is an unilocular berry, containing only one ſeed. *Linnæi* Gen. Plant. p. 474.

This genus comprehends the *Gale* of Tournefort and others; and is nearly allied to the *Piſtachia-nut* tree, a ſpecies of *Terebinthus*. See the article TEREBINTHUS, *Suppl.*

MYRTLE, the Engliſh name of a genus of trees, called by botaniſts *Myrtus*. See the article MYRTUS, *Suppl.*

Dutch-MYRTLE, or *Candleberry*-MYRTLE, names ſometimes given to the *Myrica*, or *Gale* of botaniſts. See the article MYRICA, *Append.*

MYRTLE-*Sumach*. See the article SUMACH, *infra*.

N.

NAIA, in zoology, the name of a ſpecies of *Coluber*, the ſcuta of whoſe abdomen are one hundred and ninety in number, and the ſquamæ of the tail ſixty. See the article COLUBER, *Append.*

NAMES. *Specific* NAMES. See the article SPECIFIC, *Suppl.*

NAPELLUS. See the article ACONITE, *Cycl.*

NAPHA, a name given by many of the writers in pharmacy to orange-flower water.

NASEBERRY *tree*, the Engliſh name of a diſtinct genus of plants, called by botaniſts Cainito, or *Chryſophyllum*. See the article CHRYSOPHYLLUM, *Append.*

NASTURTIUM *aquaticum*, the name by which C. Bauhine calls the *Syſimbrium*. See the article SYSIMBRIUM, *Suppl.*

NASTURTIUM-*Indicum*, in botany, a name uſed by ſome for a genus of plants, called by others *Cardamindum*, and *Trapæolum*. See the articles CARDAMINDUM, *Suppl.* and TRAPÆOLUM, *Append.*

NAVEL *(Suppl.)* — NAVEL-*boods*, in ſhip-building, large pieces of ſtuff fitted into the hawſe-holes, to keep the cables from wearing them. *Blanckley*'s Nav. Expoſ. p. 110.

NAVEL-*line*, on ſhip-board, a rope reeved through a block made faſt to the middle rib, and another block made faſt to the maſt-head.

NAVEL-*wort (Suppl.)*— *Baſtard* NAVEL-*wort*, a name ſometimes given to the *Craſſula* of botanical writers. See the article CRASSULA, *Append.*

Venus's NAVEL-*wort*, the name of a genus of plants, called by authors *Omphalodes*. See the article OMPHALODES, *Suppl.*

Water NAVEL-*wort*, a name ſometimes given to the *Hydrocotyle* of botaniſts. See the article HYDROCOTYLE, *Suppl.*

NECKIB-*el-eſheraf*, in Egypt, the head of the ſherif, or relations of Mahomet, who has the great cognizance of their actions, and the power of inflicting puniſhments upon them. *Pocock*'s Egypt, p. 171.

NECKLACE-*ſnake*. See the article SNAKE, infra.

NECTYDALIS, in zoology, the name of a genus of four-winged inſects, diſtinguiſhed by having the antennæ ſetaceous, the exterior pair of wings dimidiated, and the interior pair membranaceous. *Hill*, Hiſt. Anim, p. 55.

Some have called it a *cimex*, and others a *forficula*, or ear-wig, but both erroneouſly. Id. p. 56.

NEEDLE-*fiſh*, the Engliſh name of the *Syngnathus*, with the middle of the body hexangular, and the tail pinnated. See the article SYNGNATHUS, *Suppl.*

It is the ſame fiſh with the *Acus Ariſtotelis ſpecies altera major*. See the article ACUS, *Suppl.*

NEEDLE-*ſhell*, the Engliſh name of a ſpecies of *Centronia*, or *Echinoderma*. See the articles ECHINODERMA, *Suppl.* and CENTRONIA, *Append.*

NEEDLE-*ſhell* is alſo the Engliſh name of a ſpecies of *Turbo*, which is ſlender, and has ventricoſe ſpires, and a ſmall mouth. See the article TURBO, *Suppl.*

Touch-NEEDLES. See the article TOUCH-*needles*, *Suppl.*

Shepherd's-NEEDLE, the name by which ſome writers call the *Scandix*, or *Venus's-comb*. See the article SCANDIX, *Suppl.*

NEGRO-*oil*, a name by which the *palma* of botaniſts is ſometimes called. See the article PALMA, *Append.*

NEP, *Nepeta*, a name ſometimes uſed for the Cat-mint, or *Cataria* of botaniſts. See the article CATARIA, *Suppl.*

NEPA, the name by which ſome call a genus of inſects, otherwiſe known by that of *Scorpio paluſtris*, the water-ſcorpion. See the article SCORPIO, *Suppl.*

NEREIS, in zoology, a genus of inſects of the gymnarthria kind, the body of which is of a cylindric figure; the tentacula are four in number, but two of them are uſually very ſhort. *Hill.* Hiſt. Anim. p. 92.

Authors have deſcribed this genus under the name of *Scolopendra marina*. See the article SCOLOPENDRA *marina*, *Suppl.*

NERIUM, or NERION, in botany, the name of a genus of plants, called in Engliſh *Oleander*. See the article NERION, *Suppl.*

NETTLE *(Suppl.)* — *Sea*-NETTLE, the Engliſh name of a genus of inſects, called by Dr. Hill *Meduſa*. See the article MEDUSA, *Append.*

Hedge-NETTLE, a name by which ſome call the *Galeopſis* of botanical writers. See the article GALEOPSIS, *Suppl.*

Shrubby Hedge NETTLE, the name given by ſome writers to the *Praſſium*, a diſtinct genus of plants. See the article PRASIUM, *Suppl.*

NEUROPTERA, in zoology, the name by which Dr. Hill calls a claſs of four-winged flies, from their wings being membranaceous with nerves, and being diſpoſed in a reticulated form. Vid. *Hill*, Hiſt. Anim. p. 69.

NIGHT *(Cycl.)* — For the diviſions of the *Night* among the antients, ſee the articles DAY, HOUR, *&c. Cycl.*

NIGHTSHADE, *Climbing* NIGHTSHADE, a name ſometimes uſed for the *Baſella* or *Cuſcuta* of botaniſts. See the article CUSCUTA, *Suppl.*

Deadly NIGHTSHADE, a name by which ſome call the *Belladonna*, a diſtinct genus of plants. See the article BELLADONNA, *Suppl.*

Inchanter's NIGATSHADE, the Engliſh name of a genus of plants, called by botaniſts *Circæa*. See the article CIRCÆA, *Suppl.*

American NIGHTSHADE, a name given to the *Solonoides*, or *Rivinia*, of botaniſts. See the article RIVINIA, *Suppl.*

Virginian NIGHTSHADE, the name by which ſome call a ſpecies of *Phytolacca*. See the article PHYTOLACCA, *Suppl.*

NINDSI, or NINZI, the name of a diſtinct genus of plants, called by botaniſts *Sium*. See the article SIUM, *Suppl.*

NINSI, in botany, a name uſed by ſome for the *Panax*, or All-heal of Linnæus. See the article PANAX, *Append.*

NINTH, in muſic, one of the diſſonant intervals in muſic. It is properly the ſecond doubled; but is differently uſed. When an upper part ſyncopates, the ſecond is accented and treated as a *Ninth*; i. e. it is reſolved by an eighth, and accompanied by a third or fifth, and often a ſyncopated ſeventh. But when the lower part ſyncopates, the ſecond is not thus uſed, but is accompanied by the fourth and ſixth. In thorough baſs, as the *Ninth* has always, or at leaſt commonly, an eight placed after it thus, 9 8; to ſhew that that is reſolved by deſcending to the Octave. Vid. *Broſſ.* Dict. Muſ. in voc.

NOLI *me tangere*, the name uſed by ſome for a ſpecies of *Balſamine*. See the article BALSAMINA, *Suppl.*

NONE-*ſo-pretty*, a popular name for the *Geum* of botanical authors. See the article GEUM, *Suppl.*

NONE-*ſuch*, a name ſometimes given to the *Lychnis* of botaniſts. See the article LYCHNIS, *Suppl.*

NOSE-*bleed*, in botany, a popular name for the *Millefolium* of botanical writers. See the article MILLEFOLIUM, *Suppl.*

NOTOPEDA, in zoology, a name ſometimes given to the *Elater*, a genus of four-winged flies. See the article ELATER, *Append.*

NUMB-*fiſh*, or *Cramp-fiſh*, names given to the *Torpedo*, which is a ſpecies of *raja*, See the articles RAJA, *Suppl.* and TORPEDO, *Cycl.*

NUMBER *(Cycl.)* — *Figurate* NUMBERS. Thoſe of the firſt order are 1, 1, 1, 1, &c. Thoſe of the ſecond order the ſucceſſive ſums of thoſe of the firſt order, viz. 1, 2, 3, 4, 5, &c. and form an arithmetical progreſſion. Thoſe of the third order are the ſucceſſive ſums of thoſe of the ſecond, viz. 1, 3, 6, 10, 15, and are the triangular numbers. Thoſe of the fourth order are the ſucceſſive ſums of the third, viz. 1, 4, 10, 20, 35, and are the pyramidal numbers, and ſo on.

The figurate *Numbers* of any order may be found without computing thoſe of the preceding orders, by taking the ſucceſſive products of as many of the *Numbers* 1, 2, 3, 4, 5, &c. in their natural order, as there are units in the *Number*, which denominates the order of figurates required, and dividing thoſe products always by the firſt product. Thus the triangular *Numbers* are found by dividing the products 1×2, 2×3, 3×4, 4×5, 5×6, &c. each by the firſt product 1×2. The pyramids alſo are found by dividing the products $1 \times 2 \times 3$, $2 \times 3 \times 4$, $3 \times 4 \times 5$, $4 \times 5 \times 6$, &c. each by $1 \times 2 \times 3$. In general, the figurate *Numbers* of any order denoted by M, are found by ſubſtituting ſucceſſively 1, 2, 3, 4, 5, &c. in the place of x in the general expreſſion $\frac{x.\ x+1.\ x+2.\ x+3.\ \&c.}{1.\ 2.\ 3.\ 4.\ \&c.}$ where the factors in the numerator and denominator are ſuppoſed to be multiplied by each other, and to be continued, till the number in each be equal to that which expreſſes the order of the figurates required, diminiſhed by unity. And when a figurate *Number* of any order is divided by the correſponding figurate of any higher order, the numerator of the quotient is invariable, and x. is in its denominator of as many dimenſions as there are units in the difference of the *Numbers* that denote thoſe orders. See *Mac Laurin*'s fluxions Art. 351 in the notes.

Figural NUMBERS. See the article FIGURAL, *Append.*

Muſical NUMBERS. See the article MUSICAL, *Append.*

NUMBERING *Rods*. See the article NEPER's *Bones*, *Cycl.*

NUMMULARIA, *Money-wort*, the name by which ſome call the *Lyſimachia* of botaniſts. See the article LYSIMACHIA, *Suppl.*

NUT *(Suppl.)*—*Bladder*-NUT, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Staphylæa*, and *Staphylodendron*. See the article STAPHYLODENDRON, *Suppl.*

Cocoa-NUT, the name of a genus of plants, called by botaniſts *Cacao*. See the article CACAO, *Suppl.*

Earth-NUT, in botany, a name given to two diſtinct genuſes of plants, called by botaniſts *Bulbocaſtanum* and *Arachis*. See the articles BULBOCASTANUM, *Suppl.* and ARACHIS, *Append.*

Hazle-NUT, in botany. See the article HAZLE, *Suppl.*

Malabar-NUT, the name of a genus of plants, known among botaniſts by that of *Adhatoda*. See the article ADHATODA, *Suppl.*

Peas-NUT, the name by which ſome call the *Lathyrus* of botanical writers. See the article LATHYRUS, *Suppl.*

Phyſic NUT, a name ſometimes given to the *Ricinoides* of Tournefort. See the article RICINOIDES, *Suppl.*

Pig-NUT, a name by which the *Bulbocaſtanum*, or earth-*nut*, is ſometimes called. See the article BULBOCASTANUM, *Suppl.*

Spaniſh-NUT, a name by which ſome call the *Siſyrinchium* of botanical writers. See the article SISYRINCHIUM, *Suppl.*

Wall-NUT, the name of a well known genus of trees, called by Linnæus *Juglans*, and by Tournefort ſimply *Nux*. See the article NUX. *Suppl.*

NYCTANTHES, in the Linnean ſyſtem of botany, the name of a genus of plants, the characters of which are theſe; the cup is a one-leaved perianthium, very ſmall, of a cylindric figure, lightly divided into eight ſegments, or denticulæ, of a ſubulated figure, and permanent. The flower conſiſts of a ſingle petal, and is of a hypocrateriform kind; the tube is cylindric, and longer than the cup; the limb is plain, divided into eight ſegments of an oblong figure, and patent; the ſtamina are two extremely ſmall filaments, affixed to the receptacle, and of a ſubulated figure; the antheræ are erect, and ſomewhat acute; the germen of the piſtil is roundiſh and depreſſed; the ſtyle is ſimple, and of the length of the tube; the ſtigmata are two, and are erect; the fruit is a didymous berry, of a roundiſh figure, and contains two cells; the ſeeds are roundiſh and large, and one only is contained in each cell. *Linnæi* Gen. Plant. p. 6.



O.

OAK *(Cycl.)* — OAK-*of-Jeruſalem*, the Engliſh name of a genus of plants, called by botaniſts *Chenopodium*, See the article CHENOPODIUM, *Suppl.*

Poiſon-OAK, a name ſometimes given to the *Toxicodendron* of botaniſts. See the article TOXICODENDRON, *Suppl.*

OAT-*graſs*, in botany. See the article GRASS, *Append.*

OBELIAS, among the antients, a kind of ſmall cakes, which were toaſted on little ſpits, and ſerved to table as a deſert to be eaten dipped in ſweet wine, called *Paſſum*. *Pitiſc.* in voc.

OBELLISCOTHECA, the name given by Vaillant to a genus of plants, called by Linnæus *Rudbeckia*. See the article RUDBECKIA, *Append.*

OBTUSE *(Cycl.)* — OBTUSE-*angular Section of a Cone*, a name given to the hyperbola by antient geometricians, becauſe they conſidered it only in ſuch a cone, whoſe ſection by the axis is a triangle, *obtuſe*-angled at the vertex.

OCKHAM, or OCHAM, See the article OAKHAM, *Cycl.*

OCTAETIS, in natural hiſtory, a name given by Linnæus, and many other authors, to a kind of ſtar-fiſh of the aſtrophyte claſs, the rays of which are eight in number, where they firſt part from the body, but ſoon divide into many more.

OIL-*beetle*, the Engliſh name of a genus of inſects, called by Dr. Hill *Meloe*. See the article MELOE, *Append.*

OILY-*grain*, the name by which ſome call the *Seſſamum*, of botanical authors. See the article SESSAMUM, *Append.*

OLD-*wife-fiſh*, the name by which a ſpecies of *Balliſtes* is called in ſeveral of our plantations. See the article BALLISTES, *Suppl.*

OLD-*wife* is alſo a name given to the *wraſſe*, a ſpecies of *Labrus*. See the article LABRUS, *Suppl.*

OLIVE *(Suppl.)* — *Spurge*-OLIVE, a name ſometimes given to the *Thymelæa* of botaniſts. See the article THYMELÆA, *Suppl.*

Wild-OLIVE, the Engliſh name of a diſtinct genus of plants, called by Linnæus *Elæagnus*. See the article ELÆAGNUS, *Suppl.*

Wild-OLIVE *of Barbadoes*, a name by which ſome call the *Bontia*, a diſtinct genus of plants. See the article BONTIA, *Suppl.*

ONE-*berry*, a name by which the *herba Paris* is ſometimes called. See the article HERBA *Paris*, *Suppl.*

ONE-*blade*, or ONE-*leaf*, names ſometimes given to the *Smilax* of botanical writers. See the article SMILAX, *Suppl.*

ONION *(Suppl.)*— *Sea*-ONION, a name by which the *Scilla* of botaniſts is ſometimes called. See the article SCILLA, *Append.*

OPERCULUM, in the hiſtory of ſhell-fiſh, denotes the cartilaginous cover, with which nature has furniſhed the mouths of the univalve water-ſhells; for as to the land ones, they have only a viſcid liquor to ſupply the place of an *Operculum*.

ORACH, a name by which the *Chenopodium* of botanical authors is ſometimes called. See the article CHENOPODIUM, *Suppl.*

ORANGE-*Mint*, the name of a ſpecies of *Mint*. See the articles MENTHA and MINT, *Suppl.*

Mock-ORANGE, a name ſometimes given to the *Syringa*, or pipe-tree. See the article SYRINGA, *Suppl.*

ORELLANA, in botany, a name given to a ſpecies of *Mitella*. See the article MITELLA, *Suppl.*

ORPHEUS. This fiſh has been called *Orphos*, *Orphus*, and *Cernua*, by different writers. It is a ſpecies of *Sparus*, with the tail not forked, and with a black ſpot near it. See the articles SPARUS and ORPHEUS, *Suppl.*

ORPINE, in botany, the Engliſh name of a genus of plants, known among botanical writers by that of *Telephium*. See the article TELEPHIUM, *Suppl.*

Baſtard-ORPINE, a name given to two diſtinct genuſes of plants, called by botaniſts *Anacampſeros* and *Andrachne*. See the articles ANACAMPSEROS, and ANDRACHNE, *Suppl.*

ORRERY, an aſtronomical inſtrument, or rather machine, for repreſenting the motions and various appearances of the planets; and hence, with greater propriety, called *Planetarium*. See the article PPANETARIUM, *Append.*

The reaſon of its being called an *Orrery*, was this: Mr. Rowley, a mathematical inſtrument-maker, having got one from Mr. George Graham, the original inventor, to be ſent abroad with ſome of his own inſtruments, he copied it, and made the firſt for the Earl of *Orrery*. Sir Richard Steel, who knew nothing of Mr. Graham's machine, thinking to do juſtice to the firſt encourager, as well as to the inventor, of ſuch a curious inſtrument, called it an *Orrery*, and gave Mr. Rowley the praiſe due to Mr. Graham. *Deſaguliers*, Experiment. Phil. vol. 1. p. 430.

Since that time *Orreries* have been much in vogue, and executed in the moſt ornamental manner.

ORTHOCEROS, the ſame as *Orthocerites*. See the article ORTHOCERITES, *Suppl.*

ORYZA, *Rice*, in botany, the name of a genus of plants, of which we know only one ſpecies: The characters are theſe: The cup is a glume, compoſed of two valves, with a ſingle flower; it is very ſmall, and the valves are acuminated, and nearly equal in ſize; the flower is alſo compoſed of two obtuſe and permanent valves; the nectarium conſiſts of two very ſmall deciduous leaves; the ſtamina are ſix capillary filaments of the length of the flower; the antheræ are bifid at the baſe; the germen of the piſtil is of a turbinated figure; the ſtyles are two, capillary, and reflex; the ſtigmata are plumoſe; there is no pericarpium; the ſeed is ſingle, large, oblong, obtuſe, and compreſſed. *Linnæi* Gen. Plant. p. 152.

OSCULATION in geometry, is uſed for the contact between any given curve and its oſculatory circle; that is, the circle of the ſame curvature with the given curve. See the article CURVATURE, *Append.*

OSCULATORY-*circle*, in geometry, is uſed chiefly by foreign mathematicians, for the circle of curvature; that is, the circle having the ſame curvature with any curve at any given point. See the article CURVATURE, *Append.*

OSCULATORY-*Parabola*. See the article PARABOLA, *Append.*

OSCULATORY-*point*, the point of contact between a curve and its *oſculatory* circle. See the article CURVATURE, *Append.*

OSIER, the Engliſh name for the willow with very long and narrow leaves. See the article SALIX, *Suppl.*

OTARDES, in ornithology. See the article OTIS, *Suppl.*

OUZEL, or *Ring*-OUZEL, the Engliſh name of the black *Turdus*, with a white ring round its neck. See the article TURDUS, *Suppl.*

OWL, in ornithology, a large genus of birds, for the characters of which ſee the article STRIX, *Suppl.*

Grey-OWL. See the article ULULA, *Suppl.*

Great-white OWL, a very large ſpecies, nearly equal to a gooſe in bigneſs; of a beautiful bright white all over, only ſprinkled, as it were, with little ſpots of a blackiſh colour.

The other ſpecies are: 1. The black and white horned *Owl*. 2. The leſſer horned *Owl*. 3. The yellow *Owl*. 4. The hazel-eyed *Owl*. 5. The yellow-eyed *Owl*. 6. The *Owl*, with a variegated tail. 7. The little *Owl*. 8. The common brown *Owl*, or Jay-*Owl*. 9. The *Scops*. 10. The German horned *Owl*. 11. The church *Owl*, or leſſer barn *Owl*. 12. The white-beaked *Owl*. 13. The yellow-beaked American *Owl*. 14. The *Jacurutu*. *Hill*, Hiſt. Anim. p. 119. ſeq.

OX-*eye*, in botany, the Engliſh name of a genus of plants, called by botaniſts *Buphthalmum*. See the article BUPHTHALMUM, *Suppl.*

Ox-*eye-daiſy*, a name ſometimes given to the *Leucanthemum* of botannical writers. See the article LEUCANTHEMUM, *Suppl.*

Ox-*lip*, a name by which the *Primula veris*, primroſe, or prime roſe, is ſometimes called. See the article PRIMULA, *Suppl.*

P.

PADDLE, or PADDLE-*ſtaff*, a ſmall ſtaff, ſhod with iron, for cleanſing the plough from ſtubble, clods, earth, &c. Dict. Ruſt. in voc.

It is alſo much uſed by mole-catchers.

PADUS, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: The cup is a permanent perianthium, formed of a ſingle leaf, of a campanulated figure, villoſe at the baſe, divided into five ſegments, patent, and ſcarce at all reflex; the flower conſiſts of five large, roundiſh, patent petals, inſerted by their ungues into the edge of the calyx; the ſtamina are twenty or thirty filaments, of a ſubulated figure, nearly of the length of the flower, and inſerted into the calyx; the antheræ are roundiſh; the germen is roundiſh; the ſtyle is filiform, and of the length of the ſtamina; the ſtigma is obtuſe and entire; the fruit is a roundiſh drupe; the ſeed is an oval, acuminated nut, with a furrow; the receptacle of the flower, which inveſts the inner ſurface of the cup, is hairy in this genus; which comprehends the *Lauroceraſus*, and *Ceraſus avium* of authors. Vid. *Linnæi* Gen. Plant. p. 215.

PAIGLES, a name ſometimes uſed for the *Primula*, or *Cowſlip*. See the article PRIMULA, *Suppl.*

PAINS, or *After*-PAINS in Midwifry. See the articles DELIVERY and LYING-*in-women*.

PALM-*tree*, *Palma*, in botany, the name of a diſtinct genus of plants, called by Linnæus *Phœnix*. See the article PHOENIX, *Suppl.*

PALMA *Chriſti*, a name frequently given to the common *Ricinus*. See the article RICINUS, *Suppl.*

PALMETTO, the name by which ſome call a ſpecies of the palm or date-tree, deſcribed by Linnæus under that of *Phœnix*. See the article PHOENIX, *Suppl.*

PANAX, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, the characters of which are theſe: The umbel of the calyx is ſimple, equal and thick; the involucrum is very ſmall, and formed of a number of leaves, ſubulated and permanent; the perianthium of each flower is very ſmall, divided into five ſegments, and permanent; the general corolla is uniform, and the peculiar ones conſiſt of five oblong, crooked, equal petals. The ſtamina are five very ſhort filaments; the antheræ are ſimple; the germen of the piſtil is roundiſh, and placed below the perianthium; the ſtyles are two, and ſmall; and the ſtigmata are ſimple; the fruit is a roundiſh berry, having one cell, and is coronated with the cup; the ſeeds are two, and of a kidney-like ſhape.

This genus comprehends the famous *Ginſeng*, *Araliaſtrum*, *Ninſi*, and *Aureliana* of other writers.

PANCRATIUM, the *ſea-daffodil*, in botany, the name of a genus of plants, the characters of which are theſe: The cup is an oblong, obtuſe, compreſſed ſpatha, opening in the plane ſide, and deciduous; the nectarium of the flower is formed of a ſingle leaf, of a cylindraceo-infundibuliform ſhape, coloured at top, and with an open mouth, divided into ten ſegments; the petals are ſix, lanceolated and plane, and are inſerted externally into the tube of the nectarium, above the baſe; the ſtamina are ſix ſubulated filaments, affixed to the apex of the nectarium; the antheræ are oblong, and incumbent; the germen of the piſtil is trigonal, and placed under the receptacle; the ſtyle is filiform, and ſomewhat longer than the ſtamina; the ſtigma is obtuſe; the fruit is a roundiſh, triquetrous capſule, formed of three valves, and containing three cells; the ſeeds are numerous and globoſe; and the receptacle is columnar. Vid. *Linnæi* Gen. Plant. p. 138.

PANIC, *Panicum*, in botany, the name of a diſtinct genus of plants. See the article PANICUM, *Suppl.*

PANICLE, *Panicula*, among botaniſts. See the article PANICULA, *Cycl.* and *Append.*

PANICULA *(Cycl.)* — According to Mr. Miller, the *Panicula*, or panicle, is a ſtalk diffuſed into ſeveral pedicles, or foot-ſtalks, ſuſtaining the flowers or fruits, as in oats, &c. *Miller*, Gard. Dict.

PANORPA, the *ſcorpion-fly*, in zoology, a genus of four-winged inſects of the *Neuropetra* kind, the diſtinguiſhing characters of which are theſe: Its roſtrum or trunk is of a cylindric figure, and horny ſtructure; and its tail is furniſhed with a weapon of the cheliform kind. See the article SCORPION-*fly*, *Suppl.*

PANSEY, or PANSY, a ſpecies of violet, otherwiſe called the *Heart's-eaſe*. See the articles VIOLA, *Suppl.* and HEART'S EASE, *Append.*

PAPAW, the name by which ſome call the *Papaya*, a diſtinct genus of plants. See the article PAPAYA, *Suppl.*

PAPPOSE-*plants*, among botaniſts, ſuch whoſe ſeeds are covered with a *Pappus*, or down. See the article PAPPUS, *Cycl.*

PARABOLA *(Cycl.)* — *Oſculatory*-PARABOLA, in geometry, is uſed particularly for that *Parabola* which not only oſculates or meaſures the curvature of any curve at a given point, but alſo meaſures the variation of the curvature at that point. See *Mac Laurin*'s Appendix to his Algebra, p. 17. *Cramer*, Analyſ. des Lignes Courbes, p. 559. See the article CURVATURE, *Append.*

A curve, ſtrictly ſpeaking, may have an indefinite number of *Oſculatory Parabolas* at any of its points; but the appellation may be reſtrained to that particular *Parabola* which meets the curve ſo cloſely, that no other parabolic arc can be drawn between them; and this *Parabola* will meaſure the variation of the curvature of the curve at that point. See the article VARIATION of *curvature*, *Suppl.*

PARABOLIFORM *Curves*, a name ſometimes given to the parabolas of the higher kind.

PARADISE *(Cycl.) Bird of* PARADISE. See the articles PARADISÆA and MANUCODIATA, *Suppl.*

PARALLELOGRAM *(Cycl.* and *Suppl.)* — *Newtonian*, or *Analytic*. PARALLELOGRAM, in algebra, an appellation uſed for an invention of Sir Iſaac Newton's, to find the firſt term of an infinite converging ſeries.

This is ſometimes called the method of the *Parallelogram* and *Ruler*; becauſe a ruler or right line is alſo uſed in it.

This *analytic Prallelogram* is formed by dividing any *Parallelogram* into equal ſquares or *Parallelograms*, by lines drawn horizontally and perpendicularly through the equal diviſions of the ſides of the *Parallelogram*. The cells thus formed are filled with the dimenſions of the ſpecies x and y, and their products. The powers, $y^0 = 1$, y, y^2, y^3, y^4, &c. of y, for inſtance, being placed in the loweſt horizontal range of cells, and the powers of x, or $x^0 = 1$, x, x^2, x^3, &c. in the vertical column to the left, or vice verſa; ſo that theſe powers and their products will ſtand thus:

A

x^4	$x^4 y$	$x^4 y^2$	$x^4 y^3$	$x^4 y^4$	
x^3	$x^3 y$	$x^3 y^2$	$x^3 y^3$	$x^3 y^4$	
x^2	$x^2 y$	$x^2 y^2$	$x^2 y^3$	$x^2 y^4$	
x	$x y$	$x y^2$	$x y^3$	$x y^4$	
1	y	y^2	y^3	y^4	

B C

Then, when any literal equation is propoſed, mark ſuch of the the *Parallelograms* or cells, as correſpond to all its terms; and let a ruler be applied to two, or perhaps more, of the *Parallelograms* ſo marked, of which let one be the loweſt in the left-hand column at A B, the other touching the ruler towards the right-hand; and let all the reſt not touching the ruler lie above it. Then ſelect theſe terms of the equation which are repreſented by the *Parallelograms* that touch the ruler, and from them find the quantity to be put in the quote.

This is Sir Iſaac Newton's famous rule, of the application of which he has left us ſome examples in his method of fluxions and infinite ſeries, p. 9 and 10. but without demonſtration; which has been ſince ſupplied by others. See Mr. *Colſon*'s Comment on that treatiſe, p. 192, ſeq. *Mac Laurin*'s Algebra, p. 251, ſeq. and particularly Monſ. *Cramer*'s Analyſ. des Lignes Courbes, chap. 7. p. 148, ſeq.

This learned author obſerves [a], that this invention, which is the true foundation of the method of ſeries, was but imperfectly underſtood, and not valued as it deſerved for a long time. He thinks it more convenient in practice to uſe the *Analytic Triangle* [b] of the Abbé de Gua, which takes in no more than the diagonal cells lying between A and C, and thoſe which lie between them and B. [a In his preface, p. 11. b Lib. cit. p. 156.]

PARALLELOPLEURON, a term uſed by ſome writers for an imperfect parallelogram, or a kind of trapezium, having unequal angles and ſides, but which obſerve a certain regularity and proportion.

PARAMECIUM, in zoology, the name given by Dr. Hill to a genus of animalcules of the *Gymnia* kind, and of an irregular oblong figure. See the articles ANIMALCULE *Cycl. Suppl.* and *Append.* and GYMNIA, *Append.*

Of this genus authors deſcribe ſeveral ſpecies; for which ſee *Hill*, Hiſt. Anim. p. 4. ſeq.

PARASITICAL *Plants*. See the article PARASITE, *Cycl.*

PARK *Leaves*, a name by which the *Androſæmum*, or *Tutſan*, is ſometimes called. See the article ANDROSÆMUM, *Suppl.*

PARENCHYMA *(Cycl.)* — Beſides the veſſels and canals of the human body, the antients ſuppoſed a ſimple homogeneous and firm matter, peculiar to each part, and thereby diſtinguiſhing

the habit of one part from that of another. But ſome moderns have denied the exiſtence of a *Parenchyma*, or pulpy matter, and have aſſerted, that the whole body is compoſed of veſſels and canals. The chief promoter of this opinion was Ruyſch, who having laid the injected parts of the body in rectified ſpirit of wine, and then dried them in the air; whatever was not injected, was thereby diſſipated, and the remainder conſiſted merely of veſſels; from whence he concluded, that the whole was compoſed of veſſels. But it ſeems certain, that a freſh muſcle can never be ſo injected, as to appear wholly compoſed of canals. If indeed, after injection, it be ſuffered to dry, the parts not injected will exhale, and the more the muſcle is dried, the more it will appear compoſed of veſſels. What is here ſaid of a muſcle, holds true of all other parts of the body. Thus many veſſels run through the ſubſtance of a bone; but no one has yet been able to demonſtrate, that the whole bone is compoſed of veſſels. There always remains a ſubſtance peculiar to bones, which has never yet been ſhewn to be vaſcular. In the brain alſo there always remains ſomething which cannot be demonſtrated vaſcular.

The *Parenchyma* is ſenſibly full of juices, ſo that very little of truly ſolid matter remains, when theſe juices are exhaled.

PARIS-*herb*, in botany, the name of a diſtinct genus of plants. See the article HERBA *Paris*, *Suppl.*

PAROTID-*glands*. In a ſuppuration of theſe, one caution only is needful; namely, to open the abſceſs, as ſoon as it can be ſuppoſed to have formed matter; without waiting for a fluctuation, or even ſoftneſs of the tumour, that may never happen; the pores being here ſo very viſcid, that after it is ripe, the part will feel as hard as if the ſuppuration had not begun. *Pringle*, Obſerv. on the Diſeaſes of the Army, p. 277.

PARROQUET, in ornithology, the name by which we call the ſmaller ſpecies of Parrots. See the article PSITTACUS, *Suppl.*

There are a great number of diſtinct ſpecies of *Parroquets*, as well as of Parrots, which having got peculiar names, are deſcribed under their reſpective articles.

PARSLEY *(Suppl.)* — *Baſtard*-PARSLEY, the name of a genus of plants, known among botaniſts by that of *Caucalis*. See the article CAUCALIS, *Suppl.*

Corn-PARSLEY, *Field*-PARSLEY, and *Macedonian*-PARSLEY, names uſed by ſome for a ſpecies of *Sium*. See the article SIUM, *Suppl.*

Fool's-PARSLEY, the name given by ſome writers to a ſpecies of *Cicuta*, or hemlock. See the article CICUTA, *Suppl.*

Macedonian-PARSLEY, the name by which the *Myrrhis* of botaniſts is ſometimes called. See the article MYRRHIS, *Suppl.*

Mountain-PARSLEY, the Engliſh name of a genus of plants, called by botaniſts *Oreoſelinum*. See the article OREOSELINUM, *Suppl.*

PARSLING, on ſhip-board, ſmall pieces of old canvas, cut four inches broad, and wrapped about ſhrouds, ſtays, ſtraps for blocks, &c. before ſerved with ſpun yarn. *Blanckley*'s Nav. Expoſ. p. 115.

PARSNEP *(Suppl.)* — *Cows*-PARSNEP, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Sphondylium*. See the article SPHONDYLIUM, *Suppl.*

Sea or *Prickly-headed* PARSNEP, names given to the *Echinophora* of botaniſts. See the article ECHINOPHORA, *Suppl.*

Water-PARSNEP, the name uſed by ſome for a ſpecies of *Sium*, See the article SIUM, *Suppl.*

PASSION-*flower*, the Engliſh name of a genus of plants, called by botaniſts *Granadilla*. See the article GRANADILLA, *Suppl.*

PASTE *(Suppl.)* — *Chryſolite* PASTE. See the article CHRYSOLITE, *Append.*

PASTINACHA *(Suppl.)* — is alſo uſed for the carrot, or *Daucus* of botaniſts. See the article DAUCUS, *Suppl.*

PEA *(Suppl.)* — *Everlaſting*-PEA, or *Earth-nut* PEA, names ſometimes given to the *Lathyrus*. See the article LATHYRUS, *Suppl.*

Heart-PEA, or *Bladder*-PEA, names by which the *Corindum* of botaniſts is ſometimes called. See the article CORINDUM, *Suppl.*

Indian-PEA, the name by which a ſpecies of *Orobus* is ſometimes called. See the article OROBUS, *Suppl.*

Pigeon-PEA, a name ſometimes given to the *Cytiſus*, or ſhrub-trefoil. See the article CYTISUS, *Suppl.*

Scarlet-PEA, in botany, the Engliſh name of a genus of plants, called by Linnæus *Glycine*. See the article GLYCINE, *Suppl.*

Winged-PEA, a name by which ſome call the *Lotus*. See the article LOTUS, *Suppl.*

PEACOCK, in ornithology, the Engliſh name of a genus of birds, called by zoologiſts *Pavo*. See the article PAVO, *Suppl.*

PEACOCK-*fiſh*, the Engliſh name of a fiſh of the *Turdus*, or wraſſe-kind. See the article PAVO, *Suppl.*

PEAR *(Suppl.)* — *Prickly*-PEAR, a name ſometimes uſed for the *Opuntia Cereus*, *Melocactus*, &c. all comprehended by Linnæus under that of *Cactus*. See the article CACTUS, *Suppl.* and *Append.*

PEDALES. See the article ABBOT, *Cycl.*

PEEVIT, the Engliſh name of a bird of the *Larus*, or gull-kind, with a black head, and grey coloured body. See the article LARUS, *Suppl.*

PELLITORY *of Spain*, the Engliſh name of a genus of plants called by different authors *Chamæmelum* and *Buphthalmum*. Linnæus deſcribes it under this laſt. See the article BUPHTHALMUM, *Suppl.*

The root of this plant is known in the ſhops by the name of *Pyrethrum*. See the article PYRETHRUM, *Suppl.*

Double PELLITORY, a name ſometimes given to the *Ptarmica*, or ſneezewort, of botanical writers. See the article PTARMICA, *Suppl.*

PENDULUM *(Cycl.* and *Suppl.)* — Huygens having diſcovered that the vibrations of a *Pendulum* movingin a cycloid, would be performed in equal times, even tho' the vibrations were unequal, this principle was applied to the conſtruction of *Pendulum*-clocks; but great inequalities were ſtill obſerved in their motions; and many years paſſed before any ſucceſsful attempts were made to remedy theſe irregularities. The late excellent artiſt Mr. George Graham apprehending, that the irregularities in the motions of clocks aroſe from a change of length in the *Pendulum*, by the influences of heat and cold, made ſeveral trials in order to diſcover whether there was any conſiderable difference of expanſion between braſs, ſteel, iron, ſilver, &c. when expoſed to the ſame degrees of heat; conceiving that it would not be very difficult, by making uſe of two ſorts of metals differing conſiderably in their degrees of expanſion and contraction, to remedy, in a great meaſure, the irregularities to which common *Pendulums* are ſubject. But no hopes of ſucceſs ariſing from the experiments he then made, he turned his thoughts to the application of the obſervations he had made about the extraordinary expanſion of quickſilver by heat, and he found out a proper method of applying a column of that fluid to the *Pendulum* of a clock, in order to prevent the irregularities ariſing from its different lengths by the effects of heat and cold, which ſucceeded extremely well, and is what is now called Mr. Graham's *Quickſilver Pendulum*.

After this, Mr. John Harriſon, of Barrow, in Lincolnſhire, one of the moſt ingenious artiſts of the age, and famous for his invention of the clock for finding the difference of longitude at ſea, without having the leaſt knowledge of what Mr. Graham had done before him, made ſeveral experiments upon wires of different metals, in order to find their different degrees of expanſion and contraction. He thought that by a proper combination of wires of two different metals, differing conſiderably in their expanſion and contraction, he might be enabled to keep the center of oſcillation of a *Pendulum* always at the ſame diſtance, from the point of ſuſpenſion. In conſequence of theſe experiments, he made a *Pendulum* conſiſting of one ſteel wire, at the end of which is the bob or weight; and on each ſide of this wire, four wires alternately braſs and ſteel, ſo diſpoſed and contrived, as to raiſe the *Pendulum* by the ſame quantity that it is lengthened by heat, and to let down the *Pendulum* in the ſame proportion as it is raiſed by cold.

Mr. Harriſon, in his firſt machine for meaſuring time at ſea, likewiſe applied this combination of wires of braſs and ſteel, to prevent any alterations by heat and cold. And in the two machines or clocks he has ſince made for the ſame purpoſe, a like method of guarding againſt the irregularities ariſing from this cauſe is uſed.

Mr. Graham alſo made a *Pendulum* conſiſting of three bars, one of ſteel between two of braſs, and the ſteel bar acted upon a lever, ſo as to raiſe the *Pendulum*, when lengthened by heat, and to let it down, when ſhortened by cold; but he found this clock liable to ſudden ſtarts and jerks in its motion. See Mr. Short, in the Phil. Tranſ. vol. 47. p. 517. ſeq. who there alſo mentions a *Pendulum* of this kind made by Mr. Fotheringham, a quaker in Lincolnſhire.

The ingenious Mr. Ellicot [a] has given a deſcription of two methods uſed by himſelf, by which the irregularity of the motion of a clock, ariſing from the influence of heat and cold, upon the rod of the *Pendulum*, may be prevented. Mr. Ellicot tells us, that having by many experiments with his pyrometer [b] found a great difference between the expanſion of braſs and iron, he made a *Pendulum* compoſed of thoſe two metals, and applied it ſo ſucceſsfully to regulate the motion of a clock, that he avoided all the jerks to which it was ſuſpected the motion of the machine would be liable. [a Phil. Tranſ. vol. 47. p. 479. ſeq. b See the article PYROMETER, *Append.*]

Beſides the irregularities ariſing from heat and cold, *Pendulum*-clocks are liable to others from friction, and from foulneſs, owing to the oil uſed. But Mr. Harriſon has ſeveral excellent contrivances by which his clocks are almoſt entirely free from friction; and therefore he uſes no oil, ſo that there is no neceſſity of ever cleaning. See Mr. *Short*, ubi ſupra. See alſo Monſ. Caſſini, in Mem. Acad. Scienc. 1741.

PENGUIN, or PINGUIN, in botany, the name by which Dillenius calls the *Ananas* of Tournefort. See the article ANANAS, *Suppl.*

PENNY-*wort*, a name ſometimes given to the *Cotyledon*, or navel-wort of botanical writers. See the article NAVEL-WORT, *Suppl.*

Marſh-PENNY-*wort*, the Engliſh name of a genus of plants, called by botaniſts *Hydrocotyle*. See the article HYDROCOTYLE, *Suppl.*

PENTELASMIS, in the hiſtory of ſhell-fiſh, the name by which Dr. Hill calls the *conchæ anatiferæ* of other writers. See the article ANATIFERA *concha*, *Suppl.*

The *Pentelaſmis*, according to him, is a genus of animals, compoſed of a ſhelly body, affixed to a fleſhy and ſoft pedicle; the body is compoſed of five valves, and the pedicle is ſometimes ſhort, and ſometimes long. The animal itſelf belongs to the *Tritons*. See the article TRITON, *Append.*

PEONY, or PIONY, in botany, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Pæonia*. See the article PÆONIA, *Suppl.*

PEPPER *(Suppl.)* — *Indian* PEPPER, or *Guinea* PEPPER, names by which ſome call the *Capſicum* of botaniſts. See the article CAPSICUM, *Suppl.*

Poor-man's-PEPPER, a name ſometimes given to the *Lepidium*. See the article LEPIDIUM, *Suppl.*

Water-PEPPER, a name ſometimes given to a ſpecies of *Sedum*, or Houſe-leek. See the article SEDUM, *Suppl.*

PEPPER-*mint*, the name of a ſpecies of mint. See the articles MENTHA and MINT, *Suppl.*

PEPPER-*wort*, a name by which ſome call the *Lepidium*, or dittander. See the article LEPIDIUM, *Suppl.*

PEPPER-*bird*, the Engliſh name of the *Rhamphaſtos*, with a yellow rump, otherwiſe called *Toucan*. See the article TOUCAN, *Suppl.*

PERESKIA, in botany, a name given by Plumier to a genus of plants, comprehended under the *Cactus* of Linnæus. See the articles CACTUS, *Append.* and MELOCACTUS, *Suppl.*

PERSEA, in botany, the name given by Plumier to a ſpecies of the Laurel of Linnæus. See the article LAURUS, *Append.*

PERSIMON, in botany, a name ſometimes given to the *Lachryma Jobi*, or Job's tears. See the article LACHRYMA, *Append.*

PESTILENCE-*wort*, a name ſometimes given to the *Petaſites*, or butter-burr. See the article PETASITES, *Suppl.*

PETAL *(Suppl.)* — The *Petal* of a plant is that part which, for want of a more diſtinct expreſſion, we call in Engliſh the leaves of the flower. See the article FLOWER, *Suppl.*

That great botaniſt, the late Mr. Pitton Tournefort, fixed upon the moſt ſtriking and ſhewy parts of vegetables, as the foundation of his method and generical diviſions of the vegetable world; which he has accordingly rang'd into twenty-two claſſes.

The firſt is of the plants with a *monopetalous* or one-leaved flower, form'd like a bell; and the flowers of this claſs he afterwards ſubdivides into four kinds; firſt, the *bell-faſhioned* flowers properly ſo called, as being very nearly of the regular ſhape of a bell: Secondly, the *tubulate bell-faſhioned* flowers, which are narrow and oblong: Thirdly, the *expanded*, which open in form of a wide baſon: And, fourthly, the *globoſe*; the mouth of which is narrower than the body. In this claſs he comprehends the *Mandrake*, *Lilly of the valley*, &c.

The ſecond claſs is of the plants with *monopetalous funnel-faſhioned*, and *rotated*, or wheel-like flowers. The flowers of this claſs he divides into two kinds only; the one repreſenting at its mouth, the bottom of an inverted cone, the other a ſalver or ſawcer; and theſe he diſtinguiſhes by the names of *funnel-faſhioned* and *ſalver-like* flowers: Of this claſs are the *Tobacco*, *Henbane*, &c.

The third claſs is of what he calls the plants with *anomalous*, *monopetalous* flowers; of theſe he makes the variouſly-ſhaped *monopetalous* flowers of *Birthwort*, *Foxglove*, *Figwort*, and ſome others; ſome of which repreſent a face, and others the ſnout of an animal: To diſtinguiſh the plants of this claſs the author however is oblig'd fairly to confeſs the imperfection of the method of claſſing by the *Petals* alone, and call in the aſſiſtance of the different ſtructure of the ſeed veſſels. In this claſs he comprehends the *Toadflax*, *Butterwort*, &c.

The fourth claſs is of the plants, which have a *monopetalous*, *labiated*, or lipp'd flower; which he defines to be ſuch an one as is narrow, like a pipe within, and expanded; and in form of lips at the mouth. In this claſs are comprehended the *Sage*, *Clary*, *Deadnettle*, *Mint*, *Baum*, &c.

The fifth claſs is of the plants with a *polypetalous*, *cruciform* flower; that is, ſuch an one as is compoſed of a number of leaves, diſpoſed in form of a croſs; and theſe he afterwards more nicely defines to be ſuch as are always compoſed of four *Petala*, or leaves only, and thoſe ever diſpoſed in form of a croſs. Of this claſs are the *Creſſes*, *Muſtard*, *Scurvy-graſs*, &c.

The ſixth claſs is of the plants which have a *roſaceous*, or roſe-like flower. This he defines to be ſuch an one as is compoſed of many leaves or *Petals*, diſpoſed like thoſe of the roſe into a round figure: The number of *Petals*, he adds, is uncertain and indeterminate in this claſs; and that they are frequently five, and more rarely four than two. Of this claſs are the *Chickweed*, *Orpine*, *Saxifrage*, *Rue*, &c.

The ſeventh claſs is of the plants with *umbelliferous* flowers. Theſe he defines to be *polypetalous*, *roſaceous* flowers, whoſe cup goes off into a fruit compoſed of two ſeeds, cohering firmly together while green, but naturally ſeparating, when ripe; and obſerves, that in this claſs the flowers are generally diſpoſed in great numbers together, and in the form of what the ladies call an *umbrella*, us'd to be carry'd over them to keep off the ſun; but he does not make this a neceſſary character of the claſs. The plants comprehended under this are *Carrots*, *Parſneps*, *Earth-nuts*, *Chervel*, *Fennel*, &c.

The eighth claſs is of the plants with a *caryophyllous* or pink-like flower, which he defines to be ſuch an one as is compoſed of many *Petals*, diſpoſed in an orbicular form, and ariſing each from the bottom of the cup, as from a tube, in the ſame manner as they do in the common pink. Of this claſs are the *Catchfly*, *Sea-lavender*, *Flax*, &c.

The ninth claſs is of the plants which have a *liliaceous*, or lilly-like flower, which he defines to be ſuch an one as is compoſed of ſix *Petals*, ſometimes indeed but three, but always divided however into ſix at the end. Here the author alſo again acknowledges the imperfection of claſſing by the *Petals*, ſince here he takes in the aſſiſtance of the figure and diviſion of the ſeed veſſel, which he ſays muſt always in this claſs be tricapſular, or divided into three cells; and plants which have this ſeed veſſel, tho' their flowers are not ſtrictly of the lilly ſhape, are allowed to be truly of the claſs. Of this are the *Aſphodel*, *Saffron*, *Flower-de-luce*, *Tulip*, *Crown-Imperial*, &c.

The tenth claſs is of the plants with a *polypetalous*, *papilionaceous* flower, or one that is compoſed of many *Petals*, and in form reſembles a butterfly. Theſe flowers the author defines to be compoſed of four diſſimilar *Petals*, which iſſue from a one-leaved cup, which is hollow, and like the conic paper-caſes people twiſt up to put ſpices, &c. in; and divided into many ſegments at the rim; and from this cup ariſes alſo the *Piſtil* of the flower. The upper leaf in theſe flowers which in ſome ſort repreſents the colours carried by ſoldiers in battle, he calls the *Vexillum* or *Enſign*; the lower, which is hollow'd, and in form of a boat, the *Hulk*; and the two ſide ones the *wings*. The plants comprehended under this claſs are the *Liquorice*, *Peas*, *Fenugreek*, &c.

The eleventh claſs is of plants with an *anomalous* or irregular *polypetalous* flower. Among theſe he comprehends ſuch of the *polypetalous* flowers as are of various ſhape, and compoſed of diſſimilar or irregular *Petals*, and could not well be comprehended under any one expreſſive or determinate character. Of this claſs are the *Violet*, *Fumitory*, *Dier's-weed*, *Woolfsbane*, &c.

The twelfth claſs is of the plants with a *floſculous* flower. This he defines to be one compoſed of a number of ſmall flowers, crowded cloſe together, and comprehended in the ſame general *Calyx*, or cup; theſe flowers, which together compoſe this complex one, he obſerves are generally compoſed of only one *Petal*, which is wider at the mouth, than at the other end, and generally notched or divided there into many ſegments. He alſo has recourſe to the other parts of the flower for farther deſcriptions; and comprehends under it the *Thiſtles*, *Knapweed*, *Bluebottle*, &c.

The thirteenth claſs is of the plants with a *ſemifloſculous* flower. Theſe he defines to be compoſed of a multitude of half flowers, each compoſed of one *Petal*, hollow in its lower part, but in its middle and upper part flat and plain; and diſpoſed into a ſingle or manifold circle. He here alſo deſcribes the fructification of the plants of this claſs, and comprehends in it the *Lettuce*, *Dandelion*, *Hawkweed*, &c.

The fourteenth claſs is of the plants with a *radiated* flower. Theſe flowers the author deſcribes to have two parts, a middle or *diſk*, compoſed of ſmall *fiſtular* flowers, and a *rim*, or *edge*, called the *corona*, which is made up of half flowers; and ſometimes, though ſeldom, of plain flat *Petals*. Under this claſs are comprehended the *Starwort*, *Ragwort*, *Golden-rod*, *Sunflower*, &c.

The fifteenth claſs is of the plants which have flowers compoſed of *ſtamina* or *threads*, ſuſtaining the *apices* or *capſules* of the fecundating farina. The author diſtinguiſhes theſe alſo by their *Piſtil* changing into a ſingle ſeed envelop'd in a huſk, and of this claſs makes the *Sorrel*, *Arſmart*, *Orrach*, the *Graſſes*, *Horſetails*, &c.

The ſixteenth claſs is of thoſe plants which the author ſuppoſes to have no flower at all; and yet to produce ſeeds. Of this claſs he determines the *Ferns*, *Liverwort*, and *Adder's-tongue*, to be.

The ſeventeenth claſs is of thoſe plants whoſe flowers and fruit he ſays are both ordinarily wanting. Theſe he afterwards divides into the earth and water plants; among the firſt he reckons the *Moſſes*, *Muſhrooms*, &c. And among the others the *Fucuſes*, *Algas*, *Corallines*, &c. the flowers and ſeeds of which he obſerves we are as yet at leaſt ignorant of.

The eighteenth claſs is of the trees and ſhrubs, which have *apetalous* flowers, or flowers without *Petals* or leaves at all. Of this claſs are the *Aſh*, *Box*, &c.

The nineteenth class is of the trees and shrubs which have *Catkins* or *Iuli* for their flowers. These the author says consist either of *stamina* and *apices* alone, that is, of the threads or capsules of the farina; or they are composed of these with some little leaves affixed to a long slender axis: These *Catkins* he observes are always in a different place from the fruit; and that, sometimes on the same, sometimes on different trees. Of this class are the *Walnut*, *Oak*, *Beech*, &c.

The twentieth class is of trees and shrubs, which have a *monopetalous* flower; and of this are the *Elm*, *Lilac*, *Storax*, *Olive*, &c.

The twenty first class is of the trees and shrubs which have a *rosaceous* flower; and among these are comprehended the *Lime*, *Sumach*, *Ivy*, *Vine*, &c.

And the twenty second, or last class, is of the trees and shrubs with a *papilionaceous* flower; among which are reckoned the *Broom*, *Bean*, *Trefoil*, *Judas-tree*, &c.

It is very easily seen, that this is far from a strictly accurate method; the author has indeed assisted it with figures, which are very useful and instructive; and, as the judicious Linnæus observes, more is in reality to be learned from them, than from all the author has said. *Linnæus* has well observed, that this method is neither perfect nor sufficiently distinctive; the glory of instructing the botanist with truth and certainty was indeed reserved for that author alone, who when he had shewn the imperfection and uncertainty of all the before established methods, plan'd out an absolutely new one, founded on the unalterable parts of plants, their organs of fructification. See the article FRUCTIFICATION, *Append.*

PETER'S *wort*, or St. PETER's-*wort*, the English name of a genus of plants, called by botanists *Hypericoides* and *Ascyrum*. See the article ASCYRUM, *Append.*

PETOLA, in zoology, the name of a species of *coluber*, the scuta of whose abdomen are two hundred and nine, and the squamæ of the tail ninety. See the article COLUBER, *Suppl.*

PETREL, the name of a very remarkable bird, called *Procellaria*, by authors. See the article STORM-*fink*, *Suppl.*

The feet are large, the toes are slender, and connected by a fine, thin, black membrane; there is no hinder toe, but the claw in that part is small, and connected immediately to the back of the foot. The middle toe is shortest, and has only two joints; the outer is longer, and has four; and the interior has three, and is longer than either. *Hill*, Hist. Anim. p. 514.

PETRIDIA, in Natural History, the name of a genus of fossils of the *Scrupi*-kind, of a plain uniform structure, of no great variety of colours, and emulating the external form of pebbles. See the article SCRUPI, *Append.*

Of this genus the following are all the known species: 1. The various sized, pellucid, colourless, crystalline *Petridium*, commonly called *Pebble-crystal*. 2. The purple, semipellucid, crystalline *Petridium*. 3. The snow-white, opake, crystalline *Petridium*. 4. The opake, whitish, reddish, or yellowish, crystalline *Petridium*, commonly called red, white, or yellow sparry pebbles. 5. The yellowish-white pumicose, or spungy *Petridium*. 6. The hard, porous, whitish, crystalline *Petridium*. 7. The greyish-white, opake, stony *Petridium*. 8. The friable, shining, white, arenaceous *Petridium*. 9. The white, crystalline *Petridium*, spotted with small yellow dots. 10. The whitish-brown, dull *Petridium*. 11. The bluish-white, hard, crystalline *Petridium*. 12. The browniſh white, hard, shining *Petridium*. Vid. *Hill*, Hist. Foss. p. 563—572.

PETTY-*Whin*, a name by which some call the *Ulex*, or *Genista Spartium*. See the article GENISTA SPARTIUM, *Suppl.*

PHACA, in the Linnæan system of botany, the name of a distinct genus of plants, called by Tournefort *Astragaloides*. See the article ASTRAGALOIDES, *Suppl.*

PHALÆNÆ, in the history of insects, the name by which zoologists call the night-butterflies, or moths, as they are vulgarly called. See the article PHALENÆ, *Suppl.*

PHASIANUS, the *Pheasant*, in ornithology, the name of a genus of birds of the gallinaceous kind. See the articles GALLINÆ, and PHEASANT, *Suppl.*

The distinguishing characteristic of this genus of birds, is, that the area or space about the eyes is naked, and that they have no wattles.

The species are these: 1. The common *Pheasant*, with a blackish purple-colour'd breast. 2. The red, or scarlet-breasted *Pheasant*: This is nearly of the size of the common *Pheasant*, and its breast is of a high scarlet, and the belly red, but not so bright. 3. The East-India *Pheasant*: This is an extremely beautiful bird, the whole body of which is variegated with a profusion of the brightest colours, yellow, red, bluish-green, and almost every other tinge. *Hill*, Hist. Anim. p. 486.

PHEASANT's-*eye*, in botany, a name sometimes given to the *Adonis*. See the article ADONIS-*flos*, *Suppl.*

PHEASANT's-*eye Pink*, the name of a species of *Caryophyllus*. See the article PINK, *Suppl.*

PHOCA *(Suppl.)* — Dr. Parsons has lately given us a dissertation upon the class of the *Phocæ marinæ*. See Phil. Transf. vol. 47. pag. 109.

Phoca is the generic name, and all the species have a great likeness to each other, and may all alike have the names *phoca*, *vitulus marinus*, *sea-cow*, *sea-lion*, &c. The *manati*, the *soil* or *seal*, the *walrus* or *mors*, are so many species of this genus. Phil. Transf. ib.

PHYSIC *nut*, the English name of a distinct genus of plants, called by botanists *Ricinoides*. See the article RICINOIDES, *Suppl.*

PHRYGANIUM, in the history of insects, a genus of four-winged flies, of the *Neuroptera* class. See the article NEUROPTERA, *Append.*

The wings of the *Phrygania*, of which there are a great many species, are incumbent; they have four tentacula, two on each side.

PICKTOOTH *(Suppl.)*— *Spanish* PICKTOOTH, a name by which some call the *Visnaga* of Ray, a species of *Daucus*. See the article DAUCUS, *Suppl.*

PIECES. Plants may be propagated from their cuttings, slips, or *Pieces*; and it has been found that some kinds of animals have the like property, which may be called a reproduction of the animal or plant from a part of it. See the articles REPRODUCTION and PLANT, *Append.* and POLYPE, *Suppl.*

PIGEON-*Pea*, a name sometimes used for the *Cytisus*, or shrub-trefoil. See the article CYTISUS, *Suppl.*

PILE *(Suppl.)* — To estimate the force of the rammer made use of to drive *Piles*, its weight ought to be multiplied into the velocity it acquires in falling. Thus, if a rammer which weighs 500 *lb.* be let fall from four feet, it will fall that height in half a second, and have at the time of percussion a velocity capable to carry it eight feet in half a second, without any farther help from gravity; so that we must multiply 500 by 16, or its weight by the number of feet it would fall in a second, and the product 8000 gives the momentum of the stroke. If a capstan, pullies, or windlas be made to raise the rammer to a considerable height, and then by an easy contrivance lopsen it at once from its hook, the momentum of the stroke will always be as the square root of the height from which the rammer fell. *Desaguliers*, Experim. Phil. p. 336, seq.

But it is to be observed, that the effect of the blow of the rammer will be as the square of its velocity; that is, as the height from whence it falls, and not as the square root of that height. Thus if the blow of the rammer drive the *Pile* 6 foot deep; a blow given with twice the velocity, will, cæteris paribus, drive it four feet deep. This follows from the nature of the force of bodies in motion. See the article FORCE, *Append.*

We have the figure and description of a new machine for driving *Piles*, invented by Mr. Vauloue, in Desaguliers, Experim. Philosoph. p. 417, seq.

PILE-*wort*, a name by which some call the *Ranunculus*, or Crowsfoot. See the article RANUNCULUS, *Suppl.*

PIMPILLO, a name sometimes given to the *Opuntia* of botanical writers. See the article OPUNTIA, *Suppl.*

PIMPINEL *(Suppl.)* is also a name by which the *Sanguisorba*, or burnet, of botanists is sometimes called. See the article SANGUISORBA, *Suppl.*

PINASTELLA, in botany, the name by which Dillenius calls the *Hippuris* of Linnæus. See the article HIPPURIS, *Suppl.*

PINASTER, the name of several species of pine. See the article PINE, *Suppl.*

Ground-PINE, or *Dwarf*-PINE, names by which the *Chamæpitys* of botanical writers is sometimes called. See the article CHAMÆPITYS, *Suppl.*

Wild-PINE, a name sometimes given to the *Karatas*, or *Ananas*, of botanical writers. See the article ANANAS, *Suppl.*

PINQUIN, or PENQUIN, the names by which the *Ananas* of Tournefort is sometimes called. See the article ANANAS, *Suppl.*

PINK *(Suppl.)* — *Sea*-PINK, a name by which some call the *Statice*. See the article STATICE, *Suppl.*

PINTLE *(Suppl.)*—*Priest*'s PINTLE, a name sometimes given to the *Arum*, or wake-robin. See the article ARUM, *Suppl.*

PIPE *(Cycl.)* — *Air*-PIPE, an invention of the late ingenious Mr. Sutton to clear ships of foul air. This he does by a *Pipe*, the branches of which are laid in the hold, and the extremity of which is fixed into the ash-hole of the furnace. Mr. Watson has shewn how these *Pipes* may be laid, so as to be no way inconvenient, and relates the success of a trial of them, made on a hulk. See Phil. Transf. N° 462. p. 12.

We have now three different contrivances published for cleaning ships, and other close places, of foul air.

One by Dr. Desaguliers, which will change the air in the chamber of sick people, in a little time; either by drawing out the foul air, or driving in fresh; or doing both successively, without opening doors or windows. See Phil. Transf. N° 437.

The other by Mr. Sutton before mentioned; and the third by means of Dr. Hale's ventilators, which seems to be the most expeditious and simple method. See the article VENTILATORS, *Append.*

PIPE-*tree*, the English name of a genus of plants, called by botanists *Lilac* and *Syringia*. See the articles LILAC and SYRINGIA, *Suppl.*

Pudding-

Pudding-PIPE-*tree*, a name by which the *Caſſia* of botaniſts is ſometimes called. See the article CASSIA, *Suppl.*

PIPER, in ichthyology, the Engliſh name of a ſpecies of *Trigla*, with a bifid roſtrum, and tubuloſe noſtrils. It is called by the generality of authors LYRA. See the articles TRIGLA and LYRA, *Suppl.*

PIPERIDGE-*tree*, a name ſometimes given to the *Berberis*, or barberry-buſh. See the article BERBERIS, *Suppl.*

PIQUET, a well-known game at cards, and which has in ſome caſes been the object of mathematical computations.

Thus Mr. de Moivre has propoſed and ſolved the following problems:

1° To find at *Piquet* the probability which the dealer has for taking one ace or more in three cards, he having none in his hands. He concludes from his computation, that it is 29 to 28 that the dealer takes one ace or more.

2° To find at *Piquet* the probability which the eldeſt has of taking an ace or more in five cards, he having no ace in his hands. Anſwer; 232 to 91, or 5 to 2, nearly.

3°. To find at *Piquet* the probability which the eldeſt has of taking both an ace and a king in five cards, he having none in his hand. Anſwer; the odds againſt the eldeſt hand taking an ace and a king are 331 to 315, or 21 to 20 nearly.

4°. To find at *Piquet* the probability of having twelve cards dealt to, without king, queen, or knave; which caſe is commonly called *cartes blanches*. Anſwer; the odds againſt *chartes blanches* are 323 to 578956, or 1791 to 1 nearly.

5°. To find how many different ſets eſſentially different from one another, one may have at *Piquet* before taking in. Anſwer; 28,967,278. This number falls ſhort of the ſum of all the diſtinct combinations, whereby twelve cards may be taken out of 32, this number being 225,792,840; but it ought to be conſidered, that in that number ſeveral ſets of the ſame import, but differing in ſuit, might be taken, which would not introduce an eſſential difference among the ſets.

Mr. de Moivre alſo gives ſome obſervations on this game, which he had from an experienced player. See Doctrine of Chances, pag. 151 to 159.

Monſ. de Monmort has alſo treated of *Piquet* in his Analyſe des jeux de Hazard, pag. 162.

PISHAMIN, or PERSIMON, names by which ſome call the *Lacryma Jobi*, a diſtinct genus of plants. See the article LACRYMA, *Append.*

PISTACHIA, in the Linnæan ſyſtem of botany, the name of a genus of trees, called by Tournefort *Terebinthus*. See the article TEREBINTHUS, *Suppl.*

Wild-PISTACHIA, a name given to the *Staphylodendron*, or bladder-nut-tree. See the article STAPHYLODENDRON, *Suppl.*

PISTON *(Cycl.)* — There are two ſorts of *Piſtons* uſed in pumps; the one with a valve, which is called a *Bucket*; and the other without a valve, which is called a *forcer*. See the articles FORCER and PUMP, *Append.*

PITCH-*tree*, in botany, a name ſometimes given to the *Fir-tree*. See the article FIR, *Suppl.*

PITCHING, a word ſometimes uſed for paving. See the article PAVEMENT, *Cycl.*

PITH *(Suppl.)* — Dr. Hales ſhews that the *Pith* ſerves to ſupply the dilating moiſture for the tender ſhoots of plants, and that the figure of theſe may be oblong, and not round, like the fruit, there are tough diaphragms, or partitions in the *Pith* at ſmall diſtances from each other, which check the lateral expanſion; as alſo horizontal fibres, which ſerve for the ſame purpoſe.

Of the ſame ſort is the *Pith* in the large growing feathers of birds; being compoſed of veſicles that can be diſtended lengthwiſe, but have ſphincters at the ends, to prevent too large a lateral dilation. Vid. *Hales*'s Veget. Statics, vol 1. p. 337.

PLAGIURI. Under this claſs of fiſhes are comprehended the following genera: The Phyſeter, Delphinus, Balæna, Monodon, Catodon, and Thrichechus; which ſee under their reſpective articles PHYSETER, &c.

PLANE-*tree (Suppl.)*— *Baſtard* or *Falſe* PLANE-*tree*, a name by which ſome call the *Acer*, or Maple-tree. See the article MAPLE, *Suppl.*

PLANETARIUM, an aſtronomical machine, made to repreſent the motions of the planets, as they really are in nature, or at leaſt agreeably to the Copernican ſyſtem, and commonly called an *Orrery*. See the article ORRERY, *Suppl.*

The moſt remarkable of theſe machines was that invented by Huygens, and deſcribed by himſelf. See Deſcript. Automati planetarii, ap. *Huygen.* Opuſcul. poſthum. Tom. 2. p. 157. edit. Amſt. 1728.

In this *Planetarium*, the five primary planets perform their revolutions about the ſun; and the moon performs her revolution about the earth, in the ſame time that theſe revolutions are really performed in the heavens. The orbits alſo of the moon and planets are repreſented with their true proportions, excentricity, poſition, and declination, from the ecliptic or orbit of the earth: So that by this *Planetarium* the ſituation of the planets, their conjunctions, oppoſitions, &c. may not only be known for the preſent time, but for any time paſt, or future, as in a perpetual ephemeris.

This machine is now preſerved among the curioſities of the univerſity of Leyden.

But the *Planetariums* or Orreries now moſt commonly uſed, do not repreſent the true times of the celeſtial motions; but only their proportions; and are of uſe to beginners, to give them an idea of the planetary ſyſtems, as alſo, if conſtructed with ſufficient accuracy, to ſolve ſeveral queſtions relating to the motions of the planets, and of the earth and moon, &c.

Theſe machines are made of various ſizes, ſome repreſenting more planets than others. However, theſe complex ones are far from being improvements upon the original *Planetarium*, or Orrery, which ſhewed only the motion of the moon round the earth, and of the earth and moon round the ſun. They give but very confuſed, and even falſe ideas of the diſtances and bigneſs of the planets; which muſt always be ſo whilſt the orbits of the moon, and other ſecondary planets, are fixed to the ſame machine, which contains the primary ones. In the original one, every thing was well and properly executed; as the phænomena of day and night, and their gradual increaſe and decreaſe, according to the ſeaſons; the places of the earth where the ſun is ſucceſſively vertical, and ſeems to deſcribe its parallels; the real annual motion of the earth, which gives the ſun an apparent annual motion; the rotation of the ſun about its axis; the periodical and ſynodical month; the ſolar and ſydereal days; the ſucceſſive illumination of all the parts of the moon, &c.

It is therefore proper to have a machine for repreſenting the general ſolar ſyſtem by itſelf; the ſun moon, and earth ought alſo to be ſhewn ſeparately; and the ſyſtem of any other primary planet; as Jupiter, for inſtance, with all its ſatellites, ſhould have a ſeparate machine ſo contrived, as to repreſent in true proportion their magnitudes, diſtances, and other phænomena.

As to the magnitudes of the primary and ſecondary planets, if the ſun's diameter be ſuppoſed 100, that of Saturn will be $7\frac{5}{10}$, of Jupiter 10, of Mars $\frac{53}{100}$, of the Earth 1, of Venus 1, of Mercury $\frac{54}{100}$, and of the Moon $\frac{2853}{10000}$. As to the ſatellites of Jupiter and Saturn, they are ſuppoſed to be about the bigneſs of our Earth.

Again, if the diſtance of the Earth from the Sun be divided into 10 parts, Mercury will be diſtant from the Sun four of theſe parts, Venus ſeven, Mars fifteen, Jupiter fifty-two, and Saturn ninety-five.

Dr. Deſaguliers deſcribes a *Planetarium* of his own contrivance, the frame of which, containing the clock-work, is made of ebony; its outſide is adorned with twelve pilaſters, between which are painted, on as many vertical planes, the twelve ſigns of the zodiac. The upper ſurface is flat, and made of poliſhed braſs; on the outward circumference of which are ſcrewed ſix braſs pillars, ſupporting a large flat ſilvered ring. On this ring, which repreſents the ecliptic, are drawn ſeveral circles; the three innermoſt being divided into twelve parts for the ſigns of the zodiac, and each of theſe into 30 degrees; and among thoſe degrees are graved in their proper places, the nodes, aphelia, and greateſt north and ſouth latitudes of the planets. The next three circles have the months and days of the months, exactly correſponding to the Sun's place at noon each day throughout the year; and upon the braſs ſurface of the machine graduated are ſilver circles, which carry the planets, repreſented by ſilver balls, and raiſed upon arbors or ſtems to the height of the ecliptic.

Above the ecliptic ſtand ſome of the principal circles of the ſphere, according to their reſpective ſituation in the heavens, viz. the two colures, one half of the equinoctial circle, the tropic of cancer, the arctic circle, &c. The whole machine is alſo ſo contrived, as to be ſet to any latitude, without injuring any of the inſide motions.

Within the ecliptic ſtand the Sun and other planets; the Sun being in the center of the whole ſyſtem, and the reſt repreſented agreeably to the above-mentioned magnitudes and diſtances. When things are thus diſpoſed, by turning about the handle, or winch of the *Planetarium*, all the planets perform their revolutions round the Sun, according to their periodical times; and being furniſhed with indices of blued-ſteel, theſe ſhew the longitudes of the planets, by pointing to the diviſions on the graduated ſilver circles, as they move round.

As the diſtances of the planets are in their true proportions to each other, ſo likewiſe are their magnitudes; but it cannot be expected, that the diameters of the planets ſhould be in proportion to the diameters of their orbits; for to effect this, the machine muſt either be made 3000 times bigger than uſual, or the balls repreſenting the planets 3000 times leſs than uſual; whereby they would all be rendered inviſible, excepting the Sun, and even it would be leſs than $\frac{1}{100}$ part of an inch in diameter. For the ſame reaſon it is found impracticable to repreſent the ſun by a ball, proportionally bigger than thoſe repreſenting the other planets.

Now as the orbit of the Moon, as well as of the ſatellites of Jupiter and Saturn, bear no manner of proportion to the orbit of the primary planets, the diſproportion between theſe and their ſatellites muſt be ſtill greater. Hence appears the abſurdity of crowding them all into one machine, as is the caſe in the common *Orreries*.

To give a right notion of the diſtances and magnitudes of the ſatellites with reſpect to their primary planets, it will be neceſſary to have a ſeparate machine for each ſyſtem; or, the

ſame machine may be ſo contrived, as to repreſent one ſyſtem after another, by ſhifting and adjuſting the magnitudes and diſtances of the balls. In this manner, the general ſolar ſyſtem may be firſt exhibited; then that of the Moon and Earth round the Sun; afterwards that of Jupiter and its ſatellites: and, laſtly, that of Saturn and its ſatellites.

We have already taken notice of ſome of the phænomena explained by the general *Planetarium*, as well as of that contrived to exhibit the revolution of the Earth and Moon round the Sun. By theſe is likewiſe plainly ſhewn the cauſes of eclipſes, as well as of the apparent ſtationary and retrograde motions of the planets.

By the *Planetarium* adapted to the ſyſtem of Jupiter, and its ſatellites, are exhibited the immerſion or entrance of a ſatellite into the ſhadow of Jupiter; its emerſion out of the ſhadow; when theſe are viſible; when a ſatellite is hidden by the body of Jupiter, before it comes into, or after it is gone out of the ſhadow; when a ſatellite may be ſeen to croſs the body of Jupiter; when a ſatellite makes a ſolar eclipſe in Jupiter; and when ſatellites eclipſe one another.

PLANT *(Suppl.)—Propagation of* PLANTS. Tho' the moſt natural, as well as moſt univerſal method of propagating *Plants*, is that of ſowing the ſeeds of each kind in a proper ſoil; yet ſuch is the prolific power of nature, that in ſome inſtances, like the polype-animal, they may be propagated by ſets, pieces, ſlips, or cuttings taken from the parent tree, or *Plant*, and ſet in ſuch a ſoil as they are known to delight in. The whole family of willows are propagated in this manner with the greateſt eaſe. Thoſe ſorts which grow to be large trees, and are cultivated for timber, are generally planted from ſets of about ſeven or eight feet long, ſharpened at their larger ends, which is thruſt into the ground by the ſides of ditches and banks where the ground is moiſt; in which places they make a conſiderable progreſs, and are a great improvement to ſuch eſtates; becauſe their tops will be fit to lop every fourth or fifth year. The ſallows are planted of leſſer ſets, only three feet long, thruſt two feet into the ground, and one foot above it. The rows ſhould be three feet aſunder, and the ſets in each row eighteen inches; obſerving always to place the rows ſloping, in the ſame manner as the ground. The beſt ſeaſon for planting theſe cuttings is in February; and if the ſoil be good, they will produce a great crop of ſhoots every year, which will produce, at a moderate computation ten pounds per acre. See *Miller*'s Gard. Dict. in voc. *Salix*.

Beſides the willow-kind, the plane-tree, mint, &c. may be propagated in this manner; only it ought to be remarked, that in providing the ſlips, ſprigs, or cuttings, ſuch branches as have knots or joints, ſhould be cut off two or three inches beneath them; and that ſmall top ſprigs of two or three years growth, are the beſt for this operation. Ruſt. Dict. in voc. *Cuttings*.

Another way of propagating *Plants*, is by parting or dividing their roots, each part of which will, by proper management, thrive and ſend out freſh roots, which may be ſeparated in the ſame manner. See the article ROOT, *Cycl.* and *Suppl.*

The manner of propagating *Plants*, by laying the tops of branches in the ground, is deſcribed under the head LAYER, *Cycl.* and *Suppl.* And the common way by ſowing of the ſeeds, is ſufficiently explained under the articles NURSERY, SOWING, SEED, &c. *Cycl.* or *Suppl.*

Syſtems of PLANTS. Ray's Syſtem of *Plants* is delivered in the Cyclopædia under this head PLANT. The ſyſtem of Linnæus is to be found in the Appendix, under the head FRUCTIFICATION; and the Syſtem of Tournefort in the Appendix under the head PETAL.

Vegetation and œconomy of PLANTS. The theory of the growth and œconomy of *Plants* has received great improvmenets from the experiments of the ingenious Dr. Hales, in his vegetable ſtatics.

It appears from a great number of experiments made by that gentleman, that *Plants* imbibe and perſpire moiſture very copiouſly.

As to the quantity of moiſture perſpired by *Plants* and trees, there appears to be a very conſiderable difference in different vegetables. The lemon-tree, which is an ever-green, perſpires much leſs than the ſun-flower, or than the vine, or the apple-tree, whoſe leaves fall off in winter. Thus, from equal areas, the lemon-tree was found to perſpire only $\frac{1}{248}$ of an inch in height, during twelve hours of the day in the month of July; the apple-tree $\frac{1}{162}$; a cabbage $\frac{1}{80}$; a vine $\frac{1}{191}$; and a ſun-flower $\frac{1}{163}$ in a day and night. *Hale*'s Veget. Stat. Vol. 1. p. 20, ſeq.

In order to try what moiſture *Plants* would imbibe, the Dr. cut off ſeveral branches of apple-trees, pear, cherry, and apricot-trees; and having immerſed them into a known quantity of water, he found ſome of them imbibed 15 ounces, ſome 20 ounces, and others 25 or 30 ounces in 12 hours day more or leſs, according to the quantity of leaves they had; and and yet when he weighed them at night, they were lighter than in the morning, which undoubtedly was owing to their perſpiration. The quantity imbibed decreaſed very much every day, the ſap veſſels being probably ſhrunk at the tranſverſe cut, and too much ſaturated with water, to let any more paſs; ſo that uſually in four or five days the leaves faded and withered much. Id. ibid. p. 29.

The Doctor made the ſame experiments with elm-branches, oak, oſier, willow, ſallow, aſpen, curran, gooſberry, and philbert branches; but none of theſe imbibed ſo much as the foregoing, and ſeveral ſorts of ever-greens very much leſs. Id. ibid.

He alſo made ſeveral experiments to aſcertain the force with which *Plants* imbibe moiſture. This he did by putting the ſtump of a branch into one end of a glaſs tube, cementing it faſt; and then immerſing the other end of the tube, after being firſt filled with water, into a ciſtern of mercury; on which removing his finger that ſtopped up the lower end of the tube, the ſtump imbibed the water with ſo much vigour, that in ſix minutes time the mercury was raiſed eight inches in the tube. It is obſervable, that in all the experiments of this ſort, the mercury roſe higheſt, when the ſun was very clear and warm; and that it ſubſided in the night-time, and roſe again the next day, as the ſun ſhone upon the branch; only it was neceſſary to fill the tube with water; otherwiſe it would not riſe at all. It is alſo remarkable, that the top or ſmall end of a branch imbibed the water as well as the ſtump end. Id. ibid. p. 85, ſeq.

The imbibing force of a great variety of trees being tried in the ſame manner, by immerſing branches of them in aqueo-mercurial gages, it was found that the pear, quince, cherry, walnut, peach, apricot, plum, black-thorn, white-thorn, gooſeberry, water-elder, and ſycamore, raiſed the mercury from three to ſix inches high. The elm, oak, horſe-cheſnut, filbert, fig, mulberry, willow, ſallow, oſier, aſh, lynden, and curran raiſed the mercury only one or two inches. But the ever-greens, and the following trees and plants, viz. laurel, roſemary, lauruſtine, phyllerea, fuz, rue, barberry, jeſſamine, cucumber-branch, pumkin, Jeruſalem artichoak, &c. did not raiſe it at all. Id. ibid. p. 101.

In order to diſcover with what force the ſap of the vine is puſhed forth in the bleeding ſeaſon, the following experiments were made. Dr. Hales cut off a vine on a weſtern aſpect, within ſeven inches of the ground; the remaining ſtump having no lateral branches, and being four or five years old, and $\frac{3}{4}$ inch diameter. To the top of this ſtump he fixed a glaſs tube, twenty five feet high; ſecuring the joint with ſtiff cement made of bees-wax and turpentine, beſides ſeveral folds of wet bladder faſtened over it with Packthread. As the ſtem did not at firſt bleed into the tube, he filled the tube two feet high with water, which the ſame afternoon was imbibed by the ſtem within three inches of the bottom. Next day the ſtem began to bleed, ſo that the ſap in the tube continued riſing daily, till itwas above twenty-one feet high, and would very probably have riſen higher, if the joint had not ſeveral times leaked. In the chief bleeding ſeaſon, it would continue riſing night and day; but much more in the day than night; and moſt of all in the greateſt heat of the day. When the ſun ſhone hot upon the vine, there was always a continued ſeries of air bubbles aſcending from the ſtem through the ſap in the tube, in ſo great plenty, as to make a large froth on the upper part of the ſap, which ſhews the great quantity of air drawn in through the roots and ſtem. Id. ibid. p. 108.

This force of the riſing ſap is five times greater than the force of the blood in the great crural artery of a horſe; ſeven times greater than the force of the blood in the like artery of a dog; and eight times greater than the blood's force in the ſame artery of a fallow doe. Id. ibid. p. 114.

The free communication of the ſap veſſels of *Plants* appears from hence; that tho' deep gaps or notches be cut in a branch, it will nevertheleſs imbibe water in the manner already mentioned. In order to try whether it would not be the ſame in branches, as they grow on trees, the Dr. cut two ſuch oppoſite gaps in a duck-cherry-branch, three inches diſtant from each other, notwithſtanding which, the leaves of this branch continued green, within eight or ten days as long as the leaves on the other branches of the ſame tree. Id. ibid. p. 129.

However, it is the opinion of this excellent author, that there is no uniform circulation of the ſap in trees, like that of the blood in animals; for this reaſon, that if there were ſuch a circulation, the leaves of the ilex grafted upon the Engliſh oak would fall in winter equally with thoſe of the oak itſelf, which is not found to be the caſe. Id. ibid. p. 149.

And, that the ſap does not deſcend between the bark and the wood, as the favourers of a circulation ſuppoſe, ſeems evident from hence, viz. that if the bark be taken off for three or four inches breadth quite round, the bleeding of the tree above that bared place will much abate, which ought to have the contrary effect, by interrupting the courſe of the refluent ſap, if the ſap deſcended by the bark. But the reaſon of the abatement of the bleeding in this caſe may be accounted for, from hence, that the ſap is ſtrongly attracted upwards by the vigorous operation of the perſpiring leaves. Id. ibid. p. 150.

We have a great many other curious experiments and obſervations, in the ſame book, relative to the vegetation and analyſis of *Plants*; which are compoſed of the following principles, viz. ſulphur, volatile ſalt, water, earth, and air. See the article AIR, *Suppl.*

The leaves of *Plants* ſerve not only as excretory ducts to ſeparate and carry off the redundant watery fluid, which by

being long detained in the *Plants*, would turn rancid and prejudicial to them; but likewiſe to imbibe the dew and rain, which contain ſalt, ſulphur, &c. and to be of the ſame uſe to *Plants*, that the lungs are to animals. However, the Dr. remarks, that as *Plants* have not a dilating and contracting thorax, their inſpirations and expirations will not be ſo frequent as thoſe of animals, but depend wholly on the alternate changes from hot to cold for inſpiration, and *vice verſa* for expiration. Id. ibid. p 326.

But it is from the roots, that by far the greater part of the nouriſhment of *Plants* is derived. Theſe, therefore, are always found to bear a conſiderable proportion to the body of the *Plant* above ground; the ſuperficies of the former being about four tenths of that of the latter. Hence, appears the neceſſity of cutting off many branches from a tranſplanted tree; becauſe in digging it up, a great part of the roots are cut off. See *Hales*'s Veget. Statics, vol. 1. p. 6, 16.

Paraſitical PLANTS, among botaniſts. See the article PARASITE, *Cycl.*

Senſitive PLANT, the Engliſh name of a diſtinct genus of *Plants*, called by botaniſts *Mimoſa*. See the article MIMOSA, *Suppl.*

PLANTAIN-*tree*, the Engliſh name of a genus of trees, called by botaniſts *Plantago*. See the article PLANTAGO, *Suppl.*

PLANTAIN-*tree* is alſo a name given to the *Muſa* of Linnæus. See the article MUSA, *Append.*

Buckſhorn PLANTAIN, the name given by ſome to a ſpecies of *Coronopus*. See the article CORONOPUS, *Suppl.*

PLANTAIN-*ſhot*, a name by which ſome call the *Canna* and *Cannacorus* of botaniſts. See the articles CANNA and CANNACORUS, *Suppl.*

Water-PLANTAIN, a name given to ſeveral ſpecies of *Ranunculus*. See the article RANUNCULUS, *Suppl.*

PLANTATION *(Cycl.)* — As *Plantations* of trees are not only profitable to the owner, as well as ornamental to the country around them, but a national advantage, it may not be improper to give ſome directions concerning them.

Firſt, then, care muſt be taken to prepare the ground before trees are taken out of the earth; becauſe they ſhould never be ſuffered to remain long out of the ground. Care likewiſe is to be taken not to tear or bruiſe the roots of the trees, in raiſing them in order to be tranſplanted. When taken up, the next thing to be done is to prepare them for planting; which is done by cutting off all the ſmall fibres of the roots, and ſuch roots as are any wiſe injured in pulling up, or which croſs one another. The downright roots of fruit trees are likewiſed to be pruned off, as ſhould all their irregular branches; that when agitated by the wind, they may not rub againſt or bruiſe each other. However, the main ſhoots ought by no means to be cut off, as is but too often injudiciouſly practiſed.

Having thus prepared the trees for *planting*, they are next to be fixed in the ground; in doing which, care muſt be taken to place them deeper or ſhallower, according to the nature of the ſoil; but the beſt method of all is to raiſe a hill of earth, wherein to *plant* them. They ſhould be placed as erect as may be, and the earth gently preſſed down about their roots; for it is a fault to make it too hard. Pales or ſtakes ſhould be fixed round them, in order to prevent their being diſplaced or blown down by the wind.

When the trees are thus *planted* and ſecured, a little mulch ſhould be laid upon the ſurface of the ground, to prevent its drying; and as to watering them, it ought to be done with great moderation, nothing being more hurtful to them, than over-watering.

The ſeaſons for *planting* are various, according to the different ſorts of trees, or the ſoil in which they are to be *planted*. For ſuch trees whoſe leaves fall off in winter, the beſt time is the beginning of October, provided the ſoil be dry; but for a wet ſoil, it is better to defer it to the latter end of February, or the beginning of March; and for many kinds of evergreens, the beginning of April is by far the beſt ſeaſon; tho' they may be ſafely removed at Midſummer, provided they are not to be carried far. They ſhould always be removed in a cloudy moiſt ſeaſon, by which means they will take root in a few days.

As the method of cultivating moſt trees, eſpecially garden ones, is explained under their reſpective articles, there is the leſs reaſon to be particular on that head in this place. However one thing more deſerves to be well attended to, as regarding *Plantations* in general. It is this; that *Plantations* ſhould be raiſed always from trees tranſplanted from nurſeries, and never from hedge-rows, or trees of a large ſize, becauſe theſe laſt ſeldom come to good account, often dying after continuing alive for many years.

Another general rule in regard to *Plantations*, is, to keep the ground clear of weeds, at leaſt for the ſpace of ſeven years; for which purpoſe it ſhould be annually dug, or plowed, where that can be done. This will encourage the roots of the trees to extend themſelves, whereby they will draw a larger proportion of nouriſhment. *Miller*'s Gard. Dict.

PLANTING *Reverſe*. It has been already obſerved, that the branches of trees may be made to ſerve inſtead of roots; the putting of which in practice is called *Planting Reverſe*. See the article BRANCH, *Suppl.*

Mr. Fairchild of Hoxton gives the following directions on this head. When you have made choice of a young tree of one ſhoot, whether alder, elm, willow, &c. that will eaſily take root by layers, the top of the ſhoot is to be bent gently down into the earth, there to remain till it has taken root; the tree all the while reſembling a bow or arch above ground. When the top end is judged to have ſtruck ſufficiently ſtrong roots, the old root is to be gently raiſed out of the ground, and kept in an upright poſition; after which all the injured parts of the raiſed roots are to be pruned off, as well as the buds or ſhoots on the ſtem of the tree; taking care to rub over theſe pruned parts with a compoſition made of four ounces of tallow, as many of bees-wax, two ounces of roſin, and as many of turpentine, melted together in a pipkin; this to be uſed moderately warm. Vid. *Miller*'s Gardeners Dict.

PLATANOCEPHALUS, in botany, a name uſed by ſome botanical writers for the *Cephalanthus*. See the article CEPHALANTHUS, *Suppl.*

PLATANUS, the *Plane-tree* in botany. See the article PLANE-*tree*, *Suppl.*

PLAY *(Cycl.)* — See the article GAMING, *Cycl.*

Duration of PLAY, in the Doctrine of Chances is uſed for the probability of the play's ending in a given number of games.

In the Cyclopædia, under the article GAMING, the two laſt problems relate to the duration of *Play*; but this difficult ſubject has been further purſued by Mr. De Moivre in the ſecond edition of his Doctrine of Chances, p. 162—211.

PLOVER *(Suppl.)*— *Baſtard*-PLOVER, a name uſed in ſome parts of the kingdom for the *Capella*, or lapwing. See the article CAPELLA, *Suppl.*

PLOUGHMAN, in huſbandry, the perſon who guides the plough in the operation of tilling, or tillage. See the articles PLOUGH and TILLAGE, *Cycl.* and *Suppl.*

PLOUGHMAN's *Spikenard*, the Engliſh name of a genus of plants, called by botaniſts *Conyza*; it is likewiſe called by us *Flea-bane*. See the article FLEA-*bane*, *Suppl.*

PLUM *(Suppl.)* — *American* PLUM, *Maiden* PLUM, or *Black* PLUM, names given to a diſtinct genus of plants, called by botaniſts *Chryſobalanus*. See the article CHRYSOBALANUS, *Suppl.*

Hog-PLUM, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Spondias*. See the article SPONDIAS, *Suppl.*

Indian date PLUM, a name ſometimes given to the *Dioſpyros* of Linnæus, and *Guajacana* of Tournefort. See the article GUAJACANA, *Suppl.*

PLUNGER, in Mechanics, a ſolid braſs cylinder uſed as a forcer in forcing pumps. See the articles FORCER and *Forcing* PUMP, *Append.*

POCCOON, a name by which ſome call the *Sanguinaria*. See the article SANGUINARIA, *Suppl.*

POCK-*wood*, a name ſometimes given to *Guaiacum*. See the article GUAIAC, *Cycl.*

PODARIA, in the hiſtory of inſects, a claſſical name comprehending all ſuch inſects as have limbs, but no wings. See the article APTERIA, *Append.*

Of this claſs there are two ſubdiviſions. 1. Such *Apteria Podaria* as have oblong bodies with numerous legs, or more than ſix pair: Theſe are the *Iulus*, or gally-worm; the *Scolopendra*, or *Centipes*; and the *Oniſcus*, or wood-louſe. 2. The *Apteria Podaria* with ſhorter bodies, and leſs numerous legs, or fewer than ſix pair; This ſubdiviſion contains numerous genera, as the Pulex, the Podura or Puceron, the Pediculi of various kinds, the Monoculi, the Acari, the Araneï, the Scorpio, and a great many others. See the articles GALLY-*worm*, SCOLOPENDRA, &c. *Suppl.*

PODOPHYLLUM, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by Tournefort *Anapodophyllum*. See the article ANAPODOPHYLLUM, *Suppl.*

PODURA, in the hiſtory of inſects, the name by which Dr. Hill calls the *Pucerons*. See the article PUCERON, *Suppl.*

The body of theſe animals is ſhort and roundiſh; the tail is crooked and forked, and aſſiſts them in leaping. They have three pair of legs, which ſerve only for walking. The eyes are only two, but each compoſed of eight others. *Hill*, Hiſt. Anim. p. 20.

They belong to the claſs of inſects which have limbs, but no wings, and are called by the ſame author *Podaria*.

POET's *Roſemary*. See the article ROSEMARY, infra.

POINT *(Cycl. and Suppl.)*—In the Cyclopædia, a *Point* is defined to be a quantity, which has no parts, or which is indiviſible; and Euclid's authority is quoted for this. But it ought to be obſerved, that the calling a *Point* a quantity; or ſpeaking of indiviſible quantities, are abſurdities, of which Euclid was never guilty. As to the demonſtrations of the proportions of mathematical *Points* to each other, mentioned in the Cyclopædia; they are mere paralogiſms. Thus in Mr. Robartes's reaſoning [a], ſuppoſing with him that the chord of a greater circle, touching a ſmaller circle at the extremity of its diameter, is $= z$, and the chord of the ſmaller circle cor-

responding to the common verſed ſine $= x$, the diameter of the greater circle $= R$, and the diameter of the leſſer circle $= S$, it is certain, that $zz = 4Rx - 4xx$ and that $yy = 4Sx - 4xx$, as Mr. Robartes ſays. But what follows from thence? No more than this, that the ratio of zz to yy is the ſame with the ratio of $4Rx - 4xx$ to $4Sx - 4xx$, or dividing both theſe terms by $4x$, as $R - x$ is to $S - x$; and that the ultimate or limiting ratio of zz to yy, is the ſame with the ultimate or limiting ratio of $R - x$ to $S - x$. But the ultimate ratio of $R - x$ to $S - x$ is the ratio of R to S, and conſequently, the ratio of R to S is the ultimate ratio of zz to yy; or, the ratio of $\sqrt{R}$ to $\sqrt{S}$ is the ultimate ratio of z to y. But what then? Does it follow that the terms of this ultimate ratio muſt be conceived as *Points*? Nothing leſs. The ultimate ratio of z to y does not imply that the quantities z and y ever exiſt under this ultimate ratio of $\sqrt{R}$ to $\sqrt{S}$, but only that they may approach to this ratio, ſo as to differ from it by leſs than any aſſigned ratio. Mr. Robartes was miſled by the too prevailing language of infiniteſimals. See the article FLUXION and LIMITS, *Suppl.*—[[a] Phil. Tranſ. N°. 334.]

Singular POINT in geometry, is uſed for any *Point* of a curve, which has ſomething peculiar to diſtinguiſh it from the other *Points* of the curve. *Cramer*, Analyſ. des lign. courbes, p. 148.

Of theſe *Points* there are various kinds, ſuch as *double*, *triple*, &c. or in general, *multiple Points*; *Points of Inflexion* or contrary flexure, *&c.*

Every *Point* of a curve is *ſimple*, or *multiple*.

A *ſimple* POINT, is that which belongs only to one branch of a curve.

A *multiple* POINT is that which is common to ſeveral branches of a curve, in particular:

Double POINT is that which is common to two branches of a curve. The conic ſections or lines of the ſecond order have no double *Points*; but we find them in the lines of the third order.

Triple POINT is that which is common to three ſeveral branches of a curve.

Hence the terms *quadruple*, *quintuple*, &c. *Point* are eaſily underſtood.

If a *Point* be ſuppoſed to deſcribe a curve, it will paſs twice thro' a *double Point*; thrice thro' a *triple Point*, &c.

A *ſimple* POINT is ſometimes *ſingular*, as when it becomes a *Point* of contrary flexure, of double inflexion, and in many other caſes; for a detail of which we refer to *Cramer*, Analyſ. de lignes courbes, chap. x. p. 400. ſeq. and chap. xiii. p. 568. ſeq.

In the caſe mentioned in the Supplement, under the head POINT *of contrary Flexure*, where a double infinitely ſmall flexure or inflexion is ſaid to be formed in a *Point*, this *Point* is called by ſome a *Point of double inflexion*, and by Monſieur de Maupertuis[a], and Mr. Cramer[b], *Point de Serpentement*, and by others, *Point of rectitude*. — [[a] Mem. Acad. Scien. 1729. p. 277. Ed. Paris. [b] Analyſ. des lignes courbes.]

POINT *of Rectitude*, is defined by Sir *Iſaac Newton*, to be that in which the radius of flexure becomes infinite, or its center at an infinite diſtance: ſuch it is at the vertex of the parabola $a^3x = y^4$.

The *Point of Rectitude* is commonly the limit of contrary flexure: but there are alſo *Points of Rectitude*, which do not come between the parts of contrary flexure. For the method of inveſtigating theſe *Points*, ſee *Newton*'s Meth. of Flux. and Inf. Series. pag. 72.

Theſe *Points of rectitude* are not found in lines of a lower order than the fourth. In lines of this, and of higher orders, a tangent at a *Point* of inflexion may alſo meet the curve in another *Point*, and if the diſtance between this *Point* and the *Point* of inflexion be ſuppoſed to be infinitely diminiſhed, the ſecant will become a tangent, and the contact in this caſe will be equivalent to four interſections, in the ſame manner that the contact at a *Point* of contrary flexure is equivalent to three interſections. See *Cramer*, lib. cit. p. 403. and *Newton*, Method of Fluxions p. 72.

Theſe *Points of double Inflexion*, are alſo called *Points of inviſible Inflexion*; becauſe in effect they are not ſenſible, but only known by their analytical properties. Analyſts have conſidered ſeveral degrees of theſe *Points*. *Cramer*, loc. cit.

POINTERS, in ſhip-building, are pillars in an oblique poſition, from the floor-rider heads on each ſide, pointing or meeting each other at the middle of the gun-deck beams. *Blanckley*'s, Naval Expoſitor, p. 121.

POISON *(Suppl.)*—In the Philoſophical Tranſactions vol. 47. pag. 75. ſeq, we have an account of ſeveral experiments made by Monſieur Heriſſan, on living animals, with the Indian *Poiſon* brought over by Monſieur de la Condamine; and mentioned in the Supplement under this head.

This *Poiſon* which ſeems to be of a very ſubtile and dangerous nature is extracted by fire from divers plants, eſpecially from thoſe which the French call Lianes. The Indians in various places of South America prepare this *Poiſon*, and make uſe of it for the killing of wild beaſts, in this manner:

Thoſe ſavages are very dextrous at making long trunks, which are the moſt common weapon uſed by them in hunting. To theſe trunks or tubes they fit little arrows made of palm-tree, on which they put a little roll of cotton exactly fitting the bore of the tube. They ſhoot theſe with their breath, and ſeldom miſs the mark. They dip the points of theſe little arrows, as well as of thoſe of their bows, in this *Poiſon*; which is ſo active, that in leſs than a minute, eſpecially when freſh, it kills certain animals, from which the arrow has drawn blood.

Tho' a very ſmall drop of this *Poiſon*, conveyed into the blood by puncture is ſometimes ſufficient to kill a man, or at leaſt to cauſe great diſturbance in the animal œconomy, it is quite otherwiſe when taken in at the mouth; for then it does no ſort of miſchief. See Phil. Tranſ. loc. cit.

POISON-*Buſh*, a name by which ſome call the *Tithymalus*. See the article TITHYMALUS, *Suppl.*

POKE or PORK *Phyſic*, the name by which the *Phytolacca* of botaniſts is ſometimes called. See the article PHYTOLACCA, *Suppl.*

POLE-*cat*, in zoology, the Engliſh name of a creature of the weaſel-kind, called by authors *Putorius*. See the article PUTORIUS, *Suppl.*

POLEY-*Mountain*, in botany, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Polium*. See the article POLIUM, *Suppl.*

POLYANTHES, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, called by ſome *Tuberoſa*, and *Tuberoſe Hyacinth*.

The characters are theſe: There is no cup; the flower conſiſts of one leaf, of an infundibuliform ſhape; the tube is oblong and crooked; the limb is divided into ſix ſegments; the ſtamina are ſix ſubulated filaments, connivent, and of the length of the limb; the antheræ are linear; the germen is roundiſh, and ſtands in the bottom of the corolla; the ſtyle is filiform, and ſhorter than the corolla; the ſtigma is trifid, thick, and covered with a honey-like juice; the fruit is a capſule, of a roundiſh, but obtuſely trigonal form, compoſed of three valves, containing three cells, and wrapped up in the baſe of the corolla; the ſeeds are numerous, ſemiorbicular, plane, and placed in a double ſeries. *Linnæi* Gen. Plant. p. 140.

POLYANTHUS, the name by which the *primula veris* of botaniſts is ſometimes called. See the article PRIMULA, *Suppl.*

POLYCNEMUM, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, called by Tournefort *Camphorata*. See the article CAMPHORATA, *Suppl.*

The characters of it are theſe: The cup is a ſubulated, acute, and permanent perianthium, conſiſting of three leaves; the flower conſiſts of five petals, extremely like thoſe of the cup, only ſhorter; the ſtamina are three capillary filaments, ſhorter than the flower; the antheræ are obtuſe; the germen of the piſtil is roundiſh; the ſtyle is bifid, and of the length of the ſtamina; the ſtigmata are obtuſe; the ſeed, which follows every flower, is ſingle, and has ſcarce any covering, at moſt, only a very thin membrane. *Linnæi* Gen. Plant. p. 21.

POLYTRICHUM, πολύτριχον. See the article ADIANTUM, *Suppl.*

POND-*weed (Suppl.)*— *Water* POND-*weed*, a name ſometimes given to a ſpecies of *Perſicaria*. See the article PERSICARIA, *Suppl.*

POOR-*man's Pepper*, a name ſometimes given to the *Lepidium* of botanical writers. See the article LEPIDIUM, *Suppl.*

POPPY *(Suppl.)*— *Prickly* POPPY, a name by which ſome call the *Argemone*, a diſtinct genus of plants. See the article ARGEMONE, *Suppl.*

Spatling POPPY, a name by which the *Lychnis* is ſometimes called. See the article LYCHNIS, *Suppl.*

POPULUS, the *Poplar* in botany, the name of a genus of trees. See the article POPLAR, *Suppl.*

PORCUPINE-*fiſh*, in ichthyology, the Engliſh name of ſeveral ſpecies of *Oſtracion*. See the article OSTRACION, *Suppl.*

POROPHYLLUM, a name given by Vaillant to a genus of plants, called by Linnæus *Kleinia*. See the article KLEINIA, *Append.*

POSSET *(Suppl.)* — *Beer*-POSSET. See the article ZYTHOGALA, *Suppl.*

POSTULATE, or POSTULATUM *(Cycl.)* — Authors are not agreed as to the ſignification of the term *poſtulatum*. Many, with whom the Cyclopædia agrees, make the difference between axioms and *poſtulata*, to be the ſame as that between theorems and problems; axioms, according to thoſe authors, being indemonſtrable theoretical truths, and *poſtulata* indemonſtrable practical truths.

But others will have it, that axioms, or common notions are primitive, and common to all things partaking of the nature of quantity, and which therefore may become the objects of mathematical ſcience, ſuch as number, time, extenſion, weight, motion, &c. and that *poſtulata* relate particularly to magnitudes ſtrictly ſo called, or to things having local extenſion,

ſion, ſuch as lines, ſurfaces and ſolids; ſo that in this ſenſe of the word *poſtulatum*, Euclid, beſides axioms, or thoſe principles which are common to all kinds of quantity, has aſſumed certain *poſtulata* to be granted him, peculiar to extenſive magnitude. Hence ſeveral of the principles aſſumed in his elements, and ranked among the axioms by the moderns, are by Proclus ranked among the *poſtulata*; which has induced Dr. Wallis to judge, that the laſt of the two ſenſes given to the term *poſtulatum* is moſt agreeable to the meaning of the antient geometers. And thoſe who contend for this ſenſe of the word, add, that Euclid, in *poſtulating* to draw a right line from one point to another, does not mean that any man can actually do this, but only that it may be conceived as poſſible. So that *poſtulata* are axioms no leſs than the other principles aſſumed in the elements of geometry, but axioms relating to a particular ſubject, and not common to all. *Wallis's* Oper. Vol. 1. p. 667, 668. See the article PRINCIPLE, *Append.*

POTATOES, the Engliſh name of the tuberoſe-rooted, eſculent *Lycoperſicon* or *Solanum* of botanical writers. See the article SOLANUM, *Suppl.*

The Engliſh name ſeems evidently formed from *Batatas*, the Indian name of the ſame plant. See the article POTATOES, *Suppl.*

Spaniſh POTATOE, the name by which ſome call ſeveral ſpecies of *Convolvulus*, or bindweed. See the article CONVOLVULUS, *Suppl.*

POTENTILLA, a name uſed by ſome for ſeveral ſpecies of *Cinquefoil*. See the article CINQUEFOIL, *Suppl.*

POUCH *(Suppl.)* — *Shepherd's*-POUCH, a name ſometimes given to the *Alyſſon*, or mad-wort. See the article ALYSSON, *Suppl.*

POWER *(Cycl.* and *Suppl.)* — *Arithmetical* POWER is uſed by Mr. Machin, for compoſite numbers or quantities whoſe factors are in arithmetical progreſſion. See Phil. Tranſ. N° 447, and Dr. Martyn's Abridg. Vol. 8. p. 78.

Mr. Machin uſes a particular notation for quantities of this kind. The quantity expreſſed by this notation has a double index; that at the head of the root at the right hand, but ſeparated by a hook to diſtinguiſh it from the common index, denotes the number of factors; and that above, within the hook on the left hand, denotes the common difference of the factors proceeding in a decreaſing or increaſing arithmetical progreſſion.

Thus the quantity $\overset{a}{\smile}\!\!\left(\overline{n+a}\right.^{m}$ denotes by its index m on the right hand, that it is a compoſite quantity, conſiſting of ſo many factors as there are units in the number m; and the index a above on the left, denotes the common difference of the factor's decreaſing in an arithmetical progreſſion, if it be poſitive; or increaſing, if it be negative; and ſo ſignifies, in the common notation, the common number or quantity, $\overline{n+a}\,.\,\overline{n+a-n}\,.\,\overline{n+a-2a}$. &c.

For example, $\overset{2}{\smile}\!\!\left(\overline{n+5}\right.^{6}$ is $= \overline{n+5}\,.\,\overline{n+3}\,.\,\overline{n+1}\,.\,\overline{n-1}\,.\,\overline{n-3}\,.\,\overline{n-5}$, conſiſting of ſix factors whoſe common difference is 2. After the ſame manner, $\overset{2}{\smile}\!\!\left(\overline{n+4}\right.^{5} = \overline{n+4}\,.\,\overline{n+2}\,.\,\overline{n-2}\,.\,\overline{n-4}$, conſiſting of five factors. According to which method it will eaſily appear, that if a be an integer, then $\overset{2}{\smile}\!\!\left(\overline{n+2a+1}\right.^{2a+2}$ will be $= \overline{nn-1}\,.\,\overline{nn-9}\,.\,\overline{nn-25}$ continued to ſuch a number of double factors as are expreſſed by $a+1$, or half the index, which in this caſe is an even number. Thus alſo $\overset{2}{\smile}\!\!\left(\overline{n+2a}\right.^{2a+1}$ will be equal to $n.\,\overline{nn-4}\,.\,\overline{nn-16}\,.\,\overline{n-36}$, and ſo on, where there are to be ſo many double factors, as with one ſingle one n, will make up the index $2a+1$, which is an odd number.

If the common difference a be an unit, it is omitted: Thus $\smile\!\!\left(\overline{n}\right.^{6} = n.\,\overline{n-1}\,.\,\overline{n-2}\,.\,\overline{n-3}\,.\,\overline{n-4}\,.\,\overline{n-5}$, containing ſix factors. So $\smile\!\!\left(\overline{6}\right.^{6} = 6.\,5.\,4.\,3.\,2.\,1.$ and the like for others.

If the common difference a be nothing, the hook is omitted, and it becomes the ſame with the geometrical *power*: Thus $\overset{0}{\smile}\!\!\left(\overline{n+a}\right.^{m} = \overline{n+a}\,|^{m}$ according to the common notation.

The learned author above quoted applies this doctrine of arithmetical *powers* to the inveſtigation of the principal rule in the method of fluxions, and its inverſe, which is, that if the ordinate $y = m\,\dot{z}^{\frac{m-1}{n}}$, then will the area, or rather the form of the quantity for the area, be $= z^{m}$; or vice verſa, that if the area be z^{m}, the ordinate will be $m\,\dot{z}\,z^{m-1}$; on which occaſion he obſerves, that the ſymbol $\dot{z}$, conſidered as a component part of the rectangle z, may bear a plain interpretation, viz. that it is the meaſure according to which the quantity z is meaſured. See Phil. Tranſ. loc. cit. in the poſtſcript. See alſo FLUXION, *Suppl.*

PRECESSION *(Cycl.)* — The *preceſſion* of the equinoctial points varies; nor are aſtronomers entirely agreed as to the quantity of the variation, ſo as to eſtabliſh what the mean *preceſſion* is. Dr. Bradley aſſumes the mean *preceſſion* to be one degree in ſeventy one years and an half. See Phil. Tranſ. N° 485. p. 22.

According to this eſtimate, the platonic or great year would be equal to 25740 ſolar years.

Sir Iſaac Newton, in determining the quantity of the annual *preceſſion* from the theory of gravity, upon ſuppoſition that the equatorial is to the polar diameter of the earth, as 230 is to 229, finds the ſun's action ſufficient to produce a *preceſſion* of $9''\frac{1}{8}$ only; and collecting from the tides the proportion between the ſun's force and the moon's to be as 1 to $4\frac{1}{2}$, he ſettles the mean *preceſſion* reſulting from their joint actions, at 50″. But ſince the difference between the polar and equatorial diameter is found, by the late obſervations of the gentlemen of the Royal Academy of Sciences at Paris, to be greater than what Sir Iſaac had computed it to be; the *preceſſion* ariſing from the ſun's action muſt likewiſe be greater than what he has ſtated it at, nearly in the ſame proportion. From whence it will follow, that the moon's force muſt bear a leſs proportion to the ſun's, than $4\frac{1}{2}$ to 1. See Dr. *Bradley* in Philoſoph. Tranſ. N° 485, pag. 37.

PREVENTERS, on board a ſhip of war, are ropes of different ſizes, cut into ſhort lengths, and knotted at each end, to be ready in caſe a ſhroud ſhould be ſhot or broke, that they may be ſeized to them. *Blanckley's* Naval Expoſitor, p. 123.

PRICKET, among ſportſmen. See the article SPITTER, *Append.*

PRICK-*Madam*, the name of a ſpecies of *Sedum*; the ſame with the yellow houſe-leek, with ſharp-pointed leaves. See the article SEDUM, *Suppl.*

PRICK-*Timber*, a name ſometimes given to the *Euonymus*, or ſpindle-tree. See the article EUONYMUS, *Suppl.*

PRIEST'S *Pintle*, in botany, a name by which *Arum*, or wake-robin is ſometimes called. See the article ARUM, *Suppl.*

PRIMROSE, the Engliſh name of a genus of plants, called by botaniſts *Primula veris*. See the article PRIMULA VERIS, *Suppl.*

PRIMROSE-*tree*, or *Night*-PRIMROSE, the Engliſh name of a genus of plants, known among authors by that of *Onagra*. See the article ONAGRA, *Suppl.*

PRINCIPLE *(Cycl.)* — Philoſophers and mathematicians are generally agreed in admitting that there are axioms, that is, certain indemonſtrable truths, which muſt be reckoned among the principles of human knowledge in the ſtricteſt ſenſe. Hobbes ſeems to advance the contrary, when he ſays, in his logic, or firſt part of his book de Corpore, that definitions, or their parts, are the only primary propoſitions *(propoſitiones primæ)* that is, *principles* in an abſolute and ſtrict ſenſe. But this doctrine of Hobbes cannot be admitted. For however true it may be in itſelf, and with reſpect to the divine mind, it ſeems certain, that the human mind has never yet attained, and perhaps never will attain to a perfect analyſis of its own notions in all caſes. And wherever this analyſis ceaſes, definitions ceaſe with it; and where definitions ceaſe, we are forced, if we would demonſtrate any thing of the undefined ſubject, to have recourſe to axioms, or to indemonſtrable truths admitted by all men, tho' never yet demonſtrated by any one. This will appear evident to thoſe who attentively conſider Euclid's Elements. This great geometer, it is known, does not, ſtrictly ſpeaking, define a right line; becauſe he could not probably, analyſe the notion of rectitude; for that which is commonly called his definition of a right line, in the beginning of his elements, is no definition, nor is it ever applied afterwards, as the definitions of an equilateral triangle, a ſquare, and a circle are. But to ſupply the place of a definition, he has aſſumed the axioms, that two right lines cannot comprehend a ſpace; and that they cannot have a common ſegment; and theſe axioms become of uſe more than once afterwards. No one has as yet been able to ſupply with ſucceſs what Euclid omitted to do; for tho' ſome, both ancients and moderns, have demonſtrated ſeveral very plain axioms, as that the whole is greater than its part, yet none have demonſtrated all the principles of extenſive magnitude aſſumed by Euclid, which Proclus and others choſe to diſtinguiſh by the name of *Poſtulata*. See the article POSTULATE, *Append.*

Hobbes brings this very inſtance of the demonſtration that a whole is greater than its part, to prove, that the propoſitions commonly called axioms, are not, ſtrictly ſpeaking, primary, but only ſecondary propoſitions, and really deducible from definitions. Had he attempted the demonſtration of all Euclid's axioms and poſtulata, he would ſoon have found that he had made a raſh induction; and what he gives for a demonſtration of the properties of parallels, evidently ſhews, how little able he was to ſupply what Euclid had omitted. What is here ſaid of Hobbes, may be applied to others who have attempted to refine upon Euclid, and who have been fond of carrying the analyſes of their demonſtrations beyond

him.

him. They have all ſhewn their inability of demonſtrating, without taking ſome axioms or poſtulata for granted; and indeed moſt of them expreſly admit this, only contending that the *principles* they aſſume are more evident than thoſe of Euclid. But whether they be ſo, or not, is of no importance to the preſent queſtion, which is, whether we are not often obliged to have recourſe to axioms, that is, to ſelf-evident, or indemonſtrable truths, in the ſtricteſt ſenſe; and whether theſe can be ſupplied by deductions, or ſyllogiſtic reaſoning, from definitions only. We ſhould not have taken any notice of this queſtion, had not Hobbes and other metaphyſicians and logicians of repute run counter to the common opinion.

But tho' we are forced to aſſume axioms and poſtulata in geometry, it may be a queſtion, whether any thing of this kind be neceſſary in arithmetic, or the ſcience of numbers; and whether the analyſes of our notions may not here be carried up to the notions of unity, and of the act of addition, *tamquam poſſibilia prima*; and whether it was not ſome conſideration of this kind that led Ariſtotle to ſay, that arithmetic was more accurate (ακριβεστερον) than geometry. It is certain at leaſt, that the analyſis may be, though it ſeldom is, carried farther in the former than in the latter of theſe ſciences. Becauſe the axioms commonly aſſumed, and peculiar to arithmetic, ſuch as the addition and multiplication tables, are no more than the aggregates of the ſimple ſigns, or ſimple notations of numbers; and may eaſily be demonſtrated from the definitions of the ſimple ſigns made uſe of; ſuch as that $1 + 1 = 2$; $2 + 1 = 3$; $3 + 1 = 4$, &c.

Biſhop Berkeley [a] obſerves very juſtly, that the *principles* of ſcience are neither objects of ſenſe nor imagination, but notions of relation, that is, acts of the mind. Thus, ſpace, time, number [b] are not objects of ſenſe or imagination, altho' the things coextended with ſpace or time, or things numbered, be objects of ſenſe. This is moſt evident in number, which is plainly different from the perception of the things numbered. Nor can the act by which we number be taught or exemplified. For inſtance, that act of the mind by which we conceive $1 + 1 = 2$, cannot be explained or analyſed into others; and ſuppoſing it could, we muſt ſtill ſtop ſomewhere, and wherever that be, there is ſomething a diſciple muſt have *a ſe*, *non a præceptore*, as Ariſtotle ſays. So that, ſtrictly ſpeaking, *principles* are not taught. And thoſe who maintain them innate, are perhaps not ſo abſurd as Locke pretends. [[a] Reflections on Tar-water, Art. 264. [b] Ibid. Art. 288.]

Leibnitz maintained, that the *principles* of contradiction, and of a ſufficient reaſon, were the foundations of all ſcience; that the firſt was ſufficient for the demonſtration of all neceſſary, and the other of all contingent, truths. But though it be true, that the *principle* of contradiction, that is, the *reductio ad abſurdum*, often occurs expreſly, and is oftner implied in geometry, yet by what has been ſaid it appears, that this *principle* alone is not ſufficient to demonſtrate all the other univerſally received *principles* of that ſcience. Far leſs is it true, that we are enabled by the *principle* of a ſufficient reaſon, which amounts to the excluſion of pure chance out of the univerſe, to demonſtrate all phyſics and morals; but additional *principles* derived from experience, muſt be aſſumed.

PRIVIES *of a Camp*. See the article CAMP, *Append.*

PRIVET *(Suppl.)* — *Mock* PRIVET, a name ſometimes given to the *Phillyrea* of botaniſts. See the article PHILLYREA, *Suppl.*

PROCELLARIA, in ornithology, the name uſed in the Stockholm Tranſactions, and elſewhere, for the *ſtorm-fink*, or *ſtorm-bird*. See STORM, *Suppl.* and PETREL, *Append.*

PROBABILITY *(Cycl.)* — In the doctrine of *Probability*, one important obſervation may be made, *viz.* that if one premiſs only of an argument be probable, the concluſion is neceſſarily probable. But if two or more premiſſes be *probable* the concluſion will not be neceſſarily *probable*. Thus for inſtance, ſuppoſing the *Probability* of each premiſs expreſſed by $\frac{7}{10}$, the *Probability* of the concluſion will be but $\frac{49}{100}$, which ſhews it to be improbable. For we may call any thing *improbable*, if the meaſure of the chance for its happening is leſs than $\frac{1}{2}$. If there had been three premiſſes, and the *Probability* of each equal to $\frac{7}{10}$, the *Probability* of the concluſion would be $\frac{343}{1000}$, which is conſiderably improbable. Again, ſuppoſing the *Probability* of the truth of each premiſs to be 2 to 1 or expreſſed by $\frac{2}{3}$, the probability of the concluſion in the caſe of the two premiſſes would be $\frac{4}{9}$. Where three premiſſes are aſſumed to infer a concluſion, this would be $\frac{8}{27}$; and in caſe of four premiſſes, the *Probability* of the concluſion would be but $\frac{16}{81}$, which is leſs than $\frac{1}{5}$, ſo that one might with advantage lay 4 to 1 againſt the truth of a concluſion founded on four probable premiſſes, for the truth of which ſeparately taken 2 to 1 might be laid. It is to be obſerved in all theſe caſes, that the premiſſes are ſuppoſed independent, that is, not neceſſarily connected with each other.

Hence it is eaſy to account, how it happens, that the moſt plauſible political and phyſical reaſonings, lead ſo often to concluſions falſe in fact.

Mr. de Moivre has ſolved two problems, tending to eſtabliſh the degree of aſſent that ought to be given to experience. He determines from his ſolutions, that if after taking a great number of experiments, it ſhould have been obſerved, that the happenings or failings of an event have been very near in a ratio of equality, it may ſafely be concluded, that the *Probabilities* of its happening or failing, at any one time aſſigned, are very near equal.

And if after taking a great number of experiments, it ſhould be perceived, that the happenings and failings have been nearly in a certain proportion, ſuch as 2 to 1, it may ſafely be concluded, that the *Probabilities* of happening or failing at any one time aſſigned, will be very near in that proportion; and that the greater the number of experiments has been, ſo much the nearer the truth will the conjectures be, that are derived from them.

Chance very little diſturbs the events which, in their natural inſtitution, were deſigned to happen or fail according to ſome determined law. For if in order to help our conception we image a round piece of metal, with two poliſhed oppoſite faces, differing in nothing but their colour, whereof one may be ſuppoſed to be white and the other black, it is plain that this piece may with equal facility exhibit a white or black face; and we may even ſuppoſe that it was framed with that particular view of ſhewing ſometimes the one face, ſometimes the other; and that conſequently, if it be toſſed up, chance will decide the appearance. But altho' chance may produce an inequality of appearance, and that a greater inequality, according to the length of time in which it may exert itſelf, ſtill the appearance, either one way or the other, will perpetually tend to a proportion of equality. This is, in like manner applicable to a ratio of inequality; and thus in all caſes it will be found, that although chance produces irregularities, ſtill the odds will be infinitely great, that in proceſs of time, thoſe irregularities will bear no proportion to the recurrency of that order which naturally reſults from original deſign. See *De Moivre*'s Doctrine of Chances, p. 231. — 243.

PROBLEM *(Cycl.)* — *Kepler*'s PROBLEM *(Cycl.)* — As to the ſolution of this *problem*, the late excellent mathematician Mr. Machin obſerves, that many attempts have been made, at different times, but never yet with tolerable ſucceſs, towards the ſolution of the *problem* propoſed by Kepler: To divide the area of a ſemicircle into given parts, by a line from a given point of the diameter, in order to find an univerſal rule for the motion of a body in an elliptic orbit. For among the ſeveral methods offered, ſome are only true in ſpeculation, but are really of no ſervice. Others are not different from his own, which he judged improper. And as to the reſt, they are all ſome way or other ſo limited and confined to particular conditions and circumſtances, as ſtill to leave the *problem* in general untouch'd. To be more particular, it is evident, that all conſtructions by mechanical curves are ſeeming ſolutions only, but in reality unapplicable; that the roots of infinite ſerieſes are, upon account of their known limitations in all reſpects, ſo far from affording an appearance of being ſufficient rules, that they cannot well be ſuppoſed as offered for any thing more than exerciſes in a method of calculation. And then, as to the univerſal method, which proceeds by a continued correction of the errors of a falſe poſition, it is, when duly conſidered, no method of ſolution at all in itſelf; becauſe unleſs there be ſome antecedent rule or hypotheſis to begin the operation (as ſuppoſe that of an uniform motion about the upper focus, for the orbit of a planet; or that of a motion in a parabola for the perihelion part of the orbit of a comet; or ſome other ſuch) it would be impoſſible to proceed one ſtep in it. But as no general rule has ever yet been laid down to aſſiſt this method, ſo as to make it always operate, it is the ſame in effect as if there were no method at all. And accordingly in experience it is found, that there is no rule now ſubſiſting but what is abſolutely uſeleſs in the elliptic orbits of comets; for in ſuch caſes there is no other way to proceed but that which was uſed by Kepler. To compute a table for ſome part of the orbit, and therein examine if the time to which the place is required, will fall out any where in that part. So that, upon the whole, it appears evident, that this *problem* (contrary to the received opinion) has never yet been advanced one ſtep towards its true ſolution. Vid. *Machin*, in Phil. Tranſ. N° 447. and Martyn's Abridg. Vol. 8. p. 73.

Mr. Machin afterwards proceeds to give his own ſolution of this *problem*, which is particularly neceſſary in orbits of a great excentricity; and he illuſtrates his method by examples, for the orbits of Mercury, of Venus, of the Comet of the year 1682, and of the great Comet of the year 1680, all which ſhew the univerſality of that method. See Phil. Tranſ. loc. cit.

PROPERTY *(Cycl.)* — In the law of England, ſtrictly ſpeaking, that which is called an *eſtate* in lands and tenements, is termed a *property* in perſonal chattels, the law conſidering the firſt as permanent, the other as temporary and precarious. Peer Williams's Reports, p. 3.

PROSCARABÆUS, in zoology, the name by which ſome call the *Meloe*, a genus of four-winged flies. See the article MELOE, *Append.*

PSEUDO-*Fumaria*, in botany, a name uſed by ſome for a ſpecies of *Fumitory*. See the article FUMARIA, *Suppl.*

PSEUDO-*Lotus*, in botany, a name by which ſome call the *Guaiacana* of Tournefort. See the article GUAIACANA, *Suppl.*

PSEUDO-*Viburnum*, in botany, the name given by Rivinus to a ſpecies of *Lantana*. See the article LANTANA, *Suppl.*

PUDDING-*graſs*, a name by which the *pulegium*, or penny-royal, a ſpecies of mint, is called. See the articles MENTHA and MINT, *Suppl.*

PUDDING-*pipe-tree*, the Engliſh name of a genus of plants, called by botanical writers *Caſſia*. See the article CASSIA, *Suppl.*

PUDENDUM-*regale*, a name uſed by Columna for the *Aphrodita*, a genus of ſea-inſects. See the article APHRODITA, *Append.*

PULEX-*Aquaticus*, the *water-flea*, a name ſometimes uſed for the water beetles. See the article DYTISCUS, ſupra.

PULMONES-*marini*, in zoology, a name uſed by ſeveral authors for the *Urticæ marinæ*. See the article URTICA *marina*, *Suppl.*

PUMP (*Cycl.*) — The deſcription of the *Forcing-pump*, given in the Cyclopædia, is erroneous. This kind of *Pump* conſiſts of a barrel, in which there is a forcer, that is, a piſton, or embolus without a valve, which moves up and down in the barrel. This communicates with two pipes, the one called a *ſucking pipe*, which goes down into the well, and the other called a *forcing pipe*, which goes upwards. There are two valves; the one at any place of the ſucking pipe, the other in the forcing pipe, both of which let the water go up, and hinder it from going down. Then when the forcer is moved upwards, as it rarifies the air in the ſucking pipe (for the valve in the forcing pipe hinders the outward air, which preſſes upon it, from going through) the water riſes in it, till after ſeveral ſtrokes it comes to the forcer; then at every time the forcer goes down, the water that is preſſed downwards, being hindered from going through the valves of the ſucking pipe, opens and goes through the valves in the forcing pipe. When the forcer goes up again, then the water in the forcing pipe ſhuts the valves there by its preſſure, and conſequently the water in the well will riſe up in the part of the forcing pipe, between that valve and the ſucking pipe; and the ſame happens at every motion of the forcer.

It is to be obſerved in the *Forcing-pump*, that the nearer the forcer comes to the well, the better it is. See *Deſagulier*'s Courſe of Experim. Philoſ. p. 160, 161.

As to the various kinds of *Forcers*, ſee the article FORCER *Append.*

The *Pump* deſcribed in the Cyclopædia, under the name *Forcing-pump*, is properly a *lifting-pump*; and the common *Pump*, which works by the preſſure of the air, is called a *Sucking-pump*. Dr. Deſaguliers, in his courſe of Experimental Philoſophy, [a] has given a full account of the conſtruction of of all theſe kinds of *Pumps*, and of ſome others more complex; as alſo of their buckets, valves, and other parts belonging to them. [[a] Vol. 2. p. 152, to 166.]

Air-PUMP. See the article AIR-*pump*, *Cycl.*

There are ſeveral inconveniencies attending AIR-*pumps* of the common form, tho' much improved from what they uſed to be formerly. Theſe inconveniencies are enumerated, and a method ſhewn to remedy them, by Mr. *Smeaton*, in the Phil. Tranſ. Vol. 47. p. 415, ſeq.

This ingenious artiſt has ſucceeded ſo well in his conſtruction of the *Air-pump*, as to be able to rarify air a thouſand times; whereas the beſt of the common *Air-pumps*, eſteemed good in their kind, and in complete order, never rarified it above one hundred and forty times.

Mr. Smeaton's *Air-pump* acts alſo as a condenſing engine, by the very ſimple apparatus of turning a cock. So that this *Air-pump* is an univerſal engine, for ſhewing any effect ariſing from an alteration in the denſity or ſpring of the air, and with a little addition may be made to ſhew the experiments of the air-fountain, wind-gun, &c. See the Phil. Tranſ. loc. cit. p. 422, ſeq.

PUMPELMOES, a name ſometimes uſed for a ſpecies of Orange. See the article ORANGE, *Suppl.*

PURGING-*nut*, or *Phyſic-nut*, the name by which ſome call the *Ricinoides*, a diſtinct genus of plants. See the article RICINOIDES, *Suppl.*

PURPLE-*wort*, a name given to ſeveral ſpecies of trefoil, of a purple colour. See the article TREFOIL, *Suppl.*

PURSLAIN (*Suppl.*)—*Sea*-PURSLAIN, a name by which ſome call two very different genuſes of plants, the *Atriplex* and *Chenopodium*. See the articles ATRIPLEX and CHENOPODIUM, *Suppl.*

PUTREFACTION (*Suppl.*) — It is an obſervation of Lord Bacon, that an inquiry into the means of preventing or ſtaying *putrefaction*, is of excellent uſe in phyſic. Dr. Pringle has made a great many curious experiments and remarks on this ſubject, which are publiſhed by way of Appendix to his Obſervations on the Diſeaſes of the Army.

Putrefaction is one of the inſtruments of nature, by which many great changes are brought about. With regard to medicine, we know that neither animal nor vegetable ſubſtances can become aliment, without undergoing ſome degree of *Putrefaction*. Many diſtempers proceed from a deficiency of this action. The criſis of fevers ſeems to depend upon it; and even animal heat, according to Dr. Stevenſon, does the ſame. See the article HEAT, *Suppl.*

Now, that the concoction of the humours is nothing elſe but *Putrefaction*, ſeems probable from hence, that whenever they are in that ſtate, they are always more fluid, and fitter to paſs through the ſmaller veſſels, where they ſtagnated before. Again, the offenſiveneſs of the ſweats, or other excretions conſequent on a criſis, is likewiſe a ſure ſign of a high degree of corruption. The time of reſolution or *Putrefaction* depends on the degree of heat, the habit of the patient, and on the part obſtructed. Reſolution is the *Putrefaction* of the impacted humour only, but ſuppuration implies a corruption of the veſſels alſo. This manner of ſpeaking, indeed, has been diſuſed, from the prejudice that nothing was putrid but what was offenſively ſo; whereas, in fact, every fibre becoming more tender, and humour thinner, may be conſidered as putrid in ſome degree, whether the change tends to the better health, or to the deſtruction of the perſon, or whether it becomes grateful or offenſive to the ſenſes. *Pringle*, Obſerv. on Diſeaſ. of the Army. p. 337.

Mr. Boyle has uſed the words *fermentation* and *Putrefaction* of the blood promiſcuouſly, in his treatiſe on the human blood. Stahl and other celebrated chemiſts likewiſe uſe the terms *putrid ferment*. See the article FERMENT, *Suppl.* *Putrefaction* is always found to generate air. Hence, though fleſh, as well as blood, be ſpecifically heavier than water, yet dead bodies are found to float, after lying ſome time at the bottom, from air generated in the bowels by *Putrefaction*. Now, as it has been found by experiments, that the blood and other animal ſubſtances begin to emit air, before they are ſo far corrupted, as the ſame frequently are in putrid diſeaſes, it is probable that ſeveral of the ſymptoms in deep ſurfeits may be owing to the action of the confined air.

As all the humours of animal bodies become thinner by *Putrefaction*, ſo the ſolid or fibrous parts are thereby relaxed or rendered more tender. And hence the extraordinary bulk of the heart, liver, and ſpleen, incident to perſons labouring under putrid diſeaſes, may be accounted for. It is remarkable, that in diſſections of people who die of the plague, the heart is almoſt always found of an uncommon bigneſs; and as to the ſcurvy, the liver and ſpleen are ſometimes inlarged to ſuch a degree, that the tumour may be ſeen outwardly. Id. ibid. p. 391, ſeq.

It being a received opinion, that bodies become highly alkaline by *Putrefaction*, the Doctor made the following experiments, in order to diſcover how far this might be true.

The ſerum of human blood *putrified*, made, with a ſolution of ſublimate, firſt a turbid mixture, and afterwards a precipitation; which is indeed one of the teſts of an alkali, but not to be admitted here, ſince the ſame thing was done with the recent urine of a perſon in perfect health, which is never accounted alkaline. The ſame ſerum did not tinge the ſyrup of violets green, and made no efferveſcence when the ſpirit of vitriol was poured upon it. The experiment was twice made upon portions of different ſerums, both highly putrid; and once on water, in which corrupted fleſh had been ſometime infuſed; and the moſt that could be found was, that a reddiſh caſt having been previouſly given to the ſyrup with an acid, this colour was rendered fainter, but not deſtroyed by the *putrid* humours. And as to efferveſcence, the ſpirit of vitriol being dropped into thoſe liquors unmixed, and alſo diluted with water, the mixture was quiet, and only a few air-bubbles appeared on ſhaking the glaſſes.

Upon the whole, though there were ſome marks of a latent alkali in the putrid ſerum, they were ſo very faint, that a quantity of water equal to that of the putrid liquors, mixed with only one drop of ſpirit of hartſhorn, being put to the ſame trial, ſhewed more of an alkaline nature, than any of the other.

It has alſo been a maxim, that all animal ſubſtances, after *Putrefaction*, being diſtilled, ſend forth a great quantity of volatile ſalt in the firſt water; but Mr. Boyle found, that this held good only in urine; and that in the diſtillation of the ſerum of human blood *putrefied*, the liquor which came over firſt had little ſtrength, either as to its ſmell or taſte, and did not at firſt efferveſce with an acid. And here it may be obſerved, that the chemiſts have generally applied thoſe properties which they diſcovered in urine, to all the humours indifferently; whereas, in fact, there is a great diverſity: for ſome animal ſubſtances, ſuch as urine, the bile, and the craſſamentum of the blood, ſoon putrefy; the ſerum, the ſaliva, and the white of an egg, ſlowly. Yet thoſe that ſooneſt corrupt, do not always arrive at the higheſt degree of *Putrefaction*: thus, the bile is ſooneſt corrupted, but the rankneſs of it is not to be compared to that of fleſh; and the white of an egg is not only much leſs diſpoſed to putrify than the yolk, but when corrupted, yields a different and leſs offenſive ſmell.

Doctor Pringle farther obſerves, that it ſeems peculiar to ſtale urine to contain an alkaline ſalt, which, without diſtillation,

makes a ſtrong efferveſcence with acids. Whereas moſt other animal humours putrefied, though of a more intolerable feltor, yet contain leſs volatile ſalt, leſs extricable, and then not efferveſcing with acids. But, what makes the difference between ſtale urine, and other putrid ſubſtances ſtill more ſpecific, is its inoffenſiveneſs with regard to health; whilſt the ſteams of moſt other corrupted bodies are often the cauſe of putrid and malignant diſeaſes. So far then from dreading the volatile alkali as the deleterious part of corrupted bodies, it ſhould rather ſeem to be a corrector of *Putrefaction*. *Pringle* obſerv. on the diſ. of the army.

But ſtill there remains a prejudice, as if theſe ſalts being the produce of corruption, ſhould therefore haſten *Putrefaction*; and that not only in diſtempers where they are unwarily taken, but alſo in experiments out of the body. As to the effects ariſing from the internal uſe of them, little can be ſaid, unleſs the kind of diſeaſe were preciſely ſtated: for ſuppoſing theſe ſalts were by their nature diſpoſed to promote *Putrefaction*; yet if that is already begun, from a languor of circulation, and obſtruction, then may the volatiles, by their ſtimulating and apperient qualities, be the means of ſtopping its progreſs; and, on the other hand, though they were really antiſeptic, yet, if the humours are diſpoſed to corrupt, from exceſs of heat or motion, theſe very ſalts by adding to the cauſe, may augment the diſeaſe. So that upon the whole, it ſeems to be the faireſt criterion of the true nature of theſe volatiles, to enquire whether they accelerate or retard *Putrefaction* out of the body.

In order to decide this queſtion, repeated experiments were made, by joining both the ſpirit and the ſalt of hartſhorn to various animal ſubſtances; and it was conſtantly found, that ſo far from promoting *Putrefaction*, they evidently hindered it, even more powerfully than common ſea-ſalt. Hence, the Doctor thinks it probable, that the ſame taken by way of medicine, will likewiſe prove antiſeptic; or at leaſt, that we cannot juſtly ſuppoſe them corrupters of the humours, more than fermented ſpirits or ſea-ſalt.

With regard to the *Putrefaction* of dead bodies, it is found that ſome parts corrupt much ſooner than others. Thus, as the abdominal viſcera and muſcles corrupt the ſooneſt, it is a rule with anatomiſts, to begin their diſſections and demonſtrations with thoſe parts, the quick *Putrefaction* of which may be aſcribed to the putrid ſteams of the fæces. Next to the abdominal viſcera and adjacent parts, the lungs are commonly ſooneſt tainted; either from the air ſtagnating in the veſiculæ bronchiales, or from ſome remains of perſpirable matter, that by acting as a ferment, may haſten the *Putrefaction*. Id. ibid. p. 392.

It is obſervable, that the *Putrefaction* of meat, and other ſubſtances, advances quicker in a confined than free air; for, as the moſt putrid parts are alſo the moſt fugitive, they inceſſantly iſſue from a corruptible ſubſtance, and diſperſe with the wind; but, in a ſtagnation of air, they remain about the body; and, in the nature of a ferment, excite its corruption.

Putrefaction is one cauſe of bilious and intermitting fevers, the dyſentery, malignant or peſtilential fevers, the ſcurvy, lepra Arabum, &c. See the articles BILIOUS, DYSENTERY, MALIGNANT, &c. *Append.*

Thoſe ſubſtances which reſiſt *Putrefaction*, are called *Antiſeptics*, and the promoters of it *Septics*. See the articles ANTISEPTICS and SEPTICS, *Append.*

Putrefaction of the blood. See the article BLOOD, *Append.*

PUTRID *ferment.* See the article FERMENT, *Suppl.*

PUTRID *fever.* See the articles BILIOUS and MALIGNANT.

PUTREFIERS, among phyſicians, the ſame with *Septics*. See the article SEPTICS, *Append.*

PYE, or MAGPYE, in ornithology. See the article PICA, *Suppl.*

Sea-PYE, in ichthyology, the Engliſh name of the *Pica marina*. See the article PICA *marina*.

PYROMETER, the name of a machine contrived to meaſure the alteration of the dimenſions of metals, ariſing from heat.

Muſchenbroek, who was the original inventor of this machine, has given a table of the expanſion of the different metals, in the ſame degree of heat. See the article HEAT, *Append.*

As to the conſtruction of the *Pyrometer*, the curious may conſult Deſagul. Experim. Philoſoph. p. 421, ſeq.

But it has been obſerved, that Mr. Muſchenbroek's *Pyrometer* was liable to ſome objections, and theſe have been removed, in a good meaſure, by Mr. Ellicott, who has given a deſcription of his improved *Pyrometer* in the Philoſophical Tranſactions, N° 443. This may alſo be ſeen in Dr. Martyn's Abridgment, vol. 8. p. 464.

In this *Pyrometer* the lengthening of a bar of metal by heat $\frac{1}{25}$ of an inch, will carry an index once round a circle divided into 360 degrees, ſo that if the metal lengthens the 7200th part of an inch, the index will move one degree. ibid.

By the help of this inſtrument Mr. Ellicott found, upon a medium, that the expanſions of bars of different metals, as nearly of the ſame dimenſions as poſſible, by the ſame degree of heat, were as follows:

Gold,	Silver,	Braſs,	Copper,	Iron,	Steel,	Lead,
73	103	95	89	60	56	149

The great difference between the expanſions of iron and braſs, has been applied with good ſucceſs to remedy the irregularities in pendulums ariſing from heat. Phil. Tranſ. Vol. 47. p. 485. See the articles HEAT and PENDULUM, *Append.*

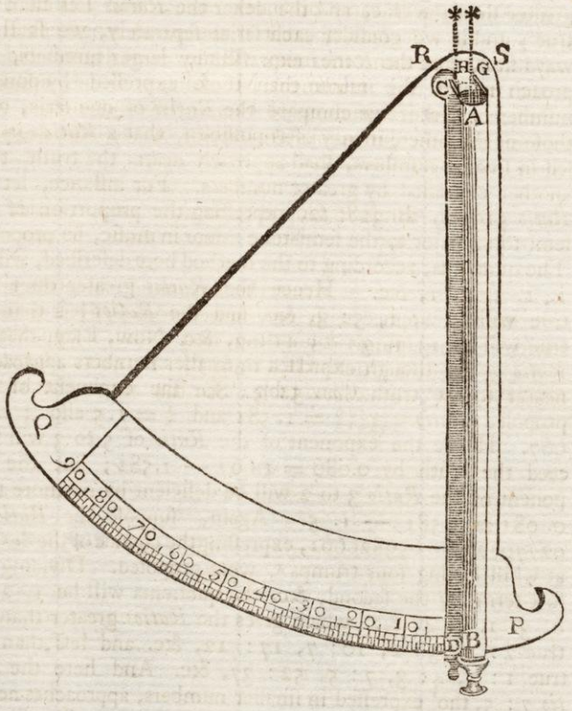
PYTHAGORIC, or *Abacus* table. See the article TABLE, *Cycl.*

Q.

QUADRANT *(Cycl.)* — *Davis*'s QUDDRANT. When the horizon is obſcured by hazy weather, *Davis*'s *Quadrant* is of no uſe; and this often occaſions melancholy conſequences. Means have therefore been ſought after to remedy this defect. Mr. Leigh propoſes a water-level to be fixed to the *Quadrant*; and he likewiſe has given the deſcription and uſe of an apparatus to be added to this inſtrument, conſiſting of a mercurial level, which he prefers, no doubt juſtly, to a water-level. See Phil. Tranſ. N° 431. Sect. 1 and 2.

Hadley's QUADRANT, the common name for the juſtly eſteemed *Quadrant*, invented by the late John Hadley, Eſq; This *Quadrant*, which at firſt had the fate of all other ingenious inventions, to be neglected by ignorant and obſtinate men, even though highly uſeful to them in their profeſſion, ſeems at laſt to have made its way, in ſpite of habit and prejudice.

We cannot here inſert a full deſcription and draught of this inſtrument; but we muſt obſerve, that though the late Mr. Hadley was undoubtedly the inventor of it, yet the principle upon which his invention turns, had not eſcaped the ſagacity of Sir Iſaac Newton, long before, as appears from a paper in his hand-writing found among the papers of the late Dr. Halley. But this was totally unknown to Mr. Hadley, and ſeemed to have been forgot by Dr. Halley himſelf. The account of Sir Iſaac's invention is inſerted in the Philoſophical Tranſactions, N° 465, and in Dr. Martyn's Abridgment, vol. 8. p. 129. and is as follows:



P Q R S denotes a plate of braſs accurately divided in the limb D Q, into $\frac{1}{2}$ degrees, $\frac{1}{2}$ minutes, and $\frac{1}{12}$ minutes, by a diagonal ſcale; and the $\frac{1}{2}$ degrees, $\frac{1}{2}$ minutes, and $\frac{1}{12}$ minutes, counted for degrees, minutes, and $\frac{1}{6}$ minutes. A B is a teleſcope, three or four feet long, fixed on the edge of the braſs plate. G is a ſpeculum, fixed on the ſaid braſs plate perpendicularly, as near as may be to the object glaſs of the teleſcope, ſo as to be inclined 45 degrees to the axis of the teleſcope, and intercept half the light which would otherwiſe come through the teleſcope to the eye. C D is a moveable index, turning about the center C, and, with its fiducial edge, ſhewing the degrees, minutes, and $\frac{1}{6}$ minutes, on the limb of the braſs plate P Q; the center C, muſt be over-againſt the middle of the ſpeculum G. H is another ſpeculum, parallel to the former, when the fiducial edge of the index falls on $00^d\ 00'\ 00''$; ſo that the ſame ſtar may then appear through the teleſcope, in one and the ſame place, both by the direct rays and by the reflected ones; but if the index be turned, the ſtar will appear in two places, whoſe diſtance is ſhewed, on the braſs limb, by the index.

By this inſtrument the diſtance of the moon from any fixed ſtar is thus obſerved: view the ſtar through the perſpicil by the direct light, and the moon by the reflected (or, on the contrary) and turn the index till the ſtar touch the limb of the moon, and the index ſhall ſhew upon the braſs limb of the inſtrument, the diſtance of the ſtar from the limb of the moon; and though the inſtrument ſhake, by the motion of your ſhip at ſea, yet the moon and ſtar will move together, as if they did really touch one another in the heavens; ſo that an obſervation may be made as exactly at ſea as at land. And, by the ſame inſtrument may be obſerved, exactly, the altitudes of the moon and ſtars, by bringing them to the horizon; and thereby the latitude, and times of obſervations, may be determined more exactly than by ways formerly practiſed. In the time of obſervation, if the inſtrument move angularly about the axis of the teleſcope, the ſtar will move in a tangent of the moon's limb, or of the horizon; but the obſervation may notwithſtanding be made exactly, by noting when the line, deſcribed by the ſtar, is a tangent to the moon's limb, or to the horizon. To make this inſtrument uſeful, the teleſcope ought to take in a large angle: And to make the obſervation true, let the ſtar touch the moon's limb, not on the outſide of the limb, but on the inſide. Vid. Philoſoph. Tranſact. N° 465. p. 155, 156.

For the common uſes at ſea a teleſcope is not neceſſary; Mr. Hadley's Quadrants are therefore generally made without one, which renders the uſe of them much more ready. He has alſo added ſome contrivances to facilitate their uſe; which are deſcribed in the printed papers uſually ſold with the inſtrument: Other *Quadrants* have been contrived ſince, by ſome ingenious artiſts, all of which have their merit, but the particulars of their conſtructions are too many for this place; and perhaps on the whole nothing preferable to Mr. Hadley's invention has yet been found.

Mural QUADRANT. Mr. Gerſten has lately given us a deſcription of a new aſtronomical *mural Quadrant*, which he ſays is free from many of the uſual inconveniencies attending the uſe of ſuch inſtruments. See Phil. Tranſ. N° 483. Sect. 18.

QUADRIGA, in ſurgery, otherwiſe called CATAPHRACTA, is a ſtrong bandage made uſe of in fractures of the *Sternum*. It is compoſed of a double headed roller about ſix Paris ells long, and three or four fingers broad. See *Heiſter*'s Surgery, P. III. Ch. 4. §. 14.

QUADRILLE, a well known game at cards; and which has been, in ſeveral caſes, the object of mathematical computations. See Mr. *De Moivre*'s Doctrine of Chances, 2d edit. p. 83 to 90.

QUAKING-*graſs*, in botany. See the article GRASS, *Append.*

QUANTITY *(Cycl.)* — The note in the Cyclopædia, from Mr. Machin's paper in the Phil. Tranſ. N° 447. ſhould have been extended, as it ſerves to render the notions of mathematical *Quantity* more diſtinct and adequate than any thing that is commonly to be met with in authors on this ſubject. Not to give the reader the trouble of turning to the Cyclopædia for the ſake of a few lines, we ſhall inſert the whole. Mr. Machin, in the poſtſcript to the ſolution of Kepler's problem, inſerted in the before cited number of the Phil. Tranſ. ſays,

That he takes a mathematical *Quantity*, and that for which any ſymbol is put, to be nothing elſe but number with regard to ſome meaſure which is conſidered as one. For we cannot know preciſely and determinately, that is, mathematically, how much any thing is but by means of number. The notion of continued *Quantity*, without regard to any meaſure, is indiſtinct and confuſed; and although ſome ſpecies of ſuch *Quantity*, conſidered phyſically, may be deſcribed by motion, as lines by points, and ſurfaces by lines, and ſo on; yet the magnitudes or mathematical *Quantities* are not made by that motion, but by numbering according to a meaſure.

Accordingly, all the ſeveral notations that are found neceſſary to expreſs the formations of *Quantities*, do refer to ſome office or property of number or meaſure; but none can be interpreted to ſignify continued *Quantity* as ſuch.

Thus ſome notations are found requiſite to expreſs number in its ordinal capacity, or the *numerus numerans*, as when one follows or precedes another, in the firſt, ſecond, or third place from that upon which it depends; as the *Quantities* $x^{\prime}$, $x^{\prime\prime}$, x, x', x'', referring to the principal one x.

So, in many caſes, a notation is found neceſſary to be given to a meaſure as a meaſure; as for inſtance, Sir Iſaac Newton's ſymbol for a fluxion $\dot{x}$; for this ſtands for a meaſure of ſome kind, and accordingly he uſually puts an unit for it, if it be the principal one upon which the reſt depend.

So ſome notations are expreſly to ſhew a number in the form of its compoſition, as the index to the geometrical power x^n, denoting the number of equal factors which go to the compoſition of it, or what is analogous to ſuch.

But that there is no ſymbol or notation but what refers to diſcreet *Quantity*, is manifeſt from the operations, which are all arithmetical.

And hence it is, there are ſo many ſpecies of mathematical *Quantity* as there are forms of compoſite numbers, or ways in the compoſition of them; among which there are two more eminent for their ſimplicity and univerſality than the reſt; one is the *geometrical power*, formed from a conſtant root; and the other, though well known, yet wanting a name, as well

well as a notation, may be called the *arithmetical power*; or the power of a root uniformly increaſing or diminiſhing. This is the Power whoſe notation is deſigned in the article *Arithmetical* POWER, *Append.*

QUARTER *(Cycl.* and *Suppl.)* — QUARTER-*round*, in architecture, denotes any moulding whoſe contour is either a perfect quadrant, or *Quarter* of a circle, or that approaches near to that figure. Build. Dict. in voc.

QUARTERS, — *Winter*-QUARTERS, in military affairs. *Winter-Quarters*, when cold and moiſt, are productive of inflammatory diſorders, particularly hard coughs, with inflammations of the pleura and lungs. See the article BARRACKS, *Append.*

In very hot countries it has ſometimes been cuſtomary, to put armies into *Summers quarters.*

QUEEN'S *Gilliflower*, the name by which ſome call the *Heſperis* of botanical writers. See the article HESPERIS, *Suppl.*

QUICK, the name by which ſome call a ſpecies of *Meſpilus*, or medlar. See the article MESPILUS, *Suppl.*

QUICK-*beam*, a name ſometimes given to the *Sorbus*, or ſervice-tree. See the article SORBUS, *Suppl.*

QUICK-*graſs*, the Engliſh name of a genus of plants, called by Linnæus *Agroſtis*. See the article AGROSTIS, *Suppl.*

QUICKEN-*tree*, a name alſo given to the *Sorbus*.

QUICKSILVER-*water*. See the article WATER, *Append.*

R.

RAR

RADICULA, in botany, the name by which Dillenius calls the *Siſymbrium* of other botaniſts. See the article SISYMBRIUM, *Suppl.*

RADISH *(Suppl.) Horſe*-RADISH, a popular name for a ſpecies of *Cochlearia*, or ſcurvy graſs. See the article COCHLEARIA, *Suppl.*

Water-RADISH, the name by which ſeveral ſpecies of *Siſymbrium* are ſometimes called. See the article SISYMBRIUM, *Suppl.*

RADIUS *of Concavity*, in geometry, is ſometimes uſed [a] for the *Radius* or ray of curvature, or the *Radius* of the oſculatory circle. See the article CURVATURE, *Append.* [[a] De Moivre, Miſcel. Analyt. p. 231.]

RADIUS *of Curvature*, in geometry. See the article CURVATURE.

RADIUS *Oſculi* is alſo uſed in the ſame ſenſe.

RADIUS *Vector*, in mechanics, is uſed for a right line drawn from the center of force in any curve in which a body is ſuppoſed to move by a centripetal force, to that point of the curve where the body is ſuppoſed to be. See the article *Central* FORCE, *Append.*

RAGGED *Robin*, a name uſed ſometimes for the *Lychnis*. See the article LYCHNIS, *Suppl.*

RAIN *(Suppl.)* — Beſides the cauſes of rain mentioned in the Cyclopædia, Deſaguliers thinks it owing to the loſs of electricity in the vapours whereof the clouds are formed. See the articles VAPOUR and ELECTRICITY, *Append.*

RAISING *Pieces*, in carpentry, the pieces which lie on the tops of the poſts and punchions, and under the beams; thoſe lying on the brick work being called platbands. Build. Dict. in voc.

RAMMER *for piles*. See the article PILE, *Append.*

RAMPHASTOS, in ornithology, the name by which Dr. Hill calls the *Toucan* of other writers. See the article TOUCAN, *Suppl.*

The *Ramphaſtos* is a diſtinct genus of birds, of the *Pica*, or magpie kind. Its beak is remarkably large, equal, in moſt ſpecies to the whole body in magnitude. There are no viſible noſtrils. The feet have each four toes, two of which ſtand forward, and the other two backward, as in the parrot. *Hill*, Hiſt Anim. p. 381. The ſpecies are theſe: 1. The *Ramphaſtos* with a red rump 2. The *Ramphaſtos* with a yellow rump. 3. The *Ramphaſtos* with a white rump. 4. The green *Ramphaſtos*, with a party-coloured beak.

Theſe birds have been called by Linnæus, and other writers, *Roſtratæ*, from the largeneſs of their beaks.

RAMPION is alſo a name given to the blue-flowered *Campanula*, or bell-flower, with an eſculent root. See the article CAMPANULA, *Suppl.*

RAMSONS, a name given to the broad-leaved wild *Allium*, or Garlick. See the article GARLICK, *Suppl.*

RANGLE, in falconry, is when gravel is given a hawk to bring her to her ſtomach. Dict. Ruſt. in voc.

RANUNCULUS *(Suppl.)* — *Globe*-RANUNCULUS, a name ſometimes given to a ſpecies of *Hellebore*. See the article HELLEBORUS, *Suppl.*

RAPE, a name ſometimes uſed for the *Napus*, or navew. See the article NAPUS, *Suppl.*

Wild-RAPE, the Engliſh name of a genus of plants, called by botaniſts *Rapiſtrum*. See the articles RAPISTRUM, *Suppl.*

RAPHIDIA, in the hiſtory of inſects, the name by which Dr. Hill calls a genus of four-winged flies, of the neuroptera-kind. See the article NEUROPTERA, *Append.*

The head of the *Raphidia* is of a horny ſubſtance, and is depreſſed. The tail is armed with a weapon of a ſlender form, ſharp, horny, and ſimple, not biſid at the extremity. *Hill*, Hiſt. Anim. p. 70.

RARATAS, in botany, the name by which Plumier calls

REE

the *Ananas*, or pine-apple of Tournefort. See the article ANANAS, *Suppl.*

RAT *(Suppl.)* — *Mountain*-RAT, the Engliſh name of a creature, otherwiſe called the *Marmotte*. See the article MARMOTTE, *Suppl.*

RATIO *(Suppl.)* — It is to be obſerved, that in this article of the Supplement the method deſcribed of inſerting ſecondary *Ratios*, gives two ſeries, the one containing the *Ratios* greater than the true, and the other the *Ratios* leſs than the true; and if we conſider each ſeries ſeparately, we ſhall always find, that the *Ratios* expreſſed by larger numbers, approach nearer the truth than thoſe expreſſed by ſmaller numbers. But if we compare the *Ratios* of one ſeries with thoſe of the other, it may often happen, that a *Ratio* expreſſed in ſmaller numbers, ſhall approach nearer the truth, than another expreſſed by greater numbers. For inſtance, let the *Ratio* 519529 to 328612, expreſſing the proportion of the ſemi-tone major to the ſemi-tone minor in muſic, be propoſed. The quotients, according to the method here deſcribed, will be 1. 1. 1. 2. 1, &c. Hence the *Ratios* greater than the true will be 2 : 1, 5 : 3, &c. and the *Ratios* leſs than the true will be 1 : 1, 3 : 2; 11 : 7, &c. Now, I ſay, that the *Ratio* 3 : 2, though expreſſed in ſmaller numbers approaches nearer to the truth than 5 : 3; for the exponent of the propoſed *Ratio* $\frac{5}{3}\frac{1}{2}\frac{9}{8}\frac{5}{6}\frac{2}{1}\frac{9}{2} = 1.581$ and $\frac{3}{2} = 1.5$ alſo $\frac{5}{3} = 1.667$. Hence the exponent of the *Ratio* of 5 to 3 will exceed the truth by $0.086 = 1.667 - 1.581$; but the exponent of the *Ratio* 3 to 2 will be deficient by no more than $0.081 = 1.581 - 1.5$. Again, ſuppoſe the *Ratio* of 927707238 to 659826661, expreſſing the chance of the dealer's at whiſt having four trumps [a], were propoſed. Dividing the firſt term by the ſecond, &c. the quotients will be 1. 2. 2. 6. 3. 1. 1. 4, &c. which gives the *Ratios* greater than the true 2 : 1, 3 : 2, 10 : 7, 17 : 12, &c. and leſs than the true 1 : 1, 4 : 3, 7 : 5, 52 : 37, &c. And here the *Ratio* 7 : 5, tho' expreſſed in ſmaller numbers, approaches nearer to the truth, than either 10 : 7, or 17 : 12, as will eaſily appear by reducing their exponents to decimals, But no inconveniencies of this kind can happen, if we content ourſelves with the principal and primary *Ratios*, they being alternately greater and leſs, and continually approaching nearer to the truth. — [[a] See the article WHIST, *Append.*]

RATTLE-*graſs*, a name ſometimes uſed for a ſpecies of *Pedicularis*, or Louſe-wort. See the article PEDICULARIS, *Suppl.*

RATTLE-*net*. See the article WOLF-*net*, *Suppl.*

RATTLE-*ſnake-root*, in botany, a name ſometimes uſed for the *Polygala*, or Milk-wort. See the article POLYGALA, *Suppl.*

RAVEN *(Suppl.)* — *Indian*-RAVEN, the Engliſh name of the *Buceros*. See the articles BUCEROS, *Append.* and CORVUS-*Indicus*, *Suppl.*

RAY, in geometry, is often uſed for *Radius*.

RAY *of Curvature*. See the article CURVATURE.

RAZOR-*fiſh*, is a name frequently given to a ſpecies of *Coryphæna*, otherwiſe called *Novacula piſcis*. See the articles CORYPHÆNA and NOVACULA, *Suppl.*

REBUS *(Suppl.)* — REBUS, in heraldry, a coat of arms which bears an alluſion to the name of the perſon; as three caſtles, for Caſtleton; three cups, for Butler, three conies, for Coniſby; a kind of bearings which are of great antiquity.

RED-*breaſt*, in ornithology, the Engliſh name of a ſpecies of *Motacilla*, called alſo *Rubecula* and *Erithacus*. See the articles MOTACILLA and RUBECULA, *Suppl.*

REED *(Suppl.)* — *Indian flowering* REED, the name by which the *Canna* of botaniſts is ſometimes called. See the article CANNA, *Suppl.*

REEMING-*irons*, a kind of chiſſels, broader than ordinary, uſed for opening the ſeams of ſhips, before they are caulked. *Blankley*'s Nav. Expoſ. p. 130.

REFRACTION *(Cycl.)* — The *Refraction* of the air has many times ſo uncertain an influence on the places of celeſtial objects, very remote from the zenith, that wherever *Refraction* is concerned, the concluſions deduced from obſervations that are much affected by it, will always remain doubtful, and too precarious in many caſes to be relied upon. See Dr. *Bradley*, in Phil. Tranſ. N° 485.

REGIMENTAL *Hoſpital*. See the article HOSPITAL, *Append.*

REIN-*deer*, the Engliſh name of the *Rangifer*, a creature of the deer-kind. See the articles DEER and RANGIFER, *Suppl.*

RELL-*mouſe*, the Engliſh name of the white bellied mouſe, with a blackiſh back, and long body. See the article GLIS, *Suppl.*

REPRESENTATIVE *(Cycl.)*--REPRESENTATIVE *Power*, in metaphyſics, a term introduced by Leibnitz, to ſignify that power of the human ſoul, by which it repreſents to itſelf the univerſe, according to the ſituation of the body in the univerſe. See the article IDEA, *Suppl.*

Wolfius calls this power *vis repreſentativa*, to denote its being an active power, or rather a force actually exerting itſelf. For he expreſly ſays, *quod vis conſiſtat in continuo agendi conatu.* And he thinks that from this principle of a *vis repreſentativa*, every phænomenon of the human mind may be accounted for. See his Phſycholog. Ration. Art. 529.

But it may be preſumed, that many will find this principle too obſcure to be admitted.

When it is ſaid, that our ideas are *repreſentative* of things without us, or of the univerſe; it may be aſked in what ſenſe this is to be underſtood? Do they *repreſent* it 1° as a picture does its original? or 2° as an effect of a cauſe? or 3° as a ſign repreſents the thing ſignified? The firſt opinion is exploded in part by Locke and the Carteſians, and totally by Dr. Berkely, late Biſhop of Cloyne. The ſecond is admitted by Hobbes, but denied by Leibnitz himſelf, and the idealiſts. The third ſhould ſeem to be the opinion of Leibnitz, but he is not ſufficiently explicit.

Dr. Berkeley admits ideas to be ſigns; but according to him they are arbitrary ſigns, depending on the immediate will of the deity: hence the viſual language; and ideas, only ſignify or ſuggeſt each other, and ſpirits; but not bodies, the exiſtence of which is totally unknown.

REMITTENTS, or REMITTING *fevers*, the ſame with the bilious ones. See the article BILIOUS, *Append.*

REMOTION, *Remotio*, in rhetoric. See the article METASTASIS, *Suppl.*

REPETEND, in arithmetic, is uſed for that part of an interminate decimal fraction, which is continually repeated ad infinitum.

Thus in the interminate decimal fraction 317. 45 316 316 316, &c. the figures 316 are called the *Repetend*. *Cunn*, Treat. of Fractions.

Theſe *Repetends* often ariſe in the reduction of vulgar fractions to decimals, thus $\frac{1}{3} = 0.3333$, &c. $\frac{1}{7} = 0.142857\ 142857$, &c. $\frac{1}{11} = 0.090909$, &c.

Single REPETEND, is that where one figure only is repeated, as in 0. 3 3 3, &c.

Compound REPETEND, is that where two or more figures are repeated, as in 0. 09 09, &c. or in 0. 142857 142857, &c.

Decimals with *Repetends* may always be reduced to vulgar fractions. For either the *Repetend* begins with the decimal, or not:

If the *Repetend* begins with the firſt place of decimals, make it the numerator of a vulgar fraction, and make the denominator conſiſt of as many 9's as the *Repetend* has figures, then will this vulgar fraction be equal to the decimal.

Thus, if the *Repetend* be ſingle, as in 0. 3 3 3 3, the vulgar fraction equal to it will be $= \frac{3}{9} = \frac{1}{3}$. So if the *Repetend* be compound, as in 0. 09 09, &c. the equivalent vulgar fraction will $= \frac{09}{99} = \frac{9}{99} = \frac{1}{11}$.

And in like manner 0. 142857 142857, &c. $= \frac{142857}{999999} = \frac{1}{7}$.

The reaſon is obvious from this conſideration, that the decimal 0. 3 3 3, &c. is $= \frac{3}{10} + \frac{3}{100} + \frac{3}{1000}$, &c. the ſum of which by the rule mentioned under FRACTION, *Suppl.* will be equal to $\frac{3}{10}$ divided by $1 - \frac{1}{10} = \frac{9}{10} = \frac{1}{3}$, and ſo of the reſt.

If the *Repetend* does not begin with the firſt place of decimals, but at ſome place farther on towards the right, as in the decimal 0. 8 3 3 3 3, &c. where the *Repetend* does not begin till the ſecond place of decimals, *obſerve*, that 0. 8333 + &c. $= \frac{8}{10} + \frac{3}{100} + \frac{3}{1000} +$ &c. $= \frac{8}{10} + \frac{1}{10} \times \frac{3}{10} +$ $\frac{1}{10^2} +$ &c. But $\frac{1}{10} + \frac{1}{10^2} +$ &c $= \frac{3}{9} = \frac{1}{3}$, as before. therefore the propoſed decimal is $= \frac{8}{10} + \frac{1}{10} \times \frac{1}{3} = \frac{8}{10} + \frac{1}{30} = \frac{24}{30} + \frac{1}{30} = \frac{25}{30} = \frac{5}{6}$.

Thus alſo if the decimal 0. 2 27 27, &c. were propoſed, we ſhall find it $= \frac{2}{10} + \frac{1}{10} \times \frac{27}{100} + \frac{27}{100^2} +$ &c. And $\frac{27}{100} + \frac{27}{100^2} +$ &c. being $= \frac{27}{99} = \frac{3}{11}$, the decimal will be $= \frac{2}{10} + \frac{1}{10} \times \frac{3}{11} = \frac{2}{10} + \frac{3}{110} = \frac{22+3}{110} = \frac{25}{110}$. The reaſon of which is obvious from what has been ſaid.

It may perhaps be worth while to obſerve, that if the numerator of a vulgar fraction be unity, and the denominator any prime number, except 2 and 5, the decimal equal to the propoſed fraction will always be a *Repetend*, beginning at the firſt place of decimals; and this *Repetend* muſt neceſſarily be a ſubmultiple, or an aliquot part of a number expreſſed by as many 9's as the *Repetend* has figures; that is, if the *Repetend* have 6 figures, it will be a ſubmultiple of 999999; if four figures, it will be a ſubmultiple of 9999, &c. From whence it follows, that if any prime number be called p, the ſeries 9999, &c. produced as far as is neceſſary will always be diviſible by p, and the quotient will be the *Repetend* of the decimal fraction $= \frac{1}{p}$.

REPRODUCTION *(Cycl.)* — It is very well known, that trees and plants are to be raiſed from ſlips and cuttings, and ſome late obſervations have ſhewn, that there are ſome animals which have the ſame property.

The Polype was the firſt inſtance we had of this; but we had ſcarce time to wonder at the diſcovery Mr. Trembley had made, when Mr. Bonett diſcovered the ſame property in a ſpecies of water-worm. See the articles POLYPE and WATER-WORM, *Suppl.*

Amongſt the plants which may be rais'd from cuttings, there are ſome which ſeem to poſſeſs this quality in ſo eminent a degree, that the ſmalleſt portion of them will become a complete tree again. See the article PLANT, *Append.*

It deſerves enquiry, whether or not the great author of nature, when he ordained that certain inſects as theſe polypes and worms ſhould reſemble thoſe plants in that particular, allowed them this power of being *reproduced* in the ſame degree; or, which is the ſame thing, whether this *Reproduction* will or will not take place in whatever part the worm is cut: In order to try this, Mr. Bonett entered on a courſe of many experiments on the water-worms which have this property. Theſe are, at their common growth, from two to three inches long, and of a browniſh colour, with a caſt of reddiſh. From one of theſe worms he cut off the head and tail, taking from each extremity only a ſmall piece of a twelfth of an inch in length, but neither of theſe pieces were able to *reproduce* what was wanting. They both periſhed in about twenty-four hours; the tail firſt, and afterwards the head. As to the body of the worm from which theſe pieces were ſeparated, it lived as well as before, and ſeemed indeed to ſuffer nothing by the loſs, the head-part being immediately used as if the head was thereon, boring the creature's way into the mud. There are, beſides this, two other points in which the *Reproduction* will not take place, the one of theſe is about the fifth or ſixth rim from the head, and the other the ſame diſtance from the tail; and in all probability the condition of the great artery in theſe parts is the cauſe of this.

What is ſaid of the want of the *reproductive* power of theſe parts, relates only to the head and tail ends; for as to the body, it feels very little inconvenience from the loſs of what is taken off, and very ſpeedily *reproduces* thoſe parts. Where then does the principle of life reſide in ſuch worms, which after having their heads cut off, will have, not only the ſame motions, but even the inclinations, that they had before; and yet this difficulty is very ſmall, compared to ſeveral others, which at the ſame time offer themſelves to our reaſon? Is this wonderful *Reproduction* of parts only a natural conſequence of the laws of motion, or are there lodged in the body of the creature a chain of minute buds or ſhoots, a ſort of little embryos already formed and placed in ſuch parts where the *Reproductions* are to begin? Are theſe worms only mere machines, or, are they like more perfect animals, a ſort of compound, the ſprings of whoſe motions are actuated or regulated by a ſort of ſoul? And if they have themſelves ſuch a principle, how is it that this principle is multiplied and is found in every ſeparate piece? Is it to be granted, that there are in theſe worms not a ſingle ſoul (if it is to be ſo called) in each, but that each contains as many ſouls as there are pieces capable of *reproducing* perfect animals? Are we to believe with Malpighi, that theſe ſorts of worms are all heart and brain from one end to the other? This may be, but yet if we knew that it was ſo, we ſhould know in reality but very little the more for knowing it; and it ſeems after all, that in caſes of this kind we are only to admire the works of the great Creator, and ſit down in ſilence.

The nice ſenſe of feeling in ſpiders has been much talked of by naturaliſts; but it appears that theſe worms have yet ſomewhat more ſurprizing in them in regard to this particular. If a piece of ſtick, or any other ſubſtance, be brought near them, they do not ſtay for its touching them, but begin to leap and friſk about, as ſoon as it comes towards them. There want however ſome farther experiments to aſcertain whether this be really owing to feeling or to ſight; for tho' we can diſcover no diſtinct organs of ſight in theſe creatures, yet they ſeem affected by the light of the ſun or a candle, and always friſk about it in the ſame manner at the approach of either; nay even the moon-light has ſome effect upon them.

A twig of willow, poplar, or many other trees being planted in the earth, takes root, and becomes a tree, every piece of which will in the ſame manner produce other trees. The caſe is the ſame with theſe worms; they are cut to pieces, and theſe ſeveral pieces become perfect animals; and each of theſe may be again cut into a number of pieces, each of which will in the ſame manner produce an animal. It had been ſuppoſed by ſome, that theſe worms were oviparous; but Mr. Bonett, on cutting one of them to pieces, having obſerved a ſlender ſubſtance reſembling a ſmall filament to move at the end of one of the pieces, ſeparated it, and on examining it with glaſſes, found it to be a perfect worm of the ſame form with its parent, which lived and grew larger in a veſſel of water into which he put it. Theſe ſmall worms are eaſily divided, and very readily complete themſelves again, a day uſually ſerving for the production of a head to the part that wants one, and in general the ſmaller and ſlenderer the worms are, the ſooner they complete themſelves after this operation. When the bodies of the large worms are examined by the microſcope, it is very eaſy to ſee the appearance of the young worms alive and moving about within them; but it requires great preciſion and exactneſs to be certain of this; ſince the ramifications of the great artery have very much the appearance of young worms, and they are kept in a ſort of continual motion by the ſyſtoles and diaſtoles of the ſeveral portions of the artery which ſerve as ſo many hearts. It is very certain, that what we force in regard to theſe animals by our operations, is done alſo naturally every day in the brooks and ditches where they live. A curious obſerver will find in theſe places many of them without heads or tails, and ſome without either; as alſo other fragments of various kinds, all which are then in the act of completing themſelves; but whether accidents have reduced them to this ſtate, or they thus purpoſely throw off parts of their own body for the *Reproduction* of more animals, is not eaſy to determine. They are plainly liable to many accidents, by which they loſe the ſeveral parts of their body, and muſt periſh very early, if they had not a power of *reproducing* what was loſt; they often are broken into two pieces, by the reſiſtance of ſome hard piece of mud, which they enter; and they are ſubject to a diſeaſe, a kind of gangrene rotting off the ſeveral parts of their bodies, and muſt inevitably periſh by it, had they not this ſurprizing property.

This worm was a ſecond inſtance after the polype, of the ſurprizing power in an animal of recovering its moſt eſſential parts, when loſt; but nature does not ſeem to have limited her beneficence in this reſpect to theſe two creatures; Mr. Bonett tried the ſame experiments on another ſpecies of water-worm, differing from the former in being much thicker: This kind of worm, when divided in the ſummer ſeaſon, very often ſhews the ſame property; for if it be cut into three or four pieces, the pieces will lie like dead for a long time, but afterwards will move about again, and will be found in this ſtate of reſt to have recovered a head, or a tail, or both. After recovering their parts, they move very little, and according to this gentleman's experiments, ſeldom live more than a month.

It ſhould ſeem that the more difficult ſucceſs of this laſt kind of worm, after cutting, and the long time it takes to recover the loſt parts, if it do recover them at all, is owing to its thickneſs; ſince we always find in that ſpecies of worms which ſucceeds beſt of all, that thoſe which are thinneſt always recover their parts much ſooner than the others.

The water inſects alſo are not the only creatures which have this power of recovering their loſt parts. The earth affords us ſome already diſcovered to grow in this manner from their cuttings, and theſe not leſs deſerving our admiration than thoſe of the water; the common earth worms are of this kind. Some of theſe worms have been divided into two, others into three or four pieces, and ſome of theſe pieces, after having paſſed two or three months without any appearance of life or motion, have then begun to *reproduce* a head or a tail, or both. The *Reproduction* of the anus, after ſuch a ſtate of reſt is no long work; a few days does it, but it is otherwiſe with the head, that does not ſeem to perform its functions in the divided pieces, till about ſeven months after the ſeparation. It is to be obſerved, that in all theſe operations both on earth and water-worms, that the hinder part ſuffers greatly more than the fore part in the cutting, for it always twiſts itſelf about a long time, as if actuated by ſtrong convulſions; whereas the head uſually crawls away without the appearance of any great uneaſineſs.

REVERSION *of Series (Cycl.)* — The problems mentioned under this head in the Cyclopædia may indeed be ſolved by the method of *Reverſion of Series*, but are only particular caſes of it, and not a general account of that method, which is to be underſtood thus: The value of any indefinite quantity, y, for inſtance, being expreſſed by an infinite *Series* of ſimple terms, including different powers of another variable quantity, x, the value of x is thence to be found, by a kind of reverſed operation, expreſſed in a *Series* of ſimple terms, including different powers of the quantity y. Thus, if $y = x - \frac{1}{2}x^2 + \frac{1}{3}x^3 - \frac{1}{4}x^4 +$ &c. by the *Reverſion of the Series*, we ſhall have, $x = y + \frac{1}{2}y^2 + \frac{1}{6}y^3 + \frac{1}{24}y^4 + \frac{1}{120}y^5$. Thus alſo, if $dx + bx^2 + cx^3 + dx^4 +$ &c. $= gy + hy^2 + iy^3 + ky^4 +$ &c. x may be found by this method, expreſſed by the powers of y.

There are various ways of doing this. One, which is often convenient, is, by aſſuming a *Series* with indeterminate coefficients of a certain form; examples of which are given under the head FORM *of a Series*, *Append.* See Mac Laurin's Algebra, pag. 263. and Mr. De Moivre, in the Phil. Tranſ. N° 240.

Other methods may be ſeen in Mr. Stuart's explanation of Sir Iſaac Newton's Treatiſe of Analyſis by equations of an infinite number of terms, p. 455.

RESERVATORY, a term ſometimes uſed in a ſynonymous ſenſe with *Reſervoir*, See the article RESERVOIR, *Cycl.*

RETURN, in the military language, denotes the liſt of the ſick, given in once a week by the ſurgeon to the commanding officer of a regiment.

Commiſſioned officers are not put in the *Returns*, which, on that account, are but an imperfect liſt of the ſick.

Twelve ſick, in a battalion of 780 private men, is the loweſt *Return* that can be expected, even in the moſt healthy ſeaſon and climate, as well as beſt quarters. *Returns* are often much higher, but ſeldom exceed ſeventy in a battalion.

It is to be obſerved, that *Returns* include all accidents unfitting a ſoldier for duty. See *Pringle*, Obſerv. on the Diſ. of the Army, p. 12, 36.

RHAPONTICOIDES, in botany, a diſtinct genus of plants, according to Vaillant, but eſteemed only a ſpecies of *Centauria* by Linnæus. See the article CENTAURIA.

RHAPONTICUM, a diſtinct genus of plants, according to Vaillant, but comprehended under the *Centauria* by Linnæus. See the article CENTAURIA, *Append.*

RHETORICAL *Accent*, among Hebrew grammarians. See the article ACCENT, *Cycl.*

RHEUM, in botany, the name given by Linnæus to *Rhubarb*. See the article RHUBARB, infra.

RHEUMATISM *(Cycl.)* — This is a diſeaſe incident to winter, and owing, chiefly, to a ſuppreſſion of perſpiration.

In a complete and obſtinate *Rheumatiſm*, the joints are often conſiderably ſwelled and inflamed; but in fevers with *rheumatic* pains, this is ſeldom the caſe. Accordingly, in theſe laſt, the cure may be effected in a few days, by twice or thrice bleeding, and promoting a diaphoreſis by the cooler medicines, particularly vinegar-whey. But if the *Rheumatiſm* be attended with violent pains or ſwelling of the joints, ſweating is reckoned improper; ſo that the cure muſt be obtained by repeated and almoſt daily bleedings, till the fever is gone, and the pains either entirely removed, or rendered much eaſier.

If the pain and ſwelling of the joints remain after the fever is abated, three or four leeches may be applied to the part where the inflammation and tumour are greateſt; letting the blood ooze, till it ſtops of itſelf. As the relief hereby obtained is ſometimes conſiderable, and the evacuation but ſmall, the repetitions need not be limited. But, then, no benefit is to be expected from leeches in any pains of the joints, not attended with both inflammation and ſwelling.

In the true acute *Rheumatiſm*, internal medicines avail little. The beſt perhaps are the neutral ſalts, with very ſmall doſes of camphor, ſo as neither to heat or force a ſweat. As to diet, it ought to be of the loweſt kind. Outward applications are alſo to be omitted, as long as any fever or inflammation remains. The ſpirituous and volatile liniments inflame, and the emolient fomentations, though they give eaſe for the time, do harm by relaxing, unleſs very ſparingly uſed. If there is no inflammation, the aking parts may be rubbed with flannel, and anointed with the linimentum volatile or ſaponaceum, according as the ſkin is too much hardened or relaxed by the uſe of the one or other. After the patient has continued ſome time in this courſe, his recovery will be quickened by the uſe of the cold-bath, or the bark; and to thoſe who can afford it, riding is ſpecific. *Pringle*, Obſerv. on the Diſ. of the Army, p. 152, ſeq.

RHUBARB, in botany, the Engliſh name of a diſtinct genus of plants, of which there is only one known ſpecies. See the article RHABARBARUM, *Suppl.*

Monk's-RHUBARB, the name of a ſpecies of *Lapathum*, or dock. See the article LAPATHUM, *Suppl.*

RIB-*wort*, a name ſometimes given to the *Plantago* of botaniſts, See the article PLANTAGO, *Suppl.*

RIBBAND-*Screw-ſhell*, the Engliſh name of the *Turbo*, with broad ſpiral faſciæ, and a ſmall mouth. See the article TURBO, *Suppl.*

RIBES, in botany, a general name given by Linnæus to the gooſberry and currant buſhes, which he makes one genus of plants, called by others *Groſſularia*. See the article GROSSULARIA, *Suppl.*

RICE, the Engliſh name of a genus of plants, known among botaniſts by that of *Oryza*. See the article ORYZA, *Append.*

RIFTS, a diſeaſe in horſes ariſing from corruption lodged in the palate of the mouth. Ruſt. Dict. in voc.

RIG, or RIGLING, the ſame with *Ridgling*. See the article RIDGLING, *Cycl.*

RING-*Ouzel*, the Engliſh name of the black *Turdus*, with a white ring round its neck. See the article TURDUS, *Suppl.*

RIPENING *of fruit*, in gardening, may be forwarded ſeveral ways. The method practiſed in the Levant, for maturating the domeſtic fig-tree, has been already mentioned; alſo the great uſe of hot beds, for bringing to maturity many exotic plants, which could not be otherwiſe effected in cold climates. See the articles CAPRIFICATION, *Suppl.* and HOT-*beds*, *Cycl.* and *Suppl.*

Several other methods of haſtening the fructifications of trees, and other vegetables, have likewiſe been taken notice of under the article *Forcing*. See the article FORCING, *Suppl.*

ROBIN *(Suppl.)* — RAGGED-ROBIN, a name ſometimes uſed for the *Lychnis*. See the article LYCHNIS, *Suppl.*

Wake-ROBIN, the Engliſh name of a genus of plants, called by botaniſts *Arum*. See the article ARUM, *Suppl.*

ROCK-*roſe*, a name ſometimes given to the *Ciſtus* of botaniſts. See the article CISTUS, *Suppl.*

ROCKET, in botany, the Engliſh name of a genus of plants, called by botaniſts *Eruca*. See the article ERUCA, *Suppl.*

Corn-ROCKET, or *ſquare-podded* ROCKET, a diſtinct genus of plants, called by botaniſts *Erucago*. See the article ERUCAGO, *Suppl.*

Garden-ROCKET, a name by which the *Heſperis* of botaniſts is ſometimes called. See the article HESPERIS, *Suppl.*

Water-ROCKET, or *Winter*-ROCKET, the name of a ſpecies of *Siſymbrium*. See the article SISYMBRIUM, *Suppl.*

ROD *(Suppl.)* — *Shepherd*'s-ROD, *Dipſacus*, in botany, the Engliſh name of a diſtinct genus of plants. See the article DIPSACUS, *Suppl.*

ROE-*buck*, the Engliſh name of the *Cervus* with ramoſe, cylindric, and erect horns. It is the ſmalleſt of the deer-kind, and has been called *Capreolus* and *Caprea*, tho' without the leaſt reſemblance of the goat-kind. See the article CAPREOLUS, *Suppl.*

ROLLER *(Suppl.)* is alſo the name by which ſome call the *Ampelis*, or *Garrulus Bohemicus*. See the article AMPELIS, *Suppl.*

ROOT *(Suppl.)* — The *roots* of plants may be reverſed and turned into branches; and *vice verſa*, the branches into roots. This is called *Planting reverſe*. See the articles PLANT and PLANTING *reverſe*, *Append.*

Seminal-ROOT. See the article SEMINAL, *Suppl.*

ROPE *(Cycl.* and *Suppl.)* — Though it be difficult to give a certain account of the forces required to bend *ropes* of different diameters, in making them go round bodies of different bigneſſes, yet to make no allowance for the loſs of motion ſuſtained thereby, would be as prejudicial to the practice of mechanics, as it would be to overlook the friction of the parts of engines. The difficulty of aſcertaining this force ariſes from the different materials of which they are made, their different ſtiffneſs, according as they are more or leſs twiſted; and ſometimes from the temperature of the air, as to moiſture and dryneſs.

Dr. Deſaguliers has computed the forces required to bend *Ropes* of different diameters, ſtretched by different weights, round rollers of different bigneſſes: The reſult of his experiments is expreſſed in the following table.

Diameters of the *Ropes* of three ſtrands, expreſſed in tenth parts of an inch	Weights ſtretching the *ropes*, expreſſed in *lb.* avoirdupois.	Reſiſtance about a roller of half an inch diameter, in *oz.* avoirdupois	Reſiſtance about a roller of one inch diameter in *oz.* avoirdupois	Reſiſtance about a roller 1 ½ inches diameter in *oz.* avoirdupois.
0, 5	60 *lb.*	225 *oz.*	112 ½ *oz.*	75 *oz.*
0, 2	60	90	45	30
0, 1	60	45	22 ½	15
0, 5	40	150	75	50
0, 2	40	60	30	20
0, 1	40	30	15	10
0, 5	20	75	37 ½	25
0, 2	20	30	15	10
0, 1	20	15	7 ½	*

On the whole, it has been found by experiments, that the difficulty of bending a *rope* round a roller decreaſes directly as the diameter of the roller increaſes; or is, inverſely, as the diameter of the roller. See *Deſaguliers*, Experim. Phil. vol. 1. p. 233, ſeq.

ROSE *(Suppl.)* — *Bay*-ROSE, the name of a genus of plants, called by botaniſts *Nerium*, or *Nerion*. See the article NERION, *Suppl.*

Campion-ROSE, a name ſometimes given to the *Lychnis*. See the article LYCHNIS, *Suppl.*

China-ROSE, the name by which ſome call the *Ketmia* of botaniſts. See the article KETMIA, *Suppl.*

Mountain-Bay ROSE, a name by which the *Chamærhododendros* of botaniſts is ſometimes called. See the article CHAMÆRHODODENDROS, *Suppl.*

Gelder-ROSE, a name ſometimes given to the *Opulus*, or water-elder. See the article OPULUS, *Suppl.*

ROSE of *Jericho*, a name by which ſome call the *Heſperis*. See the article HESPERIS, *Suppl.*

South-Sea ROSE, a name ſometimes given to the *Nerion* of botaniſts. See the article NERION, *Suppl.*

Rock-ROSE, the name by which the *Ciſtus* of botaniſts is ſometimes called. See the article CISTUS, *Suppl.*

ROSE-*Root*, a name by which ſome call the *Anacampſeros*, or Orpin. See the article ANACAMPSEROS, *Suppl.*

ROSEMARY *(Snppl.)* — *Spaniſh*-ROSEMARY, a name ſometimes given to the *Thymelæa* of botaniſts. See the article THYMELÆA, *Suppl.*

Poet's-ROSEMARY, a name ſometimes given to the *Caſſia* of botaniſts. See the article CASSIA, *Suppl.*

ROSTRATA, in zoology, a name uſed by ſeveral zoologiſts for the *Ramphaſtos* or Toucan, a genus of birds. See the article RAMPHASTOS, *Append.*

ROTHER, a term uſed by *Blanckley*, in his Naval Expoſitor, for *Rudder*. See the article RUDDER, *Cycl.* and *Suppl.*

ROUCOU, in botany, a name given to a ſpecies of Mitella.

ROVES, in ſhip-building, ſmall ſquare pieces of iron, with a hole punched in the middle through which the nail goes, where it is clenched, and binds together the boards of pinnaces, yawles, &c. *Blanckley*'s Naval Expoſitor, p. 137.

ROUGHINGS, a word uſed in many parts of the kingdom for the graſs which comes after mowing. Ruſt. Dict. in voc.

ROUP, in poultry, is a filthy boil or ſwelling upon their rumps, known by the ſtaring, or turning back of the feathers.

The *Roup*, if not ſoon remedied, will corrupt the whole body; to prevent which, the feathers are to be pulled away, the ſwelling laid open, and the matter preſſed out; after which the part is to be waſhed with ſalt and water, or brine. Ruſt. Dict. in voc.

ROWLUCKS, among ſhip-carpenters, ſmall ſpaces left in the gunwale, where two thoals are let in at ſuch a diſtance from each other, as to admit the oar, at the end of the loom to lie on to row the boat. *Blanckley*'s Naval Expoſitor, p. 188.

RUDBECKIA, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by Vaillant *Obeliſcotheca*, and in Engliſh the *Dwarf-ſun-flower*.

The characters are theſe: The common cup is compoſed of a double order of leaves, ſix in each order, and covered with plane, broad, but ſhort ſquamæ; the compoſite flower is radiated; the proper one tubuloſe, infundibuliform, with its mouth divided into five ſegments; the ſtamina are five very ſhort, capillary filaments; the antheræ cylindric; the germen of the piſtil is placed under the receptacle; the ſtyle is filiform, and of the length of the flower; the ſtigma is divided into two parts, which bend backwards; the receptacle is paleaceous and conic; the ſeeds are ſingle and oblong. Vid. *Linnæi* Gen. Plant. p. 415.

The ſpecies of *Rudbeckia* are theſe. 1. The *Rudbeckia*, with the lower leaves divided into three lobes, and the upper ones undivided. 2. The compoſite laciniated-leaved *Rudbeckia*. 3. The oblong, hairy-leaved *Rudbeckia*. 4. The great, ſcabrous *Rudbeckia*. 5. The broad-leaved, many-flowered *Rudbeckia*. 6. The tall *Rudbeckia*, with red ſtalks. 7. The ſmall, ſhort-leaved *Rudbeckia*. 8. The great-flowered, hairy *Rudbeckia*. Vid. *Hill*, Hiſt. Plant. p. 584.

RUDBECKIA is alſo a name uſed by Houſton for the *Conocarpus* of Linnæus. See the article CONOCARPUS, *Append.*

RUE *(Suppl.)* — *Dog*'s-RUE, a name ſometimes given to the *Scrophularia*, or fig-wort. See the article SCROPHULARIA, *Suppl.*

Meadow-RUE, the Engliſh name of a genus of plants, called by botaniſts *Thalictrum*. See the article THALICTRUM, *Suppl.*

Wall-RUE, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Ruta muraria*. See the article RUTA *muraria*, *Suppl.*

RULE *(Cycl.)* — RULE *of five*, or, *Compound* RULE *of Three*. What is ſaid in the Cyclopædia of this *rule*'s being more eaſily performed by two ſimple *rules of three*, is ſometimes true, but not always. In ſome caſes, not only five, but ſeven, or nine terms may be given, from whence it is neceſſary to determine an eighth, or a tenth, which indeed might be performed by repeated applications of the ſimple *rule of three*, but not ſo expeditiouſly. Mr. Jones has therefore given a general *rule* by which all caſes of the *rule of Three* or of proportion may be ſolved.

The *rule* is, 1°. Set down the terms expreſſing the condition of the queſtion, in one line. 2°. Under each conditional term ſet its correſponding one in another line. 3°. Multiply the *producing terms* of one line, and the produced term of the

the other line continually, and take the result for a dividend. 4°. Multiply the remaining terms continually, and let the product of them be a divisor. 5°. The quotient of this division will be the term required.

By *producing terms* here, are meant, whatever necessarily and jointly produce any effect; as the Cause and the Time; length, breadth, and depth; buyer and his money; seller and his goods; all necessarily inseparable in producing their several effects.

In a question where a term is understood, and not expressed that term may be expressed by unity.

Example. If 250 *l.* serve six persons for nine months; how long will 1000*l.* serve four persons at the same rate?

Here the terms which express the condition are.

	£.	*P.*	*M.*
	250	6	9
corresponding terms	1000	4	Q

Where Q is put to represent the term required.

Among the conditional terms, six persons and nine months are producing, and 250*l.* is produced: among their corresponding terms four persons and Q are producing, and 1000*l.* are produced.

But it being impossible to multiply the producing terms in the second line, and the produced in the first, because Q is unknown; therefore multiply the producing terms of the first line, by the produced in the second, and divide by the product of the rest.

Then will $Q = \frac{6 \times 9 \times 1000}{4 \times 250} = 6 \times 9 = 54$.

See Mr. *Dodson*'s Anti logarithmic Canon, pag. 38. seq.

But if the notion of producing and produced terms should seem obscure, those who have a knowlege of the doctrine of compound ratios, will easily perceive that in the foregoing question, Q is to 9 months in the compound ratio of 4 persons to 6 persons inversely, and of 1000*l.* to 250*l.* directly, that is, $\frac{Q}{9} = \frac{6}{4} \times \frac{1000}{250}$, therefore $Q = \frac{6 \times 9 \times 1000}{4 \times 250} = 54$ as before. And in like manner may other questions, relating to the compound rule of proportion, be stated and solved, however complex.

RUNT *(Suppl.)* — RUNT is also a name given to Scotish or Welch neat, or cows of a small size. Dict. Rust. in voc.

RUPTURE, *(Cycl.)* in surgery. See the article HERNIA, *Cycl.* and *Suppl.*

RUPTURE-*Wort*, the English name of a genus of plants, called by botanists *Herniaria*. See the article HERNIARIA, *Suppl.*

RUSH *(Suppl.)* — *Flowering*-RUSH, the English name of a genus of plants, called by botanists *Butomus*. See the article BUTOMUS, *Suppl.*

RUSSET, a country word for a dark brown colour. Rust. Dict. in voc.

RUT *(Suppl.)* — RUT is also the term used for the track or mark of a wheel in the road. Rust. Dict. in voc.

RYE-*Grass*, in botany, the same with what is otherwise called *Rey-grass*. See the article REY-*Grass*, *Suppl.*

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SAFFRON (*Suppl.*)—*Indian* SAFFRON, a name ſometimes given to turmeric. See TURMERIC, *Cycl.*

Baſtard-SAFFRON, the Engliſh name of a genus of plants, called by botaniſts *Carthamus*. See the article CARTHAMUS, *Suppl.*

SAGE (*Suppl.*)—SAGE *of Jeruſalem*, a name ſometimes given to a ſpecies of *pulmonaria*. See PULMONARIA, *Suppl.*

SAGE *of Jeruſalem*, or SAGE-*tree*, names by which the *phlomis* of botaniſts is ſometimes called. See the article PHLOMIS, *Suppl.*

Wild SAGE, a name ſometimes given to the *lantana* of botaniſts. See the article LANTANA, *Suppl.*

Wood-SAGE, the name by which ſome call the *ſcordium* or *teucrium* of botaniſts. See the article TEUCRIUM, *Suppl.*

SAGITTA, in architecture, a name ſometimes uſed for the key-piece of an arch. See KEY and ARCH, *Cycl.*

SAGREE, a name ſometimes given to the *galeus ſpinax*, or prickly hound-fiſh. See the article GALEUS, *Suppl.*

It is a ſpecies of *ſqualus*. See the article SQUALUS, *Suppl.*

SAINT-*foin*, in botany, the Engliſh name of a genus of plants, called by botaniſts *onobrychis*. See the articles ONOBRYCHIS and SAINT-FOIN, *Suppl.*

This plant is propagated as clover for the food of cattle. It will hold well in the ground, and continue to grow and be of uſe for twenty years; but then the main crop is always to be mowed, and not to be eaten upon the ground.

SAKER (*Suppl.*)—SAKER, in ornithology, the ſame with *ſacre*. See the article SACRE, *Suppl.*

SALACIA, in zoology, the name of a genus of inſects of the *gymnarthria* kind; the body of which is ovato-oblong, and the tentacula are numerous, and diſpoſed in little cluſters. See GYMNARTHRIA, *Append.*

It is called by different authors *priapus marinus*, and *mentula marina*. See the article PRIAPE *de mer*, *Suppl.*

SALICORNIA, in botany, the name of a genus of plants, the characters of which, according to *Linnæus*, are theſe: the cup is of a tetragonal form, truncated, bellied out, and permanent. There is no corolla. The ſtamen is a ſingle, ſimple, capillary filament. The anthera is roundiſh. The germen of the piſtil is of an oblong ovated figure: the ſtyle is ſimple and placed under the ſtamen, and the ſtigma is bifid. There is no pericarpium, but the cup becomes more ventricoſe, and contains a ſingle ſeed. Vid. *Linnæi* Gen. Plant. p. 4.

There are only two ſpecies of this genus, which are, 1. The ſhort-jointed *ſalicornia*, and 2. The longer-jointed *ſalicornia*. *Hill*, Hiſt. Plant. p. 154.

SALIVA (*Cycl*)—Dr. *Pringle*, in the appendix to his obſervations on the diſeaſes of the army, has given the reſult of ſeveral experiments made to aſcertain the effects of the *ſaliva* in digeſtion.

By adding a ſmall portion of it to ſome raw beef, he remarked, that this mixture putrefied ſlower than another which had no *ſaliva* in it; from whence he infers its antiſeptic nature.

Another experiment, made to aſcertain the fermentative power of *ſaliva*, was this: he took two drachms of freſh meat, the ſame quantity of bread, and to theſe added as much *ſaliva* as he ſuppoſed neceſſary to digeſtion. This mixture being beat in a mortar, was put into a cloſe phial, and ſet in the furnace, where it remained about two days, with ſcarce any viſible fermentation; but, on the third day, this action became manifeſt. The bread and fleſh were then found riſen in the water, a ſediment forming, and bubbles of air continually mounting. In ſhort, the fermentation was complete, being diſtinguiſhed by a vinous ſmell, as in ordinary working liquors. The action continued about twice as long as when no *ſaliva* was uſed; it was likewiſe much more moderate, and generated air with little tumult. When the fermentation intirely ceaſed, the mixture had a pure acid taſte; and what was equally remarkable, had no putrid ſmell during the whole proceſs.

From theſe experiments the doctor concludes, that if the *ſaliva* is well prepared, is in a ſufficient quantity, and well mixed with the aliment, it is qualified for reſiſting putrefaction, preventing immoderate fermentation, flatulence, and acidity in the primæ viæ. But if the *ſaliva* is deficient, unſound, or not well mixed with what is ſwallowed, that the aliment may firſt putrefy, then grow acid, and in that action ferment ſtrongly, and generate much air in the ſtomach and bowels. *Pringle*, Obſerv. p. 355.

Accordingly, in ſurfeits, or upon ſwallowing without due maſtication; when meats are eat tough and fat, or with farinaceous ſubſtances unfermented; or, when by any accident the *ſaliva* is vitiated, too ſcanty, or not intimately mixed with the food, the fermentation becomes tumultuous, the ſtomach ſwells with air; and this extraordinary commotion being attended with an unuſual heat, brings on that uneaſineſs called the *heart-burn*, and occaſions that exceſſive ſourneſs of the ſtomach, whereby the teeth are not only ſet on edge, but the throat excoriated. This laſt, however, only happens when the ſtomach is relaxed, or any wiſe diſabled from conveying the whole aliment into the inteſtines; for, what is left having time to undergo a complete fermentation, is thereby changed into a harſh ſort of vinegar. Id. ibid. p. 368.

Since one great uſe of *ſaliva* is to moderate fermentation, it is probable, that ſuch ſubſtances as reſemble it moſt in this quality, will prove the beſt ſtomachics whenever that humour fails. Of this claſs are acids, wines, ſpirits, and bitters; but as all theſe retard as well as moderate fermentation, they may be frequently leſs proper than ſome of the antiſcorbutics, as horſe-radiſh, muſtard, and garden ſcurvy-graſs, which, at the ſame time that they moderate, retard fermentation but little. As to aromatics, however aſſiſting they may be in digeſtion by their heat and ſtimulus, they promiſe leſs of a carminative quality than either the bitters or antiſcorbutics; in as much as they are more diſpoſed to increaſe than to moderate fermentation, and conſequently to produce air inſtead of ſuppreſſing it. Id. ibid. p. 376.

SALLOW, a name by which ſeveral ſpecies of the *ſalix*, or willow, are frequently called. See the article SALIX, *Suppl.*

SALMON (*Suppl.*)—SALMON-*peel*, the name of a fiſh found in great plenty in the rivers of Wales, agreeing in the colour of its fleſh, and perhaps in kind with the common ſalmon. Ruſt. Dict. in voc.

SALMON-*ſewſe*, a name ſometimes uſed for the young fry of ſalmon.

SALOMON's *ſeal*, in botany, the ſame with *ſolomon's ſeal*. See SOLOMON's *ſeal*, infra.

SALT (*Suppl.*)—*Ætna* SALT. See the article ÆTNA, *Suppl.*

SALT-*wort*, a name ſometimes given to the *ſalicaria* or willow-herb, of other writers. See the article SALICARIA, *Suppl.*

SAMPHIRE, the Engliſh name of a genus of plants, called by botaniſts *crithmum*. See the article CRITHMUM, *Suppl.*

Prickly SAMPHIRE, the name given by ſome writers to a ſpecies of *echinophora*. See the article ECHINOPHORA, *Suppl.*

SAND (*Suppl.*)—SAND-*eel*, in ichthyology, the Engliſh name of the *ammodytes*. See the article AMMODYTES, *Suppl.*

SAND-*ſnake*, a ſpecies of ſerpent. See the article AMMODYTES, *Suppl.*

SANICLE, the Engliſh name of a genus of plants, called *ſanicula* by botaniſts. See the article SANICULA, *Suppl.*

Water-SANICLE, a name ſometimes given to a genus of plants, called by botaniſts *geum*. See the article GEUM, *Suppl.*

Bear's ear SANICLE, the name by which ſome call the *cortuſa* of botaniſts, a diſtinct genus of plants. See the article CORTUSA, *Suppl.*

SAPLING, among gardners, a name by which they call any young tree that is full of ſap. Ruſt. Dict. in voc.

SAPONARIA, *ſoap-wort*, in botany, the name of a genus of plants, the characters of which are theſe. The cup is a permanent perianthium, formed of a ſingle leaf, oblong and divided into five ſegments at the edge. The flower conſiſts of five petals: the ungues are narrow, angulated, and of the length of the cup: the limb is plane, the bracteæ broadeſt towards the extremity, and obtuſe. The ſtamina are ten ſubulated filaments, of the length of the tube of the flower, alternately inſerted into the ungues of the flower: the antheræ are oblong and incumbent. The germen of the piſtil is cylindric; the ſtyles are two, ſtrait, parallel, and of the length of the ſtamina: the ſtigmata are acute. The fruit is a covered capſule, nearly of the length of the cup, and containing only one cell; in which are included numerous ſmall ſeeds. The receptacle is free. The germen and capſule are, in ſome ſpecies, more ſhort and rounded, and the ſegments of the cup are deeper in ſome than in others; in ſome they are almoſt five leaved. Vid. *Linnæi* Gen. Plant. p. 191.

Dillenius and others make this genus only a ſpecies of *ſpergula*. See the article SPERGULA, *Append.*

SAPPADILLA, a name uſed by ſome for the *cainito*, or *chryſophyllum*, of botaniſts. See the article CHRYSOPHYLLUM, *Append.*

SARACEN's *conſound*, a name ſometimes given to the *ſolidago* or *virga aurea* of botaniſts. See the article VIRGA *aurea*, *Suppl.*

SARFE, the Engliſh name of a ſpecies of *cyprinus*, with the iris of the eye, and all the fins and tail red. See CYPRINUS, *Suppl.*

It is otherwiſe called *erythrophthalmus*, or the *red-eye*. See the article ERYTHROPHTHALMUS, *Suppl.*

SASSAFRAS-*tree*, in botany, the names of a ſpecies of *laurus*, according to Linnæus, with undivided and trilobate leaves. See LAURUS, *Append.*

It is a native of America, and called by C. Bauhine, *ſaſſafras arbor ficulneo folio.*

The bark of this tree is an excellent diaphoretic and attenuant, the wood is alſo in much eſteem. See SASSAFRAS, *Cycl.* and *Suppl.*

SATTIN *(Cycl.)*—*White* SATTIN, in botany, a name given by ſome to the *lunaria*. See the article LUNARIA, *Suppl.*

SATYRIUM, in the linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is formed of vague ſpathæ. There is no perianthium. The flower conſiſts of five ovato-oblong petals. The nectarium is monophyllous. The ſtamina are very ſhort and ſlender filaments; the antheræ are ovated; the germen of the piſtil is contorted; the ſtyle is very ſhort; and the ſtigma compreſſed and obtuſe. The fruit is an oblong capſule, containing one cell; in which are numerous, very ſmall ſeeds, like ſaw-duſt. *Linnæi* Gen. Plant. p. 432.

This genus is called *orchis* or *tragoorchis* by other botaniſts. See the article ORCHIS, *Suppl.*

SAUCE-*alone*, a name ſometimes uſed for the *heſperis* of botaniſts. See the article HESPERIS, *Suppl.*

SAVIN *(Suppl.)*—*Indian* SAVIN, the name of a genus of plants, deſcribed by Linnæus under that of *bauhinia*. See the article BAUHINIA, *Suppl.*

SAW-*wort*, in botany, the Engliſh name of a genus of plants, known among botaniſts by that of *ſerratula*. See the article SERRATULA, *Suppl.*

SAXIFRAGE *(Suppl.)*—*Pimpernel*-SAXIFRAGE, or *burnet*-SAXIFRAGE, names uſed for the *tragoſelinum* of botanical writers. See the article TRAGOSELINUM, *Suppl.*

SCALD, a burn cauſed by ſome boiling liquor. See the article BURN, *Suppl.*

SCALE—*differential* SCALE, is uſed for the ſcale of relation ſubtracted from unity. See SERIES, *Append.*

SCALE *of relation*, in algebra, an expreſſion denoting the relation of the terms of recurring ſeries to each other. See the article SERIES, *Append.*

SCALLOP, in conchyliology, the Engliſh name of the *pecten*. See the article PECTEN, *Suppl.*

SCAMMONY *(Cycl.)*—SCAMMONIA, in botany, the name uſed in the ſhops and among medicinal writers for a ſpecies of bind-weed. See the article CONVOLVULUS, *Suppl.*

SCARE-*crow*, the Engliſh name of a bird of the *larus*, or gull kind, with grey wings, red legs, and the reſt of the body black. See the article LARUS, *Suppl.*

SCARLET *lychnis*, in botany, the name of a ſpecies of *lychnis*. See the article LYCHNIS, *Suppl.*

SCARLET *cardinals flower*, the name of a ſpecies of *rapuntium*. See the article RAPUNTIUM, *Suppl.*

SCARLET *oak*, the Engliſh name of a ſpecies of *ilex*, called by antient writers *ſmilax*. See the article ILEX, *Suppl.*

SCAVEL *ſpitter*, denotes a ſmall ſpade, ſhod only half way, and uſed in digging clay. *Blanckley*, Naval Expoſitor, p. 142.

SCELASIUS, in zoology, the name by which Dr. Hill has called a genus of animalcules with viſible legs.

It is common in ditch-water, and is leſs quick in its motions than moſt other animalcules. *Hill*, Hiſt. Anim. p. 10.

SCIATICA *(Cycl.)* See the article GOUT, *Cycl.* and *Suppl.*

SCIATICA-*creſs*, a name by which ſome call the *cardamine*, or ladies ſmock. See the article CARDAMINE, *Suppl.*

SCIATICA-*creſs* is alſo a name ſometimes given to a ſpecies of *lepidium*, or dittander. See the article LEPIDIUM, *Suppl.*

SCILLA, *ſquill*, in the linnæan ſyſtem of botany, the name of a diſtinct genus of plants, the characters of which are theſe; there is no cup; the flower conſiſts of ſix oval, deciduous, and very patent petals: the ſtamina are ſix ſubulated filaments, of half the length of the flower; the antheræ are oblong, and incumbent, the germen of the piſtil is roundiſh; the ſtyle is ſimple, of the length of the ſtamina, and deciduous; the ſtigma is ſimple: the fruit is a ſmooth capſule, of a ſuboval figure, marked with three furrows, formed of three valves, and containing three cells: the ſeeds are numerous and roundiſh.

This genus comprehends the *liliohyacinthus*, and the *hyacinthus ſtellaris* of other botanical writers; and is reckoned only a ſpecies of *ornithogalum* by Tournefort, Vid. *Linnæi* Gen. Plant. p. 145.

SCORCHING *fennel*. See FENNEL, ſupra.

SCORDIUM, in botany, the name by which ſome call the *teucrium* of other botanical writers. See the article TEUCRIUM, *Suppl.*

SCORPION-*inſect*, the Engliſh name of a ſpecies of *acarus*, called by ſome *Araneus coccineus*. See ACARUS, *Append.*

SCORPION-*ſhell*, the Engliſh name of a ſpecies of murex, otherwiſe called the *ſpider-ſhell*. See the article MUREX, *Suppl.*

Water-SCORPION, the Engliſh name of a genus of four winged flies, called by authors *nepa*. See the article NEPA, *Append.*

SCORPION-*graſs*, the Engliſh name of a genus of plants, called by botaniſts *ſcorpioides*. See the article SCORPIOIDES, *Suppl.*

SCORPION-*ſena*. See the article SENA, infra.

SCORPIURUS, in the linnæan ſyſtem of botany, the name of a genus of plants, called by Tournefort *ſcorpioides*, and in Engliſh *ſcorpion-graſs*. See the article SCORPIOIDES, *Suppl.*

SCOURINGS, among farriers, ſuch gentle purges as preſerve horſes from noxious humours. Vid. Ruſt. Dict. in voc.

SCREEN, an inſtrument for keeping off the wind, or the heat of the fire.

SCREEN is alſo uſed for a frame of laths to ſift earth, ſand, gravel, &c.

SCREEN likewiſe denotes a wire frame for ſeparating of corn from duſt, ſand, cockle, &c. Dict. Ruſt. in voc.

SCRUPI, in natural hiſtory, the name of a claſs of foſſils, formed in detached maſſes, without any cruſts; of no determinate figure, or regular ſtructure; and compoſed of a cryſtalline or ſparry matter, debaſed by an admixture of earth, in various proportions.

Under this claſs are comprehended, 1. The *telaugia*. 2. The *petridia*. 3. The *Lithozugia*. 4. The *Jaſpides*, or *Jaſpers*. See the articles TELAUGIA, PETRIDIA, &c. *Append.*

All theſe genera ſtrike fire with ſteel, only ſome more readily than others. Vid. *Hill*, Hiſt. Foſſ. p. 546, ſeq.

SCRY, in falconry, denotes a great flock of fowl. Ruſt. Dict. in voc.

SCULL-*cap*, a name ſometimes given to a genus of plants, called *ſcutellaria* or *caſſida* by botaniſts. See the article CASSIDA, *Suppl.*

SCUT, among ſportſmen, a term uſed for the tail of a hare or rabbit. Dict. Ruſt. in voc.

SEA-*apple*, or SEA-*egg*, the Engliſh name of the roundiſh *Centronia*, with crooked and faſciculated ſpines. See the article CENTRONIA, *Append.*

SEA-*dragon*, the Engliſh name of the *cottus*, with the ſecond back-fin white. See the article COTTUS, *Suppl.*

SEA-*eagle*, *aquila marina*, the Engliſh name of the *raja*, with a long ſerrated ſpine on a finny tail. See the articles RAJA, and AQUILA *marina*, *Suppl.*

SEA-*hare*, in the hiſtory of inſects, the Engliſh name of the *lernea*. See the article LERNEA, *Append.*

SEA-*horſe*, a name ſometimes, though improperly, given to the *Hippopotamus*, or river-horſe. See the article HIPPOPOTAMUS, *Suppl.*

SEA-*lungs*, in the hiſtory of inſects, the Engliſh name of a ſpecies of *meduſa*. See the article MEDUSA, *Append.*

SEA-*mouſe*, in the hiſtory of inſects, the Engliſh name of the *aphrodita*. See the article APHRODITA, *Append.*

SEA-*nettle*, in zoology, a name improperly given to the *meduſa*, a genus of naked-bodied inſects. See the article MEDUSA, *Append.*

SEA-*pearch*, *perca marina*, in ichthyology. See the article PERCA *marina*, *Suppl.*

SEA-*ſerpent*, *ſerpens marinus*, the Engliſh name of the cylindric *muræna*, with the tail naked and acute. See the articles SERPENT and MURÆNA, *Suppl.*

SEA-*water*. See the article WATER, *Append.*

SEA-*worms*, See the article WORMS *of the ſea*, *Append.*

SEAL *(Suppl.)*—*Ladies* SEAL, in botany, the name by which ſome call the *tamnus*, a diſtinct genus of plants. See TAMNUS, *Suppl.*

Solomon's SEAL, the Engliſh name of a diſtinct genus of plants, called by authors *polygonatum*. See the article POLYGONATUM, *Suppl.*

SEAMS, or SEYMS, in horſes, certain clefts in their quarters, occaſioned by the dryneſs of the foot, or by riding upon hard ground. Ruſt. Dict. in voc.

SEAN, a kind of long and large net. Ruſt. Dict. in voc.

SECRETION *(Suppl.)*—It is the opinion of ſeveral authors that all *ſecretion* is performed by glands, but this ſeems very doubtful, not to ſay falſe.

SEELING *(Suppl.)*—SEELING, in falconry, is the running a thread through the eye-lids of a hawk, when firſt taken, to make her endure the head the better. Ruſt. Dict. in voc.

SELANDERS, in horſes, the ſame with the *malanders*. See the article MALANDERS, *Cycl.*

SELF-*heal*, a name by which the *prunella* or *brunella* of botaniſts is ſometimes called. See the article PRUNELLA, *Suppl.*

SELF-*heal* is alſo a name given to ſanicle, on account of its great efficacy in healing freſh wounds, ſtopping fluxes and the gonorrhœa. Ruſt. Dict. in voc. SANICLE.

SELINUM, a name given by ſome to a ſpecies of *ſium*. See the article SIUM, *Suppl.*

SEMENDA, in ornithology, a ſpecies of birds found in the inland parts of the Eaſt-Indies. Scaliger makes no doubt but it is the ſame with the *phœnix*. *Hofm.* Lex. in voc. See the article PHOENIX, *Cycl.*

SENA *(Suppl.)*—This genus of plants is comprehended by Linnæus under the *caſſia*. See CASSIA, *Suppl.* and *Append.*

Baſtard SENA, in botany, a name by which authors call *caſſia*. See the article CASSIA, *Suppl.*

Bladder-SENA, the Engliſh name of a genus of plants, called by botaniſts *colutea*. See the article COLUTEA, *Suppl.*

Podded-SENA, the name by which the *coronilla* of botanical writers is ſometimes called. See the article CORONILLA, *Suppl.*

Scorpion-SENA, the name of a genus of plants, called by authors *emerus*, See the article EMERUS, *Suppl.*

SENGREEN, a name ſometimes given to *ſedum*, or houſe-leek. See the article SEDUM, *Suppl.*

SENNA, in botany, &c. See SENA, *Cycl.* and *Suppl.*

SENSITIVE *plant*, *mimoſa*, in botany, the Engliſh name of a diſtinct genus of plants. See the article MIMOSA, *Suppl.*

SEPELAER. See PLATEA, *Suppl.*

SEPIA, in zoology, the name of a genus of ſea-inſects of the gymnarthria kind, called by us the *cuttle-fiſh*, and *ink-fiſh*. See INK-*fiſh*, *Append.*

The body of the *ſepia* is of an oblong figure, and depreſſed; it is furniſhed with ten tentacula, two of which are longer than the others, and are pedunculated. It is often ſix inches in length, and three and a half in diameter.

It is ſupported by an oblong, light and ſpungy ſubſtance, of a friable texture, and lined with a light fungous pith. This is uſed by the ſilver-ſmiths, and as a dentifrice under the name of *os ſepium*, *os ſepiæ*, or cuttle-fiſh-bone. *Hill*'s Hiſt. of Anim. p. 97.

SEPTICS, among phyſicians, an appellation given to all ſuch ſubſtances as promote putrefaction. See PUTREFACTION, *Append.*

From the many curious experiments, made by Dr. Pringle to aſcertain the *ſeptic* and *antiſeptic* virtues of natural bodies, it appears that there are very few ſubſtances of a truly *ſeptic* nature. Thoſe commonly reputed ſuch by authors, as the alcaline and volatile ſalts, he found to be no wiſe *ſeptic*. However, he diſcovered ſome, where it ſeemed leaſt likely to find any ſuch quality: theſe were chalk, common ſalt, and the teſtaceous powders. He mixed twenty grains of crabs eyes, prepared with ſix drachms of ox's gall, and an equal quantity of water. Into another phial he put an equal quantity of gall and water but no crabs-eyes. Both theſe mixtures being placed in the furnace, the putrefaction began much ſooner, where the powder was, than in the other phial. On making a like experiment with chalk, its *ſeptic* virtue was found to be much greater than that of the crabs-eyes: nay, what the doctor had never met with before, in a mixture of two drachms of fleſh, with two ounces of water and thirty grains of prepared chalk, the fleſh was reſolved into a perfect mucus in a few days.

To try whether the teſtaceous powders would alſo diſſolve vegetable ſubſtances, the doctor mixed them with barley and water, and compared this mixture with another of barley and water alone. After a long maceration by a fire the plain water was found to ſwell the barley, and turn mucilaginous and ſour; but that with the powder kept the grain to its natural ſize, and though it ſoftened it, yet made no mucilage and remained ſweet.

Nothing could be more unexpected, than to find ſea-ſalt a haſtener of putrefaction; but the fact is thus. One drachm of ſalt preſerves two drachms of freſh beef in two ounces of water, above thirty hours, uncorrupted, in a heat equal to that of the human body; or, which is the ſame thing, this quantity of ſalt keeps fleſh ſweet twenty hours longer than pure water. But then half a drachm of ſalt does not preſerve it above two hours longer. Twenty five grains have little or no antiſeptic virtue, and ten, fifteen, or even twenty grains manifeſtly both haſten and heighten the corruption. The quantity, which had the moſt putrefying quality, was found to be about ten grains to the above proportion of fleſh and water.

Many inferences might be drawn from this experiment. One is, that ſince ſalt is never taken in aliment beyond the proportion of the corrupting quantities, it would appear that it is ſubſervient to digeſtion, chiefly by it's *ſeptic* virtue, that is, by ſoftening and reſolving meats: an action very different from what is commonly believed.

It is to be obſerved that the above experiments were made with the ſalt kept for domeſtic uſes. See *Pringle*, Obſerv. on the diſeaſes of the army, p. 848, ſeq.

SERAPH (*Cycl.*)—SERAPH is alſo the name of a Turkiſh gold-coin, worth about five ſhillings ſterling. Dict. Ruſt. in voc.

SERCIL *feathers of a hawk*, the ſame with thoſe called pinions in other fowl. Dict. Ruſt. in voc.

SERE, in falconry, the yellow between the beak and eyes of a hawk. Dict. Ruſt. in voc.

SERJEANT of the acatery, See ACATERY, *Cycl.*

SERIES, in algebra (*Cycl.*)—The notion of a *ſeries* given in the Cyclopædia is too limited, when confined to ranks or progreſſions of quantities increaſing or decreaſing in ſome conſtant ratio: for the term *ſeries* is indifferently uſed whether the terms of any number of quantities following each other have a conſtant ratio, or even relation or not. And, ſtrictly ſpeaking, a *ſeries* of quantities increaſing or decreaſing in a conſtant ratio is no more than what is commonly called a geometric progreſſion.

The doctrine of *ſeries* is of extenſive uſe in mathematics, and has been carried far; though not ſo far as could be wiſhed. It would far exceed the limits of our deſign to enter into a detail of the diſcoveries relating to this ſubject. Something, however, ſhould be added to what has been ſaid in the Cyclopædia, to give a notion of the principal kinds of *ſeries*, and the method of notation uſed in treating of them.

A *ſeries* being propoſed, one of the principal queſtions concerning it, is, to find the law of its continuation. For this no univerſal rule can be given; but it often happens, that the terms of the *ſeries* taken two and two, three and three, or in greater numbers have an obvious and ſimple relation, by which the *ſeries* may be determined and produced indefinitely. Thus if unity be divided by $1-x$, the quotient will be a geometric progreſſion, any term of which will be to the next antecedent term as x to 1. And by this property the *ſeries* $1 + x + x^2 + x^3 +$ &c. may be diſtinguiſhed and produced *ad infinitum*. In like manner in other caſes of diviſion, other *ſeries's* will ariſe, the terms of which will have a conſtant relation to each other, and this relation recurring always throughout the *ſeries*, they have been called recurring *ſeries* by Mr. de Moivre, who firſt conſidered them, and applied them to the ſolution of ſeveral intricate problems. See *Recurring* SERIES, *infra*.

In many caſes, the relation of the terms of a *ſeries* is not conſtant, as it is in thoſe ariſing from diviſion. Yet this relation often varies according to a certain law obvious upon inſpection. Thus in the *ſeries* $1 + \frac{2}{3}x + \frac{8}{15}x^2 + \frac{16}{35}x^3 + \frac{128}{315}x^4 +$ &c. The terms may be continued indefinitely by the continued multiplication of theſe fractions $\frac{2}{3}$, $\frac{4}{5}$, $\frac{6}{7}$, $\frac{8}{9}$, &c. And the following *ſeries*. $1 + \frac{1}{6}x + \frac{3}{40}x^2 + \frac{5}{128}x^3 + \frac{35}{1152}x^4 +$ &c. may be continued by the multiplication of the fractions $\frac{1\times1}{2\times3}$, $\frac{3\times3}{4\times5}$, $\frac{5\times5}{6\times7}$, $\frac{7\times7}{8\times9}$, &c.

Series's of this kind may be defined by *differential equations*. The equation defining a *ſeries* is that which aſſigns the relation of the terms generally by their diſtances from the beginning. To do this Mr. Stirling conceives the terms of the *ſeries* to be placed as ſo many ordinates on a right line given by poſition, and he, for the ſake of ſimplicity, takes unity as the common interval of theſe ordinates. The initial terms of the *ſeries* he denotes by the initial letters of the alphabet, A, B, C, D, &c. A being the firſt, B the ſecond, C the third &c. And he denotes any term in general by the letter T, and the reſt following it in order, T′, T″, T‴, T⁗, &c. He denotes the diſtance of the term T from any given term, or from any given intermediate point between two terms, by the indeterminate quantity z: ſo that the diſtances of the terms T′, T″, T‴, &c. from the ſaid term or point, will be, $z+1$, $z+2$, $z+3$ &c. for the increment of the abſciſs is the common interval of the ordinates, or terms of the *ſeries* applied to the abſciſs.

Theſe things being premiſed let this *ſeries* be propoſed, $1, \frac{1}{2}x, \frac{3}{8}x^2, \frac{5}{16}x^3, \frac{35}{128}x^4, \frac{63}{256}x^5$ &c. in which the relations of the terms are $B = \frac{1}{2}Ax$, $C = \frac{3}{4}Bx$, $D = \frac{5}{6}Cx$, $E = \frac{7}{8}Dx$ &c. The relation in general will be defined by the equation, $T' = \frac{z+\frac{1}{2}}{z+1}Tx$, where z denotes the diſtance of T from the firſt term of the *ſeries*. For by ſubſtituting 0, 1, 2, 3, 4, &c. ſucceſſively in the place of z, the relations of the terms of the propoſed *ſeries* will ariſe. In like manner, if z be the diſtance of T from the ſecond term of the *ſeries*, the equation will be $T' = \frac{z+\frac{2}{3}}{z+2}Tx$, as will appear by ſubſtituting the numbers -1, 0, 1, 2, 3, 4, &c. ſucceſſively for z. Or if the indeterminate z denotes the place of the term T in the *ſeries*, its ſucceſſive values will be 1, 2, 3, 4, &c. and the equation will be $T' = \frac{z-\frac{1}{2}}{z}Tx$.

It appears therefore that innumerable differential equations may define one and the ſame *ſeries*, according to the different points from whence the origin of the abſciſſa z is taken. And on the contrary the ſame equation defines innumerable different *ſeries's* by taking different ſucceſſive values of z. For in the equation $T' = \frac{z-\frac{1}{2}}{z}Tx$, which defines the *ſeries* above mentioned, when 1, 2, 3, 4, &c. are the ſucceſſive values of the abſciſſæ; if $1\frac{1}{2}$, $2\frac{1}{2}$, $3\frac{1}{2}$, $4\frac{1}{2}$, &c. be ſucceſſively ſubſtituted for z, the relations of the terms ariſing will be $B = \frac{2}{3}Ax$, $C = \frac{4}{5}Bx$, $D = \frac{6}{7}Cx$, &c. from whence the *ſeries* $A, \frac{2}{3}Ax, \frac{8}{15}Ax^2, \frac{16}{35}Ax^3, \frac{128}{315}Bx^4$, &c. will ariſe, which is different from the former. But the equation will always determine the *ſeries* from the given values of the abſciſſa and of the firſt term, when the equation includes but two terms of the *ſeries*; as in the laſt example, where the firſt term being given, all will be given. But when the equation includes three terms, two muſt be given; and three muſt be given, when it includes four, and ſo forth.

If the *ſeries* $x, \frac{1}{6}x^3, \frac{1}{40}x^5, \frac{5}{112}x^7, \frac{35}{1152}x^9$ &c. be propoſed, where the relations of the terms are, $B = \frac{1\times1}{2\times3}Ax^2$, $C = \frac{3\times3}{4\times5}Bx^2$, $D = \frac{5\times5}{6\times7}Cx^2$, &c. the equation defining

this

this *series* will be $T' = \frac{2z-1 \times 2z-1}{2z \times 2z+1} T x^2$, or $T' = \frac{4zz-4z+1}{4zz+2z} T x^2$, where the succeſſive values of z are 1, 2, 3, 4, &c. See Mr. *Stirling*'s *methodus differentialis*, in the introduction.

This may ſuffice to convey a notion of theſe differential equations, defining the nature of *ſeries's*. But as to the application of theſe equations in finding the ſums of *ſeries's*, it would require a treatiſe to explain it. We muſt therefore refer the curious to that excellent one juſt quoted, as alſo to Mr. de Moivre's *Miſcellanea Analytica*; and ſeveral curious papers by Mr. Euler in the acta Petropolitana.

A *ſeries* often converges ſo ſlowly as to be of no uſe in practice. Thus if it were required to find the ſum of the *ſeries* $\frac{1}{1.2} + \frac{1}{3.4} + \frac{1}{5.6} + \frac{1}{7.8} + \frac{1}{9.10} +$ &c. which lord Brounker found for the quadrature of the hyperbola true to 9 figures, by the mere addition of the terms of the *ſeries*, Mr. Stirling computes that it would be neceſſary to add a thouſand millions of terms for that purpoſe; for which the life of man would be too ſhort. But by that gentleman's method the ſum of the *ſeries* may be found by a very moderate computation. See Meth. Diff. p. 26, ſeq.

Recurring SERIES, is uſed for a *ſeries* which is ſo conſtituted, that having taken at pleaſure any number of its terms, each following term ſhall be related to the ſame number of preceding terms according to a conſtant law of relation.

Thus in the following *ſeries*,

A B C D E F

$1 + 2x + 3xx + 10x^3 + 34x^4 + 97x^5 +$ &c.

in which the terms being reſpectively repreſented by the capitals A, B, C, D, &c. we ſhall have

$D = 3Cx - 2Bxx + 5Ax^2$

$E = 3Dx - 2Cxx + 5Bx^3$

$F = 3Ex - 2Dxx + 5Cx^3$ &c.

Where it is evident, that the law of relation between D and E is the ſame as between E and F, each being formed in the ſame manner from the three terms which precede it in the *ſeries*.

The quantities $3x - 2xx + 5x^3$ taken together and connected with their proper ſigns is what Mr. de Moivre calls the *Index* or the *ſcale of relation*. Sometimes the bare coefficients $3 - 2 + 5$ are called the ſcale of relation. And this ſcale of relation ſubtracted from unity is called the *differential ſcale*. Thus in the foregoing *ſeries* the ſcale of relation being $3x - 2xx + 5x^3$, the differential ſcale will be $1 - 3x + 2xx - 5x^3$.

On the ſubject of recurring *ſeries* ſee Mr. de Moivre's Miſcellan. Analytic. p. 27. ſeq. and p. 72. ſeq. as alſo his doctrine of chances 2d Edit. p. 193. ſeq. and Mr. Euler's analyſ. infinit. Tom. I. p. 175. ſeq.

A recurring *ſeries*, with its ſcale of relation being given, the ſum of that *ſeries* continued *in infinitum* will alſo be given. For inſtance, ſuppoſe a *ſeries* $a + bx + cxx + dx^3 + ex^4 +$ &c. where the relation of the coefficient of any term to the coefficients of any two preceding terms may be expreſſed by $f - g$; that is, $e = fd - ge$; and $d = fc - gb$ &c. Then will the ſum of the *ſeries* continued *in infinitum* be, $\frac{a + bx - fax}{1 - fx + gxx}$

To facilitate the intelligence of this rule by a particular example, aſſume any *ſeries* whereof the two firſt coefficients are given, ſuch as 2 and 5, and ſuppoſe f and g to be reſpectively 2 and 1; then we ſhall have the following *ſeries*, $2 + 5x + 8xx + 11x^3 + 14x^4 + 18x^5 +$ &c.

And the ſum $= \frac{2 + 5x - 4x}{1 - 2x + xx} = \frac{2 + x}{1 - x^2}$

For the proof divide 1 by $1 - x^2$

$1 - 2x + xx)\ 1\ (1 + 2x + 3xx + 4x^3 +$ &c. which multiplied by $2 + x$

gives $2 + 4x + 6xx + 8x^3 +$ &c.

$+ x + 2xx + 3x^3 +$ &c.

the product $= 2 + 5x + 8xx + 11x^3 +$ &c. $=$ the given *ſeries*.

Analogous rules might be derived for more complex caſes; and Mr. de Moivre's general rule is,

1°. Take as many Terms of the *ſeries* as there are parts in the ſcale of relation. 2°. Subtract the ſcale of relation from unity, the remainder is the differential ſcale. 3°. Multiply the terms taken in the *ſeries* by the differential ſcale, beginning at unity, and ſo proceeding orderly, remembring to leave out what would naturally be extended beyond the laſt of the terms taken. Then will the product be the numerator, and the differential ſcale will be the denominator of a fraction expreſſing the ſum required.

But we muſt here obſerve that when the ſum of a recurring *ſeries* extended *ad infinitum* is found by Mr. de Moivre's rule, it ought to be ſuppoſed, that the *ſeries* converges indefinitely, that is, that the terms may become leſs than any aſſigned quantity. For, if the *ſeries* diverges, that is, if its terms continually increaſe, it is not true, that the rule gives the ſum. For the ſum in ſuch caſes is infinite, or greater than any given quantity, whereas the ſum exhibited by the rule will often be finite. The rule therefore in this caſe only gives a fraction, the reduction of which into a *ſeries* gives the propoſed *ſeries*. Thus $\frac{1}{1 - x^2}$ reduced to an infinite *ſeries* gives the recurring *ſeries* $1 + 2x + 3xx +$ &c. whoſe ſcale of relation is $2 - 1$, and its ſum by the rule will be $\frac{a + bx - fax}{1 - fx + gxx} = \frac{1 + 2x - 2x}{1 - 2x + xx} = \frac{1}{1 - x^2} =$ the quantity from which the *ſeries* aroſe. But this quantity cannot in all caſes be deemed equal to the infinite *ſeries* $1 + 2x + 3xx$ &c. For ſtop where you will, there will always be a ſupplement required to make the product of the quotient by the diviſor equal to the dividend. When the *ſeries*, indeed, converges infinitely, the ſupplement diminiſhing continually, it becomes leſs than any aſſigned quantity, and is therefore, without error, reputed nothing; but in diverging *ſeries*, this ſupplement becomes indefinitely great, and the *ſeries* deviates indefinitely from the truth. See Mr. *Colſon*'s comment on Sir *Iſ. Newton*'s method of fluxions and infinite *ſeries* p. 152. Mr. *Stirling*'s method. Differentialis p. 36. *Bernoulli*, de Serieb. infinit. p. 249. *Cramer*, Analyſe des lignes Courbes, p. 174.

A *recurring ſeries* being given, the ſum of any number of the terms of that *ſeries* may be found. This is prob. III. p. 73. Miſcel. Analyſ. and prop. V. p. 196. of the Doctrine of chances. One ſolution of the ſimpleſt caſe will be ſufficient to give an idea of the method there uſed.

Let there be a geometric progreſſion $a + ax + ax^2 + ax^3 +$ &c: it is required to find the ſum of a number n of its terms. Then will the laſt term be ax^{n-1}. Suppoſe the progreſſion continued *ad infinitum*, and we ſhall have two infinite progreſſions, the firſt beginning with a and the ſecond with ax^n. Now the difference of the ſum of theſe two muſt be the ſum of the number n of terms. By the rule the ſum of the firſt infinite progreſſion will be $\frac{a}{1 - x}$; and the ſum of the ſecond will be $\frac{ax^n}{1 - x}$. But $\frac{a}{1 - x} - \frac{ax^n}{1 - x} = \frac{a - ax^n}{1 - x}$, which will therefore be the ſum of a number n, of terms.

This quantity $\frac{a - ax^n}{1 - x}$ is equal to $\frac{ax^n - a}{x - 1}$, which laſt expreſſion, calling $ax^{n-1} = l$, will be equivalent to this, $\frac{lx - a}{x - 1}$, which is the common rule for finding the ſum of any geometric progreſſion of which a, the firſt term; x, the ratio; and l the laſt term are given.

The *ſeries* reſulting from the diviſion of unity by $\overline{1 - x^p}$ or $\frac{1}{1 - x^p} = \overline{1 - x}^{-p}$ is $1 + px + p \times \frac{p+1}{2} xx + p \times \frac{p+1}{2} \times \frac{p+2}{3} x^3 +$ &c. And the ſum of any number of terms expreſſed by n of this *ſeries* will be $\frac{\overline{1 - x}^n}{1 - x^p} - \frac{nx^n}{1 - x^{p-1}} - \frac{n}{1} \times \frac{n+1}{2} x^n - \frac{n}{1} \times \frac{n+1}{2} \times \frac{n+2}{3} x^n -$ &c. which is to be continued till the number of terms $= p$. See Miſcel. Analyſ. pag. 167. Doctrine of chances. p. 196. This theorem is of uſe in finding the ſums of progreſſions of figurate numbers, and others.

Suppoſe, for inſtance, it were required to find the ſum of any number n of terms of the geometric progreſſion $1 + x + xx + x^3 +$ &c. generated by $\frac{1}{1 - x}$. Here $p = 1$. And the ſum will conſequently be $= \frac{1 - x^n}{1 - x^p} = \frac{1 - x^n}{1 - x}$.

Again, if the ſum of a number n of terms of the *ſeries* $1 + 2x + 3xx + 4x^3 +$ &c. were required. The *ſeries* is generated from $\frac{1}{1 - x^2}$. Then $p = 2$. And the ſum $= \frac{1 - x^n}{1 - x^2} - \frac{nx^n}{1 - x}$. Suppoſe $x = 1$ then will the ſum be $\frac{nn + n}{2} = n \times \frac{n+1}{2}$ which is the ſum of the arithmetical progreſſion $1 + 2 + 3 + 4 +$ &c. continued to the number n of terms. But it is to be obſerved that it requires a particular artifice to derive this ſum from the general rule: for at firſt ſight the ſum appears under this form $\frac{1 - 1}{\overline{1 - 1}^2} - \frac{n}{1 - 1}$

$\frac{n}{1-1}$ which determines nothing. See Miſc. Analyſ. loc. cit.

In like manner, the ſum of a number n of terms of the *ſeries* of triangular numbers will be found to be $n \times \frac{n+1}{2} \times \frac{n+2}{3}$, as in Miſcel. Analyſ. p. 168.

By the like methods the ſum of any number of ſquares, cubes, &c. of the natural *ſeries* of numbers may be found. Which may alſo be done by Sir Iſaac Newton's differential method. See DIFFERENTIAL *method*, *Append.*

3° In a recurring *ſeries* any term may be obtained whoſe place is aſſigned. For after having taken ſo many terms of the *ſeries* as there are terms in the ſcale of relation, the *ſeries* may be protracted till it reach the place aſſigned. But if that place be very diſtant from the beginning of the *ſeries*, the continuation of the terms will prove laborious: other methods have therefore been contrived. See Miſcel. Analyſ. p. 33, ſeq. and Doct. of chances, p. 197, ſeq.

Theſe queſtions have been reſolved in many caſes, beſides thoſe of *recurring ſeries*. But as there is no univerſal method for the quadrature of curves, neither is there one for the ſummation of *ſeries*; there being a great analogy between theſe things, and ſimilar difficulties ariſing in both. See the authors before cited.

The inveſtigation of Mr. Daniel Bernoulli's method for finding the roots of algebraic equations, which is inſerted in the article EQUATION, *Suppl.* depends upon the doctrine of *recurring ſeries*. See *Euler*, Analyſis infinitorum, Tom. I. pag. 276, ſeq.

In general algebraic quantities may be expreſſed by a *ſeries*, either by diviſion or by the extraction of roots, in a method analogous to that uſed in arithmetic for expreſſing vulgar fractions and roots by decimals. And the conſideration of this analogy ſeems to have given riſe to Sir Iſaac Newton's doctrine of infinite *ſeries*. See his method of fluxions and infinite *ſeries* in the beginning.

But the ſame great author had alſo another method of throwing quantities into an infinite *ſeries*, by means of a general form aſſumed for that purpoſe. See FORM.

Interpolation of a SERIES, ſee INTERPOLATION.

Interſcendent SERIES. See INTERSCENDENT *ſeries*.

Tranſcendental SERIES. See TRANSCENDENTAL *ſeries*.

Hyperbolic SERIES is uſed for a *ſeries* whoſe ſum depends upon the quadrature of the hyperbola. Such is the *ſeries* $\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} +$ &c. *De Moivre*, Miſc. Analyſ. p. 111.

Circular SERIES, is uſed for a *ſeries* whoſe ſum depends on the quadrature of the circle. Such is the *ſeries* $1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} -$ &c. *De Moivre*, Miſc. Analyſ. p. 111. or the ſum of the *ſeries* $1 + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} + \frac{1}{25} +$ &c. continued *ad infinitum*, according to Mr. Euler's diſcovery.

Mixt SERIES, that *ſeries* whoſe ſum depends partly on the quadrature of the circle and partly on that of the hyperbola. *De Moivre*, Miſc. Analyſ. p. 111.

Determinate SERIES, a *ſeries* the terms of which proceed by the powers of a determinate quantity. If that determinate quantity be unity, the *ſeries* is ſaid to be *determined by unity*. *De Moivre*, Miſcel. Analyſ. p. 111.

Reverſion of SERIES. See REVERSION *of ſeries*.

Summable SERIES, is uſed when the ſum of the terms of a *ſeries* may be found. Such is the *ſeries* $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} +$, &c. the ſum of which is ſaid to be equal to unity, or, to ſpeak more accurately, the limit of whoſe ſum is unity. See the article PROGRESSION, *Suppl.*

An indefinite number of ſummable infinite *ſeries's* may be found: ſuch are, for inſtance, all infinite recurring *ſeries*, when converging, and many others, for which Meſſieurs De Moivre [a], Bernoulli [b], Stirling [c], Euler [d], and Mac Laurin [e], may be conſulted.—[[a] Miſcel. Analyſ. p. 110, ſeq. [b] De Serieb. infinit. paſſim. [c] Method. Different. p. 34, ſeq. [d] Acta Petropolit. paſſim. [e] Fluxions, Art. 350, ſeq. See alſo PROGRESSION, *Suppl.*]

SERMOUNTAIN, a name ſometimes given to the plant called *ſeſili*, or *ſiler* by authors. See the articles SESILI and SILER, *Suppl.*

SERPENT's *tongue*, or ADDER's *tongue*, names by which the *ophioglоſſum* of botaniſts is frequently called. See the article OPHIOGLOSSUM, *Suppl.*

SERPYLLUM (*Suppl.*) is alſo uſed by ſome as the name of a ſpecies of *thymbra*. See the article THYMBRA, *Suppl.*

SERVICE-*tree*, in botany, the Engliſh name of a genus of trees, called by botanical writers *ſorbus*. See the article SORBUS, *Suppl.*

Wild SERVICE, a name by which ſome call the *cratægus* of botanical writers. See the article CRATÆGUS, *Suppl.*

SESAMUM, *oily grain plant*, in botany, the name of a genus of plants, the characters of which are theſe. The cup is a one-leaved perianthium, divided into five ſegments; the uppermoſt of which is ſhorteſt. The flower conſiſts likewiſe of one petal of a campanulated form, and divided into five ſegments; of which the loweſt is by far the longeſt. The ſtamina are four filaments, ſhorter than the flower; the antheræ are oblong, acute, and erect. The germen of the piſtil is oval and rough; the ſtyle is filiform; the ſtigma is lanceolated, and divided into two parts. The fruit is an oblong capſule, containing four cells, in which are numerous ſeeds of an oval figure. *Linnæi* Gen. Plant. p. 293.

SESSION (*Suppl.*)—The court of *ſeſſion*, otherwiſe called the *college of juſtice*, is the ſupreme court in Scotland for all civil cauſes. It conſiſts of one conſtant preſident and fourteen other judges, who are lords by their office, which they hold by patent *quamdiu ſe bene geſſerint*. The Lord High Chancellor preſides here when preſent. The king names ſeveral other extraordinary lords, who ſit, but are not obliged to attendance, becauſe they have no ſalaries; but they may vote among the reſt.

The court ſits from the firſt of November, old ſtyle, to the laſt of February, and from the firſt of June to the laſt of July, all incluſive; which holds of all the inferior courts or judicatories in Scotland. In time of *ſeſſion*, or term, they ſit from nine o'clock to twelve in the forenoon, every day in the week but Sunday and Monday: ſometimes they ſit in the afternoon, to end concluded cauſes, or to hear ſuch long debates as the forenoon was too ſhort to hear, which gives a great diſpatch to cauſes that come before them. The lords, both ordinary and extraordinary, when in the inner houſe, ſit on a ſemicircular bench in their robes; where the advocates debate their clients cauſes before them. There are ſix principal clerks belonging to this court. Nine of the lords make a quorum in the inner houſe, otherwiſe they cannot vote in any caſe, except ſuch as are referred to one or more of the whole lords; and one of the ordinary lords (the preſident being always excepted) is weekly appointed judge in the outer houſe, for diſcuſſing of ordinary actions, and has ſix under clerks to attend him. He meddles with no extraordinary caſes, except where it is remitted to him by all the lords to be diſcuſſed in the outer houſe for diſpatch.

That the lords may have time to read informations, petitions, &c. and the ſuitors be eaſed of the trouble of going with them to their houſes, every lord has a box ſtanding upon a table in the waiting room in the inner houſe from two to four o'clock in the afternoon every day; wherein all who have papers to offer, may put them by a ſlit in the cover. Each of the principal clerks have alſo a box, and parties muſt put their bills, anſwers, or informations of cauſes to be reported, into the clerk of the proceſs's box.

The rolls of the court bring in all cauſes in their due order. Cauſes of the greateſt conſequence are at firſt adviſed by the whole lords in the inner houſe. Other cauſes are called of courſe before an ordinary in the outer houſe, who decides the controverſy, if clear, without farther trouble or expence; and, in caſe of difficulty, takes ſome little time to adviſe it himſelf, or to adviſe with the whole lords upon it. And if any of the parties think themſelves wronged by the ſentence of the ordinary, they may complain to the lords, and get their anſwer upon a bill. See *Chamb.* Preſ. State of Gr. Brit. p. 381, ſeq.

An appeal lies from this court to the Houſe of Lords.

SETTER-*wort*, a name by which hellebore is ſometimes called. See the article HELLEBORUS, *Suppl.*

SETTING, (*Suppl.*) among cock-maſters, is the placing a cock, that has fought ſo that he cannot ſtand, beak to beak againſt the other cock, and if he does not ſtrike the battle is won. Dict. Ruſt. in voc.

SETTING *down*, in falconry, is when a hawk is put into the mew. Id. ibid.

SETTING-*dog*, one trained up to find out and diſcover to the ſportſman whereabouts fowl are.

SETTS *for ſaws*, inſtruments for ſetting their teeth when out of order. *Blanckley*, Nav. Expoſ. p. 145.

SETWELL, in botany, a name ſometimes uſed for a ſpecies of *valerian*. See the article VALERIAN, *Suppl.*

SEWEL, among ſportſmen, denotes any thing that is ſet or hung up, to keep a deer out of any place. Ruſt. Dict. in voc.

SEYMS, among farriers. See SEAMS.

SHADDOCK, in botany, the name by which ſome call a ſpecies of orange. See the article ORANGE, *Suppl.*

SHAKLES, aboard a ſhip. See SHACKLES, *Suppl.*

SHAKY, or SHAKEN, among builders, an appellation given to timber which is cracked either with the heat of the ſun, or the drought of the wind. Build. Dict. in voc.

SHAVE-*graſs*, a name ſometimes uſed for the *equiſetum*, or horſe-tail. See the article EQUISETUM, *Suppl.*

SHAVING-*irons*, among gardeners, tools to keep a garden free from weeds, otherwiſe called *edging-irons*. Ruſt. Dict. in voc.

SHAW (*Suppl.*)—SHAW-*fowl*, an artificial bird, made for fowlers to ſhoot at. Ruſt. Dict. in voc.

SHEAT, or SHUT, a name by which ſome call a young hog. Ruſt. Dict. in voc.

SHELDAPLE, a name uſed in ſeveral parts of the kingdom for the chaffinch. Ruſt. Dict. in voc.

SHELL (*Suppl.*)—*Caterpillar*-SHELL, the Engliſh name of a ſpecies of *turbo*. See the article TURBO, *Suppl.*

Crown imperial SHELL, the Engliſh name of a ſpecies of *voluta*. See the article VOLUTA, *Suppl.*

Chalice-SHELL, or *cup*-SHELL, the Engliſh name of a ſpecies of *balanus*. See the article BALANUS, *Suppl.*

Dog-tooth SHELL, the Engliſh name of a ſpecies of *dentale*. See the article DENTALE, *Suppl.*

Needle-SHELL, the Engliſh name of a ſpecies of *centronia*. See the article CENTRONIA, *Append.*

Needle-SHELL. See the article NEEDLE, ſupra.

Scorpion-SHELL, or *Spider*-SHELL, names uſed for a ſpecies of *murex*. See the article MUREX, *Suppl.*

Tiger-SHELL, the Engliſh name of the red *voluta* with large white ſpots. See the article VOLUTA, *Suppl.*

Toe-SHELL, the Engliſh name of a genus of *ſhells*, otherwiſe called *pollicipes*. See the article POLLICIPES, *Suppl.*

Turtle-SHELL, the Engliſh name of two ſpecies of different kinds of *ſhells*, the *murex* and *voluta*. See the articles MUREX and VOLUTA, *Suppl.*

SHELL-*drake*, in zoology, a common Engliſh name for the *tadorna*. See the article TADORNA.

SHEPHERD, in country affairs, a perſon who keeps or looks after ſheep. Dict. Ruſt. in voc.

SHEPHERD'*s needle*, a name by which the *ſcandex* of botaniſts is ſometimes called. See the article SCANDEX, *Suppl.*

SHEPHERD'*s pouch*, *alyſſon*, in botany, the name of a diſtinct genus of plants, otherwiſe called *madwort*. See the article ALYSSON, *Suppl.*

SHEPHERD'*s ſtaff*, or SHEPHERD'*s rod*, in botany, names given to the *dipſacus* of botanical writers. See the article DIPSACUS, *Suppl.*

SHERBET, or SHERBIT, a compound drink, firſt brought into England from Turkey and Perſia, conſiſting of fair water, lemon juice, ſugar, amber, and other ingredients. Another kind of it is made of violets, honey, juice of raiſins, *&c.*

The word *ſherbet*, in the Perſian language, ſignifies *pleaſant liquor*. Dict. Ruſt. in voc.

SHRIMP, the Engliſh name of the common *ſquilla* with a long tail, and the ſnout ſerrated above, and tridentated below. See the article SQUILLA, *Append.*

SHROVE, in zoology, the ſame with *ſhrew*. See the article SHREW, *Suppl.*

SHUT, among farmers. See SHEAT, *Append.*

SICYANIA, the *gourd-worm*, the name of a genus of worms; the body of which is of an oblong form, flat on the belly, and rounded on the back; its ſkin is ſoft, and its mouth large, horizontal, and emarginated, or dented in the middle. It reſembles the common gourd in figure, and from thence has got this name of *vermis cucurbitinus*, or the *gourd-worm*. It is frequently found in the inteſtines of animals. *Hill*, Hiſt. Anim. p. 16.

SIDE-*ſaddle-flower*, a name ſometimes given to the *ſarracena* of botanical writers. See the article SARRACENA, *Suppl.*

SIDEROCHITA, in natural hiſtory, a claſs of cruſtated ferrugineous bodies, of a moderately firm and compact texture, compoſed of ferrugineous mixed with earthy matter, and formed of repeated incruſtations, making ſo many coats or cruſts round a ſofter or harder nucleus, or round looſe earths, or an aqueous fluid. Vid. *Hill*, Hiſt. Foſſ. p. 531. Under this claſs are comprehended the *empherepyra*, *heteropyra*, *geodes*, and *enhydri*. See the article EMPHEREPYRA, &c. *Append.*

SIDEROXYLUM, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, the characters of which are theſe: the cup is a ſmall erect perianthium, compoſed of a ſingle leaf, divided into five ſegments, and permanent. The flower conſiſts of a ſingle petal, divided into five roundiſh, erect, concave ſegments; and, at the baſe of every one of theſe, there is placed a cuſpidated, ſerrated denticle, bending inwards. The ſtamina are five ſubulated filaments, of the length of the flower: the antheræ are ſimple: the germen of the piſtil is roundiſh; the ſtyle is ſubulated, and of the length of the ſtamina; the ſtigma is ſimple. The fruit is a roundiſh berry, containing only one cell. The ſeeds are four in number. *Linnæi* Gen. Plant. p. 81.

SILK-*graſs*, a name uſed for two very different genuſes of plants, the *aloe* and *dog's bane*. See the articles ALOE and DOG'S BANE, *Suppl.*

SILK-*machine*. See the article MACHINE, *Append.*

SILVER-*bruſh*, a name ſometimes given to the *barba jovis* of botaniſts. See the article BARBA-*jovis*, *Suppl.*

SILVER-*weed*, *potentilla*, or *argentina*, in botany, the name of a diſtinct genus of plants. See the articles ARGENTINA and PENTAPHYLLOIDES, *Suppl.*

SILVERING (*Cycl.*)—This is a ſpecies of gilding, and may be done thus: take as much aqua fortis as you think there is occaſion for, put it into a glaſs, which ſet in warm aſhes; then put in your quantity of ſilver, after having beaten it very thin, and cut it into little ſhreads. When the ſilver is diſſolved, take it off the aſhes; and, mixing that liquid with as much white tartar as will make it like paſte; rub with this mixture the metal you want to ſilver. Copper, braſs, or any other metal may be thus made to appear like ſilver itſelf. Copper, braſs, ſteel, or iron may be *ſilvered*, ſo as not to come off, unleſs made red-hot, in the following manner. Take urine which is made in the morning, cover it, and let it ſtand a whole month, and it will ferment; put it afterwards into an earthen pot, and let it boil; ſkim it, and when the third part is evaporated, take to two pints of urine one ounce of tartar, and one ounce of galiz-ſtone; mix them all together, and let them boil once up. When you would *ſilver* any metal, rub it well with brick-duſt on a wet woollen rag, till it is clean and fine, then put it twenty-four hours in the prepared urine; afterwards dry it, and where you deſign to *ſilver*, rub it over with quick-ſilver, which muſt be laid on thin with an iron ſpatula that has alſo lain two hours in urine. The quick-ſilver thus laid on, muſt be then rubbed on with a ſoft woollen rag, and it will make a fine *ſilvering*.

Braſs may be *ſilvered*, by boiling it with filings of good pewter and white tartar, in equal quantities. There are ſeveral other methods of *ſilvering*, for which ſee *Smith*'s Laboratory, p. 37. ſeq.

SINGLE (*Suppl.*)—SINGLE, among ſportſmen, the tail of a buck, or any of the deer kind. Ruſt. Dict. in voc.

SISON, the officinal name of a ſpecies of *ſium*. See the article SIUM, *Suppl.*

SKEETS, in the ſea language, narrow oblong ladles, for weting the ſails or ſides of a ſhip. *Blanckley*'s Nav. Expoſ. p. 152.

SKEPE, or SKUTTLE, in country affairs, a ſort of flat, broad baſket for winnowing of corn. Dict. Ruſt. in voc.

SKIDS, wooden fenders laid on the outſide of a ſhip for the conveniency of hoiſting things into the ſhip. *Blanckley*'s Nav. Expoſ. p. 152.

SKREEN. See SCREEN, *Append.*

SLEEPER, in zoology, a name peculiarly given to the dormouſe, or *mus avellanorum* of authors. See the article MUS, *Suppl.*

SLEEPER, in building, a name uſed for the oblique rafter that lies in a gutter. Build. Dict. in voc.

SLIPPER (*Suppl.*)—*Lady*'s SLIPPER, the Engliſh name of a genus of plants, called by botaniſts *helleborine*. See the article HELLEBORINE, *Suppl.*

SLIPPER is alſo a name ſometimes uſed for a *plinth*. See the article PLINTH, *Cycl.*

SLOTH, in zoology. See SLOATH, *Suppl.*

SNAIL, in the hiſtory of inſects, the Engliſh name for the *limax*. See the articles SNAIL, *Suppl.* and LIMAX, *Append.*

SNAIL is alſo the name of the animal inhabiting many kinds of ſhells, as the patella, cochlea, nerite, buccinum, turbo, trochus, voluta, murex, purpura, lyra, and concha veneris. *Hill*, Hiſt. Anim. p. 114. See the articles PATELLA, COCHLEA, *&c.*

SNAIL *trefoil*. See the article TREFOIL, infra.

SNAKE (*Suppl.*)—*Coach-whip*-SNAKE, the name by which ſome call a ſpecies of *coluber*. See the article COLUBER, *Append.*

Corn-SNAKE, the name of another ſpecies of *coluber*.

Necklace-SNAKE, the Engliſh name of the *natrix torquata* of zoologiſts. See the article NATRIX, *Suppl.*

Sand-SNAKE, the Engliſh name of a kind of ſerpent found in Lybia, and ſome parts of Italy. See the article AMMODYTES, *Suppl.*

SNAKE-*root*, *ariſtolochia*, in botany, the name of a genus of plants, otherwiſe called *birthwort*. See the article ARISTOLOCHIA, *Suppl.*

Rattle-SNAKE-*root*, a name ſometimes given to *polygala*, a diſtinct genus of plants. See the article POLYGALA, *Suppl.*

SNAP-*tree*, *adhatoda*, in botany, the name of a diſtinct genus of trees. See the article ADHATODA, *Suppl.*

SNEAD, or SNEATH, in country affairs, the handle of a ſcythe, or the like tool. Ruſt. Dict. in voc.

SNEEZE-*wort*, *ptarmica*, in botany, the Engliſh name of a diſtinct genus of plants. See the article PTARMICA, *Suppl.*

SNET, among ſportſmen, denotes the fat of all kinds of deer. Ruſt. Dict. in voc.

SNIPE (*Suppl.*)—*Mire*-SNIPE, the name uſed in ſome parts of the kingdom for the *ardea ſtellaria*, or bittern. See the article BITTERN, *Suppl.*

SNIPE-*bills*, in the ſea language, a kind of hooks uſed for faſtening the axel-trees of the chain-pumps to the bitts. *Blanckley*'s Nav. Expoſ.

SNOW-*drop*, the Engliſh name of a diſtinct genus of plants, according to Linnæus, who calls it *galanthus*, but is made only a ſpecies of *narciſſo-leucoium* by *Tournefort*. See the article NARCISSO-LEUCOIUM, *Suppl.*

SNOW-*drop-tree*, the Engliſh name of a genus of trees, called by botaniſts *chionanthus*. See the article CHIONANTHUS, *Append.*

SOAP-*berry-tree*, *ſapindus*, in botany, the name of a genus of trees. See the article SAPINDUS. *Suppl.*

SOAP-*wort*, the Engliſh name of the *ſaponaria* of botaniſts. See SAPONARIA, *Append.*

SOAR (*Suppl.*)—SOAR-*age*, in falconry, denotes the firſt year of a hawk's age. Ruſt. Dict. in voc.

SOLAN-

SOLANDERS, in farriery. See MALANDERS, *Cycl.*

SOLANOIDES, in botany, the name of a genus of plants, called by Linnæus *rivinia*. See the article RIVINIA. *Suppl.*

SOLDIER (*Suppl.*)—Not only humanity but intereſt require that great care ſhould be taken of the health of *ſoldiers*. Much inſtruction may be drawn for this purpoſe from Dr. Pringle's excellent treatiſe, called obſervations on the diſeaſes of the army. He there remarks, that the circumſtances of *ſoldiers* in time of war, differ from thoſe of other people, in that they are more expoſed to the injuries of the weather, and always crouded together, whether in camp, barracks, or hoſpitals: wherefore the moſt general diviſion of theſe diſtempers, may be into ſuch as ariſe from the intemperature of the weather, and thoſe from infection.

Military diſeaſes depending on the weather, are reducible to two ſorts, *viz.* to thoſe of ſummer, and to thoſe of winter. However, as expoſitions to cold are unavoidable upon the firſt encampment, as alſo for ſome time before the army uſually goes into winter-quarters, the winter diſorders beginning about the end of autumn, will not entirely ceaſe before the ſummer is well advanced; and, on the other hand, as the heats of ſummer and damps of autumn diſpoſe the body to ſickneſs, the camp-diſtempers are never quite over with the campaign, but continue ſome time after the troops retire into winter-quarters.

The ſummer diſeaſes are all of a bilious or putrid nature, as thoſe of winter are inflammatory. See BILIOUS and INFLAMMATORY, *Append.*

Diſeaſes of SOLDIERS, ariſing from heat and cold. See the articles HEAT and COLD, *Append.*

Diet of SOLDIERS. See DIET, *Append.*

Exerciſe of SOLDIERS. See EXERCISE. See alſo the articles CAMP, HOSPITAL, FEVER, &c.

Freſh-water SOLDIER, a name given in ſeveral parts of England to the *ſtratiotes*, a diſtinct genus of plants, called by Boerhaave *aloides*. See the article STRATIOTES, *Append.*

SOLEMN *acceptance*. See ACCEPTANCE, *Cycl.*

SOLIDAGO, in the Linnæan ſyſtem of botany, the name of a very comprehenſive genus of plants, taking in the *virga aurea* of Tournefort, with ſeveral ſpecies of the *jacobæa* of the ſame author. *Linnæi* Gen. Plant. p. 403. See the article VIRGA *aurea*, *Suppl.*

The great characteriſtic of this genus, is, that the receptacle is naked, the down ſimple, the ſquamæ of the cup imbricated, and the radii of the corollulæ about five.

SOLINE, among carpenters, a joiſt, rafter, or piece of wood, either ſlit or ſawed, wherewith the builders lay their ceilings. Build. Dict. in voc.

The word is French.

SOLOMON's *ſeal*, the Engliſh name of a diſtinct genus of plants, called by botaniſts *polygonatum*. See the article POLYGONATUM, *Suppl.*

SOPES. See the article SOAP, *Cycl.* and *Suppl.*

SOPHIA *chirurgorum*, a name ſometimes given to a ſpecies of *ſiſymbrium*. See the article SISYMBRIUM, *Suppl.*

SORREL (*Suppl.*)—*Wood* SORREL, the Engliſh name of a genus of plants, called by botaniſts *lujula*, or *oxys*. See the article OXYS, *Suppl.*

Indian SORREL, a name ſometimes given to *ketmia*. See the article KETMIA, *Suppl.*

SOURE-*ſop*, or SOWRE *ſop*, in botany, a diſtinct genus of plants, called by botaniſts *guanabanus* and *anona*. See the article ANONA, *Suppl.*

SPACE (*Cycl.*)—Some authors have aſſerted that *ſpace* is a ſubſtance. The Carteſians, who do not allow of any diſtinction between *ſpace* and matter, were naturally enough led to the opinion, that *ſpace* or extenſion was a ſubſtance. Others who admit a vacuum, and conſequently an eſſential difference between *ſpace* and matter, aſſert alſo that *ſpace* is a ſubſtance. Among theſe we find *s'Graveſande*, Introd. ad Philoſ. ſect. 19.

Others put *ſpace* into the ſame claſs of beings as time and number; that is, they make it to be no more than a notion of the mind. Hence, according to theſe authors, abſolute *ſpace*, of which the Newtonians ſpeak, is a mere chimera. See the writings of the late biſhop of Cloyne, *paſſim.*

SPADE (*Suppl.*)—SPADE alſo denotes any gelded beaſt, or a deer three years old. Ruſt. Dict. in voc.

SPAID, or SPAYD, a term uſed by ſportſmen for a red male deer that is three years old. Ruſt. Dict. in voc.

SPANISH-*broom*, *ſpartium*, in botany. See the article SPARTIUM, *Suppl.*

SPANSHAKLE, aboard a ſhip, a large claſp of iron, which goes round the end of the davit upon the forecaſtle. *Blanckley*, Naval Expoſitor, p. 155.

SPARING, among cock-fighters. See the article SPARRING, *Suppl.*

SPARROW (*Suppl.*)—*Reed*-SPARROW, the Engliſh name of a bird of the *picus*, or wood-pecker kind. See the article REED-*ſparrow*, *Suppl.*

SPARROW-*hawk*, the Engliſh name of the yellow-legged *falco*, with a white undulated breaſt, and a faſciated brown tail. See the article FALCO, *Suppl.*

SPAT, a term uſed by the fiſhermen for the ſpawn of oyſters, which is caſt in the month of May. Dict. Ruſt. in voc.

SPEAR-*mint*, in botany, the Engliſh name of the narrow-leaved, aromatic-ſcented mint. See the articles MINT and MENTHA, *Suppl.*

SPERGULA, *ſpurry*, in the Linnæan ſyſtem of botany, makes a diſtinct genus of plants, but is comprehended by Tournefort among the *alſines*. See the article ALSINE, *Suppl.*

SPHERES, poliſhed ſpherical maſſes of a mixt metalline compoſition, uſed in optics. The manner of making them is as follows. Take of pure tin three pounds, copper one pound; melt theſe two metals together, and when in fuſion caſt upon the maſs ſix ounces of burnt tartar, and an ounce and half of ſalt petre; and laſtly, a quarter of an ounce of alum, and two ounces of arſenic: let all theſe matters evaporate and burn away, and then caſt the pure metal into the figure of a *ſphere*, and it will be capable of a high and elegant poliſh. *Neri*'s Art of Glaſs, p. 166.

SPIDER-*ſhell*, the Engliſh name of ſeveral ſpecies of *murex*. See the article MUREX, *Suppl.*

SPIDER-*wort*, (*Suppl.*) is alſo the name by which many call the *ephemerum* of botanical writers. See the article EPHEMERUM, *Suppl.*

SPIKES (*Suppl.*)—The word *ſpikes*, among botaniſts, denotes flowers ſet thick above each other. Dict. Ruſt. in voc.

SPIKE-*lavender*. See the article LAVENDULA, *Suppl.*

SPIKENARD, (*Cycl.*) *nardus*, in botany. See the article NARDUS, *Suppl.*

Ploughman's SPIKENARD, the Engliſh name of a genus of plants, otherwiſe called *conyza*, and *flea-bane*. See the article FLEA-*bane*, *Suppl.*

SPILES, in a ſhip, are ſmall wooden pins, which are driven into the nail-holes, when a ſhip's ſheathing is taken off. *Blanckley*, Naval Expoſitor, p. 156.

SPINACH (*Suppl.*)—*Strawberry*-SPINACH, a name ſometimes given to *blite*. See the article BLITUM, *Suppl.*

SPINDLE (*Suppl.*)—The ſtaff which ſupports the vane at the maſt-head, is likewiſe called a *ſpindle*. *Blanckley*, Naval Expoſitor, p. 156.

SPINDLE-*ſhell*, the Engliſh name of a ſpecies of buccinum. See the article TRUMPET-*ſhell*, *Suppl.*

SPINDLE-*tree*, the Engliſh name of a genus of trees, called by botaniſts *euonymus*. See the article EUONYMUS, *Suppl.*

African SPINDLE-*tree*, the Engliſh name of a genus of plants, called *euonymoides* and *celaſtrus* by authors. See the article CELASTRUS, *Append.*

SPINDLING, a term uſed by gardeners for the firſt appearance or putting forth of flowers, ſtems; or their running up in length. Ruſt. Dict. in voc.

SPIRKETTING, among ſhip-carpenters, denotes ſtrakes of thick plank wrought from the lower edge of each port to each deck reſpectively within ſide of the ſhip. *Blanckley*, Naval Expoſitor, p. 156.

SPIT-*deep*, a term uſed among farmers for a ſoil as deep as can be dug up at once with a *ſpit* or ſpade. Dict. Ruſt. in voc.

SPITTER, among ſportſmen, a red male deer near two years old, whoſe horns begin to grow up ſharp and ſpitwiſe. It is otherwiſe called a *brocket* and *pricket*. Ruſt. Dict. in voc.

SPLEEN-*wort*, a name ſometimes uſed for a genus of plants, called by botaniſts *aſplenium*, and in Engliſh more commonly *milt-waſte*. See the article ASPLENIUM, *Suppl.*

SPOON-*bill*, in ornithology, the Engliſh name of the *platea*. See the article PLATEA, *Suppl.*

SPOON-*wort*, a name by which ſome call the *cochlearia*, or ſcurvy-graſs. See the article COCHLEARIA, *Suppl.*

SPRAINTS, among ſportſmen, a term uſed for the dung of the otter. Ruſt. Dict. in voc.

SPRAT, the Engliſh name of the little *clupea*, with the lower jaw longeſt, and the belly very acute. See the article CLUPEA, *Suppl.*

SPROUTS, a word uſed by country people for ſmall ſhoots of old cabbage. Ruſt. Dict. in voc.

SPUNK, a term uſed indifferently for half-rotten wood, match for guns, and a ſubſtance growing on the ſides of trees. Dict. Ruſt. in voc.

SPUR-*ſhell*, a name ſometimes given to the little elevated *cochlea*, with the edge of the volutions ſerrated. See the article COCHLEA, *Suppl.*

SPURGE-*olive*, the Engliſh name of a genus of plants, called by botaniſts *chamelæa*. See the article CHAMELÆA, *Suppl.*

Sun-SPURGE, a name by which ſome call ſeveral ſpecies of *tithymalus*. See the article TITHYMALUS, *Suppl.*

SQUASH, the Engliſh name of a genus of plants, called by authors *melopepo*. See the article MELOPEPO, *Suppl.*

SQUILL, *ſquilla*, in zoology, a large genus of animals, comprehending the ſhrimp or *ſquilla*, properly ſo called, the cray-fiſh, the crab, and lobſter: all which, according to Dr. Hill, make one genus of inſects, of the podaria kind. See the articles INSECT, *Suppl.* and *Append.* and PODARIA, *Append.*

The characteriſtics of this genus are, that they have ten legs, the foremoſt pair cheliform, or made for pinching and holding

holding things; that they have only two eyes, and that the tail is foliated.

The *squillæ* may be conveniently arranged under three ſubdiviſions. 1. The ſmaller long-tailed *squillæ*, commonly called *ſhrimps*. 2. The larger long-tailed *squillæ*, or the *lobſter* and *cray-fiſh* kind. 3. The ſhort-tailed kind, called alſo *canceres*, and in Engliſh *crabs*.

Of thoſe denominated *ſhrimps* we have the following ſpecies. 1. The long-tailed *squilla*, with the ſnout ſerrated above, and tridentated below. This is the common *ſhrimp*. 2. The long-tailed *squilla*, with a ſmooth ſnout, called the ſmooth-noſed *ſhrimp*. 3. The long-tailed *squilla*, with a ſoft tail, and the right claw largeſt. This is called the *hermit*. 4. The larger, long-ſnouted ſea-*squilla*. 5. The ſmaller, narrow-ſnouted ſea-*squilla*. 6. The freſh-water ſmall *squilla*.

Of the ſecond order of *squillæ*, commonly called *lobſters*, or *cray-fiſh*, we have the following ſpecies. 1. The common *lobſter*. 2. The thick-horned, ſlender-bodied *lobſter*. 3. The ſhort and broad-bodied *lobſter*. 4. The very long-bodied *lobſter*. 5. The ſmall-bodied *lobſter*. 6. The great ſea *cray-fiſh*. 7. The *cray-fiſh* with the ſnout ſerrated above, and with a ſingle denticulation at the baſe. This laſt ſpecies, though only three inches and an half in length, greatly approaches to the figure of the common *lobſter*.

Of thoſe *squillæ*, called *crabs*, *canceres*, there are the following ſpecies. 1. The common large *crab*. 2. The *wart-crab*, *cancer verrucoſus*. 3. The *ſpider-crab*, or long-legged, ſhort-tailed *squilla*. 4. The *king-crab*, or *molucca-crab*, called the *squilla clypeata*. 5. The rough-bodied, ſmooth-clawed *squilla*, called *cancer mæas*. 6. The ſmooth and long-clawed *crab*, called by Johnſton the female of the common kind. 7. The little ſquall *crab*. 8. The little woolly *crab*. 9. The thick-bodied duck *crab*. 10. The round-bodied duck *crab*. 11. The common, or oval-bodied duck *crab*. 12. The very long-armed duck *crab*. 13. The very ſmall-bodied, rough, long-armed *crab*. 14. The lunar *crab*. 15. The florid *crab*. 16. The frog *crab*. 17. The prickly and hairy, long-armed *crab*. 18. The great prickly, long-armed *crab*. 19. The ſhort-bodied, reticulated *crab*. 20. The elliptic-bodied *crab*. 21. The ſmooth, long-legged *crab*. Vid. *Hill*, Hiſt. Anim. p. 28, ſeq. and Table of Cruſtaceous Animals, N° 18, 19, *&c.*

SQUILL, *ſcilla*, in botany, the Engliſh name of a diſtinct genus of plants. See the article SCILLA, *Append.*

SQUILL, *ſcilla*, in botany, the Engliſh name of a diſtinct genus of plants, according to Linnæus; but comprehended under the *ornithogala* by Tournefort. See the article ORNITHOGALUM, *Suppl.*

STAFF (*Suppl.*)—*Shepherd's* STAFF, or *ſhepherd's rod*, in botany, the name of a genus of plants, called by botaniſts *dipſacus*. See the article DIPSACUS, *Suppl.*

STAG-*beetle*, in the hiſtory of inſects, the Engliſh name of a ſpecies of *ſcarabæus*, with ramoſe horns. See the article SCARABÆUS, *Suppl.*

STAG's *horn-tree*, a name ſometimes given to the *rhus*, or ſumach, a diſtinct genus of plants. See the article RHUS, *Suppl.*

STAGGARD, among ſportſmen, a young male deer only four years old. Ruſt. Dict. in voc.

STAINING (*Suppl.*)—STAINING *of horn*. See the article HORN, *Append.*

STAINING *of ivory*. See IVORY, *Append.*

STANDARD (*Suppl.*)—STANDARDS, in ſhip-building, a ſort of knees fayed from the deck to the ſides of the ſhip within board, to ſtrengthen her. *Blanckley*, Naval Expoſitor, in voc.

STAPHYLÆA, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by Tournefort *ſtaphylodendron*. See the article STAPHYLODENDRON, *Suppl.*

STAPHYLINUS, in zoology, the name of a genus of four-winged flies, the antennæ of which are ſlender and filiform. There are two veſicles ſituated above the tail. The exterior wings are dimidiated and ſhort.

Of this genus there are a great many ſpecies, diſtinguiſhed from each other by the colour of the ſeveral parts of their bodies. Vid. *Hill*, Hiſt. Anim. p. 57.

STAR (*Suppl.*)—Our excellent aſtronomer, Dr. Bradley, had no ſooner diſcovered the cauſe, and ſettled the laws of the aberration of the fixed *ſtars* [b], than his attention was again excited by another new phænomenon, *viz.* an annual change of declination in ſome of the fixed *ſtars*, which appeared to be ſenſibly greater than a proceſſion of the equinoctial points of 50″ in a year, the mean quantity now uſually allowed by aſtronomers, would have occaſioned.—[b See the article LIGHT, *Append.*]

This apparent change of declination was obſerved in the *ſtars* near the equinoctial colure; and there appearing at the ſame time an effect of a quite contrary nature, in ſome *ſtars* near the ſolſtitial colure, which ſeemed to alter their declination leſs than a proceſſion of 50″ required, Dr. Bradley was thereby convinced, that all the phænomena in the different *ſtars* could not be accounted for merely by ſuppoſing that he had aſſumed a wrong quantity for the proceſſion of the equinoctial points. He had alſo, after many trials, ſufficient reaſon to conclude, that theſe ſecond unexpected deviations of the *ſtars* were not owing to any imperfection of his inſtruments. At length, from repeated obſervations, he began to gueſs at the real cauſe of theſe phænomena.

It appeared from the Doctor's obſervations, during his reſidence at Wanſted, that ſome of the *ſtars* near the ſolſtitial colure had changed their declinations 9″ or 10″ leſs than a proceſſion of 50″ would have produced; and, at the ſame time, that others near the equinoctial colure had altered theirs about the ſame quantity more, than a like preceſſion would have occaſioned: the north pole of the equator ſeeming to have approached the *ſtars*, which come to the meridian with the ſun, about the vernal equinox and the winter ſolſtice; and to have receded from thoſe, which come to the meridian with the ſun, about the autumnal equinox and the ſummer ſolſtice.

From the conſideration of theſe circumſtances, and the ſituation of the aſcending node of the moon's orbit when he firſt began to make his obſervations, he ſuſpected that the moon's action upon the equatorial parts of the earth might produce theſe effects. For, if the preceſſion of the equinox be, according to Sir Iſaac Newton's principles, cauſed by the actions of the ſun and moon upon thoſe parts; the plane of the moon's orbit being, at one time, above ten degrees more inclined to the plane of the equator, than at another; it was reaſonable to conclude, that the part of the whole annual preceſſion, which ariſes from her action, would in different years be varied in its quantity; whereas the plane of the ecliptic, wherein the ſun appears, keeping always nearly the ſame inclination to the equator, that part of the preceſſion, which is owing to the ſun's action, may be the ſame every year; and from hence it would follow, that although the mean annual preceſſion, proceeding from the joint actions of the ſun and moon, were 50″; yet the apparent annual preceſſion might ſometimes exceed, and ſometimes fall ſhort of that mean quantity, according to the various ſituations of the nodes of the moon's orbit.

In the year 1727, the moon's aſcending node was near the beginning of Aries, and conſequently her orbit was as much inclined to the equator, as it can at any time be; and then the apparent annual preceſſion was found, by the Doctor's firſt year's obſervations, to be greater than the mean; which proved, that the *ſtars* near the equinoctial colure, whoſe declinations are moſt of all affected by the preceſſion, had changed theirs, above a tenth part more than a preceſſion of 50″ would have cauſed. The ſucceeding year's obſervations proved the ſame thing; and in three or four years time the difference became ſo conſiderable, as to leave no room to ſuſpect that it was owing to any imperfection either of the inſtrument, or obſervations.

But ſome of the *ſtars*, that were near the ſolſtitial colure, having appeared to move, during the ſame time, in a manner contrary to what they ought to have done, by an increaſe of the preceſſions; and the deviations in them being as remarkable as in the others, it was evident that ſomething more than a mere change in the quantity of the preceſſion would be requiſite to ſolve this part of the phænomenon. Upon comparing the obſervations of *ſtars* near the ſolſtitial colure, that were almoſt oppoſite to each other in right aſcenſion, they were found to be equally affected by this cauſe. For whilſt γ Draconis appeared to have moved northward, the ſmall *ſtar*, which is the 35th Camelopardali Hevelii, in the Britiſh catalogue, ſeemed to have gone as much towards the ſouth; which ſhewed, that this apparent motion in both thoſe *ſtars* might proceed from a nutation in the earth's axis; whereas the compariſon of the Doctor's obſervations of the ſame *ſtars*, formerly enabled him to draw a different concluſion, with reſpect to the cauſe of the annual aberrations ariſing from the motion of light. For the apparent alteration in γ Draconis, from that cauſe, being as great again as in the other ſmall *ſtar*, proved, that that did not proceed from a nutation of the earth's axis; as, on the contrary, this may. Upon making the like compariſon between the obſervations of other *ſtars*, that lie nearly oppoſite in right aſcenſion, whatever their ſituations were with reſpect to the cardinal points of the equator, it appeared, that their change of declination was nearly equal, but contrary; and ſuch as a nutation or motion of the earth's axis would effect.

The moon's aſcending node being got back towards the beginning of Capricorn in the year 1732, the *ſtars* near the equinoctial colure appeared about that time to change their declinations no more than a preceſſion of 50″ required; whilſt ſome of thoſe near the ſolſtitial colure altered theirs above 2″ in a year leſs than they ought. Soon after the annual change of declination of the former was perceived to be diminiſhed, ſo as to become leſs than what 50″ of preceſſion would cauſe; and it continued to diminiſh till the year 1736, when the moon's aſcending node was about the beginning of Libra, and her orbit had the leaſt inclination to the equator. But by this time, ſome of the *ſtars* near the ſolſtitial colure had altered their declinations 18″ leſs, ſince the year 1727, than they ought to have done from a preceſſion of 50″. For γ Draconis, which in thoſe nine years ſhould have gone about 8″ more ſoutherly, was obſerved

in 1736, to appear 10″ more northerly than it did in the year 1727.

As this appearance in γ Draconis indicated a diminution of the inclination of the earth's axis to the plane of the ecliptic, and as ſeveral aſtronomers have ſuppoſed that inclination to diminiſh regularly; if this phænomenon depended upon ſuch a cauſe, and amounted to 18″ in nine years, the obliquity of the ecliptic would, at that rate, alter a whole minute in thirty years; which is much faſter than any obſervations before made, would allow. The Doctor had therefore reaſon to think that ſome part of this motion at leaſt, if not the whole, was owing to the moon's action upon the equatorial parts of the earth; which he conceived might cauſe a libratory motion of the earth's axis. But as he was unable to judge, from only nine years obſervations, whether the axis would entirely recover the ſame poſition that it had in the year 1727, he found it neceſſary to continue his obſervations through a whole period of the moon's nodes; at the end of which he had the ſatisfaction to ſee, that the *ſtars* returned into the ſame poſitions again, as if there had been no alteration at all in the inclination of the earth's axis: which fully convinced him that he had gueſſed rightly as to the cauſe of the phænomenon. This circumſtance proves likewiſe, that if there be a gradual diminution of the obliquity of the ecliptic, it does not ariſe only from an alteration in the poſition of the earth's axis, but rather from ſome change in the plane of the ecliptic itſelf: becauſe the *ſtars*, at the end of the period of the moon's nodes, appeared in the ſame places, with reſpect to the equator, as they ought to have done, if the earth's axis had retained the ſame inclination to an invariable plane.

The Doctor having communicated theſe obſervations, and his ſuſpicion of their cauſe, to the late Mr. Machin, that excellent geometer ſoon after ſent him a table, containing the quantity of the annual preceſſion in the various poſitions of the moon's nodes, as alſo the correſponding nutations of the earth's axis; which was computed upon the ſuppoſition that the mean annual preceſſion is 50″, and that the whole is governed by the pole of the moon's orbit only: and therefore Mr. Machin imagined that the numbers in the table would be too large; as, in fact, they were found to be. But it appeared that the changes which Dr. Bradley had obſerved, both in the annual preceſſion and nutation, kept the ſame law, as to increaſing and decreaſing, with the numbers of Mr. Machin's table. Thoſe were calculated upon the ſuppoſition, that the pole of the equator, during a period of the moon's nodes, moved round in the periphery of a little circle, whoſe center was 23° 29′ diſtant from the pole of the ecliptic: having itſelf alſo an angular motion of 50″ in a year, about the ſame pole. The north pole of the equator was conceived to be in that part of the ſmall circle, which is fartheſt from the north pole of the ecliptic, at the time when the moon's aſcending node is in the beginning of Aries: and in the oppoſite point of it, when the ſame node is in Libra.

If the diameter of the little circle, in which the pole of the equator moves, be ſuppoſed equal to 18″; which is the whole quantity of the nutation, as collected from Dr. Bradley's obſervations of the *ſtar* γ Draconis; then all the phænomena in the ſeveral *ſtars* which he obſerved will be very nearly ſolved by his hypotheſis. But for the particulars of his ſolution, and the application of his theory to the practice of aſtronomy, we muſt refer to the excellent author himſelf [b]; our intention being only to give the hiſtory of the invention.—[[b] See Phil. Tranſ. N° 485.]

The corrections ariſing from the aberration of light, and from the nutation of the earth's axis, muſt not be neglected in aſtronomical obſervations; ſince ſuch neglects might produce errors of near a minute in the polar diſtances of ſome *ſtars*. See Phil. Tranſ. loc. cit. p 26.

As to the allowance to be made for the aberration of light, Dr. Bradley aſſures us, that having again examined thoſe of his own obſervations, which were moſt proper to determine the tranſverſe axis of the ellipſis, which each *ſtar* ſeems to deſcribe, he found it to be neareſt to 40″; and this is the number he makes uſe of in his computations relating to the nutation. Ibid. p. 23.

Monſieur d'Alembert has publiſhed a treatiſe, intitled, *Recherches ſur la preceſſion des equinoxes et ſur la nutation de la terre dans le ſyſteme Newtonien*, 4to. Paris, 1749. The calculations of this learned gentleman agree, in general, with Dr. Bradley's obſervations. But Monſieur d'Alembert finds, that the pole of the equator deſcribes an ellipſis in the heavens, the ratio of whoſe axes is as 4 to 3 [c]; whereas, according to Dr. Bradley, the curve deſcribed is either a circle, or an ellipſis, the ratio of whoſe axes is as 18 to 16 [d]. —[[c] Journal. Britan. par Monſieur *Maty*, Jan. 1750, p. 93. [d] Phil. Tranſ. ibid. p. 35.]

Dr. Bradley [e] ſays, in general, that experience has taught him that the obſervations of ſuch *ſtars* as lie neareſt the zenith, generally agree beſt with one another, and are therefore the fitteſt to prove the truth of any hypotheſis.—[[e] Phil. Tranſ. loc. cit. p. 29.]

From the reſult of the compariſon of our beſt modern obſervations, with ſuch as were formerly made with any tolerable degree of exactneſs, there appears to have been a real change in the poſition of ſome of the fixed *ſtars*, with reſpect to each other; and ſuch as ſeems independent of any motion in our ſyſtem, and can only be referred to ſome motion in the *ſtars* themſelves. Arcturus affords a ſtrong proof of this: for if its preſent declination be compared with its place, as determined either by Tycho or Flamſteed, the difference will be found to be much greater, than what can be ſuſpected to ariſe from the uncertainty of their obſervations.

It is reaſonable to expect, that other inſtances of the like kind muſt alſo occur among the great number of viſible *ſtars*; becauſe their relative poſitions may be altered by various means. For if our own ſolar ſyſtem be conceived to change its place with reſpect to abſolute ſpace, this might, in proceſs of time, occaſion an apparent change in the angular diſtances of the fixed *ſtars*: and in ſuch a caſe, the places of the neareſt *ſtars* being more affected than of thoſe that are very remote, their relative poſition might ſeem to alter, though the *ſtars* themſelves were really immoveable. And, on the other hand, if our ſyſtem be at reſt, and any of the *ſtars* really in motion, this might likewiſe vary their apparent poſitions; and the more ſo, the nearer they are to us, or the ſwifter their motions are, or the more proper the direction of the motion is to be rendred perceptible by us. Since then the relative places of the *ſtars* may be changed from ſuch a variety of cauſes, conſidering the amazing diſtance at which it is certain ſome of them are placed, it may require the obſervations of many ages, to determine the laws of the apparent changes, even of a ſingle *ſtar*: much more difficult, therefore, muſt it be to ſettle the laws relating to all the moſt remarkable *ſtars*.

When the cauſes which affect the places of all the *ſtars* in general are known; ſuch as the preceſſion, aberration, and nutation; it may be of ſingular uſe, to examine nicely the relative ſituations of particular *ſtars*; and eſpecially of thoſe of the greateſt luſtre, which, it may be preſumed, lie neareſt to us, and may therefore be ſubject to more ſenſible changes, either from their own motion, or from that of our ſyſtem. And if, at the ſame time that the brighter *ſtars* are compared with each other, we likewiſe determine the relative poſitions of ſome of the ſmalleſt that appear near them, whoſe places can be aſcertained with ſufficient exactneſs; we may perhaps be able to judge to what cauſe the change, if any be obſervable, is owing. The uncertainty that we are at preſent under, with reſpect to the degree of accuracy wherewith former aſtronomers could obſerve, makes us unable to determine ſeveral things relating to this ſubject: but the improvements, which have of late years been made in the methods of taking the places of the heavenly bodies, are ſo great, that a few years may hereafter be ſufficient to ſettle ſome points, which cannot now be ſettled, by comparing even the earlieſt obſervations with thoſe of the preſent age. See Dr. *Bradley*, in Phil. Tranſ. N° 485.

STAR-*apple*, the Engliſh name of a genus of plants, called by botaniſts *cainito* and *chryſophyllum*. See the article CHRYSOPHYLLUM, *Suppl.*

STAR-*thiſtle*, the Engliſh name of a ſpecies of centaury, called by ſome *calcitrapa*. See the article CENTAUREA, *Append.*

STARCH *(Cycl.)*—In the hiſtory of the royal Academy of Sciences 1739, p. 24, Edit. Paris, a kind of *ſtarch* is mentioned, made of potatoes and red truffles. By the ſhort account there given, this *ſtarch* ſeems not to be ſo good as the common, but might be of uſe in caſe of a ſcarcity of wheat.

STARLING, the Engliſh name of a genus of birds, called by authors *ſturnus*. Some, erroneouſly, account it a ſpecies of *turdus*, or thruſh.

Of this genus there is only one ſpecies, which is the *ſtarling*, the beak of which is of a ſubulated figure, depreſſed in an angulated manner, and obtuſe at the extremity; and it's tongue is marginated and acute. It is of the ſize of the common black-bird. The beak is near half an inch long, and is yellow in the male, and brown in the female. The general colour is black, but variegated with ſpots of grey; and the tips of the feathers of the neck and back are yellowiſh. It has alſo various other tinges, according to the light it is ſeen in. The wing and tail-feathers are brown, with ſome yellow at their edges. *Hill*, Hiſt. of Animals, p. 496.

STEEL *(Suppl.)*—The manner of hardening *ſteel* for magnetical bars, which Mr. Canton [a] ſays proved better than any other he could meet with, is as follows: Cut a ſufficient quantity of the leather of old ſhoes into very ſmall pieces; provide an iron pan, a little exceeding the length of a bar, and wide enough to lay two ſide by ſide without touching each other or the pan, and at leaſt an inch deep. This pan is to be nearly half filled with the bits of leather, upon which the two bars are to be laid, a ſmall wire being faſtened to the end of each to take them out by. Then fill the pan quite with the leather, and place it on a gentle flat fire, covering and ſurrounding it with charcoal. The pan being brought to ſomewhat more than a red heat, and kept ſo for about

about half an hour, the bars are to be ſuddenly quenched in a large quantity of cold water.—[a See Method of making artificial magnets, Lond. 1751.]

For the expanſion of *ſteel* by heat, ſee the article HEAT, *Append.*

STELLULARIA, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by Tournefort *alſine*. See the article ALSINE, *Suppl.*

STICK-*a-door*, a name ſometimes uſed for the *ſtoechas*. See the article STOECHAS, *Suppl.*

STILLATORY, a name ſometimes uſed for a ſtill-houſe. See the article STILL-*houſe*, *Suppl.*

STILOBATUM, in architecture, denotes the body of the pedeſtal of any column. See PEDESTAL, *Cycl.*

STIRK, or STURK, a word uſed among country people for a young ox or heifer. Ruſt. Dict. in voc.

STITCH-*wort*, a name ſometimes given to the *alſine*, or *ſtellularia* of botaniſts, otherwiſe called *chickweed*. See the article ALSINE, *Suppl.*

STITHY, or STUTHY, is uſed either for a ſmith's anvil, or a diſeaſe in oxen, cauſing the ſkin to ſtick ſo cloſe to the ribs that they cannot ſtir. Ruſt. Dict. in voc.

STIVER, a Dutch coin, twenty of which make a guilder. See the article COIN, *Cycl.*

STOCK-*July-flower* (*Suppl.*)—*Dwarf* STOCK-*July-flower*, a name given by ſome to the *heſperis*. See the article HESPERIS, *Suppl.*

STOECHAS, in botany, the name of a genus of plants, printed *ſtaechas* in the Supplement by an error of the preſs. See STÆCHAS, *Suppl.*

STOMATIA, in zoology, the name of a genus of ſhell-fiſh, frequently confounded with the *ear-ſhell*. See the article EAR-*ſhell*, *Suppl.*

The ſhell of the *ſtomatia* is formed of one piece, has no perforations in any part of its ſurface, and is of a depreſſed, flat figure; and its mouth is the moſt patent of all the univalve ſhells, the limpet only excepted. It has a ſhort ſpiral turn running into the mouth at the head.

There are ſeveral ſpecies of this genus. See *Hill*, Hiſt. Anim. p. 119, ſeq.

STONE (*Cycl.*)—We have not only accounts of *ſtones* of various degrees of hardneſs taken out of the bladders of perſons affected with this terrible malady, but even of extraneous matter lodged within, and ſerving for the nucleus of thoſe *ſtones*. Thus, in the Philoſophical Tranſactions, there is an account of a boy who for a long time voided hair by urine, and afterwards being troubled with the *ſtone*, on being cut for it, the *ſtone* taken away was very hard and heavy, and of the bigneſs of a gooſe's egg: it was covered with a cruſt, looking like the mortar of an old wall, and this was full of cracks and chinks, out of every one of which there was found to grow hair.

The hairs, which he had been uſed to void by urine, certainly grew alſo out of the clefts of this *ſtone*, for they would often hang out at the end of the penis; and on pulling them away, ſeemed to grow faſt to ſomething, and to be pulled out by the roots.

In another boy of about five or ſix years of age, who was cut for the *ſtone*, the *ſtone* taken out being broken by accident, there was diſcovered within it a piece of flint, of the ſhape and figure, as well as bigneſs, of a common piſtol flint. This ſerved as the nucleus to the other *ſtony* matter which encruſted it over. It is utterly impoſſible that a flint, of this ſhape, ſhould have been formed in the bladder, nor is it eaſy to account for its coming there; the boy muſt have ſwallowed it at ſome time, but then its making its way into the bladder, is a very hard matter to account for. A perſon, who uſed himſelf to ſwallow piſtol bullets, is recorded in the ſame place to have voided them by urine, cruſted over with *ſtony* matter; but all this is equally hard to account for. Philoſ. Tranſ. N° 266. p. 688.

Dr. Cheyne ſays, that ſoap lees, ſoftened with a little oil of ſweet almonds, drunk about a quarter of an ounce twice a day, on a faſting ſtomach; or ſoap and egg-ſhell pills, with a total milk and ſeed diet, and Briſtol-water; will either diſſolve the *ſtone* in the kidneys or bladder, or make it eaſy. See Nat. Meth. of Curing, p. 266.

We often meet with hiſtories, in medical writers, of the *ſtone*, or human calculus, making its way through unuſual places, as the perineum, ſcrotum, &c. See Philoſ. Tranſ. N° 456.

Mr. le Dran aſſures us, when a ſmall *ſtone* is lodged in the neck of the bladder, the patient only is pained in piſſing till the firſt drops of the urine come away; when the *ſtone* is large, his greateſt pain is while the laſt drops are evacuated; but when the difficulty of urining depends on the diſeaſes of the coats of the bladder, the pain continues all the time of the evacuation. By obſerving theſe ſymptoms, he has declared people to have no *ſtone* in the bladder, after ſeveral others had aſſured them there was a *ſtone*; and his opinion was confirmed by probing with the catheter. He names one inſtance of this, in a perſon who had laboured under what he calls a contracted hardened bladder, whom he cured after ſeveral bleedings and purges, by injecting into the bladder a decoction of marſh-mallow roots and linſeed, which he changed afterwards for barley-water, with ſome honey of roſes. By theſe he removed the pain, and brought the bladder, which at firſt could ſcarce contain two ſpoonfuls of liquor, to the ordinary capacity.

We have an account, in the Philoſophical Tranſactions, of a *ſtone* weighing above ten ounces, taken out of the bladder of a large maſtif: on cutting the *ſtone* aſunder, a piece of dog-graſs was found in its center. Vid. Philoſ. Tranſact. N° 482. ſect. 1.

We read of a *ſtone* in the bladder formed on a needle. See Med. Eſſ. Edinb. Vol. IV. art. 16.

Mr. Hales is of opinion that all paſſable *ſtones*, which have lately fallen from the kidneys into the bladder, and which have broken off from larger ones, might readily and eaſily be brought out thence, by conveying into the empty bladder, by a catheter, ſome very mucilaginous ſubſtance, ſuch as ſyrup of marſh-mallows, or a ſolution of gum arabic, or barley-water: ſuch ſubſtances would bring away the *ſtones* ſoon, and with great eaſe to the patient; and thereby not only prevent much pain by the fruitleſs endeavours to bring them away with the weak force of the urine, but alſo effectually ſecure the patient from the danger of their growing too big to come away, by long continuing in the bladder. Phil. Tranſ. N° 477.

Pitcarn recommends the uſe of milk for common drink, in the *ſtone*, with barley-water and a little ſugar. He adds, that he cannot give any better reaſon why milk is ſerviceable to nephritics, than becauſe the ſame is always found ſerviceable to gouty perſons. The ſymptoms of both diſeaſes are the ſame, excepting what relates to the parts affected.

Dr. Mead ſeems to think, that the proximate cauſe of this diſeaſe is a tartarous ſalt conveyed out of the blood into the ſmall ducts of the kidneys: for it is the nature of theſe ſalts to contain a conſiderable quantity of that ſubtile matter which Newton [a] has ſhewn to be the cauſe of the coheſion of bodies. Thus, the calculus is a ſubſtance compoſed of earth and a very large ſhare of air concreted in the renal ducts; and either remains therein, or drops down into the urinary bladder.

As to the method of cure the Doctor obſerves, to prevent thoſe ſalts from ſhooting into cryſtals, lixivial ſalts ſeem to be very proper. Next to keep the cryſtals from coaleſcing into a calculous ſubſtance, oily medicines are very efficacious; and this rule ought to take place with regard to diet as well as medicines.

But when calculous concretions are actually formed in the kidneys, and are to be brought away by the ureters, the caſe requires very prudent management. It is a very common error in practice to give ſtrong forcing diuretics with an imaginary view of driving out the gravel with the urine: whereas this intention is anſwered with greater ſafety in moſt caſes by relaxing and lubricating medicines; eſpecially, if in caſe of violent pain, bleeding be premiſed, and anodynes interſperſed. For a *ſtone* is never forced out while the patient is in great torture; though when the pain ceaſes it ſometimes comes away unexpectedly, and almoſt of its own accord, with the urine; and the reaſon of this is, that pain conſtringes the fibres of the parts, which reſume their natural ſtate, and perform their functions properly when the troubleſome ſenſation is over. Wherefore three or four grains of opium, diſſolved in five or ſix ounces of the common decoction, may be given by way of clyſter; which will greatly relieve the pain, and ſometimes procure greater advantages. However, there are conjunctures, after the pain is abated, when powerful diuretics may be adminiſtred; but with this precaution, that as ſoon as they have had their effect, they are no longer to be continued.—[a See Life of Mr. Boyle prefixed to his works.]

All this while the body ſhould conſtantly be kept open: wherefore, in caſe of coſtiveneſs, it will be expedient to give clyſters, and ſometimes to purge gently with infuſion of ſena and manna: but ſtrong cathartics are to be avoided.

Of the lubricating medicines abovementioned, the chief are oil of ſweet almonds, ſyrup of marſh-mallows, emulſions made with almonds, and the like; to which may be added, the uſe of the warm bath. But among the powerful diuretics, turpentine and ſoap are the beſt.

Such is the courſe to be purſued in the paroxyſm of the diſeaſe. But out of it the patient ſhould uſe bodily exerciſe, eſpecially riding every day, but ſo as not to fatigue: his food ſhould be mild, and of eaſy digeſtion; and his drink either ſmall wine and water, or new ſoft ale; which will be rendered better and wholſomer, if ground-ivy leaves be infuſed in it, while it is working. Mead is likewiſe a proper drink; for honey is an excellent diuretic. A ſpoonful alſo of honey in a glaſs or two of the infuſion of marſh-mallows roots, is an admirable cleanſer of the kidneys, if uſed for a conſtancy. The wines ought to be the ſofteſt and ſmootheſt that can be had; and the lighteſt, cleareſt river, or running water, is preferable to all other. For, as Pliny [b] ſays, thoſe ſprings are particularly condemned, the waters

of which line the veſſels, in which they are boiled, with thick cruſts.—[b *Plin.* Nat. Hiſt. lib. 31. cap. 3.] See the articles LITHONTRIPTIC and LITHOTOMY, *Append.*

But particular care ſhould be taken, not to put the patient into a courſe of powerful diuretics, with a view of preventing the gravel from concreting in the kidneys: becauſe, whatever great things may be ſaid of this ſort of medicines by ignorant pretenders, they certainly injure the parts by their heat and acrimony. *Mead*, Monit. & Pract. Med. p. 191, ſeq.

The Leipſic Acts give a very remarkable inſtance of *ſtones* in the blood veſſels, diſcovered by accident on opening a vein in the arm: the ſurgeon finding it neceſſary to make a large orifice, ſeveral ſmall but very hard *ſtones* were diſcharged at it with the blood. The patient was a man of ſeventy two years of age.

STONES *in animals*. We meet with great variety of forms and appearances in the *ſtones* produced by different animals, and in their different parts. Wedelius deſcribes a vaſt number of various kinds taken from dogs, hogs, cows, and other animals which he had opened: but the moſt ſingular inſtance is of one which was taken from a cow, and was of the colour of burniſhed gold. Dr. Liſter confirms this ſingular obſervation with another of a like kind, that came within his own knowledge: this was of two hundred ſmall globular *ſtones*, the largeſt not exceeding the ſize of a ſmall tare, and the ſmaller not bigger than pins heads. They were covered with a frothy ſubſtance in the bladder, and adhered to one ſide of it; but when cleaned and dried, they reſembled ſeed pearl in ſhape, and were of a fine gold colour. They were finely poliſhed, even when viewed by the microſcope; and when broken, and examined in the ſame manner, it was found to be only a thin ſkin of gold colour that covered them in this manner, their inner ſubſtance being coarſe and opake, ſomewhat reſembling ſugar-candy, but not ſo fine. *Wedel.* Obſerv. N° 106. Philoſ. Tranſ. N° 206.

Corner STONES. See the article CORNER, *Append.*

STONE-*break*, a name by which ſome writers call the *alchimilla*, or ladies mantle. See the article ALCHIMILLA, *Suppl.*

STONE-*crop*, a name ſometimes given to the *ſedum*, or houſeleek. See the article SEDUM, *Suppl.*

STONE-*crop-tree*, in botany, the name by which ſome call the *blitum*, or blite, of other authors. See the article BLITUM, *Suppl.*

STOOK, a term uſed in many parts of the kingdom for a ſhock of corn, containing twelve ſheaves. Ruſt. Dict. in voc.

STOOL, (*Suppl.*) in ſhip-building, the name of the ſupporters of the poop and top lanterns. *Blanckley*, Naval Expoſitor, in voc.

STORAX-*tree*, in botany, the Engliſh name of the *ſtyrax*. See the article STYRAX, *Suppl.*

STORK, the name of a bird of the *ardea*, or heron kind. See the article HERON, *Suppl.*

The *ſtork* has been deſcribed under the name *ciconia* by ſeveral authors. See the article CICONIA, *Suppl.*

STOVE (*Suppl.*)—STOVES, at ſea, are ſquare boxes made of planks, and lined with brick, for burning charcoal in to dreſs the admiral's victuals. *Blanckley*, Nav. Expoſ.

STOVER, a word uſed by country people for ſtraw or fodder for cattle. Ruſt. Dict. in voc.

STRATIOTES, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, the characters of which are theſe. The cup is a two-leaved ſpatha, compreſſed, obtuſe, connivent, and carinated on each ſide. Beſide this, there is alſo a perianthium, which is formed of a ſingle leaf, divided into three ſegments, and is erect and deciduous. The flower conſiſts of three obverſely cordated, erect and patent petals, of double the ſize of the cup. The ſtamina are twenty filaments, of the length of the perianthium, and inſerted into the receptacle. The antheræ are ſimple. The germen of the piſtil ſtands under the receptacle of the perianthium. There are ſix ſtyles, divided each into two parts, and of the length of the ſtamina. The ſtigmata are ſimple. The fruit is an oval berry, attenuated at each end, ſomewhat hexaedral, and contains ſix cells. The ſeeds are numerous, oblong, crooked, and as it were alated.

There is only one known ſpecies of this genus. Vid. *Linnæi* Gen. Plant. p. 253.

STRATIOTES, in botany, is alſo a name by which ſome call the *hottonia* of Linnæus. See the article HOTTONIA, *Suppl.*

STRAWBERRY-*cinquefoil*, the name by which ſome call the *pentaphylloides* of botaniſts. See the article PENTAPHYLLOIDES, *Suppl.*

STRAWBERRY-*blite*. See the article BLITUM, *Suppl.*

STRAWBERRY-*ſpinach*. See SPINACH, ſupra.

STRICKLE, or STRICKLESS, an inſtrument for ſtriking off the over-meaſure of corn, &c. Ruſt. Dict. in voc.

STUBBING, among farmers, is the pulling up of ſhrubs, broom, hops, or the like, out of lands. Ruſt. Dict. in voc.

STUBBLE, that part of the ſtalks of corn which remains on the land, after the corn is reaped.

STUFF, among joiners, &c. a term uſed for the wood they work on. Build. Dict. in voc.

STURGEON, the Engliſh name of the *ſturio* of ichthyologiſts. See the article STURIO, *Suppl.*

STURK, the ſame with *ſtirk*. See the article STIRK, *Append.*

STURLING, the Engliſh name of a bird called by zoologiſts *ſturnus*. See the article STURNUS, *Suppl.*

STUTHY, the ſame with *ſtithy*. See the article STITHY, *Append.*

STYE, in the management of ſwine, a place for keeping or fattening them. Ruſt. Dict. in voc.

STYLOBATUM, in architecture, the ſame with pedeſtals. See the article PEDESTAL, *Cycl.*

SUBSTANCE, (*Cycl.*) is uſually diſtinguiſhed into thinking and unthinking *ſubſtances*. Of the former claſs is the human ſoul; and of the latter, philoſophers commonly conſider matter only. But ſome [b] reckon ſpace among *ſubſtances*. The Carteſians conſider ſpace and matter as the ſame. The Leibnitians put ſpace in the ſame claſs of being with number and time, and make them all alike notional. Leibnitz ſaid, *agere eſt character ſubſtantiarum.*—[b s'*Graveſande*, Introd. ad Philoſ. ſect. 19.]

The idealiſts deny matter to be a *ſubſtance*, making it a mere phænomenon. See biſhop *Berkley*'s Dialogues.

The materialiſts, on the other hand, deny ſpirit to be a *ſubſtance*. But as they cannot deny the exiſtence of thought, as the idealiſts deny the exiſtence of matter, the materialiſts are forced either to allow all matter to have perception, eſſentially; or to ſay, that it is ſuperadded to matter, or a modification thereof. All which lead to inextricable difficulties.

SUCCORY (*Suppl.*)—*Gum*-SUCCORY, the name by which ſome call the *chondrilla* of botaniſts. See the article CHONDRILLA, *Suppl.*

SUCCULENT *plants*, among botaniſts, thoſe which are plump and full of juice. Ruſt. Dict. in voc.

SUCKER, or SUCK-*fiſh*, in ichthyology. See the article REMORA, *Suppl.*

Stone-SUCKER, the Engliſh name of a genus of fiſhes. See the article PETROMYZON, *Suppl.*

Great SUCKER, the Engliſh name of a ſpecies of *hirundo*, or ſwallow, with an undivided tail, and briſtles at the mouth. See HIRUNDO, *Suppl.*

The generality of authors have erroneouſly made this bird a ſpecies of owl; it much reſembles the cuckow in ſhape, and has been called the *churn-owl*, and *caprimulgus*. See the article CAPRIMULGUS, *Suppl.*

SUDORIFICS (*Cycl.* and *Suppl.*)—*Sudorifics*, if taken in time, are the beſt medicines for preventing inflammatory and feveriſh diſorders of all kinds. See the articles FEVER and INFLAMMATORY, *Append.*

Dr. Pringle condemns the uſe of treacle, given with this intention, on account of its heating quality. However, he obſerves, that it is rendered more *ſudorific*, and leſs narcotic, by adding ten grains of ſalt of hartſhorn to a common doſe, and promoting the ſweat by a large draught of vinegar-whey. Inſtead of this compoſition, two ſcruples of ſalt of hartſhorn, ſaturated with about three ſpoonfuls of common vinegar, may be given at bed-time. *Pringle*, Obſerv. on the Diſeaſes of the Army, p. 131.

SUGAR-*cane*, *ſaccharum*, in botany, the name of a diſtinct genus of plants, according to Linnæus. See the article SACCHARUM, *Suppl.*

SULL, a word uſed in the weſtern parts of England for a plough. Ruſt. Dict. in voc.

SULPHUR-*wort*, the name by which *peucedanum*, or hog's fennel is ſometimes called. See the article PEUCEDANUM, *Suppl.*

SULTAN-*flower*, a name ſometimes uſed for the *cyanus*, or blue bottle. See the article CYANUS, *Suppl.*

SUMACH, the Engliſh name of a genus of plants, called by botaniſts *rhus*. See the article RHUS, *Suppl.*

Coriars SUMACH, or *myrtle* SUMACH, the name by which *coriaria*, a diſtinct genus of plants is ſometimes called. See the article CORIARIA, *Append.*

Venetian SUMACH, a name by which ſome call the *coccygria*, or *cotinus* of botaniſts. See the article COTINUS, *Suppl.*

SUMMITS *of flowers*, the ſame with the antheræ, or tops of the ſtamina. See the article FLOWER, *Suppl.*

SUN-*flower* (*Suppl.*)—*Dwarf* SUN-*flower*, the Engliſh name of a genus of plants, called by botaniſts *rudbeckia*. See the article RUDBECKIA, *Append.*

SUN-*ſpurge*, in botany. See the article SPURGE, *ſupra.*

SUPERCILIUM *terræ*. See ADIANTUM.

SUPPLICATION, *ſupplicatio*, in antiquity, a religious ſolemnity obſerved on account of ſome remarkable ſucceſs againſt an enemy; and eſpecially when the army had conferred the title of *imperator* on their general, in whoſe name the ſenate ordered the temples to be opened for the reception of the people, and thanks to be rendered to the Gods.

On ſuch an occaſion the imperator ſent meſſengers crowned with laurel with letters to the ſenate, which were likewiſe adorned with laurel, to demand of them the title of *imperator*, and the honour of a *ſupplication*. This ſolemnity conſiſted in ſacrificing and feaſting in the temples, with giving thanks to the gods for the ſucceſs obtained, and praying for the continuance of their aſſiſtance. At firſt there were only a few days taken up in ſuch feſtivals; but afterwards they were increaſed gradually, till they came to no leſs than fifty. On ſubduing the Sabines, in the year of the city 304, a *ſupplication* of one day only was ordained; on the taking of Veii, Camillus had a *ſupplication* of four days decreed him; Pompey had twelve on putting an end to the Mithridatic war; Cæſar had fifteen, and afterwards twenty for reducing Gaul; Octavianus and Panſa had fifty days of *ſupplication* for delivering the colony of Mutina.

SWALLOW (*Suppl.*)—*Sea*-SWALLOW, the Engliſh name of a genus of birds, called by authors *ſterna*. See the article STERNA, *Suppl.*

SWARTH, among country people, the ſame with *ſwath*. See the next article.

SWATH, (*Cycl.*) a word uſed by country people for a row of graſs or corn, as laid by the mower. Ruſt. Dict. in voc.

SWEALING *a hog*, a word uſed in ſome parts of the kingdom for ſinging him. Ruſt. Dict. in voc.

SWEATH, the ſame with *ſwath*. See the article SWATH, ſupra.

SWEET-*apple*. See the article APPLE, ſupra.

SWEET-*Johns*. See the article JOHNS, ſupra.

SWEET-*William of Barbadoes*, the Engliſh name of a genus of plants, called by botaniſts *quamoclit*. See the article QUAMOCLIT, *Suppl.*

SWEET-*willow*. See the article WILLOW, infra.

SWINE's *creſs*, a name given to a ſpecies of *naſturtium*. See the article NASTURTIUM, *Suppl.*

SWIVELS, a kind of rings made to turn round in a ſtaple, or other ring. Theſe are uſed when a ſhip lies at her moorings; alſo in tedders for cattle, that they may turn round without unwarping the tedder.

SWORD-*fiſh*, the Engliſh name of the *xiphias*, a genus of fiſhes. See the article XIPHIAS, *Suppl.*

SWORD-*graſs*. See ACORUS, *Cycl.*

SYMPHORICARPOS, in botany, the name of a genus of plants, according to Dillenius, but made a ſpecies of *lonicera* by Linnæus. See the article LONICERA, *Append.*



T.

TADORNA, the name of a ſpecies of duck, printed *tadoma* in the Supplement, by an error of the preſs. See the article TADOMA, *Suppl.*

TANNER, a perſon who dreſſes hides by tanning. See the article TANNING, *Cycl.* and *Suppl.*

TANSEY, or TANZY, the Engliſh name of a genus of plants. See the article TANACETUM, *Suppl.*

Wild TANSEY, a name by which ſome call the *potentilla*. See the article POTENTILLA, *Suppl.*

TARE, *vicia*, in botany, the name of a genus of plants, otherwiſe called vetch. See the article VICIA, *Suppl.*

TARRAGON, a name ſometimes given to *abrotanum*, or ſouthernwood. See the article SOUTHERNWOOD, *Suppl.*

TEA, *thea*, in botany, is made a diſtinct genus of plants. See the article THEA, *Append.*

TEDDER, or TETHER, a rope tied to a horſe's foot, that he may graſe within a certain compaſs. Ruſt. Dict. in voc.

TEG (*Suppl.*)—TEG, among ſportſmen, denotes a doe of the ſecond year. Ruſt. Dict. in voc.

TELAUGIA, in natural hiſtory, the name of a genus of *ſcrupi*, of a glittering appearance, uſually containing flakes of talc, and emulating the ſtructure of the granites. *Hill*, Hiſt. Foſſ. p. 547. See SCRUPI, *Append.*

Of this genus we have the following ſpecies. 1. The hard, ſhining, black and white *telaugium*. 2. The hard, ſhining, red and white *telaugium*. 3. The red *telaugium*, variegated with white and black. 4. The hard, heavy *telaugium*, of a greyiſh black, variegated with white. 5. The browniſh red *telaugium*, variegated with white and yellowiſh. 6. The reddiſh white *telaugium*, variegated with black and gold colour. 7. The hard, white *telaugium*, variegated with brown. 8. The bluiſh white, brittle *telaugium*. 9. The brown, friable *telaugium*, variegated with yellow. 10. The hard, purpliſh brown *telaugium*, variegated with white and yellow. 11. The heavy, red *telaugium*, variegated with black and white. 12. The hard, bluiſh green *telaugium*, variegated with white. Id. ibid. p. 547—556.

TELEPHIASTRUM, *baſtard orpine*, in botany, the name of a genus of plants, called by Linnæus *anacampſeros*. See the article ANACAMPSEROS, *Suppl.*

TELESCOPE (*Cycl.*)—Mr. James Gregory was undoubtedly the firſt inventor of reflecting *teleſcopes*. The conſtruction of his *teleſcope* is different from that of Sir Iſaac Newton, and in ſome reſpects not ſo advantageous, as is ſhewn in Phil. Tranſ. N° 83.

Mr. Gregory deſcribes this *teleſcope* at the end of his *Optica Promota*, publiſhed in 1663; being led into the invention of it, not by the conſideration of the different refrangibility of the rays of light, which was not then known, but by an inconvenience he foreſaw would follow from an hyperbolic object-glaſs. For he obſerves, that if it be ſufficiently broad to receive light enough into a *teleſcope* that ſhall magnify very much, it muſt of conſequence be very thick; in which caſe, the cleareſt glaſs would hinder too much of the light from being tranſmitted. He might alſo have added another inconvenience, that though it will collect a pencil of rays coming parallel to its axis into a ſingle point, yet it cannot collect the rays of an oblique pencil ſo accurately as a glaſs conſiſting of ſpherical ſurfaces will do, as has been found by experience; and therefore ſpherical lenſes, upon this and ſome other accounts, are fitter for optical uſes than thoſe of any other figure.

Theſe reflecting *teleſcopes* were not brought into practice till 1719, by Mr. John Hadley; Sir Iſaac Newton's firſt, and that of Mr. Gregory ſoon after. This laſt, in ſmall lengths, has an excellent effect, and is exceeding commodious. We have a deſcription of it by Dr. Smith [a], which differs from that of its inventor chiefly in this, that he directs his larger reflecting concave lens to be made of a parabolic figure, and his leſſer of an elliptical one, inſtead of the ſpherical ones now uſed, as being the only figures that can be poliſhed without inſuperable difficulties.—[a Optics, in the remarks, ſect. 137, ſeq.]

Reflecting *teleſcopes* have been greatly improved by Mr. Short; but the particulars of his method are not publiſhed. For the theory of theſe and other *teleſcopes*, ſee Dr. Smith's Optics.

TELESCOPE-*ſhell*, the Engliſh name of a ſpecies of *turbo*, of a conic figure, with plane, ſtriated, and very numerous ſpires. See the article TURBO, *Suppl.*

TEMPERAMENT (*Suppl.*)—As Huygens has not given the names of all the intervals that occur in his *temperate* ſcale, we ſhall here inſert them in the octave, from C to *c*, with their reſpective meaſures in commas, and tenths of a comma.

Intervals.		Names.	Meaſures.
From C to	D 𝄫.	1. Diminiſhed ſecond, extreme flat ſecond, or enharmonic dieſis,	1.8.
	C ♯.	2. Semitone minor, or chromatic dieſis,	3.6.
	D ♭.	3. Flat ſecond, or ſemitone major,	5.4.
	C ♯♯.	4. Double ſemitone minor,	7.2.
	D.	5. Second, or tone,	9.0.
	E 𝄫.	6. Diminiſhed third, or extreme flat third,	10.8.
	D ♯.	7. Superfluous ſecond,	12.6.
	E ♭.	8. Third minor, or flat third,	14.4.
	D ♯♯.	9. Extreme ſuperfluous ſecond,	16.2.
	E.	10. Third major, or ſharp third,	18.0.
	F ♭.	11. Diminiſhed fourth,	19.8.
	E ♯.	12. Superfluous third,	21.6.
	F.	13. Fourth,	23.4.
	G 𝄫.	14. Extreme diminiſhed fifth,	25.2.
	F ♯.	15. Falſe fourth, or tritonus,	27.0.
	G ♭.	16. Falſe fifth, or ſemidiapente,	28.8.
	F ♯♯.	17. Extreme ſuperfluous fourth,	30.6.
	G.	18. Fifth,	32.4.
	A 𝄫.	19. Diminiſhed ſixth, or extreme flat ſixth,	34.2.
	G ♯.	20. Superfluous fifth,	36.0.
	A ♭.	21. Flat ſixth, or ſixth minor,	37.8.
	G ♯♯.	22. Extreme ſuperfluous fifth,	39.6.
	A.	23. Sharp ſixth, or ſixth major,	41.4.
	B 𝄫.	24. Diminiſhed ſeventh, or extreme flat ſeventh,	43.2.
	A ♯.	25. Superfluous ſixth,	45.0.
	B ♭.	26. Flat ſeventh, or ſeventh minor,	46.8.
	A ♯♯.	27. Extreme ſuperfluous ſixth,	48.6.
	B.	28. Sharp ſeventh, or ſeventh major,	50.4.
	c ♭.	29. Diminiſhed octave,	52.2.
	B ♯.	30. Superfluous ſeventh,	54.0.
	c.	31. Octave,	55.8.

The *temperate* dieſis enharmonica of Huygens being 1.8 comma, nearly, which is eaſily remembred, the meaſure of any interval in the octave may be found by multiplying it by the number denoting the place of that interval. Thus the ſixth minor, being the twenty-firſt interval, will be $= 1.8 \times 21 = 37.8$. The octave being the thirty-firſt, will be $= 31 \times 1.8 = 55.8$, which does not differ from the truth by more than 0.00237, that is, not by $\frac{1}{400}$ of a comma, and therefore perfectly inſenſible. See INTERVAL, *Suppl.*

All the intervals in the foregoing table, either have received names, or at leaſt might receive them, from a perfect analogy to the names in uſe among practical muſicians; but many of theſe intervals are as yet unheard of among practitioners. Perhaps, if all the genera of antient muſic were reſtored, every interval here mentioned might be of uſe, either in melody or harmony, and thereby greatly add to the variety of compoſition.

TENDERLINGS, a name given to the ſoft tops of deer's horns, when they begin to ſhoot forth. Ruſt. Dict. in voc.

TENDREL, a term peculiarly applied to the young ſhoot, or ſprig of a vine.

TENEBRIO, the *ſtinking beetle*, the name of a genus of beetles, the antennæ of which are oblong, ſlender, and filiform.

It has no interior wings, in which ſingular deficiency it differs widely from all other beetles; but the form and ſtructure of all its other parts refer it to this claſs. See the article SCARABÆUS, *Suppl.*

Mouffet has called it the *blatta fœtida*. There are ſeveral ſpecies of it.

TERRA *alana*, a name ſometimes given to the yellowiſh white *tripoli*. See the article TRIPOLI, *Cycl.* and *Supplement.*

TETHYS, in zoology, the name of a genus of naked ſea-inſects, the bodies of which are formed, as it were, of two lips, with an oblong cartilaginous body between them. They have four tentacula, ſhaped like ears, and there are two perforations in moſt ſpecies near the tentacula.

There are ſeveral ſpecies of this genus. Vid. *Hill*, Hiſt. Anim. p. 92.

THATCH, a common covering for houſes in moſt parts of the country.

The beſt kind of *thatch* is that called *helm*, or ſtiff unbruiſed wheat-ſtraw, with the ears cut off, and bound up in bundles. This being diſpoſed in an uniform and longitudinal

order on the roof, is fixed on with laths, withies, or ropes. Ruſt. Dict. in voc.

THEA, the *tea-tree*, in botany, the name of a genus of plants, the characters of which are theſe. The cup is a very ſmall, plane, permanent perianthium, divided into ſix roundiſh, obtuſe leaves. The flower conſiſts of ſix large roundiſh, concave, and equal petals. The ſtamina are numerous filaments, about two hundred, and are very ſlender, capillary, and ſhorter than the flower. The antheræ are ſimple. The germen of the piſtil is globoſe and trigonal. The ſtyle is ſubulated, and of the length of the ſtamina. The ſtigma is ſimple. The fruit is a capſule, formed of three globular bodies, growing together: it contains three cells, and opens into three parts at the top. The ſeeds are ſingle, globoſe, and internally angulated. *Linnæi* Gen. Plant. p. 233.

Of this genus there is only one known ſpecies, which is the tree whereon our common *tea* is produced. See the article TEA, *Cycl.*

THEAVE, among country people, denotes an ewe lamb of the firſt year. Ruſt. Dict. in voc.

THERMOMETER (*Cycl.*)—In the Philoſophical Tranſactions [b] we have the deſcription of a *thermometer*, made with a rod of metal, either braſs or iron.—[[b] N° 485. p. 128–130.]

This inſtrument is compoſed of an upright ſtaff or bar of the beſt iron, four feet long, and an inch and a quarter broad, having a poliſhed braſs bar of the ſame length and width ſcrewed to it before it, with four ſteel ſcrews, and being alſo capped with ſteel, and thereon a lever moving upon a ſtud of ſteel, which communicates with another leſs lever, which is alſo upon a ſtud, having a chain at the end of it, which laps round an axis, whereto the index is fixed, which ſhews the degrees marked on a ſemicircular arch. Under the ſteel ſcrew heads there are ſmall ſlits in the braſs bar, except the lowermoſt which is fixed, which admit of its expanding, whereby it protrudes and operates on the firſt mentioned lever, which being raiſed moves the leſs lever, and thereby draws the chain which turns the axis affixed to the index, which ſhews the degree of warmth of the weather marked on the ſemicircular arch. There is a ſcrew through two ſtuds to draw the great lever backwards and forwards, as occaſion may be; and there is alſo a counterbalance to the ſmall lever, to draw the hand back when the braſs bar ſhrinks.

Dr. Mortimer laid claim to a like invention, and gave the deſcription of his *thermometer* in the Phil. Tranſ. N° 484, in the Appendix, p. 672.

The late Dr. George Martine, in his Book of Eſſays printed at London 1740, has treated the ſubject of *thermometers* very fully. Among other curious things, he has given a plate of ſeveral *thermometers*, which he compares, in order to ſhew the correſponding degrees in each.

As a fixed and unalterable point of heat is not yet found, the conſtruction of *thermometers* ſtill remains imperfect. For the heat of boiling water is not always preciſely the ſame, neither can we depend abſolutely on the point of freezing.

Fahrenheit has placed the freezing point at 32, and that of boiling water at 212; ſo that he divides the diſtance between the freezing point and that of boiling water into 180 degrees.

Sir Iſaac Newton [c], in his ſcale of the degrees of heat, marks the freezing point 0, and that of boiling water 34. Hence one of his degrees correſponds to $5\frac{5}{17}$ degrees of Fahrenheit's *thermometer*.—[[c] See Phil. Tranſ. N° 270.]

It is to be obſerved, that if two *thermometers* be filled with different ſpirits, they cannot be adjuſted to correſpond by comparing together their ſcales: for example, if the firſt *thermometer* riſes 4 diviſions, when the ſecond riſes but 3, it is not to be expected that the ſecond ſhall juſt riſe 6, 9 or 12 diviſions, when the firſt riſes 8, 12 or 16; becauſe the ſpirit will not dilate in one in the ſame proportion that it does in the other; ſo that unleſs the liquor be made to go its whole range in each of them, and the one be new marked for every degree of the other, they will not be brought to correſpond. Mr. de Reaumur being aware of this, attempted in a very ingenious way to eſtabliſh a general conſtruction of ſuch *thermometers*, which might be copied at all times, and in all countries; and ſo to ſettle a general correſpondence of obſervations to be made by ſuch inſtruments. He took a large ball and tube, and knowing well the contents of the ball and that of the tube in every part, he graduated the tube, ſo that the ſpace from one diviſion to another might contain $\frac{1}{1000}$ part of the liquor, which contained 1000 parts when it ſtood at the freezing point. Then putting the ball of his *thermometer* and part of the tube into boiling water, he obſerved whether it roſe 80 diviſions, which if it exceeded, he changed his liquor, and adding water to it lowered it ſo, that on the next trial from the freezing point to the point of boiling water it ſhould only riſe 80 diviſions: but if the liquor being too low, fell ſhort of 80 diviſions, he raiſed it by adding rectified ſpirit to it. The liquor thus prepared fitted his purpoſe, and would ſerve for making a *thermometer* of any ſize, whoſe ſcale would agree with his ſtandard. Such liquor or ſpirits being nearly of the ſtrength of brandy may be eaſily had, and may be made of a proper degree of denſity by raiſing or lowering it.

Dr. Martine finds ſome faults in this *thermometer*; one of which is, that the ball or bulk of the *thermometer* being large, is not heated or cooled ſoon enough to ſhew the quick variation of the weather. And, indeed, this is a fault common to all *thermometers*, which have bulbs to hold their liquor; a cylinder being much better, whatever liquor is uſed, except where great degrees of heat are to be meaſured, as in Sir Iſaac Newton's linſeed-oil *thermometer*. For though moſt ſpirit *thermometers* have the degree of the heat of boiling water marked upon them, as one of their boundaries; yet the heat of boiling water is always greater than that of boiling ſpirits, and therefore they are unfit to meaſure that degree of heat. But linſeed-oil is capable of ſuſtaining much greater degrees of heat; for it will bear a greater degree than what will melt lead, without firing or having the glaſs ball of the *thermometer* melted. Whereas water is only capable of a certain degree of heat, much lower, at which it will evaporate; but this is only when water boils in open veſſels.

Of late years quickſilver has been made uſe of for *thermometers*, and theſe are found to be the moſt uſeful of any; becauſe they will bear ſuch degrees of heat or cold as will burſt ſpirit-*thermometers*, or freeze the liquor in them. This laſt inconveniency happened to the French philoſophers, who went to the north polar circle to examine into the figure of the earth; for the ſpirit in their *thermometers* froze, but their mercurial ones were as uſeful as any where elſe. Fahrenheit of Amſterdam may be looked upon as the inventor of this *thermometer*; and though Prins, and ſome others in England, Holland, France, and other countries, have made this inſtrument as well as Fahrenheit, yet ſtill they may be called Fahrenheit's, as being graduated according to his ſcale.

For the different kinds of theſe *thermometers*, ſee *Deſaguliers*, Exper. Phil. Vol. II. p. 295. See alſo Dr. *Martine*'s Eſſays before mentioned.

Sir Iſaac Newton filled his *thermometer* with linſeed-oil, which will bear a very great heat. He aſſumes the rarefaction of the oil to be proportional to its heat [d]; and this aſſumption ſeems juſt from his experiments. However, it were to be wiſhed that this ſubject were farther examined.—[[d] See the Phil. Tranſ. loc. cit.]

Dr. Hales places the freezing point at 0, and the heat of water on which floating wax begins to melt at 100. In his *thermometer* the heat of boiling water anſwers to $146\frac{1}{3}$.

We ſhall here inſert a table of ſome obſervations made, with the *thermometers* of Fahrenheit, Reaumur, Sir Iſaac Newton, and Dr. Hales, communicated by Mr. Labelye.

1. *Obſervations by Fahrenheit*'s thermometer.

Deg.	
at 212	Boiling water.
190	Brandy boils.
174	Alcohol boils.
156	Serum of blood, and white of eggs hardens.
146	Killing heat for animals, in a few minutes.
108	A hen hatching eggs, but ſeldom ſo hot.
from 107 to 103	Heat of ſkin in ducks, geeſe, hens, pigeons, partridges and ſwallows.
at 106	Heat of ſkin in a common ague and fever.
from 103 to 100	Heat of ſkin in dogs, cats, ſheep, oxen, ſwine and other quadrupeds.
from 99 to 92	Heat of the human ſkin, in health.
at 97	Heat of a ſwarm of bees.
96	A perch died in three minutes, in water ſo heated.
80	Heat of the air in the ſhade, in very hot weather.
74	Butter begins to melt.
64	Heat of the air in the ſhade, in warm weather.
48	Temperate air, in England and Holland.
43	Oil of olive begins to ſtiffen and grow opaque.
32	Water juſt freezing, or ſnow and ice juſt thawing.
30	Milk freezes.
28	Urine and common vinegar freezes.
25	Blood out of the body freezes.
20	Good Burgundy, ſtrong claret and Madera freezes.
7	One part of ſpirits of wine mixt with three parts water freezes.
5	Greateſt cold in Penſilvania in 1731-2, 40° lat.
4	Greateſt cold at Utrecht in 1728-9.
0	A mixture of ſnow and ſalt, which is able to freeze oil of tartar *per deliquium*, but not brandy.

We muſt here obſerve, that the heat of a hen hatching chickens is placed, by this table, at 108 of Fahrenheit's *thermometer*; but it appears from Mr. Reaumur's experiments, that eggs will hatch in a heat no greater than that of the human ſkin. See HATCHING, *Append.*

2. *Obſervations by Reaumur*'s thermometer.

$97\frac{1}{2}$	Anſwers to the heat of boiling water.
80	Spirit of wine in Reaumur's *thermometer* boils.

Deg.

at $29\frac{2}{3}$ } Greateſt heat of the air in the ſhade; obſerved at Paris in 1706, 1707, 1724.

$10\frac{1}{4}$ } Conſtant heat of the caves of the obſervatory of Paris.

0 Artificial congelation of water.

$14\frac{1}{4}$ Lower than (0) greateſt cold at Paris, in 1709.

3. *Obſervations by Sir Iſaac Newton's* thermometer.

34 Water boils vehemently.

$28\frac{6}{11}$ Heat between water boiling and wax melting.

24 Heat of water on which floating wax melts.

$20\frac{2}{11}$ } Heat of water on which floating melted wax begins, by cooling, to loſe its fluidity and tranſparency.

17 Heat of a bath ſupportable to the hand at reſt.

$14\frac{3}{11}$ } Heat of a bath ſupportable to the hand in motion. The heat of blood juſt let out, is almoſt the ſame.

12 } Heat of *thermometer*, in contact with a human body. The heat of a bird hatching her eggs much the ſame.

6, 5, 4 } Heats of the air in the ſummer.

4, 3, 2 } Heats of the air in ſpring and autumn.

2, 1, 0 } Heat of the air in the winter.

0 Water begins to freeze.

4. *Obſervations by Dr. Hales's* thermometer.

$146\frac{1}{3}$ Anſwers to the heat of boiling water.

100 } Heat of water on which floating wax begins to melt.

59 Leaſt proper heat for the melon-thiſtle.

56 ——————— ananas, or pine-apple.

53 ——————— pimiento.

51 ——————— euphorbium.

48 ——————— cereus.

45 ——————— aloes.

43 ——————— Indian fig.

40 ——————— ficoides.

38 ——————— orange.

36 ——————— mirtle.

0 Freſh water juſt freezing.

THICKET, a thick buſh, or place full of buſhes and brambles. Ruſt. Dict. in voc.

THILL, the beam, or draught-tree of a cart or waggon, upon which the yoke hangs. Ruſt. Dict. in voc.

THILLER, or THILL-*horſe*, the horſe that is put under, or immediately yoked to the *thill*. Ruſt. Dict. in voc.

THIMBLE, a cover for the finger, made of braſs, ſteel or ſilver, and uſed by all people who ſow, as taylors, milliners, *&c.*

THIMBLE, in the ſea language, a ſort of ring, the outſide of which is conſiderably hollowed to receive ropes. *Thimbles* are fixed as loops, to prevent the tackle-hook from galling the rope. *Blanckley*, Naval Expoſ. p. 169.

THIRDENDALE, a liquid meaſure in uſe at Saliſbury, containing three pints. Ruſt. Dict. in voc.

THIRST (*Suppl.*)—We find warm druggs, as liquorice, ſometimes effectual in allaying *thirſt*: nay pepper will, in ſome caſes, have a like effect, by cauſing a more plentiful flow of the ſaliva.

In feveriſh diſorders, the patient is frequently tormented with a violent *thirſt*, which is moderated by acidulating the barley-water, or ſage-tea, with ſpirit of vitriol, or with lemon-juice; but by nothing ſo much, as allowing the patient ſome ſlices of an orange. *Pringle*, Obſerv. on Diſeaſ. of Army, p. 135.

THISTLE (*Suppl.*)—*Bleſſed* THISTLE, a name by which ſome call the *cnicus*, or ſaffron-flower. See the article CNICUS, *Suppl.*

Carline-THISTLE, *carlina*, in botany, the name of a genus of plants. See the article CARLINA, *Suppl.*

Diſtaff-THISTLE, in botany, the name of a genus of plants, called by botaniſts *atractylis*. See ATRACTYLIS, *Append.*

Fiſh-THISTLE, a name ſometimes uſed for the *cinara*, or artichoak. See the article CINARA, *Suppl.*

Fuller's THISTLE, the name by which ſome call the *dipſacus*, or teaſel. See the article DIPSACUS, *Suppl.*

Melon-THISTLE, or *Torch*-THISTLE, the Engliſh name of a genus of plants, called by botaniſts *cactus*. See the article CACTUS, *Suppl.* and *Append.*

Melancholy-THISTLE, the ſame with the *gentle thiſtle*, or *cirſium*. See the article *gentle*-THISTLE, *Suppl.*

Sow-THISTLE, the Engliſh name of a genus of plants, called *ſonchus* by botaniſts. See the article SONCHUS, *Suppl.*

Star-THISTLE, the name by which ſome call the *calcitrapa*, a ſpecies of *centauria*. See the article CENTAURIA, *Appendix.*

THORN, a name denoting, or characterizing ſeveral different genera of prickly plants. Thus:

THORN-*apple* is the Engliſh name of the *ſtramonium* of botaniſts. See the article STRAMONIUM, *Suppl.*

Black-THORN, the name by which ſome call the *prunus ſylveſtris*, or wild plum, more uſually called *ſloe*. See the article PRUNUS, *Suppl.*

Box-THORN, or *Avignon*-THORN, names given to the *lycium* of botanical writers. See the article LYCIUM, *Append.*

Buck-THORN, the name of a genus of plants. See the article RHAMNUS.

Chriſt's THORN, the Engliſh name of a genus of plants, called *paliurus* by botanical writers. See PALIURUS, *Suppl.*

Egyptian-THORN, a name ſometimes given to *acacia*. See the article ACACIA, *Suppl.*

Goat's THORN, the Engliſh name of a genus of plants, called by botaniſts *tragacanth*. See the article TRAGACANTH, *Suppl.*

Haw-THORN, *White*-THORN, *Ever-green*-THORN, *&c.* names given to the *meſpilus*. See the article MESPILUS, *Suppl.*

Purging-THORN, a name ſometimes given to the *rhamnus*. See the article RHAMNUS, *Suppl.*

THORNBACK, the Engliſh name of a ſpecies of ray-fiſh, prickly on the back, and with tuberculoſe teeth, and a tranſverſe cartilage in the belly. See the article RAIA, *Suppl.*

THOROUGH-*wax*, in botany, a name by which ſome writers call the *bupleurum*, or hare's ears. See the article HARE'S *ears*, *Suppl.*

THREE-*leaved graſs*. See the articles TREFOIL and TRIFOLIUM, *Suppl.*

THRICHECUS, in zoology, the name uſed by Dr. Hill for the *manati*, or ſea-cow. See the article MANATI, *Suppl.*

THROAT-*wort*, a name given to ſeveral ſpecies of *campanula*. See the article CAMPANULA, *Suppl.*

THROPPLE, among country people, denotes the windpipe of a horſe. Ruſt. Dict. in voc.

THROSTLING, a diſeaſe of black cattle, proceeding from humours gathering under their throats; by which means their throats are ſo dangerouſly ſwelled, that they will be choaked unleſs ſeaſonably relieved by bleeding. Ruſt. Dict. in voc.

THRUSH, in ornithology, the Engliſh name of a large genus of birds, called by authors *turdus*. See the article TURDUS, *Suppl.*

THYME (*Suppl.*)—*Wild* THYME, *Lemon*-THYME, or *Mother-of*-THYME, names uſed for a diſtinct genus of plants, called by botanical writers *ſerpyllum*. See the article SERPYLLUM, *Suppl.*

Maſtich-THYME, a name uſed for the *marum*, *maſtichina*, or *thymbra*. See the article THYMBRA, *Suppl.*

THUYA (*Suppl.*)—The leaves of this tree ſmell like ointment, and in fact prove an excellent one for freſh wounds, cloſing them ſpeedily. Ruſt. Dict. in voc. *lignum.*

TICK, in the hiſtory of inſects, the name of the ſheep-louſe, called by authors *acarus*. See the article ACARUS, *Suppl.*

TIER, in the ſea language, the name of the ſeveral ranks of guns; which, according as they are placed on the lower, middle, or upper decks, are called the lower, middle, or upper *tier*. *Blanckley*, Nav. Expoſ. p. 169.

TIERCEL, in falconry, a name given to a male hawk, as being a third part leſs in ſize than the female. Ruſt. Dict. in voc.

TIGER (*Suppl.*)—The ſkull of this creature, both as to the teeth and other particulars, very much reſembles that of the cat, except that, in the room of the tranſverſe ſutures of the cat's, there is in the *tiger's* one in the figure of a great Y, ſo cloſe and firm, that the bones ſeem contiguous.

Its tuſks are a little crooked, like thoſe of the dog and cat; their exerted part very white, and the bow of ſome of them very long, not leſs than five inches. Its claws are whitiſh, and ſemitranſparent, very flat, ſharp and pointed, and extremely hooked; every way in colour and ſhape like the claw of a cat. Uſually, on the fore paws of the larger *tigers*, theſe are at the baſis an inch broad, and are two inches and a half long. The bone on which the claw is ſet receives it into a little groove, and is by a double epiphyſis itſelf inſerted into the claw; by which means the claw is firmly held in its place. *Grew's* Muſ. p. 13.

TIGER-*ſhell*, the Engliſh name of the red *voluta*, with large white ſpots. See the article VOLUTA, *Suppl.*

TIKE (*Suppl.*)—TIKE is alſo uſed for a ſmall bullock or heifer, and for a ſort of worm. Ruſt. Dict. in voc.

TILLER, (*Cycl.*) a term uſed by farmers to ſignify, that the produce of the grain branches out into ſeveral ſtalks. In which ſenſe, it denotes the ſame thing with the Latin word *fruticare*. Vid. *Tull's* Horſe-hoeing Huſbandry, p. 105.

TILTH, a country term for tillage, manuring, or improving of ground. Ruſt. Dict. in voc.

TIMBER (*Suppl.*)—*Prick*-TIMBER, a name by which ſome call the *euonymus*, or ſpindle-tree. See the article EUONYMUS, *Suppl.*

TIN, how expanded by heat. See the article HEAT, *Append.*

TIPULA (*Suppl.*)—*Waſp*-TIPULA, in natural hiſtory, the name of an inſect, the deſcription of which ſee under the article WASP-*tipula*, *Suppl.*

TIRING,

TIRING, in falconry, is the giving a hawk a leg or pinion of a pullet to pluck at. Dict. Ruſt. in voc.

TIT-*lark*. See ALAUDA, *Suppl.*

TOBACCO, *nicotiana*, the Engliſh name of a diſtinct genus of plants. See the article NICOTIANA, *Suppl.*

TOE-*ſhell*, the Engliſh name of a genus of ſhells, called by authors *pollicipes*. See the article POLLICIPES, *Suppl.*

TOFT (*Cycl.*)—TOFT alſo ſignifies a grove of trees. Dict. Ruſt. in voc.

TOLK, in ornithology, a name ſometimes given to the black, brown, and white, mottled *tringa*. See the article TRINGA, *Suppl.*

TONGUE (*Suppl.*)—To the inſtances briefly mentioned under this head in the Supplement, we may add the following account of a man at Montagu, in the Bas Poictou, who being ſeized with the ſmall-pox in his fifth or ſixth year, loſt his whole *tongue* by gangrene, or putrefaction; yet, notwithſtanding, performed in perfection the five actions belonging to the *tongue*, *viz.* ſpeaking, taſting, ſpitting, chewing, and ſwallowing [a]; nature having, with infinite artifice, given a new conformation to the mouth, proper to ſupply the want of the laſt organ.—[a *Jac. Rolandi Agloſtomographia, ſive deſcriptio oris ſine lingua quod perfectè loquitur et reliquas ſuas functiones naturaliter exercet*; firſt publiſhed in French, at Saumur, in 1630; tranſlated into Latin by Car. Ruygerus, and publiſhed in the Ephem. German. D. an. 3. p. 481—513.]

For ſpeech, inſtead of the ordinary proviſion, the little fleſhy part of the *tongue* remaining was inflected in the middle towards the palate, the teeth inverted, and long inwards, the muſculi buccinatores eaſily contracting between the dentes molares. In fine, there was a diſpoſition in all the organs to produce ſpeech without a *tongue*: for the breath iſſuing at the oval aperture of the larynx, was further broken, and rendered vocal by the inflation of the fleſhy body, the motion of the lips, the retraction of the buccinatores, the tremulous agitation of the uvula, and the commotion of the lower jaw. Laſtly, by the inverſion of the teeth, the depreſſion of the palate, the abundance of ſaliva, and the capacity of the mouth, the ſound was ſtill further modified and determined, ſo as to render it articulate. Habit too, and the repeated attempts to ſpeak at an age when the parts were eaſily flexible, had contributed greatly to the diſtinctneſs of it. For taſting, it is evident from this, as well as other conſiderations, that the *tongue* is not the only organ of it, but that the palate is alſo a ſeat of this ſenſe. For chewing, the office of turning the meat in the mouth was here performed by the lips and cheeks, the muſcles whereof repelled towards the maxillares; ſuch parts, as in maſtication might fall from one ſide to the other. For the firſt morſel he took, he could only chew on that ſide into which he put it with his hand; the ſecond he put in like manner on the other ſide; and thus varied and ſupplied each alternately. For ſwallowing, the gravity of the food contributed ſomething to this; which he further promoted by ſtretching out his neck, inclining his head, and drawing back the buccinatores within his teeth; all which were ſeconded by the mouth and fauces, being well moiſtened with plenty of ſaliva. In effect, divers animals, as the tortoiſe and the crocodile, ſtork, *&c.* ſwallow without any *tongue*; and fiſhes, though their *tongue* is fixed immoveable to their palate. For ſpitting, it was performed by the lips, aided by the internal contraction of the mouth, and the retraction of the buccinatores over the grinders.

Roland's inſtance was ſingular at that time, but a parallel one has been ſince obſerved in a girl at Liſbon fifteen years old; of which an account was given in 1718 to the Royal Academy of Sciences, by M. de Juſſieu [b]. Upon inſpecting the mouth of this girl, there appeared nothing in all that part ordinarily poſſeſſed by the *tongue*, but a little eminence in form of a papilla, between three and four lines high, in the middle of her mouth, ſcarce perceivable by the eye. Upon preſſing this with the finger, a kind of motion of contraction and dilatation was perceived in it; which ſhewed, that though the *tongue* was wanting, the muſcles of which it was formed, and which are deſtined to give it motion, were nevertheleſs there. With the help of theſe ſhe ſpoke as diſtinctly and eaſily, as if nothing had been wanting: ſhe diſtinguiſhed taſtes like other people. For maſtication, it was chiefly effected by the motion of the lower jaw, which ſhe drew nearer to, or further from the grinders of the upper, under which the food to be chewed was. In this action ſhe ſometimes alſo made uſe of her fingers, but much more in the action of ſwallowing, in order to protrude the maſticated food towards the orifice of the œſophagus. For drinking, ſhe performed it like other people, excepting the attention ſhe employed to prevent the liquor going down too faſt; in order to which, ſhe kept her head a little inclined forwards. Laſtly, the action of ſpitting was ſupplied by the muſcles of the papilla, which filled the lower part of her mouth: theſe riſing almoſt to a level with the teeth of the lower jaw, and the buccinatores approaching towards both jaws, expreſſed the ſaliva, and conducted it to the ſphincter of the lips, from whence the air, driven with violence from the larynx, ſerved as a vehicle to expel it out of the mouth [c].—[b Mem. de l'Acad. Scienc. an. 1718. p. 6—16. c *Juſſieu*, loc. cit. p. 7, ſeq.]

Serpent's TONGUE, or *Adder's* TONGUE, names given to the *ophioglоſſum*, a diſtinct genus of plants. See the article OPHIOGLOSSUM, *Suppl.*

TONIC *accent*. See the article ACCENT, *Cycl.*

TOOTH-*pick*, a name by which ſome call the *viſnaga*, a ſpecies of *daucus*, according to Linnæus. See the article DAUCUS, *Suppl.*

TOOTH-*wort*, the Engliſh name of a genus of plants, called by botanical writers *dentaria*. See the article DENTARIA, *Suppl.*

TORROCK, a bird of the larus or gull kind, with a white head, and a ſpot of black on each ſide. See the article LARUS, *Suppl.*

TOUCH-*me-not*, the name of a ſpecies of *balſamine*. See the article BALSAMINA, *Suppl.*

TOURNEFORTIA, in botany, a name given by Pontedera to a genus of plants, called by Linnæus *anthoſpermum*. See the article ANTHOSPERMUM, *Append.*

TOWER-*muſtard*, the Engliſh name of a genus of plants, called *turritis* by botaniſts. See the article TURRITIS, *Suppl.*

TRACES (*Suppl.*)—*Ladies* TRACES, in botany, the name of a diſtinct genus of plants, called by botaniſts *orchis*. See the article ORCHIS, *Suppl.*

TRACHELIUM (*Suppl.*) is alſo a name uſed by many for ſeveral ſpecies of *campanula*. See the article CAMPANULA, *Suppl.*

TRADESCANTIA, in the Linnæan ſyſtem of botany, the name given to the *ephemerum* of Tournefort. See the article EPHEMERUM, *Suppl.*

TRAGO-*orchis*, in botany, a name uſed by ſome authors for the *ſatyrium* of Linnæus. See the article SATYRIUM, *Append.*

TRAJECTORY (*Cycl.*)—This term is often uſed, in general, for the path of any body moving either in a void, or in a medium that reſiſts its motion; or even for any curve paſſing through a given number of points. Thus Newton, Princip. lib. 1. prop. 22. propoſes to deſcribe a *trajectory* that ſhall paſs through five given points.

TRAVE, among farriers, the ſame with *travice*. See the article TRAVICE, *Suppl.*

TRAVELLER'*s joy*, a name by which the *clematitis*, or virgin's bower, is ſometimes called. See the article VIRGIN'*s bower*, *Suppl.*

TREACLE-*muſtard*. See the article MUSTARD, ſupra.

TREE (*Suppl.*)—*Cork*-TREE, the Engliſh name of a genus of plants, called by botaniſts *ſuber*. See the article SUBER, *Suppl.*

Chaſte TREE. See the article VITEX, *Suppl.*

Germander TREE. See the article TEUCRIUM, *Suppl.*

White-leaf, or *mealy* TREE, a name by which ſome call the *viburnum*. See the article VIBURNUM, *Suppl.*

TREE *of life*, the Engliſh name of a genus of *trees*, called *thuya* by botaniſts. See the article THUYA, *Suppl.*

TREE-*louſe*. See the article LOUSE, ſupra.

TREFOIL (*Suppl.*)—*Bean* TREFOIL, a name ſometimes given to the *cytiſus*. See the article CYTISUS, *Suppl.*

Bird's foot TREFOIL, a name given by ſome writers to the *lotus*. See the article LOTUS, *Suppl.*

Marſh-TREFOIL, the name of a genus of plants, called by botaniſts *menyanthes*. See MENYANTHES, *Suppl.*

Moon-TREFOIL, the name by which many call the *medicago* of botanical writers. See the article MEDICAGO, *Suppl.*

Shrub-TREFOIL, a name given to very different plants; as the *ptelea* of Linnæus, the *cytiſus*, and *dorycnium*, or the ſilvery *convolvulus*. See the articles PTELEA, CYTISUS, *&c. Suppl.*

Snail TREFOIL, *medica*, in botany, the name of a diſtinct genus of plants. See the article MEDICA, *Suppl.*

TRELLIS, an aſſemblage of wooden bars, croſſing one another, either in a ſtrait line, or ſlopewiſe, deſigned to ſupport wall-trees.

There is another kind of *trellis*, made of iron-wire. See Build. Dict. in voc.

TRILATERAL, in geometry, an appellation given to all three-ſided figures. See TRIANGLE, *Cycl.*

TRILOCULAR, in botany, is applied to a capſule having three cells. See CAPSULE, *Append.*

TRIM, in carpentry, is to fit one piece of timber into another. Build. Dict. in voc.

TRIOSTEOSPERMUM, in botany, the name by which Dillenius calls a ſpecies of *lonicera*. See the article LONICERA, *Append.*

TRIPETALOUS *plants*, ſuch whoſe flower conſiſts of three petals or leaves. Ruſt. Dict. in voc.

TRITON, in zoology, the name by which Dr. Hill calls a genus of inſects of the *gymnarthria*, or naked kind.

The body of the *triton* is oblong; the roſtrum at the mouth is of a ſpiral form; the tentacula are fourteen in number, and twelve of them cheliferous. Vid. *Hill*, Hiſt. Anim. p. 89, ſeq.

TROAT, among ſportſmen, the cry of a buck in rutting time. Dict. Ruſt. in voc.

TROCHING, the ſmall branches on the top of a deer's head. Ruſt. Dict. in voc.

TROPÆOLUM, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by Tournefort *cardamindum*, and by C. Bauhine *naſturtium indicum*.

The characters are theſe: The cup is a deciduous perianthium, compoſed of a ſingle leaf, divided into five ſegments, erecto-patulous, acute, coloured, and the two lower ones narrower than the reſt. The flower conſiſts of five roundiſh petals, inſerted into the diviſions of the cup; the two upper petals are ſeſſile; the three others have very long and barbated ungues. The ſtamina are eight ſhort, ſubulated, declinated, unequal filaments. The antheræ are erect, oblong, quadrilocular, and aſſurgent. The germen is roundiſh, ſtriated, and formed of three lobes. The ſtyle is ſimple, erect, and of the length of the ſtamina. The ſtigma is trifid and acute. The fruit conſiſts of three capſules, convex, ſulcated, and ſtriated on one ſide, and angular on the other. The ſeeds are three in number, gibbous on one ſide, and angulated on the other; but, upon the whole, ſomewhat roundiſh, and ſtriated deeply. Vid. *Linnæi* Gen. Plant. p. 158. See the article CARDAMINDUM, *Suppl.*

TROPHY (*Cycl.*)—TROPHY, in architecture, an ornament repreſenting the trunk of a tree, charged or encompaſſed all round with arms, or military weapons, both offenſive and defenſive. Build. Dict. in voc.

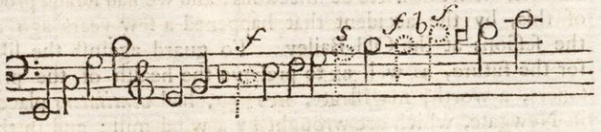
TROUGH, (*Cycl.*) a hollow wooden veſſel for kneading bread in, or to beat apples in for cyder; alſo a piece of the trunk of a tree made hollow, to feed ſwine in, or an open pipe or channel, made of boards, for the conveyance of water. Dict. Ruſt. in voc.

TRUE-*love*, or *Herb* TRUE-*love*, the name of a genus of plants, called *herba Paris* by botaniſts. See the article HERBA *Paris*, *Suppl.*

TRUG (*Cycl.*)—TRUG is alſo a country word for a milk-tray, or a hod to carry mortar in.

TRUMPET (*Cycl.*)—The uſual ſounds of the *trumpet* are repreſented by the following muſical notes.

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.



Here the loweſt ſound being denoted by 1, the pitch of the reſt, or the number of their reſpective vibrations, during the time that C vibrates once, will be expreſſed by the numbers denoting the order of the ſounds, 2, 3, 4, 5, &c. The ſounds expreſſed by the muſical numbers, that is, by 2, 3, 5 [a], and their compoſites, which are 4, 6, 8, 9, 10, 12, 15, 16, are all perfectly in tune; but the ſounds expreſſed by numbers not muſical, as 7, 11, 13, 14, are falſe. Three of theſe, *viz.* B♭, its octave, and A, diſtinguiſhed by *f* placed over them, are too flat; and the remaining note F, marked with an S, is too ſharp.—[[a] See MUSICAL *numbers*, *Suppl.* and *Append.*]

The reaſon of which is, that B♭ ought to be a tone major below C; that is, its pitch to that of C will be as 8 to 9; but the proportion given by the *trumpet* is as 7 to 8; which being a leſs proportion than that of 8 to 9, it follows, that B♭ will be too flat. The ſame holds true of its octave. And A being a tone minor above G, it ought to be to G as 10 to 9: but in the *trumpet*, it is to G as 13 to 12; which being leſs than the proportion of 10 to 9, it follows, that A will be too flat. On the other hand, F ought to be a ſemitone major above E; that is, F ought to be to E, as 16 to 15; but, in the *trumpet*, F is to E, as 11 to 10; which being a greater proportion than that of 16 to 15, it follows that F is too high or too ſharp.

This ſyſtem of *trumpet* notes is an effectual confutation of thoſe who are for introducing 7, 11, 13, and other primes into muſic.

TRUMPET-*honeyſuckle*. See the article HONEYSUCKLE, ſupra.

TRUNK (*Suppl.*)—TRUNK is alſo uſed for a ſtrong cheſt, or box, of a roundiſh form, at leaſt on the upper ſide. Ruſt. Dict. in voc.

TUBEROSA, a name given by Heiſter to a genus of plants, called by Linnæus *polyanthes*. See POLYANTHES, *Append.*

TUE-*iron*, in ſmithery, the iron through which a ſmith's bellows blow. *Blanckley*, Naval Expoſ. p. 178.

TUEL, among ſportſmen, denotes the fundament of a horſe, or wild beaſt. Dict. Ruſt. in voc.

TULIP (*Suppl.*)—*African* TULIP, or *Cape* TULIP, names uſed by ſome for the *hæmanthus*, a diſtinct genus of plants. See the article HÆMANTHUS, *Suppl.*

TULIP-*tree*, the Engliſh name of a genus of trees, called by botaniſts *tulipifera*, and *liriodendrum*. See the article LIRIODENDRUM, *Suppl.*

Laurel-leaved TULIP-*tree*, a name ſometimes given to the *magnolia* of botanical writers. See the article MAGNOLIA, *Suppl.*

TUMPING, the making a kind of fence in the fields, by ſetting trees almoſt on the ſurface of the ground, and covering their roots with mould. Ruſt. Dict. in voc.

TUN-*hoof*, a name ſometimes uſed for ground-ivy. See the article IVY, *Suppl.* and *Append.*

TURBITH, in botany, a name uſed by many for the *thapſia*, or deadly carrot. See the article THAPSIA, *Suppl.*

Mineral TURBITH (*Cycl.*)—We read of this preparation's being given to the quantity of ten grains, with the ſame quantity of camphor, and fifteen grains of the pilul. ex duob. to remove the ſwelling of the teſticles. This medicine, which in the beginning vomited and purged, at laſt operated chiefly as an alterative. It is ſaid to be ſucceſsful in obſtinate venereal and ſcrophulous diſorders. See Medic. Eſſ. Edinb. Vol. IV. art. 4.

TURCOIS (*Cycl.*)—This gem has many virtues attributed to it; but all that we know of it at preſent is, that, like other bodies which contain copper, it is a violent emetic, and not at all fit to be received into practice.

TURCOIS *colour*, the pale blue of the natural *turcois* gem. This is a very favourite colour in the glaſs trade, and is given to glaſs in the following manner. Firſt calcine common ſea-ſalt, and beat it to a fine powder; then make a pot of the ſea-green glaſs, of a fair and full colour: to this, when in fuſion, throw in at times the powder of ſalt, till the maſs has loſt all its tranſparence, and is become paler and opake; then add, by very ſmall quantities at a time, more and more ſalt, till the colour is exactly that of the *torcois* gem; and when it is ſo work it immediately, for the ſalt is ſoon burnt off, and the glaſs becomes tranſparent, and of its green colour. If it become tranſparent while working, more ſalt muſt be thrown in, and that will reduce it to the ſame opacity again. *Neri*'s Art of Glaſs, p. 57.

TURCOIS *enamel*, an enamel exactly of the colour of the *torcois* gem, and very much reſembling it in many reſpects. It is made in the following manner: Take of the common matter of enamels ſix pounds, melt it, refine it, and caſt it into the furnace again; when it is melted and refined put in, of thrice-calcined braſs three ounces, zaffer prepared ninety-ſix grains, wherewith mix well forty-eight grains of manganeſe; mix theſe well, and put them into the matter at four times; let the whole incorporate, and afterwards take a proof to ſee if it be right, or if it require more of any of the powders. *Neri*'s Art of Glaſs, p. 149.

TURK's *cap*, a name uſed by ſome for a ſpecies of lilly. See the article LILIUM, *Suppl.*

TURK's *head*, a name ſometimes uſed for the *cactus*, a diſtinct genus of plants. See the article CACTUS, *Append.*

TURKY-*baum*. See the article BAUM, ſupra.

TURKY-*wheat*, a name ſometimes given to *maiz*, or *yucca*. See the articles YUCCA and MAIZ, *Suppl.*

TURNEP (*Suppl.*)—*French* TURNEP, the name by which ſome call the *napus* of botanical writers. See the article NAPUS, *Suppl.*

TURNEP-*cabbage*, in botany. See the articles BRASSICA and CABBAGE, *Suppl.*

TURTLE-*ſhell*, (*Suppl.*) is alſo the name of ſeveral ſpecies of the *teſtudo*, or tortoiſe. See the article TESTUDO, *Supplement.*

TUSK (*Cycl.*)—TUSK, in carpentry, a bevel ſhoulder, made to ſtrengthen the iron of the joiſt, which is let into the girder. Build. Dict. in voc.

TWITCH-*graſs*, the ſame with *quick-graſs*, a weed very hurtful to the farmers. Ruſt. Dict. in voc.

TWYBLADE, a name uſed by ſome for the *ophris* of botanical writers. See the article OPHRIS, *Suppl.*

TYPH-*wheat*, a kind of corn very like rhye. Ruſt. Dict. in voc.

U.

VACCA *marina*, in zoology, a name ſometimes uſed for the *manati*, or ſea cow. See the article MANATI, *Suppl.*

VALERIAN (*Suppl.*)—*Greek* VALERIAN, a name frequently uſed for the *polemonium* of botaniſts. See the article POLEMONIUM, *Suppl.*

VALERIANOIDES, in botany, a name given by Petiver to the *cephalanthus* of Linnæus. See the article CEPHALANTHUS, *Append.*

VALLEY (*Cycl.*)—VALLEYS, in building, denote the gutters over the ſleepers in the roof of a building. Build. Dict. in voc.

VALLOR, VALLOW, or VATE, among country people, a hollow mould, in which a new-made cheeſe is preſſed. Ruſt. Dict. in voc.

VARVELS, in falconry, ſmall ſilver rings about a hawk's leg, with the owner's name on them. Ruſt. Dict. in voc.

VATE, in the making of cheeſe. See VALLOR, ſupra.

VAULT (*Suppl.*)—*Going to the* VAULT, a term uſed by ſportſmen for a hare's taking the ground like a coney, which ſhe ſometimes does. Ruſt. Dict. in voc.

VEGETABLE (*Suppl.*)—*Perſpiration of* VEGETABLES. See PERSPIRATION, *Append.*

VELLICULA, a name ſometimes uſed for the *forficula*, an inſect called in Engliſh the *ear-wig*. See the article EAR-*wig*, *Append.*

VELLING, a term uſed by huſbandmen in the weſt of England for plowing up by the turf. Ruſt. Dict. in voc.

VENTILATOR, a machine by which the noxious air of any cloſe place, as an hoſpital, gaol, ſhip, chamber, *&c.* may be changed for freſh.

The noxious qualities of bad air have been long known, tho' not ſufficiently attended to in practice; but it is to be hoped, that the indefatigable pains taken by Dr. Hales to ſet the miſchiefs ariſing from foul air in a juſt light, and the eaſy remedy he has propoſed by the uſe of his *ventilators*, will at length prevail over that unaccountable ſloth, or obſtinacy, which, where particular intereſts are not immediately concerned, ſeems to poſſeſs the generality of mankind, and which rarely allows them to give due attention to any new diſcovery.

The *ventilators* invented by that ingenious author conſiſts of a ſquare box of any ſize; in the middle of one ſide of this box a broad partition, or midriff is fixed by hinges, and it moves up and down by means of an iron rod, fixed at a proper diſtance from the other end of the midriff, and paſſing through a ſmall hole in the cover of the box. Two boxes of this kind may be employed at once, and the two iron rods may be fixed to a lever moving on a fixed center; ſo that by the alternate raiſing and preſſing down of the lever, the midriffs are alſo alternately raiſed and depreſſed, whereby theſe double bellows are at the ſame time both drawing in air, and pouring it out through apertures with valves made on the ſame ſide with, and placed both above and below the hinges of the midriffs. For a farther account of this machine we refer to the author himſelf, who gives a full detail of it, and of its manner of working. See Deſcription of *Ventilators*, by Stephen Hales, D. D. Lond. 1743, 8vo.

The Doctor has ſhewn the uſe of his *ventilators* very fully. As to ſhips, in particular he obſerves that the wind-ſail, made uſe of at ſea to introduce freſh air between decks, is far from being ſufficient for that purpoſe; nor can it be uſed with equal ſafety to the ſick, and thoſe who are ſleeping, by means of the ſtrength of the wind which conveys the air with too much violence. But when the foul air is carried off by means of *ventilators*, notwithſtanding the great velocity with which they throw out the air, which they may do at the rate of ſixty tuns in a minute, yet the motion of it downwards into the hold, to ſupply what is carried off, is ſo very gentle, that it cannot be perceived; becauſe the ſum of all the open paſſages for it through the deck exceeds the opening of the trunk of the *ventilator*, in ſo great a proportion as 100 to 1, or more. Beſides, in a calm the wind-ſail can do little or no good; nor when the ſhip is under ſail, at which time the wind-ſail is not uſed. And it is to be obſerved, that it is not the *ventilating* of a ſhip now and then with a wind-ſail, when wind and weather ſerve, that will ſuffice; it ought to be done daily, if due regard be had to the health of the ſhip's crew. The great quantity of rancid noxious vapours, which are inceſſantly exhaling from a number of live human bodies, the ſtench that inceſſantly ariſes from the bilge water, and from the hot, ſtagnant, putrid air in the hold, makes it very adviſeable to refreſh ſo bad an air continually, either with the wind-ſail, when that can be properly uſed, or elſe with *ventilators*, which are intended to ſupply the defects of the wind-ſail.

Ventilators muſt alſo be of particular ſervice in new ſhips, which are obſerved to be more unhealthy, on account of a greater quantity of ſappy wreak which ariſes from new timber, and makes the confined air the more unwholeſome. They will alſo be an effectual preſervative of horſes in tranſports, where they are ſometimes ſuffocated, when in a ſtorm there is a neceſſity to ſhut the hatches down.

Theſe *ventilators* will alſo drive out of the hold of a ſhip that dangerous vapour which ariſes from corn, which is ſo noxious, that ſometimes they dare not venture into the hold, till after the hatches have been opened for ſome time.

Ventilation will not only be of ſervice to preſerve ſeveral kinds of goods, but alſo the timbers and planks of the hold itſelf, when laid up in ordinary, as well as when in uſe, and will make the air in the hold leſs noxious, though it will ſtill be offenſive to the ſmell, by reaſon of the bilge water. But this may be made leſs offenſive, by often letting in ſweet water from the ſea, and then pumping it out; which good practice ought to be continued, notwithſtanding the uſe of the *ventilators*.

What is here ſaid of the foul air of ſhips may be applied to that of mines, gaols, work-houſes, barracks and hoſpitals. In mines, *ventilators* may guard againſt the ſuffocations, and other terrible accidents ariſing from damps. The air of gaols has been often known to be infectious; and we had a fatal proof of this, by the accident that happened a few years ago at the ſeſſions at the Old-Bailey. To guard againſt the like for the future, as well as to preſerve the health of the priſoners, a worthy magiſtrate, in 1752, had *ventilators* placed in Newgate, which are wrought by a wind-mill: and in the beginning of the preſent year, 1753, Dr. Hales gave an account of the good ſucceſs attending the uſe of theſe machines, by a remarkable decreaſe in the uſual mortality and ſickneſs of that place.

The Doctor is alſo of opinion, that a *ventilation* of warm dry air from the adjoining ſtove, with a cautious hand, might be of ſervice to trees and plants in green-houſes; where it is well known that an air full of the rancid vapours, which perſpire from the plants, is very unkindly to them, as well as the vapours from human bodies are to men. For freſh air is as neceſſary to the healthy ſtate of vegetables, as of animals.

The larger kinds of *ventilators*, uſed by the Doctor, are ten feet long, five feet broad, and two feet high, in the clear within. Thoſe he uſed by way of experiment on board the Captain, a ſeventy gun ſhip, were ten feet long, four feet three inches wide, in the clear within, and thirteen inches deep; one inch of which being occupied by the midriff, there remained a foot depth for it to riſe and fall in. A *ventilator* of theſe dimenſions will, through a trunk of a foot ſquare, drive the air at the rate of twenty-five miles in an hour, which is double of what Mariotte aſſigns for the velocity of a pretty ſtrong wind.

But beſides theſe large *ventilators*, the Doctor made a ſmaller ſort, four feet in length, ſixteen inches in breadth, and thirteen inches, all in the clear within. This ſmaller *ventilator* may be very uſeful in preſerving the bread, in the bread-room of a ſhip, ſweet and dry. Peaſe alſo, and oatmeal, which are apt to heat and ſpoil in caſks, may be preſerved, by putting them into a large bin, with a falſe bottom of hair cloth laid on bars, whereby freſh air may be blown upwards through them with theſe ſmall *ventilators*.

Ventilators are alſo of excellent uſe for the drying of corn, hops, and malt. *Hales*, lib. cit. p. 100, 108, 129, 151. Gunpowder may be thoroughly dried, by blowing air up through it by means of *ventilators*. *Hales*, ib. p. 119, ſeq. What advantage dry gunpowder has over that which is damp, may be ſeen by the experiment mentioned in the article GUNPOWDER, *Append.*

VENUS (*Cycl.*)—Signior Bianchini has given the deſcription of a globe for *Venus*, the principal properties of which are, that the plane of the ecliptic makes an angle of 15° with the axis, the tropics are 75° from the equator, and the polar circles only 15° from it. For a farther account of it, ſee *Deſaguliers*, Experim. Philoſoph. Vol. II. p. 552, ſeq.

VENUS's *comb*, the Engliſh name of a genus of plants, called by botanical writers *ſcandix*. See the article SCANDIX, *Suppl.*

VENUS's *looking-glaſs*, a name ſometimes uſed for the *campanula*, or bell-flower. See the article CAMPANULA, *Suppl.*

VENUS's *navel-wort*, the name by which ſome call the *omphalodes*, a diſtinct genus of plants. See the article OMPHALODES, *Suppl.*

VERGE, among gardeners, generally denotes the edge or outſide of a border; but more particularly, is uſed for a ſlip of graſs adjoining to gravel-walks, and dividing them from the borders in the parterre-garden. *Miller*, Gard. Dict.

VERMIS *aureus*, the name by which Bartholine, and others, call the *aphrodita*, a genus of ſea-inſects. See the article APHRODITA, *Append.*

VERVAIN *mallow*, the Engliſh name of a diſtinct genus of plants, called by botanical writers *alcea*. See the article ALCEA, *Suppl.*

VESSEL (*Cycl.*)—*Chemical* VESSELS. The article of *chemical* APPARATUS, *Suppl.* having been accidentally forgot, we are forced to inſert it under this title VESSEL, though ſomewhat improperly, the word APPARATUS being of much more extenſive ſignification.

Dr. Shaw, in his Eſſay on the uſe of a portable laboratory, has given a liſt of all the apparatus neceſſary for it, which will ſerve alſo, in general, for a complete chemical apparatus for all ordinary caſes, and common courſes of chemical experiments: for extraordinary purpoſes it may be enlarged at diſcretion, according to the views of the operator.

The chemical apparatus may be divided into two kinds, the remote and immediate; or, in other words, ſuch as are preparatory to the operations, and ſuch as are actually employed in them. The remote apparatus conſiſts of ſeveral particulars. Among theſe are firſt ſuch as are neceſſary to the exactitude of the proceſs, for every chemical operation is to be performed in an exact manner. Good ſcales and weights are neceſſary for the exactly determining the quantity of the ſubject to be employed, weight being the true index of the quantity of matter in bodies; but in common caſes, or where water, or other liquors of nearly the ſame ſpecific gravity with water are uſed, the work is conſiderably ſhortened by the uſe of a meaſure, which in water very nearly correſponds to weight in the common acceptation, a pint of it very nearly anſwering to a pound in weight. Hence the next thing to a ſet of ſcales and weights, in the chemical apparatus, is a ſet of nice meaſures; but they muſt be uſed with great diſcretion, and though ever ſo exact as to their contents, they muſt not be truſted to in the nicer operations. A pint of ſpirit of wine falls conſiderably ſhort of a pound, and a pint of quickſilver weighs fourteen pounds; between the ſeveral weights of theſe there is a great variety.

Many ſolid ſubſtances require to be reduced into ſmall parts, before they can be made the ſubjects of chemical operations; and for this reaſon there will be a neceſſity for mortars, ſieves, raſps, files, hammers, ſlicers, and forceps. Next to theſe come the inſtruments uſed in the management of the fire; theſe are ſhovels, hooks, tongs, and blow-pipes: and for charging the veſſels with the ſubject matters to be worked upon in the operations, there are required hollow ſhells, horns, tin plates, bruſhes, hares feet, ſpoons, and ſpatulas. Rounds are alſo required to ſet certain glaſſes on; and for emptying their contents, and thoſe of other veſſels, hooked tongs, cones, ingots, baſons, funnels, and ſtore-glaſſes, furniſhed, according to the nature of the things to be kept in them, with common cocks, wax ſtopples, and glaſs ſtopples; and for the tying down of theſe, bladders, leather, and the like. In the laſt place come the inſtruments for making certain utenſils, as moulds for muffles, teſts, crucibles and melting-pots, and iron rings for cutting glaſſes and the necks of retorts.

The more immediate apparatus, or that employed in the operations themſelves, are veſſels containing the ſubjects to be wrought upon; particularly glaſs eggs, and bodies for digeſtion; retorts and receivers for diſtillation; blind heads for bodies in ſublimation; ſtone pans and cut glaſſes for evaporation; peculiar ſpout-receivers, and glaſſes for ſeparation; ſtrainers for percolation; paper for filtration; muffles and teſts for cupellation; crucibles for melting; pots for cementing; and lutings to cloſe the junctures of the veſſels whenever neceſſary. *Shaw*'s Chemiſtry, p. 384.

See Tab. of Chemical Furnaces, Veſſels, and Utenſils.

VESTIBLE (*Cycl.*)—VESTIBLE is alſo uſed for a kind of little antichamber before the entrance of an ordinary apartment.

VETCH (*Suppl.*)—*Ax*-VETCH, in botany, the Engliſh name of a genus of plants, called by authors *ſecuridaca*. See the article SECURIDACA, *Suppl.*

Bitter-VETCH, the Engliſh name of a genus of plants, known among botanical writers by that of *orobus*. See the article OROBUS, *Suppl.*

Bindweed-leaved-VETCH, a name ſometimes given to the *vetchling*. See the article VETCHLING, infra.

Chickling-VETCH, the Engliſh name of the *lathyrus*, a diſtinct genus of plants. See the article LATHYRUS, *Suppl.*

Crimſon-graſs-VETCH, a name ſometimes uſed for the *niſſolia*, a diſtinct genus of plants. See the article NISSOLIA, *Suppl.*

Hatchet-VETCH, the name by which ſome call the *ſecuridaca* of botanical writers. See the article SECURIDACA, *Suppl.*

Kidney-VETCH, the name by which ſome call a ſpecies of *vulneraria*. See the article VULNERARIA, *Suppl.*

Liquorice-VETCH, the Engliſh name of a genus of plants, known among botaniſts by that of *glycine*. See the article GLYCINE, *Suppl.*

Medic-VETCH, the name by which many call the *onobrychis*, a diſtinct genus of plants. See the article ONOBRYCHIS, *Suppl.*

Milk-VETCH, the Engliſh name of a genus of plants, called by botanical writers *aſtragalus*. See the article ASTRAGALUS, *Suppl.*

VETCH-*graſs*, in botany. See the article GRASS, *Append.*

VETCHLING, the Engliſh name of a diſtinct genus of plants, known among botaniſts by that of *aphaca*. See the article APHACA, *Suppl.*

VIGILIA, *watch*, in antient chronology. See the article WATCH, *Append.*

VINE (*Suppl.*)—*Black*-VINE, a name by which the *tamnus*, or black briony is ſometimes called. See the article TAMNUS, *Suppl.*

Spaniſh-arbor-VINE, a name by which ſeveral ſpecies of *convolvulus* are ſometimes called. See the article CONVOLVULUS, *Suppl.*

White-VINE, or *Wild*-VINE, a name ſometimes given to the *bryonia alba*. See the article BRYONIA *alba*, *Suppl.*

VINEGAR (*Suppl.*) is ſaid to be a good remedy for the ſting of waſps. Perhaps it might alſo be ſucceſsfully applied to the ſting of bees, gnats, &c. A late author pretends, that taken internally, eſpecially if mixed with the powder of cantharides, *vinegar* is a remedy againſt the hydrophobia. *Vinegar* and honey, or oxymel, of the conſiſtence of a ſyrup, ſwallowed warm, is very good in many caſes of ſore throats ariſing from colds.

VIOLET (*Suppl.*)—*Dame*'s, or *Queen*'s VIOLET, the Engliſh name of a diſtinct genus of plants, called by botaniſts *heſperis*. See the article HESPERIS, *Suppl.*

Bulbous-VIOLET, a name ſometimes given to the ſnow-drop, a plant which Linnæus makes a diſtinct genus under the name *galanthus*; but which Tournefort comprehends among the *narciſſo-leucoiums*. See the article NARCISSO-*leucoium*, *Suppl.*

Corn-VIOLET, a name ſometimes given to the *campanula*, or bell-flower. See the article CAMPANULA, *Suppl.*

Dog's tooth VIOLET, the name by which ſome call the *dens canis* of botanical writers. See the article DENS *canis*, *Suppl.*

VIPER's *bugloſs*. See the article BUGLOSS, ſupra.

VIPER's *graſs*, the Engliſh name of a diſtinct genus of plants, called by botanical writers *ſcorzonera*. See the article SCORZONERA, *Suppl.*

VIS *viva*, in mechanics, a term uſed by Leibnitz and his diſciples for *force*, which they diſtinguiſh into two kinds, *vis mortua*, and *vis viva*; underſtanding by the former any kind of preſſure, and by the latter that force or power of acting, which reſides in a body in motion. See FORCE.

VISNAGA, in botany, a genus of plants, according to Ray, but comprehended by Linnæus nnder the article *daucus*. See the article DAUCUS, *Suppl.*

VISNAGA is alſo uſed by J. Bauhine as the name of a ſpecies of *foeniculum*. See the article FOENICULUM, *Append.*

VITRUM *Archimedeum*, *Archimedes's glaſs*, a name given by Swedenborg to an inſtrument which he invented for the examination of mixt metals, and by means of which he could diſcover the quantities, without the trouble of the apparatus, and calculation commonly uſed for this purpoſe.

VIXEN, or FIXEN, among ſportſmen, denotes a fox's cub. Ruſt. Dict. in voc.

UMBER (*Cycl.* and *Suppl.*)—This earth when burnt makes a good ſhade for gold. It need only be put into the naked fire in large lumps, which ſhould not be taken out till they be thoroughly red hot. Build. Dict. in voc.

UNACCENTED *part of a bar*. See ACCENT, *Cycl.*

UNILOCULAR, in botany, is applied to a capſule having but one cell. See CAPSULE, *Cycl.*

UNRECLAIMED *hawk*, in falconry, one that is wild and untamed. Ruſt. Dict. in voc.

UNSUMMED, a term uſed by falconers for a hawk's feathers before they have arrived at their full length. Ruſt. Dict. in voc.

VOLUBILIS, in botany, the name of a genus of plants, according to Dillenius; but comprehended by others under *convolvulus*, or bind-weed. See the article CONVOLVULUS, *Suppl.*

VOMIT (*Suppl.*)—*Black*-VOMIT, a diſtemper frequent in the Weſt-Indies, particularly at Carthagena. The following account of this diſtemper has been communicated to us by a friend.

The city of Carthagena is ſituate 10 degrees 25 minutes 48½ ſeconds of north latitude. The weather there is always ſultry hot. A thermometer conſtructed by Monſieur de Reaumur gave on the 19th of November, 1735, one of their winter months, the degree of the warmth of the air 1025

diviſions and a half; and this with little variation both night and day. The greateſt height to which the ſpirit aſcended at Paris the ſame year by a thermometer, graduated in the ſame manner, was 1025½ diviſions; ſo that the heat of the cool nights at Carthagena was nearly equal to that of the hotteſt days at Paris.

As the heats in this climate are ſo great without receiving any mitigation from the night, it is no wonder that the perſpiration of the inhabitants is very great. From this it comes about, that all thoſe who make their abode there any time appear pale and weakly, as though newly recovering from a fit of illneſs. You remark in all their actions, even ſo far as in their ſpeaking, a certain idleneſs, and, as our author expreſſes himſelf, a disjointedneſs: notwithſtanding this they are in good health, though their aſpect indicates the contrary. The people who arrive there from Europe, hold their appearance of ſtrength and colour in their countenances during three or four months; but after that time they loſe both one and the other from the quantity of ſweat, until they become like the former inhabitants. Theſe effects are moſt obſervable in younger people: on the contrary, thoſe who are further advanced in life when they go thither, preſerve their former appearance better, and enjoy ſo good a ſtate of health, that they live commonly to more than eighty years of age.

As the temperament of this country is particular, ſo are ſome of its diſtempers. Theſe may be conſidered of two kinds, *viz.* thoſe diſtempers to which the Europeans newly arrived there are liable, and they only; and thoſe which are common to all perſons there, as well Criollos as Chapetones.

The diſtempers of the firſt claſs are many, as the reſort of the Europeans there is very great. They are very dangerous, and often mortal. They frequently deſtroy a great part of the people, both ſailors and others, who arrive there from Europe. The continuance of theſe diſtempers is very ſhort: they laſt but three or four days, in which time the ſick either die, or are out of danger. The particular diſtemper, to which they are moſt liable, is very little known, though it takes its riſe in ſome from taking cold, in others from indigeſtion; but from whichſoever of theſe, or what other cauſe it takes its riſe, it becomes in the ſhort time before mentioned the *vomito prieto*, or *black vomit*, which is what kills them; it being very rare that thoſe who have it eſcape. It is obſerved in ſome that their delirium is ſo violent, that they are obliged to be tied down in their beds, that they may not tear themſelves to pieces, and they often die raving with the greateſt degree of agony.

It is to be remarked, that thoſe only are ſubject to this diſtemper who are lately arrived from Europe, the inhabitants of the country, as well as thoſe who have lived there any time, are by no means liable to it, and enjoy perfect health during its greateſt violence. As the crews of ſhips are very liable to this diſtemper, and more ſo than the officers and paſſengers, who have greater variety of food and liquor; it has been conceived that the great exerciſe and labour of theſe people, and their feeding upon ſalt proviſions, prepares their conſtitutions to be liable in this climate to corruption of the blood and humours, from whence is ſuppoſed to proceed the *vomito prieto*. What muſt be obſerved, is, that although the crews of ſhips ſuffer the greateſt mortality, nevertheleſs paſſengers and others, who go the voyage under the greateſt advantages with regard to the conveniences of life, are not free from being expoſed to it. It muſt be remarked alſo, that thoſe perſons, who after having been uſed to this climate, go from thence, and are abſent even three or four years, are not liable to it at their return, but retain their health like the other inhabitants, although in their way of living they have not obſerved the moſt exact regimen.

The deſire of knowing the cauſe of this terrible calamity has occupied from time to time the minds of the ſurgeons who make this voyage in the galleons, as well as thoſe of the phyſicians of the country; and their opinion has been, that it chiefly takes its riſe from the labour, to which the ſhips crews are conſtantly expoſed, and their manner of living. There is no doubt but theſe may greatly contribute thereto; but then it will be difficult to conceive why perſons, who are better circumſtanced, are likewiſe liable to it: and it is ſomewhat extraordinary, that notwithſtanding many endeavours have been made towards finding out remedies equal to this diſeaſe, none have been diſcovered either as ſpecifics or preſervatives; for the inconſtancy of the ſymptoms is ſo great, that they are not in the beginning to be diſtinguiſhed from thoſe, which are in common to this with ſlighter diſtempers; but the principal complaints at firſt are a wearineſs and great diſorder in the head.

This diſtemper does not always attack the ſhips of Europe at their arrival in the bay of Carthagena, nor is it very antient in that country; for what they heretofore called *chapetonada*, ſo denominated, as thoſe from Europe were only liable to it, were indigeſtions; and though they were in that climate always attended with danger, the women of the country, as they do now, cured them with eaſe, eſpecially when they were taken in time. The ſhips afterwards going from Carthagena to Porto Bello, it was there ſucceeded the great mortality, which was always attributed to the unſeaſonableneſs of the climate, and to the fatigue of the ſhip's crew in unloading their ſhips, and in the buſineſs of the fair there.

The *black vomit* was not known at Carthagena, nor in its neighbourhood, until the years 1729 and 30; when firſt it carried off a great part of the crews of the ſhips of war, which Don Domingo Juſtiniani then commanded, and were then there as guarda coſtas. Theſe ſhips were firſt attacked at Santa Martha, where the ſeverity of this diſtemper, and its great ſlaughter, had caſt a great terror upon their crews. The ſecond attack of this diſtemper was on board the galleons commanded by Don Manuel Lopez Pintado, when its mortality was highly formidable; and death followed the attack ſo quick, that perſons who were one day ſeen walking at large, were next day met carrying to their graves.

Our author is of opinion that this, as well as ſome other diſtempers, to which Europeans are liable to at, or ſoon after their arrival at Carthagena, and other places under the ſame circumſtances, ſhould be conſidered as ariſing from the great alteration that happens in their conſtitutions there: and this change, which from the climate is ſoon brought about, makes them ſuffer this and other diſtempers, which either deſtroy them, or generate in them a diſpoſition to bear the heats; after which, being as it were naturaliſed, they enjoy the ſame ſhare of health with the natives.

Our author remarks, that at Carthagena, when the ſhips from Spain fail in their arrival, the European productions, which at all times are dear and much valued there, are ſometimes quite expended. Theſe more particularly are wine, oil and raiſins. When this is the caſe with regard to wine, the people there ſuffer much in their health; as every body, except the negroes and thoſe who uſe brandy, accuſtom themſelves to drink it with their food. From the want of this their ſtomachs fail, they grow ſick, and this ſickneſs becomes general. This want of wine happened when our author arrived at Carthagena, and the ſickneſs in conſequence was ſo general in that city, that maſs was celebrated only in one of their churches.

URSUS, the *bear*, in zoology. See the article BEAR, *Suppl.*

URUBU, in ornithology, the name by which Marcgrave calls a ſpecies of *vultur*. See the article VULTUR, infra.

VULTUR, in ornithology, the name of a genus of birds of the falcon, or hawk-kind. See the article FALCO, *Suppl.*

The neck of the *vultur* is long, and almoſt bare of feathers; the legs are covered with feathers down to the feet, or nearly ſo; under the throat there is a ſpace covered with hair, inſtead of feathers; the head alſo, in many ſpecies, is naked, or has, at the utmoſt, only a downy matter on it.

Of this genus of birds we have the following ſpecies. 1. The greyiſh black *vultur*, with a ſhort tail. This is of the ſize of a full grown turkey. 2. The cheſnut-coloured *vultur*, called alſo the *Bæctic vultur*, with a ſhort tail. This is equal in ſize to a full grown hen. 3. The yellow-legged, creſted *vultur*, called *leporarius*, or the hare-catcher. This is of the bigneſs of a gooſe. 4. The golden-breaſted, blue-legged *vultur*, with a blackiſh back. Its ſize is equal to that of a turkey-cock. 5. The tawney brown *vultur*, with yellow legs. This is of the bigneſs of a large capon. 6. The Braſilian, white-legged *vultur*, called by ſome authors *urubu* and *aura*. In ſize it is equal to the common kite.

W.

WAAL, in the ſea language, the ſame with *wale*. See the article WALE, *Suppl.*

WAG-*tail*, in ornithology, the Engliſh name of the *motacilla* with a black breaſt. See the article MOTACILLA, *Suppl.*

WAIL, in the ſea language, the ſame with *wale*. See the article WALE, *Suppl.*

WALL-*wort*, a name ſometimes given to the *ſambucus*, or dwarf-elder. See the article SAMBUCUS, *Suppl.*

WARDS *of hoſpitals*. See HOSPITAL, *Append.*

WARREN (*Suppl.*)—WARREN is alſo uſed for a contrivance to preſerve fiſh in the midſt of a river, to be taken at pleaſure. Ruſt. Dict. in voc.

WART-*wort*, the name ſometimes given to two very different genuſes of plants, the *tithymalus* and *lampſana*. See the articles TITHYMALUS and LAMPSANA, *Suppl.*

WASHING (*Cycl.* and *Suppl.*)—The *waſhing* or cleanſing of ſome colours may be thus performed: take the colours to be *waſhed*, and put them into a veſſel of fair water; ſtir it about till the water be all coloured therewith, and if any filth ſwim on the top of the water, ſcum it clean off; and when you think the groſſeſt part of the colour is ſettled at the bottom, then pour off that water into another earthen veſſel, that is able to contain the firſt veſſel full of water four or five times; then pour more water into the firſt veſſel, and ſtir the remaining colour till the water be thick; and after it is a little ſettled, pour that water alſo into the ſecond veſſel. Let this be repeated till all the fineſt of the colour is drawn off, and nothing but courſe gritty ſtuff remains behind. Then letting the water in the ſecond veſſel ſtand to ſettle, till it is perfectly clear, pour it off, and reſerve the *waſhed* colour in the bottom of the veſſel for uſe.

The colours to be thus *waſhed* are red lead, blue and green bice, verditer, blue and green ſmalt, Spaniſh brown, yellow ochre, *&c.* Build. Dict. in voc.

WASP. The application of vinegar is ſaid to be good againſt the ſting of theſe creatures.

WATCH (*Cycl.*)—WATCH, *vigilia*, in Roman antiquities, a diviſion of their night; being the fourth part of the ſpace of time between ſun-ſet and ſun-riſing, and conſequently varying according to the ſeaſon of the year. See the articles DAY, HOUR, *&c. Cycl.*

Death-WATCH. See the article DEATH, ſupra.

WATER (*Cycl.*)—It has been proved by many inſtances, that *water* alone is capable of ſuſtaining human life a long time. Phyſical writers give us many accounts of people's living four or five days on it, but the Philoſophical Tranſactions furniſh us with a much more memorable inſtance.

Some people at work in a deep coal-pit near Liege, had the misfortune to pierce into a ſubterranean current of *water*, of ſuch force that it inſtantly filled a great part of the works. The perſon who ſtruck the blow into it was drowned, and ſome that were near the mouth of the pit eſcaped very narrowly by being drawn up; but twenty-four days after, when the mine was cleared of the *water*, and people came down to work in it again, four of the perſons, who had been ſuppoſed drowned, were found alive: they had ſaved themſelves by climbing into a place above the reach of the *water*; they had not the leaſt morſel of bread with them, but had lived all this time on the *water* of a little ſpring which broke out by them. This *water* was examined, and found to have no peculiar matter contained in it, but only the common ſparry ſubſtance found in all *water*, and that not in any abundance. Phil. Tranſ. N° 159.

We have alſo an account in the Philoſophical Tranſactions of a man who lived for eighteen years on no other aliment than *water*, and now and then, though ſeldom, clarified whey. The man was pretty healthy. See N° 466. ſect. 7.

The Italian phyſicians have talked much of cures performed by means of cold *water*, which they eſteem almoſt an univerſal remedy; giving in a day fifteen, twenty, or twenty-five pounds of *water*, made cold by ice, and applying at the ſame time cold *water*, or ſnow, to ſeveral parts of the body. By this method they treat fevers, ſmall-pox, dropſy, *&c.* See Commerc. Norimb. 1736. hebd. 8. ſect. 2.

Water, when applied to animal bodies, and when nearly of the ſame heat with theſe, relaxes their ſolids, and dilutes their fluids.

Water putrifying by ſtagnation is extremely dangerous to health. Thus in the holds of ſhips, the bilge *water*, if the ſhip is tight, and the *water* not pumped out often, ſoon becomes ſo extremely poiſonous, as frequently to ſuffocate thoſe ſeamen, who, as the pumps are ſubject to be clogged with filth, venture down to cleanſe them; and alſo to affect perſons at a diſtance with violent head-achs, cold ſweats, and frequent vomitings, which continue more or leſs, in proportion to the diſtance from the well of the ſhip when the injury was received, and the degree of putrefaction in the *water* and air. Phil. Tranſ. N° 463. p. 63.

To prevent the above mentioned inconveniences many ſchemes have been thought of, particularly the machines of Dr. Hales [a], and Dr. Deſaguliers [b]; the firſt by an inſtrument, which he calls the ventilator, and may not improperly be called the ſhip's lungs; ſee VENTILATOR; and the latter by a machine, which is an improvement of the Heſſian bellows.—[a In his Treat. of Ventilators. b Phil. Tranſ. N° 437.]

Putrified *water* being thus noxious, a method of preventing its putrefaction would be very deſirable, and this ſeems now to be found in the uſe of lime. See LIME-*water*, *Append.*

Rough *waters*, that will not bear ſoap, may often be corrected by letting them ſtand a few days. See *Boyle*'s Works abr. Vol. I. p. 141.

It has been ſaid that Thames *water* has a peculiar property of recovering after putrefaction; but others have the ſame. See *Boyle*'s Works abr. Vol. I. p. 141.

Mr. Boyle tells us, he prepared a ſalt of the ſame nature with Glauber's ſal mirabile, which ſeemed to have a power of coagulating common *water*; for being diſſolved in a proper quantity of it, the whole mixture ſhot together into fine cryſtals, apparently of an uniform ſubſtance, and ſo brittle, as to be reducible into powder. See *Boyle*'s Works abr. Vol. I. p. 332.

Water may be uſed with good ſucceſs in taking the height of any acceſſible object, as it naturally becomes parallel to the horizon. The manner of performing this operation is exactly the ſame as with a mirror. Tr. Pract. Geom. p. 19. See the article MIRROR, *Cycl.*

Water by its fall may be made to afford wind enough to blow a fire. This is practiſed in the braſs works of Tivoli near Rome. See Phil. Tranſ. N° 2.

Chalybeate, or *Steel*-WATERS. The learned Mr. Monro of Edinburgh has an inquiry into *ſteel*, or *chalybeate waters*, where he conſiders them with regard to their medical uſe, in order to diſcover what their real or comparative ſtrength is, how they bear carriage, and how long they retain their virtues; that phyſicians may judge which of them is moſt proper in the various diſeaſes and circumſtances of patients, which muſt be drank at the fountain-head, and which might be conveniently drank at a diſtance from it. See Medical Eſſays, Vol. III. art. 7. Abr. Vol. I. p. 126.

Chalybeate waters ſtrike a red, purple, violet, or black colour with galls; and it is ſaid by ſeveral writers, that this change of colour is a certain mark of a *chalybeate water*, and that the deepeſt colour ſhews the greateſt proportion of ſteel. Mr. Monro, to ſatisfy himſelf of the truth of this, made a weak ſolution of ſal martis in *water*, and found that, with a tincture of galls, he could form all the different colours, the larger quantity of the ſolution always requiring the greater number of drops of the tincture to bring it to all the colour it would take; and that it was deeper, in proportion to the quantity and ſtrength of the ſolution and tincture employed. If words could expreſs the various ſhades of colours betwixt the pale red and the black, the ſimple experiment of bringing *ſteel-waters* to the deepeſt colour they could ſtrike with galls, might determine the proportions of ſteel in each. But as this is impracticable, and as it is neceſſary to know the quantity of ſteel contained in any given quantity of *water*, ſome general ſtandard muſt be appointed, to which all may be brought. To obtain this, he made ſeveral experiments to find out the quantity of ſteel in its artificial ſalt, and found it to be a little more than a third part. He diſſolved ſome of the ſalt in *water*. Twenty ounces of the ſolution contained an ounce, except a ſcruple, which was precipitated; one hundred and forty-two drops of this ſolution weighed two drachms; every drop therefore contained one twenty-fifth of a grain of ſalt, or one ſeventy-fifth of a grain of ſteel. To compare a *chalybeate water* with this ſolution, into a known quantity of ſuch *water* drop a ſtrong clear tincture of galls, allowing a ſufficient time between each drop for its full effect, till the addition of more tincture makes no change. This experiment ſhould be repeated, to come at the exact number of drops requiſite. Then mix the ſame number of drops of tincture with as much common

water, as there was mineral *water*, in a glaſs, exactly like that made uſe of in the preceding trial. Drop in the ſolution of ſteel cautiouſly, till the colour is the ſame with that of the mineral water. By this means, the due proportion of the ſolution to imitate any *ſteel-water* may be known. He has thus made ſpring *water* ſo like to ſeveral *chalybeate waters*, that none could diſtinguiſh them. Med. Eſſ. Edin. Vol. I. p. 126.

Galls in tincture are more convenient than in ſubſtance for making theſe experiments, for it acts much ſooner, and more equally, and can be added in leſs quantities, which deſerves to be regarded; for too large a proportion of galls poured at once into *ſteel-waters*, will be ſo far from ſtriking the colour ſtronger or ſooner, that no change will happen for ſeveral hours after, and at laſt the *water* gradually becomes of a deep ſea-green colour, inſtead of a purple or violet. Good *chalybeate waters* may have been condemned as containing no iron, or as being impregnated with copper, from an addition of too much galls. Freſh tincture of galls is preferable to that which has been long kept; but even ſuch as was grown mouldy, and had a thick ſediment, anſwered the common trials. Frequent trials ſhould be made, at different times, with *water* bottled at different ſeaſons, in order to aſcertain the proper ſeaſons for bottling mineral *waters*, and to find out the time each will keep. It is alſo requiſite to obſerve what time it is before the galls ſtrike the full colour, and how long it remains in an open glaſs; for Mr. Geoffroy's ſuppoſition appears reaſonable, that both theſe effects will be moſt ſlowly produced, when the ſteel is moſt intimately blended with the other principles of the *water*. Med. Eſſ. Edinb. Vol. I. p. 127.

There is a ſtrong reſemblance between our *ſteel-waters* and common *water*, in which ſal martis is diſſolved, but the natural ſpaw expoſed to the air ſoon loſes its chalybeate taſte, and will not ſtrike a purple colour with galls; expoſed to heat its virtues are ſooner loſt, and it becomes vapid in no long time in the cloſeſt veſſels; but a ſolution of ſal martis bears heat, and being expoſed to the air, without alteration; it may be ſuſpected that this difference depends upon the ſmall proportion of the vitriolic principles, and ſome change they may thereby undergo in the *water*; and therefore Mr. Monro having added as much ſal martis to ſome bottles of *water*, as had been found to make it of the ſame taſte, and to ſtrike the ſame colour with *chalybeate waters*, he corked ſome carefully, others leſs carefully, and a third ſort he left open. The *water* in theſe laſt loſt its taſte and virtues in a fortnight, became muddy, and had a ſaffron-coloured powder at the bottom. The ſecond kind kept longer, but had a ſtinking ſmell before it became vapid. The *water* which was carefully corked and roſined kept well, but acquired a ſtrong ſmell of rotten eggs, like to what ſeveral ſpaws have when kept; when the bottle was left open, the ſtinking ſmell went off; ſoon after, the chalybeate virtues were not to be obſerved, and the bottom of the bottle was covered with the ſaffron-coloured powder, which is generally to be ſeen in bottles where *chalybeate waters* have been kept. The difference therefore between the natural and artificial *ſteel-waters* conſiſts in the greater volatility of the former. Med. Eſſ. Edinb. Vol. I. p. 128.

Spaw and Pyrmont, and ſome of our own *chalybeate waters*, ſeem an exception to the reſemblance between the diluted ſolution of ſalt of ſteel and the natural *ſteel-waters*; for the colours they ſtrike with the galls is faint, while their taſte and other effects are ſtrong. This produced another experiment to imitate them, by mixing filings of iron, oil of vitriol, and *water*, in a Florence flaſk, which being laid on its ſide, and another, in which was ſome fountain *water*, immediately fitted to it. The fumes which aroſe upon the effervescence of the oil of vitriol with the ſteel, came over into this. After the effervescence was over, on taking away the glaſs with the *water*, it was found limpid, but with a ſtrong empyreumatic ſmell; its taſte at firſt was pungent, and then the acidulous taſte prevailed. When tincture of galls was mixed with it, it became of a purple, but faint colour, which held many days without precipitation. Next morning the empyreuma was gone, and the *water* had an agreeable ſpaw taſte. In leſs than a day this went off, a ſmall quantity of ſaffron-coloured powder fell to the bottom, and the galls had no effect on the *water*. Med. Eſſ. Edinb. Vol. I. p. 129.

This *water* gives no ſign of acidity, as might be ſuſpected, when mixed with ſyrup of violets and clove-july-flowers, in the colour of which it makes no alteration; neither do the more ſpirituous ſpaws; whereas the ſolution of ſalt of ſteel, and ſome ſpaws, appear alkaline, from changing the colour of both the ſyrups green.

The ſucceſs of this experiment produced ſome others, to diſcover what it was that evaporated, and what precipitated in theſe *waters*. Oil of vitriol poured on the ſaffron-coloured reſiduum made no effervescence; upon the addition of a little *water*, ſome of the powder ſeemed to be diſſolved. Tincture of galls did not change the colour, but upon adding ſpirit of hartſhorn, a great effervescence aroſe, and a deep purple coagulum was made. The ſame experiments ſucceed with ruſt of iron, which reſembles this powder. Neither ruſt, nor the powder, when ſuſpended in *water*, ſtrike any colour with galls, although crocus martis does. What evaporates is the menſtruum, which carries away ſome of the principles of the iron with it. From ſeeing the effects of acid, and of the air upon iron, and finding vitriol naturally formed, it may reaſonably be ſuppoſed, that the menſtruum of the irony particles in theſe *waters* is an acid. From conſidering how much ſulphur is in iron, what a ſtinking ſmell mineral *waters* have before they turn vapid, and how much the ſulphur of iron is deſtroyed before the iron turns into ruſt, which again reſembles the powder precipitated in theſe *waters*, we may fairly ſuppoſe that the menſtruum carries the ſulphur along with it, and leaves only the earthy parts with a ſmall proportion of ſulphur. Med. Eſſ. Edinb. Vol. I. p. 130.

It may hence be ſuſpected, that *ſteel-waters* are impregnated with common groſs vitriol, or with the more ſubtile fumes of iron diſſolved in the natural menſtruum; or with both in different proportions. The quicker precipitation, and leſs volatility of *chalybeate waters*, ſeems to ſhew that the ſulphur is not ſo much freed from the earthy particles, as in others which precipitate more ſlowly, and are more volatile. The common obſervation of air generated in all effervescences, fermentations, putrefactions, and wherever a conſiderable change is produced in the compoſition of bodies, ſeems to account for the quantity of elaſtic air, obſerved in *chalybeate waters*, in the more ſpirituous when recent, and in others, when the putrid ſmell ſhews the ſulphur to be more diſengaged.

It ſeems alſo, that the different kinds of *ſteel-waters* ſhould be preſcribed, according as there is occaſion for a ſubtile, penetrating ſulphureous ſpirit, to pervade the ſmalleſt veſſels, or according to the quantity of an abſorbent aſtringent earth, which is required to be joined with this ſpirit.

Where different ſpaws are not to be had, the ſame *water* perhaps may be made to anſwer each of theſe intentions, according to its being more or leſs kept, or expoſed to the air or heat. Med. Eſſ. Abr. Vol. I. p. 131.

The ingenious author, from whom theſe obſervations and conjectures have been taken, ſeems to think that the menſtruum really flies off from mineral *waters*; but this, as is obſerved in a note added by his learned abridger [a], has not yet been made appear by any ſatisfactory experiments. It is certain, that ſome mineral *waters*, when carefully bottled at the well-head, and oiled at top, after the manner of Florence wine, and then well corked and cemented, have been found to continue many months poſſeſſed of their properties of ſtriking black or purple with galls; and hence it appears that the irony particles, or mineral ſpirit of the *water*, cannot eaſily eſcape through the pores of glaſs; at leaſt not while the *water* remains in a ſound ſtate. When the *water* begins to corrupt, as in time it will, though thus ſecured, it tinges leſs and leſs with galls, and at length affords no red, purple, or duſky colour therewith. Whence we are led to conclude, that the irony particles make their eſcape through the pores of the glaſs, or of the oil, the cork and cement; or elſe are ſo changed, as no longer to retain their irony nature, and ſtrike with galls. But that the latter ſeems rather to be the truth of the caſe, is ſupported by this, that during the diminution of the tinging faculty, there appears to be a manifeſt change in the natural texture of the *water*; for a viſible ſeparation of parts enſues, the whole grows fetid, a groſs matter falls to the bottom, the oil that was liquid before, now becomes almoſt as hard as tallow, and appears tinged black to a conſiderable height: but what is remarkable, the *water* now affords manifeſt ſigns of its containing actual brimſtone, not the leaſt indication whereof appeared before. It ſeems therefore that the *water*, as taken from the well, is a compound liquor, gradually tending to an alteration in its parts, as if there was a ſlow fermentation among them, whereby the natural texture of the whole is broke in time, even though the external air be kept from communicating therewith; but if external air be admitted, remarkable changes muſt ſooner begin, and finiſh their period [b].—[a] Ibid. p. 130. [b] *Shaw*'s Enq. into Scarb. *Wat.* p. 160, ſeq.]

There is commonly ſuppoſed to be ſomething ſo very volatile in many *ſteel-waters*, as well as of thoſe of Liege and Pyrmont, that it diſappears upon the leaſt acceſs of air, after they are taken up from the well, eſpecially in hot weather; yet it does not ſeem clear from experiments, that the alterations which ſpaw *waters* undergo, by being expoſed to the air, is owing to the diſſipation of any volatile part. Ibid. p. 109, and note *.

Though *chalybeate waters* are commonly ſuppoſed to contain vitriol, and to be of a ferruginous nature, and have from thence obtained their name, yet it is not eaſy to determine what ſalts they contain, or whether they be all impregnated with the ſame kind of ſalts. Mr. Du Clos could neither find alum nor vitriol in any of the French wells, only in one he found ſome reſemblance of the latter. All the other wells gave a ſalt, anſwering to a compoſition of nitre and ſea ſalt mixed in various proportions, which probably is the natural ſalt of the earth diſcovered by Tournefort [c], reſembling,

bling, in moſt trials, the nitrum of the Levant, which is neither acid nor alcali, but approaching moſt to the latter [d]. —[c Pref. to Hiſt. of Plants near Paris. [d] Medic. Eſſ. Abr. Vol. I. p. 108.]

Chalybeate waters often break the bottles into which they are put, and many of them ſoon loſe their chalybeate properties when bottled. To prevent the former inconvenience, Dr. Hales put a ſmall glaſs tube through the cork of the bottles, filling them ſo, as to leave no air bubbles between the cork and the *water*. In other bottles he put very ſoft compreſſible corks. By both theſe means the *water* was allowed to rarify, without burſting the bottles. By mixing very few drops of an acid, ſuch as oil of ſulphur, with the *ſteel-waters*, they long retain their chalybeat properties. See *Hales*, Philoſoph. Experiments.

Mineral-WATERS. The method of analyſing *mineral-waters*, according to Dr. Shaw, ſhould be this. Firſt, let it be tried what changes they will ſuffer by mere ſtanding; let ſome of the *water* be put into open glaſſes, and ſome into ſuch as are ſtopt, and after ſome hours keeping, examine by the taſte whether it be any way different from that freſh drawn from the ſpring; after this let it ſtand ſome days or weeks, and finally compare it with freſh *water* of the ſame ſpring, and obſerve whether it have any ſcum at top, or ſediment at bottom, or ſides of the glaſſes.

2. Let ſome of the *water* be kept in open cylindrical glaſſes in a warm place till it is wholly evaporated, the dry ſubſtance left behind muſt be carefully preſerved, to be compared with the reſiduum to be afterwards made by fire.

3. Put a quantity of the *water* at the ſpring-head into a glaſs retort, and a receiver being luted on, let the whole be carefully diſtilled over, and both the *water* and the dry reſiduum weighed, and carefully preſerved. If during this operation a vapour is ſeen to force its way out at the joints, it ſhews there is a ſpirit, or light ſubtile matter. In the *water* too fine to be ſeparated this way, the *water* ſeparated by diſtillation is to be tried ſeveral ways, to ſee whether it differs from common diſtilled *water* or not, and whether it have the ſame mineral particles that the *water* itſelf had before diſtillation. If it contains any ſea ſalt, it will turn white with a ſolution of ſilver; if any vitriol of iron, it will turn black with powdered galls; and if any ſulphur united with an alkaline ſalt, it will turn black in time with any of the metallic ſolutions. The dry matter left in the retort is to be boiled in ſix times its own weight of pure diſtilled *water*, this being afterwards filtered and ſet to cryſtallize, will give, after a proper evaporation, its own peculiar ſalt in cryſtals; and if more ſorts of ſalt than one ſhould be contained in the *water*, they will be all thus ſeparated by repeated evaporations and cryſtallizations.

Whether theſe ſalts be acids or alkalis, is eaſily found by the common experiments, the acid turning ſyrup of violets red, and the alkali turning a ſolution of corroſive ſublimate yellow. The neutral ſalts, waſhed out of the earth by *waters*, are chiefly ſea ſalt, and ſuch as conſiſt of a vitriolic ſalt, and a ſalt or earth of an alkaline nature. Sea ſalt is diſcovered by its taſte, by the white fume it yields on being mixed with oil of vitriol, and by its figure in cryſtallization: and the other neutral ſalts are diſcovered by their property of producing, or regenerating ſulphur, upon being mixed and melted with ſalt of tartar and powdered charcoal. Thus, if two ounces of ſuch ſalt be mixed with one ounce of ſalt of tartar, and an ounce of powdered charcoal, and the whole put into a crucible, there will be produced a reddiſh-coloured maſs of a ſulphureous alkaline taſte, and giving a high yellow colour to ſpirit of wine, which will turn ſilver black; and being precipitated by an acid affords a true lac ſulphuris, which may be ſublimed, and melted into brimſtone like the common.

What remains of the reſiduum, after *water* has ſeparated the ſalt, is properly earth: this is often of more kinds than one, and may be ſeparated by repeated waſhings into bole, ochre, ſand, and whatever elſe it conſiſts of; and theſe may afterwards be tried, as to their nature, by fire in the common ways, the firſt and readieſt of which is the ſeeing whether they will calcine or vitrify; and the next, with proper additions, to try whether they contain any metalline or mineral particles, which may be ſeparable by the ſeveral fluxes: and if the quantity of metalline matter be too ſmall to be collected into a regulus, or ſhew itſelf in the common way, it may be melted with chryſtalline glaſs, and from the colour it gives that glaſs, the metal it contains may be known.

It is generally ſuppoſed, that the *mineral-waters* receive their virtue from the ſalts they contain. Dr. Liſter is of opinion that theſe are principally two, the one common ſea ſalt, and the other the nitrum calcarium; and found, on experiment, that from thoſe very *waters*, which others had boldly affirmed contained nitre of the common kind, vitriol, alum, and the reſt, he only could ſeparate theſe two ſalts.

Theſe ſalts mixed with ochres make the various kinds of our *mineral-waters*, as they happen to be mixed in various proportions.

Monſieur Du Clos obſerves of the examining the virtues of *mineral-water*, that moſt of them are liable to great errors. The French Academy, after long deliberation, propoſed to themſelves a method of examining the *waters* of their own country, by which they arrived at a more thorough knowledge of their virtues than was had before, and which may ſerve as a leſſon to all other experimenters in the ſame way. They have found by all their enquiries, that the principal things giving virtues to *waters* are ſalts and earths, and theſe give very different qualities to them, as they differ in quantity or in quality in the ſeveral ſprings. The ſalts, which they procured by a ſlow evaporation or diſtillation, proved to be of two kinds: the one the nitre of the antients, a ſulphureous mineral ſalt, much reſembling the alkali of plants; the other the common culinary ſalt. This conſiſts of two parts, an alkaline baſis and an acid. Theſe two principles are ſometimes combined in the *waters*, and then it is abſolute ſalt that they contain, and eaſily ſeparated and known: but it ſometimes alſo happens, that theſe principles are ſeparated, and only the one or the other contained in a *water*; theſe therefore, when procured in the analyſis, are not eaſily known, and when they are, as it very often happens, blended with the diſunited principles of other ſalts, they form together a ſort of concretes, yet more hard to be known than the other. It is generally ſuppoſed, that in almoſt all medicinal *waters* there is either alum or vitriol; but this is an opinion taken up too much at random, and it appeared, on the examination of all the mineral ſprings of France, that no one of them contained either the one or the other of theſe ſalts, except that of Vahls in Dauphiné, which contained a ſalt ſomewhat reſembling white vitriol. The taſte and the mixture with acids, alkalis, and tinctures of vegetables, are the great means of knowing theſe ſalts; for as to their figures they vary greatly, even in the ſame portion of ſalt, according to the different degree of the evaporation of the *water* they were diſſolved in. *Du Clos*, Exam. des Eaux Min.

Earths are found in different quantities in the different *waters*, and ſo confuſed by being blended with one another, and with other foſſils, that it is much more difficult to aſcertain their ſpecies, than thoſe of earths in any other form, or than thoſe of the ſalts in the ſame *waters*. The colours of the earths are very various, but this is the leaſt variety; for ſome of them form themſelves into ſhapes and appearances ſo different from the others, that it is hard to ſay what they are like, or to what ſuch ſingularities in their concretions ſhould be attributed. Some float about in the almoſt evaporated *water* in form of films and clouds, ſome like flocks, ſome appear in the form of mucilages, others like little flaccid clods of clay, and others like grains of ſand; ſome are ſoluble in acids, ſome only in part ſoluble, and ſome not at all ſo; ſome will give a tincture to diſtilled vinegar, others not; and in the fire ſome run to glaſs, and others calcine to lime.

The great quantity of the *mineral-waters*, which phyſicians uſually preſcribe to be taken by thoſe they recommend them to, ſeems to prove that they expect the principal benefit from them by their cleanſing the viſcera by this internal ablution; and this effect is indeed no trifling one, ſince moſt of thoſe ſtubborn diſeaſes, which they recommend theſe *waters* in, are owing to obſtructions of the viſcera, which the large quantities of theſe *waters* may eaſily remove: but it were well, if the phyſicians would be more accurate in diſtinguiſhing the different properties of them, and not give them at random, as is too often done, to the no ſmall detriment of the patient.

The vinous ſharp taſte of ſome of theſe *waters* which evaporate with the leaſt heat, or on being expoſed to the air, ſeems to be owing to that matter which is the firſt ſtate or being of ſulphur, and of all the concretions thence reſulting; ſuch as the various vitriols, and the like. There are found earths impregnated with this acid volatile ſulphureous matter, of the concretions of which are ſometimes made ſulphureous and vitriolic minerals. This vaporous and indigeſted matter may very well be the baſis of vitriol; but in this its firſt ſtate it cannot be a vitriolic concretion, if it be found in earths where there is yet no vitriol. It is more eaſy to obſerve it in its products, when it has received ſome mineral concretion, than in its natural ſtate; though in this latter ſtate it is as likely to impregnate *waters* as in any other. The moſt probable opinion, as to the heat of theſe *waters*, is, that there are in certain deep receſſes of the earth hot vapours, which continue at all times ſo, becauſe there is no acceſs of the external air to cool them; and where thoſe rarified matters have not room to become more rarified, and ſo to become leſs hot, or more diſſipated; and that ſuch collections of hot vapours are what give heat to the warm baths, and hot *medicinal-waters*. *Du Clos*, Exam. de les Eaux Min.

Many *mineral-waters* evidently contain a large quantity of ſpar, which though ſuſpended in them in an abſolutely pellucid ſtate, may yet be regularly ſeparated from them by evaporation in its own figure. The *waters* of the fountain de Salut, and thoſe of the ſpring du Pied, and ſeveral other in Gaſcony, have been tried, and are found, if gradually evaporated to a certain degree, to yield a ſcum, which, when examined

examined by the microſcope, is found to conſiſt of oblique parallellopiped parts; and if they are evaporated wholly to dryneſs, there is found at the bottom a ſhining duſt, which, when examined in the ſame manner, is found to contain many particles of the ſame kind, all bright as fragments of the pureſt ſpars.

As to the uſe of *mineral-waters* the learned Heiſter [a] obſerves, that in general they are found to agree much better with perſons in the middle ſtages of life, than with the very old or very young. If any general rule can be given in this caſe, it is, that people ſhould not take them when younger than eighteen, or when older than ſixty. Young people, eſpecially ſuch as are under ten years old, ſhould by no means be allowed to drink the chalybeate *waters*, becauſe of the tender ſtate of their viſcera; and older people than thoſe of ſixty are never found to receive any benefit from them, unleſs they are of very robuſt conſtitutions, or have been long accuſtomed to the drinking them: in ſome caſes however, particularly in hectics, young people may be allowed to drink the milder kinds mixed with an equal quantity of milk, and often find great benefit from them.—[a Compend. Medic. Pract. cap. 20.]

In confirmed conſumptions and ulcers of the lungs, the ſtronger chalybeate *waters* are found to do no ſort of ſervice, but rather hurt; but in caſes where the ulcers are but beginning, the drinking the weaker ones with milk has been known to do great good. In ſpittings of blood ariſing from ulcerations of the lungs, the ſtronger cold chalybeate *waters* do nothing but harm; but in the ſame caſes, where the milder kinds are taken warm, and mixed with an equal quantity of milk, they are found to be very beneficial. They muſt never be taken in caſes of dyſenteries in confirmed dropſies, nor where there is a ſtone in the bladder or kidneys; but in œdematous ſwellings of the legs and feet, they are often found highly uſeful. In venereal caſes, whether recent, or of long ſtanding, they do not cure, but they diſpoſe the body the more readily to be cured: but in a ſimple gonorrhœa, where there is no venereal taint, they have been often known to cure, when all other methods have failed.

Method of taking them. All people who are of a plethoric habit ought to be blooded before they begin to take them, for by this means there is a freer acceſs given them into the veſſels, and they become much more able to correct the whole maſs. Perſons who are not of a plethoric habit have no occaſion to bleed before they take them, but all ought to take a gentle purge to clear the primæ viæ; and to this purpoſe nothing is more proper than the common purging ſalts of Epſom, or Glauber's: but all the draſtic purges are carefully to be avoided on this occaſion, ſuch as ſcammony, reſin of jalap, and the like. If there be indications for vomiting in the patient, ſuch as pains, and a ſenſation of weight at the ſtomach, with bitterneſs in the mouth, naufeas, and reachings to vomit, then it is extremely proper to give, a day or two before the beginning the courſes of the *waters*, a gentle doſe of ipecacoanha.

Time moſt proper. The beſt hour of drinking them is early in the morning; ſix or ſeven o'clock is very proper, becauſe they then have time to finiſh their operation before dinner, but earlier than this is not ſo proper; and thoſe who go to the wells or ſprings at three or four in a morning, are expoſed to all the injuries of a cold and damp air, which prevents perſpiration, and often brings on coughs and other diſorders of the breaſt and head. It was formerly a cuſtom to drink them in an afternoon, but this is at preſent left off, as found to produce many diſorders of the ſtomach; and ſuch as are deſirous of having the utmoſt effects of the *waters*, content themſelves at this time of the day with drinking them at home in ſmall quantities, and mixed with wine.

Seaſon moſt proper. The ſummer is the ſeaſon in which the *mineral-waters* are to be drank with the greateſt advantage. The months of June, July and Auguſt, are more proper for the taking them than any other time of the year; but upon urgent occaſions, the courſe of them may be begun in May, and continued till September; and in ſome extraordinary caſes, the uſe of them may be allowed even in winter.

Method of drinking them. It is always proper to begin the uſe of them by ſmall quantities, and gradually increaſe them to larger. Thus the firſt day it may be proper to drink about a pint and half at four draughts, the ſecond day a quart may be drank, and on the third or fourth three pints: after this the quantity may be increaſed to two quarts a day, and more than this it is not proper to take, unleſs the perſon be of a very robuſt habit; for many people have injured themſelves by taking too large quantities. The quantity that is taken as the moſt the ſtrength will bear, whether it be two, three or four pints, is to be continued every day for a fortnight or three weeks, or longer, if the nature of the diſeaſe requires it; and when the courſe is to be finiſhed, it muſt be done in the ſame manner in which it was begun, by taking leſs and leſs every day, till the uſe is gradually worn off, and no purge or other medicine is neceſſary afterwards.

The *mineral-waters* in general operate in ſome conſtitutions by ſtool, and in others by urine ſingly; but in moſt they operate both ways together. Theſe are both very proper ways of excretion, and whichever nature chooſes the *waters* ſhould paſs off by, it is to be judged proper and ſalutary, and by no means to be checked. If the diſcharge by urine be plentiful, and the bowels are moved but once a day, it is very well in many conſtitutions; but where, as in ſome conſtitutions, it happens that the *waters* actually act as aſtringents in the bowels, this is to be prevented, and a ſmall doſe of the common purging ſalts is to be taken in the firſt draught of the *waters* every morning.

In the taking them it is to be obſerved, that they are not to be poured down as it were all at once, for the ſtomach is often loaded and injured by this, but the firſt glaſs ſhould be ſuffered to paſs off, and then, after walking about for ten minutes or longer, a ſecond is to be taken, and ſo on; and no draught ſhould exceed half a pint in quantity; ſo that the taking the whole quantity in this manner ſhould be the buſineſs of an hour and half, or two hours. After this it is proper to uſe moderate exerciſe by walking, or otherwiſe, till dinner time; and in the mean time, if the *waters* would paſs off by urine or ſtool, this muſt be by no means repreſſed. People who have very weak and tender ſtomachs, or who have diſorders of the breaſt, and drink the *waters* in a rainy ſeaſon, ſhould have them gently warmed before they take them: this is beſt done by ſetting a glaſs of them in a veſſel of hot *water*, and they are only to be ſuffered to ſtand thus till moderately hot, and then immediately drank off; for if heated to too high a degree, they eaſily loſe their virtues by evaporation.

All perſons are to regulate the quantity of the *waters* they drink to the ſtrength of their own conſtitution; however ſmall a quantity they perceive to be enough, and to operate in the manner they expect, they are to be contented with that, and never to teize nature to make her bear more.

It is a certain rule, in regard to all *mineral-waters*, that they are much the beſt when drank at the place, though ſome of them bear carriage much better than others. It is a neceſſary caution, that the motion of the body be never violent in the time of taking the *waters*, for if it produce ſweat it always obſtructs, in ſome degree, their operation by urine or ſtool; and if flatulences are troubleſome at the time, it will be proper to take candied orange-peel, or ſome other carminative at the time. In order to have all the good effects of the *waters*, a regulation of diet is extremely neceſſary; it is proper to dine and ſup early, and the dinner ſhould not be too heavy. It is a good rule indeed, under ſuch a courſe as this, never to eat or drink ſo much as one can, but always to riſe with an appetite. The foods principally to be avoided, during ſuch a courſe, are ſuch as are dried in the ſmoak, or have been long kept in ſalt, and the fleſh of young animals is in general to be greatly preferred to that of old ones; and in general, a too great quantity of vegetables, eſpecially of the flatulent ones, is to be avoided. Lamb, chickens, veal, and the like, are moſt proper for the diet at this time; and to theſe are to be added the tender river fiſh, as trout and pike: broths alſo of all kinds are good; and peas, kidney-beans, ſpinach, and aſparagus, are all very proper. The bread that is eaten under the courſe ſhould never be ſtale; the moſt proper drink at the time is good wine, and if the perſon is not over thirſty, it is beſt to drink this pure, not mixed with *water:* but in this caſe it is only to be allowed within the bounds of moderation; half a pint, at the utmoſt, at a meal to thoſe who have not been habituated to it; and to thoſe who have, ſomewhat leſs than their cuſtomary quantity. The liquor next proper after wine, is ſound and well-bodied ale; but ſuch as is either new and fermenting, or ſo old as to be ſtale, is by no means to be uſed.

Violent exerciſe is wrong, but different conſtitutions will bear different degrees of it, and thoſe of cold and pituitous habits ſhould uſe conſiderably more than others. The ſeaſon of the year is alſo to be regarded, for the ſame degree of exerciſe that is good in a cooler, is too much in a hotter air. The greateſt caution, in the courſe of the taking theſe *waters*, is to avoid too much ſitting ſtill, either after the taking them, or after meals; for the *waters* remaining in the body, or the food remaining undigeſted, from theſe cauſes the conſequence is, that the patient is ſubject to flatulencies, colics, diarrhœas, and pains of the ſtomach. Sleeping immediately after meals is alſo improper, as it occaſions at this time diſorders of the head, and many other complaints.

There are ſome caſes, however, in which the *mineral-waters* may be drank with great advantages by perſons confined to their bed: thus gouty, paralytic, and other extremely emaciated, or weak perſons, have often found great benefit by this method. Slare even goes ſo far, as to adviſe this as the beſt method of taking them in all caſes; but the more judicious writers all judge him in an error in this, becauſe there are very many reaſons why motion and bodily exerciſe, after the drinking them, muſt be beneficial. It is proper to abſtain, as much as poſſible, from all ſorts of paſſi-

paſſions, during the courſe of taking theſe *waters*. Violent anger, grief, or terrors and frights, have been known to occaſion more miſchief at ſuch a time than they would otherwiſe have done; and all people are to abſtain as much as may be from venery during the time, leſt it too much debilitate the body, already weakened by the diſcharges occaſioned by the *waters* by ſtool and urine. Suppers ſhould be moderate during the courſe, and the wine drank at that meal ſhould be diluted with *water:* it is always very adviſeable in this caſe alſo to walk for ſome time after ſupper, that the ſleep may be more quiet, ſound, and refreſhing. And the cold air of the night, eſpecially if it be a damp ſeaſon, is cautiouſly to be avoided, leſt it occaſion catarrhs and other diſorders; for this reaſon, it is proper to ſup early all the while.

Symptoms attending the taking theſe waters. Theſe are of many kinds, and differ greatly from the ſame *waters* drank at the ſame ſeaſon, in perſons of different habits and conſtitutions. One of the moſt common, is a binding of the bowels; and from this there often ariſe pains in the bowels, colics and vomitings, with other the like diſorders. People of melancholy, hypocondriac, and hyſteric habits, are more ſubject than any others to this complaint from them: this is a ſymptom eaſily removed by any of the mild cathartics, and nothing in particular is more proper for that purpoſe than a decoction of ſena, tamarinds, and rhubarb, to be taken a few ſpoonfuls at a time, as occaſion ſhall require. A ſmall doſe of the cooling ſalts may alſo be taken, but all the hot and reſinous purges are apt to occaſion hypercatharſes. On the other hand, ſome are thrown into a diarrhœa by them, and this is often a ſalutary ſymptom; and while the patient's ſtrength is unhurt, and he is not found to ſuffer any great inconvenience from it, this is by no means to be checked, for very often the patient is greatly relieved by a copious diſcharge of the noxious humors this way, and by a continuance in the ſame courſe, becomes abſolutely cured by this means: but when the perſon is perceived to be greatly weakened by this ſymptom, and it is attended with nauſeas, vomitings, and pains in the bowels, it muſt be carefully checked or reſtrained. This is often done by drinking the ſame *waters* in a ſmaller quantity, and warm inſtead of cold; but if this do not prove ſufficient, ſmall draughts of cinnamon-*water* are to be allowed, and, if neceſſary, ſmall doſes of diaſcordium every night. In caſes where the *waters* take this turn violently, it is proper to abſtain from them for ſome days, and then to take to them again with great caution, and in ſmall quantities.

Some perſons, at their firſt entering on a courſe of the *mineral-waters*, are thrown into vomitings by them; and theſe are ſometimes ſalutary, ſometimes merely ſymptomatic. If it be ſalutary, the perſon is always the better for it, and the noxious humors are very happily attenuated and diſcharged this way by the *waters:* in this caſe, all the cautions neceſſary is not to drink too much of them at a time, and ſometimes, between whiles, to take a little of ſome bitter tincture. But if, on the contrary, the patient is greatly weakened by this vomiting, the method is to drink ſmaller quantities, and to eat and drink more ſparingly at meals. Sometimes this ſymptom ariſes from a redundance of bile, or of pituitous humors from the ſtomach and bowels, not having been emptied by a purge before the entering on the courſe: in this caſe a gentle purge is to be given, and after that the common ſtrengthening and bitter ſtomachics, and the *waters* are afterwards to be cautiouſly taken in ſmall quantities.

When the patient is attacked with violent colic pains, and the common method of eating candied orange-peel, and the carminative ſeeds, does not take effect, a gentle purge is to be given to evacuate the humors which occaſion them, and after this, tincture of cardamum ſeeds, or ſome other ſuch carminative, uſually takes effect. In caſes where the pains are more violent and obſtinate, a glyſter of camomile flowers boiled in milk, with a little ſugar, may be given at times, and the *waters* afterwards muſt be drank in ſmall quantities, and always warmed.

If an immoderate flux of the menſes or hæmorrhoids ſhould happen during the time of taking the *waters*, it will be proper to abſtain from the uſe of them on that occaſion for a few days; but if theſe evacuations are in a moderate degree, the *waters* may be continued, only taking them in ſmaller quantity, and not quite cold. Sometimes intermittent fevers come on while perſons are drinking the *waters*; but theſe are not to be regarded as any very bad caſe; for if the uſe of the *waters* be continued, and the carminatives and bitters of the common kind taken at times with them, they are uſually ſoon cured. Pains of the gout, rheumatiſm, ſciatica, and teeth, alſo ſometimes return upon people accuſtomed to them, while they are in a courſe of the *waters*; but theſe are not to be greatly regarded, for they uſually go off again very eaſily, only by continuing the uſe of the *waters*, and require no peculiar cure: only, during the time the pains laſt, ſome comforting cordial may be taken at times; and if they are violent, a few drops of laudanum may be taken every night going to reſt, or a few grains of the ſtorax pill. See *Heiſter*, loc. cit.

Bath and *Briſtol*-WATER. Dr. Guidot pretends that the *Bath* and *Briſtol-waters* are of the ſame virtues, but in a different degree; that both are impregnated with the ſame principles, but the *Bath-waters* containing a much greater ſhare of them, and therefore capable of doing that in a little time which thoſe of *Briſtol* could only do in a much longer. But this ſeems to be far from a true ſtate of the caſe.

The due ſecretions of the blood, and their proper diſtributions, are as neceſſary to the preſervation of life, as the circulation itſelf; and the greateſt part of diſeaſes take their origin from the glandular ſecretions being either too much increaſed or diminiſhed. The blood is ſometimes too thin, and then a too great quantity of its ſerous part is ſeparated either by the glands of the ſkin, guts, or kidneys, as in colliquative ſweats, fluxes of the belly, and diabetes. Some times the blood is too thick and viſcous, and by this means occaſions obſtructions, not only in its own canals, but in the glands; and then the ſecretions are as much leſs than they ſhould be, as in the former inſtance they were greater, and hence ariſe as long a train of diſeaſes. In ſome caſes there is alſo a too great fullneſs of blood, and in others a deficiency, both which hinder the proper ſecretions.

In theſe different caſes the *Bath* and *Briſtol-waters* have their ſeveral uſes: the *Bath-waters* are beneficial when the ſecretions are diminiſhed, the *Briſtol-waters* when they are too much increaſed: the *Bath-waters* powerfully attenuate, the *Briſtol* not leſs powerfully incraſſate: the *Bath-waters* are ſpirituous, and help in deficiences of the blood; the *Briſtol-waters* are cooling, and ſuppreſs plenitude with its ſeveral conſequences, ſuch as inflammations, hæmorrhages, *&c.*

The *Briſtol-waters* are ſuppoſed by many a modern diſcovery, and their uſe but of late date, but this is a very erroneous opinion. Dr. Venner, near eighty years ago, has written profeſſedly of them, and given them their true character, and proper commendations in all the diſeaſes in which they are at this time found effectual, the diabetes only excepted, in which their uſe has not been known ſo long. They were not indeed much frequented at that time, nor of ſome years afterwards; but that was merely from the want of the neceſſary accommodations at the place. Dr. Maplet, in the year 1639, writes largely of their virtues, particularly in diſorders of the urinary bladder and kidneys, and adds great praiſes of their external efficacy in curing cancerous ulcers; but with all this praiſe, they never came into an univerſal repute, till their character was eſtabliſhed by Dr. Mead and Dr. Lane.

The diſeaſes in which the *Briſtol-waters* are found moſt ſucceſsful, are internal hæmorrhages and inflammations, ſpitting of blood, dyſenteries, and immoderate fluxes of the menſes, and purulent ulcers of the viſcera. Hence they are given in conſumptions, ſcurvies, rheumatiſms, diabetes, ſlow fevers, atrophy, gleets, and even in ſcrophulous caſes, with very happy effects: and in all theſe caſes the *Bath-waters* are not only improper, but hurtful; for they rouſe and quicken the circulation, whereas theſe allay the heat, and reſtrain the too rapid motion of the blood. *Bath-waters* ſeem to be adapted to the diſorders of the ſtomach, guts, and nerves; *Briſtol* to thoſe of the lungs, kidneys, and bladder. *Bath-waters* are at variance with a milk courſe, and the *Briſtol-waters* can never be judiciouſly directed, but where milk may be joined with ſucceſs. This is ſo great a truth, that it holds good even in caſes of the diabetes, in which milk is of great ſervice, and has been preſcribed almoſt from the earlieſt times.

The *Briſtol* and *Bath-waters* are both preſcribed by different phyſicians in dropſies. No one can doubt, but that diuretic and drying medicines are of ſervice in this diſeaſe, and as the *Briſtol-waters* poſſeſs theſe virtues in a much greater degree than the *Bath*, they are certainly the moſt adviſeable, unleſs in caſes where a jaundice is joined with the dropſy; in which caſe the *Bath-waters* claim the preference, from their great efficacy in opening obſtructions of the viſcera, where there is no formidable inflammation.

The efficacy of the *Briſtol-water* in the diabetes, has procured it the name of a ſpecific in that diſeaſe; and it certainly much better deſerves that title than moſt of the medicines which have, at one time or other, been honoured with it, for it cures this terrible diſeaſe almoſt infallibly, and that in a very ſhort time, and without any ſenſible evacuation. The patient in this caſe may drink it in as large quantities as he pleaſes. The time for drinking the *Briſtol-waters* medicinally, is from April to September. The *Bath-waters* may be drank the whole year, but the colder months are much the beſt for them, or at leaſt the very heat of ſummer is leſs eligible than any other ſeaſon; and perhaps the beſt months for them are April, May, September, and October.

Buxton-WATERS, the *waters* of medicinal ſprings near Buxton in the Peak of Derbyſhire.

Theſe *waters* are the hotteſt of any in England, except thoſe of

of Bath. The *Buxton-waters* break out in ſeveral places thereabouts; what is called Buxton-bath takes in ſeveral warm ſprings. Thirty-two yards north eaſt of this is St. Anne's well, which is chiefly ſupplied from a ſpring on its north ſide. Twenty yards ſouth eaſt of St. Anne's, in another cloſe, is a place where a hot ſpring and a cold one riſe in the ſame receptacle. About ſixty-three yards ſouth eaſt of this is that called Bingham's well, called alſo Leigh's *water*, from the great benefit a neighbouring gentleman of that name received from it. A little way eaſt of this is another; and in the ſtreams of the level that carries the *water* from the bath, there riſes another very plentiful one; and about four yards farther eaſt there ariſe three or four other ſmall ones. From this account, it may eaſily be conceived that there can be no great difference between the *waters* of theſe ſeveral ſprings, though on trials they ſeem to yield different portions of ſalts and ſediments; at the utmoſt, their difference can be only in degree.

The diſtempers they are recommended in, are the rheumatiſm, gout, ſcurvy, wandering pains, cramps, convulſions, dry aſthmas, want of apetite, indigeſtions, contractions, ſtiffneſs and lameneſs of the limbs, ſuppreſſion of the menſes, and all ſtoppages and beginning obſtructions.

As to the difference of age and ſex in patients, there is little caution required in the drinking them, except that they ſhould be taken more ſparingly by young people, between the ages of twenty-three and thirty, if very full of blood and juices, and by women with child in their firſt and laſt months.

As to the method of uſing them, except the body be coſtive, and the firſt paſſages furred up with groſs humors, it is not only unneceſſary, but hurtful, to prepare the body for them, as it is called, by purging; or at leaſt by any ſtronger purges than manna, cream of tartar, and the like.

The heat of *Buxton-waters*, in froſty weather, is equal to that of common river *water* with which two fifths of boiling *water* has been immediately mixed. See *Short*'s Hiſt. of Min. *Wat.*

Sea-WATER. Authors, who write with accuracy of *ſea-water*, diſtinguiſh it as to its degrees of ſaltneſs and virtues, according to the nature of the ſeas where it is taken, and the depths from which it is drawn up. Count Marſigli always divides the *waters* of a deep ſea into three portions, the upper, the middle, and the deep: each of theſe, according to him, reach to one third of the depth of the bed of *water* from the ſuperficies to the bottom. The upper *water* he finds greatly to differ from the lower or deep *water* in its qualities and ſtrength, but the middle portion to be always more nearly allied to one of the others; he therefore never takes any notice of the middle portion, but makes all his obſervations of the differences of *ſea-water* from the upper and lower portions.

The *ſea-water* is brighter and clearer than that of any river or pond, but this is not ſeen, as the whole body of it is viewed together, becauſe then many various colours are reflected from its ſurface; but on taking up a large glaſs of it, and ſetting it in a ſtill place, it is ſeen to have none of all the whole ſeries of its colours when viewed at ſea, being intirely owing to its motion, and the different reflections its waves have in different angles and directions.

The *ſea-water* appears indeed coloured in its ſuperficial part in ſome places, particularly about the mouths of large rivers; but this is not of its own nature, but is merely owing to the foul *water* of theſe rivers mixing itſelf with it, they being frequently yellowiſh or bluiſh, ſometimes blackiſh, from the quantity of dirt they contain, or the various earthy particles which they waſh off from their banks and bottoms in their paſſage.

As theſe freſh *waters* principally mix themſelves with the ſuperficial part of the *ſea-water*, they extend themſelves a great way, and give a foulneſs to the upper part of a vaſt quantity of *ſea-water*, whoſe bottom part is all the while perfectly clear. Theſe foul *waters* of rivers extend themſelves alſo farther, or a leſs way into the ſea, according to the way the wind ſits; for if the wind blows directly into the mouth of the river, the ſurface is diſturbed in ſuch a direction, that the freſh *water* is beaten under, and blends itſelf below as well as above, and therefore tinges the ſurface for a much leſs extent: but if, on the contrary, the wind ſits directly from the river, all its *waters* are blown on, without ſinking ſo deep as they otherwiſe would, and the foulneſs is extended over a large ſurface, though it is not ſo conſiderable in degree.

The *water* of the ſea taken up at great depths, is generally clear and bright, as has been obſerved; but this is not always the caſe, for in ſome places a quantity of it taken up in very deep *water*, and that near the bottom, is found fouled in the ſame manner as the ſuperficial part is near the mouths of large rivers; and this, when ſtrictly inquired into, is found to proceed from the ſame cauſe, the mixing of a foul river *water* loaded with particles of earth, which it has waſhed off from the ſubſtances it paſſed through, and containing large quantities of blue, black, or yellow earth, all which it would ſuffer to ſubſide, if ſet by for a time in a ſtill place. Count Marſigli has proved, that as rivers burſt up in many places out of the ſurface of the dry ground, ſo they do alſo in ſeveral parts of the bottom of the ſea: in theſe places they pour in their whole body of freſh *water*, which is fouler than that of our common rivers, becauſe, in its ſubterranean paſſage, it has been ſurrounded on all parts with earth, and confined to a much fouler channel. The foul *waters* theſe mouths of rivers diſcharge from the bottom upwards into the *ſea-water*, cannot but act upon that clear liquor, in the ſame manner as the ſuperficial *waters* do on the ſurface, and both muſt be fouled alike. This author has particularly deſcribed one of theſe ſubterranean rivers opening into the ſea from his own obſervations. This foulneſs in ſhallow *water* is ſometimes ſeen through the clearer ſuperficial part by the naked eye, and often, beſide this, an obſerver thinks he ſees many other colours in mid-*water*; but theſe are, for the moſt part, not inherent in the *water*, but are formed by the reflections of the clouds, *&c.* The *ſea-water* being naturally clear, in deep places where it is not diſturbed it appears blue, but in ſhallower *water* it often has different colours, which are owing to the reflections of the coloured matter at the bottom, which will give a tinge to the *water* in places, where not ſo near the eye as to be diſtinctly ſeen themſelves. The clouds alſo give a ſort of coloured appearance to the ſurface of the *ſea-water*, in regard to our eye, though the *water* itſelf be really colourleſs as that of the pureſt ſpring. We have a familiar inſtance of this in the white look of the *ſea-water* in the ſouth ſeas at certain times: and, on the contrary, when any thing fouls the *ſea-water*, and gives it a duſky colour, the clouds above add greatly to that appearance. This we ſee in the Euxine, which being very deep would naturally appear blue if the *water* were clear, but as it is often fouled with duſky matter, and clouds are frequent over it, it appears for a great part of the year abſolutely black, and has thence obtained the name of the Black ſea.

Count Marſigli commemorates alſo another ſingular inſtance of this effect of the clouds on the colour of the *ſea-water*, which fell within his own obſervation. Being at the port of Caſſis on the ſeventeenth of December, in the year 1706, at about an hour before ſun-ſet, there aroſe a large cloud of a blood-red colour, of the nature of thoſe uſual in ſome evenings about ſun-ſet, but accidentally very large, and ſtrongly coloured: as this extended itſelf above, the *ſea-water* under it appeared of the ſame colour, and looked as red as blood for a great extent, ſtill ſpreading the ſame blood colour farther as the cloud extended. This remarkable phænomenon laſted till the darkneſs hid it; and the people of the place, who ſaw the ſea blood coloured, paid no attention to the cloud above that cauſed this colour, but looked on it as a miraculous preſage of war and bloodſhed.

As the clouds in many caſes thus evidently give colour to the *ſea-water*, in regard to our eye, ſo the ſun does the ſame thing in many others: but in all theſe caſes it is to be obſerved, that the colours are ſo far from being real, that the *water* is all the time clear, pellucid, and colourleſs; only its different reflections, from theſe different occaſions, preſent our eyes with colours, as the colourleſs glaſs priſm, or the cut ſide or edge of a common looking-glaſs does.

The ſun, as it ſhines with different force at different times, gives different tinges to the *water*, by ſhewing more or leſs plainly the ſubſtances which are at its bottom. This is evident from a familiar experiment of this author's, who fiſhing on the coaſts with a live bait, which was a ſmall red fiſh, and with a red line, obſerved, that when he let down his bait into the *water*, in places where the rocks kept off the ſun's rays, he could only ſee his fiſh at the depth of ſeven yards; but that even there the fiſh and the line both appeared white, having loſt to the eye their natural red colour: and that, on the contrary, when he let down the bait on the other ſide of the rock where the ſun ſhone, he could ſee it perfectly plain at the depth of eleven yards; and at that greater depth, both the fiſh and the line appeared of their natural red colour. It is evident from this, in how great a degree the ſun's rays affect the *water* in the ſhewing its contents; and it is very evident alſo, that upon this principle alone the ſame ſea, with a coloured bottom, at ſome moderate depth, muſt appear coloured by that bottom in ſunſhiny weather, and not at all ſo in cloudy.

Beſide the clouds, the ſun, the foulneſs of rivers, and the different bottoms, it is certain that the winds alſo contribute greatly to give the colours we obſerve in *ſea-water*. A tempeſt in the winter ſeaſon, an hour or two before ſun-ſet, will ſhew all the colours that *ſea-water* is capable of giving, and that without any other accident whatever to aſſiſt in it. The waves in this caſe ſtriking violently againſt one another, beat off from each other a great number of globules of *water*, and theſe are thrown up to different heights and diſtances; then as the ſun, now low and near the horizon, darts its rays obliquely upon them, they form ſeveral little rainbows, which are of greater and leſs extent, and of more or leſs duration, according to the circumſtances of their aſcent. The freſh *water* of ſome large rivers is alſo found to have, in particular places, the ſame effect where the

the ſtones lie high, and the waves break upon them; the globules of *water* are in the ſame manner raiſed from their ſurface, and little rainbows of ſhort duration are formed. Near the ſhores the *ſea-water*, inſtead of appearing of all this variety of colours, generally looks white: this is owing to the violent motion of the waves, in which they beat one againſt another, as alſo againſt the rocks and ſands, and by the mere agitation of their parts put on this colour. The *water* at theſe times ſeems, in theſe places, really of a milky nature, but as ſoon as it ſettles again into a calm, the clearneſs of the *water* returns, and no ſettlement happens in the whole body of it; which ſhews that it was not made white by the addition of any other matter to it, but only by the diſturbing of its own particles.

Theſe are all the various colours and appearances that the *ſea-water* puts on in different places, and on various occaſions; and we ſee, in the whole, that theſe differences are in general owing not to the alteration in its nature, but only in its change of parts in their directions to the eye, and in their breaking one againſt another, or receiving more or leſs light, or that from a clear or from a cloudy ſky. *Marſigli*, Hiſt. Phyſ. de la Mer.

Count Marſigli has gone through a long courſe of experiments upon *ſea-water*, and after a thouſand tedious proceſſes has obſerved, that three liquors alone are of power to ſhew the different nature of the *ſea-water* in various places, and that very readily: theſe only need, therefore, be carried abroad by thoſe who intend to make experiments of this kind. Theſe are an infuſion of mallow-flowers in *water*, made ſo ſtrong, as to be of a violet colour, ſpirit of ſal armoniac, and oil of tartar. The two laſt of theſe will always keep as long as there is occaſion; the other may be preſerved from decay by ſugar diſſolved in it in different quantities, according to the time it is to be kept, and the climate it is to be carried to; for this ingredient, if added in ſo large a quantity as twice the weight of the liquor, ſo as to make it a true ſyrup, does not prevent it from performing its office in theſe experiments; and in this ſtate it will keep every where, and ever ſo long. When intended for leſs ſevere trials, it may have a ſmaller proportion of the ſugar, and its effects will be then more ſudden and more manifeſt. This infuſion of mallow-flowers mixed with *ſea-water*, turns it to a greeniſh yellow colour, like that of the chryſolite. The ſpirit of ſal armoniac mixed with *ſea-water*, renders it turbid and muddy, and after a time a white ſediment is formed, and ſubſides by ſmall pieces at a time to the bottom of the glaſs. Oil of tartar occaſions the ſame change, but it does it with much more violence.

By mixing theſe liquors with *ſea-water*, taken up in different places, and at various depths, we ſee the different quantity of ſalt it contains manifeſted, by the more or leſs ſudden productions of theſe changes, and by the deepneſs or paleneſs of the colour, and the quantity of matter precipitated.

The common attempts of ſweetning *ſea-water* are alſo eaſily proved by this means, for the more ſalt it contains, after theſe pretended ſweetnings, the more colour or precipitation it will occaſion in theſe mixtures; and the mixing them with it, if perfectly freed from its ſalt, will produce no change at all, as is evident by mixing them ſeverally with *ſea-water* carefully diſtilled; for as this proceſs intirely robs it of its ſalt, there is no ſort of alteration made in it by the mixing theſe liquids. Id. ibid.

The ſudden and ſurpriſing clearneſs of *ſea-water*, on certain occaſions, is a thing not yet accounted for: we have many inſtances given of the fact by the writers of voyages and travels, but one of the moſt remarkable is recorded in the Philoſophical Tranſactions, as having happened on the ſhores of Iceland. On the 13th of May, in the year 1642, all the ſea that beats upon the promontories of that coaſt, and which is uſually very thick and turbid, was for two days together ſo perfectly pellucid and ſhining, that the ſmalleſt ſtones and plants, and the ſea ſhells, where the *water* was forty fathom deep, were ſeen in ſo diſtinct a manner, that they appeared not more than four feet from the ſurface. The fiſhermen who were out in their boats, were ſo terrified at the unuſual appearance, that they left their buſineſs, and the whole country looked on it as a prodigy. Philoſ. Tranſ. N° 110.

In the making of common ſalt from *ſea-water*, it appears that there are other ſubſtances beſide ſalt contained in it, as there is a ſtony cruſt formed on the ſides of the pans, and a powder precipitated to the bottom at the corners; beſide theſe, there are ſome ſubſtances ſeparated from the *water* before it is let into the pan, during its ſubſidence in the ciſtern, and there alſo remain ſome afterwards mixed in the bittern, after all the ſalt is extracted from it. Vid. *Brownrig* of Salt, p. 74.

The *ſea-water* in its motion gathers up mud, ſand, and many other impurities, which ſoon ſubſide in the ciſtern; others, ſomewhat more intimately mixed, are ſeparated with the ſcum raiſed by the whites of eggs in clarifying the brine. But beſide theſe groſs ſubſtances, *ſea-water* contains a glutinous matter of a much finer texture, which is more intimately mixed in it: this Count Marſigli ſays is ſo light, as to riſe with the *water* when diſtilled in a ſand-heat, and therefore may eaſily be raiſed in vapour by the ſun, and falling may fecundate the fields, and promote the growth and nouriſhment of plants. This viſcous matter ſeems earthy, ſaline, and oleaginous; and this is the ſubſtance which, in ſtormy weather, forms a thick ſcum upon the ſurface of the waves; and to this viſcous part is chiefly owing the putrefaction of *ſea-water*, when ſuffered to ſtagnate: for it is evident that the whole ſea in any place will become fetid, when it has been calm for ſome time together, ſo that in ſhips becalmed people have often been threatened with ſickneſſes from the ſtench. Mr. Boyle records two inſtances of this, one in the African ſeas, the other near the Azores iſlands. In the putrefaction of *ſea-water* this ſlimy matter is attenuated, and its texture deſtroyed, and part of it flies off in fetid exhalations, while part ſubſides to the bottom. *Marſigli*, Hiſt. Phyſ. de la Mer. *Boyle* on the Saltneſs of the Sea.

Beſide this viſcous matter, *ſea-water* probably alſo holds an earthy ſubſtance, ſo very bright and ſubtile, that it is elevated in the foregoing proceſs along with the *watery* vapours, as well as the ſlimy matter. The walls of the houſes where ſalt is boiled are covered with this earth, and it ſeems of the nature of that earth contained in clear lime-*water*, which is known to ſubſide from it by proper methods, even after it has been raiſed in diſtillation.

Beſide this light earth, *ſea-water* contains another very coarſe one; this the ſalt-workers call *ſcratch*, and find it on the ſides and at the bottom of the corners of their pans. And it is very probable that this would be ſeparated from *ſea-water* by congelation, for if Briſtol-*water* be frozen, and thawed again, there is always an earth of this kind ſeparated from it; and the petrifying *water* at Knareſborough being frozen in the ſame manner, depoſits its ſtony or calcarious ſediment. Theſe earthy particles are not ſeparated from the *water* in the ſame ſtate in which they were ſuſpended in it, for when the *watery* particles are evaporated, then ſtony ones get together, and concrete in cluſters; and in this ſtate they can no more be diſſolved in *water*, unleſs they are again ſeparated into the ſame minute maſſes which they were in before. It is evident that this powder can riſe in vapour from the experiments of diſtillation, and accident has proved this yet clearer; for in the boiler of a fire-engine, if *water* be uſed which is highly impregnated with this ſtony matter, as is uſually the caſe with that which ariſes from among ſtrata of freeſtone, and the like, the cylinder into which the vapours riſe will be ſo filled with ſtony matter, that the piſton cannot riſe in it.

This powder is properly a ſparry matter, and is in general the ſame ſubſtance which forms incruſtations on the vegetables, *&c.* in ſprings. It has been found, and deſcribed by all authors who have analyſed *waters* of any kind. Dr. Collins, in his Diſcourſe on Salt and Fiſheries, calls it ſtone-powder; Dr. Liſter calls it *arena alba*, and *lapis albus* [a], white ſand and white ſtone; and Dr. Hoffman *pulvis candidus*, and in ſome other parts of his works *ſuccus maris ſalino-terreus calciformis* [b]. [a] *Liſter*, de Font. Med. Angl. [b] *Hoffman*, Oper. Tom. III.

Theſe particles are extremely ſmall and minute while ſuſtained in the *water*, as appears by their paſſing through paper with it in filtration, as has been proved by Dr. Plot in his experiments on it; and hence it is able to enter the veſſels of plants and animals, particularly the teſtaceous fiſhes, the ſhells of which it has great affinity to. It alſo forms the ſtalactitæ in caverns, and many other of the cruſtaceous foſſils. *Plot*, Hiſt. Staffordſhire, cap. 2. p. 109.

This earth is capable of being diſſolved in *water* in very conſiderable quantities, ſome of our ſalt ſprings affording a *water* which contains it in the proportion of one thirty-ſixth part of its own weight, which is nearly the ſame proportion in which common ſalt is found diſſolved in *ſea-water* in general. *Liſter*, de Font. Med. Angl. lib. 1. cap. 6.

The great ſolubility of this earth in *water*, ſhews that it very nearly approaches to the nature of ſalts; and it is even found to enter into the compoſition of perfect ſalts, for being long expoſed to the open air, it imbibes the aerial vitriolic acid, and with it is converted into a neutral ſalt, which Liſter ranks among his calcarious nitres. This ſalt nearly reſembles the bitter purging ſalt of the Epſom-*waters*. It is of a highly alkaline quality, and turns a mixture of ſyrup of violets and *water* green.

The next ingredient of *ſea-water*, that offers itſelf in an analyſis of it, is ſalt: this is the moſt obvious of all others, and is contained in it in very different quantities at different times, and in different places. The Baltic ſea is very weakly impregnated with ſalt; the Engliſh and German ſeas are much more ſtrongly ſo, and the Mediterranean much more ſo than any other; and finally, the *water* on the coaſt of Moſambique is ſuppoſed much ſalter even than this. Mem. Acad. Par. 1711.

Father Feuillee, in paſſing through the Straits of Gibraltar towards America, obſerved the *ſea-water* to diminiſh in gravity as he approached the line. Dr. Hales found the *water* of the ſea, taken up near the buoy of the Nore, to contain $\frac{1}{29.2}$ of its whole weight in ſalt, and that of the Mediterranean contained $\frac{1}{27.5}$; and Count Marſigli found the

the *water*, taken from the ſurface of the Gulf at Lyons, to contain only $\frac{1}{32}$ of ſalt, while that of the ſame place, taken at a greater depth, contained $\frac{1}{29}$. From this that author argues for the ſeas being ſalter at greater depths than near the ſurface, but this might be owing to the falling in of the freſh-*water* rivers near that place; for Mr. Boyle found the *ſea-water* of our own ſeas to be of the ſame ſaltneſs at all depths: and indeed there is great reaſon for ſuppoſing, that in many places, where there falls in little freſh *water*, and where the ſun daily raiſes a great deal of *water* in vapour, it may remain much more ſalt near the ſurface than at great depths, juſt contrary to the foregoing ſuppoſition. *Hales*, Exper. on diſtilled *Sea-water*.

From late experiments it appears, that *ſea-water* is heavieſt and ſalteſt at great depths, and that it is of a temperate heat there; that is, 53 degrees of Fahrenheit's thermometer. See Phil. Tranſ. Vol. 47. p. 213, 214.

It is to be obſerved, that all the authors who have made experiments of this kind have evaporated *ſea-water*, and given the weight of the dry remainder as the quantity of ſalt contained in it; but this is not the true ſtate of the caſe, for this dry reſiduum always contains a quantity of the calcarious earth, or ſcratch, and of the ſalts of the bittern: beſide this, a certain quantity, more or leſs, of aqueous moiſture will remain in the ſalt, and this will alter its weight, as it will be in a greater or leſs proportion, according to the degree of fire uſed; and Mr. Boyle found that his reſiduum of the *water* of the Nore, which, when in the form of what he called a dry ſalt, was $\frac{1}{10}$ part of the *water*, when it had been well dried in a crucible, was but $\frac{1}{37}$ of the *water* uſed. *Boyle* of the Saltneſs of the Sea.

Beſide common ſalt, the *ſea-water* contains other ſalts, which are found in the bittern, or bitter brine remaining after the ſea ſalt is extracted. Firſt it contains a bitter purging ſalt, known in the ſhops under the name of *Epſom-ſalt*. This was firſt extracted from the Epſom, Dullwich, and other purging *waters*, but is now made only from the bittern at Newcaſtle, and other places; and it is chiefly to this bitter ſalt that the *ſea-water* owes its bitter taſte, though that has been ſuppoſed to proceed from bituminous matter contained in it, and often found on its ſurface, or lodged upon the rocks by its motion. Philoſ. Tranſ. N° 377, 378.

Another ſalt is alſo found in bittern, which is called a muriatic calcarious ſalt, its acid principle being ſpirit of ſea ſalt, and its baſis an earth nearly allied to quickſilver. This ſalt remains in the bittern after the purging ſalt has been extracted from it, and though it is a neutral ſalt, it cannot be made to ſhoot in cryſtals, but may be procured in a dry form by fire; but it is very difficultly kept in this form, being, of all other ſalts, the moſt ready to imbibe the *watery* particles of the air, and run *per deliquium*. *Hoffman*, Obſ. Chym. de Lixiv. a Sale relict.

Beſide theſe ſalts, the bittern contains a conſiderable portion of a fixed mineral alkali. Theſe principles are all found in boiling the *ſea-water* into ſalt. But beſide theſe there muſt be many other ſubſtances, which eſcape our ſearch in this manner, ſuch as the ſeeds and excrements of innumerable plants and animals, and the tinctures which thoſe plants and animals impart to it in their decay. Theſe, together with divers ſaline and ſulphureous particles, will naturally fall under the obſervation of thoſe who ſhall attempt a perfect analyſis of *ſea-water* by the nicer methods of chemiſtry; a thing yet much wanted in the learned world. *Brownrig* of Salt, p. 92.

Many ways have been attempted to arrive at the art of making *ſea-water* freſh and potable; the advantages of ſuch a thing are evident enough, but the difficulties very great. Liſter propoſes the doing it by means of ſea plants; theſe vegetables, like other plants, continually exhaling a large quantity of *water* in form of vapour, and that being all freſh, he propoſes on this baſis a diſtillation, without fire, in this manner. The body of a large ſtill, or alembic, is to be filled three parts with *ſea-water*, ſeveral freſh and growing ſea plants are to be put into this in their growing poſture, and the head being then fitted on, and a receiver adapted to the noſe, there will be a continual aſcent of vapours from the plant, which will condenſe into *water* in the head, and this will be thence conveyed into the receiver ſweet, clear, and every way fit for drinking. The quantity thus procured, however, though conſiderable in regard to the manner of its being obtained, can be but ſmall in proportion to the wants of a ſhip's company.

Mr. Kanton therefore attempted a more general method of doing it in quantities; to this purpoſe a large quantity of *ſea-water* is to be taken up in a proper veſſel, and as much oil of tartar *per deliquium* is to be added to this, as will render it turbid, and cauſe a large precipitation. After this the *water* is to be diſtilled, the furnace of the ſtill being ſo contrived as to take up very little room, and conſume but a ſmall quantity of fuel; the ſea itſelf may ſerve for a worm-tub, the worm paſſing out of the ſhip, and in again at another place. When the *water* is thus diſtilled, it is to be mixed with an alkaline earth, and after ſtirring thoroughly about, the earth is to be ſuffered to ſubſide to the bottom, and the *water* poured off clear; it is then ſaid by the inventor of this ſcheme to be perfectly ſweet, and no way diſtinguiſhable from the very pureſt river *water*. Phil. Tranſ. N° 67.

Another method of ſeparating ſalt from *ſea-water* without fire is propoſed in the Philoſophical Tranſactions: take a veſſel of wax, hollow within and every where tight, plunge it into the ſea, or other ſalt *water*, and there will be made ſuch a ſeparation, that the veſſel ſhall be full of ſweet *water*, the ſalt ſtaying behind. But though this *water* have no ſaltiſh taſte, yet a ſalt will be found in the eſſay. Philoſ. Tranſ. N° 7. p. 128.

To obtain freſh wholeſome *water* from *ſea-water*, Dr. Hales's method is to keep the *ſea-water* cloſe ſhut up till it has putrefied, and has again become ſweet, then to diſtill, three fourths of the *ſea-water* will be free both of the bittern and acid. Mr. Hales enters into a particular detail of the circumſtances which may make the practice of this ſupply of freſh *water* eaſy. Philoſ. Experim.

Drinking *ſea-water* with ſome wine, is ſaid to prevent people from being ſick at ſea. Act. Phyſ. Medic. Acad. Nat. Curioſ. Vol. V. Obſ. 84.

Sea-water, drank to the quantity of a pint, is a moderate purgative to moſt people. It has been of late much in faſhion, and is ſaid to be very beneficial in many caſes, particularly in glandular diſorders.

Simple-WATERS. In the diſtillation of *ſimple-waters*, a good general rule is this: take as much of the dried herb, as when cut ſmall will fill two thirds of the ſtill to be uſed; pour upon this as much rain *water* as will make the plant float commodiouſly, leaving however a fourth of the ſtill empty; digeſt this a while in a gentle heat, and then give fire enough to work the ſtill, and draw off ſo long as the *water* appears thick or milky, and taſtes of the herb. *Shaw*'s Lect. p. 198.

It is a principal caution in this operation to remove the receiver before the more pellucid, acid, faint, and dead *water* comes over, as it will at length do, and by mixing with the reſt will ſpoil the whole, by giving it a vapid or faint taſte, and ſometimes a degree of acidity or vitriolic ſtypticity, or emetic quality; for part of the eſſential ſalt of the plant now riſing, corrodes the head of the ſtill, and carries over with it ſome particles of the metal: for which reaſon, ſuch *waters* ſhould be either diſtilled with a glaſs head, or a pewter one, or elſe the laſt running carefully watched, and not ſuffered to come over and mix with the firſt; for want of this caution, children, and perſons of tender habits, have been often vomited, purged, &c. contrary to the intention of the preſcriber, by a *ſimple-water*.

The *ſimple-waters* diſtilled by this method may often be too ſtrong to give alone, but then it is eaſy to let them down to a proper ſtrength with common *water*; which is beyond all compariſon better than to mix them with their own faints, or the liquor of their ſecond running.

There are yet however two methods of improving the common *ſimple-waters*, which might eaſily be put in practice: the firſt is the cohobating, and carefully digeſting the plant; the ſecond the fermenting it. With regard to the firſt, if the liquor remaining in the ſtill be expreſſed from the herb, and returned, along with all the *water* that came over, upon a freſh quantity of the ſame ſubject, and they be digeſted together in a gentle heat for two days, and then diſtilled as before, the *water* thus obtained will be much richer, and more efficacious than before; and if the ſame operation be repeated two or three times, thoſe who have not tried it cannot eaſily conceive how very rich a *ſimple-water* may by that means be made: and this is moſt neceſſary in diſtilling the *ſimple-waters* of roſes, elder-flowers, balm, and the like ſubjects, which afford but little oil, and otherwiſe make but weak *waters*.

The other method recommended, *viz.* by fermentation, is performed by adding to the plant and *water*, put together as for diſtillation, a tenth or twelfth part of ſugar or honey, or elſe a fortieth part of yeaſt; then ſetting the whole in a warm place to ferment for three or four days only, ſo that the herb may not fall to the bottom, nor the fermentation be above half finiſhed; then the whole being committed to the ſtill, a *water* may be procured at one operation, extremely rich, or impregnated with the whole virtue of the plant; and thus may *ſimple-waters* be made fit for long keeping without ſpoiling, the ſmall quantity of inflammable ſpirit generated in the fermentation ſerving excellently to preſerve them. *Shaw*'s Lectures, p. 199.

Diſtilled-WATERS. To procure the *diſtilled-waters* of vegetables, or other ſubjects, pure and free from all mixture of the other principles of the body it was extracted from, let the *water*, as diſtilled, be put into a funnel lined with paper to be filtred, and the funnel being kept continually filled up, that the lighter oil may not come in contact with the paper, the *water* will be tranſmitted through, in a great meaſure, without the oil; but there ſtill remains ſome proportion of oily, and commonly of ſaline matter alſo in it. If the ſaline matter be acid, the way to deſtroy it is by mixing chalk, or any alkaline ſalt with the *water*, which being afterwards diſtilled again, will then riſe pure. If the plant were alkaline, and an alkaline ſalt be ſuſpended in the *water*, let it

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be made a neutral one, by mixing ſome acid, and then the *water* filtred and diſtilled again. By theſe methods the *water* of vegetables is procured pure; and this is the way of proving, that the chemical principle *water* is lodged in, and may be ſeparated from all ſuch ſubſtances. *Shaw*'s Lectures, p. 150.

Cordial-WATERS. In the making of all compound ſpirituous liquors, or, as they are called by the apothecaries, *cordial-waters*, the great care is to uſe a pure and well-rectified ſpirit, as nearly inſipid as poſſible, that the flavour of it may not mix among the flavours of the other ingredients. It is the general cuſtom to uſe the proof-ſpirit, but it would be infinitely better to uſe the alcohol, or totally inflammable; partly, as the ſtrength of the *water* would be much better aſcertained that way, the proof ſtrength determined by the crown of bubbles being very vague and uncertain, and that of the alcohol or totally inflammable ſpirit perfectly fixed and certain; and becauſe this ſpirit is always more free from the oil of the ingredient it is made from, and on that account not only approaches more to that ſo much deſired thing, a pure and taſteleſs ſpirit, but being free from oil of its own is the more hungry, the more ready to imbibe that of the ingredients added to it, and has no overpowering taſte to give of its own.

If the method of uſing alcohol be not choſen, let a fine, clear, and pure melaſſes ſpirit of the proof ſtrength be uſed, without any farther addition of *water* in the ſtill, an additional quantity of *water* only taking up room to very bad purpoſe, and prolonging and prejudicing the operation; and when alcohol is employed, it ſhould only be mixed with an equal quantity of pure *water*, to reduce it to the proof ſtrength. When the choice of a ſpirit is thus ſettled, the next thing to be had regard to is the matter of digeſtion, for without this many ingredients will not part with their flavour and virtues at all, and many others but very imperfectly. Cinnamon in particular, if not macerated in the ſpirit a long while before diſtillation, will not part with its heavy oil, which will therefore be left in the ſtill, and thrown away, while the ſlightly impregnated ſpirit is ſaved.

When the ingredients have ſtood a due time in digeſtion, according to their ſeveral natures, the ſpirit is to be drawn from them in the manner that beſt tends to bring over their virtues, whereon the character and expectation of the *water* is founded; ſo if the ingredients naturally abound in a heavy viſcous oil, the operation ſhould be performed with a briſker fire, than when the oil is thin, light, and etherial. Thus ſtrong cinnamon-*water*, after a ſufficient digeſtion to looſen the oil, may be drawn over ſmarter, or with a briſker fire, than citron-*water*, the ſpirit of mint, or the like, in which the oil of the ingredient is thin, and will eaſier aſcend with the ſpirit.

The capital thing in this compound diſtilling reſts here, that a ſufficient quantity of the fine eſſential oil of the ingredients be received into, and mixed with the ſpirit, while the groſſer, leſs ſubtile, and leſs agreeable oil is thrown out. To effect this to any degree of perfection, requires that the operation be well conducted from the beginning, that the receiver be changed in due time, and that the ſpirit be prudently made up.

When no regard is had to theſe three particulars, as is uſually the caſe among the apothecaries, the conſequence is, that the *cordial-water* becomes a thick, turbid, and milky liquor, and taſtes more like what the diſtillers call faints, than like a *cordial-water*, and is fitted to give ſickneſs rather than to cure it. At leaſt, before it can be uſed, it muſt either ſtand a long time to fine itſelf, if ever it will fine, or have its groſs and terreſtrial parts precipitated by art. On the contrary, when theſe rules are prudently obſerved, the *water* proves, without farther trouble, clean taſted, clear, briſk, pleaſant, and refreſhing.

The diſtillers in general make their compound *waters* in a much neater manner than the apothecaries; and what has led them into the way of doing ſo, is their ſtrict obſervance of the bubble proof, a thing which the apothecaries ſeem either not to underſtand, or to pay very little regard to.

The diſtillers, in the making of their compound *waters*, find, that if they let the faints run in among the clear ſpirit, it kills the proof, as they call it, before the time; hence they are inſtructed to leave the faints out, and to make up the ſpirit with pure *water*, reſerving the faints to other uſes, to which they are better adapted, as containing a copious oil; or they let the ſtill work longer than the proceſs for making the *water* would require, and by this means obtain a larger quantity of oil than is commonly imagined: this they preſerve ſeparate, if the oil of only ſome one ingredient; and they ſell large quantities of the oils of juniper, aniſe and caraway, and the like, to the druggiſts, chemiſts, and apothecaries. But this is a very ſcandalous cheat on the buyer, for there is a very great difference between a pure and clear eſſential oil, that is perfect and intire, and ſuch a one as has, in this manner, been robbed of its lighter and finer parts by diſtillation with a ſpirituous menſtruum.

It is a general rule in this buſineſs to change the receiver as ſoon as the ſpirit runs proof, and make up the quantity with *water*: in this caſe, the whole is certain to be clean and fine; but there are ſome caſes, as in particular in the diſtilling of cinnamon-*water*, where a ſmall quantity of the faints ought to be ſuffered to come into the ſpirit: but this is to be obſerved by way of ſtint, that ſo much is never to be allowed of the faints as will make the *water* milky; for the *water* ſhould always be kept in the ſtate of full proof, as it mellows and ripens, as they expreſs it, much ſooner in this than in any other ſtate. But if the cuſtom could be univerſally introduced, it would be better that all the *waters*, kept by the apothecaries, ſhould be juſt in the ſtate in which they came over, that is, three fifths of the quantity of the proof ſpirit put into the ſtill: if this were generally brought about, it would be eaſy for the phyſicians to regulate the doſes in their preſcriptions accordingly; every draught and julep that they entered into would be the better for it. *Shaw*'s Eſſay on Diſtillery.

Dr. Shaw in another treatiſe, after obſerving that the apothecaries uſually ſucceed but ill in diſtilling *cordial-waters*, lays down the four following rules, by the obſervance of which the art of making theſe *waters* might be brought to great perfection.

The firſt is, to uſe a well-cleanſed ſpirit that is freed from its own eſſential oil, for as the deſign of compound diſtillation is to impregnate a ſpirit with the eſſential oil of the ingredients, it ought firſt to be deprived of its own.

The ſecond rule is, to ſuit the time of the digeſtion of the ingredients to their tenacity, or the ponderoſity of their oil: thus rhodium wood and cinnamon require to be longer digeſted, before they are diſtilled, than calamus aromaticus, or lemon-peel. Sometimes alſo cohobation, or the pouring of the ſpirit already diſtilled back upon the ingredients, proves neceſſary, as particularly in making the ſtrong cinnamon-*water*, where the eſſential oil is extremely ponderous, and difficultly riſes along with the ſpirit without this cohobation.

The third rule is, to ſuit the degree of fire, or ſtrength of the diſtillation, to the ponderoſity of the oil intended to be raiſed with the ſpirit: thus ſtrong cinnamon-*water* ſhould be diſtilled off briſker than the ſpirit of mint or balm.

The fourth rule is, that a due proportion of only the finer eſſential oil of the ingredients be thoroughly united, or incorporated with the ſpirit, ſo as to keep out the groſſer and leſs fragrant oil. This may chiefly be effected by leaving out the faints, and making up to ſtrong proof with fine ſoft *water* in their ſtead.

The addition of ſugar to *cordial waters* is a thing of little moment, and may therefore be omitted. If the four rules before laid down be duly obſerved, there is no occaſion for diſtilling in balneo mariæ, nor for fining down *waters* with alum, whites of eggs, iſinglaſs, or the like, for they will be preſently bright, ſweet, and pleaſant taſted, without any farther trouble. *Shaw*'s Lectures, p. 127.

Motion of WATER, in hydraulics. The theory of the motion of running *water* is one of the principal objects of hydraulics, and many eminent mathematicians have applied themſelves to this ſubject. But it were to be wiſhed that their theories were more conſiſtent with each other, and with experience. The curious may conſult Sir *Iſaac Newton*'s Principles, lib. 2. prop. 36. with the comment. *Dan. Bernoulli*'s Hydrodynamica. *Jo. Bernoulli*, Hydraulica, Oper. Tom. IV. p. 389, ſeq. Dr. *Jurin*, in the Philoſ. Tranſactions, N° 452, and in Dr. *Martyn*'s Abridg. Vol. VIII. p. 282, ſeq. 'sGraveſande, Phyſic. Elem. Mathemat. lib. 3. pars 2. *Polenus*, de Caſtellis, and others. Mr. Mac Laurin, in his Fluxions, art. 537, ſeq. has illuſtrated Sir Iſaac Newton's doctrine on this intricate ſubject, which ſtill, notwithſtanding the labours of all theſe eminent authors, remains in a great meaſure obſcure and uncertain. Even the ſimpleſt caſe of the motion of running *water*, which is when it iſſues from a hole in the bottom of a veſſel kept conſtantly full, has never yet been determined, ſo as to give univerſal ſatisfaction to the learned. We ſhall here mention ſome of the phænomena of this motion, as ſtated by Dr. Jurin from Polenus.

1. The depth of the *water* in the veſſel, and the time of flowing out being given, the meaſure of the effluent *water* is nearly in proportion to the hole.

2. The depth of the *water*, and the hole being given, the meaſure of the effluent *water* is in proportion to the time.

3. The time of flowing out, and the hole being given, the meaſure of the effluent *water* is nearly in a ſubduplicate proportion to the height of the *water*.

4. The meaſure of the effluent *water* is nearly in a ratio compounded of the proportion of the hole, the proportion of the time, and a ſubduplicate proportion of the depth of the *water*.

5. The meaſure of the *water* flowing out in a given time, is much leſs than that which is commonly aſſigned by mathematical theorems. For the velocity of effluent *water* is commonly ſuppoſed to be that which a heavy body would acquire in vacuo in falling from the whole height of the *water* above the hole; and this being ſuppoſed, if we call the area of the hole F, the height of the *water* above the hole A, the velocity which a heavy body acquires in falling

in vacuo from that height V, and the time of falling T; and if the *water* flows out with this conſtant velocity V, in the time T, then the length of the column of *water*, which flows out in that time will be 2 A, and the meaſure of it will be 2 AF. But if we calculate from Poleni's [a] accurate experiments, we ſhall find the quantity of *water* which flows out in that time to be no more than about $\frac{571}{1000}$ of this meaſure 2AF.—[[a] *Poleni.* de Caſtellis, art. 35, 38, 39, 42, 43.]

Poleni alſo found, that the quantity of *water* flowing out of a veſſel through a cylindrical tube far exceeded that, which flowed through a circular hole made in a thin lamina, the tube and hole being of equal diameter, and the height of the *water* above both being alſo equal; and he found it to be ſo when the tube was inſerted, not into the bottom, which others had obſerved before, but into the ſide of the veſſel.

6. Since the meaſure of the *water* running out in the time T, is $2AF \times \frac{571}{1000}$, the length of the column of *water* which runs out in that time, is $2A \times \frac{571}{1000}$. Therefore if each of the particles of *water*, which are in the hole in the ſame ſpace of time, paſſes with equal velocity, it is plain that the common velocity of them all is that with which the ſpace $2A \times \frac{571}{1000}$ would be gone over in the time T, or the velocity $V \times \frac{571}{1000}$. But this is the velocity with which *water* could ſpring in vacuo to near $\frac{1}{3}$ of the height of the *water* above the hole.

7. But when the motion of *water* is turned upwards, as in fountains, theſe are ſeen to riſe almoſt to the entire height of the *water* in the ciſtern. Therefore the *water*, or at leaſt ſome portion of the *water*, ſpouts from the hole with almoſt the whole velocity V, and certainly with a much greater velocity than $V \times \frac{571}{1000}$.

8. Hence it is evident, that the particles of *water*, which are in the hole in the ſame point of time, do not all burſt out with the ſame velocity, or have no common velocity; though ſome mathematicians have hitherto taken the contrary to be certain.

9. At a ſmall diſtance from the hole, the diameter of the vein of *water* is much leſs than that of the hole. For inſtance, if the diameter of the hole be 1, the diameter of the vein of *water* will be $\frac{21}{25}$, or 0.84, according to Sir Iſaac Newton's meaſure, who firſt obſerved this phænomenon; and according to Poleni's meaſure $\frac{20}{26}$, or $\frac{20\frac{1}{2}}{26}$, that is, taking the mean diameter 0.78, nearly.

As to the manner of accounting for theſe phænomena we have already obſerved that authors are not agreed; and it would be far beyond our deſign to ſtate their different theories, we muſt therefore refer to the originals above quoted.

Neither are authors agreed as to the force with which a vein of *water*, ſpouting from a round hole in the ſide of a veſſel, preſſes upon a plane directly oppoſed to the motion of the vein. Moſt authors agree that the preſſure of this vein, flowing uniformly, is equal to the weight of a cylinder of *water*, the baſis of which is the hole through which the *water* flows, and the height of which is equal to the height of the *water* in the veſſel above the hole. The experiments made by Mariotte and others ſeems to countenance this opinion. But Mr. Daniel Bernoulli rejects it, and eſtimates this preſſure [b] by the weight of a cylinder, the diameter of which is equal to the contracted vein, (according to Sir Iſaac Newton's obſervation above mentioned) and the height of which is equal to twice the height of the *water* above the hole, or, more accurately, to twice the altitude correſponding to the real velocity of the ſpouting *water:* and this preſſure is alſo equal to the force of repulſion [c], ariſing from the reaction of the ſpouting *water* upon the veſſel. For he ſays that he can demonſtrate, that this force of repulſion is equal to a preſſure exerted by a vein of ſpouting *water* upon a plane directly oppoſed to its motion, if the whole vein of *water* ſtrikes perpendicularly againſt the plane. From whence it would follow, that the preſſure or force of the vein will be greater in proportion, as its contraction is leſs; and this contraction vaniſhing, as it does when the *water* ſpouts thro' a ſhort tube, and the vein being at the ſame time ſuppoſed to have the whole velocity it can acquire by theory, the ſpouting *water* will then exert a preſſure double to what is commonly ſuppoſed. But the actual velocity of the *water* being always ſomething leſs than it ought to be by theory, and the vein of *water* being not uncommonly contracted to almoſt one half, experiments have led authors to think that the preſſure, exerted by ſpouting *water*, was equal to the weight of a cylinder of the ſame diameter with the vein, and of the height of the *water* above the hole. The ingenious author remarks, that he ſpeaks only of ſingle veins of *water*, the whole of which are received by the planes upon which they preſs: for as to the preſſures exerted by fluids ſurrounding the bodies they preſs upon, as the wind, or a river, the caſe is different, though confounded with the former by writers on this ſubject.—[[b] Hydrodynamica, ſect. 13. p. 289. [c] Ib. p. 279.]

Mr. Bernoulli endeavours to confirm his theory by a diſſertation in the eighth volume of the Acta Petropolitana [d]; where he obſerves, that the experiments formerly [e] made before the Academy of Sciences at Paris, to eſtabliſh the quantity of the preſſure exerted by a vein of ſpouting *water*, are very far from proving the truth of the rule they are brought to eſtabliſh. For inſtance, in one of thoſe experiments, the height of the *water* in the veſſel above the hole from whence the vein ſpouted was two feet Paris meaſure, the diameter of the circular hole which was cut in the horizontal bottom of the veſſel was four lines, and the force of the vein of *water* was obſerved to be one ounce and three quarters. But the weight of a cylinder of *water* of the diameter of the hole, and of the height of the *water* in the veſſel, is ſcarce equal to one ounce and three eighths. The difference therefore is at leaſt $\frac{3}{8}$ of an ounce, which is about $\frac{3}{11}$ of the whole weight of the beforementioned cylinder of *water*. So that it is ſurpriſing, that this difference ſhould have been aſcribed to the removal of the plane, receiving the impulſe, to ſome diſtance from the hole; for this cauſe, ſuppoſing the plane removed to the diſtance of two inches, could not produce an increaſe of $\frac{1}{16}$ of an ounce. It appears therefore, that the common opinion is rather overturned, than confirmed by experience.—[[d] P. 114. [e] *Du Hamel*, Hiſt. Acad. Paris, An. 1679. ſect. 3. cap. 5.]

Mr. Bernoulli, on the other hand, thinks his own theory ſufficiently eſtabliſhed by the experiments he relates; for the particulars of which, we refer to the Acta Petropolitana, Vol. cit. p. 122, ſeq.

This ingenious author thinks, that his theory of the quantity of the force of repulſion, exerted by a vein of ſpouting *water*, might be uſefully applied to move ſhips by pumping; and he thinks the motion produced by this repulſive force would fall little, if at all, ſhort of that produced by rowing. He has given his reaſons and computations at length in his Hydrodynamica, p. 293 to 302.

The ſcience of the preſſures exerted by *water*, or other fluids in motion, is what Mr. Bernoulli calls *hydraulico-ſtatica*. This ſcience differs from hydroſtatics, which conſiders only the preſſure of *water* and other fluids at reſt; but hydraulico-ſtatics conſiders the preſſure of *water* in motion. Thus the preſſure exerted by *water* moving through pipes, upon the ſides of thoſe pipes is an hydraulico-ſtatical conſideration, and has been erroneouſly determined by many, who have given no other rules in theſe caſes, but ſuch as are applicable only to the preſſure of fluids at reſt. See Hydrodynam. ſect. 12. p. 256, ſeq.

Raiſing of WATER, in hydraulics. The great uſe of raiſing *water* by engines for the various purpoſes of life are well known. Machines have in all ages been contrived with this view, a detail of the beſt of which, with the reaſons of their conſtructions, would be very curious and inſtructive. Monſieur Balidor has executed this in part in his Architecture Hydraulique, and it is to be hoped that he will ſoon finiſh that uſeful undertaking. Dr. Deſaguliers has alſo given us a deſcription of ſeveral engines to raiſe *water*, in his Courſe of Experimental Philoſophy, Vol. II. not to mention the compilers of treatiſes under the title of Theatres of Machines, *&c.*

Dr. Deſaguliers [f] has ſettled the maximum of engines for raiſing *water* thus: a man with the beſt *water*-engine cannot raiſe above one hogſhead of *water* in a minute, ten feet high, to hold it all day; but he can do almoſt twice as much for a minute or two. [[f] Experim. Philoſ. Vol. II. p. 498.]

Dr. Deſaguliers obſerves [g], that when we come to examine the beſt engines, and thoſe that are moſt cried up, if we look narrowly into them, and meaſure the *water* they deliver, and at what height they deliver it; or bring to calculation the beſt atteſted relations concerning them, we ſhall find that they do not exceed this maximum, though they may far outdo ſome very bad engine that they are compared with. —[[g] Ibid.]

The famous machine at Marli, though it has many ingenious contrivances, muſt yet be reckoned a bad one, if we conſider the vaſt loſs of force in it. This loſs, according to Mr. Daniel Bernoulli's [h] computation, is not leſs than $\frac{5}{6}$ of the abſolute force of the machine.—[[h] Hydrodynam. p. 182.]

Mr. Daniel Bernoulli [i] thinks that a man may, with the moſt perfect machine, raiſe one cubic foot of *water*, in one ſecond of time, to the height of one foot. But by an experiment he made at Geneva with a good pump, he found that a man could not raiſe above four fifths of that quantity. —[[i] Hydrodyn. p. 199.]

Yet the greateſt quantity, mentioned by Mr. Bernoulli, falls ſhort of Dr. Deſaguliers's maximum: for according to the Doctor's rule, one hogſhead being equivalent to eight cubic feet, and the raiſing one hogſhead of *water* to the height of 10 feet being equivalent to the raiſing 10 hogſheads of *water*, or 80 cubic feet, to the height of one foot, it follows, that a man may raiſe 80 cubic feet of *water*, in one minute, to the height of a foot. But by Mr. Bernoulli's rule, he can only raiſe 60 cubic feet of *water* to that height in the ſame time.

Engines for raiſing *water* are either ſuch as throw it up with a great velocity, as in jets; or ſuch as raiſe it from one place

to another by a gentle motion. For the general theory of theſe engines, ſee *Daniel Bernoulli*'s Hydrodynamica, ſect. 9.

WATERS, among farriers, the name given to a diſtemperature of horſes. The hinder legs of theſe creatures are very ſubject to a defluxion of certain white, ſharp and corrupt humours, or *waters*, as they call them, which happen very rarely to the fore legs.

This diſeaſe is diſcovered by ſearching the paſterns, where, if a moiſtneſs is felt beneath the hair, and is extremely ſtinking, there is danger of its growing to the utmoſt height of this diſeaſe, in which it will grow all round the paſtern and paſtern joint, and ſometimes almoſt up to the very ham. Theſe *waters* frequently cauſe the paſterns to ſwell, keeping the legs ſtiff, and making the horſe lean; finally, they often ſeparate the fleſh from the coronet near the heel. This diſeaſe is very obſtinate and ſtubborn when once rooted in the horſe. It may eaſily be ſtopt in the beginning, but when of any continuance, it is an error to attempt to ſtop it, for if dried up ever ſo often, it will always return again. It is in vain to attempt a cure of this diſeaſe in the winter, unleſs it be but juſt begun; but in the ſummer ſeaſon all attempts ſucceed better, and what the farriers call the white honey charge has ſurpriſing effects, often performing a cure alone.

Some farriers diſtinguiſh between the *waters* and what they call *watery ſores*, though others call them only degrees of the ſame diſtemper. Thoſe who diſtinguiſh them, deſcribe the *watery* ſore as a white, corroſive, and malignant matter, iſſuing out of the pores of a horſe's leg, uſually on the lower part only, but ſometimes all over it; and beginning from a ſtinking matter, deadening the ſkin of the paſtern and fetlock, and by degrees looſening the hoof from the coronet at the heel. The breaking out of this matter is always uſhered by a ſwelling of the lower part of the leg, and attended with pain; and the humour at length acquiring a ſharp and venomous quality, it is attended with warts, clefts, and nodes, which in proceſs of time over-run the whole part, and render the cure very difficult.

This diſeaſe generally appears firſt on the outſide of the paſtern, and by degrees riſes up to the middle of the leg, peeling off ſome part of the hair all the way. The method of cure ſhould be this: as ſoon as a horſe is ſeized with the diſtemper, he ſhould be blooded ſparingly, at the utmoſt not exceeding two pounds; after this he ſhould take large doſes of a decoction of guaiacum, or of box-wood, twice every day for eight days; after this he is to take three or four briſk purges, and then to have recourſe to the decoction again. In the interim, the hair muſt be all clean ſhaved off from the diſtempered part of the leg, and it muſt be rubbed with a wiſp of hay very often, and the *watery* ſores in it anointed with the following ointment. Take a pound of black ſoap, three ounces of ſpirit of wine, two ounces of common ſalt, and three ounces of burnt alum; there is to be as much meal or flower added to theſe, as will make the whole into a proper conſiſtence: this is to be laid on all the ſores without any covering or bandage, and the next morning it is to be waſhed off with a lee of aſhes freſh made. This anointing and waſhing is to be repeated every day, and between the effect of this, and of the internal remedies, the diſeaſe ſeldom fails of a cure, if it be not very obſtinate, or of very long ſtanding.

Bird-lime-WATER. See LIME-*twigs*, *Suppl.*

Citron-WATER. See the article CITRON-*water*, *Append.*

Diſtilled-WATERS. See the article DISTILLED, *Suppl.*

Diſtilled-WATERS of laurel-leaves poiſonous. See the article LAUROCERASUS.

Egra-WATER. See the article EGRANA *aqua*, *Suppl.*

Hay-WATER. See the article HAY, *Suppl.*

Montroſe-WATERS. See the article MONTROSE, *Suppl.*

Pepper-WATER. See the article PEPPER, *Suppl.*

Pyrmont-WATER. See the article PYRMONT, *Suppl.*

Quickſilver-WATER is made with four ounces of quickſilver to two quarts of ſpring *water* boiled to one quart.

This is reckoned an efficacious medicine in ſeveral caſes, as the worms and the itch in children, by Dr. Cheyne and others.

Rain-WATER. See the article RAIN, *Suppl.*

Sorrance-WATERS. See the article SORRANCE, *Suppl.*

Spa-WATER. See the article SPA-*water*, *Suppl.*

Tar-WATER. See the article TAR, *Suppl.*

Tiberiades-WATER. See the article TIBERIADES, *Suppl.*

Vitriolic-WATER. See the article VITRIOLIC, *Suppl.*

Ziment-WATER. See the article ZIMENT, *Suppl.*

WATER-*bellows*. See the article BELLOWS, *Suppl.*

WATER-*calaminth*, the name uſed by ſome for a ſpecies of *mint*. See the articles MINT and MENTHA, *Suppl.*

WATER-*creſs*, the name by which ſome call the *ſiſymbrium*, a diſtinct genus of plants. See the article SISYMBRIUM, *Suppl.*

WATER-*drop-wort*. See the article DROP-*wort*, ſupra.

WATER-*engine*, in mechanics. This term is ambiguous; for it may either ſignify an engine to raiſe *water*, or any engine that moves by the force of *water*.

WATER-*germander*. See the article GERMANDER, ſupra.

WATER-*hemp-agrimony*. See the article *Water*-HEMP, ſupra.

WATER-*lilly*. See the article LILLY, ſupra.

WATER-*parſnep*. See the article PARSNEP, ſupra.

WATER-*pepper*. See the article PEPPER, ſupra.

WAX (*Suppl.*)—*Thorough*-WAX, in botany, the name by which ſome call the *bupleurum*, or hare's ears. See the article HARE'S *ears*, *Suppl.*

WAY, (*Suppl.*) the ſame with *weigh*. See WEIGH, *Cycl.*

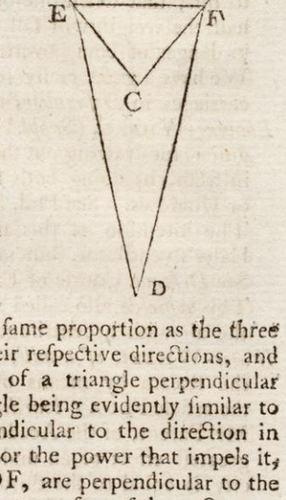
WAYFARING-*tree*, a name ſometimes given to the *viburnum*. See the article VIBURNUM, *Suppl.*

WEATHER (*Cycl.* and *Suppl.*)—WEATHER-*boarding*, among carpenters, *&c.* denotes the nailing up of boards againſt a wall, and ſometimes the boards themſelves when thus nailed up. Build. Dict. in voc.

WEATHER-*tiling*, among workmen, the covering the upright ſides of houſes with tiles. Id. ibid.

WEB-*caſe*, in natural hiſtory, the Engliſh name for what zoologiſts more uſually call *aurelia*, or *chryſalis*. See the article CHRYSALIS, *Append.*

WEDGE (*Cycl.*)—The effect of the *wedge* may be thus explained: Let ABC repreſent a *wedge* driven into the cleft EDF, of which DE and DF are the ſides; and if we ſuppoſe thoſe ſides DE and DF to react upon the *wedge* with directions perpendicular to DE and DF, let the horizontal line EF meet DF in F: then when the force impelling the *wedge*, ſuppoſed perpendicular to the horizon, is in equilibrio with the reſiſtances of the ſides of the cleft DE and DF, theſe three powers are in the ſame proportion as the three right lines EF, DE, and DF. But it follows from the compoſition of motion, that when three powers are in equilibrio with each other, they are in the ſame proportion as the three ſides of a triangle parallel to their reſpective directions, and conſequently, as the three ſides of a triangle perpendicular to their directions; ſuch a triangle being evidently ſimilar to the former. But EF is perpendicular to the direction in which the weight of the *wedge*, or the power that impels it, is ſuppoſed to act; and DE, DF, are perpendicular to the directions in which their reſiſtances are ſuppoſed to act, conſequently the power that impels the *wedge*, and thoſe reſiſtances, are in the ſame proportion as EF, DE, and DF.



If other ſuppoſitions are made, concerning the reſiſtances of the ſides of the cleft DE and DF, the proportions of the powers may be determined from the ſame principles. See *Mac Laurin*'s Account of Sir Iſaac Newton's Philoſophical Diſcoveries, p. 168, ſeq.

Mechanical writers have differed very much in determining the properties of the *wedge*, or the proportion between the moving force, and the reſiſtance the *wedge* meets with. In ſplitting of timber, the proportion here mentioned ſeems to take place, and that mentioned in the Cyclopædia wrong. In other caſes, different proportions might obtain; for a detail of which *Varignon*'s Nouvelle Mechanique, ſection 8. Vol. II. p. 149, ſeq. may be conſulted. See alſo 's*Graveſande*, Phyſ. Elem. Mathem. lib. 1. cap. 14. ſchol. 1.

WEED (*Suppl.*)—*Dyer*'s WEED, the Engliſh name of a genus of plants, known among botaniſts by that of *luteola*. See the article LUTEOLA, *Suppl.*

Silver-WEED, *pentaphylloides*, in botany, a diſtinct genus of plants. See the article PENTAPHYLLOIDES, *Suppl.*

WELL (*Suppl.*)—WELL, in ſhip-building, a ſquare place parted off and planked round the main-maſt, from the gun-deck down to the foot-waaling, to keep the ballaſt, *&c.* from the pumps placed therein. *Blanckley*'s Naval Expoſitor, in voc.

WHEAT, in botany, the Engliſh name of a diſtinct genus of plants, called by authors *triticum*. See the article TRITICUM, *Suppl.*

Cow-WHEAT, the Engliſh name of a diſtinct genus of plants, called *melampyrum* by botanical writers. See the article MELAMPYRUM, *Suppl.*

French-WHEAT, or *Buck*-WHEAT, in botany, a genus of plants, called by botaniſts *fagopyrum*. See the article FAGOPYRUM, *Suppl.*

Indian-WHEAT, a name ſometimes given to the *maiz* or *yucca*. See the articles MAIZ and YUCCA, *Suppl.*

WHEE, or WHEY, a word uſed in the northern parts of the kingdom for a heifer, or young cow. Ruſt. Dict. in voc.

WHEELS (*Cycl.*)—The *wheels* of all carriages ought to be exactly round, and the fellies ſhould be at right angles to the naves, according to the inclination of the ſpokes; that is, the plane of the curvature of the *wheel* ſhould cut the nave at right angles, though it need not paſs through the place where the ſpokes are inſerted into the nave.

The reaſon why the ſpokes ought to be inclined to the nave, ſo as the *wheels* may be diſhing, or concave, is this: in paſſing over unequal ground, that *wheel* which is in the rut bears

bears a greater part of the weight than the other, as being lower; now, in ſuch a caſe, the ſpokes of a diſhing *wheel* become perpendicular, and therefore have the greateſt ſtrength; whilſt the oppoſite *wheel*, being upon higher ground, bears a leſs part of the weight, and conſequently the ſpokes need not be at their full ſtrength. Indeed, if *wheels* always turned upon ſmooth and level ground, the ſpokes ought to be ſtrait upon the naves, or at right angles to their axes.

As to the axel-trees of *wheels*, they ought to be ſtrait in all reſpects, and at right angles to the ſhafts, or to the pole. It would alſo be much more advantageous to make the four *wheels* of a coach or waggon large, and nearly of a height, than to make the fore-*wheels* of only half the diameter of the hind-*wheels*, as is uſual in many places. Carriages too with four *wheels* have greatly the advantage of thoſe with two: for in applying horſes to a cart, or chaiſe with two *wheels*, it is plain that the tiller carries part of the weight, in what manner ſoever it be kept in equilibrio upon the axel-tree. In going down a hill, the weight bears upon the horſe; and in going up hill, the weight falls the other way and lifts the horſe, by which means part of his force is loſt. Beſides, as the *wheels* ſink into the holes in the road, ſometimes on one ſide, ſometimes on the other, the ſhafts ſtrike againſt the tiller's flanks, which is the deſtruction of many horſes. Add to this, that when one of the *wheels* ſinks into a hole or rut, half the weight will fall that way, whereby the cart will be in danger of being overturned.

We have a great many more obſervations concerning *wheel*-carriages in *Deſaguliers*'s Experim. Philoſoph. p. 201, ſeq.

Blowing-WHEEL, (*Suppl.*) a machine contrived by Dr. Deſaguliers for drawing out the foul air of any place, or for forcing in freſh, or doing both ſucceſſively without opening doors or windows. See Phil. Tranſ. N° 437.

The intention of this machine is the ſame as that of Dr. Hales's ventilator, but not ſo effectual, nor ſo convenient. See *Deſagul.* Courſe of Exper. Philoſ. Vol. II. p. 563—568. This *wheel* is alſo called a *centrifugal-wheel*, becauſe it drives the air with a centrifugal force.

Water-WHEEL *of a mill*, that which receives the impulſe of the ſtream by means of ladle-boards or float-boards. See the article FLOAT-*boards*, *Append.*

Mr. Parent, of the Academy of Sciences, has determined the greateſt effect of an under-ſhot *wheel* to be, when its velocity is equal to the third part of the velocity of the water that drives it. See MACHINE, *Append.*

In fixing an under-ſhot *wheel*, the workmen ought to conſider whether the water can run clear off, ſo as to occaſion no back-water to ſtop its motion. For a farther account of *water-wheels*, ſee *Deſaguliers*, Experim. Philoſ. Vol. II. p. 422, ſeq.

WHICKEN, a name ſometimes uſed for the *ſorbus*, or quick-beam. See the article SORBUS, *Suppl.*

WHIN, or GORSE, a name uſed in ſeveral parts of the kingdom for the *ulex* or *geniſta ſpartium* of botaniſts. See the article GENISTA *ſpartium*, *Suppl.*

WHIST, or WHISK, a well known game at cards. Several caſes of this game have been the objects of mathematical computations. Thus Mr. de Moivre has ſolved this problem: To find the odds that any two of the partners, that are pitched upon, have not the four honours? Mr. de Moivre concludes from his ſolution,

1°. That it is 27 to 2, nearly, that the dealers have not the four honours.

2°. That it is 23 to 1, nearly, that the eldeſt have not the four honours.

3°. That it is 8 to 1, nearly, that neither one ſide nor the other have the four honours.

4°. That it is 13 to 7, nearly, that the two dealers do not reckon honours.

5°. That it is 25 to 16, nearly, that either one ſide or the other do reckon honours, or that the honours are not equally divided.

The ſame learned author alſo determines, that the odds for the partners who are eight of the game, if dealers, againſt thoſe who are nine, is nearly as 17 to 11. But if thoſe who have eight of the game are eldeſt, the odds will be 34 to 29. And that without conſidering whether thoſe who are eight are dealers, or eldeſt, there is one time with another 7 to 5, nearly. But thoſe who have furniſhed the author with the data for the ſolution, not having ſtated them ſufficiently, the concluſion is deemed erroneous; but we know no body that has endeavoured to rectify it.

We ſhall here inſert another problem.

To find the chance of the dealer's having four trumps. One trump being certain, the problem is reduced to this, to find what probability there is that in taking at random 12 cards out of 51, whereof 12 are trumps, and 39 not trumps, 3 of the 12 ſhall be trumps.

By Mr. de Moivre's rules it will be found, that the total of the chances for the dealer = 92770723800; and that the total of the chances for taking any 12 cards out of 51 = 158753389900. The difference of theſe two numbers = 65982666100. The odds therefore will be 9277 *&c.* to 6598 *&c.*

Or we may compute the chance of three players having 10, 11, or 12 trumps among 39 cards. Then we ſhall find that the total of chances for taking 10, 11, or 12 trumps among 39 cards = 65982666100; and that all the chances out of 51 = 158753389900. The difference = 92770723800 = all the chances for the dealer, and the odds will be 9277 *&c.* to 6598 *&c.* as before.

The approximating ratios to the ratio of 9277 *&c.* to 6598 *&c.* by Mr. Cotes's method, (ſee RATIO, *Suppl.*) are,

Ratios greater than true 2:1, 3:2, 10:7, 17:12, 24:17, *&c.*
leſs than true 1:1, 4:3, 7:5, 52:37, 97:69, *&c.*

But it is to be obſerved that the ratio 24:17, though expreſſed in much greater terms than 7 to 5, is extremely little nearer the truth; and the ratio 17 to 12 is not ſo near as 7 to 5; which ſhews that in practice we ſhould only retain the primary approximations of Cotes's method, for the ſecondary may lead us into error.

The bets for the dealer in this caſe, among the members of a great club, were formerly laid equal. But the vaſt odds of above 40 *per cent.* may ſhew how cautious gentlemen ought to be in laying bets without previous computation. The odds in money in this caſe, is,

	l.	*s.*	*d.*	
more than	140	11	11 1/2	to 100 *l.*
leſs than	140	11	11 3/4	

WHORTLE, or WHORTLE-*berry*, the Engliſh name of a genus of plants, called by botaniſts *vaccinium*, or *vitis idæa*. See the article VITIS *idæa*, *Suppl.*

WIDGEON, in ornithology, the Engliſh name of a bird of the duck kind, with a brown head, a white front, and a tail black underneath. See the article DUCK, *Suppl.*

WIDOW-*wail*, a name by which ſome call the *cneorum* of botanical writers. See the article CNEORUM, *Suppl.*

WILLIAM, or *Sweet*-WILLIAM. See SWEET-*William*, ſupra.

Sweet-WILLIAM *of Barbadoes*. See SWEET, ſupra.

WILLOW (*Suppl.*)—*Dutch* or *Sweet*-WILLOW, the name by which the *myrica* of botaniſts is ſometimes called. See the article MYRICA, *Suppl.* and *Append.*

French-WILLOW, or *Podded* WILLOW-*herb*, names given to the *epilobium* or *chamænerium* of botanical writers. See the article CHAMÆNERIUM, *Suppl.*

WILLOW-*herb*, the Engliſh name of a genus of plants, called by botaniſts *ſalicaria*. See the article SALICARIA, *Suppl.*

WINCH, a popular term for a windlaſs. See the article WINDLASS, *Cycl.*

WINCH alſo denotes the crooked handle for turning round wheels, grind-ſtones, *&c.* *Blanckley*'s Naval Expoſitor.

WINCHING, in the manege, is ſaid of a horſe when he kicks, ſpurns, or throws out his hind feet. Ruſt. Dict. in voc.

WIND-*flower*, the Engliſh name of a genus of plants, called by writers on botany *anemone*. See the article ANEMONE, *Suppl.*

WIND-*ſeed*, the name by which ſome call the *arctotis* of botanical authors. See the article ARCTOTIS, *Suppl.*

WINDING *of ſilk*. We have an excellent machine for this purpoſe at Derby, contrived by Meſſieurs Thomas and John Lombe; but as the proprietors are not willing that a deſcription of it ſhould be made public, the following general account of it muſt ſuffice.

It conſiſts of no leſs than 26586 wheels, and 97746 movements. One water-wheel communicates motion to all the reſt of the wheels and movements, of which any one may be ſtopped ſeparately and independently of the reſt. One fire-engine conveys air to every part of the machine; and one regulator governs the whole work. 73728 yards of ſilk are *wound* every time the water-wheel goes round, which is three times every minute; ſo that 318,504,960 yards of ſilk may be *wound* every day and night, and conſequently 99,373,547,550 yards of ſilk in one year. See *Deſaguliers*, Experim. Philoſoph. Vol. I. p. 70.

WINTER-*cherry*. See the article CHERRY, ſupra.

WINTER-*creſs*. See the article CRESS, ſupra.

WINTER-*green*. See the article GREEN, ſupra.

WITCH-*hazel*. See the article HAZEL, ſupra.

WITHERING *of a cow*, is when, after calving, ſhe does not caſt her cleanſing, which if not timely remedied will kill her. Ruſt. Dict. in voc.

WITHY, a large ſpecies of willow, fit to be planted upon high banks and the ſides of ditches, within reach of the water, or on the weeping ſides of hills. Ruſt. Dict. in voc.

WOLF (*Suppl.*)—WOLF-*fiſh*, the Engliſh name of the *lupus marinus* of authors. See the article LUPUS *marinus*, *Suppl.*

WOOD (*Suppl.*)—*Almiggim*-WOOD. See the article ALMIGGIM, *Suppl.*

WOOD-*bine*, or WOOD-*bind*, the Engliſh name of a genus of plants, called by Tournefort *periclymenum*, but comprehended by Linnæus among the *loniceras*. See the articles PERICLYMENUM, *Suppl.* and LONICERA, *Append.*

WOOD-*men*, certain foreſt-officers appointed to take care of the king's *woods*. Ruſt. Dict. in voc.

WOOD-*roof*, or WOOD-*ruffe*, the Engliſh name of a genus of plants, called by botaniſts *aſperula*. See the article ASPERULA, *Suppl.*

WOOD-*ſage*. See the article SAGE, ſupra.
WOOD-*ſorrel*. See the article SORREL, ſupra.
WOODMEIL, a coarſe, hairy kind of ſtuff, made of Iceland-wool, with which the ſhip-carpenters, in ſome of his majeſty's yards, line the ports of ſhips of war. *Blanckley*'s Naval Expoſitor, in voc.
WOODY-*nightſhade*. See the article NIGHTSHADE, ſupra.
WOOLDING, in the ſea language, denotes the winding of ropes, at certain diſtances, about a maſt, in order to ſtrengthen it. *Blanckley*'s Naval Expoſitor, in voc.
WORM (*Suppl.*)—*Earth*-WORM. See the articles LUMBRICUS, *Append.* and WORMS, *Suppl.*
Golden-WORM, *vermis aureus*, a name ſometimes given to the *aphrodita*, a genus of ſea inſects. See the article APHRODITA, *Append.*
Guinea-WORM, or *Hair*-WORM, names uſed for the *chætia* of naturaliſts. See the article CHÆTIA, *Append.*
Sea-WORM. See the article LUMBRICUS, *Append.*
Tape-WORM. See the article TAPE-*worm*, *Suppl.*
WORMING *of a dog*, is the cutting out a nerve from under his tongue; by which means, it is ſaid, that if ever he runs mad, he will be rendered incapable of biting. Query the fact.
WOULD, a name uſed ſometimes by the farmers for the *luteola*, or dyer's weed. See the article LUTEOLA, *Suppl.*
WOUND-*wort*, the name of a genus of plants, called by botaniſts *vulneraria*. See the article VULNERARIA, *Suppl.*
WOUND-*wort* is alſo the name of the *ſolidago*, another genus of plants, called by Tournefort *virga aurea*, or golden rod. See the article VIRGA, *Suppl.*
WOUND-*wort of Achilles*, a name ſometimes given to the *millefolium*, or yarrow. See the article MILLEFOLIUM, *Suppl.*
WREN. See JENNY-*wren*, *Suppl.*
WYTHERS, the ſame with *withers*. See WITHERS, *Cycl.*

X.

XIPHOS, Ξιφος, among the Athenians, a capital puniſhment by beheading with the ſword. *Potter*, Archæol. Græc. Tom. I. p. 133. See the article PUNISHMENT, *Cycl.*

XYLOSTEUM, in botany, the name of a genus of plants, according to Rivinus, but comprehended under the *lonicera* by Linnæus. See the article LONICERA, *Append.*

Y.

YAMS, in botany, a name ſometimes uſed for the *rhizophora* of Linnæus. See the article RHIZOPHORA, *Append.*
YARD (*Suppl.*)—The *yards* of ſhips are uſually faſhioned into eight ſides in the middle, and from thence taper to the ends in ſixteen.
The top and top-gallant *yards* are generally made out of Gottenburg, or Norway maſts: all which are made of ſuitable dimenſions, both in diameter and length. *Blanckley*'s Naval Expoſitor, in voc.
YARN (*Suppl.*)—*Marking*-YARN, in ſhips of war. See the article MARKING, *Append.*
YARROW, the Engliſh name of a genus of plants, called by botaniſts *millefolium*. See the article MILLEFOLIUM, *Suppl.*
Water-YARROW, the Engliſh name of the *hottonia*, a diſtinct genus of plants. See the article HOTTONIA, *Suppl.*
YEANING, a term uſed for an ewe's lambing, or bringing forth a lamb. Ruſt. Dict. in voc.
YEARNING, the ſame with *earning*. See EARNING, *Append.*
YEOMAN *of the ſalt ſtores*. See ACATERY, *Cycl.*

ARTICLES omitted.

ELECTRICITY *(Cycl.)*—A body in which *electricity* may be excited by ſome action upon that body, as rubbing, patting, or warming it, and ſometimes only expoſing it to cold and dry air, after it has been covered, is called an *electric per ſe:* ſuch are glaſs, cryſtals, and pretious ſtones; reſins, gums, ſulphur, ſealing wax, and moſt dry parts of animals, as ſilk, hair, and the like.

Electrics per ſe are alſo called original *electrics*.

A *non-electric per ſe* or ſimply a *non-electric*, is a body in which *electricity* cannot be excited by any action upon the body itſelf; or at leaſt one in which that property, if at all, is very ſlightly perceptible. Of this kind are wood, animals, living or dead, vegetable ſubſtances, water and metals.

But *non-electrics* receive *electricity*, when brought near to *electrics per ſe*, in which *electricity* has been excited.

In order to know that *non-electrics* have received the communicated *electricity*, they muſt be inſulated; that is, they muſt not be ſuſpended from, or ſupported by any bodies, but what are *electrics per ſe:* for if one *non-electric* be touched by another, and this by a third, *&c.* all the *electricity* received by the firſt will go to the ſecond, and from this to the third *&c.* till at laſt it be loſt upon the ground. But if ſeveral *non-electrics* touching one another, are at laſt terminated by *electric* bodies, in that reſpect they make but one body, and receive and retain *electricity* for ſome time. However it muſt be obſerved, that bodies ſlightly *non-electric*, ſuch as dry wood, may ſerve for ſupporters to thoſe bodies which are very highly *non-electric*, as metals.

Electricity may be communicated to *non-electrics* by applying a glaſs tube or globe, excited by friction, to one end of thoſe bodies; and there are ſeveral ways of finding when the *non-electrics* have received the *electricity*. Thus, if an iron bar be ſuſpended horizontally by two ſilken ſtrings that are very dry, and the rubbed tube be applied, or brought near to one of the ends of the bar, and then ſome leaf-gold, or leaf-braſs, or any other light bodies, placed upon a ſmall ſtand, or a plate, be brought near the other end, they will be alternately attracted and repelled by the bar. Likewiſe, if the finger be brought near the end, or other part, of the bar, the *electrical* effluvia will give a very ſenſible and ſometimes painful ſtroke, with a ſnapping noiſe, and produce a flaſh of light. If the communicated *electricity* ſhould prove too faint to be tried this way, a ſmall flaxen thread, ſuſpended by a ſtick, may be brought near the body that has been *electrified*; and if the *electricity* has been communicated, even in a ſmall degree, the thread will be attracted without deſtroying the *electricity* received by the body till after ſome time. This thread Doctor Deſaguliers calls the *thread of trial.*

It is to be obſerved, that an *electric per ſe* does not receive this virtue from another *electric per ſe*, though excited, till it is become a *non-electric*; which happens when it is made wet or moiſt; and then it will be made *electric* only by communication. *Electric* bodies, in which it is difficult to excite *electricity*, may be looked upon as *non-electrics*, when their *electricity* is not excited; and then they will be in the ſame condition as *non-electrics per ſe*, and be liable to receive *electricity* by communication in the ſame manner.

From what has been ſaid, it appears that *non-electrics* are conductors of *electricity*. Water conducts it very well, but metals are the moſt convenient conductors.

Theſe things being premiſed, we ſhall here add ſome of the principal phænomena of *electricity*; that is, ſuch as ſeem to give ſome light towards a theory of this wonderful property of bodies.

1. When the *electricity* of a glaſs tube has been excited by rubbing, if you move your fingers long-wiſe from one end of the tube to the other, but without touching it, you will hear a continued ſnapping, like a diſtant noiſe of thorns burning; and if the room be darkened, you will ſee ſparks of light wherever the tube ſnaps; and likewiſe a light following the hand that rubs the tube.

2. A down feather being tied to the top of a wooden broach or ſkewer, of about ſix or ſeven inches in height, and fixed upright upon a foot, if you bring the excited tube near it, all the fibres of the feather ſtretch out towards the tube; but as ſoon as you remove the tube, the fibres of the feather turn back, and ſtick ſtrongly to the ſkewer. If you bring your finger near to the feather, while its fibres are tending towards the tube, the finger will repel them; but as ſoon as you remove the tube, they are attracted by the finger. If you cover the feather with a very dry glaſs recipient, ſuch as is uſed on the air-pump, the tube will attract the feather in the ſame manner through the glaſs: and this happens, even when the recipient has been exhauſted of its air by the pump. When the tube is rubbed near the recipient, whether it be full of air or empty, the fibres of the feather follow the motion of the hand along the tube, ariſing upon the broach or ſkewer.

3. Without making uſe of the tube, if you rub the recipient that covers the feather with both hands, the fibres of the feather will ſtretch themſelves out towards the glaſs, like the rays of a ſphere. If you rub but with one hand, the fibres will ſtretch themſelves towards that part of the glaſs which is rubbed; and when you blow againſt the glaſs, thoſe fibres will be repelled, notwithſtanding the interpoſition of the glaſs: which happens alſo, when you ſtrike the air with the hand towards the feather, without touching the recipient.

4. After the tube has been rubbed, if any aſſiſtant lets go a down feather in the air, at the diſtance of a foot or two from the tube, the feather will jump towards the tube with an accelerated motion, and adhere to it for ſome time; and then of a ſudden it will be repelled from the tube, and will fly about the air in ſuch manner, that the nearer you bring the tube to it, the more it will be repelled, till it has touched ſome other body; and then it will be drawn again by the tube; which after ſome time will drive it away again. Sometimes, when the finger is held at eight or ten inches from the tube, the feather will jump from the tube to the finger, and from the finger to the tube, thirty or forty times together.

5. If a ſtring of any kind be ſtretched horizontally, and from the ſtring you hang a thread of ſilk about three foot long, and very dry, and to the lower end of that thread you faſten a down feather; then, at the diſtance of about two or three feet, you hang up another feather, but by a flaxen thread; the rubbed tube being brought near will attract the firſt feather, which, when it has adhered to it a little while, will fly from the tube, and then be repelled by it every time the tube is brought near, till it has touched ſome other body, as in the preceding experiment, and then it will be attracted anew. But the feather, which is ſuſpended by the flaxen thread, will always be attracted at the approach of the tube, and never repelled. And if you wet the ſilken thread, the feather hanging at it will be repelled no more, but always attracted by the tube.

6. If you make uſe of a tube which is hermetically ſealed at one end, and has at the other end a braſs ferril with a ſcrew, by which means the air may be pumped out of it; if you rub the tube, after the air is exhauſted, it does not attract any more, as has already been taken notice of in the Cyclopædia, N° 7; nor does the tube give the light before mentioned, N° 2, but it gives much more light within. Then if, by opening the cock a little way which is faſtened to the tube, the air be let in ſlowly, while the tube is rubbed, the light diminiſhes; and being interrupted by the air, as it comes in, looks like lightning at a diſtance, till all the air is come in, and then there is no more light within; but the light goes all to the outſide, and the attraction returns.

7. If two ſmall boards, or two ſmall octavo books, be ſet edge wiſe, parallel to each other, and about the diſtance of ten inches aſunder, upon a ſtand of ſeven or eight inches diameter; little pieces of leaf gold, or braſs, laid upon the ſtand between thoſe boards, will not be attracted by the rubbed tube held near them, till it be brought quite between the ſaid boards, as near to the ſtand as half the diſtance of the boards from each other: that is, when the tube is ſo held, that a circle deſcribed round the axis of the tube, with the diſtance that is between that axis and the ſtand, paſſes between the boards or books without touching them. But when the rubbed tube being held horizontally, at the diſtance of a foot from the ſtand, ſeems to have no virtue, becauſe the leaf-gold has no motion, if an aſſiſtant ſnatches away the boards, all on a ſudden the pieces of gold will be attracted and repelled ſeveral times, without giving any new friction to the tube.

8. When the air is very dry, and the rubbed tube can attract the leaf-gold laid on a ſmall ſtand, to the diſtance of three foot or beyond; if the ſame leaf-gold be laid upon a table, or any large ſurface, the excited tube muſt be brought very near before it can produce its effect.

9. When the air is moiſt, the experiment, N° 4, does not ſucceed well: for after the feather in the air has been ſome time driven about by the tube, it comes back of itſelf to the tube, without having touched any other body; and ſometimes after having adhered to the tube, towards the middle of it, it flies off from it, and comes again immediately to the tube, ſticking to that part of it which is fartheſt from the hand. It happens alſo, when the air is very dry, and the tube repels the feather, after having attracted it, to the diſtance of two or three feet, that if you wet the top of the tube at the end, for the length of ſix or ſeven inches, the feather will come and ſtick to that end of the tube, without having touched any other body.

10. Having filled with water a ſmall drinking glaſs, of about an inch diameter, when you bring the rubbed tube near it, the water riſes in a little hill, accumulated at the edge of the glaſs; ſometimes jumping towards the tube in a little jet, ſo ſmall that you can hardly ſee it, though you may find the tube wholly wet with it. One may alſo obſerve, that this accumulated water riſes in the ſhape of a ſmall cone, whoſe axis is ſometimes ſtretched out horizontally towards the tube, then ſnaps and falls down again flat upon the reſt of the water. If this experiment be made in the dark, a flaſh of light accompanies the ſnapping.

11. If by means of an artificial fountain, in which air is condenſed upon the water to make it ſpout, you play a ſmall jet, of about the fortieth part of an inch diameter, upwards or downwards; the rubbed tube being brought near, the jet will bend towards the tube at the diſtance of a foot; and if the tube be brought nearer, the jet being wholly drawn away by the tube, is changed into a dew upon the tube, ſo that it adheres to the tube in little drops, provided the jet be not made to ſpout with too much force.

12. If a packthread or hempen ſtring be ſtretched horizontally to the length of about twelve hundred feet, at the end of which is ſuſpended an ivory ball of about an inch and an half in diameter; this ball will draw and repel leaf-braſs, or leaf-gold, when the rubbed tube is brought near the other end of the ſtring, and the thread of trial being brought near to the ball, is attracted by it.

In this experiment the ſupporters of the ſtring muſt be *electrics per ſe*, whether they be hair-ropes, fiddle-ſtrings, or cat-guts, ribbons, ſtrings of ſilk, glaſs tubes, long bodies of ſulphur or of reſin, *&c.* and all theſe bodies muſt be very dry. If the ſtring be wet, the experiment will ſucceed the better.

This experiment was, we believe, firſt made by the late Mr. Stephen Gray; and it might be improved, by employing an iron wire inſtead of a packthread or hempen ſtring. When an iron wire is uſed, its ſupporters might be wooden ſticks, being *non-electrics* in a ſlighter degree, as before obſerved; but *electrics* are beſt.

The conductor of *electricity*, in theſe and the like caſes, need not be ſtretched at length, but may be carried backwards and forwards in parallel or other lines, provided they be not placed too near to each other, but at a proper diſtance, as, for inſtance, three feet.

13. If two or three iron bars be ſuſpended in the ſame horizontal line, at the diſtance of ſix inches from one another, the *electricity* communicated by the rubbed tube to the end of one of the bars will go on from the one to the other quite to the end of the laſt bar, where a pricking will be felt, a noiſe heard, and a flaſh of fire ſeen. If the air is dry, the *electricity* will jump from one bar to another at a greater diſtance; but in moiſt weather, the bars muſt not hang at above an inch diſtance from each other.

Theſe experiments may be made with a glaſs tube, about three foot and an half long, an inch and an half in diameter, and about $\frac{1}{12}$ of an inch thick, open at both ends, but ſometimes hermetically ſealed at the end fartheſt from the hand. Theſe proportions are not neceſſary, but only convenient for the hand; and the glaſs of the tube ought not to be leſs than $\frac{1}{12}$ of an inch in thickneſs; for when thinner, the *electricity* is indeed ſooner excited by friction, but it does not laſt ſo long as when the tube is thicker. See *Deſaguliers*'s Diſſertation concerning *Electricity*, in his Experim. Philoſ. Vol. II. p. 316. ſeq.

The Doctor obſerves with Monſieur du Fay, that there are two ſorts of *electricity*, a reſinous, and a vitreous kind. One of the experiments, upon which this difference is eſtabliſhed, is as follows.

14. If a down feather be ſuſpended by a ſilken thread, as in the experiment N° 5, ſealing-wax, well rubbed, will produce the ſame effect as the tube, but more weakly, drawing the feather; and when once it is ſeparated from the wax, the wax repels it continually, till the feather has touched ſome other body. But the difference here is, that when the feather is in a ſtate of repulſion, in reſpect of the wax, the rubbed tube attracts it; and when the tube has given the feather its repulſive ſtate, then the rubbed wax attracts it: which ſhews, according to theſe gentlemen, that the *electricity* of glaſs is different from the *electricity* of ſealing-wax; and the like may be obſerved of other reſinous ſubſtances.

But, perhaps, this phænomenon may be accounted for, by ſuppoſing, as the truth is, that the *electrical* power of excited glaſs is ſtronger than that of ſealing-wax, and then from Mr. Ellicott's hypotheſis, hereafter mentioned, the phænomenon follows.

Doctor Deſaguliers has deduced from his experiments, that bodies which are *electric per ſe*, being excited to *electricity*, repel all other bodies that have *electricity*, but attract them as ſoon as they have loſt their *electricity*; and ſo *vice verſa*. Theſe deductions agree very well with Mr. Ellicott's mentioned below.

The Doctor conjectures alſo, that the particles of pure air are *electric* bodies, always in a ſtate of *electricity*; and that vitreous *electricity*, and from this *electricity* of the air, he conjectures, ingeniouſly, that the riſe of vapours may depend upon *electricity*. See the Diſſertation before cited.

To theſe experiments related, among others, by Dr. Deſaguliers, we muſt add from Mr. Ellicott [a], that when the tube, N° 1, is ſtrongly excited, ſparks will not only iſſue from it in ſtreams while it is rubbing, but will continue to dart out from it for a conſiderable time after the rubbing has ceaſed, and a very ſtrong offenſive ſmell will be perceived.—[a Several Eſſays towards diſcovering the Laws of *Electricity*, Lond. 1748.]

15. The ſame gentleman obſerves, that if a ball (of cork ſuppoſe, for lightneſs) be hung by a ſilk line, and the excited tube is applied to it, it will not only be attracted, but will have an attractive quality communicated to it from the tube; and if any light bodies are brought near the ball, they will be attracted by it.

16. As the tube, when ſtrongly excited, will not only attract, but afterwards repel any light bodies brought near it, in like manner the cork-ball will be endued with the ſame property; ſo that a ſmaller ball will firſt be attracted towards it, and then repelled from it, in the ſame manner as the leaf-gold in the beforementioned experiments; and on touching any other body, it will be again attracted; and this may be repeated ſeveral times, provided the ſmaller ball is much leſs than the larger one. But the effect will conſtantly grow weaker and weaker; becauſe every time the leſſer ball is attracted, it carries off with it ſome of the *electric* virtue, and is likewiſe endued with the ſame properties as the larger ball.

Mr. Gray, Monſieur du Fay, and others have obſerved, that this *electrical* quality is not only to be excited in glaſs, but in moſt ſolid bodies capable of friction, metals excepted; though in ſome it will ſcarce be ſenſible. And this *electrical* power is found to be ſtrongeſt in wax, reſins, gums and glaſs. And as glaſs is the eaſieſt procured of a proper form, it has generally been uſed in making theſe experiments. It has been further obſerved, that thoſe bodies, in which the *electrical* quality is capable of being excited the ſtrongeſt by friction, will receive the leaſt quantity of it from any other excited body, and therefore are properly made uſe of to ſupport any body deſigned to receive the *electrical* virtue. The truth of this will ſufficiently appear from the following experiments.

17. Two lines, one of ſilk, and the other of thread, being hung up, (as in the experiment, N° 5.) that of thread will be attracted by the tube at a much greater diſtance than the ſilk. If a feather, or other light body, be faſtened to each ſtring, and if the tube be brought to the feather faſtened to the ſilk, it will not only be firſt attracted and then repelled, as has been ſaid N° 5, but by the virtue communicated to the feather from the tube, the ſeveral fibres of the feather will ſtrongly repel each other. On the contrary, the feather faſtened to the thread will be ſtrongly attracted by the excited tube, and not repelled, the virtue paſſing off by the thread it is hung to. If a glaſs ball is hung to the ſilk line, it will be but weakly attracted by the tube; but one of cork or metal will be ſo much more ſtrongly.

18. Let a rod of iron be ſuſtained by ſilk lines, and by means of a glaſs ſphere (which can be more regularly and conſtantly excited than a tube) be made *electrical*, it will be found to have all the properties of the excited tube firſt mentioned. A ſtream of light will come from the end of it, if it is pointed. It will attract, repel, and communicate this virtue to any other *non-electric* body. On the approach of a *non-electric*, a ſpark of fire, with a ſnap attending it, will come from it; which ſpark will be greater or leſs, as the bodies approaching it have more or leſs of the *electrical* quality reſiding in them; and there will likewiſe be the ſame offenſive ſmell as was obſerved of the glaſs tube.

19. Let a rod of iron, pointed at one end, be ſuſpended on ſilk lines, as in the laſt experiment, and by the ſphere be made *electrical*. When the rod is ſtrongly *electrified*, a ſtream of light in diverging rays will be ſeen to iſſue from its point; and if any *non-electric* body is held a few inches from the point, the light will become viſible to a greater diſtance; and if the *non-electric* body is likewiſe pointed, a light will ſeem to iſſue from that in diverging rays, in the ſame manner as from the *electrified* rod. But if the *non-electrical* body is flat, and held at the ſame diſtance from the rod as the pointed one was, no light will be ſeen to come from it. It is alſo to be obſerved, that the effluvia from the end of the *electrified* rod ſtrike againſt the hand or face, brought near to that end, like a blaſt of wind.

20. If the *non-electric* body, whether flat or pointed, be brought nearer to the end of the rod than in the laſt experiment, there will be a ſmall ſtream of light produced, reaching quite from the *electric* to the *non-electric* body; and if brought ſtill nearer, there will iſſue a ſpark, attended with a ſmall ſnapping noiſe, which will be ſucceeded by others at equal intervals; and if the *non-electric* is held at ſome diſtance from the ſide of the rod, the point of it will frequently appear luminous, but no part of the *electrified* rod will be ſo. If it is brought nearer, there will likewiſe be

ſparks produced, at nearly equal intervals from each other, which will ſometimes appear as iſſuing from the ſide of the *electrified* rod, at others, as coming from the *non-electric*.

21. Take two plates of metal, very clean and dry, whoſe ſurfaces are nearly equal; hang one of them horizontally to the *electrified* rod, and bring under it, upon the other, any thin, light body, as leaf-ſilver, *&c.* when the upper plate is made *electrical*, the ſilver will be attracted by it; and if the under plate is held at a proper diſtance, will be perfectly ſuſpended at right angles to the plates, without touching either of them; but if they are either brought nearer together, or carried farther aſunder, the leaf-ſilver will ceaſe to be ſuſpended, and will jump up and down between them. The ſame effect will be produced, if you reverſe the experiment, by *electrifying* the bottom plate, and ſuſpending the other over it. See Mr. *Ellicott*'s Eſſays before mentioned.

22. By the experiments made in Germany, and repeated in England by Mr. Watſon, it appears, that ſpirit of wine may be ſet on fire by the power of *electricity*. This will ſucceed not only with the etherial liquor, or phlogiſton of Frobenius, and rectified ſpirit of wine, but even with common proof ſpirit. But all theſe muſt be warmed a little, ſo as to emit an inflammable vapour.

And the experiment ſucceeds equally well, whether an *electrified* perſon, or other *electrified* body, be brought near the not *electrified* ſpirit; or whether the *electrified* ſpirit be brought near a *non-electric* body.

This laſt method of firing the ſpirit is ſaid, by Mr. Watſon, to be done by the repulſive power of *electricity*. And the former, where the not *electrified* ſpirit is fired by its being brought near to a man ſtanding upon a cake of wax, or to a ſword, or bar of metal, ſuſpended by ſilk lines, is ſaid to be performed by the attractive power of *electricity*. Of theſe two kinds, the repulſive power has generally been found the ſtrongeſt.

23. Not only ſpirits of wine, but alſo ſal volatile oleoſum, dulcified ſpirit of nitre, Peony water, Daffy's elixir, Helvetius's ſtyptic, and ſome other mixtures, where the ſpirit has been very conſiderably diluted, may be fired by the power of *electricity*; and ſo may diſtilled vegetable oils, as that of turpentine, lemon, orange peels, juniper, and even thoſe which are ſpecifically heavier than water, as oil of ſaſſafras; alſo reſinous ſubſtances, ſuch as balſam capivi and turpentine; all which ſend forth, when warmed, an inflammable vapour. The inflammable vapour, produced by putting an ounce of filings of iron, an ounce of oil of vitriol, and four ounces of water into a Florence flaſk, may be fired by the ſame means; as may alſo gunpowder, if ground with a little camphor, or with a few drops of ſome inflammable chemical oil. To increaſe the ſurpriſe, theſe ſubſtances may be fired by ice, or by a drop of water, only thickened a little with the ſeeds of fleawort.

All theſe experiments have ſucceeded, though not always in damp weather, with a glaſs tube rubbed by the hand merely; but if a greater *electrical* force be excited, by means of a globe, theſe experiments will ſucceed in any weather, though not with equal eaſe.

24. If ſome oil of turpentine is ſet on fire in any veſſel, held in the hand of an *electrified* man, the thick ſmoke that ariſes therefrom, received againſt any *non-electric* of a large ſurface, held in the hand of a ſecond man ſtanding upon an *electrical* cake; this ſmoke will, at a foot diſtance from the flame, carry with it a ſufficient quantity of *electricity*, for the ſecond man to fire any inflammable vapour. The *electrical* ſtrokes have been likewiſe perceptible upon the touching the ſecond man, when the *non-electric* held in his hand has been in the ſmoke of the oil of turpentine between ſeven and eight feet above the flame. Here we find the ſmoke of an original *electric*, a conductor of *electricity*.

25. Likewiſe, if burning ſpirit of wine be ſubſtituted in the place of the oil of turpentine, and if the end of an iron rod, in the hand of the ſecond man, be held at the top of the flame, this ſecond man will kindle other warm ſpirits held near his finger. Here we find, that flame conducts the *electricity*, and does not perceptibly diminiſh its force. The like is to be obſerved of red-hot iron; and of the coldeſt mixtures that art can produce.

26. Of all the ſurpriſing phænomena of *electricity*, none ſeems to be more ſo, than the extraordinary accumulation of the *electrical* power in a phial of water, firſt diſcovered by Profeſſor Muſchenbroek of Leyden. The experiment is this: a phial of water is ſuſpended to a gun-barrel by a wire let down a few inches into the water through the cork; and this gun-barrel, ſuſpended in ſilk lines, is applied ſo near an excited glaſs globe, that ſome metallic fringes, inſerted into the gun-barrel, touch the globe in motion. Under theſe circumſtances a man graſps the phial with one hand, and touches the gun-barrel with a finger of the other; upon which he receives a violent ſhock through both his arms, eſpecially at his elbows and wriſts, and acroſs his breaſt. The experiment ſucceeds beſt *cæteris paribus*, 1°. when the air is dry. 2°. When the phial, containing the water, is of the thinneſt glaſs. 3°. When the outſide of the phial is perfectly dry. 4°. In proportion to the number of points of *non-electric* contact. Thus if you hold the phial only with your thumb and finger, the ſnap is ſmall; larger when you apply another finger, and increaſes in proportion to the graſp of your whole hand. 5°. When the water in the phial is heated, which being then warmer than the circumambient air, prevents the condenſation of the floating vapours therein upon the ſurface of the glaſs.

A gun-barrel is not neceſſary in theſe experiments; a ſword, or any other ſolid piece, or tube of metal, is equally uſeful. Mr. Watſon has given us many curious obſerva ions relating to this experiment, and has varied it a great many ways. Among other things he obſerves, that the phial may be *electrified* by applying the wire therein to the globe in motion; after which, if it is graſped in one hand, and the wire touched with a finger of the other, the ſtroke is as great as from the gun-barrel. And if you graſp the phial with your hand, and do not at the ſame time touch the wire, the acquired *electricity* of the water is not diminiſhed. So that, unleſs by accident or otherwiſe the wire is touched, the *electrified* water will retain its force many hours, may be conveyed ſeveral miles, and afterwards exert its force upon touching the wire.

To prove Mr. Watſon's aſſertion that the ſtroke is *cæteris paribus*, as the points of contact of *non-electrics* to the glaſs, Dr. Bevis wrapped up two large round bellied phials in very thin lead ſo cloſe as to touch the glaſſes every where, except their necks. Theſe were filled with water, and corked, with a ſtaple of ſmall wire running through each cork into the water. A piece of ſtrong wire about five inches long, with an eye at each end, was provided, and at each end of this, hung one of the phials of water by the ſmall ſtaple running through the cork. A ſmall wire loop was then faſtened into the lead at the bottom of each phial, and into theſe loops was inſerted a piece of ſtrong wire like the former. If then theſe phials were hung acroſs the gun-barrel and *electrified*, and a perſon ſtanding upon the floor touched the bottom wire with one hand, and the gun-barrel with the other, he received a moſt violent ſhock through both his arms and acroſs his breaſt. The *electrical* exploſion has been ſince vaſtly increaſed. But Mr. Watſon is of opinion, that the violence of the exploſion of the *electric* force accumulated in the glaſs, is not ſo much owing to the quantity of *non-electrical* matters contained in the glaſs, as to the number of points of *non-electrical* contact within the glaſs, and the denſity of the matter conſtituting thoſe points, provided this matter be in its own nature a ready conductor of *electricity*. For a cylindrical glaſs jar blown very thin, of ſixteen inches in height, and eighteen inches in circumference, having been covered both within and without with leaf-ſilver to within an inch of its top, the exploſion from this jar was equal to that from three glaſſes, each about ſeventeen inches in height, and four in diameter, and filled with fifty pounds of leaden ſhot each. The exploſion in theſe caſes is ſo violent as to become dangerous; and has been found mortal not only to ſmall birds, but even to a rat; and Mr. Franklin killed a well-grown turkey with it.

27. A very conſiderable *electrical* exploſion may be made from a plate of glaſs thus: Let a thin plate of glaſs of about a foot ſquare, be covered on both ſides with leaf-ſilver; and make this adhere to the glaſs by a very thin paſte. A margin of an inch muſt be left on both ſides; otherwiſe, upon *electrifying* this plate, the *electricity* would be prevented from being accumulated upon one of its ſurfaces, by being propagated from the ſilver on one ſide to that of the other. When the glaſs plate is thus prepared, if it be placed upon a table in ſuch a manner, that when fully *electrified* by a wire or ſuch like from the prime conductor, a perſon touches the under ſurface with a finger of one of his hands, and brings one of the fingers of the other near the upper ſurface, or near the prime conductor, he will be ſhocked in both his arms and croſs his breaſt. The ſame effect happens, if when this plate is *electrified* as before, a perſon holds it in his hand by the margin, and without touching the ſilver, preſents it, even ſome time after it has been taken from the prime conductor, to another perſon, who touches the under ſurface with his finger, and holds it there till he touches the upper ſurface with a finger of his other hand. This is an experiment contrived by Dr. Bevis, who obſerves, that though the exploſion from the glaſs plate ſilvered was occaſioned by about ſix grains of ſilver, upon which the *electricity* was accumulated, yet the exploſion was equal if not ſuperior to that from half a pint of water contained in a thin glaſs as uſual.

28. The commotion ariſing from the diſcharge of the accumulated *electricity* in the phial, may be felt by a great number of men at once. Monſieur le Monnier, at Paris, is ſaid to have communicated this ſhock through a line of men, and other *non-electrics*, meaſuring nine hundred toiſes, which is more than an Engliſh mile; and the Abbé Nollet [a] made the experiment upon 200 perſons, ranged in two parallel lines.—[a Lettres ſur l'*Electricité*, p. 207.]

29. This *electrical* commotion has been made very ſenſible quite acroſs the river Thames, by the communication of no other medium than the water of that river; and ſpirit of wine has been fired at that diſtance.

30. The commotion has alſo been perceptible to two or more

more obſervers at conſiderable diſtances from each other, even as far as two miles.

In theſe laſt experiments, and in many others of the like nature, Mr. Watſon obſerves, that the *electrical* power, accumulated in any *non-electric* matter contained in a glaſs phial, deſcribes upon its exploſion a circuit through any line of ſubſtances *non-electrical* in a conſiderable degree; if one end thereof is in contact with the external ſurface of this phial, and the other end upon the exploſion touches either the *electrified* gun-barrel, to which the phial in charging is uſually connected, or the iron hook always fitted therein. Thus if a perſon ſtands upon a dry wooden floor with a coated phial ever ſo highly charged in one of his hands, and if another perſon, without touching the firſt, ſtands but ſix inches from him, and touches the iron hook of the phial, neither of them are ſhocked; becauſe the floor between them, though the diſtance is ſo ſhort, will not conduct the *electricity* ſufficiently quick. But if theſe two perſons tread upon a piece of wire laid between them, they each of them feel the *electrical* commotion in that arm which touches the phial and hook, and in that foot which treads upon the wire; the wire here conducting the *electricity* quick enough, which the dry floor would not. The circuit is here formed by the coated phial, its hook, ſo much of the bodies of theſe two perſons as form a curve line between the wire, the phial, and hook, and the wire between theſe perſons. If theſe perſons ſtand upon, or touch with any part of their bodies any *non-electrics*, which readily conduct *electricity*, the circuit is completed, and the effect is the ſame. Hence Mr. Watſon infers, that when the obſervers have been ſhocked at the end of two miles of wire, the *electrical* circuit is four miles; *viz.* two miles of wire, and the ſpace of two miles of the *non-electric* matter between the obſervers, whether it be water, earth, or both. So in the experiments made near Weſtminſter bridge, where the river is above 400 yards over, the circuit muſt have been above 800 yards, *viz.* above 400 yards of conducting wire laid upon the Portland ſtones of the bridge, and ſomething more than 400 yards of water. That the water made part of the circuit, and that the ſhock was not communicated from the Surry ſhore to the other ſide merely by the conducting wire, is evident from this, that if the obſerver on the Weſtminſter ſhore did not communicate with the river, either by dipping his hand, or an iron rod held therein into the river, the ſhock ariſing from the diſcharge of the phial was not at all felt by him, although the obſerver on the Surry ſide felt it as before. This circuit of the *electrical* matter has been farther confirmed by ſeveral other ingenious experiments by the ſame gentleman.

It is to be obſerved, that the commotion is equally ſtrong, whether the *electricity* is conducted by water, or dry ground. And that if the wires, between the *electrifying* machine and the obſervers, are conducted upon dry ſticks, or other ſubſtances *non-electric*, in a ſlight degree only, the effects of the *electrical* power are much greater, than when the wires in their progreſs touch the ground, moiſt vegetables, or other ſubſtances in a great degree *non-electric*.

31. It is remarkable, that if the *electrical* machine, and the man who turns the wheel thereof, be mounted upon *electrical* cakes, the *electrical* power is ſo far from being increaſed hereby, as ſome might expect, that it is, on the contrary, much diminiſhed, and ſometimes is not at all perceptible.

It was this experiment which induced Mr. Watſon to conceive, that the *electrical* power was not inherent in the glaſs, but came from the floor of the room. And, he ſays, he was confirmed in this opinion when he found, that if he touched the frame of the machine with one hand, while he ſtood upon the floor, and with a finger of the other hand touched the gun-barrel, the fire would iſſue, and the ſnapping would continue as long as he held his hand upon the machine, but would ceaſe upon his taking it off. In like manner, if the man, who turned the wheel, put one of his feet upon the floor, the other remaining upon the wax, the *electricity* at the gun-barrel would ſnap, and ceaſe upon his replacing his foot. But of this hypotheſis more hereafter.

32. The accumulation of *electricity* may be meaſured to great exactneſs by the following method, diſcovered by Mr. Canton. When the phial is ſufficiently *electrified*, by applying the wire thereof to the glaſs globe, which is known by the appearance of a bruſh of flame at the end of the wire, hang a ſlender piece of wire to the ſuſpended gun-barrel, detached for this purpoſe from the globes. Upon your applying the wire of the *electrified* phial to that hanging to the gun-barrel, you perceive a ſmall ſnap; this you diſcharge by touching the gun-barrel with your finger, which likewiſe ſnaps: and thus alternately *electrifying* and diſcharging, you proceed until the whole *electricity* of the water is diſſipated, which is, ſometimes, not done under an hundred diſcharges. If you do not diſcharge the *electricity* every time, the ſnaps from the wire of the *electrified* phial to the gun-barrel, are ſcarcely perceptible. The acquired *electricity* of the water is eſtimated in proportion to the number of ſtrokes.

This accumulation of *electricity* may perhaps be thought to deſerve a farther explanation, and may be thus illuſtrated. As we take it for granted, that there is always a determinate quantity of atmoſphere ſurrounding the terraqueous globe, we conceive, when we ſee the mercury in the barometer very low, that there then is a leſs accumulated column of this atmoſphere impending over us, than when we ſee the mercury high. In like manner, when we obſerve that the *electrified* gun-barrel attracts or repels only very light ſubſtances, at a very ſmall diſtance, or that the ſnap and fire therefrom are ſcarce perceptible, we conceive then a much leſs quantity of *electrical* atmoſphere ſurrounding the gun-barrel. This power being more or leſs, is called the greater or leſs degree of the accumulation of *electricity*. And this is only attainable to a certain point, if you *electrify* ever ſo long; after which, unleſs otherwiſe directed, the diſſipation thereof is general. In the phial filled with water, in Muſchenbroek's experiment, or filled with any other *non-electric*, as filings of iron, if the wire be held to the globe in motion, when the accumulation is complete, the ſurcharge runs off from the point of the wire, as a bruſh of blue flame. That by ſtopping the current of *electricity*, *non-electrics* might be excited; and that by accumulating their power, they might be made to exert more force than *electrics per ſe* would at any point of time, is that capital diſcovery of the late Mr. Gray; which is to be regarded as the baſis upon which all the preſent improvements of our knowledge in *electricity* are founded.

33. By comparing the reſpective velocities of *electricity* and ſound, that of *electricity*, in any diſtance yet experienced, appears inſtantaneous.

For the detail of theſe curious experiments, and of ſeveral others, we muſt refer to Mr. Watſon's experiments and obſervations, tending to illuſtrate the nature and properties of *electricity*, Lond. 1745; and the ſequel to the experiments, *&c.* Lond. 1746; as alſo to his account of the experiments made by ſome gentlemen of the Royal Society, Lond. 1748.

34. Mr. Franklin of Philadelphia, in his experiments and obſervations on *electricity*, has obſerved, that granulated lead is better than water for filling the phial or glaſs jar to be *electrified*; and he has been able to excite the *electrical* force to ſuch a degree, as not only to fire gunpowder [a], and to kill a turkey of ten pound weight [b], but to produce a fuſion of metals [c].—[[a] Phil. Tranſ. Vol. XLVII. p. 291. [b] Ibid. p. 209. [c] Ibid. p. 290.]

This ingenious author's method of firing gunpowder by the *electric* flame has ſomething particular, as it does not require any inflammable vapour to be previouſly raiſed. The powder may be fired thus: a ſmall cartridge is filled with dry powder, hard rammed, ſo as to bruiſe ſome of the grains. Two pointed wires are then thruſt in, one at each end, the points approaching each other in the middle of the cartridge, till within the diſtance of half an inch: then the cartridge being placed in the circle, when four *electrified* glaſs jars are diſcharged, the *electric* flame leaping from the point of one wire to the point of the other, within the cartridge among the powder, fires it, and the exploſion of the powder is at the ſame inſtant with the crack of the *electrical* diſcharge.

35. As to metals, this gentleman obſerves, that he has been able by *electricity* frequently to give polarity to needles, and to reverſe it. A ſhock from four large glaſs jars ſent thro' a fine ſewing needle, gives it polarity; and it will traverſe, when laid on water. The polarity is given ſtrongeſt, when the needle is ſtruck lying north and ſouth; and weakeſt, when lying eaſt and weſt. In this caſe, the end entred by the *electric* blaſt points north: but when the needle lies north and ſouth, the end that lies towards the north will continue to point north, whether the fire entred at that end, or the contrary end.

36. In theſe experiments, the ends of the needles are ſometimes finely blued, like a watch-ſpring, by the *electric* flame. This colour, given by the flaſh from two glaſs jars only, will wipe off; but four will fix it, and frequently melt the needles. Sometimes the ſurface on the body of the needles is alſo run, and appears bliſtered, when examined by a magnifying glaſs. The jars Mr. Franklin made uſe of hold ſeven or eight gallons, and are coated and lined with tin-foil. Each of them takes a thouſand turns of a globe of nine inches diameter to charge it. Tin-foil has been melted between glaſs by the force of two jars only. Phil. Tranſ. loc. cit.

37. The effects of lightning and thoſe of *electricity* appear very ſimilar. Lightning has been known to ſtrike people blind, the *electrical* ſhock has had the ſame effect on animals. Animals have been killed by both. The mariners compaſs has ſometimes loſt its virtue by lightning; and by Mr. Franklin's experiments it appears, that polarity may be given and reverſed by *electricity*. The late Mr. Stephen Gray obſerved ſeveral years ago [d], that the *electric* fire ſeemed to be of the ſame nature with that of thunder and lightning. Others have ſince fallen into the ſame opinion. Indeed many experiments ſhew, that the flame of *electricity* has been juſtly called by Mr. Franklin a mimic lightning [e], ſince it blinds and kills animals, and melts metals, *&c.*

like natural lightning.—[d Phil. Tranſ. Vol. cit. p. 536. e Ibid. p. 290.]

38. This analogy is now farther confirmed by the diſcovery made in France, in conſequence of Mr. Franklin's hypotheſis, of being able, by a proper apparatus, to collect the *electricity* from the atmoſphere during a thunder ſtorm. For a pointed bar of iron, 40 feet high, having been placed upon an *electrical* body, and a ſtormy cloud having paſſed over the place where the bar ſtood, thoſe that were appointed to obſerve it drew near, and attracted from it ſparks of fire, perceiving the ſame kind of commotions as in the common *electrical* experiments. The like effect followed, when a bar of iron 99 feet high was placed upon a cake of reſin, two feet ſquare and two inches thick. For a ſtormy cloud having paſſed over the bar, where it remained half an hour, ſparks were drawn from the bar. Theſe were the firſt experiments made in France, and they have been ſufficiently varied and verified ſince; ſo that it ſeems now certain, 1°. that a bar of iron, pointed or not, is *electriſed* during a ſtorm. 2°. That a vertical or horizontal ſituation is equally fitting for theſe experiments. 3°. That even wood is *electriſed*. 4°. That by theſe means a man may be ſufficiently *electriſed* to ſet fire to ſpirit of wine with his finger, and repeat almoſt all the uſual experiments of artificial *electricity*; for ſuch may that which is excited by friction be denominated.

It is, however, to be remarked, that theſe phænomena are attended with irregularities, and do not always ſucceed perfectly. Sometimes ſimple clouds, without thunder or lightning, produce more *electricity*, than when there is loud thunder. Sometimes the *electricity* does not ſhew itſelf but where there is lightning: in other caſes, the *electricity* which ſeemed diſſipated during the rain, began again as ſoon as the rain ceaſed, altho' the thunder was very diſtant. See the Phil. Tranſ. Vol. XLVII. p. 534, ſeq.

39. Mr. Franklin has contrived a very ingenious and eaſy way of trying experiments of this kind by means of an *electrical* kite, made of a large thin ſilk handkerchief, extended and faſtened at the four corners to two ſlight ſtrips of cedar, of ſufficient length for this purpoſe. This kite being accommodated with a tail, loop, and ſtring, will riſe in the air like thoſe of paper. To the top of the upright ſtick of the croſs is to be fixed a very ſharp-pointed wire, riſing a foot or more above the wood. To the end of the twine, next the hand, is to be tied a ſilk ribband; and where the twine and ſilk join, a key may be faſtened. The kite is to be raiſed when a thunder guſt appears to be coming on, and as ſoon as the thunder-clouds come over the kite, the pointed wire will draw the *electric* fire from them, and the kite with all the twine will be *electrified*; and the looſe filaments of the twine will ſtand out every way, and be attracted by an approaching finger. When the rain has wet the kite and twine, ſo that it can conduct the *electric* fire freely, it will ſtream out plentifully from the key, on the approach of a man's knuckle. At this key the phial may be charged; and from *electric* fire thus obtained ſpirits may be kindled, and all the other *electrical* experiments be performed, which are uſually done by the help of a rubbed glaſs globe or tube, and the ſameneſs of the *electric* matter with that of lightning may thereby be completely demonſtrated. Phil. Tranſ. Vol. cit. p. 565, ſeq.

From this identity, ſome have conceived hopes of depriving the clouds of all their thunder, and thereby rendering thunder ſtorms harmleſs. See Philoſ. Tranſ. Vol. cit. p. 289, 535.

40. It has been pretended, that odours would pervade *electrified* globes and tubes of glaſs, and that the medicinal effects of drugs might likewiſe be tranſmitted this way; as alſo, that if perſons were to hold in their hands, or place under their naked feet, odoriferous, or purging ſubſtances, and were then to be *electriſed*, they would be ſenſible of the effects of theſe ſubſtances. But it ſeems now certain, that all theſe pretences have been impoſitions on the credulity of the world, and that when proper experiments have been tried, no ſuch effects have been perceived, nor have the moſt poiſonous ſubſtances manifeſted any influence in this way. See Dr. Bianchini's experiment, mentioned in the Philoſ. Tranſ. Vol. XLVII. p. 399, ſeq.

41. However, though theſe pretended wonders, tranſmitted to the reſt of Europe from Italy and Leipſic [f], have no foundation in fact, yet it does not follow, that medicinal advantages are not to be gained from *electricity* itſelf. So ſubtle and ſo elaſtic a fluid admitted in a large quantity into our bodies, as, from undoubted experience, it greatly heats the fleſh, and quickens the pulſe, may, more eſpecially when aſſiſted with the expectation of ſucceſs in the patient, in particular caſes be attended with very great advantages [g]. —[f Phil. Tranſ. Vol. cit. p. 231, ſeq. g Mr. Watſon in Phil. Tranſ. Vol. cit. p. 406.]

In effect, we meet with ſome cures performed in paralytic caſes by the force of *electricity*. See Hiſtoire generale et particuliere de l'*Electrité*, Paris, 1752, part. 3. p. 36, ſeq. And we meet with accounts of ſeveral other diſorders cured by the ſame means, in that treatiſe; but we fear not all equally well atteſted.

42. The *electrical* virtue having, in ſome caſes, accelerated and facilitated the motion of liquids through capillary tubes, the Abbé Nollet was led to ſuppoſe, that the *electrical* effluvia might alſo contribute to accelerate the growth of vegetables, and to increaſe the perſpiration of animals, and the experiments made by that gentleman ſeem to ſupport his opinion; though objections have ariſen, as to what he has advanced with reſpect to the acceleration of the motion of fluids through capillary tubes or ſyphons: for Mr. Ellicott ſeems to have proved, that this acceleration is not barely owing to the fluids being *electrified*, but that other circumſtances are neceſſary, in order to produce this effect. Mr. Ellicott obſerves, that if a veſſel of water is hung to the prime conductor, having a ſyphon in it of ſo ſmall a bore that the water will be diſcharged from it only in drops, on the water's becoming *electrical* by means of the machine, it will immediately run in a ſtream, and continue to do ſo, till the water is all diſcharged, provided the ſphere is continued in motion. And the true reaſon of the water's running in a ſtream in this caſe ſeems to be, that ſo long as the machine is in motion, there is a conſtant ſucceſſion of the *electric* effluvia excited, which viſibly run off from the end of the prime conductor in a ſtream; and as they are in like manner carried off from all bodies hung to it, thoſe effluvia which run off from the end of the ſyphon, being ſtrongly attracted by the water, carry ſo much of it along with them, as to make it run in a conſtant ſtream. See Mr. *Ellicott*'s Eſſays before mentioned, p. 11, 12, *&c.*

The ſame author obſerves farther, that if the veſſel of water, with the ſyphon in it, is ſuſpended by any *non-electric* body over another ſtrongly *electrified*, the water will immediately run from the ſyphon in a ſtream; but if ſupported by a piece of ſilk, or any other *electrical* body, the water will immediately ceaſe running, and only be diſcharged in drops. And he accounts for this phænomenon from the principles of attraction between *non-electrics* and *electrical* effluvia, and of non-attraction between the ſame effluvia and original *electrics*. See page 15 of the Eſſays before cited.

43. Mr. Watſon has given us a particular account of ſeveral curious phænomena of *electricity* in vacuo in the Philoſophical Tranſactions, Vol. XLVII. p. 362, ſeq. The *electrical* effluvia, in their paſſage through an exhauſted glaſs tube, of almoſt three inches in diameter, afford a moſt agreeable ſpectacle in a darkened room. We may obſerve, not as in the open air, bruſhes or pencils of rays an inch or two in length, but coruſcations extending the whole length of the tube, that is, in his experiment, thirty-two inches, and of a bright ſilver hue. Theſe did not immediately diverge, as in the open air, but frequently, from a baſe apparently flat, divided themſelves into leſs and leſs ramifications, and reſembled very much the moſt lively coruſcations of the aurora borealis. At other times, when the tube has been exhauſted in the moſt perfect manner, the *electricity* has been ſeen to paſs between two braſs plates, contrived ſo, that they might be placed at different diſtances from each other, in one continued ſtream, of the ſame dimenſions throughout its whole length.

If the exhauſted tube be made part of the circuit before mentioned in Muſchenbroek's experiment, at the inſtant of exploſion, a maſs of very bright embodied fire may be ſeen jumping from one of the braſs plates in the tube to the other. But this is obſerved not to take place, when one of the plates is farther diſtant from the other than ten inches. If the diſtance be greater, the fire begins to diverge, and loſe part of its force; and this force diminiſhes in proportion to its divergency, which is nearly as the diſtance of the two plates.

But though the vacuum here employed greatly exceeded that which is uſually made by common air-pumps, yet it was far from being perfect. Theſe experiments were therefore tried with a torricellian vacuum, very ingeniouſly contrived by Lord Charles Cavendiſh. The apparatus conſiſted of a cylindrical glaſs tube of about three-tenths of an inch in diameter, and of ſeven feet and an half in length, bent in ſuch a manner, that thirty inches of each of its extremities were nearly ſtraight, and parallel to each other, from which an arch ſprung, which was likewiſe of thirty inches. This tube was carefully filled with mercury; and each of its extremities being put into its baſon of mercury, ſo much of the mercury ran out, until, as in the common barometrical tubes, it was in equilibrio with the atmoſphere. Each of the baſons containing the mercury was of wood, and was ſupported by a cylindrical glaſs of about four inches in diameter, and ſix inches in length; and theſe glaſſes were faſtened to the bottom of a ſquare wooden frame, ſo contrived, as that to its top was ſuſpended, by ſilk lines, the tube filled with mercury before mentioned; ſo that the whole of this apparatus, without inconvenience, might be moved together. The torricellian vacuum then occupied a ſpace of about thirty inches. In making the experiment, when the room was darkened, a wire from the prime conductor of the common *electrical* machine, communicated with one of the baſons of mercury, and any *non-electric* touching the other baſon, while the machine was in motion,

the *electricity* pervaded the vacuum in a continued arch of lambent flame, and as far as the eye could follow it, without the leaſt divergency.

It is to be obſerved, that upon admitting a very ſmall quantity of air into the exhauſted tube, the phænomena diſappear; not ſo much from the ſmall quantity of air admitted, as from the vapours which inſinuated themſelves therewith. For theſe phænomena have been viſible, though in a leſs perfect degree, when a much larger quantity of air was left in the receiver, by omitting to exhauſt it as much as poſſible.

If the *electrifying* machine, and the man who turns the wheel thereof, are ſupported by *electrics per ſe*; and if a piece of wire be connected with the braſs cap covering the upper extremity of the exhauſted tube, or to the end of the long braſs rod, by the ſliding of which through a box of oiled leather, the upper braſs plate may be moved in the tube; and if the other end of the wire be faſtened to any part of the frame of the *electrifying* machine, when this is put in motion, the *electrical* coruſcations may be ſeen to paſs, as before, from one of the braſs plates contained in the tube to the other, and to continue, unleſs the air inſinuates itſelf, as long as the machine is in motion. If, under theſe circumſtances, the hand of a perſon ſtanding on the floor is brought near the ſides of the glaſs, the coruſcations will direct themſelves that way in a great variety of curious forms.

This experiment, in which the *electricity* is ſeen puſhing itſelf on through the vacuum by its own elaſticity, is conſidered by Mr. Watſon as an *experimentum crucis* of the truth of his doctrine hereafter mentioned.

It may be obſerved in all theſe experiments, that a vacuum does not conduct *electricity* ſo perfectly as metals or water. For, in the laſt experiment, a perſon ſtanding upon the floor, and applying his finger to the upper braſs cap of the tube, receives a ſmart ſtroke; and in the former, ſnaps of fire may be drawn from the prime conductor. Theſe are arguments of ſome degree of accumulation, while the *electricity* is paſſing through the vacuum; ſince nothing of this kind happens when metals, ſtanding upon the ground, touch the prime conductor.

Such are the principal phænomena of *electricity* hitherto diſcovered; but the chief queſtion remains: What are the general laws of theſe phænomena, and what are their cauſes?

Mr. Ellicott thinks that the following concluſions, or general laws, may be juſtly deduced from the phænomena.

1°. That theſe remarkable phænomena are produced by means of effluvia; which, in exciting the *electrical* body, are put into motion, and ſeparated from it.

2°. That the particles compoſing theſe effluvia ſtrongly repel each other.

3°. That there is a mutual attraction between theſe particles and all other bodies whatſoever.

That there are effluvia emitted from the tube when rubbed, and which ſurround it as an atmoſphere, is evident from that offenſive ſmell ariſing from them, from that ſenſation on the hands or face, when the tube is brought near either of them, and from thoſe ſparks of light, on a ſtill nearer approach of the finger to it.

That the particles of theſe effluvia repel each other, is proved by the cork balls, and the fibres of the feather repelling each other, when impregnated with them; and by the leaf-gold being repelled by the tube, and not returning to it again, until by coming near, or touching ſome *non-electric* body, the effluvia are drawn off from it. From this property it is, that theſe effluvia expand themſelves with ſo great a velocity whenever they are ſeparated from the *electric* body; and as they are likewiſe capable of being greatly condenſed, may we not from hence juſtly conclude they are *elaſtic*?

That there is a mutual attraction between theſe effluvia and moſt other bodies, appears from their collecting from the tube ſuch quantities thereof, as to endue them with the ſame properties with the tube itſelf, as is proved from ſeveral of the experiments above mentioned.

Theſe principles being admitted, it will follow, that the greater difference there is in the quantity of *electrical* effluvia in any two bodies, the ſtronger will be their attraction. For, if the effluvia in each are equal, inſtead of attracting, they will repel each other; and in proportion as the quantity of *electric* matter is drawn from one of the bodies, will the attraction between them increaſe, and conſequently be ſtrongeſt, when any one of them has all the *electrical* matter drawn from it.

The particles of theſe effluvia are ſo exceeding ſmall, as eaſily to pervade the pores of glaſs, as is evident, in that a feather, or any light bodies incloſed in a glaſs ball hermetically ſealed, will be put in motion on the excited tube being brought near the outſide of it: and it has been generally thought that they paſs thro' the pores of the denſeſt bodies, and ſeveral experiments render this ſuppoſition not improbable, tho' none of them are quite concluſive.

Mr. Ellicott then proceeds to ſhew, in a very ingenious manner, how, from theſe principles, the phænomena of ſome of the more remarkable experiments of *electricity* may be accounted for. But as what he ſays cannot, with juſtice to his reaſonings, be abridged, we muſt refer the curious to his eſſays before quoted; only adding, that we have ſeen a manuſcript of his, where he endeavours to account for the experiment of Muſchenbroek on theſe principles, in a manner that makes us wiſh to ſee the reſt of his experiments, obſervations, and reaſonings on this ſubject publiſhed.

Mr. Watſon has endeavoured to prove, that *electricity* is not furniſhed from the glaſſes employed in the experiments, nor from the circumambient air. He thinks that *electricity* is the effect of a very ſubtile and elaſtic fluid, occupying all bodies in contact with the terraqueous globe, and that every where in its natural ſtate it is of the ſame degree of denſity; and that glaſs, and other bodies, which are called *electrics per ſe*, have the power of taking this fluid from one body, and conveying it to another, in a quantity ſufficient to be obvious to all our ſenſes; and that under certain circumſtances, it is poſſible to render the *electricity* in ſome bodies more rare than it naturally is, and, by communicating this to other bodies, to give them an additional quantity, and make their *electricity* more denſe; and that theſe bodies will thus continue until their natural quantity is reſtored to each; that is, by thoſe which have loſt part of theirs, acquiring what they have loſt, and by thoſe, to which more has been communicated, parting with their additional quantity. Both one and the other of theſe is, from the elaſticity of the *electric* matter, attempted to be done from the neareſt *non-electric*; and when the air is moiſt, this is ſoon accompliſhed by the circumambient vapours, which here may be conſidered as preventing, in a very great degree, our attempts to inſulate *non-electric* bodies.

This ſhort ſketch of Mr. Watſon's ſyſtem is taken from his own words in the Philoſophical Tranſactions, Vol. XLVII. p. 371, 372. For the detail of his illuſtrations and proofs, his treatiſe before quoted, or the Phil. Tranſact. Vol. XLIV and XLV, muſt be conſulted, and particularly Vol. XLVII, p. 372, & ſeq. where, after giving the *experimentum crucis* before mentioned, he endeavours to ſhew that it amounts to a full proof of the truth of his doctrine, that *electricity* is furniſhed by thoſe bodies, hitherto called *non-electrics*, and not by the *electrics per ſe*; and that we are able to add to, or take from, that quantity of *electricity* naturally adherent to bodies.

Mr. Watſon's ſyſtem naturally leads him to aſk, by what denomination ſhall we call this extraordinary power? From its effects in theſe operations ſhall we call it *electricity*? From its being a principle neither generated nor deſtroyed; from its being every where and always preſent, and in readineſs to ſhew itſelf in its effects, tho' latent and unobſerved, till by ſome proceſs it is produced into action, and rendered viſible; from its penetrating the denſeſt and hardeſt bodies, and its uniting itſelf to them; and from its immenſe velocity; ſhall we, with Theophraſtus, Boerhaave, Niewentiit, 'sGraveſande, and other philoſophers, call it elementary fire? Or ſhall we, from its containing the ſubſtance of light and fire, and from the extreme ſmallneſs of its parts, as paſſing thro' moſt bodies we are acquainted with, denominate it, with Homberg and the chemiſts, the chemical ſulphureous principle, which, according to the doctrines of theſe gentlemen, is univerſally diſſeminated? Whatever we call it, it ſeems certain, that this power has many ſurpriſing properties, and cannot but be of great moment in the ſyſtem of the univerſe.

To conclude, we muſt obſerve that the ingenious Mr. Wilſon has, in a treatiſe expreſs, endeavoured to account for the phænomena of *electricity*, from Sir Iſaac Newton's æther.

As to other hypotheſes, we refer to the *Hiſtoire generale et particuliere de l'Electricité* before mentioned.

SOUND (*Suppl.*)—The ſpace through which *ſound* is propagated in a given time, has been very differently eſtimated by authors who have written concerning this ſubject. Roberval gives it at the rate of 560 feet in a ſecond; Gaſſendus, at 1473; Merſenne, at 1474; Du Hamel, in the Hiſtory of the Academy of Sciences at Paris, at 1172; the Academy del Cimento, at 1185; Boyle, at 1200; Roberts, at 1300; Walker, at 1338; Sir Iſaac Newton, at 968; Dr. Derham, in whoſe meaſure Mr. Flamſteed and Dr. Halley acquieſced, at 1142. But by the accounts ſince publiſhed by M. Caſſini de Thury, in the Memoirs of the Royal Academy of Sciences at Paris for the year 1738, where cannon were fired at various, as well as great diſtances, under great variety of weather, wind, and other circumſtances, and where the meaſures of the different places had been ſettled with the utmoſt exactneſs, *ſound* was propagated at a medium at the rate only of 1038 French feet in a ſecond. The French foot exceeds the Engliſh by nearly ſeven lines and a half, or is as 107 to 114: And conſequently, 1038 French feet are equal to 1106 Engliſh feet. The difference therefore

of

of the meaſures of Mr. Derham and M. Caſſini is 34 French, or 36 Engliſh feet in a ſecond. According to this laſt meaſure, the velocity of *ſound*, when the wind is ſtill, is ſettled at the rate of a mile, or 5280 Engliſh feet, in $4\frac{77}{100}''$.

UNDULATION, or BEAT, in muſic, is uſed for that rattling, or jarring of ſounds, which is obſerved, chiefly, when diſcordant notes are ſounded together.

The phænomenon is more fully deſcribed thus, by Dr. Smith[a]: In tuning muſical inſtruments, eſpecially organs, it is a known thing, that while a conſonance is imperfect, it is not ſmooth and uniform, as when perfect, but interrupted with very ſenſible *undulations* or *beats*; which, while the two ſounds continue at the ſame pitch, ſucceed one another in equal times, and in longer and longer times, while either of the ſounds approaches gradually to a perfect conſonance with the other, till at laſt the *undulations* vaniſh, and leave a ſmooth, uniform conſonance.—[a Harmonics, p. 107.]

This learned author obſerves farther, that quicker *undulations* are *beats*, and are remarkably diſagreeable in a concert of ſtrong, treble voices, when ſome of them are out of tune; or in a ring of bells ill tuned, the hearer being near the ſteeple; or in a full organ badly tuned. Nor can the beſt tuning wholly prevent that diſagreeable battering of the ears with a conſtant rattling noiſe of *beats*, quite different from all muſical ſounds, and deſtructive of them, and chiefly cauſed by the compound ſtops called the cornet and ſeſquialter, and by all other loud ſtops of a high pitch, when mixed with the reſt. But if we be content with compoſitions of uniſons and octaves to the diapaſon, whatever be the quality of their ſounds, the beſt manner of tuning will render the noiſe of their *beats* inoffenſive, if not imperceptible.

The Doctor has with great ingenuity deduced the theory of theſe *undulations* from his principles, and has applied his doctrine to the tuning of inſtruments; by which he has ſhewn, that a perſon of no ear at all for muſic may ſoon learn to tune an organ, according to any propoſed temperament of the ſcale, and to any deſired degree of exactneſs, far beyond what the fineſt ear, unaſſiſted by theory, can poſſibly attain to. This may be done by counting the number of *undulations* in a certain time, ſuch as 15 ſeconds. See the treatiſe before cited, Prop. xx. p. 215. and the table, p. 244. Plate 20.

From this ingenious theory the learned author has demonſtrated ſeveral errors in what Monſieur Sauveur has delivered concerning theſe *undulations* or *beats*. See Harmonics, Scholium 2. p. 115.

In the ſame treatiſe we find ſome curious obſervations relating to the analogy of audible and viſible *undulations*. See p. 128, 273.

FINIS.

A General Table of Fossils.


Class. 1. Native Fossils

Class. 2. Selenitæ

Class. 3. Crystals

Class. 4. Siderochitæ

Class. 5. Pyritæ

Class. 6. Extraneous Fossils

Class. 7. Corals

Class. 8. Extraneous Fossils.

Class. 9. Fossile Shells

Class. 10. Fossile Bodies once Parts of Animals

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Characters of the Classes in the Linnæan System.

Monandria. Diandria. Triandria. Tetrandia. Pentandria. Hexandria. Heptandria. Octandria. Enneandria. Decandria. Dodecandria. Icosandria.

Polyandria. Didynamia. Tetradynamia. Monadelphia. Diadelphia. Polyadelphia. Syngenesia. Gynandria. Monœcia. Dioecia. Polygamia. Cryptogamia.

Tournefort's General Characters of Flowers.

Petalodes flos. Apetalos flos. Simplex flos. Compositus flos. Flosculus. Semiflosculus.

Tournefort's Classical Characters of Flowers.

Campaniformis flos. Tubulatus campaniformis. Campaniformis patens. Campaniformis globosus. Infundibulus liformis flos. Hypocrateriformis flos. Rotatus flos. Personatus flos.

Labiatus flos. Monopetalus anomalus flos. Cruciformis flos. Rosaceus flos. Caryophyllæus flos. Liliaceus flos.

Polypetalus anomalus flos. Semiflosculosus flos. Calyx. Thalamus. Radiatus flos. Calyx. Thalamus.

Genera of Plants.

Class.1. Plants with Monopetalous Campaniform Flowers

Belladonna. Convolvulus. Oxys. Campanula. Cruciata.

Class.2. Plants with Monopetalous Infundibuliform & Rotated Flowers

Quamoclit. Hyoscyamus. Pervinca. Borago. Nymphoides.

Class.3.d Plants with Monopetalous Anomalous Flowers.

Digitalis. Antirrhinum. Pedicularis. Adhatoda. Acanthus.

Class.4. Plants with Monopetalous Labiated Flowers.

Salvia. Dracocephalon. Brunella. Molucca. Stœchas.

Class.5. Plants with Cruciform Polypetalous Flowers.

Crambe. Alyssoides. Lunaria. Cardamine. Eruca. Raphanistrum.

Class.6. Plants with Rosaceous Flowers.

Papaver. Opuntia. Murucuia. Parnassia. Nymphæa.

Class.7. Plants with Umbellated Polypetalous Rosaceous Flowers.

Umbella Seminum. Oenanthe. Astrantia. Smyrnium. Thapsia. Caucalis.

Class.8. Plants with Polypetalous Caryophylleous Flowers.

Caryophyllus. Lychnis. Cucubalus. Linum. Statice.

Class.9. Plants with Liliaceous Flowers.

Liliasphodelus. Narcissus. Iris. Gladiolus. Dens Canis.

Class.10. Plants with Polypetalous Papilionaceous Flowers.

Cicer. Orobus. Astragaloides. Lotus. Scorpioides.

Class.11. Plants with Polypetalous Anomalous Flowers.

Balsamina. Aconitum. Aquilegia. Melianthus. Orchis. Calceolus.

Class.12. Plants with Flosculous Flowers.

Carduus. Centaurium Majus. Cnicus. Bidens. Scabiosa. Dipsacus.

Class.13. Plants with Semiflosculous Flowers.

Sonchus. Tragopogon. Catanance. Scolymus. Hedypnois. Cichorium.

Class.14. Plants with Radiated Flowers.

Aster. Tussilago. Asteriscus. Xeranthemum. Carlina.

Class.15. Plants with Apetalous or Stamineous Flowers.

Bistorta. Millium. Cyperus. Ricinus. Equisetum.

Class.16. Plants which have Seeds but seem to have no Flowers.

Lonchitis. Trichomanes. Ruta Muraria. Adiantum.

Class.17. Plants which seem to have Neither Flowers nor Seeds.

Fungus. Fucus. Acetabulum. Corallina. Corallium. Madrepora. Lithophyton.

Class.18. Trees & Shrubs with Apetalous Flowers.

Buxus. Terebinthus. Fraxinus.

Class.19. Trees and Shrubs with Amentaceous Flowers.

Ilex. Fagus. Cupressus. Platanus. Salix. Populus.

Class.20. Trees and Shrubs with Monopetalous Flowers.

Jasminum. Styrax. Nerium. Opulus. Xylosteon.

Class.21. Trees and Shrubs with Rosaceous Flowers.

Hippocastanum. Rubus. Staphylodendron. Sena. Mespilus.

Class.22. Trees and Shrubs with Papilionaceous Flowers.

Genista. Siliquastrum. Anagyris. Pseudoacacia. Cytisus.

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BOTANY Tab. 2.

DISTINCTIONS OF THE LEAVES, FLOWERS, AND CUPS OF PLANTS.

Leaves.

Orbiculated
Subrotund
Ovated
Oval
Oblong
Lanceolated
Linear
Subulated
Reniform
Cordated
Lunulated
Triangular
Sagittated
Cordato-sagittated
Hastated
Obversely-cordated
Trilobate
Præmorse
Lobated
Quinquangular
Eroded
Palmated
Pinnatifid
Laciniated
Sinuated
Dentato-sinuated
Retrorso-sinuated
Partite
Repandous
Dentated
Serrated
Duplicately-serrated
Duplicately-crenated
Cartilaginous
Acutely-crenated
Obtusely-crenated
Plicated
Crenated
Curled
Obtuse
Acute
Acuminated
Obtuse with a Point
Acute and Emarginated
Cuneiform and Emarginated
Retuse
Pilose
Tomentose
Hispid
Ciliated
Rugose
Venous
Nervous
Papillous
Linguiform
Acinaciform
Dolabriform
Deltoide
Triquetrous
Canaliculated
Sulcated
Rounded
Binate
Ternate sessile
Ternate petiolated
Digitated
Pedated
Pinnated with an Odd Leaf
Pinnated without an Odd Leaf
Pinnated abrupt
Interruptedly Pinnated
Pinnated and Cirrhose
Conjugately pinnated
Decursively pinnated
Articulately pinnated
Lyrated
Duplicato-ternate

Leaves.

Duplicato-pinnated
Revolute
Reclinate
Horizontal
Patent
Erect
Inflex
Triplicato-ternate
Floral
Vaginant
Amplexicaute
Decurrent
Sessile
Cauline
Seminal
Petiolated
Fasciculated
Triplicato-pinnated without an Odd Leaf.
Imbricated
Alternate
Opposite
Quaternate
Stellate
Articulated
Triplicato-pinnated with an Odd Leaf.
Frondis pinnatus
Frondis articulatus

Parts of CUPS, FLOWERS and FRUITS.

Spathæ
Spathæ
Gluma
Involucrum
Nectaria
Pericarpium
Legumen
Amenta
Bractea
Petalum
Limbus
Tubus
Nectarium
Unguis
Siliqua
Corollula ligulata
Corollula tubulata
Pappous and Coronated Seeds

1
Byssi
2
3.
Confervæ
3
Tremellæ
4
Usneæ
5
Coralloides
6
Lichenoides
7
Mnium
8
Sphagnum
9
Fontinalis
10
Hypna
11
Brya
12
Polytricha
13
Selagines
14
Lycopodia
15
Lycopodioides
16
Selaginoides
17
Porella
18
Anthoceros
19
Lichenastra
20
Lichenes
21
Pilularia

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QUADRUPEDS and SERPENTS


1

Leo,
The Lion.


2

Lewna,
The Lioness.


3

Ursa,
The Bear.


4

Lupus Cervarius,
The Lynx, or Ounce.


5

Catus Pardus,
The Cat of the Mountain.


6

Alce famina, a Female Elk.


7

Gazella,
The Antelope.


8

Rupicapra,
The Chamois.


9

Cervus-Canadenſis,
The Canada-Stag.


10

The Greenland-Buck,
Cervus Spitsbergensis.


11

Vacca-Barbarica,
The Barbary-Cow.

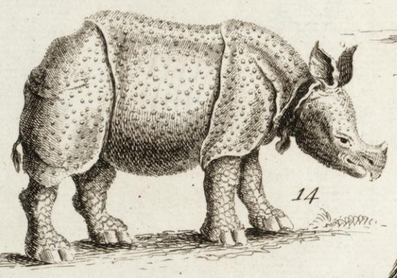

12

Bubalus,
The Buffalo.


19

Lutra,
The Otter.


13


14

Rhinoceros.


15

The Porcupine of
Hudsons Bay.


16

Dromedarius,
The Dromedary.


17

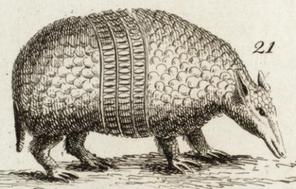
Animal Zibethicum,
The Civet-Cat.


18

Castor,
The Beaver.


20

Coati Mondi.


21

Tatu-Apara,
The long headed Armadilla.


22

Martes,
The Marten.


23

Carigucia.


24

Mustela,
The Weasel.


25

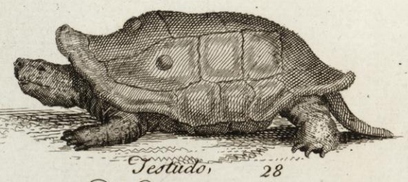
Hystrix,
The Porcupine.


26

Echinus,
The hedge-hog.


27

Mus alpinus, The Marmotte.


28

Testudo,
The Tortoise.


29

Chamæleo,
The Chameleon.


30

Lacerta Viridis,
The Green-Lizard.


31

Lacerta Chalcidica,
The Seps.


32

Aspides, Asps.


33

Hæmorrhous.


34

Lacertus Cyprius,
The Cyprian-Lizard.


35

Americima,
The Brasilian-Lizard.


36

Lacertus Tarantula dictus,
The Tarantula-Lizard.


37

Boyuna.

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THE MORE SCARCE AND CURIOUS BIRDS.

1 Aquila, The Eagle.

2 Æsalon, The Merlin.

3 Subbuteo, The Hobby.

4 The Caracara.

5 Lanius cinereus major, The greater Butcher Bird.

6 Magnocodiata, The bird of paradise.

7 The Horn Owl.

8 Coracias, The Cornish Chough.

9 Corvus Aquaticus, The Cormorant.

10 Garrulus Argentoratensis, The Roller.

11 Pica Brasiliensis, The Toucan.

12 Picus varius major, The great spotted Woodpecker.

13 Jynx Sive Torquilla, The Wryneck.

14 The Aracari.

15 Certhia, The Oxeye. Creeper.

16 Ficedula, Cannabina.

17 Merops, The Bee-Eater.

18 Ispida, The Kingfisher.

19 Struthiocamelus, The Ostrich.

20 Emeu, The Cassowary.

21 The Pintado.

22 The Dodo.

23 The Rothbeinlin.

24 Mituporanga.

25 Urogallus Sive Tetrao major, The great Cock of the Mountain.

26 Urogallus Minor, The Grous.

27 Palumbes torquatus, The Ring-Dove.

28 Otis, The Bustard.

29 Passer Solitarius, The Solitary Sparrow.

30 Merula Torquata The Ring-Ouzell.

31 Atinga.

32 Hortulanus.

33 Ananthe, The White-tail.

34 Guainumbi, The Humming Bird.

35 Luscinia, The Nightingale.

36 Loxia, The Crossbill.

37 Serinus.

38 Passer Indicus, The long-tailed Indian Sparrow.

39 Jaberu-Guacu.

40 The Demoiselle, or dancing Bird.

41 Grus Balearica.

42 Platea, The Spoonbill.

43 Himantopus.

44 The Tamatia.

45 Charadrius, The Sea-Lark.

46 Phœnicopterus, The Flamingo.

47 Columbus cristatus, The great Diver.

48 The Penguin.

49 Brenta, The Brent-Goose.

50 Clangula, The Golden-Eye.

51 Anas niger major, The great Black Duck.

52 Tropicorum Avis, The Tropick-Bird.

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THE MOST SCARCE and REMARKABLE FISHES

1 The Narwal, or Sea-Unicorn.

2 Zygæna, The hammer-headed-Shark.

3 Canis Carcharias, The Shark.

4 Galeus glaucus, The Blue Shark.

5 Pristis sive Serra Clusij, The Saw-Fish.

6 Pastinaca Marina.

7 Squatina, The Monk-fish.

8 Rana Piscatrix, The Frog-Fish.

9 Guaperva, The Toad-Fish.

10 Rhombus aculeatus.

11 Conger, The Sea-Eel.

12 Serpens marinus, The Sea-Snake.

13 Lampetra.

14 Remora, The Sucking-Fish.

15 The Sand-Creeper, or Dwarf.

16 Blennus, The Butterfly-Fish.

17 The Dracunculus, or Exocætus of Bellonius.

18 Orbis, The Moon-Fish.

19 Aper, The Strival, or Riondo.

20 Histrix Piscis, The Porcupine-fish.

21 Guamajacu-Atinga.

22 The Capriscus, or Pesce-Balester.

23 Guaperva longa.

24 Xiphias, The Sword-fish.

25 Acus, The Tobacco-Pipe-Fish.

26 Hippocampus, or Sea-Horse.

27 Mola Salvij, The Sun-Fish.

28 The Ling, or Asellus longus.

29 Thynnus, The Tunny-Fish.

30 The Pogge, or Cataphractus.

31 Thymallus, The Grayling.

32 Lumpus, The Lump-Fish.

33 Gobius Marinus, The Sea-Gudgeon.

34 Tamoata, or The Soldado.

35 The Guaracapema.

36 Monoceros piscis, The Perch-Unicorn-fish.

37 The Sea-Bat.

38 Sphyræna.

39 Clupea, A Shad.

40 Petimbuaba.

41 Milvus Piscis, The flying-Fish.

42 Huso Danubij.

43 Orfus.

44 Studis.

45 Lyra, The Piper.

46 Cuculus, The Rochet, or Red-Gurnard.

47 Lucerna.

48 Uranoscopus, The Star-gazer.

49 Nigui, The Pieterman.

50 Faber, The Doree-fish.

51 Abacatuaia, or The Picxe-Gallo.

52 Pesce Corvo.

53 Auguiuguacu, or Jacob Evertsen.

54 Sargus, The Sargoe.

55 Salpa, The Sarpoe.

56 Boops, The Boga.

57 Corcovada.

58 Brama marina cauda Forcipata, The Sea-Bream.

59 Pavo The Peacock-fish.

60 The Parrot-Beck, or Pudiano Verde.

61 Scorpius, The Sea-Scorpion.

62 Xanthurus.

63 Orbis muricatus, The Prickly Orb-fish.

64 The Bont-Fish.

65 Diabolus marinus, The Sea-Devil.

66 Piscis cornutus, The Horn'd-Fish.

67 Aquila marina, The Sea-Eagle.

68 Piscis Triangularis, The Triangular Fish.

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INSECTS.

Larger Insects.

1 Libella, The Dragon-Fly

2 The Lanthorn-Fly

3 The Common Locust

4 Mantis, The Praying Locust

5 Cicada

6 The Stagshorn'd Beetle

7 Gryllotalpa

8 Scorpion

Butter-flies and Caterpillars

9 Caterpillars

10

11 Chrysalises

Smaller Insects in their Cells and Separate.

Mineurs de Feuilles; or Leaf Insects in their

11 Chrysalises

Trefoil Leaf

12

Sowthistle Leaf & the Fly

Ranunculus Leaf

Honeysuckle Leaf

Oak Leaf

Flies of the Mineurs all with the Path of the Insects

Tæniæ of various kinds.

13

Tæniæ of Cloaths, the Cases, Worms, and Flies

Tænia of the Leaf

Tæniæ of Leaves their Cases Worms and Flies

Tænia of the Elm Leaf

14

Tænia of the Oak Leaf

Tæniæ of the Hornbeam Leaf

15

Tænia of the Artichoak with its Chrysalis

16

Tæniæ Aquaticæ, or Cadworms in their various Cases and naked

17

Papilionaceous Flies of the Tæniæ Aquaticæ

Tænia of the Lilly Leaf with the Scale pursued from p. 18

18

19

Pucerons of various kinds.

20

Tæniæ of Honey-Combs, with their long Pipes or Cases

The winged Rose Puceron magnified

21

Pucerons of the Elder

The naked Rose Pucerons magnified

Pucerons on Branches of Trees in the natural Size & magnified

Pucerons on vitiated Branches of the Lime Tree

21

Pucerons in the Tubercles of the Gooseberry Tree

Excrescences of the Peach Tree magnified

22

Cottony Pucerons of the Beech-Tree

Bastard-Pucerons of various Species with the Flies they are changid to

Bastard-Pucerons of the Fig Tree & Box

23

Puceron-eaters, or Worms

24

A Puceron-Eater on a Branch loaded with Pucerons

The Worm that destroy the Pucerons

Fly of the Puceron-Eater

Crysalis of the Puceron-Eater on a Stick

Leaf-Galls & Insects which occasion them

Flies of the Oak-leaf Galls

25

Oak Leaf Galls

Chamædrys Flower Galls

The Parasite of the Chamædrys Galls

26

Leaf Galls of the Lime

27

The Worm & Fly of the Gallsnut of the Cardus

28

Hæmorrhoidalis natural and magnified

Gallinsects of various Species

29

Gallinsects of the Peach Tree

30

Kermes Gallinsect

The Case of the Gallinsects

Fly with the Nymph all Magnified

The Boat Gallinsects

31

Gallinsects of the Vine

32

Gallinsects of the Oak

33

Nymph & Case of the Boat-Gallinsect

Flies of the Gallinsects

34

The Shell Gallinsect of the Elm

35

Progallinsects of various Species

Progallinsects of the Elm natural size & magnified

36

with the Cotton and without the Cotton

The Cochineal Progallinsect magnified

37

Young Progallinsects of the Elm magnified

38

The Swallows nest Fly in its natural Size

39

The Swallows nest

Fly Magnified

Worms of the Water &c with their Flies

The red-Water Worm

41

40

The Pencill-tailed water Worm

The Shining Canada Worm

44

The Hexapode Worm of the Libella.

45

The Hexapode Water Worm with Oars.

46

The Tail-Water Worm

50

Flies of the Rat

Their Worms and Flies

The Rat-tailed Water Worms

49

52

The Bastard-Caterpillar of the Rose with its Flies

The Fibula of the Rose Tree wounded for receiving the Eggs.

52

The Formicaleo

42

The Fly of the brown jointed waterworm coming out of its Case in its natural size & Magnified

43

Tipulæ & their Worms.

Tipula in Copulation

47

Tipula Larva

Nymph of the Tipulæ

48

Bastard-Caterpillar of the Bramble with its Chrysalis and Flies.

51

Prickly-Caterpillars

Of the Oak

53

Of the Plumb-Tree

54

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ECHINODERMATA or SEA-URCHINS

Cidares

Cidares

miliares 1

Cidares variolatæ 2

Cidares Mammillatæ 3

Cidares asfulatæ 4

Clypeus 5

Scu= Scutum humile 6

=ta

Scutum Altum 7

Arachnoides 8

Mellita 9

Placentæ

Rotulæ 10

Rotulæ 10

Corda marina

Spatangi 11 11

Ovum Marinum 12

Aciculæ Cidaris Variolatæ testæ Affixæ

13

Spatagoides 14

Echinometra Pomum Marinum dicta 15

Echinometra setacea 16

Echinometra digitata 17

SQUILLÆ et CANCERES

Locusta marina Indica 18

19

Squilla lata

Cancellus anatum longimanus 23

Squilla Arenaria 20

Cancer volans 21

Cancer Lanosus 22

Cancer spinosus longimanus minor 24

Squilla lutaria 25

Pagurus 26

Cancer raniformis 27

Cancer Spinosus longimanus major 31

Cancer lunaris 28

Cancer Spinosus 30

Cancer floridus 29

Pediculus Marinus, The Sea-Louse. 33

Cancer Arachnoides, The Spider-Crab. 34

Cancer Spinosus, The Rots-Crab. 32

Cancellus Anatum crassus 37

Cancellus Anatum vulgaris 35

Cancellus Anatum rotundus 36

Cancer Calappoides 38

Cancer Moluccensis, the King-Crab. 39

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A General Table of Shells

Patellæ, Limpets
1
2
Patellæ Limpets
Aures Marinæ
3
Dentalia
4
Cochleæ ore Semirotundo
Cochleæ ore rotundo
5
6
Cochleæ ore Semirotundo
Cochleæ ore rotundo
Cochleæ ore depresso
7
Nautilus
8
Nautilus
Nautilus
Buccina
9
The Admiral
10
The Butterfly
Turbines
11
Turbines
The Vice Admiral
Volu
te
The Shambeau
12
Cylindri
Buccinum
9
Murex
13
Murex
Purpura
14
Purpura
Dolia,
or
15
Conchæ Globosæ
16
Porcellane
17
Ostreæ
Ostreæ
Chamæ
18
Chamæ
19
Mytuli
Pinna Marina
20
Conchæ Cordiformes
21
Conchæ Cordiformes
22
Pectines
Solen
23
Echini Marini
24
Tubuli Marini
25
Balani
26
Pollicipedes
27
Conchæ Anatiferæ
28
Pholades
29
Cochleæ Aquæ Dulcis
30
Fresh Water-Snails
Cochleæ Terrestres
Land-Snails
31

MICROSCOPICAL OBJECTS and DISCOVERIES

Clafs. 1. ANIMAL SUBJECTS

The Circulation of the Blood in the tail of a Small Fish

Palpes of their Natural Sizes

Wheel Animals

Animalcules in the Semen of Different Animals

in the Seed of a Buck

in Semine Humano

in y.e Seed of a Frog

The Circulation in the Membrane of a frog's foot

in the Seed of a Rabbit

The Darts of the Gnat

The Flea

A Mite

The Animal in the Pustules of the Itch

The Louse

Cicendela Volans

The Bell Polype

The Connough Worm

Scolopendra Marina

Proboscides of the Gnat

Crustaceous Animalcules of the Waters

Tail of a Gelatinous animal

Proboscis of the little Black Fish

A Polype magnify'd with its Arms moderately Extended

A Polype of fifteen days old with nineteen Young ones

Arms fully extended

In Dunghill Water

A Bristle of a Mite

Animalcules in various fluids.

In Pepper Water

In Pepper Water

In Common Water

Capillary Eels

in Pepper Water

Capillary Eels

Animalcules in the Seed of a Dog

Animalcules in the Seed of a Stag

Clafs. 2. VEGETABLE SUBJECTS

Farinæ of Plants

Farina of Rice

Of the common Yellow Flag Flower

Of the Tulip

Of Bears-Breech

Of the Honey Suckle

Of the Iris Lavid Yellow Lilly

Of the Common Yellow Lilly

Of the Scabious

Of the Ranunculus

Of the Vine

Of Spelt, Corn or Zea

Of the Poppy

Of the Pink

Of the Thorn Apple

Of the Hypericum

Of the Lysimachia

Of Wormwood

Of the Apple

Of Bindweed

Of the White Lilly

Of the Mallow

Of Henbane

Of the Cabbage

Of the World Cabbage

Of the Narcissus

Of the Sunflower

Of the Egyptian Flower

Of the Oak

Of the Hyacynth

Of the Pear

Of the Service

Of the Anemony

Of the Hawkweed

Of the Turnip

Of the Crown Imperial

Of the Bramble

Of the Jasmine

Of the Gourd

Of Tobacco

Of the Colchicum

Auricula

Of Nightshade

Of Clary

Of the Cucumber

Of the Lilac

Of the Phyteuma

Of the Columbine

SEEDS of PLANTS

White Poppy · Dill · Angelica · Cardinus Benedictus · Plantain · Staves acre · Sorrell · Broom · Rue · Anise · Endive · Grains of Paradise out open · Mace · Macedonian Parsley

Coriander · Teseli · Henbane · Black Pepper · Pimento · Cubebs · Long Pepper · Grains of Paradise · Great Cardamum · Small Cardamom · Amonum

Convich · Ivy · Sicoides · Areca Nut · Myrtle · Seed · Cocculus Indicus · Hemp · Gourd Seed · Flax · Citrull · Pompion · Cashew Nut · Fern

Fern · Wormseed · Musk · Melon · Vervain · Hypericum · Rush · Doves foot · Spanish Strawberry · Centinodi · Ben · Chickweed · Celandine · Black Poppy

Sections of Roots of Plants

Marsh-mallow · Monks Rhubart · Iris · Piony · Dock · Burdock · Deadly Nightshade · Bugloss · Bistort · Asparagus · Bryony · Columbine · Borage · Parsley · Fignort

Clafs. 3. CRYSTALIZATIONS from SALTS and other BODIES

From the fixd Salt of Carduus benedictus

From Salt of Wormwood

from Alum

From Potashes

From Nitre

From Blue Vitriol

from Oil of Tartar per Deliquium

From Potashes

from Camphor

From the Ashes of founderies of Metals.

From the Ashes of Lead Furnaces

From the Soot of the same Furnaces

From Quick Lime

From Quick Lime Made of Shells.

From the Salt of our Glasswort

From the Salt of Glasswort of Britanny

From the Salt of Glasswort of Alicant

From Sal Armoniac.

The constituent Salts of Plants

acid · Alkaline · Nitrous · Marine

Marine Salts of Plants

Of Garden Scurvygrass

Essential Salts of Plants

Of Rosemary · Of Scurvy Grass

Salts of Plants

Of Wormwood · Of Wormwood · Of Rosemary

Essential Salts of Plants

Crystals of Common Sugar

Marine Salts of Plants

Of Fern · Of Wormwood · Of Black Thorn. · Of Wormwood

Crystals of Silver Dissolv'd in A-quafortis

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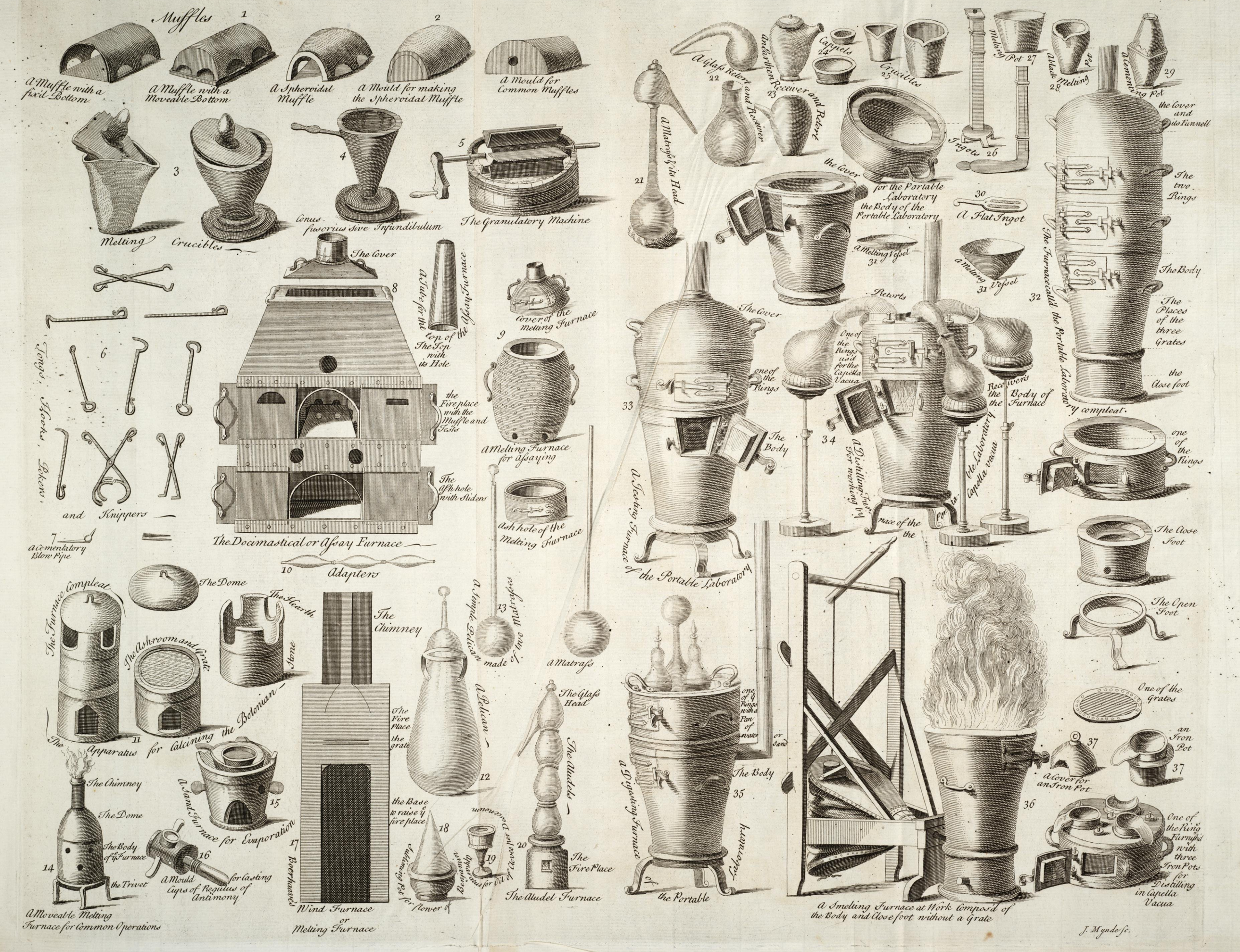
Muffles
1
A Muffle with a fixd Bottom
A Muffle with a Moveable Bottom
A Spheroidal Muffle
2
A Mould for making the Spheroidal Muffle
A Mould for Common Muffles
3
Melting
Crucibles
4
Conus fusorius sive Infundibulum
5
The Granulatory Machine
6
Tongs, Hooks, Pokers, and Knippers
7
A Cementatory Blow Pipe
The Cover
8
A Tube for the top of the Assay Furnace
The Top with its Hole
the Fire place with the Muffle and Tests
The Ash hole with Sliders
The Docimastical or Assay Furnace
10
Adapters
Cover of the Melting Furnace
9
A Melting Furnace for Assaying
Ash hole of the Melting Furnace
A Matrass
A Simple Pelican made of two Matrasses
13
A Pelican
12
The Glass Head
The Aludels
The Fire Place
20
The Aludel Furnace
The Furnace Compleat
The Dome
The Hearth
The Ashroom and Grate
Stone
11
The Apparatus for Calcining the Bolonian
The Chimney
The Fire Place
the grate
the Base to raise ye fire place
17
Boerhaave's Wind Furnace or Melting Furnace
18
Subliming Pot for flower of Benjamin
19
Apparatus for Oil of Cloves per Descensum
A Sand Furnace for Evaporation
15
The Chimney
The Dome
The Body of ye Furnace
14
the Trivet
A Moveable Melting Furnace for Common Operations
16
A Mould for Casting Cups of Regulus of Antimony
A Glass Retort and Receiver
22
An Earthen Receiver and Retort
23
Cappels
24
Crucibles
25
Melting Pot
27
Ingots
26
A Matrass & its Head
21
the Cover for the Portable Laboratory
the Body of the Portable Laboratory
30
A Flat Ingot
A Melting Vessel
31
A Melting Vessel
31
Retorts
The Cover
one of the Rings
33
The Body
A Testing Furnace of the Portable Laboratory
One of the Rings usd for the Capella Vacua
34
A Distilling Furnace for working by the Portable Laboratory Capella vacua
Receivers
the Body of Furnace
Ablack Melting Pot
28
A Cementing Pot
29
the Cover and its Funnell
The two Rings
The Body
32
The Furnace call'd the Portable Laboratory compleat.
The Places of the three Grates
the Close foot
one of the Rings
The Close Foot
The Open Foot
One of the Grates
an Iron Pot
37
A Cover for an Iron Pot
One of the Rings Furnished with three Iron Pots for Distilling in Capella Vacua
one of ye Rings with a Pan of water or Sand
The Body
35
A Digesting Furnace of the Portable Laboratory
36
A Smelting Furnace at Work Compos'd of the Body and Close foot without a Grate

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HUMANITIES REFERENCE

NON-CIRCULATING